Document 3.3 – 2010 Environmental Statement

ES Volume 1 – Appendices for Chapters 1-8

Wheelabrator Kemsley (K3 Generating Station) and Wheelabrator Kemsley North (WKN) Waste to Energy Facility DCO

September 2019 -Submission Version

PINS ref: EN010083

environmental statement technical appendices volume 1

Sustainable Energy Plant, Kemsley Paper Mill, Sittingbourne, Kent.

'DEVELOPMENT OF A SUSTAINABLE ENERGY PLANT TO SERVE KEMSLEY PAPER MILL, COMPRISING WASTE FUEL RECEPTION, MOVING GRATE TECHNOLOGY, POWER GENERATION AND EXPORT FACILITY, AIR COOLED CONDENSERS, TRANSFORMER, BOTTOM ASH FACILITY, OFFICE ACCOMMODATION, VEHICLE PARKING, LANDSCAPING, DRAINAGE AND ACCESS.'

MARCH 2010

E.ON Energy from Waste

ST REGIS

Volume 1 of 4

EIA Scoping Report

FOR A SUSTAINABLE ENERGY PLANT

AT

Kemsley Paper Mill, Sittingbourne, Kent

On behalf of St Regis Paper Co Limited

June 2009

Prepared by:	Jonathan Standen Technical Director	John Gallimore Commercial Director

Date 8 June 2009

34 Lisbon Street
Leeds
LS1 4LX

Reference DLE1726
Tel 0113 220 6190
Fax 0113 220 6191
Email standenj@rpsgroup.com

RPS Planning and Development Ltd. Registered in England No. 02947164
Centurion Court, 85 Milton Park, Abingdon, Oxfordshire, OX14 4RY
A Member of the RPS Group Plc

Planning & Development

FS 32940

Contents

Drawings & Appendices List

Drawings

Appendices

No Appendices

Executive Summary

The paper mill at Kemsley is owned and operated by St Regis Paper Company Ltd (St Regis). producing circa 900,000 tonnes of corrugated case materials and substitute white pulp recycling over 1 million tonnes of recovered UK sourced waste paper.

The paper mill process is highly energy intensive currently consuming circa 60 mw of electricity and 150mw of heat generated from the on site gas fired Combined heat and Power Plant (CHP), the intention is to reduce the site reliance on these fossil fuels.

St Regis is proposing to develop a Sustainable Energy Plant in conjunction with E.ON which will use treated Commercial and Industrial (C&I) waste, municipal solid waste (MSW), and Solid Recovered Fuel (SRF) as the fuel. The proposed development will secure the generation of sustainable energy at the plant, which in turn will support the economic viability of the paper mill.

Currently, the existing E.ON operated CHP plant is designed to generate around 80MW of electricity and 200MW of steam which is supplied to the Kemsley mill. The proposed sustainable energy plant will have a capacity of 500,000 tonnes per annum (tpa) and will produce up to 50MW of electricity and improve the overall sustainability of energy use at the site by using the steam from the proposed plant in the paper making process displacing some of the steam generated from fossil fuel sources.

A Sustainable Energy Plant of this size and nature is deemed to fall under category 10 of Schedule 1 of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999. This identifies “Waste disposal installations for the incineration or chemical treatment (as defined in Annex IIA to Council Directive 75/442/EEC under heading D9) of non hazardous waste with a capacity exceeding 100 tonnes per day” as schedule 1 development. The regulations require EIA in every case for schedule 1 development. An Environmental Impact Assessment will therefore be undertaken to allow the environmental impacts of the proposed development to be assessed. The resulting Environmental Statement will be submitted alongside the planning application for the proposed development.

This report has been prepared to assist in the formal scoping of the environmental impacts of the proposed development that will need to be addressed in the EIA. The report sets out:

- Details of the proposed development;
- Details of the site and its surroundings;
- Details of the proposed content of the EIA following initial consideration of the relevant environmental issues pertinent to the proposed development.

1 Introduction

1.1.1 The paper mill at Kemsley is owned and operated by St Regis Paper Company Ltd (St Regis) producing circa 900,000 tonnes of corrugated case materials and substitute white pulp, recycling over 1 million tonnes of recovered UK sourced waste paper.

1.1.2 The paper mill process is highly energy intensive currently consuming circa 60 mw of electricity and 150 mw of heat generated from the on site gas fired Combined Heat and Power Plant (CHP), the intention is to reduce the site reliance on these fossil fuels.

1.1.3 St Regis is proposing to develop a Sustainable Energy Plant in conjunction with E.ON which will use treated Commercial and Industrial (C&I) waste, municipal solid waste (MSW), and Solid Recovered Fuel (SRF) as the fuel. The proposed development will secure the generation of sustainable energy at the plant, which in turn will support the economic viability of the paper mill.

1.1.4 Currently, the existing E.ON operated CHP plant is designed to generate around 80MW of electricity and 200MW of steam which is supplied to the Kemsley mill. The proposed sustainable energy plant will have a capacity of 500,000 tonnes per annum (tpa) and will produce up to 50MW of electricity and improve the overall sustainability of energy use at the site by using the steam from the proposed plant in the paper making process displacing some of the steam generated from fossil fuel sources.

1.1.5 St Regis have identified a preferred site located to the north east of the site and adjacent to the existing paper mill whose location is shown on Figure 1.1.

1.1.6 A Sustainable Energy Plant of this size and nature is deemed to fall under category 10 of Schedule 1 of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999. This identifies "Waste disposal installations for the incineration or chemical treatment (as defined in Annex IIA to Council Directive 75/442/EEC under heading D9) of non hazardous waste with a capacity exceeding 100 tonnes per day" as schedule 1 development. The regulations require EIA in every case for schedule 1 development. An Environmental Impact Assessment will therefore be undertaken to allow the environmental impacts of the proposed development to be assessed. The resulting Environmental Statement will be submitted alongside the planning application for the proposed development.

1.1.7 Regulation 10(1) of the 1999 Regulations provides for a person who is minded to make an EIA application to ask the relevant planning authority to state in writing their opinion as to the information to be provided in the Environmental Statement.

1.1.8 Although not legally required by the Regulations, scoping is an important facet of EIA. This importance was highlighted in paragraph 2.2 of the Department of the Environment's Good Practice Guide 24, which states:

"Defining the scope is one of the most critical parts of an EIA in that it sets the context for what follows. If the scope is defined too narrowly, some critical area of uncertainty or adverse effect may emerge late in the day. Decisions on the shape of the project may then be too far advanced to allow for any real change. On the other hand, if the scope of the work is too loosely defined, then much time, effort and cost may be spent on pursuing unnecessary detail".

1.1.9 This report has been prepared to assist in the formal scoping of the environmental impacts of the proposed development that will need to be addressed in the EIA. The report sets out:

- Details of the proposed development;
- Details of the site and its surroundings;

- Details of the proposed content of the EIA following initial consideration of the relevant environmental issues pertinent to the proposed development.

2 Description of Proposed Development

2.1 Introduction

2.1.1 The Sustainable Energy Plant will be located on land to the north east of the existing paper mill complex. The land had historically been used for the storage of coal (fringe area) with some building material and soil depositions, however since 1995 it has been used very little other than as a construction lay down area and as a temporary storage facility.

2.1.2 Details of the proposed development are provided below. At this scoping stage, the details are in outline form only and may be amended as the result of issues identified through the Scoping and EIA process.

2.1.3 In summary, the development will comprise:

- A Sustainable Energy Plant with a fuel stock capacity of 500,000 tonnes per annum (tpa);
- An ash treatment facility to stabilise up to 150,000 tpa of boiler ash;
- Ancillary development including internal roads, parking, weighbridge, water treatment tanks, fuel tanks, fencing, landscaping and offices.
- The facility will use combustible non hazardous waste including solid recovered fuel (SRF) as the fuel source.

2.1.4 Details of the exact siting of the buildings have not yet been finalised as this will be determined following further site investigation and assessment works and through the EIA process to enable the most appropriate layout with minimal environmental impact to be designed. An indicative site layout is, however provided in Figure 1.2.

2.2 Sustainable Energy Plant

2.2.1 The Sustainable Energy Plant will be comprised of up to three individual but identical process lines. Each line will consist of a combustion zone, heat recovery zone and a flue gas treatment area before the cleaned gasses are released to atmosphere via a stack.

Waste reception and Solid Recovered Fuel (SRF) Reception and Handling

2.2.2 All fuel feedstock will be delivered pre treated to the plant by means of bulk transporters. No processing of waste fuelstock will take place on site and no Roadside Collection Vehicles (RCVs) will be allowed access to the site.

2.2.3 Delivery vehicles arriving at the plant will be weighed on one of two automatic weighbridges before and after discharging their load into the storage bunker located within the plant tipping hall. The storage bunker serves all three process lines.

2.2.4 The fuel stock storage bunker and tipping floor will be enclosed within the main Plant building. Air will continuously be drawing into the main combustion plant to enhance ventilation and minimise the escape of any odours.

2.2.5 The reception and handling equipment (including mobile equipment) will be designed to allow the fuel bunker to be back-loaded into articulated vehicles in the event of extended maintenance periods and/or shutdowns.

Efficient Combustion Technology

2.2.6 Two automated overhead grabbing cranes will feed the fuel stock into the combustion units via an inclined feed chute. The feed chute exits onto the combustion grate.

2.2.7 The core of the Plant is the combustion grate which is designed to ensure the efficient and complete combustion of the fuel whilst minimising the creation of polluting gases. The grate consists of a series of stepped horizontal moving bars, which move alternately in order to mix and progress the fuel stock down and across the combustion chamber.

2.2.8 When the fuel stock reaches the end of the combustion grate, only the inert or incombustible material remains. This material is known as Bottom Ash. The bottom ash is cooled in a water bath and then ferrous material is removed using an electromagnet (within the bottom ash treatment plant). The ferrous material is collected and taken off site for recycling. The remainder of the Bottom Ash is mechanically conveyed to an on site treatment facility.

2.2.9 The heat released by the combustion of the fuel stock is recovered in a water tube boiler, which is integral to the grate. The high pressure superheated steam produced by the boiler is fed to a pass out condensing turbine linked to an air-cooled condenser. Steam passed out from the turbine will be used efficiently by the Kemsley mill in the paper drying process. Electricity is generated in a generator driven by the turbine. The Plant consumes up to 15% of the electricity produced by the process, the balance (around 85%) either being exported to the National Grid through a step up transformer, or is used directly by the paper mills.

Flue Gas Treatment (FGT) and Residues

2.2.10 A semidry flue gas system will be designed to meet or exceed the most stringent values derived from the EC Waste Incineration Directive (2000/76/EC). To reach these emission levels, the following reagents are used: Hydrated Lime ($Ca(OH)_2$), Activated Carbon and Urea or Ammonia Reaction products. The products of reaction of these materials, along with gasses and particulates carried over from the grate are collectively known as Air Pollution Control (APC) residues and are collected in powder form at the bottom of the baghouse filter before the cleaned gases pass to the atmosphere through the stack.

2.2.11 Due to the use of hydrated lime in the FGT, the Air Pollution Control residues are alkaline and are classified as hazardous waste. As a result, the residues will be removed from the site via a vacuum tanker or IBC (Intermediate Bulk Containers) ‘Big Bags’ for safe disposal at a suitably licensed landfill facility or for use by the chemical industry as a neutralising agent for the treatment of acidic wastes.

Cleaning Reagent Storage

2.2.12 Flue gas cleaning reagents will be stored in bulk silos or containers. Storage containers will be fitted with appropriate safeguards against spillage or leakage. Water treatment chemicals will similarly be stored in bulk silos or containers.

Bottom Ash

2.2.13 Bottom ash is the cooled burnt-out residue from the combustion process as described above. Around 25% of the fuel burnt is expected to be converted to bottom ash. For a 500,000 tpa plant this equates to up to 150,000 tpa of bottom ash.

2.2.14 It is likely that the processing and stabilisation of the bottom ash residue, for reuse as an aggregate, will be undertaken at an on site Ash Processing Facility. The facility will pass the ash through screens to grade the ash prior to storage and stabilisation for 3 months. This means that at any time up to 35,000 tonnes of bottom ash will be stored within the Ash Processing Facility. The wet ash will be retained within a bunded facility to prevent any leachates from contaminating the local environment.

Water Usage, Treatment And Disposal

2.2.15 The Sustainable Energy Plant is designed as a net consumer of water and therefore there is no requirement for regular disposal of any waste water from the combustion process. However waste waters are created from the process in the following areas:

- Water from the boiler drains
- Back – flushing water from the de mineralisation plant
- Wash down water from surface cleaning
- Ash discharger occasional overflow
- De- aerator occasional overflow
- Surface water on potentially contaminated areas (roads and hardstanding).
- Leachate from the bottom ash storage area.

2.2.16 These will be routed to the existing paper mill waste water treatment plant. The paper plant is supplied water from licensed abstraction points.

2.3 Environmental Controls

2.3.1 Odour, dust and other environmental impacts in the Plant Tipping Hall are controlled in accordance with the requirements of the Environment Agency. Odours from the facility and tipping hall are effectively managed through the generation of negative pressure within the facility created by the air intake fans to the combustion process. These will continuously draw air from within the building for use within the combustion process, thereby consuming any odours arising.

2.3.2 Doors will be fitted with automatic door closures, where required.

2.4 Fuel Types, Inputs and Sources

Fuel Types

2.4.1 The fuel feedstock will consist of treated waste only. As a minimum the project will require that waste sources will have been treated by the following means;

- Metals removal
- A sorting process to remove a proportion of inert material and recyclables.
- Residual Biodegradable Waste will have been shredded as a minimum.

Inputs/Capacity

2.4.2 The Sustainable Energy Plant will combust up to 500,000 tonnes per annum (tpa) waste feedstock, depending on the Net Calorific Value. The Plant will be designed as a three stream process having a joint capacity of 63 tonnes per hour (tph). A three-line plant provides operational flexibility during periods of routine maintenance, enabling one line to be shut down whilst the remaining lines continue to operate.

2.4.3 The fuel bunker will be sized to contain the fuel delivered in the course of normal operations, allowing for normal seasonal and day to day fluctuations. This also allows for the manual mixing of waste using the overhead cranes which assists in the creation of an homogenous feed stock.

Fuel Sources

2.4.4 The fuel feedstcok will be sourced from the various authorities in the South East of England (particularly Kent) and will originate from both municipal and C & I sources. The South East generates over 10 M tonnes of municipal waste and over 20 M tonnes of C & I waste annually.

2.4.5 The sustainable energy plant will be subject to operating controls under the Environment Agency Environmental Pollution Prevention and Control (PPC) permit, which will be required prior to operation.

Outputs and Markets

2.4.6 Outputs in the form of Air Pollution Control Residue, Bottom Ash, Ferrous metal will result from the Facility.

2.4.7 The final destinations of these materials are not yet confirmed.

2.5 Traffic Generation

2.5.1 The proposed development will generate movements of heavy goods vehicles (HGVs) and staff cars. The number of HGVs associated with the transportation of waste feedstock to and from the sustainable energy plant and ash treatment facility will be confirmed but is likely to be in the order of some 112 inbound vehicles over the day (Based on 88 18 tonne HGVs for waste feedstock delivery working 6 days per week, 20 for ash removal and 4 for reagents), a two-way total of some 224 vehicles. Similarly, peak hour HGV movements will be confirmed but are likely to be highest in the morning peak hour at some 30 HGVs two-way flow. The number of staff car movements will be low and are currently estimated at 20 vehicles at peak times.

2.6 Rail Connection

2.6.1 The route for rail connection to the site for the delivery of waste feedstock in bulk has been identified within the current site plan and is being considered.

2.7 Use of Ridham Dock

2.7.1 The opportunity for importing waste feedstock to the site by barge using Ridham dock is presently being considered.

2.8 Hours of Operation

2.8.1 Permission will be sought to enable the facility to receive waste feed stock 24 hours a day, 7 days per week.

2.8.2 The 24 hour arrangements are required to provide operational flexibility for the waste disposal authorities producing the waste feed stock.

2.8.3 The incoming waste feedstock will be stored in the fuel bunker to supply the plant during the night and over the weekend and bank holidays.

2.8.4 In practice, the majority of waste feedstock will be delivered during Monday to Friday and on Saturday mornings. A small amount of waste may be delivered on Saturday afternoons or Sunday.

Fuel Processing

2.8.5 The Sustainable Energy Plant will burn waste feedstock and produce heat and power 24 hours a day, 7 days a week. It will operate continuously throughout the year except during shutdowns for maintenance

2.9 Site Staff

2.9.1 The facility will employ approximately 50 staff full time working on a combination of shift and daytime working hours. The majority of these will be day workers with a minimum of 4 operators per shift. All staff will be suitably trained, qualified and experienced.

2.10 Parking Provision

2.10.1 Parking provision will be made for employee's cars, parking spaces for visitors cars, parking place for visitor party buses.

2.11 Generally

2.11.1 The proposals will be fully described in respect to:

- Fencing and Site Security
- Access
- Surface Water Drainage
- Utilities
- Construction

2.12 Environmental Controls

2.12.1 Environmental monitoring procedures will be provided in accordance with the requirements of the Environment Agency. Sustainable construction principles will be incorporated in accordance with Good Industry Practice.

2.13 Timescales

2.13.1 The current estimates for the development timescales are as follows:

- Construction commencement; August 2010
- Construction completion: May 2012
- Commissioning: June 2012– August 2012
- Run-in period: November 2012 – February 2013.

3 The Site and Its Setting

3.1 Introduction

3.1.1 In order to identify the scope of the issues that will need to be addressed by the EIA, it is necessary to understand the characteristics of the site and the surrounding area that may be affected by the proposed development.

3.1.2 Details of the site are provided below and within the following sections. At this scoping stage, the description of the site is based on an initial desk study and limited site inspections only. More extensive investigations will take place as part of the full EIA.

3.2 Location

3.2.1 The site is located on land adjacent to and immediately north east of the existing Kemsley Paper Mill (OS Grid reference 592070, 166551) as indicated on Figure 1.1. More generally it lies some 3km to the north of the centre of Sittingbourne and 1.3km to the north east of Kemsley town centre. The village of Iwade is also located approximately 2.5km to the northwest, just beyond the A249 which links the town of Sheerness some 8km to the north, on the Isle of Sheppey with Sittingbourne and the A2 and M2 further south.

3.3 Site Description

3.3.1 The proposed development site comprises an area of approximately 5 hectares as indicated on Figure 1.2.

3.3.2 The Kemsley Mill site currently comprises a paper mill and associated infrastructure, including access, car parks and administration buildings.

3.3.3 By road Ridham Avenue is the main access road for the paper mill and runs in an east to west direction along the southern boundary of the paper mill complex. The Site is accessed from the A249 via Swale Way (Western Entrance) or from Swale Way onto Barge Way (Northern Entrance).

3.3.4 The proposed development site is "brown-field" in character, with the wider area to the north comprising marsh land. Other areas in close proximity to the site comprise mostly bare ground with sections of dense and scattered scrub together with semi-improved grassland, bounded by a sea wall protecting the land from the tidal effects of the Swale estuary. Signs of the historical 1970s paper mill waste tipping activity are evident in the surrounding land although the tips used have since been restored and levelled and are covered by scrub vegetation and grassland. One tip to the south east of the site remains visible.

3.3.5 The Swale River lies to the east, separating the area of land on which the site sits from the Isle of Sheppey to the north. The route of a dismantled railway bisects the western and south western wedge of the site as it runs southwards away from Ridham Dock.

3.4 Access

3.4.1 The site is accessed via the Swale Way section of the Sittingbourne Northern Relief Road which, when complete will provide a route around the north of Kemsley and Sittingbourne to join the A2 at Bapchild. Having opened in 2005, Swale Way serves a number of industrial uses in the area including Kemsley Mill and Ridham Dock to the north. The northern relief road enables traffic associated with the sites to avoid the settlement of Kemsley by providing the main road link to the A249.

3.4.2 The A249 serves as the main link between Sheerness on the Isle of Sheppey to the north and Maidstone to the south with the A2 and Sittingbourne located in between. The A249 also provides a strategic connection with the M2 and M20 further to the south.

3.5 Planning History (Kemsley Paper Mill & Site)

3.5.1 The manufacture of paper in Sittingbourne has taken place for over 300 years. In 1924, Kemsely Mill was built as a way of expanding operations carried out at the Sittingbourne Mill. Kemsley Garden Village was built at the same time to house the mill workers.

3.5.2 The wider Mill site has a long and complex planning history with numerous planning consents having been approved and implemented since the 1970s. There have been other major planning applications for Paper Mill Developments but those planning consents considered to be the most relevant to this proposed development are summarised in the following table:

Application No.	Development	Decision
SW/76/453	The development of land adjoining Kemsley Mill for the disposal of mill derived waste.	Approved by Kent County Council. 1 September 1977.
An application made under S.36 of the Electricity Act 1989. SW/92/999.	The construction and operation of a combined heat and power gas turbine generating station	Approved by the Secretary of State for Trade and Industry. 27 August 1993.
SW/94/0064	The construction of a paper recycling facility and associated facilities.	Approved by Swale Borough Council. 29 April 1994
SW/98/218	Extension to the existing Combined Heat And Power (CHP) plant to deal with paper related wastes from Kemsley and Sittingbourne Paper Mill sites.	Approved by Kent County Council. 23 September 1998
SW/98/367	Construction of hard standing for the storage (Class 8B) of paper bales and overnight lorry parking associated engineering works and erection of fencing, floodlighting and fire hydrants.	Approved by Swale Borough Council. 3 November 1998

3.5.3 In September 1977, Kent County Council granted planning consent (reference SW/76/453) for the continued use of land adjoining the mill for the disposal of inert solid waste and other non-toxic wastes arising from the paper mill including mill effluent slurry, fly ash, wood bark, sawdust, hardboard strippings and waste paper.

3.5.4 The areas of land the subject of this consent comprised five individual disposal sites, three of which were located on Kemsley Marshes to the east of the mill and adjacent to the mud flats of the Swale estuary, with one located just south of the mill and the fifth located to the north of Kemsley Marshes and the disused dock.

3.5.5 On 27 August 1993, a decision was made by the Secretary of State for the Department of Trade and Industry to permit the construction and operation of a Combined Heat and Power gas turbine generating station with a capacity of 85MW at the mill. The CHP plant replaced an existing coal-fired power station and associated boilers and was developed on an area of adjoining land to the east of the main mill complex.

3.5.6 The CHP plant comprises one gas turbine, one steam turbine, ancillary equipment and buildings. The plant was commissioned in 1995, it is operated by E.ON and supplies heat and electricity to Kemsley Mill for St Regis Paper Company Limited.

3.5.7 In April 1994, Swale Borough Council granted planning consent (reference SW/94/0064) for the construction and operation of a paper recycling facility and associated facilities. This enabled the paper mill to receive waste paper from Kent and Greater London and incorporate the recycled paper pulp into the paper manufacture process.

3.5.8 The paper recycling facility occupies a large area of land located in the western segment of the main paper mill complex.

3.5.9 Kent County Council granted planning consent on 23 September 1998 (reference SW/98/218) which permitted an extension to the existing combined heat and power (CHP) plant to deal with paper related wastes from the Kemsley and Sittingbourne Paper Mills (now closed). The extension took place on an area of land located within the main CHP plant complex and comprises:

- PRW (fibrous sludge-cake) storage plant;
- Fluidised bed combustion plant / boiler house;
- Fabric filter building;
- Two ash hoppers adjoining the waste storage plant; and
- One 72m high chimney stack.

3.5.10 A further planning consent (reference SW/98/367) was granted on 3 November 1998, by Swale Borough Council, permitting the construction of an area of hardstanding for the storage of paper bales and overnight lorry parking. This consent related to the area of land on which the new Sustainable Energy Plant is proposed.

3.6 Surrounding Land Uses and Proximity to Sensitive Receptors

General

3.6.1 The site at Kemsley Mill is located within Kent's Swale District. Coldharbour Marshes and Ridham Dock lie to the north together with an area of land occupied by industrial works. A series of lagoons, drains and a dismantled railway also exist to the north generally and an electricity sub station is located to the west of the site from which pylons run northwards across the landscape.

3.6.2 The site is immediately surrounded to the north, east and south by Kemsley Marshes with the main mill complex occupying land immediately to the south west and west. An outfall and three large raw water lagoons are located just to the south of the site together with the railway head for the Sittingbourne and Kemsley Light Railway.

3.6.3 The main settlement in the vicinity of the site is the town of Kemsley located approximately 1km to the south west.

Residential Properties/Areas

3.6.4 There are no residential receptors located adjacent to or in close proximity to the site. The nearest properties are located approximately 730m to the south west of the site along the north eastern edge of Kemsley.

Ecological Designations

3.6.5 The site is not covered by any statutory nature conservation designations, however The Swale Estuary and Medway Estuary and Marshes cover a large area of land spreading from the north west round to the south east of the site. These areas are designated Sites of Special Scientific Interest (SSSIs), Special Protection Areas (SPAs) and are also internationally designated RAMSAR sites.

3.6.6 Located approximately 0.2km from the site, The Swale SSSI, SPA and RAMSAR site is the largest remaining area of freshwater grazing marsh in Kent and a good example of estuarine habitat. The Medway Estuary and Marshes SSSI, SPA and RAMSAR site forms the largest area of intertidal habitats in Kent and is located approximately 2km from the site. Both sites are internationally important for wintering wildfowl and waders.

3.6.7 Elmley Island, a National Nature Reserve (NNR) is located to the north east on the Isle of Sheppey, approximately 0.6km from the site. It provides grazing marsh and estuarine salt marsh habitat which attracts wintering wildfowl and waders.

3.6.8 The closest area designated for its nature conservation interest is the Milton Creek, Sittingbourne Site of Importance for the Nature Conservation (SINC). The SINC is important for the existence of saltmarsh, wet pasture and freshwater dykes. It lies approximately 0.2km to the south of the site at its closest point and covers a strip of land stretching southwards from the site towards Sittingbourne.

Historical/Archaeological Designations

3.6.9 A search of all designated and non-designated archaeological sites has shown no sites are recorded within the site boundary. No part of the site is situated within a Conservation Area, a registered Historic Park or Garden or a Historic Battlefield.

3.6.10 There are two Scheduled Ancient Monuments within a 2km radius of the site:

- 'Castle Rough' Medieval Moated Site
- Murston Old Church, Sittingbourne

3.6.11 Eighteen additional Scheduled Ancient Monuments are recorded within a 10km radius.

Roads

3.6.12 The site is accessed via the Swale Way section of the Sittingbourne northern relief road. The main access road stems from a roundabout adjoining Swale Way.

Public Rights of Way

3.6.13 The Saxon Shore Way promoted path is approximately 500m from the proposal site to the south east as it follows the western shoreline of Milton Creek. There are no other public rights of way within 1km of the proposal site.

4 Proposed Content of the EIA

4.1 Introduction

4.1.1 The proposed content of the Environmental Impact Assessment (EIA) has been developed following an initial screening exercise, a number of desk based topic specific assessments and site visits where appropriate, a review of the relevant development plan policy and RPS's previous experience of similar developments.

4.1.2 The EIA will assess the potential significant impacts associated with the proposal. The individual EIA subjects/topics proposed include the following:

- 1. Background, Introduction and Context
- 2. The Site and its Setting
- 3. Planning History and Planning Policy Context
- 4. Description of Development
- 5. Need Alternatives
- 6. Traffic and Transportation
- 7. Air & Climate (including Human Health)
- 8. Landscape and Visual Impact
- 9. Ecology and Nature Conservation
- 10. Hydrology and Flood Risk
- 11. Hydrogeology and Ground Conditions
- 12. Noise & Vibration
- 13. Archaeology and Cultural Heritage
- 14. Socio-Economic Impact
- 15. Amenity
- 16. Summary

4.1.3 Together, these subjects will form the Environmental Statement document. Liaison between consultants will take place where necessary to ensure that where issues may cross over subjects, they are dealt with in the most appropriate way.

4.1.4 Each assessment will consider the impacts during both the construction and operation phase and also the cumulative impacts of the proposal. Each subject area will be discussed under a separate chapter within which the following matters will be addressed where relevant:

- Introduction
- Planning Context
- Assessment Methodology
- Baseline Conditions
- Incorporated Enhancement and Mitigation
- Identification and Evaluation of Key Impacts
- Mitigation
- Residual Impacts
- Conclusions

4.1.5 The following sections describe the context of each topic based upon information currently available and the proposed scope of each topic assessment to assist consultees in assessing its adequacy.

4.2 Background, Introduction and Context

4.2.1 This section will include narrative on the format and content of the ES and the statutory background to the EIA process.

4.2.2 It will also include information regarding the applicant, the assessment team and the organisation of the ES.

4.3 The Site and Its Setting

4.3.1 This part of the Statement will describe the general physical and environmental characteristics of the application site and its surrounding environs. Other chapters of the Environmental Statement will provide detailed descriptions of the application site in relation to particular environmental topics, providing “base line” surveys against which the effects of the proposals may be evaluated.

4.4 Planning History & Planning Policy Context

Context

4.4.1 This section will include information regarding the planning history of the site and a summary of the policy context at the European, national, regional and local level. The relevant policies will be reviewed and key points of relevance summarised. This will set the context for more detailed topic analysis that will be included in the specific chapters of the ES.

Proposed Scope of Assessment

4.4.2 The proposal will be reviewed in the light of European, National and Regional Policy including The Landfill Directive, The Habitat Regulations, PPS10, Waste Strategy for England 2007, PPS22, Renewable Energy, PPS23 Planning and Pollution Control and the Regional Spatial Strategy for the South East (RSS9) or 'The South East Plan'.

4.4.3 An initial review of the relevant development plan documents has identified the following documents and policies considered to be relevant to the proposals:

- RPG9: Regional Planning Guidance for the South East, RPG 9, March 2001.
- RPG9: Chapter 9: Regional Transport Strategy, July 2004.
- RPG9: Chapter 10: Energy Efficiency and Renewable Energy, Nov 2004.
- RPG9: Chapter 10: (Waste), and Chapter 11 (Minerals) June 2006.
- RPG9a: The Thames Gateway Planning Framework, June 1995.
- RSS: The 'South East Plan', Draft Plan for Submission, March 2006.
- Kent & Medway Structure Plan 2006, Adopted July 2006. (until the South East Plan is approved).
- Kent Waste Local Plan, March 1998. (Saved' Policies).
- Swale Borough Local Plan, February 2008.

4.4.4 The key saved policies of the Kent Waste Local Plan relevant to the proposals are considered to be: Policy W11 Waste to Energy, Policy W3 Locational Criteria, Policy W6 Need and Policy W17 Incinerators – Emissions and Air Quality.

4.4.5 Other relevant saved policies within the Kent Waste Local Plan include: Policy W18 Environmental Controls, Policy W20 Land Drainage and Flood Control, Policy W21 Nature Conservation, Policy W22 Access, Policy W25 and Policy W25A Siting, Design and External Appearance, Policy W27 Public Rights of Way and Policy W31 Landscaping Schemes.

4.4.6 The key policies of the Kent and Medway Structure Plan 2006 relevant to the proposals are considered to be Policy SW1 Swale Area Policy, Policy WM1 Integrated Waste Management, Policy WM2 Assessment Criteria for Waste Proposals, Policy WM4 Planning for Waste Management Capacity, Policy WM6 Assessment of Strategic Waste Management Facilities, Policy NR1 Development and Prudent Use of Natural Resources, Policy NR2 Energy Generation, Policy NR3 Renewable and Sustainable Energy Production, Policy NR4 Combined Heat and Power Generation and Policy NR5 Pollution Impacts.

4.4.7 Other relevant policies within the Structure Plan include Policy EN1 Protecting Kent's Countryside, EN2 Protecting Kent's Coast and Estuaries, Policy EN3 Protection and Enhancement of Countryside Character, Policy EN5 Special Landscape Areas, Policy EN6 International and National Wildlife Designations, Policy EN7 County and Local Wildlife Designations, Policy EN8 Protection, Conservation and Enhancement of Biodiversity, Policy EN9 Trees, Woodland and Hedgerow and Policy EN12 River Corridors, Policy EP1 Land, Workforce, Education and Skills, Policy EP2 Employment Land Provision, Policy EP4 Locations of Strategic Importance for Business, Industrial or Distribution Uses and Policy EP11 Tourism Development and Regeneration are also relevant together with Policy TP1 Integrated Transport Strategy, Policy TP3 Transport and Location of Development, Policy TP4 Safeguarding of Programmed Strategic Transport Schemes, Policy TP6 Major Transport Corridors, Policy TP7 Further Thames Crossing, Policy TP8 Future Strategic Transport

Schemes, Policy TP12 Development and Access to the Primary/Secondary Road Network, Policy TP13 Rail Freight and Handling Facilities, Policy TP15 Development Traffic and Heavy Goods Vehicles, Policy TP17 Traffic and Management of Minor Roads, Policy TP19 Vehicle Parking Standards, Policy TP 23 Major Distribution and Transport centres and Policy QL1 Quality of Development and Design.

4.4.8 The proposed site for the Sustainable Energy Plant lies within the Swale Borough administrative area and will also be subject to the policies contained within the Swale Borough Local Plan. A Public Local Inquiry into the Deposited and Re-deposited Plans was held between 20 April 2006 and 12 January 2007. The Inspector's Report on the objections to the Local Plan was received by the Council in December 2007.

4.4.9 The key policies of the local plan are considered to be: Policy E1 General Development Criteria, Policy E2 Pollution, Policy B2 Providing for New Employment, Policy T1 Providing Safe Access to new development and Policy T6 Maximising the Use of the Railways and Waterways for Commercial Purposes.

4.4.10 Other relevant policies include: Policy E4 Flooding, Policy E9 Protecting the quality and Character of the Borough’s Landscape, Policy E11 Protecting and enhancing the Borough’s Biodiversity and Geological Interests, Policy E12 Sites of Biodiversity and Geological Conservation Value, Policy E13 The Coastal Zone and Undeveloped Coast, Policy E16 Scheduled Ancient Monuments and Archaeological Sites, Policy E19 Achieving high Quality Design and Distinctiveness, Policy E20 Promoting Safety and Security Through design, Promoting High Quality Design, Policy H2 Providing for New housing, Policy T3 Vehicle Parking for New development, Policy T4 Cyclists and Pedestrians, Policy T5 Public Transport, Policy B10 and B11 Existing Committed Employment Sites, Policy H5(3) Housing Allocations and Policy T8 Sittingbourne Northern Relief Road.

4.5 Description of Development

4.5.1 This section will describe the development for which planning permission is sought including the layout of the proposed facility together with description of the processes to be undertaken on site and will set out the basis against which the Environmental Impact Assessment will be conducted. It will also include a description of management and procedures associated with the operations.

4.6 Need and Alternatives

4.6.1 The need for energy generation and management of waste at the Mill will be considered to ensure the success of the historic mill operations. Given the nature of the proposals, and its intrinsic relationship with the existing Mill, the assessment of alternatives will be limited. However, this will include a qualitatitive analysis of alternative options for energy generation and alternative layouts for the development proposals considered by the applicant.

4.7 Traffic and Transportation Issues

Context

4.7.1 The Kemsley Paper Mill was formerly accessed from Ridham Avenue that runs west from the site through Kemsley to connect to the A249 via Grovehurst Avenue and Grovehurst Road. The first section of the Sittingbourne Northern Distributor Road from the southern roundabout of the A249 'Dumbbell' junction north of Kemsley to the industrial area north-east of Kemsley was opened in January 2005. This section of the Distributor Road is known as Swale Way and provides a direct, high quality link between the site and the A249 Trunk Road. The vehicular connection between the site and Ridham Avenue has been severed and replaced with a pedestrian/cycle link.

4.7.2 The A249 connects with both the A2 west of Sittingbourne and the M2 at junction 5. To the north the A249 provides access to the Isle of Sheppey.

4.7.3 The purpose of the Northern Distributor Road is to relieve the A2 that runs east west through Sittingbourne and operates at capacity during some periods of the day. It is planned that Swale Way will be continued to the south-east over Milton Creek to connect with the A2 at Bapchild, east of Sittingbourne. The scheme has Local Transport Plan provisional funding of £29m and Sustainable Communities provisional funding of £10.4m from Government and a developer contribution

4.7.4 The site lies adjacent to a dismantled rail line that formerly connected with the branch line between Sittingbourne and the Isle of Sheppey. At Sittingbourne the line connects with the main north Kent line that connects with the Thanet coastal towns and Canterbury to the east, Chatham and Rochester to the west and further to London.

Proposed Scope of Assessment

4.7.5 The environmental effects of traffic will be assessed in accordance with guidance contained in the following principal sources:

1. Guidance Notes No. 1. Guidelines for the Environmental Assessment of Road Traffic. The Institute of Environmental Assessment, March 1993.

2. The Design Manual for Roads and Bridges. Volume 11 – Environmental Assessment. Department of Transport et.al. June 1993 (and updates).

4.7.6 The IEA Guidelines (Ref. [1]) provide guidance on the geographical extent of environmental assessment which is likely to prove necessary in relation to increases in traffic flow as follows:

> *"Rule 1: include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%);*
>
> *Rule 2: include any other specifically sensitive areas where traffic flows have increased by 10% or more."*

4.7.7 In accordance with the above guidance, this assessment of the environmental effects of traffic will be considered for the following criteria:

- Severance;
- Driver Delay;

- Pedestrian Delay;
- Pedestrian Amenity;
- Accidents & Safety;
- Hazardous Loads; and
- Dust & Dirt

4.7.8 Part of the assessment will include a detailed site inspection of the road network between the site and the strategic highway network with details of the current geometric layout of the highway, traffic management and regulation orders and general observations of existing road user movements.

4.7.9 The light and heavy vehicle trip generation during construction will be established through an assessment of the materials, equipment and personnel required over the construction period. The light and heavy vehicle trip generation during operation will be established through a consideration of the facility's inputs and outputs, the potential level of use of rail and sea transport, the expected level of staffing and any proposed measures to encourage sustainable travel and transport. The distribution of vehicular trips on the external network will be agreed with Kent County Council Highway Authority and the Highways Agency.

4.7.10 Preliminary assessments suggest that if all operational materials are transported by road there could be 200-250 heavy vehicle movements per day associated with the transport of fuel stock reagents and ash. Staff movements could amount to around 20 light vehicle movements in the peak hours.

4.7.11 The impact of new light and heavy vehicle trips generated during construction and operation will be assessed against the expected traffic flows on the network during the periods of construction and operation. Traffic flows will be obtained either from existing data sources or by undertaking new surveys. Discussions will be held with Kent County Council Highway Authority and the Highways Agency to establish whether the assessment will need to take account of possible future changes in the surrounding network including the extension of the Sittingbourne Northern Relief Road.

4.7.12 The significance of the additional vehicular flows will be assessed against the criteria set out above in relation to existing highway users, local residences and other sensitive receptors. In cases where significant impacts are identified, mitigation measures will be identified.

4.8 Air & Climate (including Human Health)

Context

4.8.1 A desk based review of existing air quality in the area has been undertaken based on published information. This has included a review of Review and Assessment (R&A) reports produced by Swale Borough Council, Maidstone Borough Council, Ashford Borough Council, Canterbury City Council and Medway Council.

4.8.2 Swale BC, Ashford BC and Canterbury CC have not declared any Air Quality Management Areas (AQMAs). The nearest AQMAs are in Maidstone town centre, along the M20 motorway within the Borough of Maidstone, and along major roads within Medway. These AQMAs are more than 10 km from the proposed site.

4.8.3 For this type of facility the study area for detailed analysis is expected to lie within a 10 km radius. Within the study area, the predicted effects of emissions will be characterised at all locations, including residential areas such as Sittingbourne and settlements on the Isle of Sheppey.

Proposed Scope of Assessment

4.8.4 The air quality assessment will be undertaken as part of the EIA and will be developed for consistency with the requirements of PPC and the local authorities' R&A process. The following tasks will be undertaken as part of the assessment:

- Site-specific baseline monitoring will be undertaken, including measurement of concentrations of metals, dioxins and furans. Diffusion tube monitoring will be undertaken to establish spatial variation in nitrogen dioxide (NO2) and sulphur dioxide (SO2) concentrations at a number of locations.

- A summary of the baseline monitoring will be provided within the EIA in addition to characterising ambient air quality through a review of other monitoring data collected by third parties (e.g. local authority and national monitoring networks).

- Local meteorological and complex dispersion considerations will be identified and the stack height of the facility optimised to take account of any terrain, local buildings and meteorology, including inter annual variation, using 5 years of hourly sequential meteorological data from the most representative recording station.

- Current versions of the dispersion models ADMS and AERMOD will be utilised as appropriate, having regard to guidance issued by the EA and Defra for this type of assessment. Local concentrations of nitrogen oxides, fine particulate matter, carbon monoxide and other trace emissions will be derived for comparison with long term and short term air quality criteria.

- Modelling will be undertaken to determine plume visibility (to inform the visual impact assessment), metal and dioxin / furan deposition at sensitive receptor locations (to inform the health risk assessment). Empirical calculations for nutrient and acid deposition will be undertaken, with comparisons against critical loads, to inform an ecological Appropriate Assessment if required.

- Cumulative effects will be assessed having regard to any relevant assessments undertaken by local industrial operators and the local authorities, on the basis of a review of reports held on the public register.

- Consultations will be held with the EA and local authorities to discuss and clarify the approach proposed.

- Construction phase impacts will be assessed using a semi-quantitative risk assessment approach to establish the scale of effects and extent of mitigation necessary.

- Off site impacts from traffic will be quantified using the DMRB methodology.

4.8.5 Emissions from fugitive sources at the plant will also be dealt with, including odorous emissions and dusts, primarily on the basis of an investigation of the site sensitivity and design solutions for the project.

4.8.6 There are several European designated site within 10 km of the proposed plant, including The Swale. It will be necessary to examine the effects of emissions to ensure that cumulative effects and potential impacts on ecosystems are addressed appropriately at these locations.

4.8.7 The assessment will consider the effects of aerial emissions in the context of relevant environmental standards set under European and UK legislation, in combination with emissions from other local emissions sources.

4.8.8 The assessment will also include a detailed Health Risk Assessment.

4.9 Landscape and Visual Impact

Context

Vegetation

4.9.1 The most significant vegetation in the area is large planted bunds which surround an existing substation to the west of the paper mill. Areas of managed hedgerow and scrub vegetation extend northwest and north along the paper mill boundary. Other areas of limited scrub vegetation occur east of the paper mill within the proposal site.

4.9.2 There are no built features on the proposal site itself which consists of mostly bare ground with scattered shrub and rough grassland. Some sign of former paper mill waste tipping is evident.

Landscape Designations

4.9.3 Designated sites and landscape and visual resources providing context to the setting of the proposal site are identified but there are no landscape designations covering the proposal site.

International and National Designations

4.9.4 Land to the east and south east of the site on the east side of the Swale and Milton Creek, within I.0km of the site boundary, is within an Environmentally Sensitive Area (ESA) or Ramsar Site and Site of Special Scientific interest (SSSI).

Regional Designations

4.9.5 There are not conservation areas within the immediate vicinity of the site. A scheduled monument at Castle Rough is located 500m south west of the proposal site.

Local Designations

4.9.6 The boundary of The North Kent Marshes Special Landscape Area (SLA) is 200m to the south of the proposal site. The Saxon Shore Way, national trail passes 500m from the site.

4.9.7 Whilst not directly relevant to landscape and visual assessment the proximity of the Kemsley Marshes and Milton Creek Site of Nature Conservation Importance adds additional context for the landscape treatment of the site.

Landscape Character

4.9.8 At national level the site is located within The Greater Thames Estuary, Countryside Character Area 81, as identified by The Countryside Agency. To the south this character area is bounded by the North Kent Plain, Countryside Character Area 113.

4.9.9 At the county level Kent County Council have further refined and subdivided the national character areas. The site is located within the Swale Marshes character area which has the following key characteristics:

- Coastal marsh with isolated low hilly outcrops
- Remote, wild and isolated
- Fleet, creeks and marshland vegetation

- Grazing animals and birds
- Extensive areas of cultivated marsh, few features
- Intrusive buildings and industry, infilling of creeks and ditches.

4.9.10 Near by landscape types also include the Fruit Belt to the south.

4.9.11 At local level the 'Swale Landscape Character Assessment and Guidelines', March 2005 provide landscape categorisation and management/enhancement objectives for the landscape types within the District. The proposal site is located within the Upchurch and Lower Halstow Fruit Belt. Nearby landscape types include Chetney and Greenborough Marshes to the north and east and Luddenham and Coyner Marshes east of Milton Creek. The South Sheppy Marshes and Mudflats are northeast of The Swale.

4.9.12 The North Kent Marshes SLA designation broadly coincides with the Cheltney Marshes and Luddenham and Coyner Marshes landscape character areas north and east of the proposal site.

4.9.13 The landscape to the north and east of the proposal site (south of the Swale) is low lying land farmed predominantly as pasture, with some arable on slightly higher land west of the existing paper mill. This flat landscape contains a number of large buildings and structures, associated with industrial use. The chimneys and other tall structures are features of this part of the area. Overhead power lines to the west and northwest are also features of the landscape. To the south west the land rises slightly. Kemsley village is situated on the higher ground, as is a recently built area of residential development adjacent to the new road, Swales Way providing access to the paper mill. The A249 (T) and the rail link to Sheppey are further to the west. Kingsferry Bridge is an important feature in the landscape, marking the point of entry to the Isle of Sheppey. The higher land and settlement pattern of small villages and individual farms surrounded by orchards west of the A249 (T) is a smaller scale landscape, in contrast to the larger scale areas of lower lying land to the east of the A249 (T).

Visual Receptors

4.9.14 The site is relatively flat and bounded by the existing buildings of the paper mill to the west with some vegetation cover along the boundary. North, east and south the surrounding topography is flat with limited tree cover. The height of the proposed building and its associated chimney stack would be open to views from these directions.

Short distance (within 1km) open views to the site would be limited to:

- Saxon Shore Way
- Sittingbourne and Kemsley Light Railway and Museum
- Middle distance (1to 3km) open views of the site would include:
- Northern sections of the A249(T) towards Kingsferry Bridge
- Public footpath on Coldharbour Wall
- Public footpaths at Elmley Marshes and Elmley Nature Reserve
- Church Road and Telegraph Hill to the south east.
- Long distance (over 3km) open views of the site may include:

- Residential properties, roads and public footpaths form higher land at Bobbing and Snipeshill.

4.9.15 Other potential visual receptors with views to more elevated parts of the proposal may include.

Short distance views:

- Swale Way approach form the west
- Residential properties at Kemsley

Middle and Long distance views of elevated parts of the proposal would include Church Marshes Country Park and other receptors would be defined by the Zone of Visual Influence (ZVI) study.

Proposed Scope of Assessment

4.9.16 The principal potential impacts to be considered will be the effects of the proposed Sustainable Energy Plant at Kemsley Mill, on views from residential receptors, other viewpoints, the landscape and seascape and the effect on landscape character and quality.

4.9.17 In summary, the landscape and visual assessment will:

- Be carried out in accordance with established methodology and guidance;
- Focus on valued landscape and visual resources (at national, regional and local levels);
- Establish the extent and importance of potentially significant landscape and visual effects.

4.9.18 In addition, the assessment will pay attention to mitigation and enhancement measures established during the site planning and design stage, and examine the scope for further mitigation and enhancement in terms of residual effects.

Published Methodologies and Guidance

4.9.19 The discipline of landscape and visual impact assessment (LVIA) has evolved over a number of years. Current LVIA methodology in the UK is founded on guidance and techniques published by the Landscape Institute/Institute of Environmental Management and Assessment and the Countryside Agency/Scottish Natural Heritage. The LVIA will be undertaken with reference to published guidance:

- Guidelines for Landscape and Visual Impact Assessment, 2nd Edition (2002) Landscape Institute and the Institute of Environmental Management and Assessment; and,
- Landscape Character Assessment: Guidance for England and Scotland (2002) Countryside Agency and Scottish Natural Heritage.

Assessment Objectives

4.9.20 The principal objectives of the assessment will be:

- To describe, classify and evaluate the existing landscape likely to be affected by the scheme at the construction and operational phases of the project;
- To identify visual receptors with views of the proposed development;

- To assess the significance of the direct and indirect impacts on landscape character and visual resources, taking into account the measures proposed to mitigate any impacts identified.

Distinction between Landscape and Visual Impacts

4.9.21 In accordance with current guidance, landscape and visual impacts will be assessed separately, but through a closely linked procedure. A clear distinction will be drawn between landscape and visual impacts as described below:

- Landscape impacts relate to the effects of the proposals on the physical and other characteristics of the landscape and its resulting character, quality and value.

- Visual impacts relate to the effects on views experienced by visual receptors (e.g. residents, footpath users, tourists etc) and on the visual amenity experienced by those people.

Study Area

4.9.22 The extent of the study area for the landscape and visual assessment will be influenced by the final height of the building(s) and chimney stack. Initial work will focus on a study area for the assessment extending to a 15km radius from the proposal site in all directions unless otherwise agreed with Kent County Council. This will be reviewed as design information is defined.

Methodology

4.9.23 The LVIA will be undertaken in six stages;

1. Baseline data collection and analysis

2. Description of the baseline landscape and visual amenity

3. Development of mitigation measures

4. Identification of potential residual impacts on the landscape and views

5. Evaluation of the significance of impacts on landscape (elements, key characteristics and overall character) and visual amenity. This will include identification of the varying sensitivity of the individual sites and visual receptors to the type of change being considered for the proposal site; and

6. Presentation of findings in the Environmental Statement.

Baseline Landscape Assessment Methodology

4.9.24 Baseline assessment will include an appraisal of the landscape within the study area. The studies will identify the landscape resources and character of the surrounding area and examine how the development will affect individual features, key characteristics and the wider landscape character.

4.9.25 Baseline information on the landscape will be gathered through a combination of desk studies, consultation and field surveys. Documents that will be used in the assessment may include aerial photographs, OS maps and published landscape character assessments.

4.9.26 A series of field surveys will be carried out to gain a better understanding of the landscape, to determine its character, elements, features and condition and identify visual receptors and visual barriers. The surveys will establish the landscape resources that combine to give the landscape a distinct sense of place.

4.9.27 Relevant landscape character assessments will be reviewed. Particular attention will be paid to the key landscape characteristics of the relevant landscape types/character areas both individually and in combination.

Baseline Visual Assessment Methodology

4.9.28 The geographical extent of potential visibility will be established for stack heights by production of theoretical Zone of Visual Influence. The ZVI will be achieved using Digital Terrain Model (DTM) and Digital Surface Model (DSM) data for this study area.

4.9.29 Due to the likely extent of the ZVI it would be impossible to assess the visual impact on every individual visual receptor within the ZVI of the scheme. Consequently, key viewpoints looking towards the proposals will be agreed with Kent County Council and other relevant consultees as part of the baseline assessment. These viewpoints would be representative of sensitive residential and recreational receptors situated within the study area at different distances and directions from the scheme. The representative viewpoints will be used to assess the potential visual impacts of the proposals on the different range of views towards the site. The exact number of viewpoints that will be used will not be determined until further baseline studies are undertaken.

4.9.30 Wireline diagrams of the proposals will be produced and set alongside baseline photographs of the landscape to illustrate the location and potential appearance of the building and stack from the agreed viewpoints. If required a number will be developed further into photomontages of the proposed development as agreed with Kent County Council.

Mitigation Measures

4.9.31 The development of the Sustainable Energy Plant and the EIA is an iterative process and every effort will be made to ensure that appropriate mitigation is incorporated into the development. Baseline information relating to sensitive landscape features and visual receptors will be used to refine the final site layout and appropriate mitigation measures will be developed to minimise potential adverse impacts. Options for screening various components of the scheme will be investigated and adopted as mitigation measures where feasible.

4.9.32 In addition, a landscape proposals plan will be prepared for the development site to illustrate landscape and visual mitigation proposals and demonstrate landscape integration and enhancement of the development site in the context of the wider paper mill site. The ecological assessment of the development site will also be taken into consideration. The landscape proposals will be presented at an appropriate scale to illustrate the main components of the proposed landscape treatment of the site with illustrative sections if required.

Assessment of Potential Effects

4.9.33 The effects of the proposed development will be established in accordance with established methodology and guidance. The proposed development will be assessed within the context of the character and attributes of the local landscape. The extent and significance of character change resulting from the proposals will be established and also evaluated as to its importance.

4.9.34 Attention will be paid to the potential effects on valued visual resources, chiefly sensitive residential and recreational receptors.

4.10 Ecology and Nature Conservation

Context

4.10.1 The site has The Swale Estuary to the east, the reedbed to the north and the Kemsley Mill infrastructure and industrial complex to the west and south. A former railway line is located north west of the site along with a covered landfill.

4.10.2 A literature search, a desktop search, a site visit and preliminary ecological survey and follow up reptile and Water Vole surveys have been undertaken. A study area of 10 km for European protected sites, 5 km for nationally protected sites and 2 km for protected species records and other designated areas were used. These distances are the predicted zones of potential influence. These zones are flexible and will be reviewed as more information is obtained, particularly with regard to development proposals.

4.10.3 An extended Phase 1 Habitat survey has been undertaken to map and determine habitats on the site, which included an evaluation of the potential for protected or otherwise notable species to be present within the impact zone of the proposed development area. This will be reviewed/updated as necessary as the development design proposals evolve.

4.10.4 A comprehensive literature and background data search has been undertaken to cover the site and the surrounding 2km to identify records of protected or otherwise notable species and habitats. The only records received that related to the site directly, or within the immediate vicinity were for Knapweed Carder Bee.

4.10.5 Consultation with Natural England is planned to discuss their requirements for mitigation for the development. Natural England has advised that an overwintering bird survey be undertaken and this work has been ongoing over the winter period.

4.10.6 No part of the site is covered by a statutory or non-statutory nature conservation designation.

4.10.7 The closest area designated for its nature conservation interest is The Swale Estuary Site of Special Scientific Interest (SSSI) and Special Protection Area (SPA), which, at its closest, is approximately 50 metres to the east from the development boundary. The Swale is designated due to the internationally important assemblages of wildfowl it supports and the large areas of grazing marsh habitat present. A Local Wildlife Site (Milton Creek) is approximately 200m to the south of the proposed development site.

4.10.8 Approximately 40% of the site surveyed comprises an open area of spoil/ bare ground. Other habitats include: unimproved neutral grassland, dense scrub, a ditch and associated marginal vegetation and tall ruderal. North of the site, a large area of reedbed (greater than two hectares) was mapped. Reedbed is a National Biodiversity Action Plan (BAP) Priority Habitat and therefore of conservation concern.

4.10.9 No records of Great Crested Newt were found within 500m and there is very limited connectivity with the small area of suitable terrestrial habitat on site and potential breeding sites. The ditch on site was not suitable for this species to breed due to very poor water quality and a lack of suitable submerged plants. Therefore, this species will not require further investigation. There are no signs of Badger within the vicinity of the site, and the Water Vole survey did not find any evidence of this species in the ditch or reedbed. However, due to the dense marginal vegetation, it was not possible to eliminate the possibility that this species was present. A repeat survey will be undertaken as part of the Phase 1 Habitat survey detailed below. The only protected species issue positively identified is a small, but breeding population of Common Lizard identified within the grassland/scrub habitats. The BAP Priority species Knapweed Carder Bee is also possibly present on site as it is known in the area from historical records and its main food source (Knapweed) was also present, although only in small numbers.

Proposed Scope of Assessment

4.10.10 A review of proposed activities and an identification of any activities likely to cause ecological impacts will be undertaken for both on-site and off-site operations and during construction and operational phases.

4.10.11 The impact assessment will also consider all cumulative impacts that may occur with other developments in the area.

4.10.12 Relevant legislation, regulations and policies will be considered at the scoping stage, as they will have a bearing on the required scope of investigations, interpretation of impacts, and the criteria to be used for determining significance.

Protected species

4.10.13 From the results of the desktop review, consultations and site visit the following protected or otherwise notable species have either been positively identified within, or based upon habitats present or that have the potential to be present within the zone of influence: Common Lizard, Water Vole and Knapweed Carder Bee.

4.10.14 No breeding bird survey is proposed at this stage. However, it is recognised that birds may use the dense scrub etc for nesting purposes, which will be considered during the phasing of works to avoid disturbance to any nesting birds. The site has also been subject to considerable disturbance in the form of earth movement by heavy plant making it unlikely that birds associated with the SPA would use it as a high tide roost. Further, no congregations of birds have been observed on the 10 site visits undertaken so far.

4.10.15 Whilst it is not proposed to carry out a specific survey for Knapweed Carder Bee, the opportunity will be taken to search for the species during any further surveys on site (it is already proposed to undertake). The Phase 1 Habitat survey planned to ensure full coverage of the site which will include mapping areas of Knapweed habitat on and around the site.

Protected habitats

4.10.16 Impact on The Swale Estuary SPA will be avoided through appropriate design and scheduling of works. Consultation with Natural England will ensure these designs are acceptable and confirmation sought that there is no need for an Appropriate Assessment.

4.10.17 Appropriate mitigation will be outlined as appropriate and potential enhancements with respect to PPS9 will be highlighted.

Ecological Impact Assessment (EcIA)

4.10.18 The Ecological Impact Assessment will follow recently published guidelines (IEEM, 2006) and will use all information gained through the various studies to identify all Valued Ecological Receptors (VERs) present within the Zone of Influence, the potential impacts on VERs, the significance of those impacts and mitigation methods through which impacts can be avoided or reduced as much as possible. Where mitigating effects are not possible then suitable compensation will be devised. The EcIA will include a confidence level for predictions and incorporate additional social and economic considerations, where appropriate.

Environmental Action Plan

4.10.19 Following best practice guidelines set out by IEEM an Environmental Action Plan (EAP) will be produced which will pull together all ecological mitigation, compensation, enhancement and monitoring proposals with respect to the scheme.

4.11 Hydrology and Flood Risk

Context

4.11.1 On the basis of the Environment Agency's on-line Flood Map and the initial development proposals, it is likely that the site of the proposed development is located within PPS25 Flood Zone 1 – Low Probability. This will be confirmed through consultation with the Environment Agency.

Proposed Scope of Assessment

Flood Risk Assessment

4.11.2 The key elements of the Flood Risk Assessment will include:

- Identification of any hydrological constraints to the proposed development of the site and assessment of any secondary risks;
- Assessment of the surface water runoff regime for the existing and proposed sites to determine the potential impacts of the development on peak runoff rates and volumes; and
- Development of a conceptual mitigation strategy for the proposed development including an outline for an appropriate sustainable surface water management system.

4.11.3 The floodplain of The Swale is to the north, east and south of the site, but is not shown to reach the boundary of the site. The OS mapping shows a number of ponds and drains surrounding the site; these will be investigated to determine the degree of flood risk they pose to the site.

4.11.4 At this stage it is considered that flood modelling will not be required and is therefore not included within the proposed scope of assessment.

4.11.5 The potential impact on the site and surrounding area from the generation of additional surface runoff will be considered. The proposed development could potentially result in an increase in impermeable area and an associated increase in surface water runoff. Therefore, a key aspect of the FRA will be the development of a surface water drainage assessment incorporating Sustainable Drainage Systems (SUDS).

4.11.6 The drainage assessment will compare the runoff regimes for the existing site and the proposed development. This will establish an allowable discharge rate for the site based on the existing runoff, and using this rate an attenuation volume will be established for the storage of surface water runoff to neutralise the potential impacts on surface water flooding at the site and to third party land. If appropriate, the use soakaways will be investigated, through percolation tests at suitable locations throughout the site.

4.11.7 A conceptual surface water drainage strategy will be developed, with sustainable drainage systems used wherever possible. This drainage strategy will ensure that there is no alteration to the existing surface water drainage regime, and an improvement provided where practicable. The drainage strategy will also investigate any insufficiencies in the capacity of the existing surface water drainage system - where available information permits - and outline options to provide any improvements or alternatives.

4.11.8 Further consultation will be held with the Environment Agency (EA), the local water authority and other regulatory authorities (including the submission of data requests as appropriate) to inform the scope of the study.

ES Chapter

4.11.9 The ES chapter will include an assessment of the existing (baseline) hydrology, flood risk and water quality conditions at the site. The potential impacts on the flood risk and water quality will be identified for the construction and operational phases and mitigation proposed to neutralise any impacts identified.

4.11.10 Any residual risks will be analysed with a view to informing the site management and maintenance plans, in order to minimise any residual impacts resulting from development, which cannot be removed through incorporated design measures.

4.12 Hydrogeology and Ground Conditions

Context

4.12.1 An initial review of the hydrogeological and ground condition aspects of the proposed development has been undertaken.

4.12.2 A limited data set has been used to conceptualise the site setting with regards to the likely ground conditions and controlled water environment.

4.12.3 Further information and any relevant reports available for the site and the adjacent land will be reviewed as part of the assessment to determine the current site conditions and identify any gaps in the data set.

Geology

4.12.4 The local geology will be confirmed but is thought to comprise Tertiary strata (i.e Reading Beds) beneath the site. The Chalk outcrops to the south and is likely to underlie the site at depth. The London Clay outcrops to the north.

4.12.5 Superficial deposits may be present on site in the form of alluvial clays, silts and sands.

Geotechnical Constraints

4.12.6 The potential for any geotechnical constraints at the site in relation to this proposal will be confirmed following the desk study and site walkover.

4.12.7 The nature of the underlying sediments may have implications for the foundations of the proposed structure.

Hydrogeology

4.12.8 The Tertiary strata (i.e. Reading Beds, Thanet Sand, Woolwich Beds) tend to be classified as a minor aquifer (*variably permeable – These can be fractured or potentially fractured rocks, which do not have a high primary permeability, or other formations of variable permeability including unconsolidated deposits. Although these aquifers will seldom produce large quantities of water for abstraction, they are important both for local supplies and in supplying base flow to rivers*). However the proximity of the Chalk major aquifer (*highly permeable formations usually with a known or probable presence of significant fracturing. They may be highly productive and able to support large abstractions for public supply and other purposes)* means that this will have to be confirmed.

4.12.9 The site is not within a Source Protection Zone for public water supply abstractions.

4.12.10 The Tertiary strata do not appear to be exploited for water supply in the local area. To date one shallow borehole (to 10 m depth) has been identified to the south of the existing paper mill.

4.12.11 The Tertiary strata are unconfined in the vicinity of the site. The proximity of the coast and the surface watercourses suggests that the unsaturated zone is likely to be extremely thin beneath the site.

4.12.12 The available information indicates a regional groundwater flow direction to the northeast with a very shallow gradient.

4.12.13 The nearest licensed groundwater abstraction is located in the centre of Sittingbourne approximately 3 km to the southwest and apparently up gradient.

4.12.14 Milton Creek, to the south of the site, flows to the northeast into The Swale. It is considered likely that the surface watercourses are in hydraulic continuity with the site.

Proposed Scope of Assessment

4.12.15 Further review of the hydrogeological and ground condition aspects of the proposed development will be undertaken followed by a comprehensive assessment of baseline conditions and the potential impacts of the development on the ground conditions and hydrogeological regimes.

4.12.16 Any existing information and relevant reports available for the site and the adjacent land will be reviewed in order to determine the current site conditions and identify any gaps in the data set.

4.12.17 An environmental data search, such as an Envirocheck report, will be obtained to inform the EIA of any potential source-pathway-receptor linkages and to provide an indication of any geotechnical constraints that may occur.

4.12.18 A site walk-over will be undertaken by a suitably qualified hydrogeologist (and potentially accompanied by a geotechnical engineer) will be undertaken as part of the desk study.

4.12.19 The effects of the proposed development on hydrogeology will be addressed as part of the including the potential impacts with the construction of the site. This includes any de-watering requirements, pollution prevention measures etc., as well as impacts during the operational phase (including accidental impacts), such as the storage of hazardous materials, site drainage and the development of hardstanding areas.

4.12.20 When considering the issues of land contamination, the focus will be in relation to contamination risks from former and/or proposed uses and activities, and/or the migration of contaminants from surrounding land uses, as referred to in PPC guidance document H7.

4.12.21 On the basis of information reviewed to date, it is not anticipated that any intrusive site investigation works will be required or that there will be a need controlled waters quantitative risk assessment (to indicate the potential risk posed by the site to the surrounding environment). This would, however, be confirmed through further consultation with the EA on completion of the desk study.

4.13 Noise & Vibration

Context

4.13.1 The baseline noise environment is likely to be dominated by vehicle movements on the A249 and local road network; train movements on the Swale to Kemsley railway line; and the operation of the existing paper mill.

4.13.2 The main settlement in the vicinity of the site is Kemsley located approximately 1 km to the south west of the proposed development. The nearest noise sensitive residential receptors are located approximately 700 m from the south west of the proposed development, on the north east edge of Kemsley. In addition, the marshes surrounding Kemsley Mill are designated sites.

Proposed Scope of Assessment

4.13.3 The noise and vibration chapter will assess the potential noise and vibration effects associated with the proposed development, which are considered to be:

- Construction: noise and vibration associated with plant and activities associated with the construction phase, including any proposed piling.
- Operation: noise and vibration associated with 24-hour operation of the site, including additional vehicle movements.

Site Description

4.13.4 Coldharbour Marshes and Ridham Dock lie to the north, with an area of land occupied by industrial works. Kemsley Marshes are located immediately to the north, east and south surrounding Kemsley Mill.

4.13.5 The site at Kemsley Mill is not covered by any statutory nature conservation designations, however there are designations within the surrounding area (See section 3.6 for details).

4.13.6 The main settlement in the vicinity of the proposed development is Kemsley, located approximately 1 km to the south west of the proposed development. The nearest noise sensitive residential receptors are located approximately 730 m from the south west of the proposed site, on the north east edge of Kemsley. In addition, an isolated farm is located approximately 2.3 km to the north east of the proposed development, on the Isle of Sheppey**.**

Overview of Baseline Conditions

4.13.7 The baseline noise environment is likely to be dominated by vehicle movements on the A249 and local road network; train movements on the Swale to Kemsley railway line; and the operation of the existing paper mill.

Proposed Consultation

4.13.8 The main consultee for noise and vibration is Swale Borough Council (SBC). It is proposed that discussions are held with an officer of the Environmental Services Department during which the location, durations and numbers of baseline surveys are discussed together with the key issues and likely assessment methods and criteria for the determination of significance.

Proposed Methodology

4.13.9 The noise and vibration assessment will need to robustly cover effects that may arise during both the construction and operational phases.

4.13.10 For the construction phase, the following methods will be applied:

- For on-site construction, noise and vibration levels will be predicted using methodologies contained within BS 5228, Parts 1 and 4 and TRL Report 429. Significant noise effects will be deemed to occur if predicted noise levels exceed levels set according to guidance in Advisory Leaflet 72 or as agreed with SBC. Temporal criteria will also apply to this assessment, such that limits would need to be exceeded for a minimum period for a significant effect to occur. For vibration, significant effects will be deemed to occur if appropriate levels are exceeded, as defined in BS 5228, Part 4 and/or BS 7385 Part 2, which relate to building damage, and in BS 6472, which relates to human response to vibration. If necessary, an assessment of construction noise affecting bird populations on Kemsley Marshes the will be carried out.
- For off-site construction activities, which will mostly relate to changes in road traffic, the change in noise level will be deemed significant if levels exceed 6 dB(A) or more.

4.13.11 For the operational phase, the following methods will be applied:

- For noise from fixed plant, the methodology contained within BS 4142 will be applied. Significance will be deemed to occur if the Rating Level exceeds the background level for the appropriate period by more than 5 dB(A), which is rated as being of 'marginal significance' by the Standard. This will take into account of any necessary acoustic feature correction for tonal, impulsive noise or other distinguishing characteristics.
- Operational noise will also be considered in relation to BS 8233 and WHO guideline noise levels for dwellings, including guidance on sleep disturbance.
- For assessing any changes in traffic noise on the road network, the change in noise level will be deemed significant if it exceeds 3 dB(A) or more.
- For assessing any changes in rail noise on the railway line, the change in noise level will be deemed significant if it exceeds 3 dB(A) or more.

4.14 Archaeology and Cultural Heritage

Context

4.14.1 To date, no systematic work on cultural heritage has been undertaken with regard to the proposed development.

4.14.2 Preliminary searches have indicated that a Scheduled Ancient Monument, Castle Rough Medieval moated site (SAM number 12729) is located some 500 metres south west of the proposed development area. There are no Registered Parks and Gardens or Registered Battlefields within a 9-kilometre radius of the proposed development area. The nearest Conservation Area is located at a distance of over 3 kilometres from the proposed development area.

4.14.3 The aim of the study is to assess the likelihood of the proposed development site to contain archaeological remains and to provide an indication of what, if any, further work would be required with regard to archaeology.

Proposed Scope of Assessment

4.14.4 It is proposed to consult the Historic Environment Record (HER). Information on Scheduled Ancient Monuments, Registered Parks and Gardens, Battlefields and listed buildings will be obtained from English Heritage. Relevant documentary and archival material, both published and unpublished, held in libraries and archives, will be examined as appropriate. An iterative approach will be taken during this process to determine the scope of such consultations.

4.14.5 A field visit and walkover survey will be undertaken to establish the presence of previously unrecorded above ground archaeology, and/ or further to assess the potential of recorded above ground archaeology. The field visit will also provide an indication of the suitability of any further survey techniques.

4.14.6 A report on the results of the assessment will be prepared. This will outline the method, the archaeological and historical background and will asses the likelihood of the proposed development area to contain archaeological remains, their relative importance and the need for and, if appropriate outline the scope of further work. On client instruction the reports will be passed to the Local Planning Authority's archaeological advisors and other parties as appropriate.

4.14.7 The assessment will conform to the relevant legislation and guidance, including:

- *Planning Policy Guidance: Planning And The Historic Environment* (PPG 15) Department of the Environment, Department of National Heritage September 1994;
- *Planning Policy Guidance: Archaeology And Planning* (PPG 16) Department of the Environment November 1990;
- *Code of Conduct* Institute of Field Archaeologists 2002 and
- *Standard And Guidance for Archaeological Desk based Assessment* Institute of Field Archaeologists 2001.

4.14.8 The baseline information will provide sufficient information to enable the formulation of a mitigation strategy, if necessary, to ensure the recording, preservation or management of any significant archaeological material, if present. It may also identify the need for further investigation, whether intrusive or not, where the character and value of the resource cannot be sufficiently defined to permit a mitigation strategy or other response to be devised.

4.14.9 PPG 16 provides guidance on the distinction between remains of national importance and those of lesser importance at paragraphs 8 and 27. A basis for establishing the relative order of importance of archaeological sites is given in Annexe 4 of PPG 16. In addition, the *Design Manual for Road and Bridges (Vol 11, Section 3 Part 2 HA208/07)* Highways Agency August 2007 details categories of relative importance:

- Sites of Very High Value – usually world Heritage sites or sites of acknowledged **International Importance**
- Sites of High Value or **National Importance** – usually Scheduled Ancient Monuments, or monuments in the process of being scheduled.
- Sites of Medium Value, these being of **Regional** or **County importance**;
- Sites of Low Value, these being of district or **Local importance**;
- Sites of **Negligible** Value - with very little of no surviving archaeological interest.
- Sites of **Unknown** Value

4.14.10 For the purposes of this project, designations of relative importance are based on this designation.

4.14.11 For the purposes of this project, archaeological periods are defined as follows:

- Prehistoric [comprising Lower Palaeolithic (pre 30,000 BC), Upper Palaeolithic (30,000 - 10,000BC), Mesolithic (10,000 - 3,500BC), Neolithic (3,500 - 2,000BC), Bronze Age (2,000 - 700BC) and Iron Age (700BC - AD43)]
- Roman (AD43 - AD450)
- Medieval (AD450 - AD1540)
- Post Medieval (AD1540 onwards)

4.15 Socio Economic Imact

Context

4.15.1 The proposed development is located in Swale Borough – and in that part of it which lies in the Thames Gateway area as defined by the South East Plan. It is also located in the wider Maidstone and North Kent Travel to Work Area (TTWA).

Proposed Scope of Assessment

4.15.2 A range of social and economic data sets will be drawn upon to carry out this assessment. The most important single source will be the 2001 Census, which contains a wide range of economic and related data, including economic activity, industry, occupation, qualifications, travel to work, mode of travel to work and car ownership.

4.15.3 Since the data in the 2001 Census are now nearly seven years old, other sources will be used for more up to date information where appropriate and available. These include the NOMIS Labour Market Profiles and studies carried out by local authorities and other agencies.

4.15.4 The issue of compatibility of data sources will be addressed. More generally, the limitations of the data sources in terms of geographical coverage, use as time series data, and the extent to which firm conclusions can be drawn, given that human behaviour and individual choice are involved in this topic area, will also be covered.

4.15.5 Baseline conditions will be established using the sources listed. The assessment will also take into account the perception of those baseline conditions as set out in the economic and community strategies of the local authorities and other agencies, and the objectives and proposed actions of those strategies.

Geographical Scope

4.15.6 Data will be presented and analysed for the ward in which the development is located and the District, with Kent, the South East Region and Great Britain for comparison where appropriate. The extent to which data are readily available for the Sittingbourne area of the Thames Gateway and the TTWA will be investigated.

4.15.7 Since the main purpose of the proposed development is to secure the longer term future of the paper industry in the Sittingbourne area, the principal impact is likely to be the new employment created at the construction stage rather than in the operational stage. It is not anticipated that the proposed development will give rise to discernible multiplier effects. However, given the significance of the industry to the area's economy, securing its future is an important objective, and subject to the availability of appropriate data, the consequences of the industry not continuing to function will be explored.

4.16 Amenity

4.16.1 In addition to the air quality and noise which will be addressed within other sections of the EIA, waste management facilities also have the potential to cause environmental nuisance due to the generation of litter or through the attraction of vermin and other pests to the site.

4.16.2 The principal means of control over these issues will be through the Environmental Permit rather than through the planning regime. Nevertheless, for information purposes, the potential impacts and proposed mitigation measures will be summarised in this chapter.

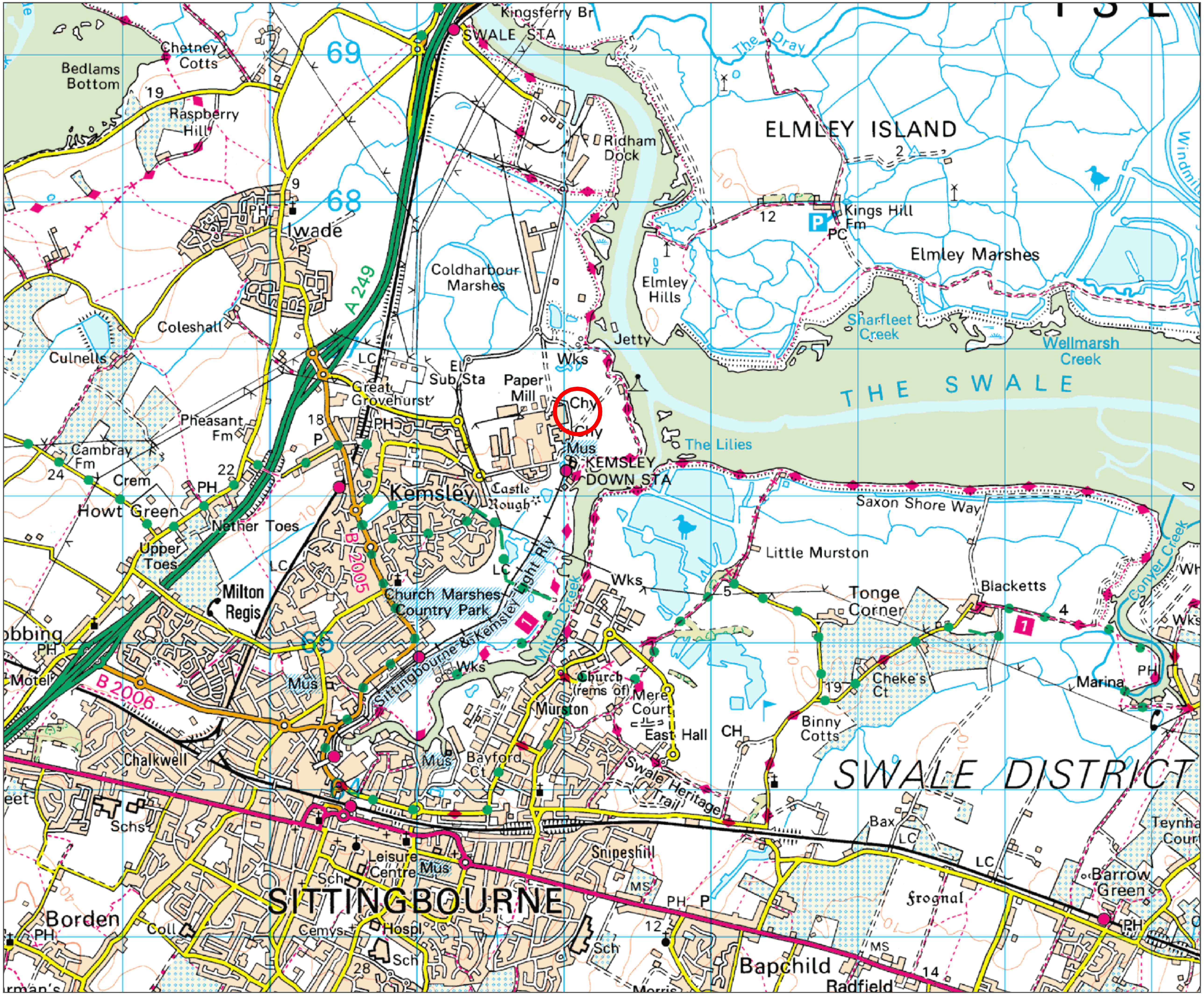
4.17 Summary

4.17.1 This concluding section of the ES will draw together the results of the topic specific assessments. It will describe the disciplines addressed, summarise how they have been assessed and identify the likely significant effects and details further mitigation measures required and recommended. It will also highlight areas where consideration has been given to the following categories of impacts;

- Cumulative impacts, which are those effects of development that may interact in an additive or subtractive manner with the impacts of other developments that are not currently in existence, but may be by the time the development is implemented;
- Interactions between impacts, where impacts in different categories as set out in the individual topic chapters may act in conjunction with either beneficial or detrimental effect;

4.17.2 Residual impacts, which relate to those that remain significant following the application of mitigation measures.

Drawings



Key:

Proposal Location

N

RPS

3RD FLOOR
34 LISBON ST.
LEEDS
LS1 4LX
TEL: 0113 220 6190
FAX: 0113 243 9161

THIS DRAWING IS NOT TO BE SCALED ALL DIMENSIONS TO BE CHECKED ON SITE DISCREPANCIES, AMBIGUITIES AND/OR OMISSIONS BETWEEN THIS DRAWING AND INFORMATION GIVEN ELSEWHERE MUST BE REPORTED IMMEDIATELY TO THIS OFFICE FOR CLARIFICATION BEFORE PROCEEDING

PROJECT
Kemsley Sustainable Energy Plant

TITLE
Site Location Plan

SCALE	DRAWN BY
1:25000 @A3	AWF
DATE	CHECKED
March 2009	JS
CAD FILE	

PROJECT NUMBER	DRAWING NUMBER	REV
DLE1726	Figure 1.1	

©RPS

Key:

Proposal Site Boundary

RPS
3RD FLOOR
34 LISBON ST.
LEEDS
LS1 4LX
TEL: 0113 220 6190
FAX: 0113 243 9161

THIS DRAWING IS NOT TO BE SCALED ALL DIMENSIONS TO BE CHECKED ON SITE DISCREPANCIES, AMBIGUITIES AND/OR OMISSIONS BETWEEN THIS DRAWING AND INFORMATION GIVEN ELSEWHERE MUST BE REPORTED IMMEDIATELY TO THIS OFFICE FOR CLARIFICATION BEFORE PROCEEDING

PROJECT
Kemsley Sustainable Energy Plant

TITLE
Proposal Site Boundary

SCALE 1:5000 @A3	DRAWN BY AWF
DATE March 2009	CHECKED JS
CAD FILE	
PROJECT NUMBER DLE1726	DRAWING NUMBER Figure 1.2

REV

RPS
RECEIVED
FILE NO.
28 JUL 2009
856
CIRC | ACTION
JS

Kent County Council

St Regis Paper Company Limited
C/o RPS Planning & Development Ltd
34 Lisbon Street
Leeds
LS1 4LX

FAO Jonathan Standen

Planning Applications Group
First Floor, Invicta House
County Hall
Maidstone
Kent ME14 1XX
Tel: 01622 221054
Minicom: 08458 247905
Fax: 01622 221072

Ask for: Mr M Clifton
Your Ref: DLE1726
Our Ref: PAG/MC/DC29/09/SW/0003
Date: 24 July 2009

Dear Sir

REQUEST FOR A SCOPING OPINION UNDER THE TOWN AND COUNTRY PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) (ENGLAND AND WALES) REGULATIONS 1999 (REGULATION 10 (1)) IN RESPECT OF A PROPOSED SUTAINABLE ENERGY PLANT AT KEMSLEY PAPER MILL, KEMSLEY, SITTINGBOURNE, KENT.

ST REGIS PAPER COMPANY LIMITED.

I write with reference to the above and in response to your request for a formal Scoping Opinion in accordance with Regulation 10 (1) of the above Regulations.

Having undertaken formal consultations in accordance with Regulation 10 (4) and having regard to the specific characteristics of the proposal in accordance with Regulation 10 (6) taking account of Schedule 4, in addition to the comments made by the attached consultation bodies, I consider the following matters would need to be specifically addressed in the Environmental Statement required to accompany the application:-

Need

I note that paragraph 4.6.1 of the EIA Scoping Report considers need and alternatives in terms of the different options available for energy generation at the site. However, if the future application is to be determined by the County Council as a 'waste processing facility', need and alternatives will also have to be considered in a broader context. That is whether, consistent with the principles set out in Planning Policy Statement 10, 'Planning for Sustainable Waste Management', what is proposed represents a facility of the right type, in the right location at the right time having regard to the nature and source of the waste arisings. In this respect particular regard will therefore need to be given to whether the site is near to the waste source consistent with the proximity principle or whether there are more suitable sites elsewhere more proximate. For example, I am mindful that whilst it is stated the source of the fuel feedstock would be from within Kent I am mindful that reference is also made to materials being sourced from various authorities in the South East of England.

[redacted]

To conclude on this issue it is therefore important that the Environmental Impact Assessment (EIA) is able to demonstrate that the above principles can be met. Furthermore, as we have previously discussed you will also need to demonstrate that the fuel source would consist primarily of waste as opposed to Solid Recovered Fuel, which is fundamental in determining whether what is proposed constitutes a 'waste processing facility' as opposed to an 'industrial type operation' which in turn dictates within whose jurisdiction the application would fall to be determined.

Traffic and Transportation

The potential impact on the road network will need to be addressed in terms of the existing capacity available and whether the anticipated vehicle movements to and from the site can be satisfactorily accommodated. Notwithstanding the improvements planned for extending the Sittingbourne Northern Relief Road which will be partly funded by developer contribution, an assessment will need to be made of any further improvements that may be deemed necessary taking account of the proposed development together with other committed development proposals in the vicinity. In particular concerns have been raised over the adequacy of the A249 – B2005 junction and junction 5 of the M2, especially during peak hour periods. The Traffic Impact Assessment will therefore need to have particular regard to peak hour traffic on the existing highway network and a comparison made with the predicted traffic flows to and from the site over a 24 hour period.

Air Quality

The scope of the proposed Air Quality Assessment in respect of stack emissions is considered appropriate which will assess both existing background levels of pollution taking account of the cumulative effects from other existing industrial processes, and through dispersion modelling will predict ground level concentrations during the operation of the plant. Consideration should also be given to continual offsite monitoring at agreed locations over an agreed period post commissioning of the plant to measure any variations in local air quality.

Given that the operational parameters of the plant will be regulated under a separate Environmental Permit issued by the Environment Agency, in accordance with advice set out under PPS23 'Pollution and Planning Control', consideration should be given to submitting the Permit Application in parallel with the Planning Application. This should help inform the planning process, particularly in respect of the stack height necessary to ensure adequate dispersion of emissions.

As previously indicated, consideration should also be given to the potential impacts from airbourne dust emissions, especially from the ash treatment process which would involve outside storage.

Finally the proposed detailed Health Risk Assessment is noted.

Landscape and Visual Impact

It is noted that details of the exact siting and design of the buildings have not yet been finalised which when this is known will enable a more detailed assessment of the potential visual impact from the development. In this respect in addition to the mass and height of the various structures, particularly the stack, regard will need to be had to their external finish when set against the general background. In addition to the visual receptors identified under paragraph 4.19.14 an assessment of the potential impacts in relation to the recent nearby residential development to the west should also be considered.

The opportunity to agree key viewpoints having regard to the proposed final design once further baseline studies have been undertaken is welcomed. In this respect particular attention is drawn to the comments from the Public Rights of Way Officer regarding the Saxon Shore Way.

Ecology and Nature Conservation

The general consensus from relevant consultation bodies is that in principle the Scoping Report has identified most of the areas that need to be addressed in the Environmental Impact Assessment (EIA). However, the importance of the need to undertake appropriate surveys at the appropriate time of the year has been emphasised having regard to both breeding seasons and periods during which certain species are in hibernation.

Notwithstanding the reference made under paragraph 4.10.16 of the report to confirmation which is being sought from Natural England that there is no need for an Appropriate Assessment to be undertaken under the Habitats Regulations, both Natural England and other relevant consultation bodies consider an Appropriate Assessment should be required. This is on the basis of there being internationally designated sites in close proximity to the proposed development and given the nature of the operations, that it will have a significant effect. It is therefore recommended that a separate section be included in the EIA to address these impacts.

Hydrology and Flood Risk

Whilst the site is not located within an area at risk of flooding it is noted that given the size of the site the design of a surface water drainage system will be based on a Flood Risk Assessment. In addition to the plant site itself particular regard will also need to be had to the ash conditioning area, with the need for the surface water system being designed such that any contaminants resulting from the percolation of rainwater through the stockpiled ash is collected separately and prevented from being discharged to groundwater.

Hydrogeology and Ground Conditions

With regard to land contamination it is noted that following the completion of a desk study confirmation will be sought from the Environment Agency to the need for any intrusive site investigation works. This is particularly important given the shallowness of the unsaturated zone beneath the site. As a result further information may be required in respect of the identification of any existing contaminants together with those which could arise from the proposed development. This may also therefore require an analysis of the direction of groundwater flows, potential pathways from the site and the identification of sensitive receptors.

Noise and Vibration

The proposed scope of the assessment is considered generally acceptable. However, in addition to the nearest noise sensitive residential receptors account should also be taken of the potential adverse impacts on nature conservation during both construction and operation of the facility, particularly on birds during their breeding season.

Archaeology and Cultural Heritage

The scope of the proposed assessments are generally considered appropriate, however with regard to the information you intend to obtain from English Heritage in respect of scheduled records, you may wish, as part of the visual impact assessment, to include any that are considered by English Heritage as requiring protection in terms of their visual setting.

Socio Economic Impact

It is recommended that the scope of the assessment includes reference to the potential contribution the development could make to the UK's energy security. Furthermore a skills analysis to identify the types of employment opportunities the proposal could create in the locality should be undertaken.

Amenity

The intention to provide a summary of potential impacts from litter and vermin and how it is proposed to mitigate these is noted.

This opinion is made in accordance with the powers delegated to me by the Planning Applications Committee. The decision does not preclude the County Council from requesting further information, when considering any future planning application and accompanying environmental statement in respect of the development.

Yours faithfully

[redacted]

Sharon Thompson
Head of Planning Applications Group

SEEDA SOUTH EAST ENGLAND DEVELOPMENT AGENCY
Working for England's World Class Region

Mr M Clifton
Planning Applications Group
Kent County Council
First Floor Invicta House
County Hall
Maidstone
ME14 1XX

29th June 2009

Dear Mr Clifton

Scoping Opinion – proposed sustainable energy plant at Kemsley Paper Mill, Kemsley, Sittingbourne

I refer to your letter dated 17th June 2009 seeking SEEDA's views on the proposed content of the EIA in support of the proposed sustainable energy plant.

Having viewed the EIA Scoping Study we consider it would be useful for the Socio-Economic Chapter to determine the contribution the development would make towards improving the UK's energy security.

In addition, NOMIS data indicates that in Swale 4,200 residents are economically in-active and wanting a job[1]. Therefore, we consider it may be useful to include a skills analysis within the socio-economic chapter to identify the types of employment opportunities generated. In addition, the local authority might wish to consider using legal agreements to fund a skills and training initiative to ensure that local residents benefit from the development.

SEEDA is involved in the Pathway to Zero Waste initiative which seeks to improve resource efficiency and waste management in the region: www.seeda.co.uk/pathwaytozerowaste

Thank you for consulting SEEDA.

Yours Sincerely

30 JUN 2009

[redacted]

Ian Mawer
SEEDA

[1] NOMIS Economic Inactivity Data (Oct 2007 – Sept 2008): www.nomisweb.co.uk

South East England Development Agency (SEEDA)
SEEDA Headquarters Cross Lanes Guildford GU1 1YA England
Tel +44 (0)1483 484 200 Fax +44 (0)1483 484 247 **email** seeda@seeda.co.uk **web** www.seeda.co.uk

creating a better place

29 JUN 2009

Environment Agency

Mr. M Clifton
Kent County Council
Planning Applications Group
Invicta House
Maidstone
Kent
ME14 1XX

Our ref: KT/2009/108836/01-L01
Your ref: PAG/MC/DC29/09/SW/0003

Date: 26 June 2009

Dear Mr. Clifton

TOWN AND COUNTRY PLANNING ACT 1990

REQUEST FOR A SCOPING OPINION IN RESPECT OF A PROPOSED SUSTAINABLE ENERGY PLANT

KEMSLEY PAPER MILL, KEMSLEY, SITTINGBOURNE

Thank you for your letter dated 17 June 2009. We would like to offer the following advice:

In general terms the proposals to reduce reliance on fossil fuels, and derive both power and heat from waste derived fuel sources are commendable. Whilst the EIA Scoping Opinion report provides only an outline of the proposal we consider a number of issues warrant particular attention at an early stage of the process.

Flood Risk

Although the site is not located in an area at risk of flooding, due to its size a Flood Risk Assessment (FRA) will be required to ensure that surface water drainage is dealt with appropriately. We acknowledge that chapter 10 of the Environmental Statement will be designed to deal with hydrology and flood risk, and we are satisfied that the requirement for a FRA can be met in this manner.

Groundwater and Contaminated Land

Planning Policy Statement (PPS) 23 states that all potential risks to groundwater should be assessed prior to development. Given the site's history, a preliminary risk assessment, including desk study and site walkover will be required to accompany

any planning applications as a minimum. However, this is not likely to be necessary at EIA stage and but rather later as part of the planning application.

Needs

The EIA should include an Energy Balance demonstrating the potential impact on efficient energy generation from the current energy generation facilities (Combined Heat and Power Plants (CHP) and Incinerator) serving the paper mill. This is because replacing the production of heat and power from the CHP`s may result in the production of power from fossil fuels less efficiently. The EIA therefore should demonstrate the overall net benefits to the production of heat and power at this installation.

Alternatives

The EIA should identify alternative uses for power and steam in the vicinity should heat demand decrease. In the absence of serious alternatives the EIA should detail the obstacles to achieving efficient production should heat demand decrease, and detail the efficiencies associated with such a scenario. The efficiencies gained from combined heat and power rely on using low grade steam from energy generation. These efficiencies are affected should steam demand at the mills reduce. As demonstrated locally, the paper sector has undergone substantial rationalisation in recent years affecting traditional energy balances and reducing efficient energy production.

Fuel

The papermaking process at Kemsley Mill produces substantial quantities of waste sludges and reject material (i.e. plastics), of which approximately 50% are used for the production of power and steam in the onsite incinerator. The remainder are disposed of / recovered off-site. The EIA should detail how the remaining waste generated on-site will be dealt with before receiving waste materials generated off-site. Where relevant, details for improving the calorific value of on-site waste (e.g. sludge drying) should be provided. We consider it to be more sustainable to derive fossil fuel replacement fuel sources from on-site waste before bringing waste generated elsewhere on site.

Nuisance

The EIA should detail what provision will be made for the removal of un-combusted waste material in the event of protracted no-operation of the incinerator and protection on the environment during this time. Particular regard should be made to pest infestation and odours. Recent local experience has shown that insufficient attention has historically been paid to the potential environmental impacts from being forced to store refuse.

Waste

The EIA should detail proposals for the disposal and recovery of incinerator bottom ash and provide a realistic assessment of recovery options, having regard to the capacity of the construction sector to adsorb increasing volumes of IBA. Whilst the recovery of IBA through construction materials is a viable option, it is likely to represent only a partial solution to dealing with the volume of waste produced from the incineration process.

Cont/d..

Permit

The proposals fall under Schedule 1, Part 2, Section 5.1, Part A(1)(c) of the Environmental Permitting (England and Wales) Regulations 2007 and as such require an Environmental Permit from the Environment Agency. We would recommend the applicant contacts us at the earliest to avoid possible delays.

Yours sincerely

[redacted]

Mr Niall Connolly
Planning Liaison Officer

Direct dial 01732 223111
Direct fax 01732 223289
Direct e-mail Niall.Connolly@environment-agency.gov.uk

RECEIVED
29 JUN 2009

End

Noise and Air Quality Comments

Application No:	PAG/MC/DC29/09/SW/0003		**File Ref:**	B1229200/0026	
Site:	Kemsley Paper Mill, Kemsley, Sittingbourne				
Proposal:	Sustainable Energy Plant at Kemsley Paper Mill – request for scoping opinion				
Response to and Date:	Mr M Clifton, Planning Applications Unit, KCC 17th June 2009				
FAO:	Mike Clifton	**From:**	Richard Woolley	**Date:**	07/07/09

Further to your recent letter enclosing details (CD) of the proposed Sustainable Energy Plant at Kemsley Paper Mill and a request for a scoping opinion upon the applicant's proposed methodology, please find my comments below –

The closest residential properties are some distance from the development (700 metres to the southwest) and the site is already occupied by industrial users; it is therefore unlikely that operation use from the fixed plant will result in noise increases at the closest residential properties. The Applicant however proposes to undertake a BS4142 assessment of the likely impacts of the proposed Energy Plant together with a consideration of BS8233 and WHO guidelines on noise levels in order to assess the potential impacts associated with the proposed plant. In terms of construction noise the Applicant states that consultation with the local EHO will be undertaken together with a BS5288 assessment of the construction process. I would consider that this approach was acceptable.

In terms of the potential noise impacts associated with vehicle movements on the road network, the applicant does not state the assessment methodology. DMRB provides guidance for assessing daily changes in traffic. Furthermore, I would wish to see an assessment of the potential impacts during the night if any additional vehicle movements were predicted.

The air quality assessment proposes that the assessment will assess the potential air quality impacts of the proposal on the local environment and the ecological resources within the zone of influence of the plant, giving a full description a number of pollutants and their predicted dispersion over a 10 km radius in line with the requirements of their PPC permit. The assessment includes extensive background monitoring and detailed dispersion modelling using ADMS or AERMOD software. The traffic impacts off-site will in addition be assessed using DMRB methodology.

The report will assess the impacts upon the local designated sites to see the impacts upon the ecosystems. The air quality assessment will also include a health risk assessment. I consider this approach to the air quality issues to be satisfactory.

If the Environmental Assessment is carried out inline with the proposed methodology then the noise air quality and dust issues would be satisfactorily addressed. Should you wish to discuss this further, please feel contact me on 01622 666154.

Richard Woolley
Checked: R Mansfield

South East England **Partnership Board**

RECEIVED
- 3 JUL 2009
PLANNING
APPLICATIONS UNIT

Sharon Thompson
Head of Planning Applications Group
Kent County Council
First Floor, Invicta House
County Hall
Maidstone, Kent
ME14 1XX

2 July 2009

Dear Ms Thompson,

RE: TOWN & COUNTRY PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) (ENGLAND & WALES) REGULATIONS 1999

REGULATION 10 (SCOPING OPINIONS) CONSULTATION ON MATTERS TO BE ADDRESSED IN THE ENVIRONMENTAL IMPACT ASSESSMENT OF A PROPOSED SUSTAINABLE ENERGY PLANT AT KEMSLEY PAPER MILL, KEMSLEY, SITTINGBOURNE KENT

OUR REFERENCE: A/09/040

Thank you very much for the opportunity to comment on the proposed sustainable Energy Plant at Kemsley paper Mill.

The South East England Partnership Board as the Regional Planning Body has no comments to make relating to this document, but look forward to receiving the details as and when this becomes a Planning Application.

If you require any further information, please contact David Nkrumah-Boateng on 01483 555224 or davidnkrumahboateng@se-partnershipboard.org.uk.

Yours sincerely,

[redacted]

Sue Janota
Planning Manager

South East England Partnership Board • Berkeley House Cross Lanes Guildford GU1 1UN
t: 01483 555200 • f: 01483 555250 • e: info@se-partnershipboard.org.uk
www.se-partnershipboard.org.uk

Swale House, East Street
Sittingbourne, Kent
ME10 3HT

Tel: 01795-424341
Fax: 01795-417217
www.swale.gov.uk

Swale
BOROUGH COUNCIL
NORTH KENT COAST

Head of Planning Applications Group
Kent County Council
First Floor, Invicta House
County Hall
Maidstone
Kent ME14 1XX

Ask for: Richard Allen
Direct Line: 01795 417307
Our Ref:
Your Ref:
PAG/MC/DC29/09/SW/0003

Date: 2 July 2009

Dear Sir/Madam,

Town and Country Planning (Environmental Impact Assessment) Regulations 1999 Regulation (10) (1) for a Scoping Opinion in respect of a Proposed Sustainable Energy Plant at Kemsley Paper Mill, Kemsley, Sittingbourne

Thank you for your consultation on the above and for giving Swale Borough Council the opportunity to comment.

The Council agrees with the proposed chapters and the extent of the study which will form the content of the forthcoming EIA. Providing Kent County Council agrees with this standpoint that all chapters are appropriate, Swale Borough Council has no further comments to make.

Yours sincerely,

[redacted]

Richard Allen
Senior Planner
Major Projects Team

- 6 JUL 2009
APPLICATIONS

Civil Aviation Authority

Safety Regulation Group
Aerodrome Standards

22 JUN 2009

RECEIVED
23 JUN 2009

Ms Sharon Thompson
Head of Planning Applications Group
Kent County Council
First Floor
Invicta House
County hall
Maidstone
Kent. ME14 1XX

18th June 2009

Dear Madam

Scoping Opinion - Proposed Sustainable Energy Plant At Kemsley Paper Mill, Kemsley, Sittingbourne

Thank you for inviting CAA to comment on the above proposals.

The CAA has no role in assessing environmental factors other than at an aerodrome designated under the Civil Aviation Act for that purpose.

The area in question does not contain any aerodrome so designated. We therefore make no comment on the environmental aspects of the work. We will nevertheless exercise our right under Section 16(5) of the Civil Aviation Act 1982 to draw your attention to the fact that if the site is within the safeguarding area for an airport or aviation technical site (as indicated in any maps issued to you for such purposes) the comment of the airport operations manager or site manager should be sought.

If any high structures are involved please bear in mind that any of 90 metres or more height should be discussed with the Directorate of Airspace Policy, Room K6 Gate 3, CAA House, 45-59 Kingsway, London WC2B 6TE.

For projects which bypass the normal process of application for planning permission, especially those involving trenching or tunneling, or substantial new structures, consult NATS as a matter of routine. The contact for the whole of the UK is Stephen Collett, Senior Systems Engineer, NATS plc, Mailbox 27, NATS Corporate & Technical Centre, 4000 Parkway, Whiteley, Fareham, Hants PO15 7FL.

Yours faithfully

[redacted]

[redacted] K RIENSEMA
Head of Strategy & Standards
Aerodrome Standards

Civil Aviation Authority
Aerodrome Standards Department 2W Aviation House Gatwick Airport South West Sussex England RH6 0YR
Telephone 01293 573252 Fax 01293 573971 www.caa.co.uk

INVESTOR IN PEOPLE

IWADE PARISH COUNCIL

Clerk Mrs Lynda Fisher, 53 Springvale, Iwade, Sittingbourne, ME9 8RX
Phone: 01795 477015, e-mail: iwadepc@blueyonder.co.uk

7th July 2009

Your Ref: PAG/MC//DC29/09/SW/0003

Mr M Clifton
Planning Applications Group
First Floor, Invicta House
County Hall
Maidstone
Kent ME14 1XX

Dear Sir,

REQUEST FOR SCOPING OPINION IN RESPECT OF A SUSTAINABLE ENERGY PLANT AT KEMSLEY PAPER MILL, KEMSLEY, SITTINGBOURNE.

ST REGIS PAPER COMPANY LIMITED

The Iwade Parish Council (IPC) has considered the proposed scope of the environmental assessment produced by the applicants, and wishes to draw attention to particular aspects that are of concern to the residents of Iwade. The site of the plant and in particular the ash handling area is extremely close to the western seawall of The Swale which is the boundary of the SSSI Ramsar Site an International and National Site of Biodiversity[1]. No figures are given in the draft EIA for the release of dioxins and other dangerous chemicals such as mercury which will be present in the flue gases and the bottom ash. The emissions from the plant and dust from ash handling will fall on the populated areas of Kemsley, Iwade, Sittingbourne, and the extensive Swale Ramsar Sites.

Ramsar Site
The north eastern boundary of the ash handling area is approximately 50 metres from the boundary of the SSSI Ramsar Site which is the bank of The Swale, after high water as the tide ebbs and the mud is exposed many hundreds of Dunlin and other waders feed on the benthic micro invertebrates, molluscs and bivalves exposed by the falling tide.

The Swale Ramsar Site is a wetland of international importance comprising intertidal mudflats, shell beaches, saltmarshes and extensive grazing marshes. It provides breeding and winter habitats for important assemblages of wetland bird species, particularly wildfowl and waders. Some 20 wildfowl species of conservation importance are recorded on the Swale Estuary, and 10 recorded in nationally important numbers, three species in internationally important numbers. A survey in 1999 along the sea wall and saltmarsh adjacent to the proposed site of the Plant, recorded Avocet and Black Tailed Godwit, both have protected status. Wigeon, Oystercatcher, Brent Goose, Teal, Shelduck, and many others of conservation importance are present in substantial numbers. Land birds of conservation concern were recorded on the marshes.

The Swale estuary is a shellfish water, designated as such in European Legislation. The potential impact of bioaccumulation of mercury and heavy metals in the human food chain through the consumption of shell fish and cattle grazed on the marshes, has to be included in the EIA.

---

1 Proposals Map of the Swale Borough Council Local Plan 2008

Water Vole, a protected species, has been recorded in the ditches adjacent to Ridham Dock 1.5km to the north of the proposed incinerator. At Iwade and in the Swale marshes, a metapopulation of great crested newts (protected by EU and National Legislation) is currently recorded.

Saxon Shore Way is located on the sea wall, about 40m from the boundary of the waste handling area. (the scale and detail of the site plans is very poor).

The Human Health Impact
It is important that a full examination of the human health impact is carried out to assess the effect of particulates, dioxins, furans, and heavy metals on the people of Sittingbourne and local villages, the walkers on the footpath, the workers at the Mill, Ridham Dock, and the new Morrisons food warehouse. There is already an Incinerator at Kemsley Mill and the combined release of PM10, SOx and NOx has the potential to increase cases of chronic cough and asthma attacks in residents, children are particularly vulnerable.

Dioxins and furans are some of the most toxic chemicals known to science. In addition to cancer, exposure to dioxin can cause reproductive and development problems (at levels 100 times lower than those associated with its cancer and asthma effects). Dioxin is well-known for its ability to damage the immune system and interfere with hormonal systems.[2]

Iwade is frequently dusted with wind borne gypsum from the stockpiles of the Knauf factory, situated close eastward of the proposed incinerator site. The airborne dioxins can attach to small particles that travel long distances - Iwade is 2.1km northwest of the Incinerator site. *The major source of dioxins in the environment comes from waste-burning incinerators of various sorts.*[3]

The EIA should include an assessment of the polluting effects of the 224 daily HGV movements delivering the waste to the incinerator. The south eastern boundary of Iwade is just 400 metres from the A249 dual carriageway junction.

In conclusion, the Iwade Parish Council is of the opinion that, incinerating 500,000 tpa of mainly municipal waste will produce toxic emissions detrimental to the wildlife of the Swale Estuary Special Protection Area and to the local population. A thorough Environmental Impact Assessment is essential.

Yours faithfully,

[redacted]

LYNDA FISHER
Clerk to Iwade Parish Council

---

[2] US National Academy of Sciences, Dioxin Homepage.
[3] Us National academy of Sciences, Dioxin Homepage.

Date: 6 July 2009
Our ref: TQ96-2/Con Plan
Your ref: PAG/MC/DC29/09/SW/0003

ENGLAND

Natural England
International House
Dover Place
Ashford
Kent
TN23 1HU

Mr M Clifton
Planning Applications Group
Kent County Council
First Floor, Invicta House
County Hall
Maidstone
Kent
ME14 1XX

By email only, no hard copy to follow

Dear Mr Clifton

Environmental Impact Assessment Scoping Report for a proposed sustainable energy plant at Kemsley Mill, Kemsley, Sittingbourne

Thank you for your letter of 17 June regarding the above. Recent case law[1] and guidance from the Office of the Deputy Prime Minister[2] has stressed the need for a full set of environmental information to be available for consideration prior to a decision being taken on whether or not to grant planning permission.

The proposed format of the Environmental Impact Assessment (EIA) covers most of the areas that we would wish to see within the EIA. However, in order to give further clarity we would advise the following:

1. Sites of Special Scientific Interest (SSSIs) and sites of European or international importance (Special Areas of Conservation, Special Protection Areas and Ramsar sites).
The development site is close to the following designated nature conservation sites:

- The Swale SSSI (200m)
- The Swale SPA (200m)
- The Swale Ramsar Site (200m)
- Medway Estuary and Marshes SSSI (2.5km)
- Medway Estuary and Marshes SPA (2.5km)
- Medway Estuary and Marshes Ramsar Site (2.5km)

Further information on the SSSIs can be found at www.natureonthemap.org.uk or by request from this office. The Environmental Statement should include a full assessment of the direct and indirect effects of the development on the features of special interest within these sites and should identify such mitigation measures as may be required in order to avoid, minimise or reduce any adverse significant effects.

European sites (e.g. designated SPAs) fall within the scope of the Habitats Regulations[3] 1994. Government policy, stated in PPS9 and Ramsar Sites in England: A Policy Statement (DETR

---

[1] Harrison, J in *R. v. Cornwall County Council ex parte Hardy* (2001)
[2] *Note on Environmental Impact Assessment Directive for Local Planning Authorities* (April 2004)
[3] *The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended)*

2000)[4], stipulates that Ramsar Sites be treated as if they are fully designated European sites for the purpose of considering development proposals that may affect them.

Under Regulation 48 of the Habitats Regulations an appropriate assessment needs to be undertaken in respect of any plan or project which is (a) likely to have a significant effect on a European site (either alone or in combination with other plans or projects) and (b) not directly connected with or necessary to the management of the site. In this case the proposal is not directly connected with, or necessary to, the management of a European site and in our view it is likely that it will have a significant effect on internationally designated sites and therefore will require an appropriate assessment. We recommend that there should be a separate section of the Environmental Statement to address impacts upon European and Ramsar sites entitled 'Information for Appropriate Assessment'. This should include consideration of:

Construction effects

- disturbance to birds from additional noise and movement on site and from traffic;
- dust from various operations (including traffic) smothering vegetation and/or habitats utilised by protected birds, invertebrates and plants;
- airborne emissions from construction traffic;
- adverse effects on hydrology

Operational effects

- disturbance to birds from additional noise;
- disturbance to birds from the use of Ridham Dock for importation of materials should this option be taken;
- smothering of vegetation and/or habitats from particulates;
- acidification and/or nutrient enrichment of habitats from airborne emissions (including transport);
- changes in local hydrology from water extraction;
- pollution of ground and surface waters.

2. Landscape Character and Designated Areas

The indicated content appears to be sufficient for our purposes.

3. Local Wildlife Sites

Our records indicate that the development site is adjacent to the following Local Wildlife Site:

- Milton Creek, Sittingbourne

Local Wildlife Sites are identified by the Kent Wildlife Trust and are of county importance for wildlife. The Environmental Statement should therefore include an assessment of the likely impacts on the wildlife interests of the site identified above. The assessment should include proposals for mitigation of any impacts and if appropriate, compensation measures. Contact the Kent Wildlife Trust for further information.

4. Species protected by the Wildlife and Countryside Act 1981 (as amended) and by the Conservation (Natural Habitats &c.) Regulations 1994 (as amended).

We note that a phase 1 habitat survey has already been undertaken and that further surveys are to be carried out for reptiles, water vole and knapweed carder bee.

If any protected species are found the Environmental Statement should include details of:

- The species concerned;
- The population level at the site affected by the proposal;
- The direct and indirect effects of the development upon that species;
- Full details of any mitigation or compensation that might be required;
- Whether the impact is acceptable and/or licensable.

---

[4] http://www.ramsar.org/wurc/wurc_policy_uk_england.htm

In order to provide this information there may be a requirement for a survey at a particular time of year. Surveys should always be carried out by suitably qualified and where necessary, licensed, consultants.

In view of the proximity of The Swale SPA the area should also be surveyed for birds. This should include surrounding areas that may be disturbed by activity on site (e.g. visual disturbance, noise etc). The survey should also note flight lines of birds travelling across the site. This will inform the level of disturbance, if any, to the designated features of the SPA.

The great crested newt, dormouse and all species of bats are European protected species such that it is illegal to intentionally kill, injure or otherwise disturb them. If any of these species are found to be present you should also consult Natural England's Wildlife Management and Licensing Unit in Bristol (Tel. 0845 6014523) about licensing implications before any work can proceed.

5. Cumulative and in-combination effects.
The EIA should include an impact assessment to identify, describe and evaluate the effects that are likely to result from the project in combination with other projects and activities that are being, have been or will be carried out. To carry out the assessment of cumulative and in-combination effects, the following types of projects should be included. (Subject to the availability of information):

a. Existing completed projects
b. Approved but uncompleted projects
c. Ongoing activities
d. Plans or projects for which an application has been made and which are under consideration by the consenting authorities
e. Plans and projects which are reasonably foreseeable, i.e. projects for which an application has not yet been submitted, but which are likely to progress before completion of the development and for which sufficient information is available to assess the likelihood of cumulative and in-combination effects.

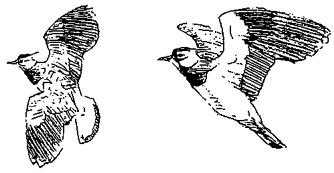
I trust these comments are helpful but please do not hesitate to contact me if you require any other information.

Yours sincerely

[redacted]

Nigel Jennings
Adviser, Environmental Planning
Direct Dial: 0300 060 4787
Fax: 0300 060 4798
E-Mail: Nigel.jennings@naturalengland.org.uk

RSPB a million voices for nature



RSPB South East Regional Office
2nd Floor Frederick House
42 Frederick Place
Brighton
BN1 4EA
Tel. 01273 775333
Fax. 01273 220236
www.rspb.org.uk

S Thompson
Planning Applications Group
First Floor, Invicta House
County Hall
Maidstone
Kent
ME14 1XX

29 June 2009

Dear Ms Thompson,

Request for EIA scoping opinion for proposed energy plant at Kemsley paper mill, Sittingbourne

Thank you for consulting the RSPB on the EIA scoping opinion for the proposed power plant at Kemsley paper mill.

We are broadly satisfied that the document has identified the potential environmental impacts of the proposal. We welcome the proposal to consider more sustainable modes of transport to import waste feedstock to the site, for example by river and rail.

The site lies within 50 m of the Swale SPA/Ramsar site and 2.5 km of the Medway Estuary and Marshes SPA/Ramsar site, therefore Regulation 48 of the Conservation (Natural Habitats &c) Regulations 1994 should be applied, and an assessment made of whether there will be a likely significant effect on the SPA/Ramsar sites.

Sufficient information should be provided in the Environmental Statement to inform the AA.

All potential direct, indirect and cumulative impacts on the designated sites, both during construction and operation of the plant, should be considered in the EIA. The application should also be assessed for any impacts in combination with other plans and projects.

The following have the potential to adversely affect the SPA/Ramsar sites:

- Loss of habitat used by SPA/Ramsar features;
- Disturbance during construction;
- Disturbance during operation; and
- Deterioration of SPA/Ramsar habitats through airborne and waterborne emissions

I hope these comments are useful and I would be grateful if you could keep me informed of the progress of this application.

Yours sincerely

[redacted]

Fay Martin
Conservation Officer

Clifton, Mike - E&R PA

From: Forster, Helen - E&R

Sent: 02 July 2009 12:50

To: Clifton, Mike - E&R PA

Subject: St Regis Paper Company Scoping opinion

Hi Mike,

I have a quick look through the document and I don't have very many comments to make about the scoping opinion as they have appeared to be included all the relevant surveys.

The EIA must assess the impact it will have on the designated sites within the area - it should be considered both by itself and the cumulative impact the development will have.

The report mentions that Common Lizards have been found on site - I was unable to identify in the report if a reptile survey had been carried out. I presume a survey has been carried out to establish a population estimate of the site? The receptor site should also have been surveyed and established if it could support the reptiles. If work needs to be carried out on the receptor site it must be completed prior to any translocation being carried out.

Paragraph 4.10.9 states that because the ditch is unsuitable for Great Crested Newts there is no need for further investigation. However there are ponds within 500 meters of the site - GCN are only found during the breeding season in waterbodies, the rest of the year they are found in terrestrial habitats up to 500 meters from a waterbody. If there is suitable habitat for reptiles there is suitable foraging habitat for GCN please provide additional information about why GCN are not expected to be found within the development site.

The report mentions carrying out enhancements - the development should try to include on site mitigation and enhancements in addition to any off site enhancements they were proposing.

Please let me know if you have any questions.

Kind Regards,

Helen

Our ref: 919650/grh
Your ref: PAG/MC/DC29/09/SW/0003

23rd June 2009

Sharon Thompson
Planning Applications Group
First Floor, Invicta House
County Hall
Maidstone
Kent ME14 1XX

Kent wildlife Trust

Kent Wildlife Trust
Tyland Barn
Sandling Maidstone
Kent ME14 3BD
Tel: (01622) 662012
Fax: (01622) 671390
info@kentwildlife.org.uk
www.kentwildlifetrust.org.uk

Dear Sharon,

RE: Request for a scoping opinion, in respect of a proposed sustainable energy plant at Kemsley Paper Mill, Kemsley, Sittingbourne

Thank you for consulting Kent Wildlife Trust on this application.

We note that no breeding bird survey is to be undertaken, and that disturbance will be avoided by appropriate phasing of works. While phasing of works may avoid breaches of protected species legislation it will not provide the information necessary to inform mitigation for the loss of potential breeding habitat for birds.

The potential presence of Knapweed Carder Bee has been highlighted. I am assuming this refers to *Bombus sylvarum*, a UK Biodiversity Action Plan species. This species forages on a number of plants, largely labiates such as Black Horehound and legumes such as Bird's-foot Trefoil. Mitigation for this species should look to recreate areas of such plants. The Phase 1 habitat survey may identify areas of habitat of value to invertebrates (such as those that may be found on post-industrial sites). If this is the case we would also expect an invertebrate survey to be undertaken.

Owing to the scale of the development and its proximity to the SPA we would expect an Appropriate Assessment to be carried out, and the applicant should therefore ensure that adequate information is provided to enable this to be undertaken. Consultation with Natural England is advised.

If you have any questions please do not hesitate to contact me.

Yours sincerely

[redacted]

Greg Hitchcock
Thames Gateway Officer

Mike

Bobbing Parish Council

www.bobbingpc.kentparishes.gov.uk

Kent County Council
Planning Applications Group
First Floor
Invicta House
County Hall
Maidstone
Kent ME14 1XX

7th July 2009

Dear Sirs

Waste Energy Plant Ridham **Ref: PAG/MC/DC29/09/SW/0003**

Thank you for the opportunity to comment on your report.

The Parish Council has taken the opportunity to discuss the proposed development.

The Parish Council feels there are two main issues here. Firstly the energy plant itself and secondly the access from the A249 to the energy plant. We have no objections in principal to the development of such a plant on the site in question.

However we do have serious concerns regarding the approach road to the site, given that the plant hopes to attract waste from the whole of South East of England which will inevitably approach the development via the A249.

The Parish Council feels that the A249 – B2005 junction (Iwade junction) is not adequate to cope with the number of HGV's that will be going to the new development. HGV traffic will use the A249 slip road and encounter 2 small roundabouts either side of the A249 - B2005 bridge (see map). One of these two roundabouts has a very tight turning circle with restricted vision. We would like to see these roundabouts enlarged to improve the tuning circle and safety aspects when cars and HGV's meet to negotiate the roundabouts (The Iwade side roundabout in particular).

Also has any thought been given to using rail or seaborne containers to run into the development site ?

We hope you will take these considerations on board.

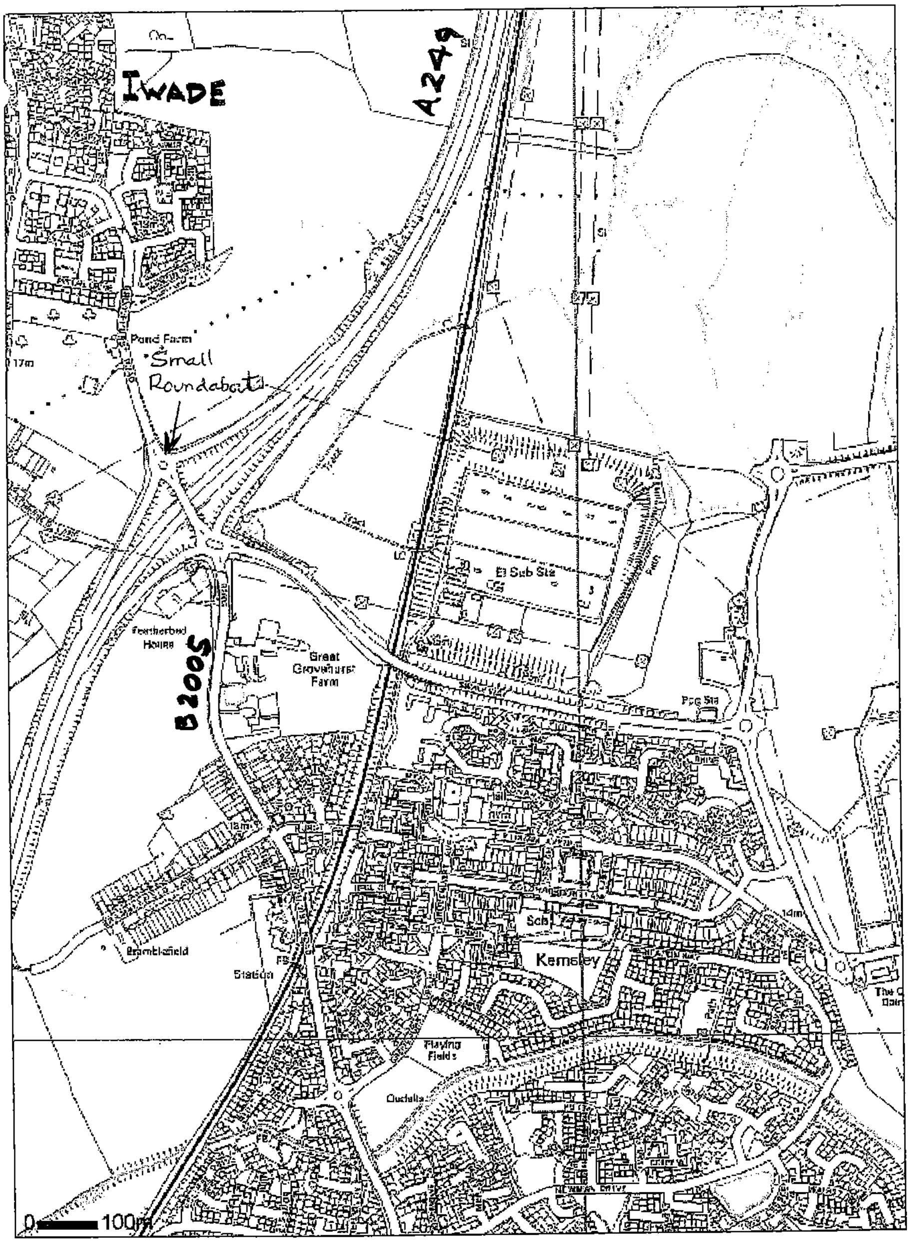
Yours faithfully

[redacted]

Sue Crawford
Bobbing Parish Clerk

1 0 JUL 2009

Mrs Sue Crawford, Bobbing Parish Clerk
1 Meadow View Cottages, Bobbing Hill, Bobbing, Sittingbourne, Kent ME9 8PA
Tel/Fax 01795 844915 E-mail sue_12@btinternet.com



Kemsley Mill

Test Map

Produced using KentView by initials on Friday, 3 July 2009 at 11.27

1:9000

Kent County Council

RECD
- 6 JUL 2009
PLANNING
APPLICATIONS UNIT

Kent County Council

Mr M Clifton
Planning Applications Group
1st Floor Invicta House
County Hall
Maidstone

Countryside Access Service
Environment & Waste Division
The Granary
Penstock Hall Farm
Canterbury Road
East Brabourne
Ashford TN25 5LL
Tel: (01303) 814534 Ext 209
Fax: (01303) 813096
Minicom: 08458 247905
Ask for: Michael Ellis
E-mail: michael.ellis@kent.gov.uk
Web site: www.kent.gov.uk/explorekent
Your Ref: PAG/MC/DC29//09/SW/0003
Our Ref: EK/ME/ZU1
Date: 03 July 2009

Dear Mike

REQUEST FOR SCOPING OPINION IN RESPECT OF PROPOSED SUSTAINABLE ENERGY PLANT AT KEMSLEY PAPER MILL, KEMSLEY, SITTINGBOURNE

Thank you for your letter of 17 June 2009 concerning this scoping opinion.

Public footpath ZU1 which forms the Saxon Shore Way in this location would be affected by the proposed development. Public footpath ZS20 at Elmley Marshes is also close to the site, there are currently works underway to create a circular walk around the Isle of Sheppey and this path would be likely to form part of that route.

I believe that the Swale Local Plan referred to any developments in the vicinity of Milton Creek enhancing and encouraging use and not distracting from use of the Saxon Shore Way. Some sort of screening maybe appropriate.

Yours sincerely

[redacted]

Mr Michael Ellis
Public Rights of Way Officer

Landscape Comments

Application No:	N/A			**File Ref:**	B1219300 Waste/09
Site:	St Regis Paper Company, Kemsley Mill, Sittingbourne				
Proposal:	Scoping Opinion for Sustainable Energy Plant				
Response to and Date:	Letter from KCC dated 17 June 2009				
FAO:	Mike Clifton	**From:**	David Green	**Date:**	08 July 2009

The Scoping Report appears to be generally satisfactory in relation to landscape issues. I have only a few comments to make as follows:

Consideration of Alternatives

This should be treated in greater depth. The landscape impacts of alternative layouts and options (as set out in 4.6) should be discussed and the development of the proposed design to minimise adverse landscape effects where possible should be included.

Landscape Designations

The Scoping Report discusses a number of wildlife designations (eg the RAMSAR site) which I would not regard as key landscape designations but which would be fully assessed under the ecology section. The key landscape designation in the area is the North Kent Marshes Special Landscape Area (SLA). The effects on the setting of Listed Buildings and Scheduled Monuments should also be considered.

Key Viewpoints

The opportunity to agree key viewpoints with KCC, once further baseline studies have been undertaken, is welcomed.

David Green
Assistant Principal Landscape Architect

Checked / Approved: HZB (8 July 2009)

Minster-on-Sea Parish Council

All communications to:-
Clerk to the Parish Council
c/o "Kits Coty"
The Glen
Minster-on-Sea
Sheerness
Kent ME12 2SD
Telephone: (07748) 967782
E-mail: minsterparish@btinternet.com

Ms Sharon Thompson
Head of Planning Applications Group
Kent County Council
First Floor – Invicta House
County Hall
Maidstone
Kent ME14 1XX

6 7 09

Dear Ms Thompson

Your Ref: PAG/MC/DC29/09/SW/0003 - **Request for a scoping opinion under the Town and Country Planning (Environmental Impact Assessment) (England and Whales) Regulations 1999 (Regulation 10 (1) in respect of a proposed sustainable energy plant at Kemsley Paper Mill, Kemsley, Sittingbourne.**

I am writing to inform you that the Planning and Transportation Committee of Minster-on-Sea Parish Council (MPC) considered the above proposal on Thursday 2nd July 2009.

MPC's comments are as follows: -

i. Domestic waste is highly toxic. Indeed it is unclear just how dangerous this material is because little is known about its content and the dangers this could present to the public and local wildlife. MPC asks for more information on the levels of the various pollutants including mercury and any other heavy metals which are toxic to wildlife and humans. MPC also asks for an Environmental Impact Assessment to be carried out to evaluate the degree of risk.

ii. Transportation of the waste derived fuel is a concern and its effect on the road structure. This proposal will generate an extra 50,000 lorry movements a year. Furthermore, the current proposal is only considering current traffic flow information. It needs to include future changes to the area in any transport assessment.

iii. Location is an issue in terms of how this will affect Junction 5 of the M2.

iv. Dust control is a serious issue because prevailing winds will carry any free dust over Sheppey including the SSSI where many endangered species live. MPC is also concerned that about dust carrying further into the residential area. We already have experience of carriage from Sheerness Steel Works.

v. MPC would also like information regarding the catchment areas for the collection of rubbish.

- 6 JUL 2009

In view of the implications, this proposal presents to the lives of Swale residents, the degree of risk to the wildlife of the Swale Area Protection Area and Ramsar site, the human food chain, the Swale fish waters and local workers, I must ask you to share MPC's comments with all those involved in the consultation process.

Sincerely

[redacted]

Trish Codrington
Clerk to Minster-on-Sea Parish Council

DEVELOPMENT OF A SUSTAINABLE ENERGY PLANT.

KEMSLEY PAPER MILL, SITTINGBOURNE, KENT

ST REGIS PAPER COMPANY LIMITED E.ON ENERGY FROM WASTE

ENVIRONMENTAL STATEMENT

APPENDIX 3.1:

PLANNING POLICY FRAMEWORK

1 The Development Plan

1.1 Kent County Council is the Waste Planning Authority responsible for the production of all planning policy including waste planning policy and determination of planning applications for wholly or mainly for waste management proposals including energy recovery. In this context, the statutory development plan thus comprises:

- The South East Plan: Regional Spatial Strategy for the South East of England (May 2009)
- The 'saved' policies of the Kent Waste Local Plan (March 1998)
- The Swale Borough Local Plan (February 2008).

2. The South East Plan

2.1 The South East Plan was adopted as the Regional Spatial Strategy for the South of England in May 2009. In accordance with the Planning and Compulsory Purchase Act 2004, paragraph 1.11 of the South East Plan is clear that the 'saved' policies of the Kent and Medway Structure Plan ceased to comprise part of the statutory development plan on 6 July 2009. The South East Plan comprises four sections, as follows:

- Section A provides an Introduction and Overview, sets out the Challenges and Context, and the Vision and Objectives;
- Section B sets out the Core Regional Policies which includes the Spatial Strategy, Cross Cutting Policies and a number of topic related policies.
- Section C sets out the Sub- Regional Policies including those for the Kent Thames Gateway within which the proposed development is located.

2.2 Section A identifies within its Challenges and Context sub-section a number of *Key Drivers of Change for the Region*, including that The South East is already being affected by signs of Climate Change. In this respect, it states:

"The 1990's was the warmest decade in 100 years, and the twelve-month period to April 2007 was the warmest since records began. Given its large ecological footprint, the region needs to do more to contribute to the national target of reducing greenhouse gas emissions and to prepare itself better for the impacts on climate change. Balancing affluence with the need to live within environmental limits will mean changes to behaviour of residents, businesses and all others who live, work, visit or invest in the region, and will be one of the biggest challenges for the next few decades."

2.3 The Vision and Objectives sub-section of Section A identifies a Regional *Vision*, and the Regions *Core Objectives.* The Regional *Vision* is set out as follows:

"A socially and economically strong, healthy and just South East that respects the limits of the global environment. Achieving this will require the active involvement of all individuals to deliver a society where everyone, including the most deprived, benefits from and contributes to a better quality of life. At the same time the impact of current high levels of resource use will be reduced and the quality of the environment will be maintained and enhanced."

2.4 The relevant Regional *Core Objectives* are as follows:

- *i. A sustainable balance between planning for economic, environmental and social benefits will be sought, to help improve quality of life for everyone in the South East*
- *ii. Economic growth and competitiveness in the region will be sustained, with Gross Value added (GVA) in the region increased by 3% per annum over the period 2006-2016*
- *viii Adequate infrastructure will be provided in a way that keeps pace with development*
- *xiii Better natural resource management and efficiency will be pursued, leading to reductions in the consumption of water and energy and the production of waste*
- *xv The best of the regions historic, built and natural environment will be protected and where possible enhanced, both for its own sake and to underpin the social and economic development of the region*
- *xvi New development will be of high quality sustainable design and construction, and be an asset to the region*

2.5 Section B sets out the Spatial Strategy for the South East as follows:

"The South East Plan is based on the following six spatial planning principles:

1. *A co-ordinated approach to managing change within the regions key settlements and their hinterlands, This will be achieved through the co-ordination of policy in nine identified sub-regions (Policy SP1).*
2. *Focussing new development on the South East's network of regional hubs, according to their role and function, whilst promoting their accessibility and inter linkages between them. This will include new development in five strategic development areas (Policy SP2). (A further two SDA's where specific development opportunities exist not linked to hubs will also be pursued).*

3. *Pursuing a continuing strategy of urban focus and urban renaissance by encouraging accessible mixed use development in the regions network of town centres and by seeking a high quality built environment in all areas (Policy SP3)*
4. *Spreading opportunities more evenly around the region through co-ordination of regeneration and social inclusion activity in the region's lagging areas (Policy SP4)*
5. *Respecting and maintaining the general pattern of the South East's settlements and undeveloped areas, through the protection of the regions identified Green Belts (Policy SP5)*
6. *Supporting the vitality and character of the regions rural areas, whilst protecting the valuable natural and historic assets of the region (policies set out in the boxes at the end of this chapter)*

2.6 Policy SP1: Sub- Regions in the South East states:

"Sub regions indentified in this Plan will be the focus for growth and regeneration. This will require co-ordinated effort and cross boundary working to better align economic and housing growth, deliver adequate infrastructure in a timely manner and to plan for more sustainable forms of development.

The Sub regions are identified as:
4. Kent Thames Gateway.

2.7 Policy SP3: urban Focus and Urban Renaissance *states:*

"The prime focus for development in the South East should be urban areas, in order to foster accessibility to employment, housing, retail and other services, and avoid unnecessary travel.

Local Planning Authorities will formulate policies to:
i. concentrate development within or adjacent to the regions urban areas
ii. seek to achieve at least 60% of all new development across the South east on previously developed land and through conversion of existing buildings
iii. Ensure that developments in and around urban areas, including urban infill/intensification and new urban extensions are well designed and consistent with the principles of urban renaissance and sustainable development
iv. Use strategic land availability assessments to identify the scope for redevelopment and intensification of urban areas, seeking opportunities for intensification around transport hubs and interchanges."

2.8 In addition to the Spatial Strategy, Section B also sets out a number of *Cross Cutting* policies, a number of which are relevant to the proposed development.

2.9 Policy CC1: Sustainable Development states:

"The principal objective of the Plan is to achieve and maintain sustainable development in the region. Sustainable development priorities for the South East are identified as:

i. achieving sustainable levels of resource use

ii. ensuring the physical and natural environment of the South East is conserved and enhanced

iii. reducing greenhouse gas emissions associated with the region

iv. ensuring that the South East is prepared for the inevitable impacts of climate change

v. achieving safe, secure and socially inclusive communities across the region, and ensuring that the most deprived people also have equal opportunities to benefit from and contribute to a better quality of life

All authorities, agencies and individuals responsible for delivering policies in this Plan shall ensure that their actions contribute to meeting the objectives set out in this policy and in the Regional Sustainability Framework."

2.10 Policy CC2: Climate Change states that:

"Measures to mitigate and adapt to current and forecast effects of climate change will be implemented through application of local planning policy and other mechanisms. Behavioural change will be essential in implementing this policy and the measures identified.

In addition, and in respect of carbon dioxide emissions, regional and local authorities, agencies and others will include policies and proposals in their plans, strategies and investment programmes to help reduce the regions carbon dioxide emissions by at least 20% below 1990 levels by 2010, by at least 255 below 1990 levels by 2015 and by 80% by 2050. A target for 2026 will be developed and incorporated in the first review of the Plan.

Adaption to risks and opportunities will be achieved through:

i. *guiding strategic development to locations offering greater protection from impacts such as flooding, erosion, storms, water shortages and subsidence*

ii. *ensuring new and existing building stock is more resilient to climate change impacts*

iii. *incorporating sustainable drainage measures and high standards of water efficiency in new and existing building stock*

iv. *increasing flood storage capacity and developing sustainable new water resources*

v. *ensuring that opportunities and options for sustainable flood management and migration of habitats and species are actively promoted*

Mitigation through reducing greenhouse gas emissions, will primarily be addressed through greater resource efficiency including:

i. *improving the energy and carbon performance of new and existing buildings and influencing the behaviour of occupants*

ii. *reducing the need to travel and ensuring good accessibility to public and other sustainable modes of transport*

iii. *promoting land use that acts as carbons inks*

iv. *encouraging development and us of renewable energy*

v. *reducing the amount of biodegradable waste landfilled."*

2.11 Policy CC3: Resource Use states:

"A sustained programme of action to help stabilise the South East's ecological footprint by 2016 and reduce it by 2026 should be incorporated into plans and programmes. Such actions will include:

i. *increased efficiency of resource use in new development*

ii. *adaption of existing developments to reduce its use of energy, water and other resources*

iii. *changes in behaviour by organisations and by individuals"*

2.12 Policy CC4: Sustainable Design and Construction

"the design and construction of all new development, and the redevelopment and refurbishment of existing building stock will be expected to adopt and incorporate sustainable construction standards and techniques. This will include:

i. *consideration of how all aspects of development form can contribute to securing high standards of sustainable development including aspects such as energy, water efficiency and biodiversity gain*

ii. *designing to increase use of natural lighting, heating, and ventilation and for proportion of energy supply of new development to be secured from decentralised and renewable or low carbon sources*

iii. *securing reduction and increased recycling of construction and demolition and procurement of low-impact materials*

iv. *designing for flexible use and adoption to reflect changing lifestyles and needs and the principles of 'whole life costing'.*

Local planning authorities will promote best practice in sustainable construction and help to achieve the national timetable's for reducing carbon emissions from residential and non-residential buildings. There will be situations where it could be appropriate for local planning authorities to anticipate levels of building sustainability in advance of those set out nationally, for identified development area or site specific opportunities. When proposing any local requirements for sustainable buildings, local planning authorities must be able to demonstrate clearly the local circumstances that warrant and allow this and set them out in development plan documents.2."

2.13 *Section B* also sets a number of topic related polices. Topics include Natural Resource Management, Waste and Minerals, and Transport.

2.14 Policy NRM1: Sustainable Water Resources and Ground water Quality states:

"Water supply and ground water will be maintained and enhanced through avoiding adverse
effects of development on the water environment. A twin-track approach of demand management and water resource development will be pursued.
In preparing local development documents, and determining planning applications, local authorities will:
i. assist the UK in achieving the objectives of the Water Framework Directive by delivering appropriate actions set out in River Basin Management plans.
ii. identify any circumstances under which new development will need to be supported by water efficiency standards exceeding extant Building Regulations standards
iii. set out the circumstances under which sustainable drainage solutions should be incorporated into new development
iv. encourage winter water storage reservoirs and other sustainable land management practices which reduce summer abstraction, diffuse pollution and runoff, increase flood storage capacity and benefit wildlife and recreation

v. direct new development to areas where adequate water supply can be provided from existing and potential water supply infrastructure. In addition ensure, where appropriate, that development is phased to allow time for the relevant water infrastructure to be put in place in areas where it is currently lacking but is essential for the development to happen.”

2.15 Policy NMR2: Water Quality states:

“Water quality will be maintained and enhanced through avoiding adverse effects of development on the water environment. In preparing local development documents, and determining planning applications, local authorities will:

i. take account of water cycle studies, groundwater vulnerability maps, groundwater source protection zone maps and asset management plans as prepared by the Environment Agency, water and sewerage companies, and local authorities

ii. ensure that the environmental water quality standards and objectives as required by European Directives are met

iii. ensure that the rate and location of development does not breach either relevant 'no deterioration' objectives or environmental quality standards

iv. not permit development that presents a risk of pollution or where satisfactory pollution prevention measures are not provided in areas of high groundwater vulnerability (in consultation with the Environment Agency and Natural England).

Local authorities will work with water and sewerage companies and the Environment Agency to:

i. identify infrastructure needs, allocate areas and safeguard these for infrastructure development

ii. ensure that adequate wastewater and sewerage capacity is provided to meet planned demand

iii. ensure that impacts of treated sewage discharges on groundwater, inland and marine receiving waters do not breach environmental quality standards or 'no deterioration' objectives

iv. ensure that plans and policies are consistent with River Basin Management Plans

v. ensure that water cycle studies are carried out, prior to development sites being given planning permission, where investigations by the Environment Agency indicate that water quality constraints exist

vi. ensure that Sustainable Drainage Systems are incorporated in a manner to reduce diffuse pollution.

Local authorities should promote land management initiatives to reduce diffuse agricultural pollution.”

2.16 Policy NRM4: Sustainable Flood Risk Management states:

"The sequential approach to development in flood risk areas set out in PPS25 will be followed. Inappropriate development should not be allocated or permitted in flood zones 2 and 3 (Diagram NRM1), areas at risk of surface water flooding (critical drainage areas) or areas with a history of groundwater flooding, or where it would increase flood risk elsewhere, unless there is over-riding need and absence of suitable alternatives. Local authorities, with advice from the Environment Agency, should undertake a Strategic Flood Risk Assessment (SFRA) to provide a comprehensive understanding of the flood risk and put in place a framework for applying the PPS25 sequential approach. This will facilitate allocating sites in a decreasing probability of flood risk. The SFRA would assess future climate change and identify appropriate types of development in accordance with the PPS25 sequential test and flood vulnerability of different land uses.

Existing flood defences will be protected from development. Where development is permitted in appropriately defended floodplains it must be designed to be resilient to flooding (to minimise potential damage) and to allow for the future maintenance, realignment or management of the defences to be undertaken.

In the preparation of local development documents and considering planning applications, local authorities in conjunction with the Environment Agency, should also:

i. take account of River Basin Management Plans, Catchment Flood Management Plans, Shoreline Management Plans and Surface Water Management Plans in developing local development documents and other strategies. Where locationally specific flood risk and land management options such as flood storage, managed realignment and set back from coastal defences are identified, land should be safeguarded for these purposes and appropriate land use and land management practices should be encouraged;

ii. consider the associated social and environmental costs and benefits to fisheries, biodiversity and the built and historic environment in assessment of new flood management schemes

iii. require incorporation and management of Sustainable Drainage Systems (SuDS), other water retention and flood storage measures to minimise direct surface run–off, unless there are practical or environmental reasons for not doing so

iv. take account of increased surface water drainage on sewage effluent flows on fluvial flood risk."

2.17 Policy NRM5: Conservation and Improvement of Biodiversity states:

"Local planning authorities and other bodies shall avoid a net loss of biodiversity, and actively pursue opportunities to achieve a net gain across the region.

i. They must give the highest level of protection to sites of international nature conservation importance (European sites (6)). Plans or projects implementing policies in this RSS are subject to the Habitats Directive. Where a likely significant effect of a plan or project on European sites cannot be excluded, an appropriate assessment in line with the Habitats Directive and associated regulations will be required.

ii. If after completing an appropriate assessment of a plan or project local planning authorities and other bodies are unable to conclude that there will be no adverse effect on the integrity of any European sites, the plan or project will not be approved, irrespective of conformity with other policies in the RSS, unless otherwise in compliance with 6(4) of the Habitats Directive.

iii. For example when deciding on the distribution of housing allocations, local planning authorities should consider a range of alternative distributions within their area and should distribute an allocation in such a way that it avoids adversely affecting the integrity of European sites. In the event that a local planning authority concludes that it cannot distribute an allocation accordingly, or otherwise avoid or adequately mitigate any adverse effect, it should make provision up to the level closest to its original allocation for which it can be concluded that it can be distributed without adversely affecting the integrity of any European sites.

iv. They shall avoid damage to nationally important sites of special scientific interest and seek to ensure that damage to county wildlife sites and locally important wildlife and geological sites is avoided, including additional areas outside the boundaries of European sites where these support the species for which that site has been selected.

v. They shall ensure appropriate access to areas of wildlife importance, identifying areas of opportunity for biodiversity improvement and setting targets reflecting those in the table headed 'Regional Biodiversity Targets - Summary for 2010 and 2026' below. Opportunities for biodiversity improvement, including connection of sites, large-scale habitat restoration, enhancement and re-creation in the areas of strategic opportunity for biodiversity improvement (Diagram NRM3) should be pursued

vi. They shall influence and applying agri-environment schemes, forestry, flood defence, restoration of mineral extraction sites and other land management practices to:

- *deliver biodiversity targets*
- *increase the wildlife value of land*
- *reduce diffuse pollution*

- *protect soil resources.*

Vii They shall promote policies that integrate the need to accommodate the changes taking place in agriculture with the potential implications of resultant development in the countryside. They shall require green infrastructure to be identified, developed and implemented in conjunction with new development."

2.18 Policy NRM9: Air Quality states:

"Strategies, plans, programmes and planning proposals should contribute to sustaining the current downward trend in air pollution in the region. This will include seeking improvements in air quality so that there is a significant reduction in the number of days of medium and high air pollution by 2026. Local development documents and development control can help to achieve improvements in local air quality through:
i. ensuring consistency with Air Quality Management Plans
ii. reducing the environmental impacts of transport, congestion management, and support the use of cleaner transport fuels
iii. mitigating the impact of development and reduce exposure to poor air quality through design, particularly for residential development in areas which already, or are likely to, exceed national air quality objectives
iv. encouraging the use of best practice during construction activities to reduce the levels of dust and other pollutants
v. assessing the potential impacts of new development and increased traffic levels on internationally designated nature conservation sites, and adopt avoidance and mitigation measures to address these impacts".

2.19 Policy NRM10: Noise states:

"Measures to address and reduce noise pollution will be developed at regional and local
level through means such as:
i. locating new residential and other sensitive development away from existing sources
of significant noise or away from planned new sources of noise
ii. traffic management and requiring sound attenuation measures in major transport schemes
iii. encouraging high levels of sound-proofing and screening as part of sustainable housing design and construction."

2.20 Policy NRM11: Development design for Energy Efficiency and Renewable Energy states

Local authorities should:
"i. promote and secure greater use of decentralised and renewable or low-carbon energy in new development, including through setting ambitious but viable proportions of the energy supply for new development to be required to come from such sources.
In advance of local targets being set in development plan documents, new developments of more than 10 dwellings or 1000m2 of non-residential floorspace should secure at least 10% of their energy from decentralised and renewable or low-carbon sources unless, having regard to the type of development involved and its design, this is not feasible or viable
ii. use design briefs and/or supplementary planning documents to promote development
design for energy efficiency, low carbon and renewable energy
iii. work towards incorporation of renewable energy sources including, in particular, passive solar design, solar water heating, photovoltaics, ground source heat pumps and in larger scale development, wind and biomass generated energy
iv. actively promote energy efficiency and use of renewable and low carbon energy sources where opportunities arise by virtue of the scale of new development including regional growth areas, growth points and eco-towns.
Local authorities and other public bodies, as property owners and managers, should seek
to achieve high levels of energy efficiency when refurbishing their existing stock."

2.21 Policy NRM12: Combined Heat and Power states:
Local development documents and other policies should encourage the integration of combined heat and power (CHP), including mini and micro–CHP, in all developments and district heating infrastructure in large scale developments in mixed use. The use of biomass fuel should be investigated and promoted where possible.
Local authorities using their wider powers should promote awareness of the benefits of mini and micro-CHP in the existing build stock.

2.22 Policy NRM13: Regional Renewable Energy Targets states:

"The following minimum regional targets for electricity generation from renewable sources should be achieved by the development and use of all appropriate resources and technologies:

Year/ timescale Installed	*Capacity (MW)*	*% Electricity Generation Capacity*
2010	*620*	*5.5*
2016	*895*	*8.0*
2020	*1,130*	*10.0*
2026	*1,750*	*16.0*

The renewable energy resources with the greatest potential for electricity generation are onshore and offshore wind, biomass, and solar. The renewable energy resources with the greatest potential for heat generation are solar and biomass."

2.23 Policy NRM14: Sub-Regional targets for Land Based Renewable Energy states:

Development plans should include policies, and development proposals as far as practicable should seek, to contribute to the achievement of the following regional and indicative sub-regional targets for land-based renewable energy (see Diagram NRM4):

Sub-region	*2010 Renewable Energy Target (MW)*	*2016 Renewable Energy Target (MW)*	*Champion*
Thames Valley and Surrey	*140*	*209*	*TV Energy*
East Sussex And West Sussex	*57*	*68*	*ECSC*
Hampshire and Isle of Wight	*115*	*122*	*Hampshire CC & Isle of Wight Council*
Kent	*111*	*154*	*Kent Energy Centre*

Local authorities should collaborate and engage with communities, the renewable energy industry and other stakeholders on a sub-regional basis to assist in the achievement of the targets through:

i. undertaking more detailed assessments of local potential

ii. encouraging small scale community-based schemes

iii. encouraging development of local supply chains, especially for biomass

iv. raising awareness, ownership and understanding of renewable energy."

2.24 Policy NRM15: Location of Renewable Energy Development states:

"Local development documents should encourage the development of renewable energy in order to achieve the regional and sub-regional targets. Renewable energy development, particularly wind and biomass, should be located and designed to

minimise adverse impacts on landscape, wildlife, heritage assets and amenity. Outside of urban areas, priority should be given to development in less sensitive parts of countryside and coast, including on previously developed land and in major transport areas. The location and design of all renewable energy proposals should be informed by landscape character assessment where available. Within areas of protected and sensitive landscapes including Areas of Outstanding Natural Beauty or the national parks, development should generally be of a small scale or community-based. Proposals within or close to the boundaries of designated areas should demonstrate that development will not undermine the objectives that underpin the purposes of designation."

2.25 Policy NRM16: Renewable Energy Development Criteria states:

"Through their local development frameworks and decisions, local authorities should in principle support the development of renewable energy. Local development documents should include criteria-based policies that, in addition to general criteria applicable to all development, should consider the following issues:

i. the contribution the development will make towards achieving national, regional and sub-regional renewable energy targets and carbon dioxide savings.

ii. the potential to integrate the proposal with existing or new development.

iii. the potential benefits to host communities and opportunities for environmental enhancement.

iv. the proximity of biomass combustion plant to fuel source and the adequacy of local transport networks.

v. availability of a suitable connection to the electricity distribution network."

2.26 Policy W3: Regional Self Sufficiency states:

"Waste authorities and waste management companies should provide management capacity equivalent to the amount of waste arising and requiring management within the region's boundaries, plus a declining amount of waste from London. Provision of capacity for rapidly increasing recycling, composting and recovery should be made reflecting the targets and requirements set out in this chapter.

Provision for London's exports will usually be limited to landfill in line with the Landfill Directive targets and, by 2016, new permissions will only provide for residues of waste that have been subject to recycling or other recovery process. Waste planning authorities (WPAs) should provide landfill capacity for the following apportionment of London's exported waste:

Landfill Provision to be Made for London Waste

	2006-2015		2016 –2025	
Waste Authority Area	*Apportionment % (2)*	*Million tonnes*	*Apportionment % (2)*	*Million tonnes*
Berkshire Unitaries	*9.3*	*1.12*	*8.6*	*0.63*
Buckinghamshire	*17.6*	*2.12*	*16.2*	*1.18*
East Sussex, Brighton and Hove	*8.8*	*1.06*	*8.1*	*0.59*
Hampshire, Portsmouth, Southampton and New Forest National Park	*0*	*0*	*7.8*	*0.57*
Kent & Medway	*13.1*	*1.58*	*12.1*	*0.88*
Milton Keynes	*10.8*	*1.30*	*10*	*0.73*
Oxfordshire	*18.7*	*2.26*	*17.2*	*1.26*
Surrey	*11.5*	*1.39*	*10.6*	*0.77*
West Sussex	*10.2*	*1.23*	*9.4*	*0.69*
SE TOTAL	*100*	*12.1 (1)*	*100*	*7.30 (3)*

(1) Estimated imports of MSW and C&I from London in 2006 is 1.21 million tonnes (Source: Environment Agency note for Inter Regional Waste Forum, March 2008).

(2) From 'Towards a Methodology for Apportionment of London's Exported Waste', Alternative Apportionment Options: Revision for EiP, page 15, option 2f, Jacobs

Babtie report, January 2007. For 2006-2015 these have been amended based on advice from SEERA to reflect the Hampshire M&W Core Strategy.
(3) Reduced to reflect Policy W5 MSW/C&I diversion targets.

Provision for recovery and processing capacity for London's waste should only be made where there is a proven need, with demonstrable benefits to the region, including improving the viability of recovery and reprocessing activity within the region, and in the nearest appropriate location. A net balance in movements of materials for recovery and reprocessing between the region and London should be in place by 2016.

The regional planning body will continue to work closely with all neighbouring regions to monitor and review waste movements and management requirements.

The figures in the above table should be used as a benchmark for the production and testing of development plan documents, but WPAs should use more recent data where this is available in order to assess and plan for capacity. Any major changes to the figures may dictate a need to reconsider the apportionment through a review of the RSS."

2.27 Policy W4: Sub Regional Self Sufficiency states:
"Waste planning authorities (WPAs) will plan for net self-sufficiency through provision for management capacity equivalent to the amount of waste arising and requiring management within their boundaries. A degree of flexibility should be used in applying the sub-regional self-sufficiency concept. Where appropriate and consistently with Policy W3, capacity should also be provided for:

i. waste from London
ii. waste from adjoining sub-regions (waste planning authority area within or adjoining the region).

WPAs should collaborate in the preparation of plans, including identifying and making provision for potential flows across the regional and sub-regional boundaries, and identifying possible sites that could be served by sustainable transport modes.

Co-operation will be encouraged between county councils and unitary authorities at the sub-regional level, particularly in respect of meeting the needs of the region's strategic growth areas."

2.28 Policy W5: Targets for Diversion from Landfill states:

"A substantial increase in recovery of waste and a commensurate reduction in landfill is

required in the region. Accordingly, the following targets for diversion from landfill of all

waste need to be achieved in the region (Policy W6 targets are a component of these):

Year	MSW	C&I	C&D	All Waste	
	Mt/yr	Mt/yr	Mt/yr	Mt/Yr	%
2008	2.0	5.2	10.0	17.2	68
2010	2.5	5.8	10.1	18.4	71
2015	3.9	7.4	10.4	21.7	79
2020	4.7	8.7	10.7	24.0	84
2025	5.1	9.4	10.9	25.5	86

Regional Targets for Diversion from Landfill.

Source: Regional Waste Management Capacity: Survey, Methodology and Monitoring,

Updated Final Report, 2008 (modelled Scenario 1)

Note: Percentage targets for diversion from landfill in the year 2008 have been interpolated.

Waste planning authorities (WPAs) should ensure that policies and proposals are in place to contribute to the delivery of these targets, and waste management companies should take them into account in their commercial decisions. The optimal management solution will vary according to the individual material resource streams and local circumstances and will usually involve one or more of the following processes:

- *re-use*
- *recycling*
- *mechanical and/or biological processing (to recover materials and produce compost,*
- *soil conditioner or inert residue)*
- *thermal treatment (to recover energy)*
- *priority will be given to processes higher up this waste hierarchy.*

WPAs should continue to provide sufficient landfill capacity to process residues and waste that cannot practicably be recovered."

2.29 Policy W6: Recycling and Composting states:

"The following targets for recycling and composting should be achieved in the region:

Year	*Municipal Solid Waste*		*Commercial and Industrial*		*Construction and Demolition*		*All Waste*	
	mt/yr	*%*	*mt/yr*	*%*	*mt/yr*	*%*	*mt/yr*	*%*
2008	*1.6*	*36*	*3.9*	*46*	*5.8*	*48*	*11.3*	*45*
2010	*1.9*	*40*	*4.5*	*50*	*6.1*	*50*	*12.9*	*50*
2015	*2.6*	*50*	*5.5*	*55*	*6.1*	*50*	*15.0*	*55*
2020	*3.1*	*55*	*6.4*	*60*	*7.3*	*60*	*17.1*	*60*
2025	*3.6*	*60*	*7.3*	*65*	*7.3*	*60*	*19.1*	*65*

Regional Recycling and Composting Targets

Source: Regional Waste Management Capacity: Survey, Methodology and Monitoring, Updated Final Report, 2008 (modelled Scenario 1)
Note: Percentage targets for diversion from landfill in the year 2008 have been interpolated. Waste authorities should adopt policies and proposals to assist delivery of these targets and waste management companies should take them into account in their commercial decisions."

2.30 Policy W7:Waste Management Capacity Requirements states:
"Waste planning authorities (WPAs) will provide for an appropriate mix of development opportunities to support the waste management facilities required to achieve the targets set out in this strategy. The annual rates of waste to be managed as shown in the table below provide benchmarks for the preparation of development plan documents and annual monitoring.

Waste Authority Area		2008-2010	2011-2015	2016-2020	2021-2025
Berkshire Unitaries	MSW	441	480	522	563
	C&I	845	919	999	1061
Buckinghamshire	MSW	272	296	322	347
	C&I	993	1080	1175	1247
Sussex, Brighton and Hove	MSW	391	426	463	499
	C&I	446	485	527	560
Hampshire, Portsmouth, Southampton and New Forest National Park	MSW	910	990	1077	1160
	C&I	1785	1942	2113	2242
Isle of Wight	MSW	97	105	115	123
	C&I	147	160	174	185
Kent & Medway	MSW	958	1042	1133	1221
	C&I	2120	2307	2509	2663
Milton Keynes	MSW	123	134	146	157
	C&I	27	29	32	34
Oxfordshire	MSW	319	347	377	406
	C&I	630	685	745	791
Surrey	MSW	638	694	755	813
	C&I	830	903	982	1042
West Sussex	MSW	473	514	559	603
	C&I	943	1026	1116	1185

Source: Regional Waste Management Capacity: Survey, Methodology and Monitoring, Updated Final Report, 2008 (modelled Scenario 1)

Note: MSW and C&I data used excludes both intra and inter-regional waste movements.

In bringing forward and safeguarding sites for waste management facilities, WPAs should consider the type, size and mix of facilities that will be required, taking into account: activities requiring largely open sites, such as aggregate recycling and open windrow composting.

Activities of an industrial nature dealing with largely segregated materials and requiring enclosed premises, such as materials recovery facilities, dis-assembly and re-manufacturing plants, and reprocessing industries activities dealing with mixed materials requiring enclosed industrial premises, such as mechanical-biological treatment, anaerobic digestion and energy from waste facilities, hybrid activities *requiring sites with buildings and open storage areas, including re-use facilities and enclosed composting systems.*

In areas of major new developments consideration should be given to identifying sites for integrated resource recovery facilities and new resource parks accommodating a mix of activities where they meet environmental, technical and operational objectives.

The figures in the above table should be used as a benchmark for the production and testing of development plan documents, but WPAs should use more recent data where this is available in order to assess and plan for capacity. Any major changes to the figures may dictate a need to reconsider the apportionment through a review of the RSS."

2.31 Policy W11: Biomass states that

"*Waste collection, planning and disposal authorities should encourage the separation of biomass waste, as defined in the Renewables Obligation, and consider its use as a fuel in biomass energy plants where this does not discourage recycling and composting*."

2.32 Policy W16: Waste Transport Infrastructure states:

"Waste development documents should identify infrastructure facilities, including sites for waste transfer and bulking facilities, essential for the sustainable transport of waste materials. These sites and facilities should be safeguarded in local development documents. Policies should aim to reduce the transport and associated impacts of waste movement. Use of rail and water-borne transport with appropriate depot and wharf provision should be encouraged wherever possible, particularly for large facilities."

2.33 Policy W17: Location of Waste Management Facilities states:

"*Waste development documents will, in identifying locations for waste management facilities, give priority to safeguarding and expanding suitable sites with an existing waste management use and good transport connections. The suitability of existing sites and potential new sites should be assessed on the basis of the following characteristics:*

i. good accessibility from existing urban areas or major new or planned development

ii. good transport connections including, where possible, rail or water

iii. compatible land uses, namely: active mineral working sites; previous or existing industrial land use contaminated or derelict land; land adjoining sewage treatment works redundant farm buildings and their curtilages

iv. be capable of meeting a range of locally based environmental and amenity criteria.

Waste management facilities should not be precluded from the Green Belt. Small-scale waste management facilities for local needs should not be precluded from Areas of Outstanding Natural Beauty and National Parks"

2.34 Policy T4: Parking states:

"*Local development documents and local transport plans should, in combination:*

i. adopt restraint-based maximum levels of parking provision for non-residential developments, linked to an integrated programme of public transport and accessibility improvements

ii. set maximum parking standards for Class B1 land uses within the range 1:30 m2 and 1:100m2

iii. set maximum parking standards for other non-residential land uses in line with PPG13: Transport, reducing provision below this in locations with good public transport

iv. include policies and proposals for the management of the total parking stock within regional hubs that are consistent with these limits

v. apply guidance set out in PPS3: Housing on residential parking, reflecting local circumstances

vi. support an increase in the provision in parking at rail stations where appropriate

vi. ensure the provision of sufficient cycle parking at new developments including secure cycle storage for new flats and houses which lack garages."

2.35 Policy T5: Travel Plans and Advice states:

"*Local authorities must ensure that their local development documents and local transport plans identify those categories of major travel generating developments, both existing and proposed, for which travel plans should be developed.*

Local transport authorities should also consider piloting the concept of transport planning advice centres for regional hubs in their local transport plans."

2.36 Section C of the South East Plan sets out the policy for the Sub-Regions. The application site falls within the Kent Thames Gateway Sub Region. The Sub-Regional Core Strategy is set out in policy KTG1 as follows:

"*Local and central government, and all parties concerned with service provision and infrastructure, will co-ordinate their policies and programmes to:*

i. as a first priority, make full use of previously developed land before greenfield sites, except where there are clear planning advantages from the development of an urban extension that improves the form, functioning and environment of existing settlements or a new community

ii. locate major development in order to exploit the potential of the regional hubs at

Ebbsfleet and the Medway Towns and locations served by the Channel Tunnel Rail Link, and locate housing, employment and community services where they are accessible by a choice of transport
iii. ensure that the benefits of new services and employment are available to existing communities, and that new development is carefully integrated with them
iv. raise the standards of education and skills in the workforce, including support for higher and further education, and achieve economic development and inward investment at an accelerated pace
v. greatly increase the supply of new housing, and affordable housing in particular
vi. set high standards for the design and sustainability of new communities, and for improvement of the existing urban areas, reflecting the riverside and historic character of the area
vii. create higher density development in the main urban areas, linked by public transport to one another and to London
viii. review local planning and transport policies to manage the forecast growth in car traffic related in particular to employment in the area and encourage greater use of sustainable modes
ix. make progress in the transfer of freight from road to rail and by water, by improvingthe links between international gateways and the regions, including freight routes around London
x. protect from development the Metropolitan Green Belt, the Area of Outstanding Natural Beauty and avoid coalescence with adjoining settlements to the south, east and west of the Medway urban area and to the west of Sittingbourne."

2.37 Policy KTG6: Flood Risk states:

In order to accommodate the growth levels proposed in this strategy it will be necessary to implement co-ordinated measures for flood protection and surface water drainage associated with the Rivers Thames, Medway and Swale. Strategic flood risk assessments will be kept up to date having regard to the latest intelligence on flood levels, and local assessments will be undertaken for major sites at risk, in the light of the Environment Agency's long term plans for flood risk management. Development will be planned to avoid the risk of flooding and will not be permitted if it would:
i. be subject to an unacceptable risk of flooding or significantly increase the risk elsewhere
ii. prejudice the capacity or integrity of flood plains or flood protection measures
Development plan documents will include policies to:
i. adopt a risk based approach to guiding categories of development away from flood risk areas
ii. ensure that development proposals are accompanied by flood risk assessments
iii. identify opportunities

3 Kent Waste Local Plan

3.1 The Kent Waste Local Plan (KWLP) was adopted in March 1998. It is due for replacement in the form of a new-style Waste Development Framework (WDF). In the interim period before the adoption of the WDF a number of KWLP policies have been 'saved' through the issue of Direction issued by the Secretary of Sate in September 2007. The following 'saved' policies remain part of the statutory development plan and are relevant to the proposed development.

3.2 Policy W11 sets out that :

"The following locations have the potential for a Waste to Energy plant adjacent to:
(iii) the Swale at Kemsley (F)

Proposals at these and other locations will be examined against the following considerations:

(a) whether the site is within a major established or committed industrial or industrial type area

(b) whether the proposed development would cause significant harm to residential amenities due to noise, dust, smell or visual impact

(c) whether the site would have, or is planned to have, ready accessibility to the primary and secondary route network and could be either rail or water linked

(d) whether the proposed development would be unduly obtrusive in the landscape

(e) whether the impact on the natural environment would be minimised

(f) whether the proposed development would use undeveloped land

(g) whether the proposed development would deal with ash residues as an integral part of the operation by depositing them according to the following order of priority:

1. Re-use or
2. deposit on site; or if no such facility is available
3. removal by making use of rail or river transport; or
4. deposit on land at an acceptable location as close as possible to the site.

3.3 Policy W17 sets out that:

"Before granting permission for an incinerator the planning authority will need to be satisfied that having regard to information on air quality and its cumulative effects, including that derived from the Kent Air Quality Model, Airborne Emissions will not adversely affect neighbouring land uses and amenity"

3.4 Policy W18 states:

"Before granting permission for a waste management operation the planning authority will require to be satisfied as to the means of control of :

i. Noise

ii. Dust, Odours and Other emissions

iii. Landfill gas

Particularly in respect of its potential impact on neighbouring land uses and amenity"

3.5 Policy W19 sets out that:

"Before granting permission for a waste management facility, the planning authority will require to be satisfied that surface and ground water resource interests will be protected and that where necessary a leachate control scheme can be derived, implemented and maintained to the satisfaction of the planning authority"

3.6 Policy W20 sets out that:

"Before granting planning permission for a waste management facility, the planning authority will require to be satisfied that proposals have taken account of:

i. Land settlement

ii. Land Stability

iii. The safeguarding of land drainage and flood control

iv. Minimisation of rainwater infiltration.

3.7 Policy W21 sets out that:

"Before granting planning permission for a waste management proposal the planning authority will need to be satisfied that the earth science and ecological interests of the site and its surroundings have been established and provisions made for the safeguarding of irreplaceable and other important geological and geomorphological features, habitats or species of wildlife importance, where an overriding need requires some direct loss or indirect harm to such features, habitats or species, where practical suitable compensatory mitigation measures should be provided."

3.8 Policy W22 sets out that:

"When considering applications for waste management facilities the planning authority will:

i. Normally refuse permission if it is considered that the proposed access, or necessary off-site highway improvements or effects of vehicles travelling to and from the site, would affect in a materially adverse way:

a. *The safety (or would exceed the capacity)of the highway network*

b. *The character of historic rural lanes*

c. *The local environment including dwellings, conservation areas and listed buildings*

ii. *Ensure that any off-site highway improvements considered to be necessary to secure acceptable access are completed, if necessary in stages related to the development of the site, before specified operations on site commence and provided at the developments expense*

3.9 Policy W25 sets out that:

"When considering details relating to the siting, design and external appearance of processing plant, hard surfacing, buildings and lighting, the planning authority will ensure that:

i *Facilities are grouped to prevent sprawl and the spreading of effects and to assist screening*

ii *Advantage is taken of topography and natural cover*

iii *Designs and means of operation minimise visual and noise intrusion appropriate colour treatment is provided, to reduce their impact and to assist their integration in the local landscape*

3.10 Policy W31 sets out that:

"When considering waste management proposals the planning authority will wish to be satisfied that an appropriate landscaping scheme will be an integral part of the development"

Swale Borough Local Plan

3.11 The proposed development is located within the Swale Borough Local Plan (SBLP) area. The SBLP was adopted in 2008, and is split in to four parts: Core Strategy – Strategic Policies, Development Control Policies, Site Allocations and Area Action Plans, and Monitoring the Local Plan. The following polices are relevant to the proposed development.

3.12 Policy SP1: Sustainable Development, of the Core Strategy states:

"In meeting the development needs of the Borough, proposals should accord with principles of sustainable development that increase local self-sufficiency, satisfy human needs, and provide a robust, adaptable and enhanced environment. Development proposals should:

1. *avoid detrimental impact on the long term welfare of areas of environmental importance, minimise their impact generally upon the environment, including those factors contributing to global climate change, and seek out opportunities to enhance environmental quality;*
2. *promote the more efficient use of previously-developed land, the existing building stock, and other land within urban areas for urban and rural regeneration, including housing, mixed-uses and community needs;*
3. *ensure that proper and timely provision is made for physical, social and community infrastructure;*
4. *provide a range and mix of housing types, including affordable housing;*
5. *provide for sustainable economic growth to support efficient, competitive, diverse and innovative business, commercial and industrial sectors;*
6. *support existing and provide new or diversified local services;*
7. *promote ways to reduce energy and water use and increase use of renewable resources, including locally sourced and sustainable building materials;*
8. *be located so as to provide the opportunity to live, work and use local services and facilities in such a way that can reduce the need to travel, particularly by car;*
9. *be located to promote the provision of transport choices other than the car;*
10. *be of a high quality design that respects local distinctiveness and promotes healthy and safe environments; and*
11. *promote human health and well-being."*

3.13 Policy SP2: Environment, of the Core Strategy states*:*

"In order to provide a robust, adaptable and enhanced environment, planning policies and development proposals will protect and enhance the special features of the visual, aural, ecological, historical, atmospheric and hydrological environments of the Borough and promote good design in its widest sense. Development will avoid adverse environmental impact, but where there remains an incompatibility between development and environmental protection, and development needs are judged to be the greater, the Council will require adverse impacts to be minimized and mitigated. Where a planning decision would result in significant harm to biodiversity interests, which cannot be prevented or adequately mitigated against, appropriate compensation measures will be sought."

3.14 Policy TG1:Thames Gateway Planning area, of the Core Strategy states:

Within the Thames Gateway Planning Area, scales of development are set commensurate with its strategic contribution to meeting the environmental, employment, and housing objectives within the Gateway area as a whole. Development will be supported by the timely provision of adequate community and transport infrastructure. Land that is of importance to agriculture, landscape, biodiversity or settlement separation, will be protected from unnecessary development. Within this planning area, within the identified Area Action Plans and elsewhere, the following planning priorities will be pursued:

1. *to secure the implementation of already identified major employment sites at Queenborough and in north and north east Sittingbourne;*
2. *to diversify the quality of local employment, with mixed-use developments within the existing urban areas and identifying the Kent Science Park as a focus for technology based businesses, in particular life sciences;*
3. *to raise the standard of the environment through high quality design, the better management of environmental resources and the creation of a network of accessible open spaces (a green-grid);*
4. *the use of previously-developed and other land within the existing urban areas for new housing and, where appropriate, mixed-uses. On Sheppey, all new housing sites will be provided on such land during the Local Plan period;*
5. *to limit greenfield land releases for housing to existing committed sites around Sittingbourne and Minster, and to new sites at Iwade, so as to make more efficient use of land to maximise community gain and provide sustainable patterns of development, and, where appropriate, to phase such additional housing to ensure their timely release;*
6. *to provide essential new transport infrastructure necessary to assist economic development, urban regeneration and address town centre congestion, in particular by the completion of the Sittingbourne Northern Relief Road and the Rushenden Link Road;*
7. *the consolidation of Sittingbourne as the main centre for employment, shopping and services, whilst ensuring that Sheerness and local centres continue to be able to provide for local needs;*
8. *the provision of sites for further secondary and Further Education provision at Sittingbourne and a Family Centre at Sheerness;*
9. *to increase local self-sufficiency in the rural communities by protecting and permitting services and facilities, and by initiatives to diversify the rural economy; and*
10. *to effectively manage the risk of flooding.*

3.15 Policy SH1 of the Core Strategy sets out the Settlement Hierarchy as follows:

Development proposals will be supported in accordance with the following defined settlement hierarchy:

1. *the primary settlement of Sittingbourne, where development will support and consolidate the town in its role as the Borough's main centre for employment, shopping and services. Development will focus on urban regeneration and strategic development opportunities that will additionally help provide essential new infrastructure;*
2. *the small towns of Faversham and Sheerness, where development will support their role as local employment, shopping and service centres meeting local needs. In recognition of their environmental constraints, and unless otherwise allocated by this Local Plan on small peripheral sites, development will be confined to the use of previously-developed and other land within the built-up area boundaries including, where appropriate, mixed-use development;*
3. *the strategic settlements of Iwade, Minster and Queenborough, where, in accordance with sub-regional planning guidance, committed and new housing development will support new economic development and, where appropriate, contribute toward providing new infrastructure and services;*
4. *the local service centres of Boughton, Eastchurch, Newington, Teynham and Leysdown, where new development may be acceptable on previously-developed land within the defined built-up areas or, in the case of new services for the settlement and the surrounding rural area, on other suitable sites that do not harm the settlement pattern or character of the surrounding countryside;*
5. *the minor development settlements of Bapchild, Bayview, Borden, Bredgar, Conyer, Doddington, Dunkirk, Eastling, Hartlip, Lewson Street, Lower Halstow, Lynsted, Neames Forstal, Newnham, Oare, Painter's Forstal, Rodmersham Green, Selling, Sheldwich Lees, Upchurch and Warden Bay, where development will be limited to infill or redevelopment proposals within the defined built-up areas, or, exceptionally, for other development considered essential to meet the needs of the local community that cannot be located elsewhere in accordance with Policy E6. Development proposals should maintain or enhance the character of the village. Redevelopment proposals of a scale that would reinforce unsustainable patterns of development will not be permitted; and*

6. *other settlements falling in the countryside, for which built-up area boundaries have not been defined, and where development proposals will be considered in accordance with Policy E6*

3.16 Policy E2 sets out the Development Control Policy for Pollution, as follows:

All development proposals will minimise and mitigate pollution impacts. Development proposals will not be permitted that would, individually or cumulatively, give rise to pollution significantly adversely affecting the following:

1. *human health;*
2. *residential amenity;*
3. *flora and fauna;*
4. *areas or buildings of architectural or historic interest;*
5. *rural areas; and*
6. *water supply sources, groundwater aquifers, or local hydrology.*

3.17 Policy E3 sets out the Development Control Policy for Land Contamination, as follows:

On sites known, or suspected, to be contaminated, the Borough Council will only grant planning permission for development proposals if the developer agrees to undertake effective investigation and remediation work to overcome any identified hazard.

3.18 Policy E4 sets out the Development Control Policy for Flooding and Drainage, as follows:

The Borough Council will not grant planning permission where acceptable sites, consistent with wider sustainability objectives and at lesser risk of flooding, are available to accommodate the development. Where there is considered to be a risk of flooding, the Borough Council will not grant planning permission where the degree of risk of flooding, either to, or arising from, the development, would give rise to adverse impacts upon, or increased risk to, human life, ecosystems, habitats and development, including those resulting from:

1. *the impedance of, or increase in, flood flows;*
2. *the loss of storage volume in the floodplain;*
3. *the loss of integrity of the flood defences; and*
4. *increased surface water run-off from the creation of large impermeable areas.*

Where there is considered to be a risk of flooding, development proposals will be accompanied by a flood risk assessment and should a) incorporate, where necessary, sustainable drainage systems within development proposals and b) *include, when necessary, new flood defence and alleviation measures installed and maintained by the developer(s).*

3.19 Policy E9 sets out the Development Control Policy for Protecting the Quality and Character of the Boroughs Landscape, as follows:

The quality, character and amenity value of the wider landscape of the Borough will be protected and, where possible, enhanced. Within the designated areas shown on the Proposals Map, priority will be given to their protection as follows:

1. *in the Kent Downs Area of Outstanding Natural Beauty (AONB), the priority is the long-term conservation and enhancement of natural beauty (including landscape, wildlife, and geological features) of this national asset over other planning considerations. Suitably located and designed development necessary to facilitate the economic and social well-being of the area and its communities, will be permitted, whilst major developments will not be permitted unless there is a proven national interest and no suitable alternative sites;*
2. *in the North Downs, Blean Woods and North Kent Marshes Special Landscape Areas (SLAs), the priority is the long-term protection and enhancement of the quality of the landscape of these county assets, whilst having regard to the economic and social well being of their communities; and*
3. *in the Areas of High Landscape Value (AHLV), the priority is the protection and enhancement of the integrity, character and local distinctiveness of these Borough assets, whilst considering the needs of local communities.*

Within the countryside and rural settlements, the Borough Council will expect development proposals to:

a. *be informed by and sympathetic to local landscape character and quality;*
b. *consider the guidelines contained in the Council's Landscape Character Assessment and Guidelines Supplementary Planning Document, so as to contribute to the restoration, creation, reinforcement and conservation, as appropriate, of the landscape likely to be affected;*
c. *safeguard or enhance landscape elements that contribute to the distinctiveness of the locality or the Borough;*
d. *remove features which detract from the character of the landscape; and*
e. *minimise the adverse impacts of development upon landscape character.*

3.20 Policy E11 sets out the Development Control Policy for Protecting and Enhancing the Borough's Biodiversity and Geological Interests, as follows:

The Borough's biodiversity and geological conservation interests will be maintained, or enhanced, particularly where they have been identified as national and county priorities in the UK and Kent Biodiversity Action Plans or through protected species legislation. Developments will be permitted that conserve or enhance the biodiversity of the area and/or locality. Where proposals would potentially adversely impact upon biodiversity or geological interests, the Council will:

1. *ensure that site evaluation is undertaken to establish the nature conservation and/or geological interest;*
2. *require the acceptable accommodation, and where appropriate, management and creation, of the interest within development proposals;*
3. *encourage the incorporation of beneficial features within the design of development, including the retention and provision of habitat to form a connected series of green corridors or stepping stones; and*
4. *expect development proposals to include measures to avoid adverse impacts wherever possible.*

Subject to the relative importance of the biodiversity or geological interest, where there may be significant harmful effects, directly, indirectly or cumulatively, development will only be permitted when the Council is satisfied that:

a. *there is an overriding need for the development that outweighs the harmful effect(s);*
b. *there is no reasonable alternative site that would result in less or no harm;*
c. *adequate mitigation measures are in place to minimise the harmful effect(s); and*
d. *where harmful effects cannot be prevented or mitigated, appropriate compensation measures will be undertaken by the developer in accordance with current best practice.*

3.21 Policy E12 sets out Development Control Policy for Sites Designated for their Importance to Biodiversity or Geological Conservation, as follows:

Within the areas designated, as shown on the Proposals Map, or any subsequently designated, the Borough Council will give priority to their protection in accordance with their relative importance for biodiversity as follows:

1. *Within a European Site, a proposed European Site, or a Ramsar site, development that may affect the site that is: a) not directly connected with, or necessary to, the management of the site for nature conservation; b) likely to*

have significant effects on the site (individually or in combination with other plans or projects); and c) where it cannot be ascertained that the proposal would not adversely affect the integrity of the site, will not be permitted unless there is no alternative solution, and there are imperative reasons of overriding public interest for the development. Where the site hosts a priority natural habitat type and/or a priority species, development will not be permitted unless the Borough Council is satisfied that it is necessary for reasons of human health or public safety or for beneficial consequences of primary importance for nature conservation.

2. *Where development may have an adverse effect, directly or indirectly on the special interest of a Site of Special Scientific Interest, it will not be permitted unless the reasons for the development clearly outweigh the nature conservation value of the site, and the national policy to safeguard such sites. In such cases, conditions and/or planning obligations will be required to mitigate the harmful aspects of the development and ensure the protection and enhancement of the sites nature conservation or geological interest.*
3. *Development likely to have an adverse effect on a Local Nature Reserve, Ancient Woodland a Site of Nature Conservation Interest or a Regionally Important Geological/Geomorphological Site, will not be permitted unless it can be clearly demonstrated that there is a need for the development which outweighs the interest of the site and that adverse impacts have been adequately mitigated, or where not possible, compensated for.*

3.22 Policy E16 sets out the Development Control Policy for Scheduled Ancient Monuments and Archaeological Sites, as follows:

1. *Development will not be permitted which would adversely affect a Scheduled Ancient Monument, as shown on the Proposals Map or subsequently designated, or other nationally important monument or archaeological site, or its setting.*
2. *Whether they are currently known or discovered during the Plan period, there will be a preference to preserve important archaeological sites in-situ and to protect their settings. Development that does not achieve acceptable mitigation of adverse archaeological effects will not be permitted.*

Where development is permitted and preservation in-situ is not justified, the applicant will be required to ensure that provision will be made for archaeological excavation and recording, in advance of and/or during development.

3.23 Policy E19 sets out the Development Control Policy High Quality Design and Distinctiveness, as follows:

The Borough Council expects development to be of high quality design. Development proposals should respond positively to the following:

1. *creating safe, accessible, comfortable, varied and attractive places;*
2. *enriching the qualities of the existing environment by promoting and reinforcing local distinctiveness and strengthening the sense of place;*
3. *making safe connections physically and visually both to and within developments, particularly through use of landscape design, open space to retain and create green corridors for pedestrians, cyclists, and plants and animals;*
4. *making efficient and prudent use of natural resources, including sensitively utilising landscape, landform, biodiversity and climate to maximise energy conservation and amenity;*
5. *providing native (regional or local) plant species for soft landscaping and hard landscaping, surface and boundary treatments that respond positively to the character of the locality.*
6. *providing features and management intended to encourage biodiversity;*
7. *providing a mix of uses through building form, use, tenure and densities;*
8. *providing development that is appropriate to its context in respect of scale, height and massing, both in relation to its surroundings, and its individual details;*
9. *making best use of texture, colour, pattern and durability of materials;*
10. *ensuring the long-term maintenance and management of buildings, spaces, features and social infrastructure;*
11. *achieving flexibility to respond to future changes in use, lifestyle and demography; and*
12. *maximising opportunities for including sustainable design and construction techniques including the use of recyclable materials and sustainable drainage systems, and minimising waste.*

3.24 Policy E21 sets out the Development Control Policy for Sustainable Design & build, as follows:

The use of innovative and high quality low-impact design and build techniques will be supported on sites considered acceptable by this Local Plan. To encourage resource conservation, the Borough Council will expect development proposals to incorporate sustainable design and build measures into the detailed design of new development in its use of siting, design, materials, and landscaping. For development proposals, the Council will advocate the meeting of the Building Research Establishment Environmental Assessment Method standard of 'good' as a minimum.

3.25 Policy B2 sets out the Development Control Policy for Providing New Employment, as follows:

Permission for new employment development has been, or will be, granted for sites shown on the Proposals Map. Additionally, the Borough Council will grant planning permission for new employment development within the built-up areas, as defined by the Proposals Map, and within the rural areas in accordance with Policy RC1.

3.26 Policy T1 sets out the Development Control Policy for Providing safe access to New Development, as follows*:*

The Borough Council will not permit development proposals that:

1. *generate volumes of traffic in excess of the capacity of the highway network, and/or result in a decrease in safety on the highway network, unless these issues can be addressed by environmentally acceptable improvements to the highway network that have been agreed by the Borough Council and the appropriate Highway Authority in accordance with Policy T2; and*
2. *lead to the formation of a new access, or the intensification of any existing access, onto a primary or secondary road or route, unless it can be created in a location that is acceptable to the Borough Council, or where an access can be improved to an acceptable standard and achieve a high standard of safety through design.*

Where appropriate, the Borough Council will require the submission of a comprehensive Transport Assessment and Travel Plan with a planning application.

3.27 Policy T3 sets out the Development Control Policy for Vehicle Parking for New Development, as follows:
The Borough Council will only permit development, or the change of use of existing premises, if appropriate vehicle parking is provided, in accordance with the adopted Kent County Council parking standards.

3.28 Policy T6 sets out the Development Control Policy for Maximising the Use of `Railways and Waterways for Commercial Purposes, as follows:

The Borough Council will permit development that proposes and/or facilitates greater use of rail or water for commercial traffic, except where it would result in an unacceptable and overriding adverse environmental impact which could not be satisfactorily mitigated. The Borough Council will not permit development that would involve the loss of usable wharfage or rail facilities.

3.29 Policy U3 sets out the Development Control Policy for Renewable Energy, as follows:

The Borough Council will permit proposals for renewable energy schemes where they demonstrate environmental, economic and social benefits and minimise adverse impacts. Before planning permission is granted, the Borough Council will consider such matters as:

1. *the contribution to the regional requirement for renewable energy;*
2. *the likely decommissioning requirements and the ability to ensure restoration of the site;*
3. *the availability of alternative, potentially more beneficial sites, especially those involving previously developed land;*
4. *power transmission requirements;*
5. *potential electromagnetic interference;*
6. *noise generation, air emissions and odour; and*
7. *the contribution to enhancing landscape and built character and nature conservation interests.*

3.30 Policy B11 sets out the Sites Allocation, as follows:

Outline planning permission has been granted for the development of 135 ha of land at Ridham and Kemsley for a mix of employment uses. Full development of the site is conditional upon the completion of the A249 Iwade to Queenborough Corner Improvement Scheme, the northern section of the Sittingbourne Northern Relief Road, and improvements to the northern access road into the site from Ridham Dock Road and within the site; and the need to accord with a Development Brief to be submitted to and agreed by the Borough Council.

4 Emerging Policy Framework

Kent Minerals and Waste Development Framework

4.1 The Kent Mineral and Waste Development Scheme (KMWDS) was published in May 2009 and sets out the current timescales for the production of each stage of the Kent Minerals and Waste Development Framework Development Plan Documents (DPD's). The DPD's relevant to the proposal are the Kent Minerals and Waste Core Strategy and Policies, and the Waste Management Sites.

4.2 The KMWDS sets out that the Mineral and Waste Core Strategy is at the preliminarily stage of preparation under Regulation 25 with publication and pre-submission consultation under Regulation 27 not anticipated until September 2010 and Adoption anticipated until November 2011.

4.3 The preparation of the Waste Management Sites DPD is linked to the adoption of the Mineral and Waste Core Strategy DPD, and therefore is at an early stage. Again the document is at the preliminary stage of preparation under regulation 25 with publication and pre-submission consultation under Regulation 27 not anticipated until October 2011, and Adoption not anticipated until November 2012.

Swale Local Development Framework

4.4 Swale Local Development Scheme was published in August 2007 and sets out the timescale for the production of the relevant Local Development Framework Development Plan Documents (DPD's). The Key DPD relevant to the proposed development is the Core Strategy which not only set out the Councils overarching spatial vision and strategic objectives but will identify strategic sites on a Proposals Map. Additionally, development control policies will also be included.

4.5 The current timescale for consultation on "Issues and Options" is March 2010, with Preferred Options in Summer 2010 and Adoption in Spring 2012. At the present time the Swale LDF is at an early stage and unlikely to be of significant weight in the planning policy framework.

RPS

DEVELOPMENT OF A SUSTAINABLE ENERGY PLANT.

ST. REGIS PAPER MILL COMPANY LIMITED & E.ON ENERGY FROM WASTE UK LIMITED.

ALTERNATIVE SITE REPORT

Prepared by:

Richard Mowat

34 Lisbon Street
Leeds
LS1 4LX

Tel	0113 220 6190
Fax	0113 243 9161
Email	rpslds@rpsgroup.com

RPS Planning & Development

Contents

Tables, Figures & Appendices

Tables

Figures

Appendices

1 Introduction

1.1.1 St Regis Paper Company Limited and E.ON Energy from Waste UK Limited propose to develop a Sustainable Energy Plant (SEP) to supply energy to Kemsley Paper Mill. The Sustainable Energy Plant fuel stock will comprise pre treated Commercial and Industrial (C&I) waste, Municipal Solid Waste (MSW), and Solid Recovered Fuel (SRF) imported to the site.

1.1.2 The energy requirements at Kemsley paper mill are currently met by the on site Combined Heat and Power (CHP) plant which is fuelled by natural gas, a fossil fuel based energy source and by a Waste to Energy plant which burns rejects from the paper making process. Both plants are owned and operated by E.ON. The mill is an intensive user of energy, consuming 55 MWe per hour of electricity and 150 MWth per hour of steam. The mill's energy cost is circa £50m per annum which represents around 25% of turnover. The pricing of natural gas has been extremely volatile in the UK in recent years which, with the European market less de-regulated than the UK, has put Kemsley mill at a disadvantage to its European competitors. The UK paper industry as a whole has suffered of late from high and volatile energy prices and 22 paper mills have closed in the UK over the last 5 years, including three in Kent. Further, with the UK becoming more reliant upon imported natural gas, there is concern about the future security of supply of natural gas. Consequently, the price of natural gas is forecast to increase over the long term and will continue to be volatile.

1.1.3 Although natural gas will remain as a significant source of energy for the mill through the CHP, there is a clear strategic need for Kemsley mill to diversify its fuel source and to thereby reduce its reliance on natural gas. The proposed SEP will reduce its dependence on fossil fuel, improve the carbon footprint of Kemsley mill, ensure a greater degree of energy supply security and improve the competitive position of the mill.

1.1.4 The SEP will have net generation capability of 48.5 MWe per hour of electricity. Under the anticipated electricity and gas pricing outlook, the SEP will usually be set up to generate 36 MWe per hour of electricity and provide in excess of 50 MWth per hour of steam to the mill. However, if required, the SEP will be able to increase its steam provision to fulfil the mill's entire steam demand, with its electricity requirements being met from the national grid.

1.1.5 The fuel source of the SEP will be approximately 500,000 to 550,000 tonnes per annum of pre treated waste comprising Solid Recovered Fuel waste, Commercial & Industrial waste and pre treated Municipal Solid Waste, and may include up to approximately 25,000 tonnes of the paper making process rejects from the mill which are currently sent to landfill.

1.1.6 The SEP therefore has the dual role of an energy generating station and a waste management facility.

1.1.7 The sources of treated waste fuel have yet to be determined, Subject to appropriate fuel supply agreements, It is anticipated that pre treated waste will be sourced from Kent with the balance from London, the South East and elsewhere in the UK subject to commercial viability. The SEP will use Energy from Waste Technology to recover energy from waste which would otherwise be landfilled. The process is by definition waste recovery rather than disposal, and the bio-degradable fraction would be regarded as a renewable energy source. The SEP will produce Good Quality CHP.

1.1.8 The proposal falls under category 10 of Schedule 1 of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 (EIA Regulations) therefore an Environmental Statement is mandatory in support of the planning application. In addition the proposal falls within the scope of Schedule 2 (3a) as an industrial installation for the production of electricity, steam and hot water.

1.1.9 The purpose of carrying out this alternative site search is to provide a comparative analysis of potential sites within the administrative areas of Kent County Council to identify the extent to which they are suitable for the proposed development in respect to potential environmental effects.

1.1.10 The consideration of alternative sites stems primarily from requirements under the EIA Regulations. The Regulations identify the information for inclusion within the Environmental Statement. Part 1(2) and 2(4) include:

> *"An outline of the main alternatives studied and an indication of the main reasons for this choice taking into account the environmental effects."*

1.1.11 Paragraph 83 of Circular 2/99 which accompanies the Regulations notes that:

> *"Although the Directive and the regulations do not expressly require the developer to study alternatives the nature of certain developments and their location may make the consideration of alternatives a material consideration…:"*

1.1.12 The following shows the alternative sites appraisal methodology undertaken, which has been based on national guidance, best practice and previous experience gained by Consultants dealing with similar proposals. The study scope also takes account of regional and local policy.

2 Alternative Site Assessment Methodology

2.1 Introduction

2.1.1 RPS Planning and Development's alternative site assessments methodology has been applied to similar proposals, undertaken across the UK for a range of clients in the waste and sustainable energy industry. The methodology reflects recent national planning guidance on site identification contained within Planning Policy Statement 10 (PPS10) and its Companion Guide. The County Council's Scoping Opinion states that need and alternatives for a waste processing facility will need to be considered in a broader context - whether what is proposed is a facility of the right type, in the right location and at the right time having regard to the nature and source of the waste arisings.

2.1.1 An initial site search has been undertaken providing a list of sites which form the basis of the alternative site appraisal (Stage 1).

2.1.2 A total of 52 sites within the administrative areas of Kent County Council have been highlighted as possible locations for a waste related use. These sites were identified following a review of a variety of sources including, adopted and emerging development plan documents and local authority publications, Ordnance Survey mapping and personal knowledge. The sites were then considered in terms of size and location having regard to the paper mill requirements and development plan considerations.

2.1.3 A second stage of the appraisal assesses 10 sites against the criteria set out in Section 3 of this report. The location of these Stage 2 sites is shown in Figure 11.

2.2 Policy Context

Planning Policy Statement 10 Planning for Sustainable Waste Management (PPS10)

2.2.1 Published in July 2005, PPS10 sets out the Government's policy on waste management. The Statement provides guidance on identifying suitable sites and areas for new or enhanced waste management facilities. Paragraph 20 requires consideration of opportunities for on-site management of waste where it arises and of a broad range of locations including industrial sites.

2.2.2 Consideration has been given to opportunities to co-locate waste facilities together with complementary activities such as re-processing industries. Paragraph 21 of PPS10 requires sites to be assessed against a range of criteria, including a series of potential local environmental impacts, and states that priority should be given to the re-use of previously developed land.

2.2.3 Annex E of PPS10 states that the suitability of a development should be assessed according to certain locational criteria. This assessment has assessed the relevant factors (from Annex E) and considers the likely impact each site could have within its area.

The Adopted Development Plan

2.2.4 Under the provisions of the Planning and Compulsory Purchase Act 2004 for the purposes of the alternative site assessment report, the adopted Development Plan comprises the following:

- The South East Plan adopted as the Regional Spatial Strategy for the South of England in May 2009
- Kent Waste Local Plan adopted March 1998
- Swale Borough Local Plan adopted February 2008

Emerging Development Plan Documents

2.2.5 In accordance with changes to the development plan process introduced by the 2004 Act, local Planning Authorities have commenced preparation of Local Development Frameworks.

2.2.6 The Kent Mineral and Waste Development Scheme (KMWDS) was published in May 2009 and sets out the current timescales for the production of each stage of the Kent Minerals and Waste Development Framework Development Plan Documents (DPD's). The DPD's relevant to the proposal are the Kent Minerals and Waste Core Strategy and Policies, and the Waste Management Sites.

2.2.7 The KMWDS sets out that the Mineral and Waste Core Strategy is at the preliminarily stage of preparation under Regulation 25 with publication and pre-submission consultation under Regulation 27 not anticipated until September 2010 and Adoption anticipated until November 2011.

2.2.8 The preparation of the Waste Management Sites DPD is linked to the adoption of the Mineral and Waste Core Strategy DPD, and therefore is at an early stage. Again the document is at the preliminary stage of preparation under regulation 25 with publication and pre-submission consultation under Regulation 27 not anticipated until October 2011, and Adoption not anticipated until November 2012.

2.2.9 Swale Local Development Scheme was published in August 2007 and sets out the timescale for the production of the relevant Local Development Framework Development Plan Documents (DPD's). The Key DPD relevant to the proposed development is the Core Strategy which not only set out the Council's overarching spatial vision and strategic objectives but will identify strategic sites on a Proposals Map. Additionally, development control policies will also be included.

2.2.10 The current timescale for consultation on "Issues and Options" is March 2010, with Preferred Options in Summer 2010 and Adoption in Spring 2012. At the present time the Swale LDF is at an early stage and unlikely to be of significant weight in the planning policy framework.

2.3 Site Identification

2.3.1 An initial site selection process is based upon the analysis of potential sites identified through available references regardless of size including waste and industrial land allocations within the adopted and emerging Development Plans, Development Plan employment land availability reports and previous work undertaken by RPS. The list of all these sites provides the basis for the criteria based analysis. The analysis of sites identified within Stage 2 is undertaken on the basis of a comparative analysis of sites by carrying out visual and desk top analysis of available environmental information.

2.3.2 Whilst consideration of location for waste management facilities is to be viewed in the wider context of considerations including proximity to waste arisings, this is underscored by the viable generation of sustainable energy for the paper mill which has specific locational requirements. The sources of treated waste fuel have yet to be determined, Subject to appropriate fuel supply agreements, It is anticipated that pre treated waste will be sourced from Kent with the balance from London, the South East and elsewhere in the UK subject to commercial viability..

2.3.3 Firstly, in order to sustain benefit from energy produced by the Sustainable Energy Plant it is important to maximise heat and pressure by minimising the distance between the Sustainable Energy Plant and the existing Paper Mill.

2.3.4 This approach is supported by the Draft Overarching National Policy Statement for Energy (EN1), states at paragraph 4.64, that:

> "*To be viable as a CHP plant, a generating station needs to be located close to industrial or domestic customers with heat demands. This is likely to mean within a distance of up to 15km. For industrial purposes, customers are likely to be intensive heat users such as chemical plants, refineries or paper mills."*

2.3.5 It should however be noted that with respect to the 15km distance it clarifies that:

> *"A 2009 report for DECC on district heating networks concluded that cost effective district heating networks would be where there was a demand for 200 MW of heat within 15km of a generating station."*
>
> *And that:*
>
> *"Additionally, the provision of CHP is most likely to be cost-effective and practical where it is included as part of the initial design of the customer's facilities. For example, adding a district heating network to an existing housing estate may not be efficient."*

2.3.6 Given that the quantum of energy to be produced by the Sustainable Energy Plant to feed directly into Kemsley paper mill, an existing industrial use rather than a housing estate under construction, the distance at which the provision of the plant would be viable is significantly diminished.

2.3.7 Furthermore, constructing the Sustainable Energy Plant beyond the boundaries of Land within the Paper Mills ownership, not only reduces the viability of the Sustainable Energy Plant, it also raises issues of availability, as the land along the route of the pipe infrastructure is not necessarily available to the developer. Additionally, the timescale to assemble the land along the route of the infrastructure also raises the issue of achievability such as whether the development and therefore the energy could be delivered to the Paper Mill within a reasonable timescale.

2.3.8 Based on these requirements, Stage 2 of this Alternative Site Search Assessment focuses on a comparative analysis of potentially alternative sites located within 2km of the Kemsley Paper Mill. This distance reflects the developers maximum preferred distance from the paper mill for the transport of steam by pipeline. The appraisal uses a non numeric system of scoring having regard to planning vision, sensitive human receptors, landscape and visual consideration, potential impacts on natural environment, potential impacts on historic environment and built heritage, road access, rail and water transport, energy utilisation, flood risk and ground water vulnerability, Aerodrome Safeguarding Zones, Air Quality Management Areas.

2.3.9 Stage 2 of the site appraisal together with plans can be seen in Appendix A.

3 Planning Consideration Criteria

3.1 Introduction

3.1.1 The following planning consideration appraisal criteria have been utilised within the final stage of the assessment.

- Planning Vision
- Sensitive Human Receptors
- Landscape and Visual Consideration
- Potential Impacts on Natural Environment
- Potential Impacts on Historic Environment and Built Heritage
- Road Access
- Rail and Water Transport
- Energy Utilisation
- Flood Risk and Ground Water Vulnerability
- Aerodrome Safeguarding Zones
- Air Quality Management Areas

3.1.2 The above criteria fully reflects the waste facility locational criteria set out in Annex E of PPS10 and other relevant national guidance.

3.1.3 Together with the site location and description, the assessment refers to the relevant development plan policy criteria for each of the appraisal sites.

3.1.4 A description of planning considerations has been provided for each of the appraisal sites and the results presented in a summary matrix table indicating the scores for all sites for each criterion indicated above.

3.2 Planning Vision

3.2.1 The adopted Development Plan include proposals maps and policies, which identify sites and broad locations for particular forms of land use. The adopted documents which comprise the Development Plan set out the spatial strategy and detailed policy to guide development in specific and broad locations. Generally this may be to achieve the regeneration of run down areas through the development of new employment related uses, or the expansion of mixed, residential or retail areas or the protection of historic areas and environmental assets.

3.2.2 The vision for an area may be expressed in the form of Area Action Plans, Supplementary Planning Documents, development briefs or master plans that tie together a range of considerations including infrastructure needs, highways, access, landscaping as well as zones of development. The assessment criterion represents a view as to how a proposed facility would fit in with the planning vision for the area and neighbouring uses and it is therefore a key basis for assessing the suitability of alternative sites.

3.3 Site Specific Policy Consideration

3.3.1 National guidance provides a framework for identifying and assessing sites which are considered suitable for specific waste management facilities, ensuring that all potential environmental and human constraints are considered with the appropriate weighting.

3.3.2 The adopted Development Plan policies and proposals maps, identify allocations for specific land-uses (such as residential, retail, waste/minerals, employment or mixed uses) and environmental designations and constraints which should guide consideration of proposals at specific sites (such as flood risk, air quality, landscape designation, nature conservation, historic interests etc).

3.3.3 The appraisal criteria represent a view as to how a proposed facility accords with site specific allocations and policy related to specific planning consideration, thus ensuring consistency, as this assessment framework will form the basis for appraising alternative sites. The following provides a summary of criteria against which alternatives will be assessed:

Sensitive Receptors

3.3.4 Sensitive receptors to noise, dust and odour include uses of land occupied or utilised by people. The appraisal criterion takes account of the potential impact of proposed waste uses on sensitive receptors at the site and with neighbouring land uses in the locality.

Landscape and Visual Consideration

3.3.5 Development proposals are considered in terms of their form (i.e. design and dimensions) and the landscape environment within which those proposals sit. The landscape setting may for example be industrial in nature with a predominance of vertical features, or it may be dominated by individual developments of lesser scale. The assessment criterion represents a view as to how a proposed facility relates to the landscape within which the site sits.

3.3.6 Furthermore landscapes can be subject to national and local designations in order to protect landscape value from unacceptable forms of development. Areas of Natural Beauty (AONB) are national designations which cover large area of land within the country. AONBs are afforded the highest degree of protection to conserve their landscape value. Proposals for major development, such as that which is proposed, need to demonstrate exceptional circumstances if the site was within an AONB and be subject to rigorous examination, satisfying a test stated in Planning Policy Statement 7 Sustainable Development in Rural Areas (PPS7).

Potential Impact on Natural Environment

3.3.7 The natural environment surrounds us all. Some areas of the natural environment however have been recognised as having particular merit by virtue of the flora, fauna or environment which characterise them. These areas are identified within the Development Plan as being of local significance or national or indeed international significance. Only with site-specific quantitative assessment is it possible to provide a detailed view as to the natural environmental merits of individual sites. The assessment criterion represents a view as to how a proposed facility relates to recognised national or international nature conservation interests.

Potential Impact on Historic Environment and Built Heritage

3.3.8 Cultural heritage may take a range of forms including World Heritage sites, listed buildings and their setting, historic parks and gardens, scheduled ancient monuments, conservation areas and battlefields. Certain developments may have the potential to impact upon these interests if they are present. The assessment criterion represents a view as to how a proposed facility relates to cultural interests within proximity of the site considered.

Road Access

3.3.9 Where a site is reliant on access by road, that access needs to be suitable for the form of development proposed, with the routing and ease of local access to the site itself being a material consideration. The assessment criterion represents a view as to how the proposed facility could be served by existing local access arrangements.

Rail or Water transport

3.3.10 Water or rail based access may present a sustainable advantage over road transport from a site. Sites may be located adjacent to water transport or rail arrangements, with existing wharves or railheads whilst others have no existing facilities. Other sites by virtue of on site constraints may not be capable of developing the necessary infrastructure. The assessment criterion represents a view as to how a proposed facility could be served by existing or potential arrangements.

Energy utilisation

3.3.11 The proposed facility may offer the opportunity to provide energy to neighbouring uses in the form of heated water or steam. Heated water can provide a low cost source of heating for local homes and steam/ hot water can be used to power other industrial/ manufacturing activities. The assessment criterion represents a view as to how a proposed facility could provide heat/ energy to neighbouring uses.

Flood Risk

3.3.12 Land may be at risk from flooding and this potential is identified by the Environment Agency within its publications. PPS25 defines a series of Flood Zones based upon the likelihood of flooding, categorises types of development based their flood vulnerability, and defines the appropriateness of the different types of development in terms of flood risk, of those types of development in each Flood Zone.

3.3.13 Development is appropriate, appropriate subject to the consideration of an exception test, or inappropriate.

3.3.14 Where a proposed development would be located within more than Flood Zone, the worse case scenario will be considered, unless the area of the proposed development in the lesser preferable Flood Zone does not effect the functionality of the development in terms of flood risk.

Aerodrome Safeguarding Zones

3.3.15 It is the role of the Ministry of Defence and Civil Aviation Authority to notify local authorities of aerodrome safeguarding zones, to ensure that consultation is carried out in respect to proposed development to ensure that the proposal would not increase risk of bird strike (through the creation of areas of open water in close proximity to airfields) or create an obstruction to aircraft due to the height of buildings. This is a material consideration in the siting of waste management facilities, particularly energy recovery facilities with associated high flues. Based on published information the assessment highlights whether the sites are within such zones.

Air Quality Management Areas

3.3.16 In accordance with Planning Policy Statement 23 Planning and Pollution control (PPS 23), the potential impact of any form of proposed development on air quality is a key planning consideration when preparing development plans and considering planning applications. It is the role of local/district authorities to designate Air Quality Management Areas (AQMAs) following assessment of local air quality in accordance with the Environment Act 1995. AQMAs do not preclude the siting of waste management facilities but the strategic site appraisal should consider this issue in general terms. Based on published information the assessment criterion indicates if the site is within or adjacent to an AQMAs.

Assessment Scoring

3.3.17 To enable comparison of all the sites and criteria, a non - numeric system of scoring has been applied within a summary table for each site as follows:

- Potential positive impact/consideration √
- Neutral **=**
- Potential negative impact/consideration **x**
- Unknown/uncertain requires further investigation **?**

3.3.18 In order to ensure transparency and consistency the following (Table 1) provides clarification about how scores have been applied against individual criterion in the assessment of sites for the purposes of this study.

Table 1: Site Appraisal Matrix

Site Allocations – Local Plan	
√	Site allocated in adopted/saved Local Plan for industrial/employment purposes and/or existing industrial/employment use
x	Site not allocated in adopted/saved Local Plan for industrial/employment purposes

Planning Vision	
√	Proposal considered compatible with existing/master plan for area as guided by the saved/adopted policy
x	Proposal considered to be inconsistent with existing/master plan for area as guided by the saved/adopted policy
=/?	Proposal considered to have a neutral or uncertain impact on vision for area

Sensitive human receptors	
√	No residential units within 200m of site boundary
x	Site is within 100m of a settlement
=	Residential units 100-200 m from site boundary

Landscape and Visual Consideration	
√	Site not within a designation, is well screened or is located within industrial area
x	Site within or adjacent to a national landscape designation
=	Site within open countryside, adjacent to open countryside, and/or within Local Landscape Areas

Natural Environment	
√	No local, National or European designations for nature conservation interest upon the site
x	Site located within or adjacent to a National and/or European designation for nature conservation
=	Site within a local designation for nature conservation interest or known ecological interest

Historic Environment	
√	Not within 100m of a site designated for historic interest
x	Designated site of historic interest within site boundary
=	In close proximity to a Scheduled Ancient Monument, Listed building and/or conservation area.

Road Access	
√	Access to/from site is on or adjacent to strategic/primary road network
x	Access to a strategic/primary road network is poor or major traffic congestion on minor roads would occur
= /?	Site near primary road network, however uncertain of capacity or standard to accommodate any increase in HGV movements

Rail or Water Transport	
√	The site can be accessed by either rail or water
=/ ?	There may be potential for the site to be accessed by rail or water due to its location however further investigation would be required.
x	The site has no possibility of being accessed by rail or water due to location

Energy Utilisation	
√	Identified heat customer/energy user for proposed development
x	No potential for heat customer/energy user for potential development
=	May be potential heat customer/energy user to be confirmed through feasibility assessment

Flood Risk	
√	The developments proposed are appropriate forms of development for the Flood Zone in which they would be located
x	The developments proposed are not appropriate forms of development for the Flood Zone in which they would be located, or Could only be appropriate subject to the Exception Test but sequentially preferable sites exist
?	The developments proposed are appropriate forms of development for the Flood Zone in which they would be located, subject to the Exception Test where sequentially p[referable sites do not exist

Groundwater Vulnerability	
√	Outside a Groundwater Source Protection Zone
x	Within a Groundwater Source Protection Zone - ‘inner zone’ or ‘outer zone’
=	Within ‘total catchment’ or Zone of Special Interest (Zone usually reflects local conditions suggesting that industrial sites could affect the groundwater source, even out of the normal catchment area)

Aerodrome Safeguarding Zones	
Yes	Within aerodrome safeguarding zone – note that further consultation required to confirm if an objection to the proposal will be raised by the CAA/MOD
No	Not within an aerodrome safeguarding zone

Air Quality Management Area (AQMA)	
Yes	Within an AQMA
No	Not within an AQMA

4 Appraisal Results

4.1.1 The list of sites identified in Stage 1 is shown below (Table 2). A total of 52 sites were identified within the Kent County Council administrative areas, with a total of 42 discounted due to their distance to the Paper Mill or insufficient size to incorporate a Sustainable Energy Plant (those <4ha discounted).

Table 2: Stage 1 Site List

Site Name	Size (ha)	Proximity to the Paper Mill	Taken forward to Stage 2 Appraisal
Allington	unknown	X	X
Allington Quarry	Unknown	X	X
The Bell Centre and adjacent land, Sittingbourne	1.11	√	X
Blue Boar Wharf, Rochester	unknown	X	X
Coldharbour Marshes East	12.0	√	√
Coldharbour Marshes South	52.2	√	√
Chart Leacon, Ashford	Unknown	X	X
Church Marshes	Unknown	√	X
Duke of Kent, Thanet Way, Faversham	1.40	X	X
Land East of Faversham	2.0	X	X
East Hall Farm	12.6	√	√
Eurocentre, Whitstable Road, Faversham (mixed uses)	7.15	X	X
Faversham Creek Basin	1.10	X	X
Land at Graveney Road (as part of mixed use development)	2.20 (indicative)	X	X
Halling	Unknown	X	X
Ham Quarry, Faversham	Unknown	X	X
Hawkinge	Unknown	X	X
Hermitage Lane Quarry	Unknown	X	X
Hersden	Unknown	X	X
Holborough	Unknown	X	X
Iwade	0.90 (indicative)	√	X
Kemsley Marshes North	4.3	√	√
Kemsley Marshes	14.8	√	√

Kemsley Paper Mill East	4.6	√	√
Kemsley Paper Mill West	20.9	√	√
Kingsnorth	Unknown	X	X
Manston Road, Margate	unknown	X	X
The Meads	12.6	X	√
Milton Creek, Sittingbourne (as part of mixed use development)	3.10 (indicative)	√	X
New Hythe	unknown	X	X
North Farm	unknown	X	X
Land at Oare Gravel Workings	6.0		
Queenborough and Rushden (as part of mixed use development)	2.30 (indicative)	X	X
Queenborough and Rushden (Neatscourt Marshes)	54.0	X	X
Richborough	unknown	X	X
Ridham Dock East	11.4	√	√
Ridham Dock West	11.4	√	√
Land and buildings west of Selling Road	1.80	X	X
Sevington	unknown	X	X
Shelford Quarry	unknown	X	X
Land to the north of Sheerness Station, Bridge Road (as part of mixed use development)	0.84	X	X
Shorncliffe, Folkestone	unknown	X	X
St Michael's Road, former Seeboard Yard and offices, Sittingbourne	0.40	√	X
Standard House, Faversham Creek	0.20	X	X
Stone Marshes, Dartford	unknown	X	X
Strood	unknown	X	X
Studd Hill, Herne Bay	Unknown	X	X
Vauxhall Road, Canterbury	unknown	X	X
Western Link, Faversham	8.30	X	X
Land at West Minister, East of Brielle Way, Queensborough	3.70	X	X
Whiteway Road, South Westminister, Queenborough	14.10	X	X

Whitfield	unknown	X	X

4.1.2 Following initial assessment the remaining 10 sites identified were referenced and subject to a detailed appraisal including site visits. The appraisal used a non numeric system of scoring having regard to planning vision, sensitive human receptors, landscape and visual consideration, potential impacts on natural environment, potential impact on historic environment and built heritage, road access, rail and water transport, energy utilisation, flood risk and ground water vulnerability, aerodrome safeguarding zones, air quality management areas.

4.1.3 Table 3 below sets out a summary of the number of positive attributes for each of the sites assessed. The detailed site appraisal can be seen in Appendix A .

Table 3: Positive Attributes

Site Ref	Site Name	Number of Attributes
1	Ridham Dock West	9
2	Ridham Dock East	9
3	Coldharbour Marshes East	9
4	Coldharbour Marshes South	9
5	Kemsley Paper Mill West	8
6	Kemsley Marshes North	9
7	Kemsley Marshes	9
8	Kemsley Paper Mill East	9
9	East Hall Farm	5
10	The Meads	7

4.1.4 In summary, the Kemsley Paper Mill East compared at least as favourably as the other shortlisted sites based upon the alternative site study criteria. It was assessed as having 9 attributes, and as such there are no sites that compare more favourably with the assessment criteria.

5 Conclusions

5.1.1 A structured approach has been adopted in analysing potential locations for the siting of the proposed Sustainable Energy Plant. The plant will utilise treated Commercial and Industrial (C&I) waste, municipal solid waste (MSW), and Solid Recovered Fuel (SRF) as its fuelstock. Whilst the consideration of site locations takes account of the context of proximity to waste arisings the primary purpose of the proposed plant is to supply energy to Kemsley Paper Mill. This report therefore also focuses upon potential alternative sites located within the context of the paper mill. The appraisal has been undertaken to assess whether since the Kemsley Paper Mill East site was identified, no better sites have emerged.

5.1.2 The methodology used for the alternative site search is transparent, based on good practice and the most up-to-date waste policy.

5.1.3 Due to the locational and operational requirements addressed in Chapter 2, the alternative site assessment identified and undertook a comprehensive assessment of 10 sites. The proposal site, Kemsley Paper Mill East (8) scored 9 attributes and as such, compared as favourably with the assessment criteria as a number of other sites.

5.1.4 Furthermore, The Sequential Approach set out by PPS25 seeks to demonstrate that there are no reasonably available sites in areas with a lower probability of flooding that would be appropriate for the type of development proposed. In this respect the assessment has revealed that 3 sites (including the proposal site) would be appropriate for the development proposed.

5.1.5 Overall, no site compared better with the assessment criteria than the proposed site. However, of the three sites that were appropriate in flood terms, the proposed site performed better than the other two against the remaining assessment criteria.

5.1.6 Additionally, there are two other valid considerations that weigh in favour of the site given its proximity to the Paper Mill. These relate to the proximity of the proposed site to the Paper Mill which the SEP will serve.

5.1.7 Firstly, the site as the proposed is located within the land owned by the applicant and there is no requirement to acquire third party land. This ensures that not just the site for the SEP is available but the land the land between SEP and the Paper Mill is available immediately with out the need to assemble ownership consent for the pipe line.

5.1.8 Secondly, given the proposed site is closest to the Paper Mill than any other site, the infrastructure and land assembly cost will compare more favourably than any other site, and therefore, ensure that the SEP can deliver the energy to the Paper Mill as viably as possible.

5.1.9 The reasons for the choice of the proposed site over potential alternative sites are therefore summarised as follows:

(a) The development incorporating mitigation measures will not result in likely significant effect upon environmental considerations.
(b) The proposal site is located so as to be integral with the paper mill. This ensures the viability of the proposed development is maximised both in terms of infrastructure costs and minimisation of costs associated with the pipeline.
(c) The site is within the applicants' ownership and no third party land or rights are required.
(d) The site is appropriate for the proposed development in respect to Flood Zoning and the provisions of PPS25.
(e) The site is a suitable site for the proposed development in that it has been previously used for storage. It is accessible by existing transportation infrastructure. It is located within an industrial area which is allocated for employment purposes within the Development Plan. The site is appropriate in terms of flood risk, and relates well to waste arisings. The site will enable the delivery of a more secure and renewable energy source to the Paper Mill.

Appendix A

Site Appraisals

Site 1 Ridham Dock West

NGR: 591833, 168327

Location

Ridham Dock is located within a 'Coastal Zone' to the north of Kemsley, alongside the River Swale. The A249 passes approximately 750m to the west. The A249 links Sittingbourne with Queenborough to the north and the M2, M20 and Maidstone to the south. Within Ridham Dock itself, the site is situated to the west of the existing access road as illustrated on Figure 1.

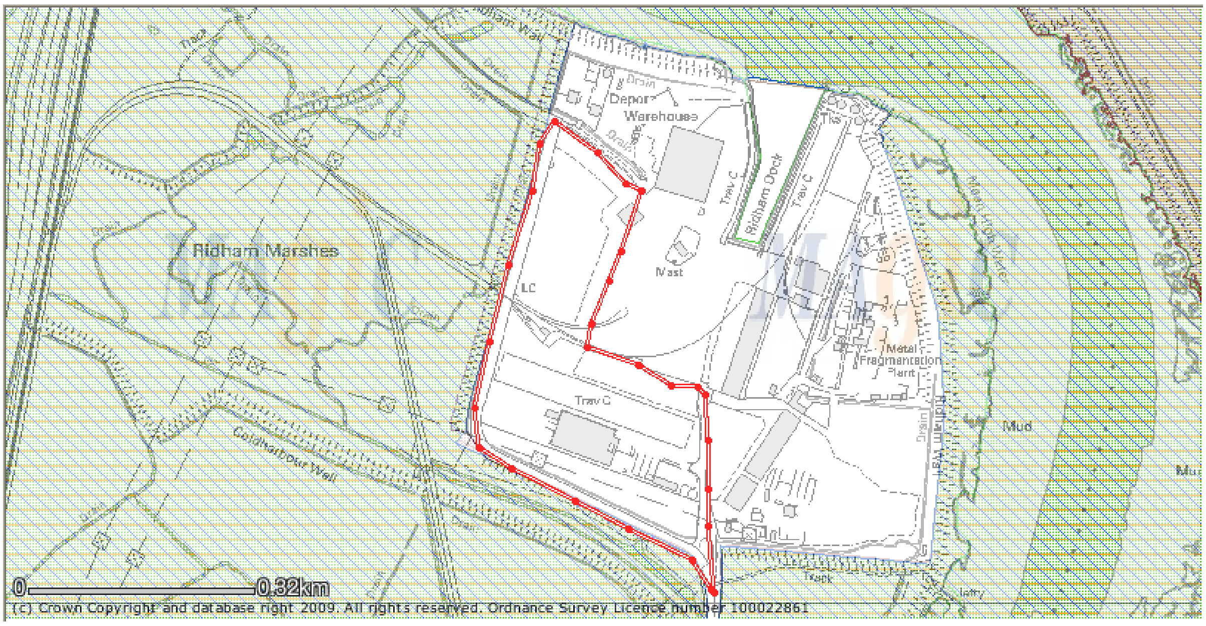
Description

The 11.4 hectare site (0.11sq km) is situated within a larger area forming part of Ridham Dock. At present the site is used for storage, Ridham Dock landing/harbour is situated to the north, next to which is a depot/warehouse. A metal fragmentation plant and disused railway are located to the east, Ridham Marshes to the west and Coldharbour Marshes (including Coldharbour Wall) to the south.

A belt of established tree planting runs to the west of the site boundary beyond which there is an existing railway line.

There are two access points, one from the south that is taken from Barge Way, heading south towards Kemsley and the A249, and one from the north west that heads towards Sheppey Crossing, Swale Station and the A249.

Figure 1



Local Plan Allocation, Waste Local Plan Allocations and designations.

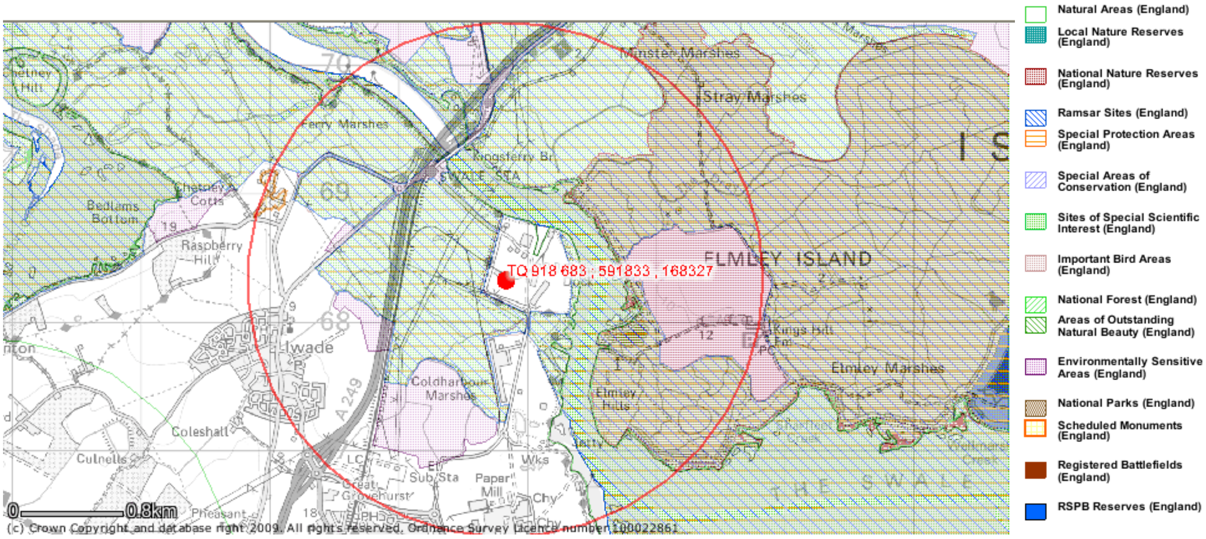
The Swale Borough Local Plan was adopted in February 2008. The Planning and Compulsory Purchase Act 2004 requires the Borough Council to prepare a Local Development Framework to replace the Swale Local Plan. The current LDS for Swale was published in August 2007. For the present the Swale Borough Local Plan is the primary Local Plan document.

The Local Plan allocates the site as an existing committed employment site under Policy B10. With recent improvements in infrastructure, the priority for the Local Plan is to secure the implementation of existing committed sites.

The Kent Waste Local Plan under Policies W7 and W9 identifies the site as having potential or being suitable for waste related uses.

The site does not lie within any ecological or geological designation. However, there are various designations within a 2km radius of the site:

- Greater Thames Estuary Natural Area
- Emley National Nature Reserve
- The Swale Ramsar Site
- Medway Estuary and Marshes Ramsar Site
- Medway Estuary and Marshes Special Protection Area
- The Swale Special Protection Area
- The Swale Site of Special Scientific Interest
- Medway Estuary and Marshes Site of Special Scientific Interest
- The Swale Important Bird Area
- Medway Estuary and Marshes Important Bird Area
- North Kent Marshes Environmentally Sensitive Area
- Scheduled Monument: ‘World War II Heavy Anti-aircraft gunsite (TS2)’, 200m east of Chetney Cottages



The site is entirely surrounded by an Ramsar site, Special Protection Area as well as a SSSI, the National Nature Reserves and Important Bird Areas are located to the east and the Environmentally Sensitive Areas to the south.

The residential areas of Iwade village are located 1.75km to the south west and separated from the site by Coldharbour Marshes. The redevelopment of site for employment could be undertaken providing the development accords with the employment policies B2, B10 and B11, set out in Part 2 (Section 3) of the Swale Borough Local Plan.

PPS10, Planning for Sustainable Waste Management confirms that industrial sites and previously developed land should be considered for waste management uses.

Appraisal

Planning Vision

(i) The Site sits within the footprint of Ridham Dock, an established industrial area. The area offers significant potential for regeneration and the development of employment land uses. Those uses will not only provide significant job opportunities for the Kemsley area, but the quality of design of new built infrastructure will complement the overall regeneration of the area. The use of the site for waste management purposes is compatible with the employment uses which predominate. The Site is allocated for employment within the Local Plan and is within the built-up area boundary of the proposals map.

Sensitive Receptors

(ii) Sensitive receptors to noise, dust and odour may include non-industrial, employment and residential uses as well as ecological and geological designated sites. The closest residential properties are located to the south west at Iwade village. Kemsley itself is located some 1.8 km to the south of the Site. The closest ecological designations (Ramsar site, Special Protection Area and SSSI) are located at the southern and western site boundaries.

Landscape and Visual Considerations

(iii) The Site itself is undesignated; however, it is bound by North Kent Marshes Special Landscape Area to the south and west, and further beyond to the north and east. Therefore, an appropriate plant design would be required to complement the objectives of the landscape designations.

Natural Environment

(iv) There are no national ecological or geological interests on the Site but the site is entirely surrounded by a Ramsar site, Special Protection Area and SSSI. National Nature Reserves and Important Bird Areas are located to the east and Environmentally Sensitive Areas to the south.

Historic Environment and Built Heritage

(v) There are no cultural heritage considerations within or neighbouring the Site. The closest Scheduled Ancient Monument is located 1.6km to the west, a WWII Heavy Anti-aircraft gunsite, 200m east of Chetney Cottages.

Road Access

(vi) Site has good access to the strategic road network with direct access onto the A249 to the west, and access via Barge Way to the south.

Rail or Water Transport

(vii) Swale Rail Station is located 700m to the north west of the Site. There is an existing rail siding that runs in a northerly direction from Kemsley towards Sheppey Crossing before arching back and running approximately 40m from the southwest corner of the site. Kemsley Down Station lies 1.9km to the south. The Site is adjacent to the River Swale, and as part of the Ridham Dock complex, provides immediate access to the water.

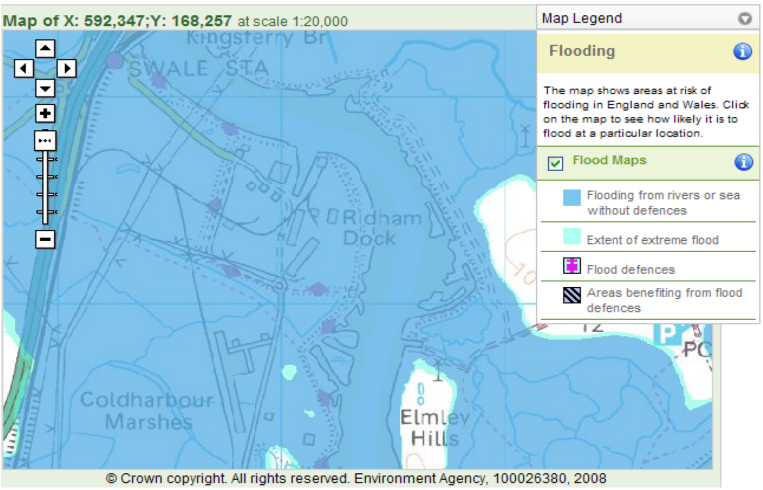
Energy Utilisation

(viii) The required development would need to be sited within 2km of Kemsley Paper Mill to be best able to provide the mill with energy utilisation in terms of steam. This site is approximately 1.5km and therefore has energy utilisation potential.

Flood Risk

(ix) The site is located in Flood Zone 3a, where Essential Infrastructure such as the SEP could only be appropriate subject to the Exception Test, if sites in Sequentially preferably Flood

Zones cannot be identified. In this case, the sites in Sequentially Preferable Flood Zones have been identified.



Ground Water Vulnerability

(x) According to the Environment Agency website the site does not lie within a Ground Water Source Protection Zone. The site does however lie within a Water Abstraction Management Area.

Within Aerodrome Safeguarding Zones

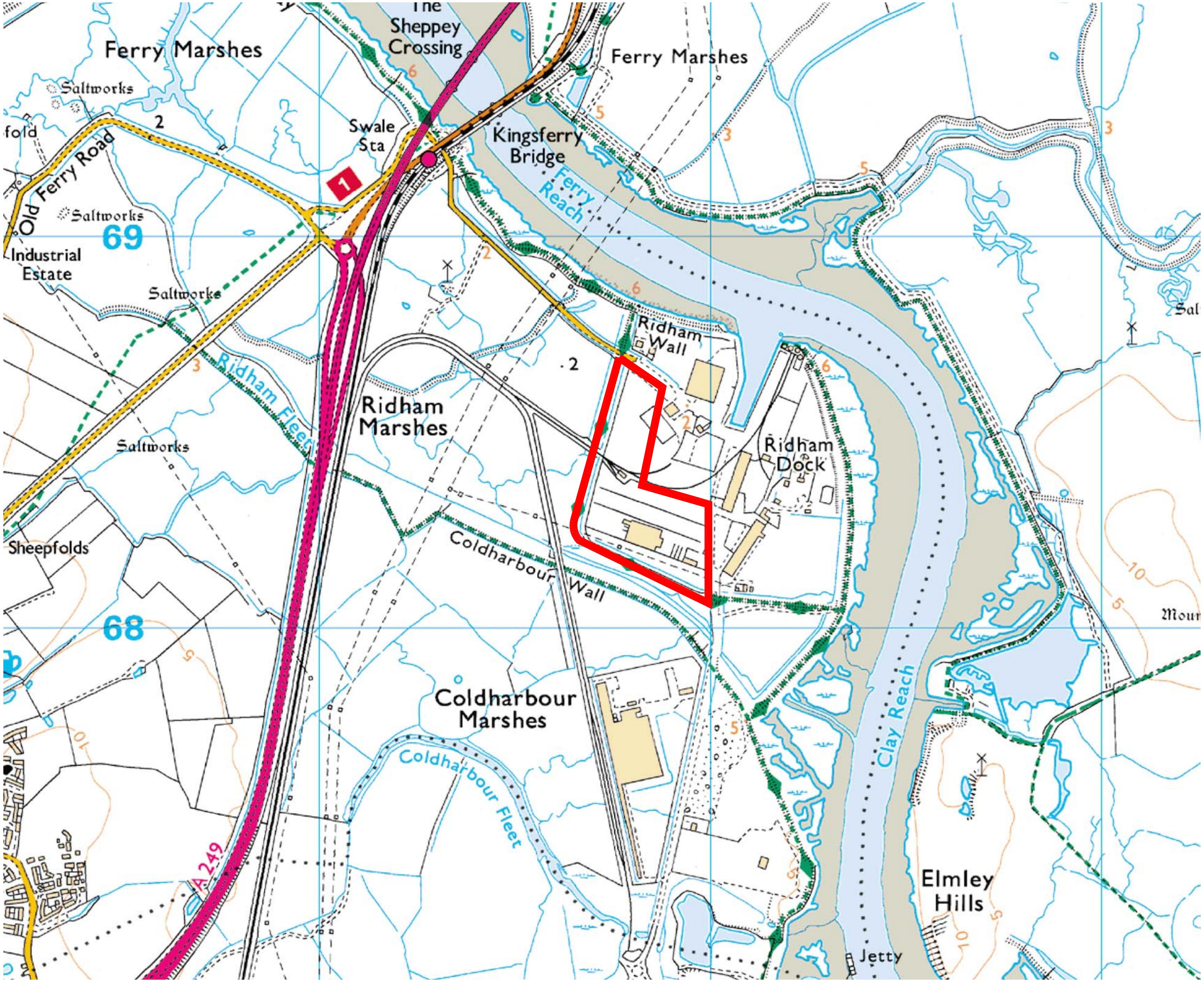
(xi) The site falls within an Aerodrome Safeguarding Zone

Within Air Quality Management Areas

(xii) The site does not lie within an Air Quality Management Area.

Appraisal Table Summary, Site 1

Criteria	**Description**	**Appraisal**
(i)	Planning Vision for the Area	√
(ii)	Sensitive Human Receptors	√
(iii)	Landscape and Visual Considerations	**=**
(iv)	Natural Environment	**x**
(v)	Historic Environment and Built Heritage	√
(vi)	Road Access	√
(vii)	Rail and Water Transport	√
(vii)	Energy Utilisation	√
(ix)	Flood Risk	**x**
(x)	Ground Water Vulnerability	√
(xi)	Within Aerodrome Safeguarding Zones	Yes
(xii)	Within Air Quality Management Areas	**No**



Key:

Proposal Site

N

RPS

3RD FLOOR
34 LISBON ST.
LEEDS
LS1 4LX
TEL: 0113 220 6190
FAX: 0113 243 9161

THIS DRAWING IS NOT TO BE SCALED ALL DIMENSIONS TO BE CHECKED ON SITE DISCREPANCIES, AMBIGUITIES AND/OR OMISSIONS BETWEEN THIS DRAWING AND INFORMATION GIVEN ELSEWHERE MUST BE REPORTED IMMEDIATELY TO THIS OFFICE FOR CLARIFICATION BEFORE PROCEEDING

PROJECT
Kemsley Sustainable Energy Plant

TITLE
Ridham Dock West

SCALE	DRAWN BY
1:10,000 @A3	RCA
DATE	CHECKED
November 2009	DC
CAD FILE	

PROJECT NUMBER	DRAWING NUMBER	REV
DLE1726		

Site 2 Ridham Dock East

NGR: 592222, 168238

Location

Ridham Dock is located within a ‘Coastal Zone’ to the north of Kemsley, alongside the River Swale. The A249 passes approximately 750m to the west.

The A249 links Sittingbourne with Queenborough to the north and the M2, M20 and Maidstone to the south.

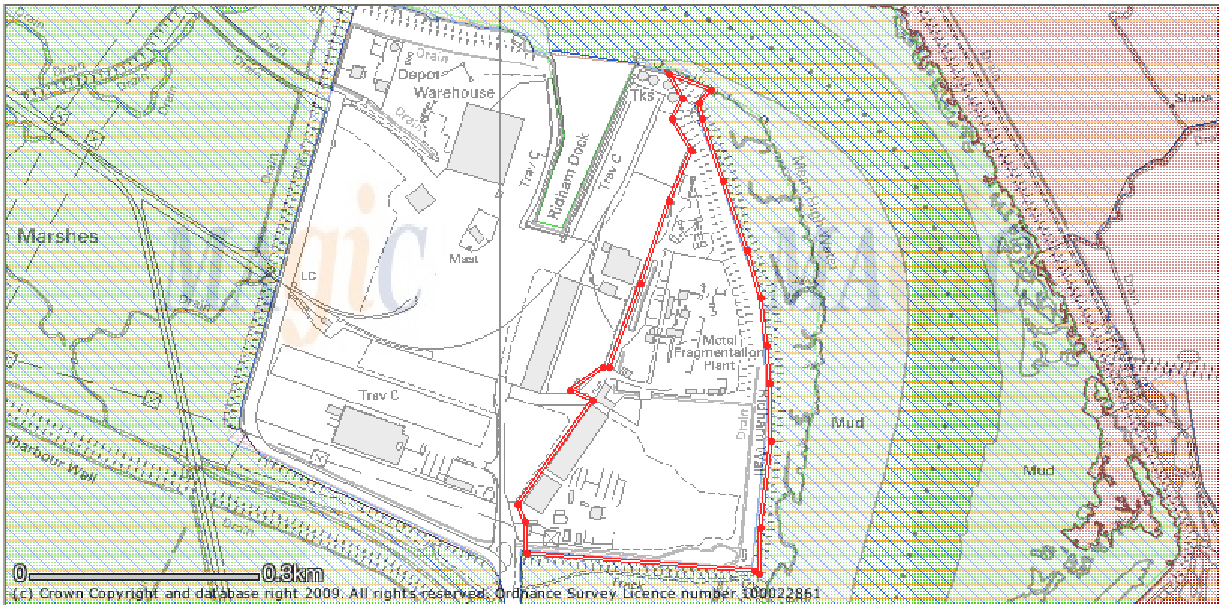
Within Ridham Dock itself, the site is situated to the east of the existing access road as illustrated on Figure 2.

Description

The 11.4 hectare site (0.11sq km) is situated within a larger area forming part of Ridham Dock. At present, the majority of the site is made up of a metal fragmentation plant, with the remainder of the site industrial in nature but also a mix of scrubland. The southern portion of the site also includes a dismantled railway line. To the west of the site lies the remainder of Ridham Dock, partly used for open-air storage, but also housing a number of warehouse units. Ridham Dock landing/harbour is situated to the northwest. Beyond the warehouses to the west are Ridham Marshes and to the south lies Coldharbour Marshes (including ‘Coldharbour Wall’). Beyond the remainder of Ridham Docks to the west of the site boundary there is an existing railway line.

Access to the site is from two main points, both are located at the southwest corner of the site, one from the south, taken from Barge Way, heading south towards Kemsley and the A249, and one from the west that heads northwest towards Sheppey Crossing, Swale Station and the A249.

Figure 2



Local Plan Allocation and designations.

The Swale Borough Local Plan was adopted in February 2008. The Planning and Compulsory Purchase Act 2004 requires the Borough Council to prepare a Local Development Framework to replace the Swale Local Plan. The current LDS for Swale was published in August 2007. For the present the Swale Borough Local Plan is the primary Local Plan document.

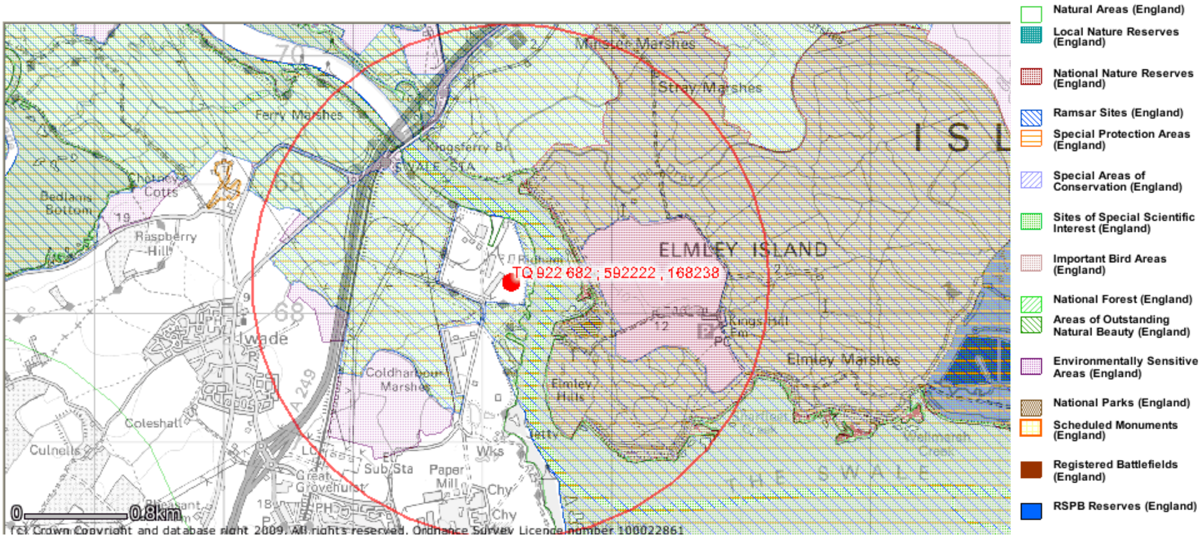
The Local Plan allocates the site as an existing committed employment site under Policy B10. With recent improvements in infrastructure, the priority for the Local Plan is to secure the implementation of existing committed sites.

The Kent Waste Local Plan under Policies W7 and W9 identifies the site as having potential or being suitable for waste related uses.

The site does not lie within any ecological or geological designation. However, there are various designations within a 2km radius of the site:

- Greater Thames Estuary Natural Area
- Emley National Nature Reserve
- The Swale Ramsar Site
- Medway Estuary and Marshes Ramsar Site
- Medway Estuary and Marshes Special Protection Area
- The Swale Special Protection Area
- The Swale Site of Special Scientific Interest
- Medway Estuary and Marshes Site of Special Scientific Interest

- The Swale Important Bird Area
- Medway Estuary and Marshes Important Bird Area
- North Kent Marshes Environmentally Sensitive Area



The site is entirely surrounded by a Ramsar site, Special Protection Area an a SSSI, the National Nature Reserves and Important Bird Areas are located to the east and the Environmentally Sensitive Areas to the south.

The residential areas of Iwade village are located 1.8km to the southwest and separated from the site by Coldharbour Marshes. The redevelopment of site for employment could be undertaken providing the development accords with the employment policies B2, B10 and B11, set out in Part 2 (Section 3) of the Swale Borough Local Plan.

PPS10, Planning for Sustainable Waste Management confirms that industrial sites and previously developed land should be considered for waste management uses.

Appraisal

Planning Vision

(i) The Site sits within the footprint of Ridham Dock, an established industrial area. The area offers significant potential for regeneration and the development of employment land uses. Those uses will not only provide significant job opportunities for the Kemsley area, but the quality of design of new built infrastructure will complement the overall regeneration of the area. The use of the site for waste management purposes is compatible with the employment uses which predominate.The Site is allocated for employment within the Local Plan and is within the built-up area boundary of the proposals map.

Sensitive Receptors

(ii) Sensitive receptors to noise, dust and odour may include non-industrial, employment and residential uses as well as ecological and geological designated sites. The closest residential properties are located to the south west at Iwade village. Kemsley itself is located some 1.8 km to the south of the Site. The closest ecological designations (Ramsar site, Special Protection Area and SSSI) are located at the southern and western site boundaries.

Landscape and Visual Considerations

(iii) The Site itself is undesignated; however, it is bound by North Kent Marshes Special Landscape Area to the south and west, and further beyond to the north and east. Therefore, an appropriate plant design would be required to complement the objectives of the landscape designations.

Natural Environment

(iv) There are no national ecological or geological interests on the Site but the site is entirely surrounded by a Ramsar site, Special Protection Area and SSSI. National Nature Reserves and Important Bird Areas are located to the east and Environmentally Sensitive Areas to the south.

Historic Environment and Built Heritage

(v) There are no cultural heritage considerations within or neighbouring the Site. The closest Scheduled Ancient Monument (1.6km to the west, a WWII Heavy Anti-aircraft gunsite, 200m east of Chetney Cottages) is outside the 2km search radius.

Road Access

(vi) Site has good access to the strategic road network with direct access onto the A249 to the west, and access via Barge Way to the south.

Rail or Water Transport

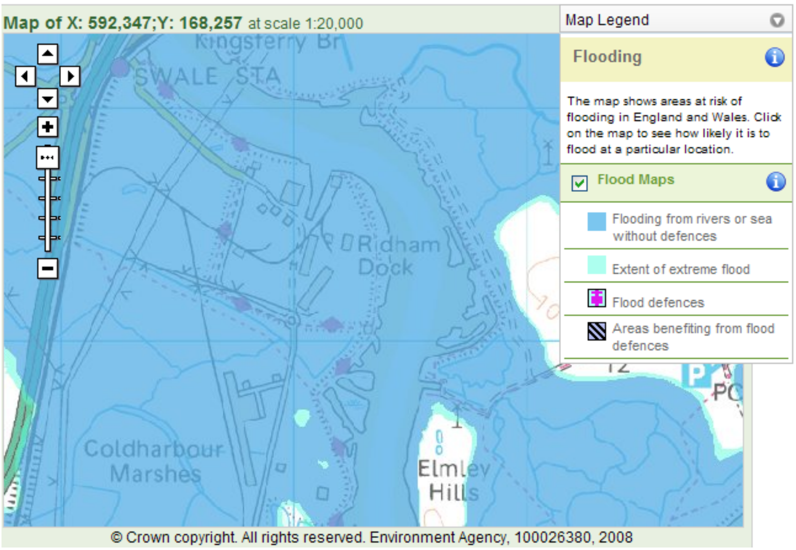
(vii) Swale Rail Station is located 1.2km to the north west of the Site. There is an existing rail siding that runs in a northerly direction from Kemsley towards Sheppey Crossing before arching back on itself and running approximately 400m from the southwest corner of the site. Kemsley Down Station lies 1.9km to the south. The Site is adjacent to the River Swale, and as part of the Ridham Dock complex, provides immediate access to the water.

Energy Utilisation

(viii) The required development would need to be sited within 2km of Kemsley Paper Mill to be best able to provide the mill with energy utilisation in terms of steam. This site is approximately 1.5km from the Mill and therefore has energy utilisation potential.

Flood Risk

(ix) The site is located in Flood Zone 3a, where Essential Infrastructure such as the SEP could only be appropriate subject to the Exception Test, if sites in Sequentially preferably Flood Zones cannot be identified. In this case, the sites in Sequentially Preferable Flood Zones have been identified.



Ground Water Vulnerability

(x) According to the Environment Agency website the site does not lie within a Ground Water Source Protection Zone. The site does however lie within a Water Abstraction Management Area.

Within Aerodrome Safeguarding Zones

(xi) The site falls within an Aerodrome Safeguarding Zone

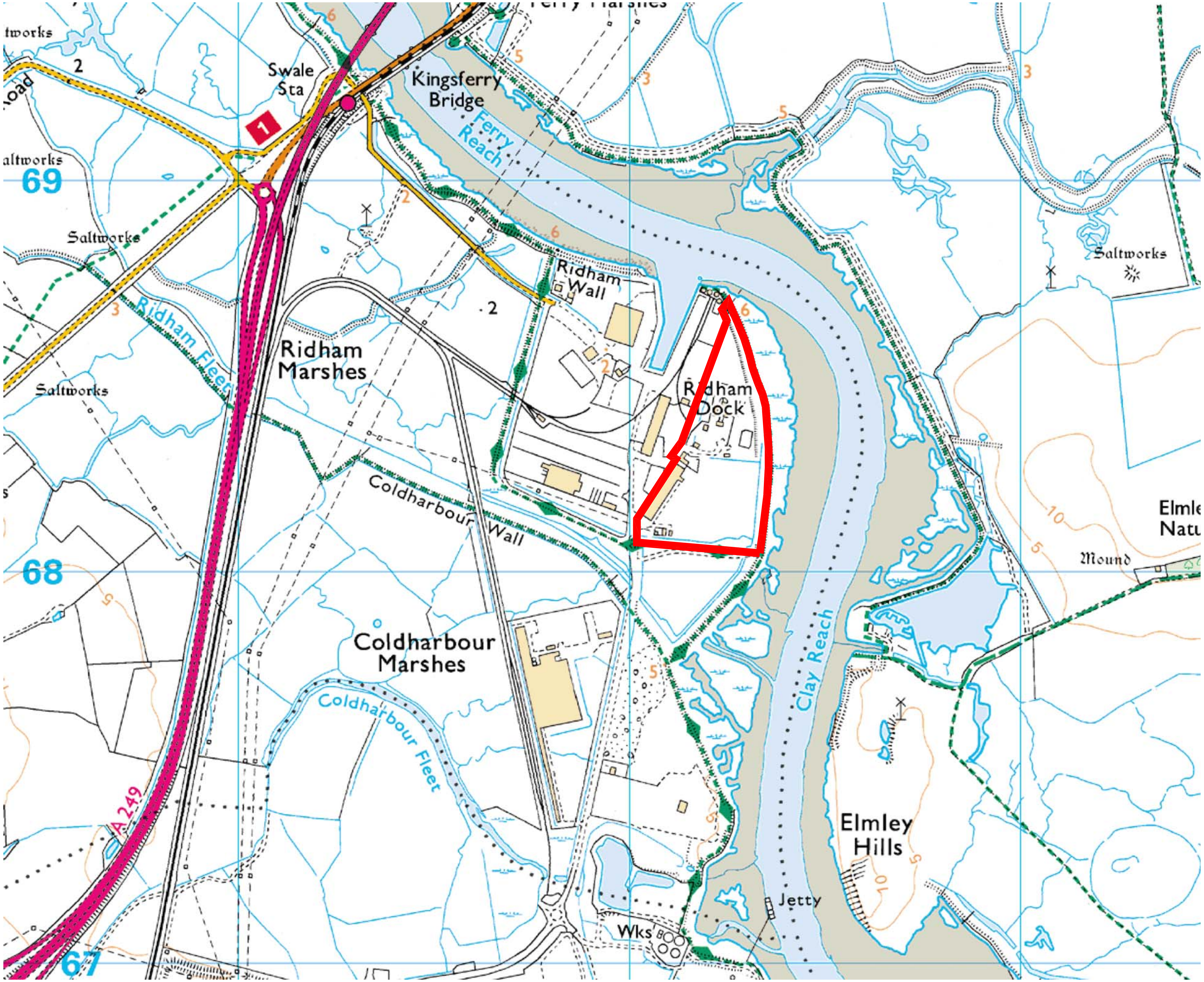
Within Air Quality Management Areas

(xii) The site does not lie within an Air Quality Management Area.

Appraisal Table Summary, Site 2

Criteria	Description	Appraisal
(i)	Planning Vision for the Area	√
(ii)	Sensitive Human Receptors	√
(iii)	Landscape and Visual Considerations	=
(iv)	Natural Environment	x
(v)	Historic Environment and Built Heritage	√
(vi)	Road Access	√
(vii)	Rail and Water Transport	√
(vii)	Energy Utilisation	√

(ix)	Flood Risk	**x**
(x)	Ground Water Vulnerability	√
(xi)	Within Aerodrome Safeguarding Zones	Yes
(xii)	Within Air Quality Management Areas	**No**



Key:

Proposal Site

N

RPS

3RD FLOOR
34 LISBON ST.
LEEDS
LS1 4LX
TEL: 0113 220 6190
FAX: 0113 243 9161

THIS DRAWING IS NOT TO BE SCALED ALL DIMENSIONS TO BE CHECKED ON SITE DISCREPANCIES, AMBIGUITIES AND/OR OMISSIONS BETWEEN THIS DRAWING AND INFORMATION GIVEN ELSEWHERE MUST BE REPORTED IMMEDIATELY TO THIS OFFICE FOR CLARIFICATION BEFORE PROCEEDING

PROJECT
Kemsley Sustainable Energy Plant

TITLE
Ridham Dock East

SCALE	DRAWN BY
1:10,000 @A3	RCA
DATE	CHECKED
November 2009	JS
CAD FILE	

PROJECT NUMBER	DRAWING NUMBER	REV
DLE1726		

Site 3 Coldharbour Marshes East

NGR: 592054, 167523

Location

The site is located to the north of Kemsley, situated between Coldharbour Marshes and the River Swale as illustrated on Figure 3. The A249 passes approximately 1.05km to the west.

The A249 links Sittingbourne with Queenborough to the north and the M2, M20 and Maidstone to the south.

Description

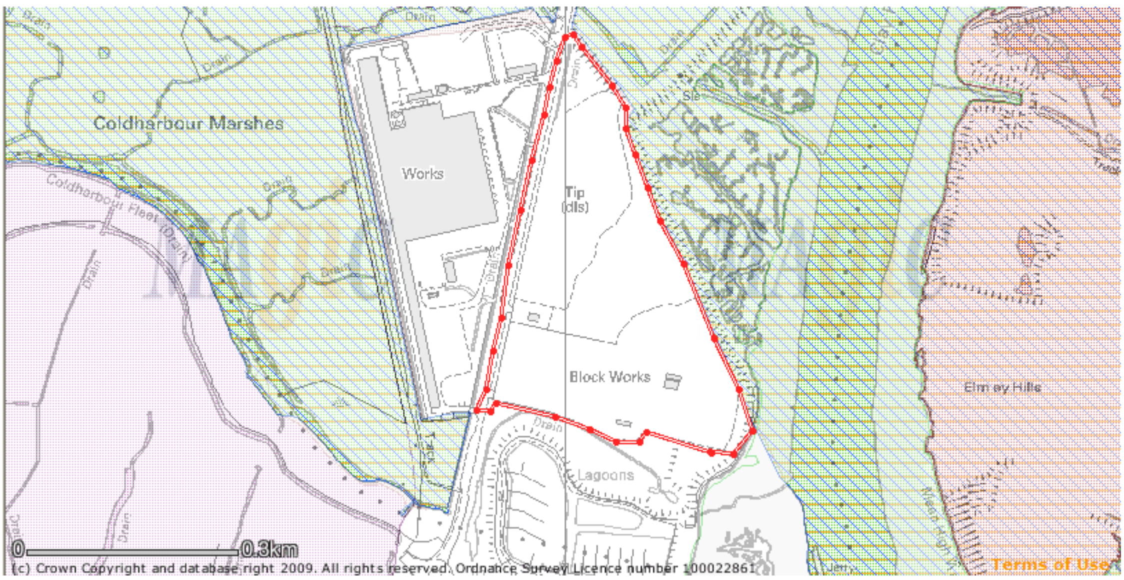
The 12 hectare site (0.12sq km) is situated to the east of Barge Way, approximately 700m to the north of Kemsley Paper Mill.

The northern portion of the site is currently covered in scrub, with the southern portion of the site used as open storage, possibly by the industrial facility located beyond Barge Way to the west. To the east of the site lies the River Swale, with tidal mudflats to the northeast. Barge Way runs along the western Site boundary, separating the site from a large industrial facility.

Immediately south of the site lies scrubland and beyond which lies 2no. settlement lagoons making up part of a sewage treatment plant. There is a track running along the eastern site boundary that provides southern access to Barge Way, the sewage works and a working jetty.

Access to the site is taken from the southwest corner, directly onto Barge Way, which can head north towards Ridham Docks and the A249, and south towards Kemsley Paper Mill and Kemsley.

Figure 3



Local Plan Allocation and designations.

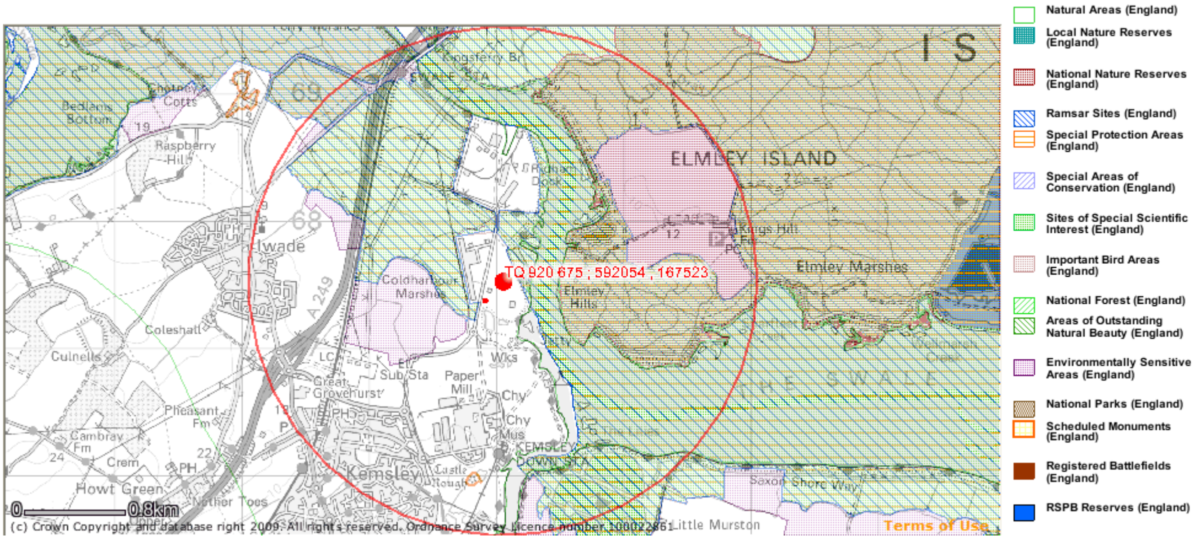
The Swale Borough Local Plan was adopted in February 2008. The Planning and Compulsory Purchase Act 2004 requires the Borough Council to prepare a Local Development Framework to replace the Swale Local Plan. The current LDS for Swale was published in August 2007. For the present the Swale Borough Local Plan is the primary Local Plan document.

The Local Plan allocates the site as an existing committed employment site under Policy B10. With recent improvements in infrastructure, the priority for the Local Plan is to secure the implementation of existing committed sites.

The Kent Waste Local Plan under Policies W7 and W9 identifies the site as having potential or being suitable for waste related uses.

The site does not lie within any ecological or geological designation. However, there are various designations within a 2km radius of the site:

- Greater Thames Estuary Natural Area
- Emley National Nature Reserve
- The Swale Ramsar Site
- Medway Estuary and Marshes Ramsar Site
- Medway Estuary and Marshes Special Protection Area
- The Swale Special Protection Area
- The Swale Site of Special Scientific Interest
- Medway Estuary and Marshes Site of Special Scientific Interest
- The Swale Important Bird Area
- Medway Estuary and Marshes Important Bird Area
- North Kent Marshes Environmentally Sensitive Area
- Castle Rough Scheduled Monument: ‘Medieval Moated Site’



The site is bound by the Swale Ramsar site, Special Protection Area and SSSI to the east, the National Nature Reserves and Important Bird Areas are located to the east and the Environmentally Sensitive Areas to the south west. The Swale Ramsar site, Special Protection Area and SSSI are located beyond the industrial facility to the west.

Kemsley lies 1.1km to the southwest, with Iwade village located 1.5km to the west of the site. The redevelopment of site for employment could be undertaken providing the development accords with the employment policies B2, B10 and B11, set out in Part 2 (Section 3) of the Swale Borough Local Plan.

PPS10, Planning for Sustainable Waste Management confirms that industrial sites and previously developed land should be considered for waste management uses.

Appraisal

Planning Vision

(i) The Site incorporates an area used as a ‘Block Works’ (southern portion) and scrubland (northern portion). Along with the industrial facility to the west, the site is part of an established industrial area. The area offers significant potential for regeneration and the development of employment land uses. Those uses will not only provide significant job opportunities for the Kemsley area, but the quality of design of new built infrastructure will complement the overall regeneration of the area. The use of the site for waste management purposes is compatible with the employment uses which predominate. The Site is allocated for employment within the Local Plan and is within the built-up area boundary of the proposals map.

Sensitive Receptors

(ii) Sensitive receptors to noise, dust and odour may include non-industrial, employment and residential uses as well as ecological and geological designated sites. The closest residential properties are located to the south within Kemsley. Iwade village is located some 1.5 km to the west of the Site. The closest ecological designations (Ramsar site, Special Protection Area and SSSI) are located at the eastern site boundary.

Landscape and Visual Considerations

(iii) The Site itself is undesignated; however, it is bound by North Kent Marshes Special Landscape Area to the west, and further beyond to the north and east. Therefore, an appropriate plant design would be required to complement the objectives of the landscape designations.

Natural Environment

(iv) There are no national ecological or geological interests on the Site but the site is surrounded by a Ramsar site, Special Protection Area and SSSI. National Nature Reserves and Important Bird Areas are located to the east and Environmentally Sensitive Areas to the southwest.

Historic Environment and Built Heritage

(v) Although there are no cultural heritage considerations within or neighbouring the Site, the closest Scheduled Monument lies 1.3km to the south, a Medieval Moated site called 'Castle Rough'.

Road Access

(vi) Site has good access to the strategic road network with direct access onto the A249 via Barge Way.

Rail or Water Transport

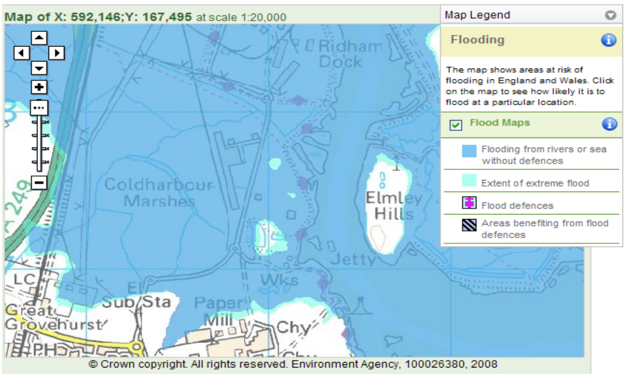
(vii) Kemsley Down Station lies 1.2km to the south. Swale Rail Station is located 1.5km to the north west of the Site. There is an existing rail siding that runs in a northerly direction from Kemsley towards Sheppey Crossing and then arcs back on itself passing approximately 100m from the southwest corner of the site. Kemsley Rail Station is located approximately 1.9km to the southwest. The Site is adjacent to the River Swale, and, 220m to the southeast of the site is an existing jetty providing immediate access the water.

Energy Utilisation

(viii) The required development would need to be sited within 2km of Kemsley Paper Mill to be best able to provide the mill with steam. This site is approximately 700m from the Mill and therefore has energy utilisation potential.

Flood Risk

(ix) The site is located in Flood Zone 3a, where Essential Infrastructure such as the SEP could only be appropriate subject to the Exception Test, if sites in Sequentially preferably Flood Zones cannot be identified. In this case, the sites in Sequentially Preferable Flood Zones have been identified.



Ground Water Vulnerability

(x) According to the Environment Agency website the site does not lie within a Ground Water Source Protection Zone. The site does however lie within a Water Abstraction Management Area.

Within Aerodrome Safeguarding Zones

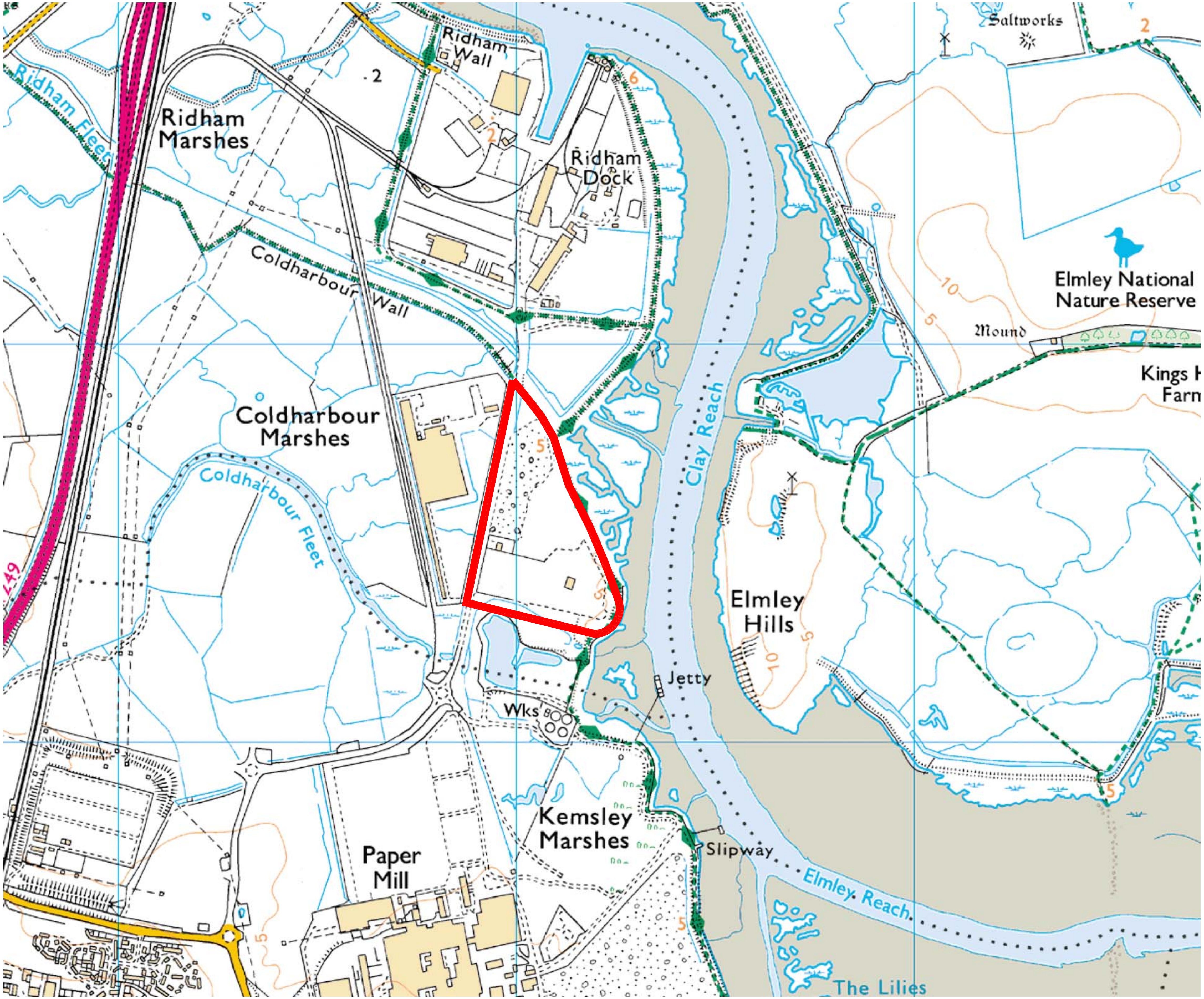
(xi) The site falls within an Aerodrome Safeguarding Zone

Within Air Quality Management Areas

(xii) The site does not lie within an Air Quality Management Area.

Appraisal Table Summary, Site 3

Criteria	**Description**	**Appraisal**
(i)	Planning Vision for the Area	√
(ii)	Sensitive Human Receptors	√
(iii)	Landscape and Visual Considerations	**=**
(iv)	Natural Environment	**x**
(v)	Historic Environment and Built Heritage	√
(vi)	Road Access	√
(vii)	Rail and Water Transport	√
(vii)	Energy Utilisation	√
(ix)	Flood Risk	**x**
(x)	Ground Water Vulnerability	√
(xi)	Within Aerodrome Safeguarding Zones	Yes
(xii)	Within Air Quality Management Areas	**No**



Key:

Proposal Site

RPS

3RD FLOOR
34 LISBON ST.
LEEDS
LS1 4LX
TEL: 0113 220 6190
FAX: 0113 243 9161

THIS DRAWING IS NOT TO BE SCALED ALL DIMENSIONS TO BE CHECKED ON SITE DISCREPANCIES, AMBIGUITIES AND/OR OMISSIONS BETWEEN THIS DRAWING AND INFORMATION GIVEN ELSEWHERE MUST BE REPORTED IMMEDIATELY TO THIS OFFICE FOR CLARIFICATION BEFORE PROCEEDING

PROJECT
Kemsley Sustainable Energy Plant

TITLE
Coldharbour Marshes East

SCALE	DRAWN BY
1:10,000 @A3	RCA
DATE	CHECKED
November 2009	JS

CAD FILE

PROJECT NUMBER	DRAWING NUMBER	REV
DLE1726		

Site 4 Coldharbour Marshes South

NGR: 591317, 167303

Location

The site is located within a 'Coastal Zone' to the north of Kemsley, situated to the south of Coldharbour Marshes as illustrated on Figure 4. The A249 passes approximately 50m to the west.

The A249 links Sittingbourne with Queenborough to the north and the M2, M20 and Maidstone to the south.

Description

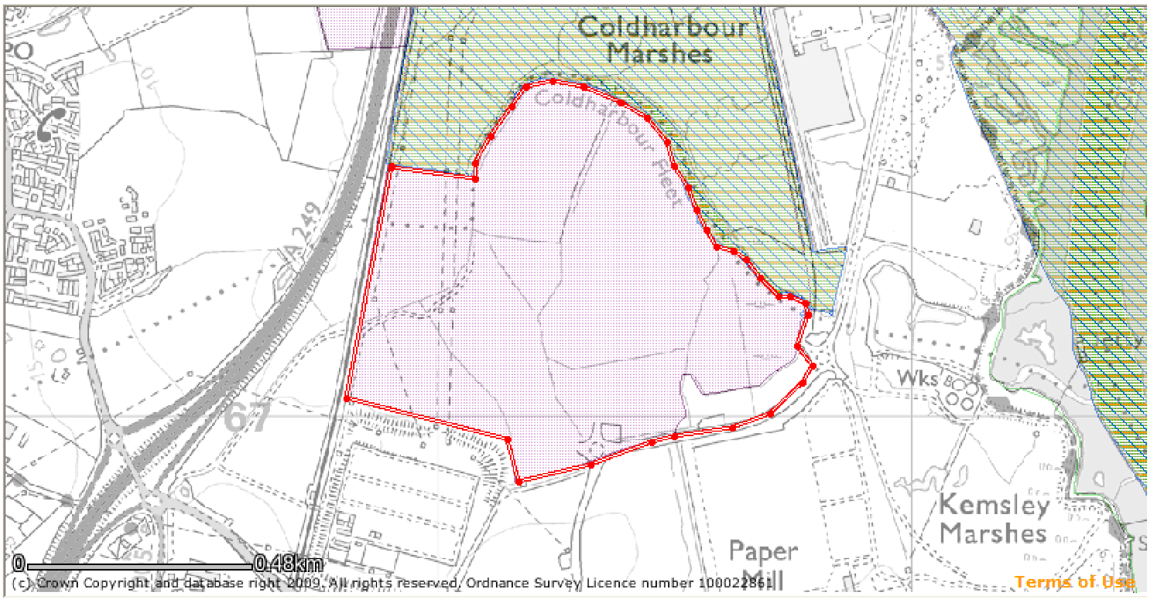
The 52.2 hectare site (0.52sq km) is situated to the east of Barge Way, approximately 400m to the north of Kemsley Paper Mill.

The site is currently being development. The western portion of the site houses a large Morrisons Distribution warehouse. The slightly smaller eastern portion of the site has been cleared and levelled.

Barge Way lies to the east of the site, beyond which is a sewage treatment works and the River Swale. Barge Way also runs partly along the southern Site boundary, separating the site from Kemsley Paper Mill. An electrical sub station is located to the southwest. Coldharbour Fleet Drain runs along the northern boundary, beyond which lies Coldhabour Marshes. The Site is bound to the west by a Rail line, beyond which is the A249.

Access to the site is taken from two points, both from Barge Way, one from the southeast corner, and one from the south. Barge Way links directly onto the A249 to the west.

Figure 4



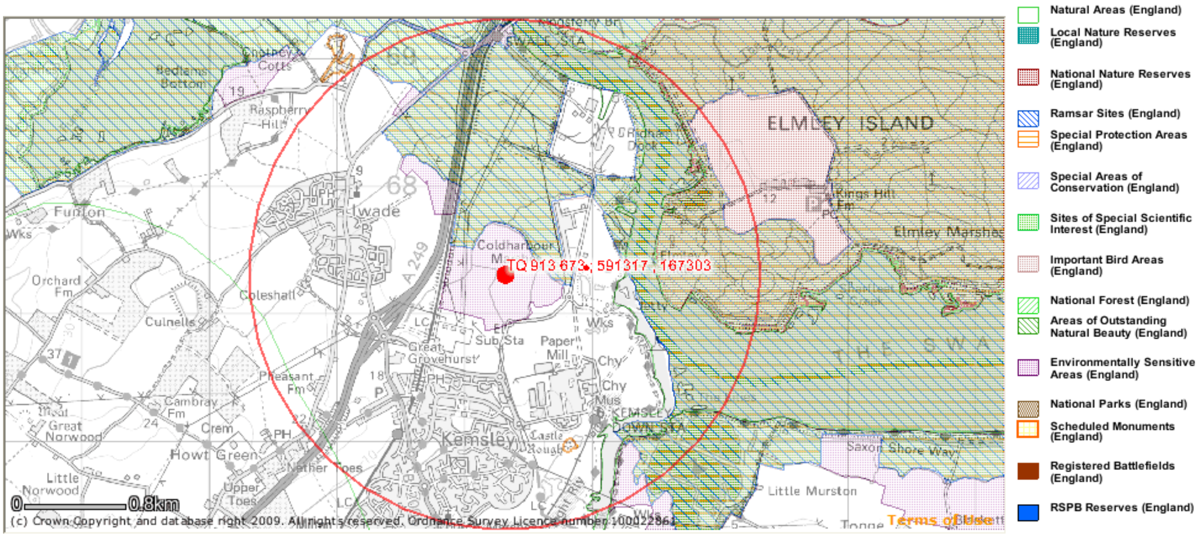
Local Plan Allocation and designations.

The Swale Borough Local Plan was adopted in February 2008. The Planning and Compulsory Purchase Act 2004 requires the Borough Council to prepare a Local Development Framework to replace the Swale Local Plan. The current LDS for Swale was published in August 2007. For the present the Swale Borough Local Plan is the primary Local Plan document.

The Local Plan allocates the site as an existing committed employment site under Policy B10. With recent improvements in infrastructure, the priority for the Local Plan is to secure the implementation of existing committed sites.

The site encompasses an area designated as a North Kent Marshes Environmentally Sensitive Area. There are also various designations within a 2km radius of the site:

- Greater Thames Estuary Natural Area
- North Kent Plain Natural Area
- Emley National Nature Reserve
- The Swale Ramsar Site
- Medway Estuary and Marshes Ramsar Site
- Medway Estuary and Marshes Special Protection Area
- The Swale Special Protection Area
- The Swale Site of Special Scientific Interest
- Medway Estuary and Marshes Site of Special Scientific Interest
- The Swale Important Bird Area
- Medway Estuary and Marshes Important Bird Area
- North Kent Marshes Environmentally Sensitive Area
- Castle Rough Scheduled Monument: ‘Medieval Moated Site’



The site is bound by the The Swale Ramsar site, Special Protection Area and SSSI to the north, with National Nature Reserves and Important Bird Areas are located to the east. The Swale Ramsar site, Special Protection Area and SSSI are also located beyond the sewage treatment plant to the east. Kemsley lies 350m to the south, with Iwade village located 400m to the west of the site. The redevelopment of site for employment could be undertaken providing the development accords with the employment policies B2, B10 and B11, set out in Part 2 (Section 3) of the Swale Borough Local Plan. PPS10, Planning for Sustainable Waste Management confirms that industrial sites and previously developed land should be considered for waste management uses.

Appraisal

Planning Vision

(i) Site comprises part of the proposed Kemsley Fields Business Park. A large portion of the site is already in use as a Morrisons distribution centre, including a large warehouse unit. The smaller eastern parcel of land is yet to be developed but has already been cleared and levelled for prospective construction work to commence. The site is part of an established industrial area. The area offers significant potential for regeneration and the development of employment land uses. Those uses will not only provide significant job opportunities for the Kemsley area, but the quality of design of new built infrastructure will complement the overall regeneration of the area. The use of the site for waste management purposes is compatible with the employment uses which predominate. The Site is allocated for employment within the Local Plan and is within the built-up area boundary of the proposals map.

Sensitive Receptors

(ii) Sensitive receptors to noise, dust and odour may include non-industrial, employment and residential uses as well as ecological and geological designated sites. The closest residential properties are located to the south within Kemsley. Iwade village is located some 400m to the west of the Site. The Site is designated as an Environmentally Sensitive Area, with a Ramsar site, Special Protection Area and SSSI located at the northern site boundary.

Landscape and Visual Considerations

(iii) The Site itself is undesignated; however, it is bound by the North Kent Marshes Special Landscape Area. Therefore, an appropriate plant design would be required to complement the objectives of the landscape designations.

Natural Environment

(iv) The site is designated as an Environmentally Sensitive Area. The Site is also bound to the north by a Ramsar site, Special Protection Area and SSSI. National Nature Reserves and Important Bird Areas are located further to the east along the banks of the River Swale.

Historic Environment and Built Heritage

(v) Although there are no cultural heritage considerations within or neighbouring the Site, the closest Scheduled Monument lies 1km to the south, a Medieval Moated site called 'Castle Rough'.

Road Access

(vi) Site has good access to the strategic road network with direct access onto the A249 via Barge Way.

Rail or Water Transport

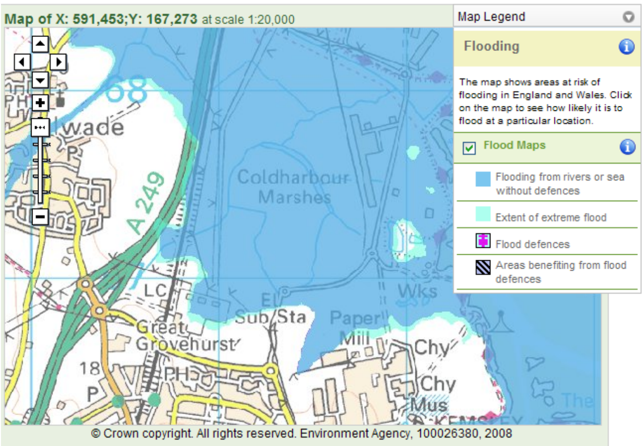
(vii) Kemsley Rail Station is located 1.3km to the southwest of the Site. There is an existing rail siding that runs in a northerly direction from Kemsley towards Sheppey Crossing and then arcs back on itself stopping up at the north east corner of the site. The site is also bound by a rail line to the west. Kemsley Down Station lies 950m to the south providing access to the Sittingbourne and Kemsley Light Railway. Swale Rail Station is located approximately 1.5km to the northwest. The Site is approximately 500m to the west of the River Swale, where there is an existing jetty.

Energy Utilisation

(viii) The required development would need to be sited within 2km of Kemsley Paper Mill to be best able to provide the mill with steam. This site is approximately 400m from the Mill and therefore has energy utilisation potential.

Flood Risk

(ix) The site is located in Flood Zone 3a, where Essential Infrastructure such as the SEP could only be appropriate subject to the Exception Test, if sites in Sequentially preferably Flood Zones cannot be identified. In this case, the sites in Sequentially Preferable Flood Zones have been identified.



Ground Water Vulnerability

(x) According to the Environment Agency website the site does not lie within a Ground Water Source Protection Zone. The site does however lie within a Water Abstraction Management Area.

Within Aerodrome Safeguarding Zones

(xi) The site falls within an Aerodrome Safeguarding Zone

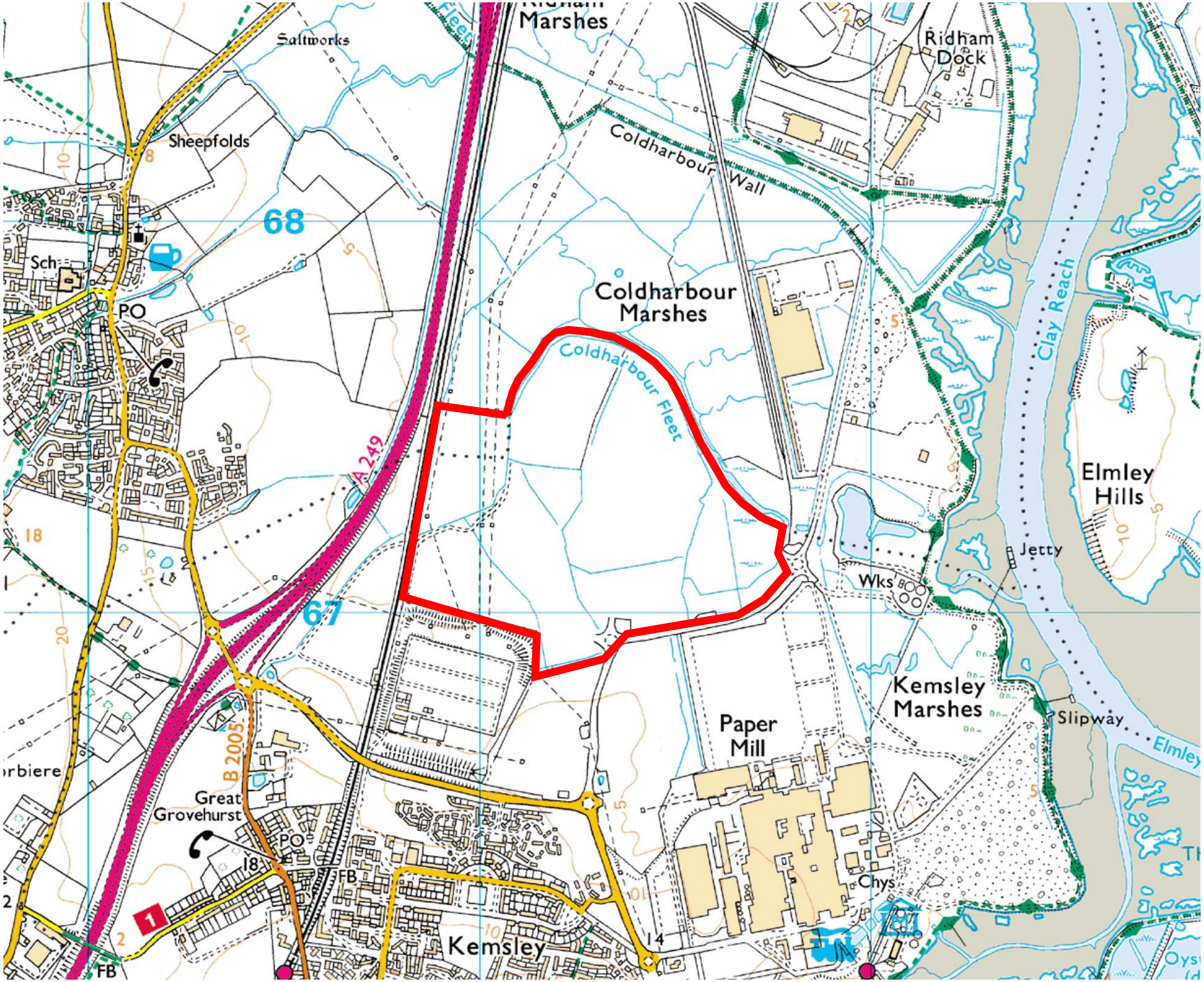
Within Air Quality Management Areas

(xii) The site does not lie within an Air Quality Management Area.

Appraisal Table

Summary, Site 4

Criteria	**Description**	**Appraisal**
(i)	Planning Vision for the Area	√
(ii)	Sensitive Human Receptors	√
(iii)	Landscape and Visual Considerations	**=**
(iv)	Natural Environment	**x**
(v)	Historic Environment and Built Heritage	√
(vi)	Road Access	√
(vii)	Rail and Water Transport	√
(vii)	Energy Utilisation	√
(ix)	Flood Risk	**x**
(x)	Ground Water Vulnerability	√
(xi)	Within Aerodrome Safeguarding Zones	Yes



Key:

Proposal Site

N

RPS

3RD FLOOR
34 LISBON ST.
LEEDS
LS1 4LX
TEL: 0113 220 6190
FAX: 0113 243 9161

THIS DRAWING IS NOT TO BE SCALED ALL DIMENSIONS TO BE CHECKED ON SITE DISCREPANCIES, AMBIGUITIES AND/OR OMISSIONS BETWEEN THIS DRAWING AND INFORMATION GIVEN ELSEWHERE MUST BE REPORTED IMMEDIATELY TO THIS OFFICE FOR CLARIFICATION BEFORE PROCEEDING

PROJECT
Kemsley Sustainable Energy Plant

TITLE
Coldharbour Marshes South

SCALE	DRAWN BY
1:10,000 @A3	RCA
DATE	CHECKED
November 2009	JS
CAD FILE	

PROJECT NUMBER	DRAWING NUMBER	REV
DLE1726		

RPS

(xii)	Within Air Quality Management Areas	**No**

Site 5 Kemsley Paper Mill West

NGR: 591382, 166583

Location

The site is located on the north edge of Kemsley, immediately north and west of Kemsley Paper Mill as illustrated on Figure 5. The A249 passes approximately 600m to the west. The A249 links Sittingbourne with Queenborough to the north and the M2, M20 and Maidstone to the south.

Description

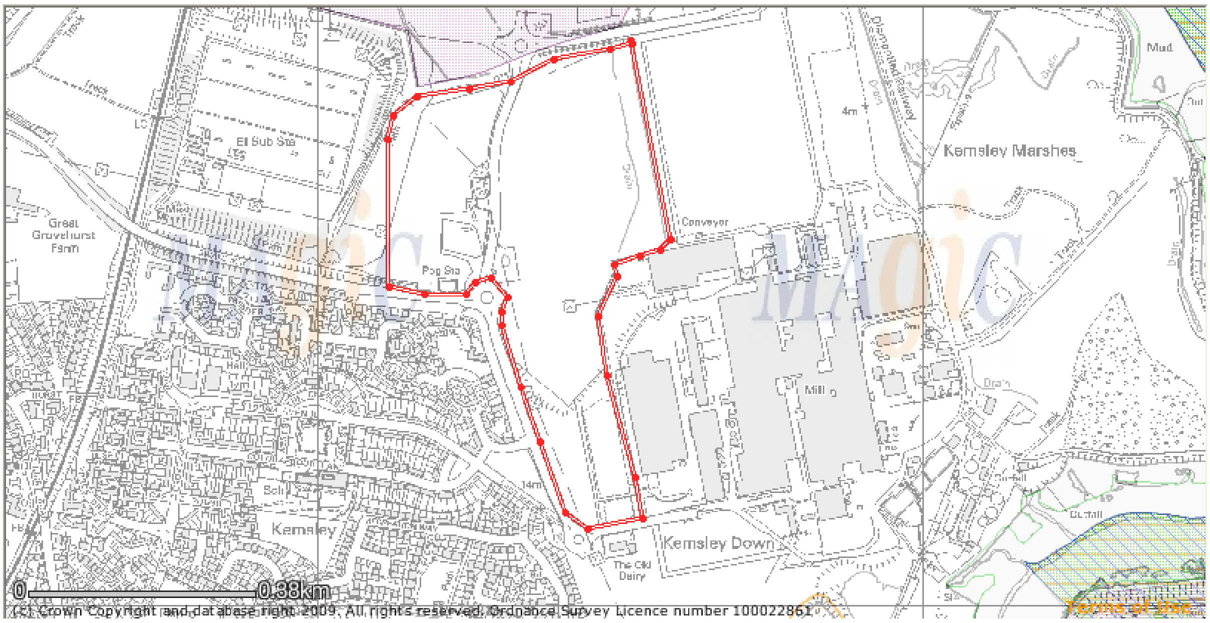
The 20.9 hectare site (0.21sq km) is situated to the north and west of Kemsley Paper Mill, to the east of recently constructed warehousing. The Site is bound to the north by Barge Way and to the south by Ridham Avenue. To the southwest lies the residential area of Kemsley and to the north the beginnings of Kemsley Fields Business Park.

The site is partly developed adjacent to the electricity substation with the remainder adjacent to the paper mill made up of scrubland at present, with Barge Way segregating the site in an east/west split.

The residential area of Kemsley lie to the west, Kemsley Paper Mill lies to the south and east, and the proposed Kemsley Fields Business Park lies to the north.

A new arm of Barge Way extends through the middle of the site, allowing for access from a number of points. Barge Way links directly onto the A249 to the west.

Figure 5



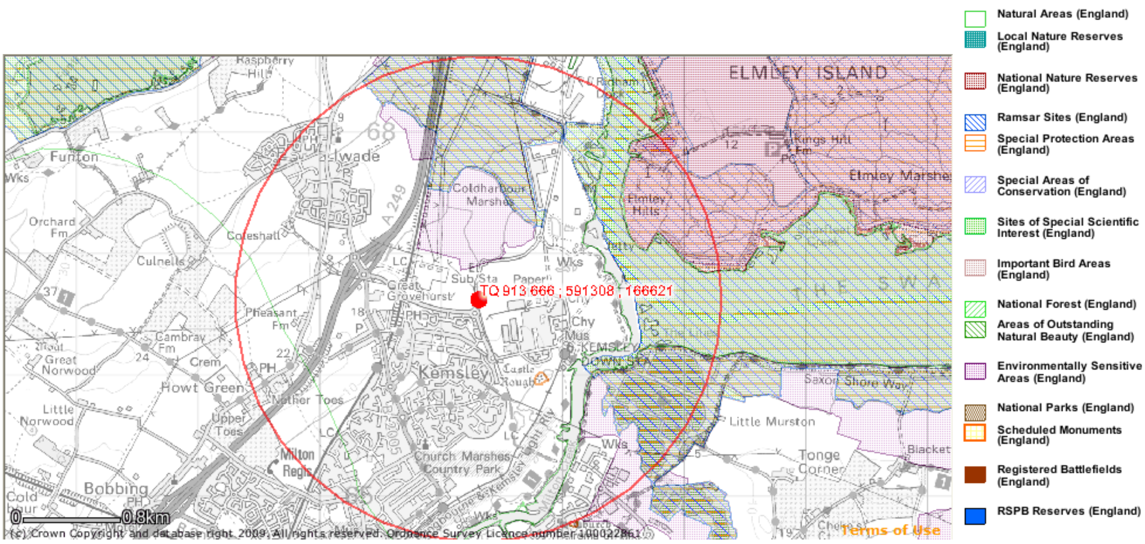
Local Plan Allocation and designations.

The Swale Borough Local Plan was adopted in February 2008. The Planning and Compulsory Purchase Act 2004 requires the Borough Council to prepare a Local Development Framework to replace the Swale Local Plan. The current LDS for Swale was published in August 2007. For the present the Swale Borough Local Plan is the primary Local Plan document.

The Local Plan allocates the site as an existing committed employment site under Policy B10. With recent improvements in infrastructure, the priority for the Local Plan is to secure the implementation of existing committed sites.

The site does not lie within any ecological or geological designation. However, there are various designations within a 2km radius of the site:

- Greater Thames Estuary Natural Area
- North Kent Plain Natural Area
- Emley National Nature Reserve
- The Swale Ramsar Site
- The Swale Special Protection Area
- The Swale Site of Special Scientific Interest
- The Swale Important Bird Area
- North Kent Marshes Environmentally Sensitive Area
- Castle Rough Scheduled Monument: 'Medieval Moated Site'
- Scheduled Monument: Murston Old Church, Sittingbourne



The site is bound by the North Kent Marshes Environmentally Sensitive Area to the north, beyond which lies The Swale Ramsar site, Special Protection Area and SSSI. Emley National Nature Reserve and Swale Important Bird Areas are located to the east.

Residential properties within Kemsley lie adjacent to the west of the site. The redevelopment of site for employment could be undertaken providing the development accords with the employment policies B2, B10 and B11, set out in Part 2 (Section 3) of the Swale Borough Local Plan.

PPS10, Planning for Sustainable Waste Management confirms that industrial sites and previously developed land should be considered for waste management uses.

Appraisal

Planning Vision

(i) Site comprises vacant scrubland adjacent to the north and west of Kemsley Paper Mill. The site is part of an established industrial area. The area offers significant potential for regeneration and the development of employment land uses. Those uses will not only provide significant job opportunities for the Kemsley area, but the quality of design of new built infrastructure will complement the overall regeneration of the area. The use of the site for waste management purposes is compatible with the employment uses which predominate. The Site is allocated for employment within the Local Plan and is within the built-up area boundary of the proposals map.

Sensitive Receptors

(ii) Sensitive receptors to noise, dust and odour may include non-industrial, employment and residential uses as well as ecological and geological designated sites. The closest residential properties are within Kemsley, adjacent to the west of the site. Although the site itself is not designated, an Environmentally Sensitive Area lies immediately to the north, with a Ramsar site, Special Protection Area and SSSI beyond Kemsley Fields Business Park.

Landscape and Visual Considerations

(iii) The Site itself is undesignated; however, the North Kent Marshes Special Landscape Area lies 400m to the northeast. Therefore, an appropriate plant design would be required to complement the objectives of the landscape designations.

Natural Environment

(iv) Although the site is not designated, an Environmentally Sensitive Area is located immediately to the north, beyond which lies a Ramsar site, Special Protection Area and SSSI. National Nature Reserves and Important Bird Areas are located further to the east along the banks of the River Swale.

Historic Environment and Built Heritage

(v) Although there are no cultural heritage considerations within or neighbouring the Site, the closest Scheduled Monument lies 1km to the south, a Medieval Moated site called 'Castle Rough'. Murston Old Church (Sittingbourne) is also located 1.5km to the south.

Road Access

(vi) Site has good access to the strategic road network with direct access onto the A249 via Barge Way.

Rail or Water Transport

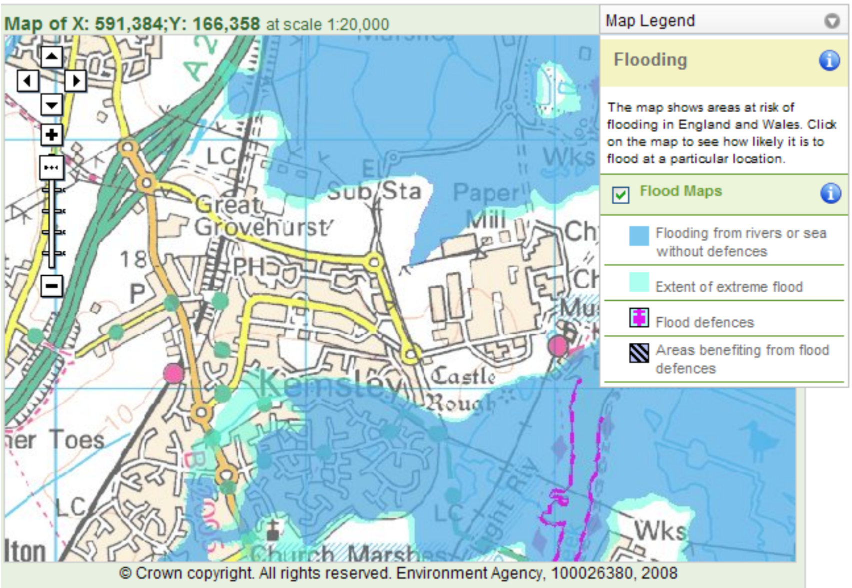
(vii) Kemsley Down Station lies 475m to the southeast providing access to the Sittingbourne and Kemsley Light Railway. Kemsley Rail Station is located 850m to the southwest of the Site. There is an existing rail siding that runs in a northerly direction from Kemsley towards Sheppey Crossing and then arcs back on itself stopping up approximately 475m to the north east. An existing rail line runs north/south approximately 375m to the west. Swale Rail Station is located approximately 2.3km to the north. The Site is approximately 900m to the west of the River Swale, where there is an existing slipway providing immediate access the water.

Energy Utilisation

(viii) The required development would need to be sited within 2km of Kemsley Paper Mill to be best able to provide the mill with energy utilisation in terms of steam. As the site lies adjacent to the Paper Mill it has significant energy utilisation potential.

Flood Risk

(ix) As shown on the Flood risk map below, the site is located generally within Flood Zone 1. Bothe the SEP and the Ash treatment Plant are likely to be accommodated in Flood Zones where they are appropriate.



Ground Water Vulnerability

(x) According to the Environment Agency website the site does not lie within a Ground Water Source Protection Zone. The site does however lie within a Water Abstraction Management Area.

Within Aerodrome Safeguarding Zones

(xi) The site falls within an Aerodrome Safeguarding Zone

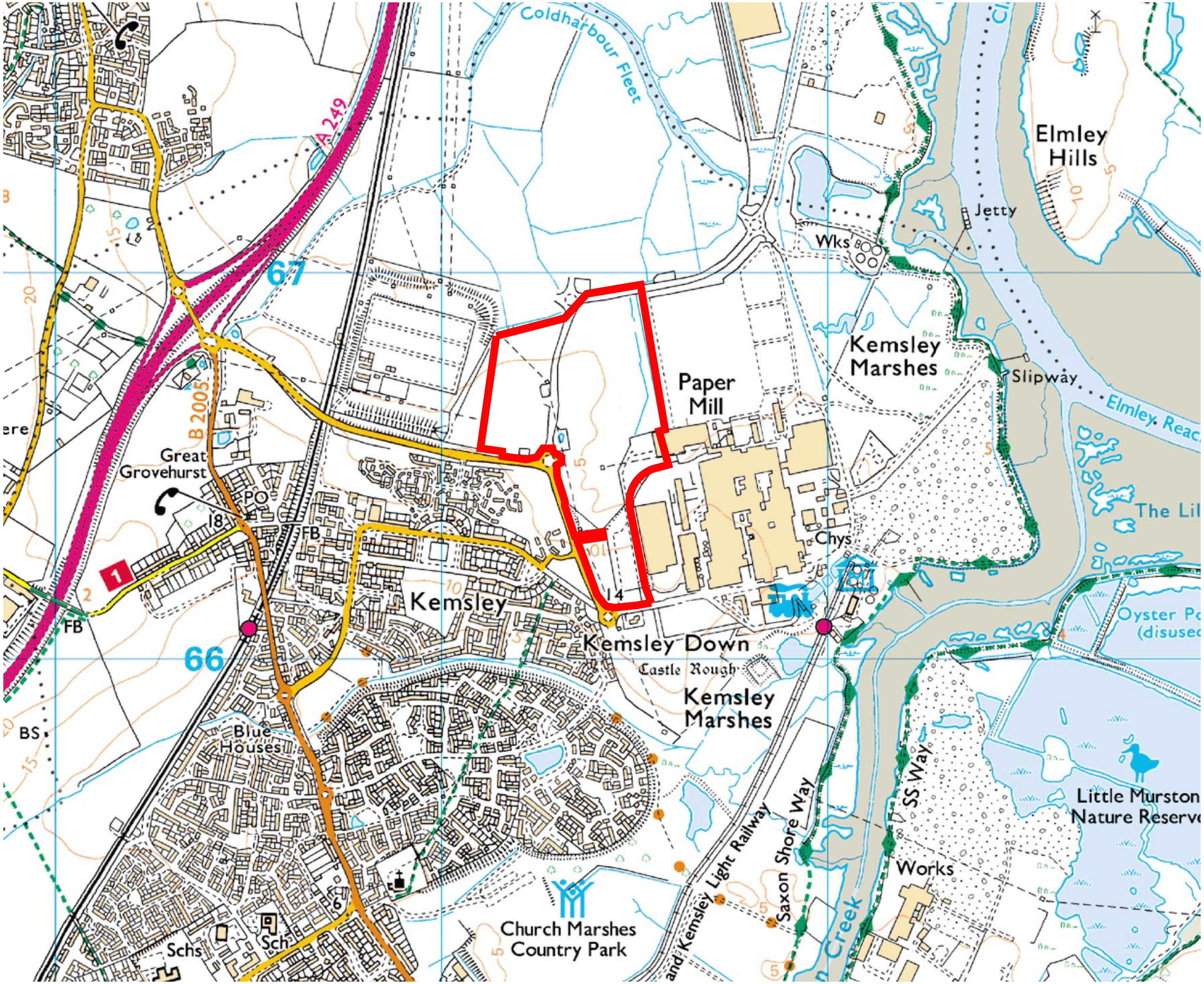
Within Air Quality Management Areas

(xii) The site does not lie within an Air Quality Management Area.

Appraisal Table

Summary, Site 5

Criteria	**Description**	**Appraisal**
(i)	Planning Vision for the Area	√
(ii)	Sensitive Human Receptors	**x**
(iii)	Landscape and Visual Considerations	√
(iv)	Natural Environment	**x**
(v)	Historic Environment and Built Heritage	√
(vi)	Road Access	√
(vii)	Rail and Water Transport	**=/?**
(vii)	Energy Utilisation	**=**
(ix)	Flood Risk	√
(x)	Ground Water Vulnerability	√
(xi)	Within Aerodrome Safeguarding Zones	Yes
(xii)	Within Air Quality Management Areas	**No**



Key:

Proposal Site

N

RPS

3RD FLOOR
34 LISBON ST.
LEEDS
LS1 4LX
TEL: 0113 220 6190
FAX: 0113 243 9161

THIS DRAWING IS NOT TO BE SCALED. ALL DIMENSIONS TO BE CHECKED ON SITE. DISCREPANCIES, AMBIGUITIES AND/OR OMISSIONS BETWEEN THIS DRAWING AND INFORMATION GIVEN ELSEWHERE MUST BE REPORTED IMMEDIATELY TO THIS OFFICE FOR CLARIFICATION BEFORE PROCEEDING

PROJECT
Kemsley Sustainable Energy Plant

TITLE
Kemsley Paper Mill West

SCALE 1:10,000 @A3	DRAWN BY RCA
DATE November 2009	CHECKED JS
CAD FILE	
PROJECT NUMBER DLE1726	DRAWING NUMBER / REV

Site 6 Kemsley Marshes North

NGR: 591851, 167132

Location

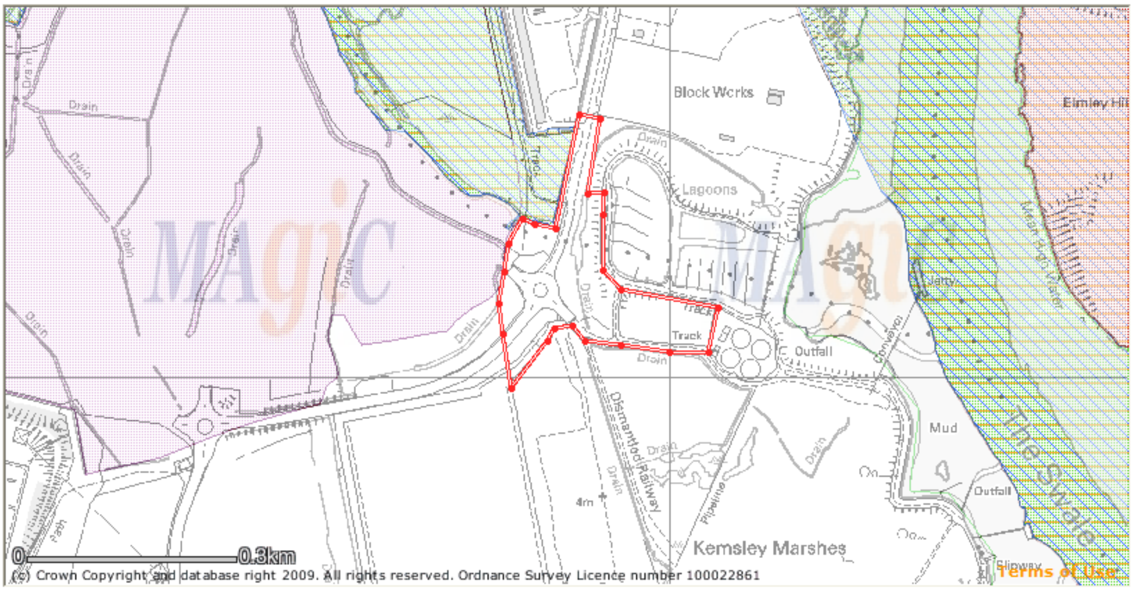
The site is located on the north edge of Kemsley, to the north of Kemsley Paper Mill, close to Kemsley Marshes as illustrated on Figure 6. The A249 passes approximately 1km to the west. The A249 links Sittingbourne with Queenborough to the north and the M2, M20 and Maidstone to the south.

Description

The 4.3 hectare site (0.04sq km) is situated to the north of Kemsley Paper Mill and comprises a portion of land to the west of a sewage treatment works. The Site is bound to the north by scrubland and a Blockworks and to the south by an open storage area used by Kemsley Paper Mill. To the east lies the proposed Kemsley Fields Business Park. To the southeast lies a dismantled railway situated upon Kemsley Marshes.

The site is made up of scrubland at present, with Barge Way (including a roundabout junction) running through the site, linking directly onto the A249 to the west. The residential area of Kemsley lies approximately 850m to the southwest.

Figure 6



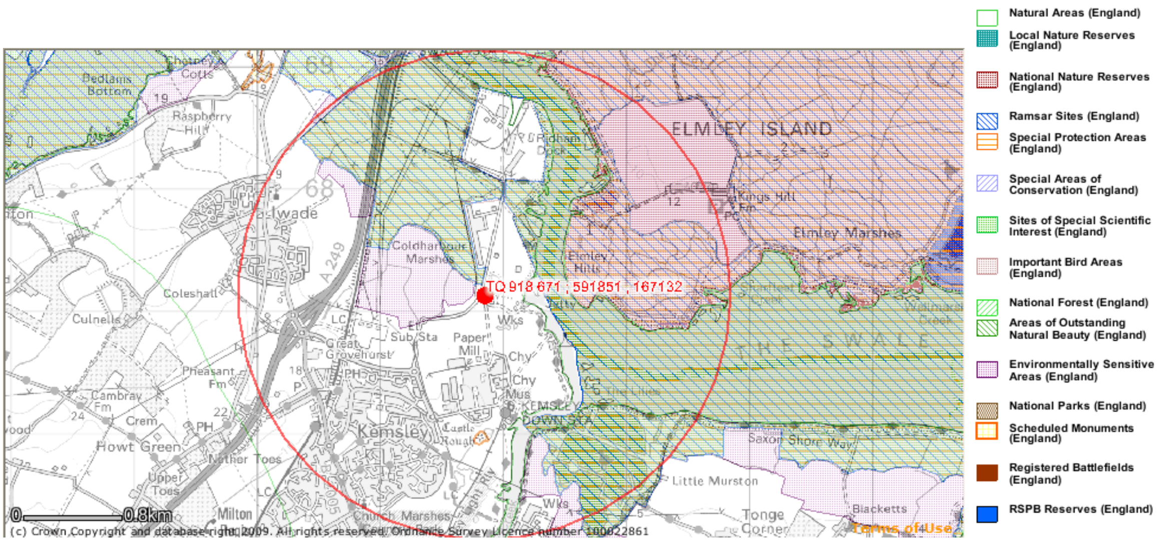
Local Plan Allocation and designations.

The Swale Borough Local Plan was adopted in February 2008. The Planning and Compulsory Purchase Act 2004 requires the Borough Council to prepare a Local Development Framework to replace the Swale Local Plan. The current LDS for Swale was published in August 2007. For the present the Swale Borough Local Plan is the primary Local Plan document.

The Local Plan allocates the site as an existing committed employment site under Policy B10. With recent improvements in infrastructure, the priority for the Local Plan is to secure the implementation of existing committed sites.

The site does not lie within any ecological or geological designation. However, there are various designations within a 2km radius of the site:

- Greater Thames Estuary Natural Area
- Emley National Nature Reserve
- The Swale Ramsar Site
- Medway Estuary and Marshes Ramsar Site
- The Swale Special Protection Area
- Medway Estuary and Marshes Special Protection Area
- The Swale Site of Special Scientific Interest
- Medway Estuary and Marshes Site of Special Scientific Interest
- The Swale Important Bird Area
- Medway Estuary and Marshes Important Bird Area
- North Kent Marshes Environmentally Sensitive Area
- Castle Rough Scheduled Monument: ‘Medieval Moated Site’



The site is bound by the Swale Ramsar site, Special Protection Area and SSSI to the northwest, North Kent Marshes Environmentally Sensitive Area lies adjacent to the western site boundary with

National Nature Reserves and Important Bird Areas located to the east. The Swale Ramsar site, Special Protection Area and SSSI are also located beyond the sewage treatment plant to the east.

Kemsley lies 850m to the southwest, with Iwade village located 1.3km to the west of the site. The redevelopment of site for employment could be undertaken providing the development accords with the employment policies B2, B10 and B11, set out in Part 2 (Section 3) of the Swale Borough Local Plan.

PPS10, Planning for Sustainable Waste Management confirms that industrial sites and previously developed land should be considered for waste management uses.

Appraisal

Planning Vision

(i) Site comprises scrubland between Kemsley Marshes and the Blockworks off Barge Way. The site is part of an established industrial area. The area offers significant potential for regeneration and the development of employment land uses. Those uses will not only provide significant job opportunities for the Kemsley area, but the quality of design of new built infrastructure will complement the overall regeneration of the area. The use of the site for waste management purposes is compatible with the employment uses which predominate. The Site is allocated for employment within the Local Plan and is within the built-up area boundary of the proposals map.

Sensitive Receptors

(ii) Sensitive receptors to noise, dust and odour may include non-industrial, employment and residential uses as well as ecological and geological designated sites. The closest residential properties are located approximately 850m to the southwest within Kemsley. Iwade village is located some 1.3km to the west of the Site. Although the Site is not designated, an Environmentally Sensitive Area lies adjacent to the western site boundary, with a Ramsar site, Special Protection Area and SSSI located at the northern site boundary. The Swale Ramsar site, Special Protection Area and SSSI are located to the east of the site on the banks of the River Swale.

Landscape and Visual Considerations

(iii) The Site itself is undesignated; however, it is bound to the north by the North Kent Marshes Special Landscape Area. Therefore, a high quality plant design would be required to complement the objectives of the landscape designations.

Natural Environment

(iv) Although the site is not designated, an Environmentally Sensitive Area lies adjacent to the western site boundary, with a Ramsar site, Special Protection Area and SSSI located at the northern site boundary. The Swale Ramsar site, Special Protection Area and SSSI are located to the east of the site on the banks of the River Swale.

Historic Environment and Built Heritage

(v) Although there are no cultural heritage considerations within or neighbouring the Site, the closest Scheduled Monument lies approximately 1.05km to the south, a Medieval Moated site called ‘Castle Rough’.

Road Access

(vi) Site has good access to the strategic road network with direct access onto the A249 via Barge Way.

Rail or Water Transport

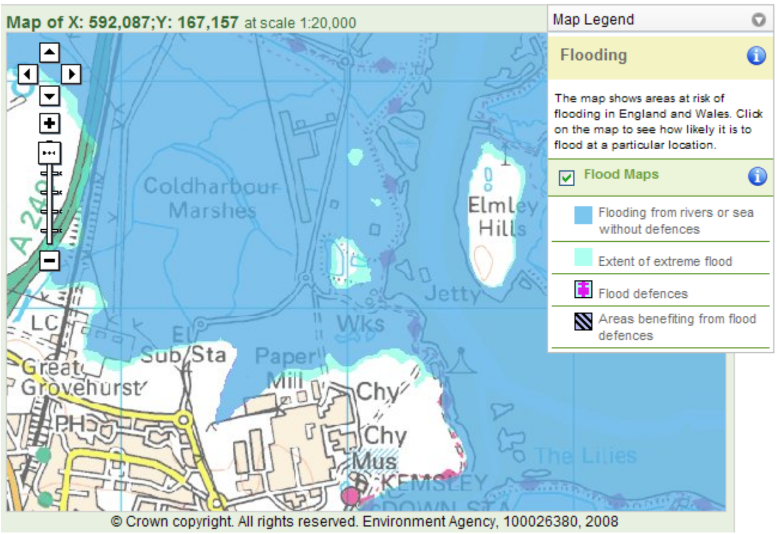
(vii) Kemsley Down Station lies 975m to the south providing access to the Sittingbourne and Kemsley Light Railway. Kemsley Rail Station is located 1.6km to the southwest of the Site. There is an existing rail siding that runs in a northerly direction from Kemsley towards Sheppey Crossing and then arcs back on itself stopping up at the northern boundary of the site. Swale Rail Station is located approximately 2km to the northwest. The Site is approximately 400m to the west of the River Swale, where there is an existing jetty providing immediate access the water.

Energy Utilisation

(viii) The required development would need to be sited within 2km of Kemsley Paper Mill to be best able to provide the mill with energy utilisation in terms of steam. As the site is approximately 400m from the Mill’s main buildings it has significant energy utilisation potential.

Flood Risk

(xiii) The site is located in Flood Zone 3a, where Essential Infrastructure such as the SEP could only be appropriate subject to the Exception Test, if sites in Sequentially preferably Flood Zones cannot be identified. In this case, the sites in Sequentially Preferable Flood Zones have been identified.



Ground Water Vulnerability

(ix) According to the Environment Agency website the site does not lie within a Ground Water Source Protection Zone. The site does however lie within a Water Abstraction Management Area.

Within Aerodrome Safeguarding Zones

(x) The site falls within an Aerodrome Safeguarding Zone

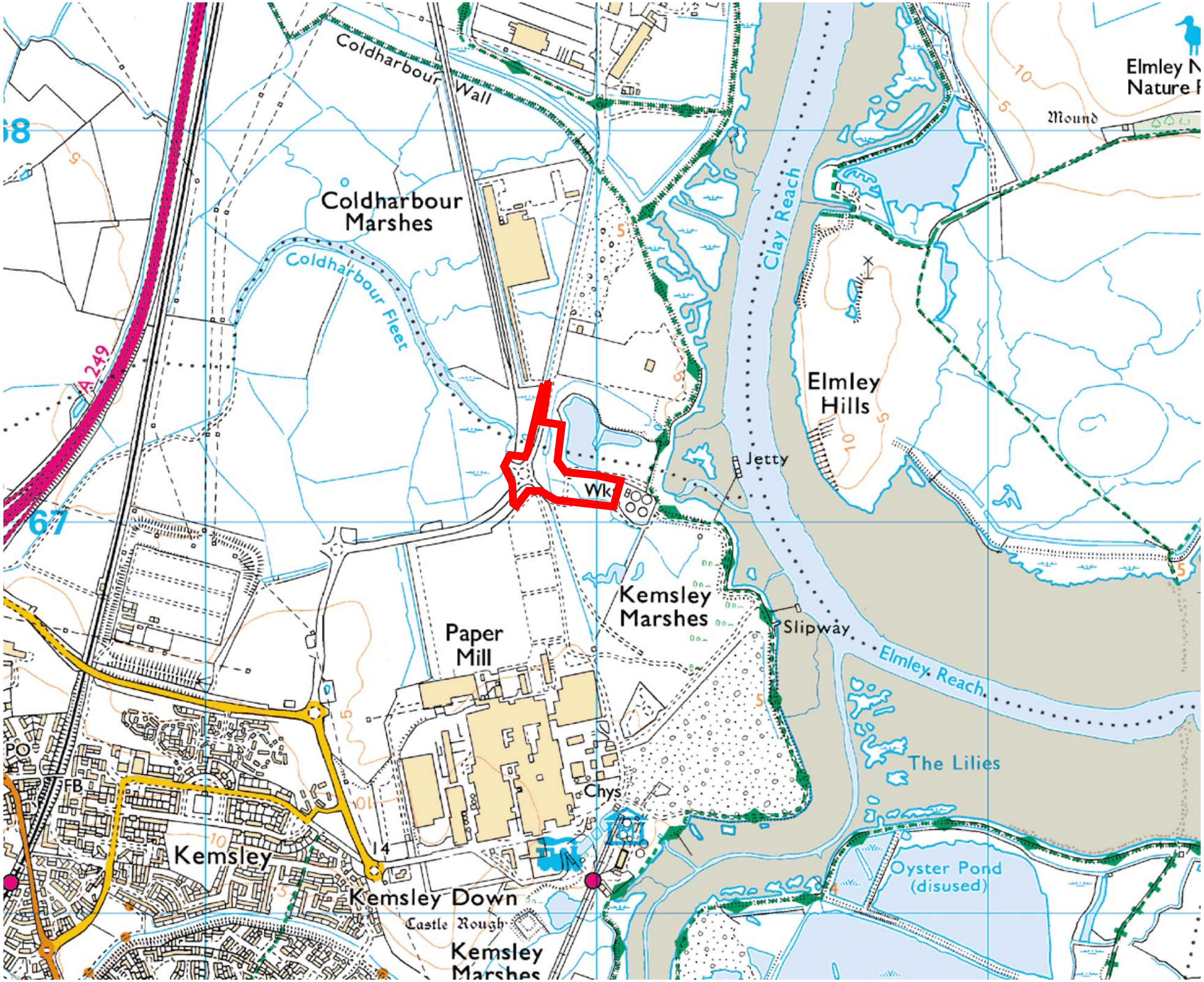
Within Air Quality Management Areas

(xi) The site does not lie within an Air Quality Management Area.

Appraisal Table

Summary, Site 6

Criteria	**Description**	**Appraisal**
(i)	Planning Vision for the Area	√
(ii)	Sensitive Human Receptors	√
(iii)	Landscape and Visual Considerations	**=**
(iv)	Natural Environment	**x**
(v)	Historic Environment and Built Heritage	√
(vi)	Road Access	√
(vii)	Rail and Water Transport	√
(vii)	Energy Utilisation	√
(ix)	Flood Risk	**x**
(x)	Ground Water Vulnerability	√
(xi)	Within Aerodrome Safeguarding Zones	Yes
(xii)	Within Air Quality Management Areas	**No**



Key:

Proposal Site

N

RPS

3RD FLOOR
34 LISBON ST.
LEEDS
LS1 4LX
TEL: 0113 220 6190
FAX: 0113 243 9161

THIS DRAWING IS NOT TO BE SCALED ALL DIMENSIONS TO BE CHECKED ON SITE DISCREPANCIES, AMBIGUITIES AND/OR OMISSIONS BETWEEN THIS DRAWING AND INFORMATION GIVEN ELSEWHERE MUST BE REPORTED IMMEDIATELY TO THIS OFFICE FOR CLARIFICATION BEFORE PROCEEDING

PROJECT
Kemsley Sustainable Energy Plant

TITLE
Kemsley Marshes North

SCALE	DRAWN BY
1:10,000 @A3	RCA
DATE	CHECKED
November 2009	JS
CAD FILE	

PROJECT NUMBER	DRAWING NUMBER	REV
DLE1726		

Site 7 Kemsley Marshes

NGR: 592122, 166842

Location

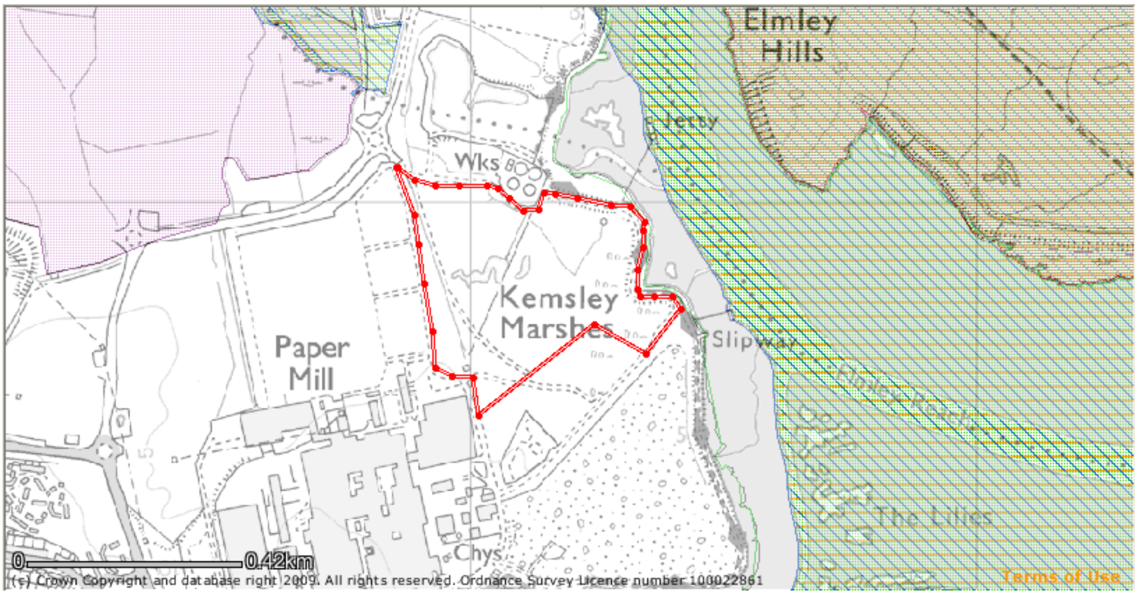
The site is located on the north edge of Kemsley, to the northeast of Kemsley Paper Mill, as illustrated on Figure 7. The A249 passes approximately 1.1km to the west. The A249 links Sittingbourne with Queenborough to the north and the M2, M20 and Maidstone to the south.

Description

The 14.8 hectare site (0.15sq km) is situated to the northwest of Kemsley Paper Mill and comprises a portion of land to the south of a sewage treatment works. The Site comprises part of Kemsley Marshes and is bound to the north by a sewage treatment works, Kemsley Paper Mill to the southwest, part of Kemsley Marshes lies to the south and to the west lies an open storage area used by Kemsley Paper Mill. The River Swale lies along the eastern boundary, with a jetty to the northeast and a slipway to the southeast. To the northwest lies Barge Way, beyond which lies an Environmentally Sensitive Area that is proposed as Kemsley Fields Business Park.

The site is made up of marsh/scrubland at present, with a pipeline and various drains running through it. A dismantled rail line runs from the northwest corner of the site down the western boundary. The site is accessed by Ridham Road, leading onto Barge Way (roundabout junction) which is situated adjacent to the northwest corner. Barge Way links directly onto the A249 to the west. The residential area of Kemsley lies approximately 700m to the southwest.

Figure 7



Local Plan Allocation and designations.

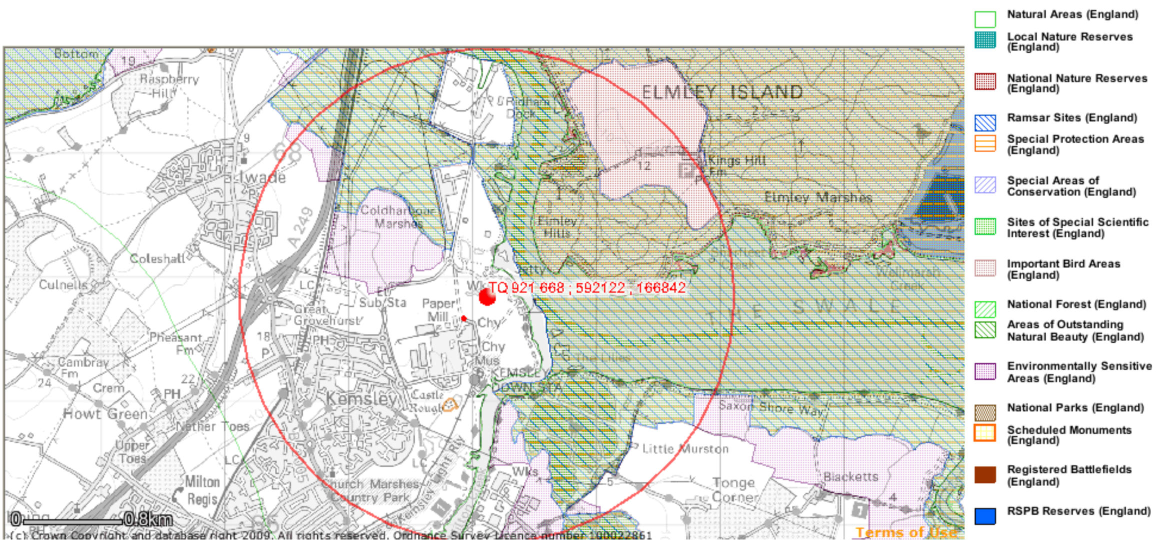
The Swale Borough Local Plan was adopted in February 2008. The Planning and Compulsory Purchase Act 2004 requires the Borough Council to prepare a Local Development Framework to replace the Swale Local Plan. The current LDS for Swale was published in August 2007. For the present the Swale Borough Local Plan is the primary Local Plan document.

The Local Plan allocates the site as an existing committed employment site under Policy B10. With recent improvements in infrastructure, the priority for the Local Plan is to secure the implementation of existing committed sites.

The Kent Waste Local Plan under Policies W7, W9 and W11 identifies the site as having potential for being suitable for waste related uses.

The site does not lie within any ecological or geological designation. However, there are various designations within a 2km radius of the site:

- Greater Thames Estuary Natural Area
- Emley National Nature Reserve
- The Swale Ramsar Site
- The Swale Special Protection Area
- The Swale Site of Special Scientific Interest
- The Swale Important Bird Area
- North Kent Marshes Environmentally Sensitive Area
- Castle Rough Scheduled Monument: ‘Medieval Moated Site’



The site lies close to The Swale Ramsar site, Special Protection Area and SSSI to the northwest, North Kent Marshes Environmentally Sensitive Area lies adjacent to the western site boundary with National Nature Reserves and Important Bird Areas located to the east. The Swale Ramsar site, Special Protection Area and SSSI are also located immediately to the east from the banks of the River Swale.

Kemsley lies 700m to the southwest, with Iwade village located 1.5km to the west of the site. The redevelopment of site for employment could be undertaken providing the development accords with the employment policies B2, B10 and B11, set out in Part 2 (Section 3) of the Swale Borough Local Plan.

PPS10, Planning for Sustainable Waste Management confirms that industrial sites and previously developed land should be considered for waste management uses.

Appraisal

Planning Vision

(i) Site comprises marsh/scrubland consisting of part of Kemsley Marshes. As the site is part of an established industrial area it offers significant potential for regeneration and the development of employment land uses. Those uses will not only provide significant job opportunities for the Kemsley area, but the quality of design of new built infrastructure will complement the overall regeneration of the area. The use of the site for waste management purposes is compatible with the employment uses which predominate. The Site is allocated for employment within the Local Plan and is within the built-up area boundary of the proposals map.

Sensitive Receptors

(ii) Sensitive receptors to noise, dust and odour may include non-industrial, employment and residential uses as well as ecological and geological designated sites. The closest residential properties are located approximately 700m to the southwest within Kemsley. Iwade village is located some 1.5km to the west of the Site. Although the Site is not designated, an Environmentally Sensitive Area lies adjacent to the northwest corner. The Swale Ramsar site, Special Protection Area and SSSI are located to the east of the site on the banks of the River Swale.

Landscape and Visual Considerations

(iii) The Site itself is undesignated; however North Kent Marshes Special Landscape Area lies to the northwest. Therefore, an appropriate plant design would be required to complement the objectives of the landscape designations.

Natural Environment

(iv) Although the site is not designated, an Environmentally Sensitive Area lies adjacent to the north western site boundary, with a Ramsar site, Special Protection Area and SSSI also located further to the northwest. The Swale Ramsar site, Special Protection Area and SSSI are located to the east of the site on the banks of the River Swale.

Historic Environment and Built Heritage

(v) Although there are no cultural heritage considerations within or neighbouring the Site, the closest Scheduled Monument lies approximately 500m to the southwest, a Medieval Moated site called 'Castle Rough'.

Road Access

(vi) Site has good access to the strategic road network. Ridham Road leads onto Barge Way which has direct access onto the A249.

Rail or Water Transport

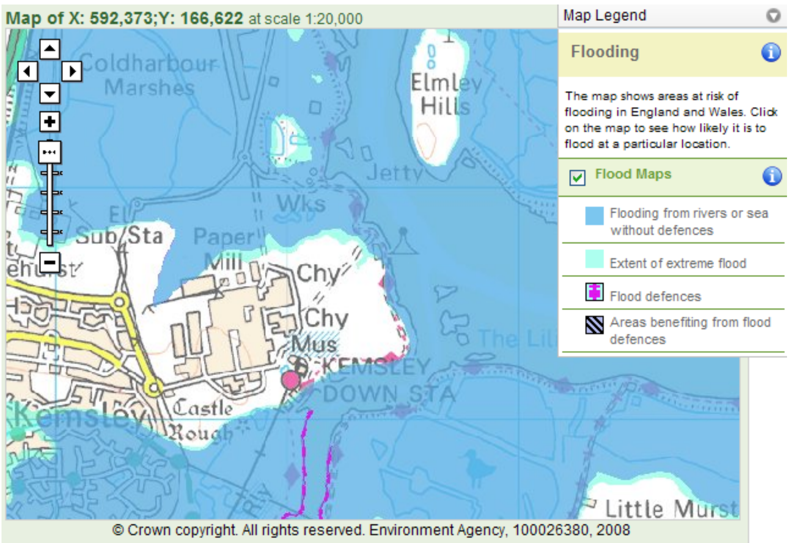
(vii) Kemsley Down Station lies 550m to the south providing access to the Sittingbourne and Kemsley Light Railway. Kemsley Rail Station is located 1.5km to the southwest of the Site. There is an existing rail siding (now disused) that runs in a northerly direction from Kemsley towards Sheppey Crossing and then arcs back on itself, stopping up within the site along the western site boundary. Swale Rail Station is located approximately 2.2km to the northwest. The sites eastern boundary lies adjacent to the River Swale, where there is an existing slipway providing immediate access the water.

Energy Utilisation

(viii) The required development would need to be sited within 2km of Kemsley Paper Mill to be best able to provide the mill with energy utilisation in terms of steam. As the site lies adjacent to the Mill's main buildings it has significant energy utilisation potential.

Flood Risk

(ix) The majority of the site is located in Flood Zone 3a, where Essential Infrastructure such as the SEP could only be appropriate subject to the Exception Test, if sites in Sequentially preferably Flood Zones cannot be identified. In this case, the sites in Sequentially Preferable Flood Zones have been identified.



Ground Water Vulnerability

(x) According to the Environment Agency website the site does not lie within a Ground Water Source Protection Zone. The site does however lie within a Water Abstraction Management Area.

Within Aerodrome Safeguarding Zones

(xi) The site falls within an Aerodrome Safeguarding Zone

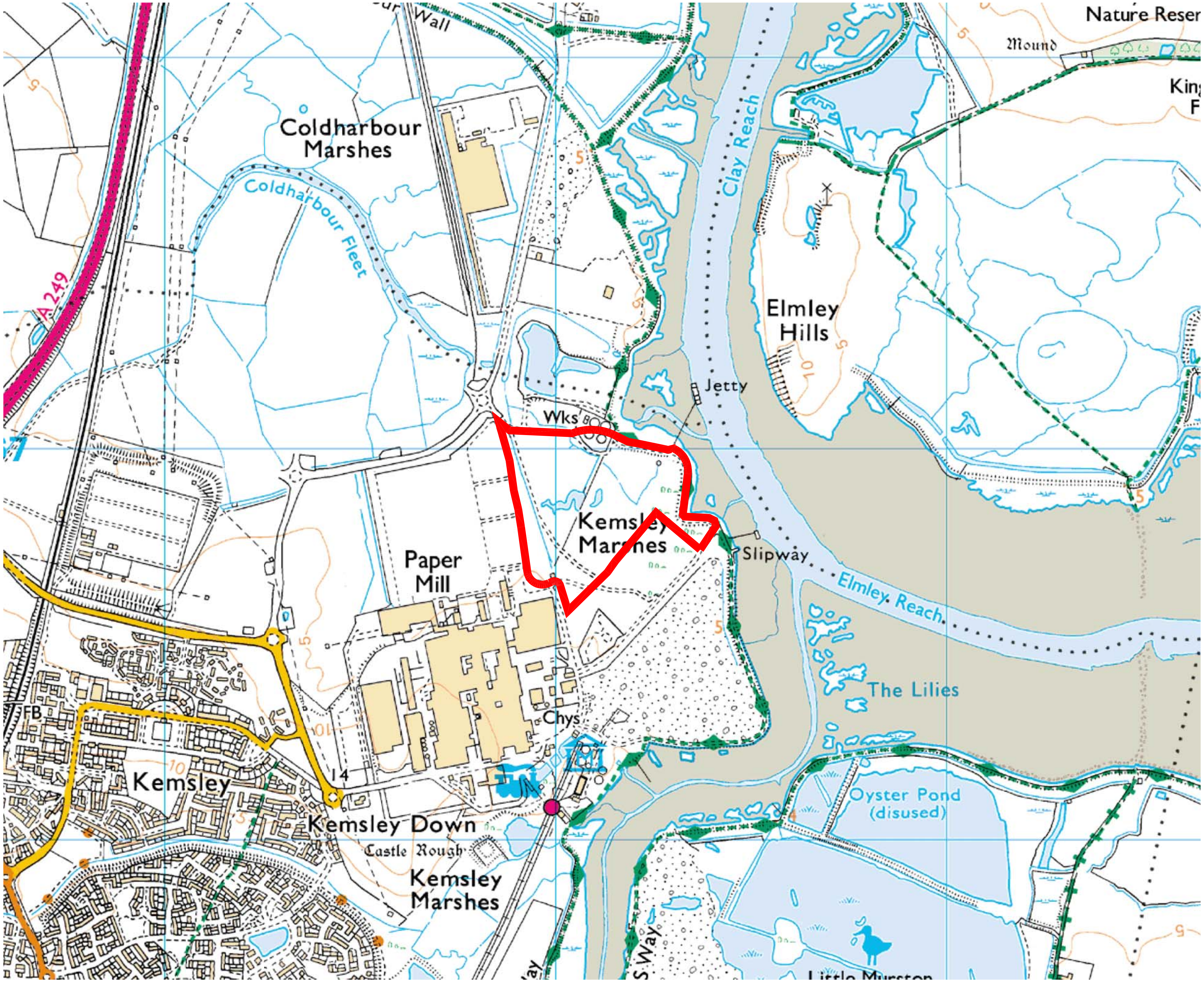
Within Air Quality Management Areas

(xii) The site does not lie within an Air Quality Management Area.

Appraisal Table

Summary, Site 7

Criteria	**Description**	**Appraisal**
(i)	Planning Vision for the Area	√
(ii)	Sensitive Human Receptors	√
(iii)	Landscape and Visual Considerations	**=**
(iv)	Natural Environment	**x**
(v)	Historic Environment and Built Heritage	√
(vi)	Road Access	√
(vii)	Rail and Water Transport	√
(vii)	Energy Utilisation	√
(ix)	Flood Risk	**x**
(x)	Ground Water Vulnerability	√
(xi)	Within Aerodrome Safeguarding Zones	Yes
(xii)	Within Air Quality Management Areas	**No**



Key:

Proposal Site

RPS

3RD FLOOR
34 LISBON ST.
LEEDS
LS1 4LX
TEL: 0113 220 6190
FAX: 0113 243 9161

THIS DRAWING IS NOT TO BE SCALED ALL DIMENSIONS TO BE CHECKED ON SITE DISCREPANCIES, AMBIGUITIES AND/OR OMISSIONS BETWEEN THIS DRAWING AND INFORMATION GIVEN ELSEWHERE MUST BE REPORTED IMMEDIATELY TO THIS OFFICE FOR CLARIFICATION BEFORE PROCEEDING

PROJECT
Kemsley Sustainable Energy Plant

TITLE
Kemsley Marshes

SCALE	DRAWN BY	
1:10,000 @A3	RCA	
DATE	CHECKED	
November 2009	JS	
CAD FILE		
PROJECT NUMBER	DRAWING NUMBER	REV
DLE1726		

Site 8 Kemsley Paper Mill East

NGR: 592228, 166658

Location

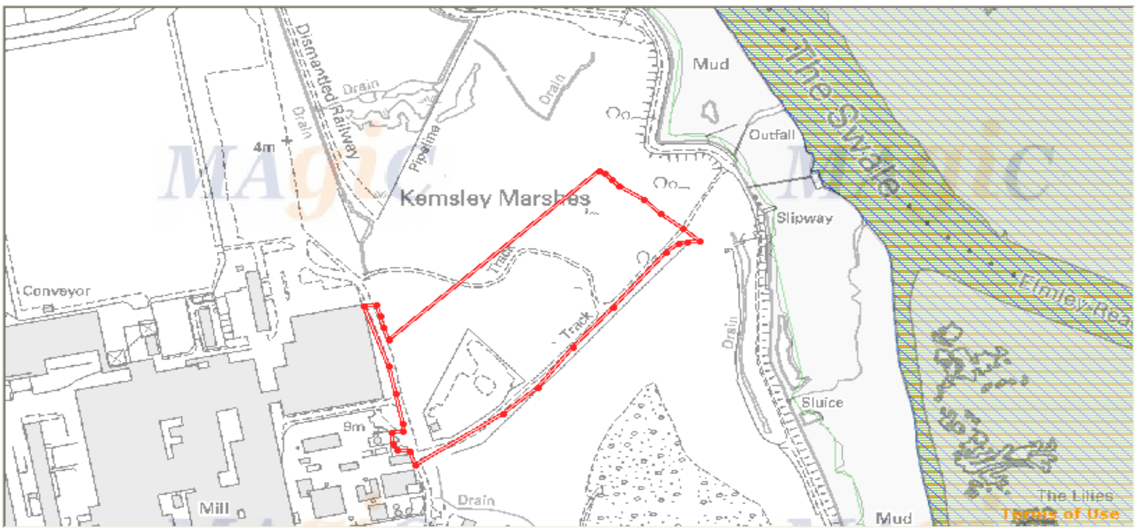
The site is located on the north edge of Kemsley, to the east of Kemsley Paper Mill, as illustrated on Figure 8. The A249 passes approximately 1km to the west. The A249 links Sittingbourne with Queenborough to the north and the M2, M20 and Maidstone to the south.

Description

The 4.6 hectare site is situated to the east of Kemsley Paper Mill and comprises a portion of land within Kemsley Marshes. The Site is bound to the north by Kemsley Marshes, marsh/scrubland to the south, Kemsley Paper Mill to the west and the River Swale lies to the east. Ridham Road borders the site to the west and provides access to Barge Way to the north.

The site is made up of scrub/marshland at present. A storage area lies to the southern corner. A dismantled rail line stops-up approximately 100m from the northwest corner. Barge Way (roundabout junction) lies 500m to the north, linking directly onto the A249 to the west. The residential area of Kemsley lies approximately 800m to the west.

Figure 8



Local Plan Allocation and designations.

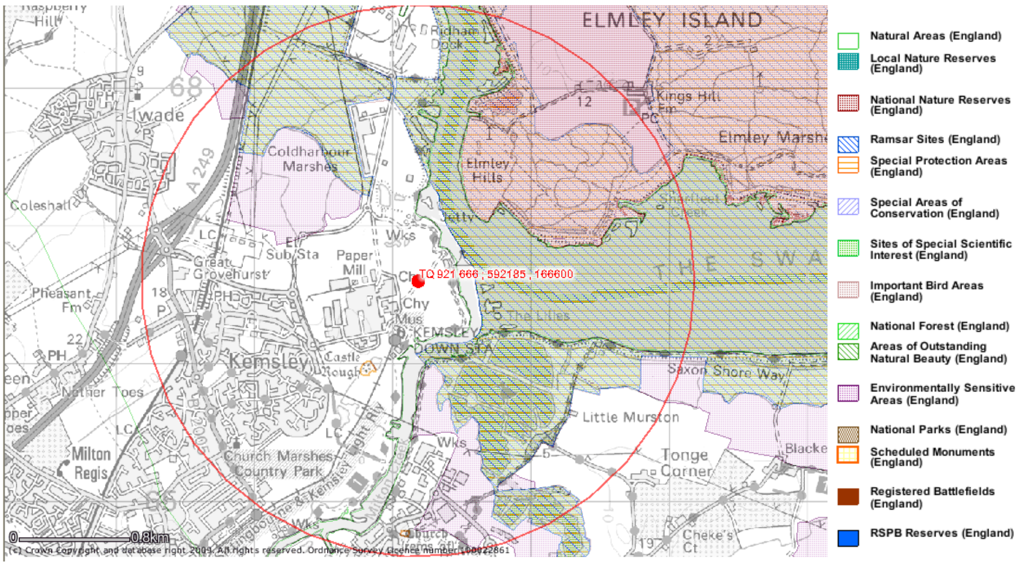
The Swale Borough Local Plan was adopted in February 2008. The Planning and Compulsory Purchase Act 2004 requires the Borough Council to prepare a Local Development Framework to replace the Swale Local Plan. The current LDS for Swale was published in August 2007. For the present the Swale Borough Local Plan is the primary Local Plan document.

The Local Plan allocates the site as an existing committed employment site under Policy B10. With recent improvements in infrastructure, the priority for the Local Plan is to secure the implementation of existing committed sites.

The Kent Waste Local Plan under Policies W7, W9 and W11 identifies the site as having potential for being suitable for waste related uses.

The site does not lie within any ecological or geological designation. However, there are various designations within a 2km radius of the site:

- Greater Thames Estuary Natural Area
- Emley National Nature Reserve
- The Swale Ramsar Site
- The Swale Special Protection Area
- The Swale Site of Special Scientific Interest
- The Swale Important Bird Area
- North Kent Marshes Environmentally Sensitive Area
- Castle Rough Scheduled Monument: 'Medieval Moated Site'
- Scheduled Monument: Murston Old Church, Sittingbourne



The site lies close to The Swale Ramsar site, Special Protection Area and SSSI to the east, North Kent Marshes Environmentally Sensitive Area lies to the northwest with National Nature Reserves and Important Bird Areas located further to the east.

Kemsley lies 800m to the west, with Iwade village located approximately 2km to the northwest of the site. The redevelopment of site for employment could be undertaken providing the development accords with the employment policies B2, B10 and B11, set out in Part 2 (Section 3) of the Swale Borough Local Plan.

PPS10, Planning for Sustainable Waste Management confirms that industrial sites and previously developed land should be considered for waste management uses.

Appraisal

Planning Vision

(i) Site comprises marsh/scrubland consisting of part of Kemsley Marshes. As the site is part of an established industrial area it offers significant potential for regeneration and the development of employment land uses. Those uses will not only provide significant job opportunities for the Kemsley area, but the quality of design of new built infrastructure will complement the overall regeneration of the area. The use of the site for waste management purposes is compatible with the employment uses which predominate. The Site is allocated for employment within the Local Plan and is identified as having potential for energy from waste development. The site is also within the built-up area boundary of the proposals map.

Sensitive Receptors

(ii) Sensitive receptors to noise, dust and odour may potentially include non-industrial, employment and residential uses as well as ecological and geological designated sites. The closest residential properties are located approximately 800m to the west within Kemsley. Iwade village is located some 2km to the northwest of the Site. Although the Site is not designated, the Swale Ramsar site, Special Protection Area and SSSI are located to the east of the site on the banks of the River Swale and an Environmentally Sensitive Area lies 550m to the northwest.

Landscape and Visual Considerations

(iii) The Site itself is undesignated; however North Kent Marshes Special Landscape Area lies to the east and further away to the northwest. Therefore, an appropriate plant design would be required to complement the objectives of the landscape designations.

Natural Environment

(iv) Although the site is not designated, an Environmentally Sensitive Area lies approximately 550m to the northwest, with a Ramsar site, Special Protection Area and SSSI also located further to the northwest. The Swale Ramsar site, Special Protection Area and SSSI are located to the east of the site on the banks of the River Swale.

Historic Environment and Built Heritage

(v) Although there are no cultural heritage considerations within or neighbouring the Site, the closest Scheduled Monument lies 475m to the southwest, a Medieval Moated site called 'Castle Rough'. Murston Old Church (Sittingbourne) is also located 1.6km to the south.

Road Access

(vi) Site has good access to the strategic road network. Ridham Road leads onto Barge Way which has direct access onto the A249.

Rail or Water Transport

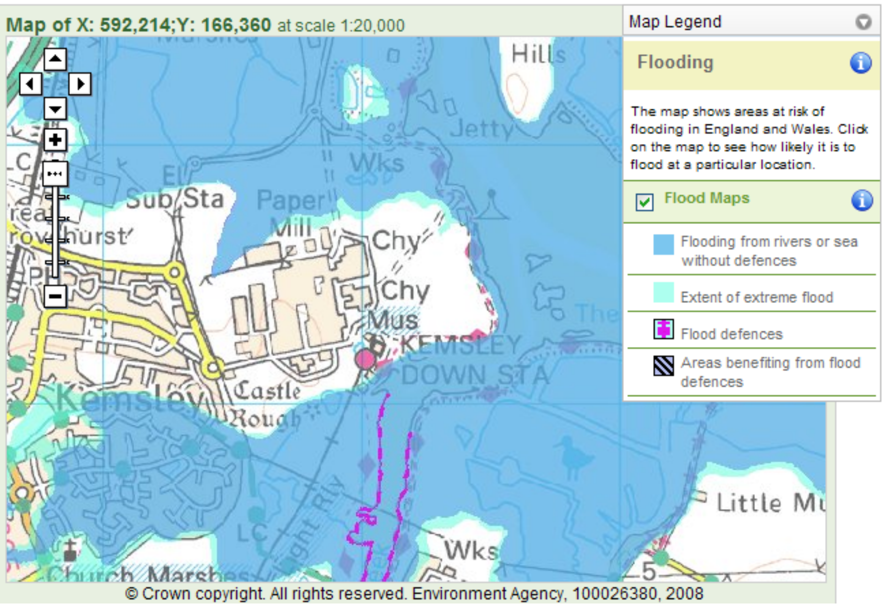
(vii) Kemsley Down Station lies 330m to the south providing access to the Sittingbourne and Kemsley Light Railway. Kemsley Rail Station is located 1.6km to the southwest of the Site. There is an existing rail siding (now disused) that runs in a northerly direction from Kemsley towards Sheppey Crossing and then arcs back on itself, stopping up 100m to the north of the site. Swale Rail Station is located approximately 2.7km to the northwest. The sites eastern boundary lies adjacent to the River Swale, where there is an existing slipway providing immediate access to the water.

Energy Utilisation

(viii) The required development would need to be sited within 2km of Kemsley Paper Mill to be best able to provide the mill with steam. As the site lies adjacent to the Mill's main buildings it has significant energy utilisation potential.

Flood Risk

(ix) The part of the site that would accommodate the SEP would be entirely located within Flood Zone 1. The Ash Treatment Plant would be located largely within Flood Zone 2 but a small part of it would be located within Flood Zone 3a. The SEP element of the proposal is classified as Essential Infrastructure by PPS25 which confirms that it is an appropriate form of development in Flood Zone 1. The Ash treatment element of the proposal is classified as Less Vulnerable Development by PPS25 which confirms that it is an appropriate form of development in Flood Zones 2 and 3a.



Ground Water Vulnerability

(x) According to the Environment Agency website the site does not lie within a Ground Water Source Protection Zone. The site does however lie within a Water Abstraction Management Area.

Within Aerodrome Safeguarding Zones

(xi) The site falls within an Aerodrome Safeguarding Zone

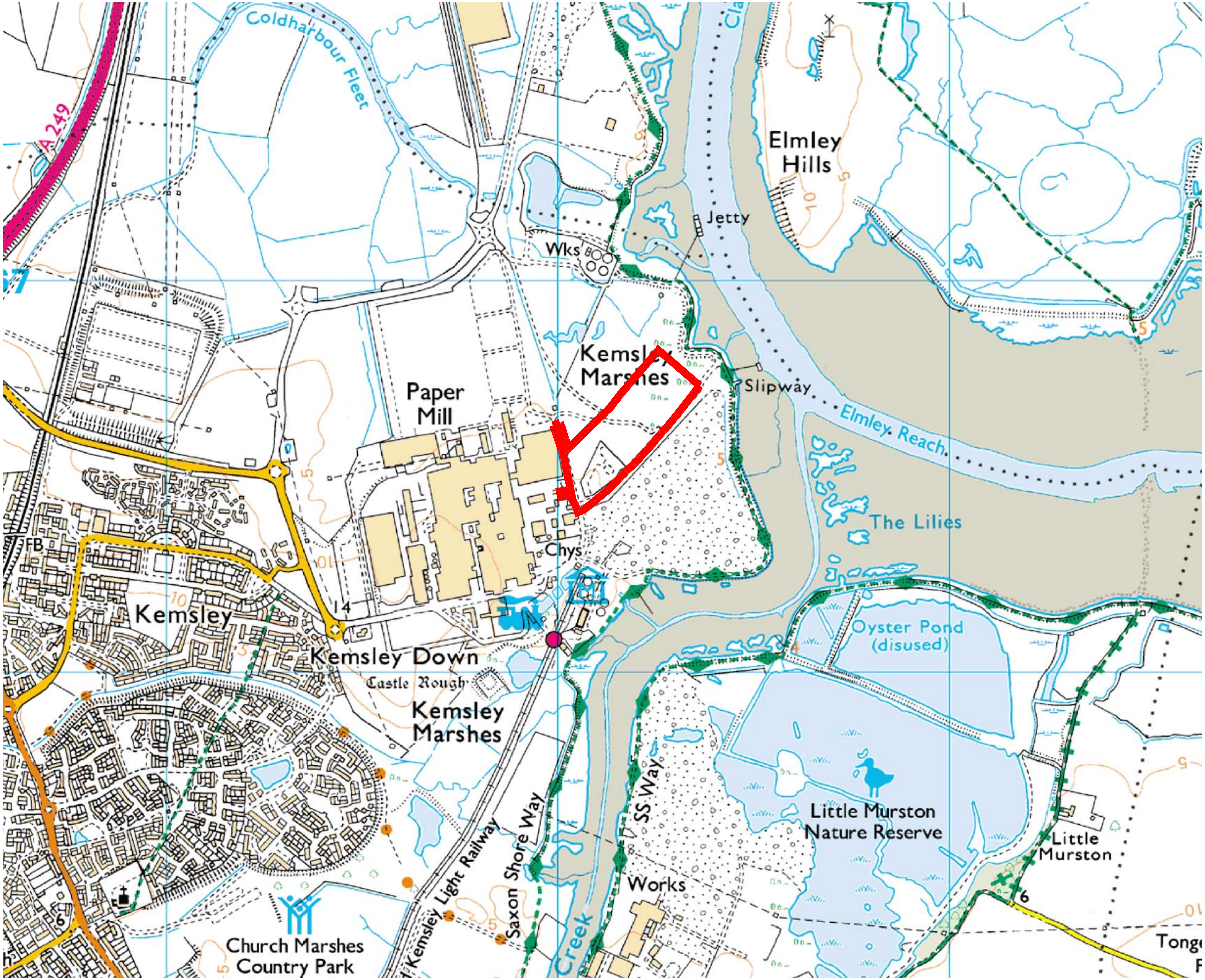
Within Air Quality Management Areas

(xii) The site does not lie within an Air Quality Management Area.

Appraisal Table

Summary, Site 8

Criteria	**Description**	**Appraisal**
(i)	Planning Vision for the Area	√
(ii)	Sensitive Human Receptors	√
(iii)	Landscape and Visual Considerations	**x**
(iv)	Natural Environment	**x**
(v)	Historic Environment and Built Heritage	√
(vi)	Road Access	√
(vii)	Rail and Water Transport	√
(vii)	Energy Utilisation	√
(ix)	Flood Risk	√
(x)	Ground Water Vulnerability	√
(xi)	Within Aerodrome Safeguarding Zones	Yes
(xii)	Within Air Quality Management Areas	**No**



Key:

Proposal Site

N

RPS

3RD FLOOR
34 LISBON ST.
LEEDS
LS1 4LX
TEL: 0113 220 6190
FAX: 0113 243 9161

THIS DRAWING IS NOT TO BE SCALED. ALL DIMENSIONS TO BE CHECKED ON SITE. DISCREPANCIES, AMBIGUITIES AND/OR OMISSIONS BETWEEN THIS DRAWING AND INFORMATION GIVEN ELSEWHERE MUST BE REPORTED IMMEDIATELY TO THIS OFFICE FOR CLARIFICATION BEFORE PROCEEDING

PROJECT
Kemsley Sustainable Energy Plant

TITLE
Kemsley Paper Mill East

SCALE	DRAWN BY
1:10,000 @A3	RCA
DATE	CHECKED
November 2009	JS

CAD FILE

PROJECT NUMBER	DRAWING NUMBER	REV
DLE1726		

Site 9 East Hall Farm

NGR: 592547, 164527

Location

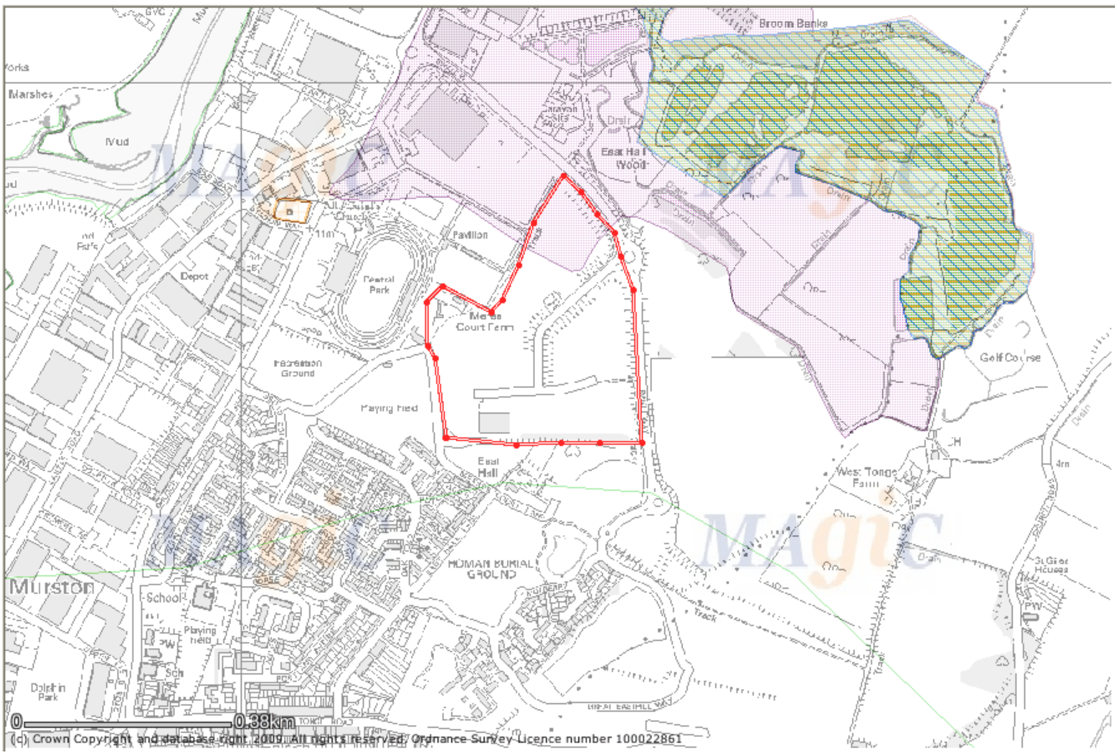
The site is located to the eastern edge of Sittingbourne, to the east of Bourne Park Sports Complex, as illustrated on Figure 9. The A2 passes approximately 1.2km to the south. The A2 links Sittingbourne with Faversham to the east and Gillingham to the west.

Description

The 12.6 hectare site (0.13sq km) is located close to East Hall Farm. The Site is bound to the north and west by Bourne Park Sports Complex including recreation ground, playing fields, athletics track and pavilion. Residential properties lie to the southwest, East Hall Farm lies to the south and open fields lie to the east beyond Swale Way. Existing site access is available from Swale Way to the northwest.

At present the site has an internal access road that leads to an industrial unit close to the southern boundary. Swale Way (roundabout junction) lies to the northwest corner, linking the site with Eurolink Industrial Estate to the west. The residential area of Murston lies adjacent to the southwest.

Figure 9



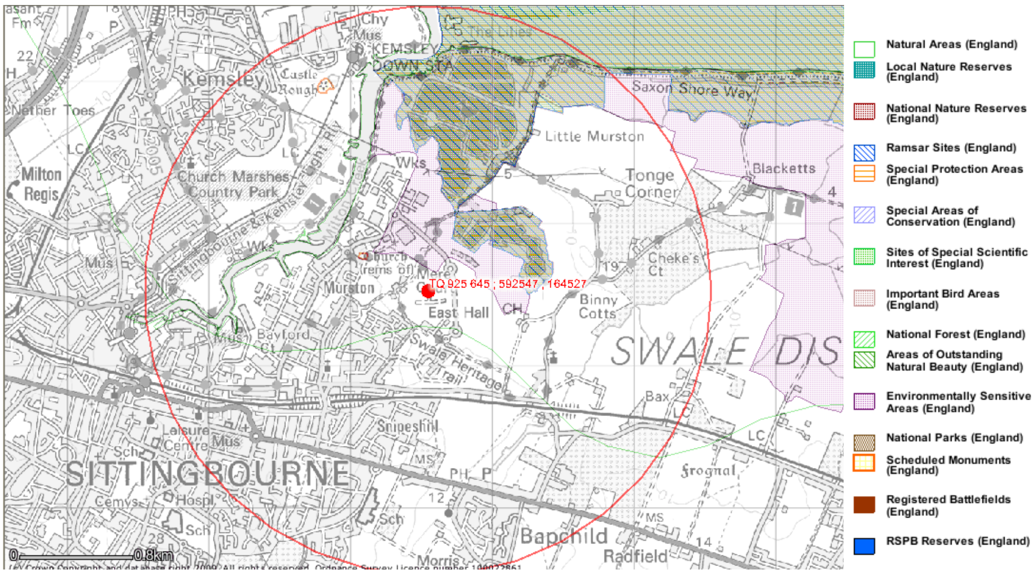
Local Plan Allocation and designations.

The Swale Borough Local Plan was adopted in February 2008. The Planning and Compulsory Purchase Act 2004 requires the Borough Council to prepare a Local Development Framework to replace the Swale Local Plan. The current LDS for Swale was published in August 2007. For the present the Swale Borough Local Plan is the primary Local Plan document.

The Local Plan allocates the site as an existing committed employment site under Policy B10. With recent improvements in infrastructure, the priority for the Local Plan is to secure the implementation of existing committed sites.

North Kent Marshes Environmentally Sensitive Area lies within the northeast corner of the site. There are also various designations within a 2km radius of the site:

- Greater Thames Estuary Natural Area
- North Kent Plain Natural Area
- The Swale Ramsar Site
- The Swale Special Protection Area
- The Swale Site of Special Scientific Interest
- The Swale Important Bird Area
- Castle Rough Scheduled Monument: 'Medieval Moated Site'
- Scheduled Monument: Murston Old Church, Sittingbourne



North Kent Marshes lies within the north eastern edge of the site. The Swale Ramsar site, Special Protection Area, Important Bird Area and SSSI lie beyond to the northeast.

The residential area of Murston lies adjacent to the southwest. The redevelopment of site for employment could be undertaken providing the development accords with the employment policies B2, B10 and B12, set out in Part 2 (Section 3) of the Swale Borough Local Plan. The Local Plan states that the site is of strategic importance to development in Sittingbourne due to its contribution towards the provision of a significant section of the Sittingbourne Northern Relief Road. Part of the site (approximately 10.56ha) is to be developed for employment purposes, including a fourth phase of the adjoining business park.

PPS10, Planning for Sustainable Waste Management confirms that industrial sites and previously developed land should be considered for waste management uses.

Appraisal

Planning Vision

(i) The majority of the site is to be considered as part of a fourth phase of the Eurolink Business Park. As the site is part of an established industrial area it offers significant potential for regeneration and the development of employment land uses. Those uses will not only provide significant job opportunities for the Kemsley area, but the quality of design of new built infrastructure will complement the overall regeneration of the area. The use of the site for waste management purposes is compatible with the employment uses which predominate; however, the Local Plan suggests that it offers an opportunity to accommodate businesses that may be displaced from Sittingbourne Industrial Park as a result of the regeneration proposals for land around Milton Creek. The Site is allocated for employment within the Local Plan and is within the built-up area boundary of the proposals map.

Sensitive Receptors

(ii) Sensitive receptors to noise, dust and odour may include non-industrial, employment and residential uses as well as ecological and geological designated sites. The closest residential properties are located adjacent to the southwest of the site. Part of the site (north eastern corner) is designated as an Environmentally Sensitive Area. As well as this East Hall Wood, Swale Ramsar site, Special Protection Area, Important Bird Area and SSSI lie approximately 140m to the northeast.

Landscape and Visual Considerations

(iii) The Site itself is undesignated; however North Kent Marshes Special Landscape Area lies 140m away to the northeast. Therefore, a high quality plant design would be required to complement the objectives of the landscape designations.

Natural Environment

(iv) The North Kent Marshes Environmentally Sensitive Area lies within the north eastern site boundary. The Swale Ramsar site, Special Protection Area and SSSI are also located further to the northeast. Little Murston Nature Reserve is also located within these designations to the north.

Historic Environment and Built Heritage

(v) Although there are no cultural heritage considerations within or neighbouring the Site, the closest Scheduled Monument lies 250m to the northwest, Murston Old Church (Sittingbourne). A Medieval Moated site called ‘Castle Rough’ is located 1.4km to the north.

Road Access

(vi) Site has adequate access to the strategic road network. Swale Way leads into Eurolink Business Park. The Site also lies adjacent to what will become a significant section of the Sittingbourne Northern Relief Road.

Rail or Water Transport

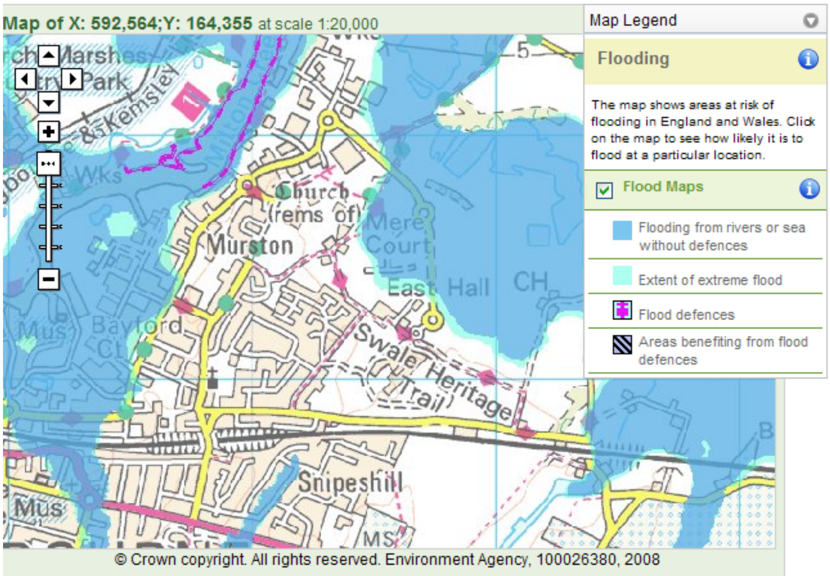
(vii) Milton Regis Station lies 1.35km to the west, Kemsley Down Station lies 1.5km to the north and Sittingbourne Viaduct Station lies 1.9km to the west. Sittingbourne Station lies 1.9km to the southwest. Milton Creek lies 500m to the west, beyond Castle Road. The River Swale lies 1.7km away to the north.

Energy Utilisation

(viii) The required development would need to be sited within 2km of Kemsley Paper Mill to be able to provide the mill with energy utilisation in terms of steam. As the site lies approximately 1.9km from the Mill’s main buildings it has some energy utilisation potential.

Flood Risk

(ix) The majority of the site is within Flood Zone 3a with remaining element being within Flood Zone 1. However, it would not be feasible to locate the SEP entirely within the part of the site that is within Flood Zone 1. PPS25 classifies the SEP as Essential Infrastructure which could only be appropriate in Flood Zone 3a where sequentially preferable sites cannot be identified. Sequentially preferable sites have been identified in the catchment area, and as such the development would be inappropriate in flood terms.



Ground Water Vulnerability

(x) According to the Environment Agency website the site lies within a Ground Water Source Protection Zone. The northern part of the site is located within a 'Total Catchment' area and the southern part of the site within an Outer Zone Area.

Within Aerodrome Safeguarding Zones

(xi) The site falls within an Aerodrome Safeguarding Zone

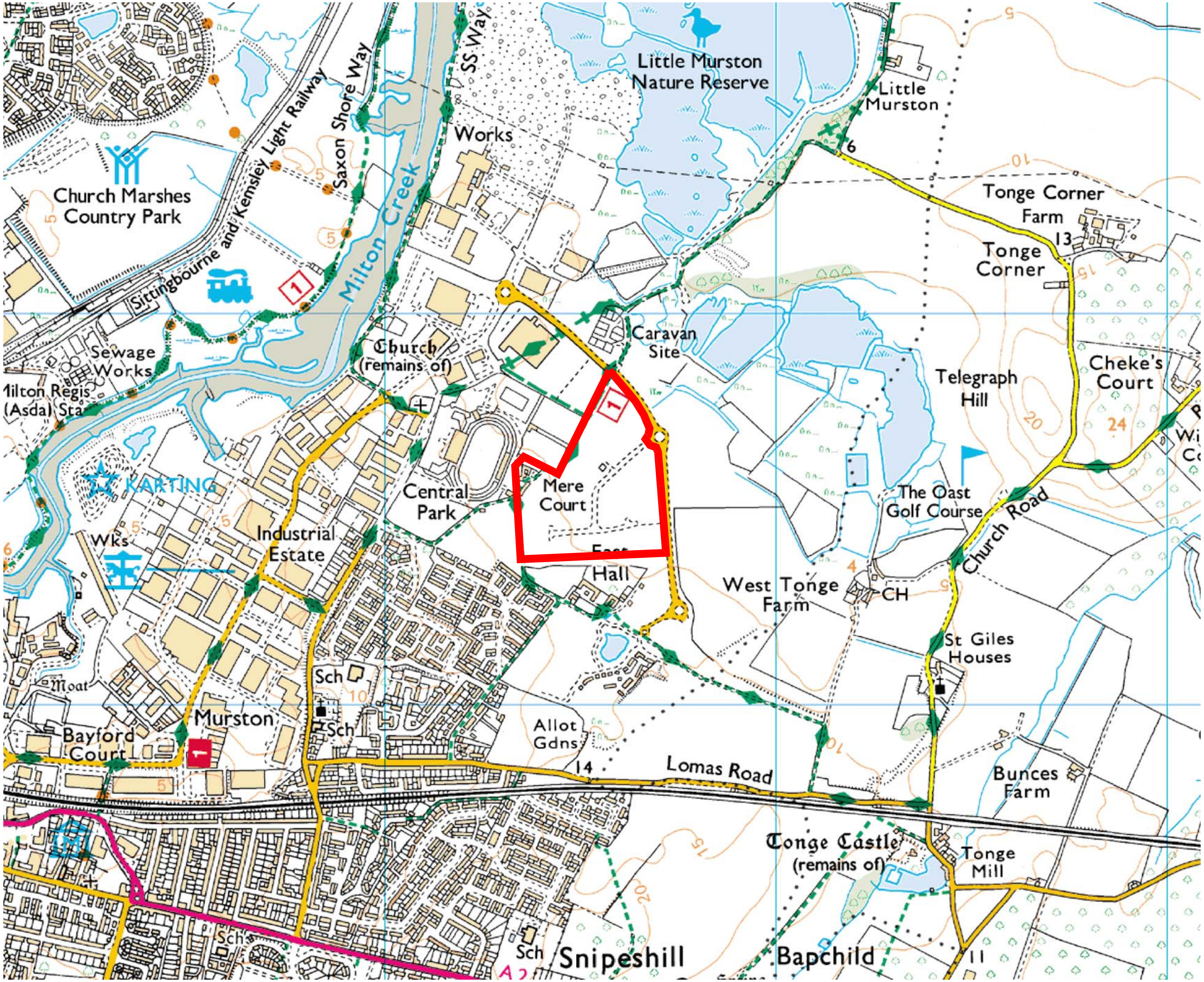
Within Air Quality Management Areas

(xii) The site does not lie within an Air Quality Management Area.

Appraisal Table

Summary, Site 9

Criteria	**Description**	**Appraisal**
(i)	Planning Vision for the Area	**x**
(ii)	Sensitive Human Receptors	**x**
(iii)	Landscape and Visual Considerations	**=**
(iv)	Natural Environment	**x**
(v)	Historic Environment and Built Heritage	**=**
(vi)	Road Access	√
(vii)	Rail and Water Transport	**x**
(vii)	Energy Utilisation	√
(ix)	Flood Risk	**x**
(x)	Ground Water Vulnerability	**x**
(xi)	Within Aerodrome Safeguarding Zones	Yes
(xii)	Within Air Quality Management Areas	**No**



Reproduced from Ordnance Survey mapping with the permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office, © Crown copyright. RPS, 3rd Floor, 34 Lisbon St., Leeds, LS1 4LX. Licence No. 100039993.

Key:

Proposal Site

N

RPS

3RD FLOOR
34 LISBON ST.
LEEDS
LS1 4LX
TEL: 0113 220 6190
FAX: 0113 243 9161

THIS DRAWING IS NOT TO BE SCALED ALL DIMENSIONS TO BE CHECKED ON SITE DISCREPANCIES, AMBIGUITIES AND/OR OMISSIONS BETWEEN THIS DRAWING AND INFORMATION GIVEN ELSEWHERE MUST BE REPORTED IMMEDIATELY TO THIS OFFICE FOR CLARIFICATION BEFORE PROCEEDING

PROJECT
Kemsley Sustainable Energy Plant

TITLE
East Hall Farm

SCALE 1:10,000 @A3	DRAWN BY RCA
DATE November 2009	CHECKED JS
CAD FILE	

PROJECT NUMBER DLE1726	DRAWING NUMBER	REV

RPS

Site 10 The Meads

NGR: 588876, 164712

Location

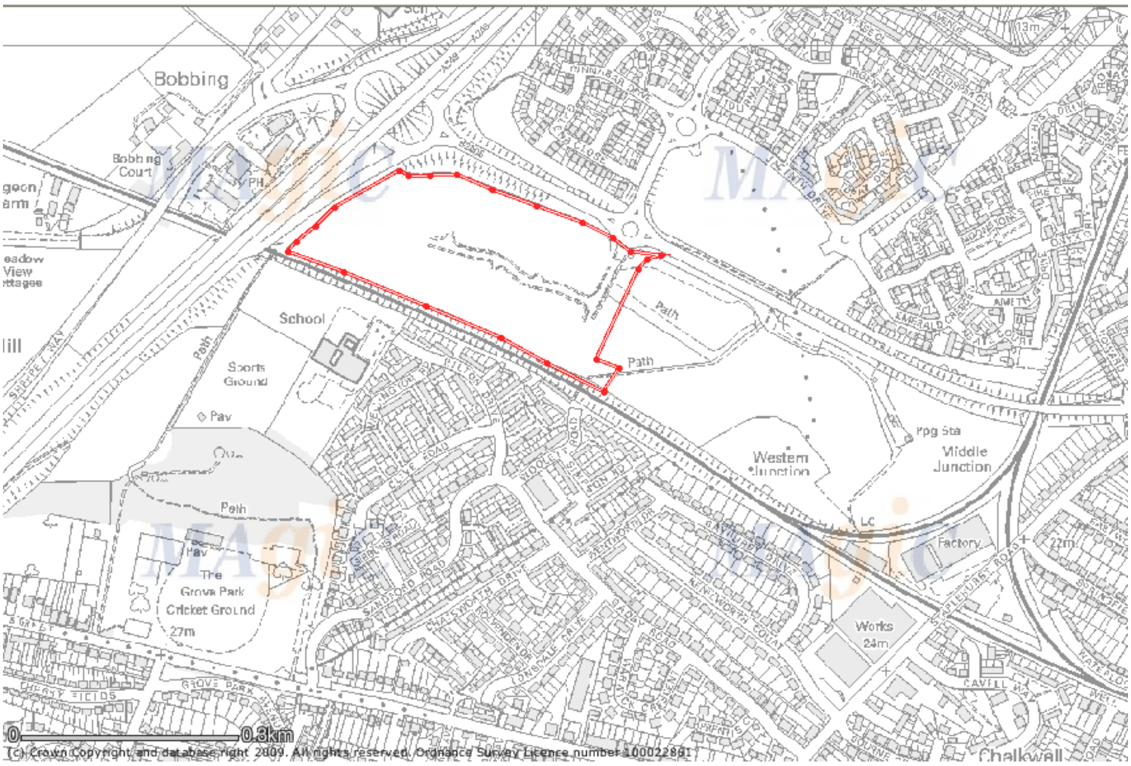
The site is located to the western edge of Sittingbourne, adjacent to the junction of the B2006 (Staplehurst Road) and the A249, as illustrated on Figure 10. The A249 links Sittingbourne with Queenborough to the north and the M2, M20 and Maidstone to the south.

Description

The 7.5 hectare site (0.08sq km) is located on land adjacent to Staplehurst Road (B2006) close to its junction with the A249. The Site is bound to the north by the A2006 and to the south by a rail line, with residential properties beyond both. To the east lies fields/parkland and to the west is the A249.

At present the site has an internal access road taken from Staplehurst Road that leads the middle of the site. The site has been levelled and is primed for development.

Figure 10



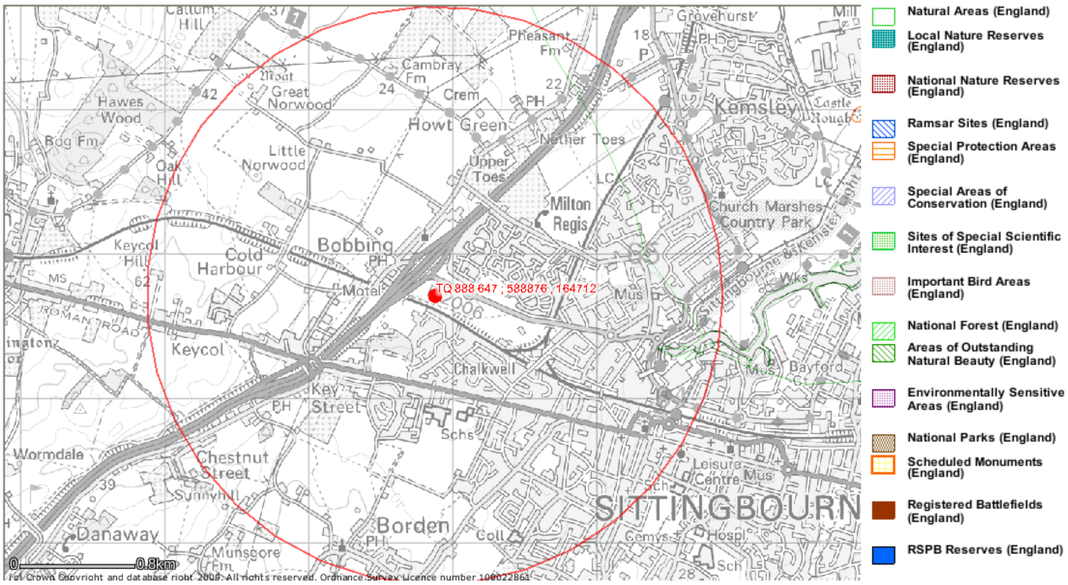
Local Plan Allocation and designations.

The Swale Borough Local Plan was adopted in February 2008. The Planning and Compulsory Purchase Act 2004 requires the Borough Council to prepare a Local Development Framework to replace the Swale Local Plan. The current LDS for Swale was published in August 2007. For the present the Swale Borough Local Plan is the primary Local Plan document.

The Local Plan allocates the site as an existing committed employment site under Policy B10. With recent improvements in infrastructure, the priority for the Local Plan is to secure the implementation of existing committed sites.

The site does not lie within any ecological or geological designation. However, there are a number of designations within a 2km radius of the site:

- Greater Thames Estuary Natural Area
- North Kent Plain Natural Area



Residential areas within Sittingbourne lie adjacent to the north and south. The redevelopment of site for employment could be undertaken providing the development accords with the employment policies B2, B10 and B13, set out in Part 2 (Section 3) of the Swale Borough Local Plan.

PPS10, Planning for Sustainable Waste Management confirms that industrial sites and previously developed land should be considered for waste management uses.

Appraisal

Planning Vision

(i) Site comprises mainly cleared land at present with an internal access road. The Local Plan states that the site has the benefit of outline planning permission, as part of the wider Meads site, for office/commercial use. The site is seen as a potential gateway site into the town, and as it is well related to the strategic route network, has seen some interest from hotel operators. The council could potentially foresee the site being utilised by this kind of prestige development. The use of the site for waste management purposes, although compatible with possible industrial uses, would be seen as less compatible with the suggested office/commercial uses proposed. The Site is allocated for employment within the Local Plan and is within the built-up area boundary of the proposals map.

Sensitive Receptors

(ii) Sensitive receptors to noise, dust and odour may include non-industrial, employment and residential uses as well as ecological and geological designated sites. The closest residential properties are located adjacent to the north and south of the site. There are no ecological or geological designations within 2km of the site.

Landscape Considerations

(iii) The Site itself is undesignated and there are no designations within 2km of the site.

Natural Environment

(iv) There are no potentially vulnerable environmental areas within 2km of the site.

Historic Environment and Built Heritage

(v) There are no cultural heritage considerations within or neighbouring the Site.

Road Access

(vi) The Site has excellent access to the strategic road network. Staplehurst Road leads directly onto the A249 and A2 to the west.

Rail or Water Transport

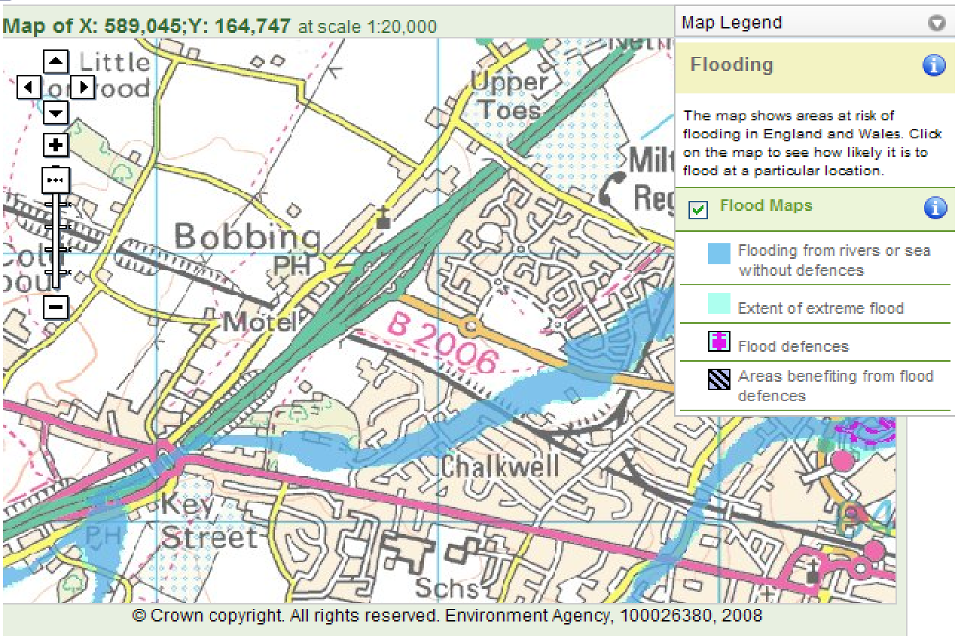
(vii) Although the site is bound to the south by a rail line the closest station lies within Sittingbourne 1.8km to the east. Milton Creek lies 1.5km to the east towards the centre of Sittingbourne.

Energy Utilisation

(viii) The required development would need to be sited within 2km of Kemsley Paper Mill to be best able to provide the mill with energy utilisation in terms of steam. As the site lies approximately 2.8km from the Mill's main buildings so it is therefore unlikely that it can be considered as a site to provide energy utilisation.

Flood Risk

(ix) As shown from the map below the site lies completely within Flood Zone 1 where both elements of the development would be appropriate in flood terms.



Ground Water Vulnerability

(x) According to the Environment Agency website the site lies within the Inner Zone area of a Ground Water Source Protection Zone.

Within Aerodrome Safeguarding Zones

(xi) The site falls within an Aerodrome Safeguarding Zone

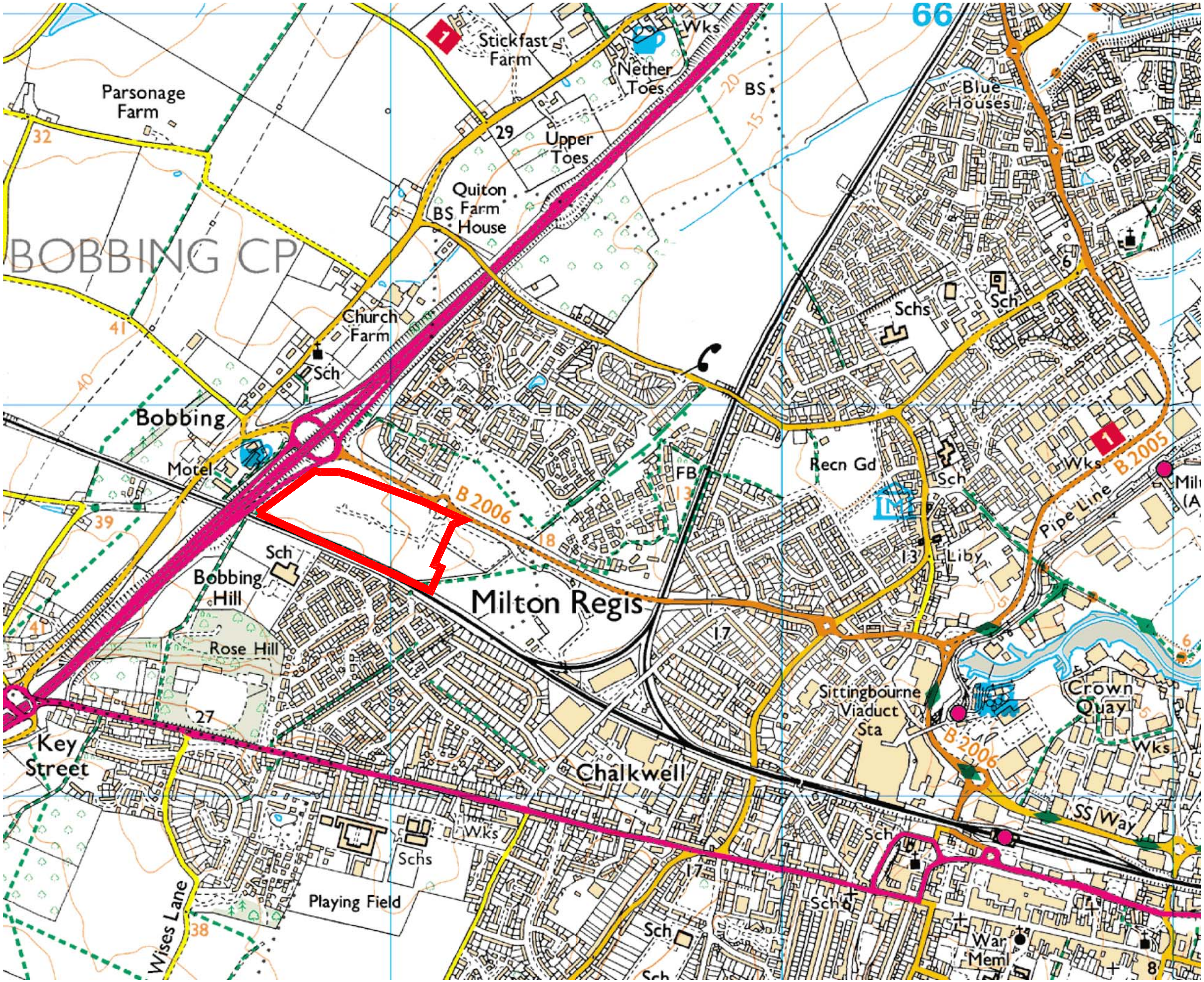
Within Air Quality Management Areas

(xii) The site does not lie within an Air Quality Management Area.

Appraisal Table

Summary, Site 10

Criteria	**Description**	**Appraisal**
(i)	Planning Vision for the Area	**x**
(ii)	Sensitive Human Receptors	**x**
(iii)	Landscape and Visual Considerations	√
(iv)	Natural Environment	√
(v)	Historic Environment and Built Heritage	√
(vi)	Road Access	√
(vii)	Rail and Water Transport	**=/?**
(vii)	Energy Utilisation	**=**
(ix)	Flood Risk	√
(x)	Ground Water Vulnerability	**x**
(xi)	Within Aerodrome Safeguarding Zones	Yes
(xii)	Within Air Quality Management Areas	**No**



Key:

Proposal Site

N

RPS

3RD FLOOR
34 LISBON ST.
LEEDS
LS1 4LX
TEL: 0113 220 6190
FAX: 0113 243 9161

THIS DRAWING IS NOT TO BE SCALED ALL DIMENSIONS TO BE CHECKED ON SITE DISCREPANCIES, AMBIGUITIES AND/OR OMISSIONS BETWEEN THIS DRAWING AND INFORMATION GIVEN ELSEWHERE MUST BE REPORTED IMMEDIATELY TO THIS OFFICE FOR CLARIFICATION BEFORE PROCEEDING

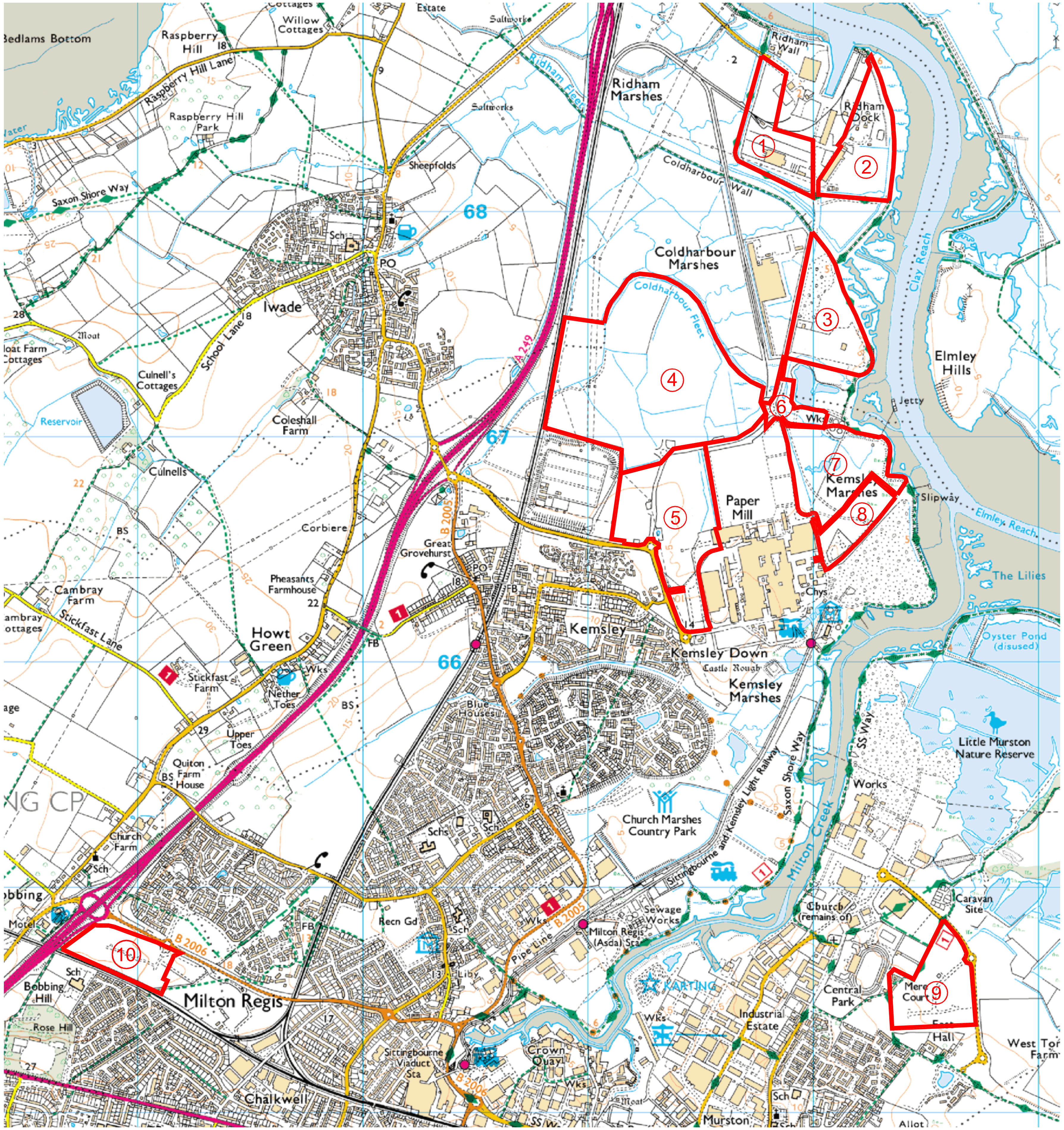
PROJECT
Kemsley Sustainable Energy Plant

TITLE
The Meads

SCALE	DRAWN BY
1:10,000 @A3	RCA
DATE	CHECKED
November 2009	JS
CAD FILE	

PROJECT NUMBER	DRAWING NUMBER	REV
DLE1726		

Figure 11: Site Overview (showing Alternative Site Locations)



Site 1 - Ridham Dock West
Site 2 - Ridham Dock East
Site 3 - Coldharbour Marshes East
Site 4 - Coldharbour Marshes South
Site 5 - Kemsley Paper Mill West
Site 6 - Kemsley Marshes North
Site 7 - Kemsley Marshes
Site 8 - Kemsley Paper Mill East
Site 9 - East Hall Farm
Site 10 - The Meads

Key:

Alternative Site Locations

N

RPS

3RD FLOOR
34 LISBON ST.
LEEDS
LS1 4LX
TEL: 0113 220 6190
FAX: 0113 243 9161

THIS DRAWING IS NOT TO BE SCALED ALL DIMENSIONS TO BE CHECKED ON SITE DISCREPANCIES, AMBIGUITIES AND/OR OMISSIONS BETWEEN THIS DRAWING AND INFORMATION GIVEN ELSEWHERE MUST BE REPORTED IMMEDIATELY TO THIS OFFICE FOR CLARIFICATION BEFORE PROCEEDING

PROJECT
Kemsley Sustainable Energy Plant

TITLE
Site Overview

SCALE	DRAWN BY
1:20,000 @A3	RCA
DATE	CHECKED
November 2009	JS
CAD FILE	

PROJECT NUMBER	DRAWING NUMBER	REV
DLE1726	Figure 11	

Development of a Sustainable Energy Plant.

St Regis Paper Mill, Kemsley

On behalf of St. Regis Paper Mill Co and EON ENERGY FROM WASTE UK LIMITED.

Environmental Statement

Appendix 5.2:

Technology Review

Prepared by:	Checked by:
Jennifer Stringer	Dan Smyth

34 Lisbon Street
Leeds
LS1 4LX

Tel 0113 220 6190
Fax 0113 243 9161
Email rpsld@rpsgroup.com

RPS Planning & Development

Contents

1 Alternative Technologies

1.1 Introduction

1.1.1 Whilst the proposed Sustainable Energy Plant will employ moving grate technology, there are a range of alternative technologies that might be considered for treating the waste including:

- Fluidised Bed.
- Gasification.
- Pyrolysis.
- Plasma Arc Gasification.
- Biological Treatment.
- Landfill.

1.1.2 A detailed description of the selected moving grate system has been provided in Chapter 4. This section provides a review of the technologies given above, identifies key features, and assesses their relative performance against moving grate technology. In particular, the suitability of technologies is considered in terms of energy recovery to provide the steam required for the energy intensive process requirements of Kemsley Paper Mill, operated by St Regis, principally in the form of heat but also electricity supply.

1.1.3 The EU Persistent Organic Pollutants (POPs) Regulations 2004 require that Member States shall, when considering proposals to construct new facilities or significantly to modify existing facilities using processes that release chemicals listed in Annex III[1], without prejudice to Council Directive 1996/61/EC, give priority consideration to alternative processes, techniques or practices that have similar usefulness but which avoid the formation and release of substances listed in Annex III. This section includes a discussion on the relative performance of the various alternatives in relation to POPs.

1.2 Moving Grate

1.2.1 Moving grate technologies are the most widely adopted system for C&I wastes, MSW, MSW derived fuels (such as solid recovered fuel, SRF) and as such, are well proven and reliable. The moving grate system is capable of burning C& I waste, MSW as well as processed fuels

---

1 Annex III substances include dioxins, furans, polycyclic aromatic hydrocarbons (PAHs), hexachlorobenzene (HCB), polychlorinated biphenyls (PCBs).

such as SRF. A variety of designs are available, but typically the grate system will include a mechanism distributing the incoming waste material across the grate and for transporting the combustible material forward, mixing the material as it traverses the length of the grate.

1.2.2 The waste material is burned with an excess of air that is continuously drawn from above the waste bunker, providing a source of odour control. Primary air is generally fed through the grate with a secondary air supply above the grate to create turbulence.

1.2.3 Moving grate systems produce two residues, bottom ash and the Air Pollution Control (APC) residues (otherwise known as Flue Gas Treatment residues and includes the fly ash). Bottom ash has the potential to be reused as an aggregate and for the proposed plant a dedicated ash processing plant is included to promote the suitability of the residue for this application.

1.2.4 All moving grate plant burning waste or waste derived fuels will be required to be designed and operated in accordance with the requirements of the Waste Incineration Directive (WID) 2000, including meeting the stringent limits on emissions to air.

1.3 Fluidised Bed

1.3.1 Fluidised Bed (FB) technology operates by feeding the waste material onto a bed of 'fluidised' sand particles where combustion is thermally more efficient than conventional technologies such as moving grate. The fluidised bed technology requires a homogenous feedstock. In this respect fluidised bed would be suited to the SRF waste material proposed that would comprise approximately 60% of incoming waste materials since further pre-treatment (sorting, crushing, shredding) prior to combustion taking place would possibly not be required. However, the incoming waste stream proposed for this facility will also comprise a further stream of C&I waste and MSW, both of which would require pre-treatment if fluidised bed technology was used.

1.3.2 Similar to a moving grate plant the requirements of the WID will apply fluidised bed plant burning waste or waste derived fuels and consequently the plant will need to be designed and operated to meet the WID.

1.3.3 Fluidised bed technology is capable of achieving somewhat lower NOx emissions in the raw gas than are typically achievable in moving grate systems. This is achieved through lower bed temperatures thus reducing thermal NOx formation. However, additional abatement using either Selective Catalytic Reduction (SCR) or Selective Non Catalytic Reduction (SNCR) will still be required to guarantee WID compliance.

1.3.4 Additional raw materials are required in the form of sand within the fluidised bed system.

1.3.5 Solid waste streams from the process typically include bottom ash, cyclone ash (usually mixed with the bottom ash), and APC residues. Due to the addition of sand for fluidisation, waste residues may be higher for FB systems. As for moving grate plant, the bottom ash can be reused as an aggregate.

1.3.6 Fluidised Bed technology is employed in Europe and elsewhere, including in the UK, where it is operational both at Allington in Kent and in Scotland at Baldovie, Dundee. The larger Allington plant has three lines with a combined capacity of approximately 500,000 tpa. UK experience with fluidised bed plant experience is reported as problematic with both Dundee and Allington having experienced significant downtime.

1.4 Gasification

1.4.1 Gasification is the partial thermal degradation of a substance in the presence of oxygen but with insufficient oxygen to oxidise the waste material completely. This process produces gaseous fractions known as ‘synthesis gas’ or ‘syngas’, primarily a combination of carbon monoxide, hydrogen and methane. The synthesis gas offers the potential to be utilised in a number of ways, including combustion in engines, steam raising boilers or other energy conversion processes, subject to gas quality and legislative requirements.

1.4.2 Gasification is reported by some as offering the opportunity for higher efficiency electrical generation compared to conventional combustion technologies. However, to achieve this, the syngas needs to be burnt in a turbine specifically designed to burn low calorific value syngas and in practice it will be necessary to provide clean up of the syngas and these processes both consume and lose energy. The overall efficiency achieved is therefore lower than for conventional combustion of waste materials [1].

1.4.3 Operationally to obtain consistent gas quality a homogeneous incoming waste stream with a high organic content is required and therefore this technology is better suited to applications where the incoming waste material has been pre-treated and therefore the proposed waste material could be suited to this application, subject to pre-treatment of all the incoming waste streams.

1.4.4 The process requires energy input from supplementary combustion, likely to be using either natural gas or low sulphur oil, to achieve the temperature required for thermal treatment. Typical temperatures for gasification would be above 750°C.

1.4.5 Ash and char are also produced from the gasification process. The ash from some gasification plant is suitable for re-use as an aggregate material. Residues from exhaust gas cleaning, similar to those from conventional combustion plant would be disposed of as hazardous waste.

1.4.6 Combustion of the fuels from the gasification stage will be subject to the requirements of the WID. To ensure compliance with emission limits these emissions will require treatment and generally similar abatement to that applied to conventional plant will be required [2].

1.4.7 Currently there is limited experience of gasification technology employed for the treatment of waste materials, with only a few applications in Europe, where experience has proven mixed or is limited. There are a number of planned facilities in the UK, for industrial/commercial waste streams, or pre-treated waste such as the proposed Novera plant in East London (now owned by Biossence) that will treat just over 100,000 tonnes per annum of solid recovered fuel (SRF) in a single line facility. It may be cost effective at small scale and it may scale on a modular basis, although its presence in the market is not well established.

1.4.8 Although there are plans for larger scale facilities in the UK, it remains uncertain as to whether these schemes will be successfully financed and ultimately brought into operation. It is also noted that although larger schemes are proposed elsewhere, these plants would not meet the steam requirements of the St Regis Paper Mill.

1.4.9 Proven availability remains an issue for the technology, which raises questions over the fate of the feedstock during periods of downtime. There is limited alternative for feedstock when the plant is unavailable and it can be assumed that the feed material would be diverted to landfill or an alternative thermal treatment facility.

1.5 Pyrolysis

1.5.1 Pyrolysis is the thermal degradation of a substance in the absence of added oxygen. Pyrolysis also offers the potential option of more innovative use of the pyrolysis syngas other than immediate combustion to produce heat. The process requires energy input from a combination of waste heat from the process and supplementary combustion, likely to be using either natural gas or low sulphur oil, to achieve the temperature required for thermal treatment. Typical temperatures for pyrolysis are between 300-800°C [3].

1.5.2 As with gasification combustion of the fuels will be subject to the requirements of the WID and to ensure compliance with emission limits these emissions will require treatment, generally using similar abatement to that applied to conventional plant [2].

1.5.3 Solid residues from pyrolysis plant have a high carbon content. Unlike combustion bottom ash or the residue from some gasification plant this material will require landfilling or further treatment. Residues from exhaust gas cleaning would require disposal to hazardous landfill.

1.5.4 As for gasification there is limited experience of the application of pyrolysis technology for the treatment of MSW materials, its presence in the market is not well established and its commercial application is limited. It is being tested in a size range of up to 30,000 tonnes per annum, with pre-prepared waste material. It therefore cannot be considered to be fully proven at the current time, particularly at the scale proposed for the Kemsley Site.

1.5.5 Proven availability remains an issue for the technology. There is limited alternative for feedstock when the plant is unavailable and it can be assumed that the feed material would be diverted to landfill or an alternative thermal treatment.

1.5.6 To obtain consistent gas quality, a less heterogeneous incoming feed stream is required and some pre-treatment is therefore necessary.

1.6 Plasma Arc Gasification

1.6.1 Plasma arc gasification technology transforms high calorific waste streams into synthesis gas and a vitrified slag by means of thermal plasma. The plasma is a mixture of electrons, ions and neutral particles (atoms and molecules).

1.6.2 It is reported by some as achieving a greater level of environmental performance in terms of energy production, emissions and residues. To date the process has been used mainly to treat hazardous wastes including organics, metals, PCBs (including small-scale equipment) and HCB.

1.6.3 Plasma Arc technology produces very high temperatures to destroy waste materials (5,000 to 15,000 °C). It involves passing a large electric current though an inert gas stream. Under these conditions, hazardous contaminants, such as PCBs, dioxins, furans, pesticides, etc, are broken into their atomic constituents, by injection into the plasma. Care should be taken when cooling the gas stream to avoid reformation of dioxins/furans.

1.6.4 The high temperature and oxygen starved environment is used to decompose the feed material into simple molecules as CO, CO_2, H_2, CH_4, etc., and also ash and slag.

1.6.5 Whilst plasma arc gasification is an established technology, the process can be very complex, expensive and operator intensive. There would be significant challenge in achieving the very high temperature throughout a solid waste mass at large scale and this is a practical constraint for scaling the application. To date, most applications of Plasma Arc technology for wastes or waste derived fuels have only been carried out on an R&D or demonstration basis at small scale and therefore the technology has not been proven on a commercial basis. It is not considered proven for scale up to the size of the proposed facility and is therefore discounted from further consideration.

1.7 Biological Treatment (Anaerobic Digestion (AD))

1.7.1 Biological treatment processes are designed to degrade biogenic waste materials and are best suited to waste streams which have undergone segregation to comprise of kitchen wastes, garden wastes, agricultural wastes (including slurries), sewage sludge etc.

1.7.2 The process gives rise to a number of outputs including biogas, digestate and floc. The biogas can be collected and subsequently burned to generate energy either onsite or offsite. Outlets for the other residues include landspreading (although for the digestate fraction this may need pretreatment), incineration or co-mingling with compost.

1.7.3 The proposed facility is being designed to provide heat and power security to the paper mill and consequently any biological solution would also need to provide a means to generate both heat and power.

1.7.4 For the waste streams to be handled at the facility further waste segregation would be required to separate out those fractions suited to biological treatment from those which are unsuitable. The remaining wastes unsuitable for biological treatment would themselves requiring further treatment (separation of recyclables followed by either landfill or incineration of the residual material).

1.7.5 For the SRF element of the waste stream some biological treatment may have already been carried out on the material thereby reducing the benefits from further biological treatment of this material.

1.7.6 In order to meet the required steam demand via an AD solution would necessitate significant additional processing plant to include the required separation and feedstock quality. The volumes of waste handled would also be considerably higher to provide sufficient waste to yield the volume of biogas required to generate the steam demand desired by the Kemsley Paper mill. Further given the waste sorting activities required for the AD solution, residue generation (i.e. recyclables and other wastes unsuited to AD processing and solid residues from the AD plant itself) would be increased compared to that from the proposed combustion solution. The current proposals to satisfy the need from St Regis paper to secure future energy supplies would move from an energy solution based on combustion of waste to the installation of an integrated waste management facility including a more complex range of waste management activities incorporating energy generation as one element. The combined effect of this would be to significantly increase traffic movements and associated environmental impacts and increase the land take requirements.

1.7.7 Overall an AD solution is not considered suitable for the proposed location on the basis traffic effects, land take requirements and need to implement significant addition processing plant against only potentially small atmospheric emission release benefits.

1.8 Landfill

1.8.1 Whilst landfill would be an alternative option for the SRF and other waste input materials, this option would not generate energy from the material and therefore would not meet the fundamental requirements for heat and electricity, which is driving the need for the proposed facility. Further, landfill presents a number of environmental issues and for some time has been recognised as an unsustainable option for waste management. Consequently, landfill cannot be considered as a practical alternative to the proposed facility.

1.9 Persistent Organic Pollutants (POPs)

1.9.1 As already highlighted, the EU Persistent Organic Pollutants (POPs) Regulations 2004, Article 6(3) require that Member States shall, when considering proposals to construct new facilities or significantly to modify existing facilities using processes that release chemicals listed in Annex III [2], without prejudice to Council Directive 1996/61/EC, give priority consideration to alternative processes, techniques or practices that have similar usefulness but which avoid the formation and release of substances listed in Annex III. The EU POPs Regulations implement amongst other requirements the obligations agreed under the Stockholm Convention on Persistent Organic Pollutants.

1.9.2 Of the options discussed above only Anaerobic Digestion and landfill can be considered as options which avoid producing POPs. For the other options considered, thermal treatment at high temperatures will achieve destruction of POPs present in the incoming waste stream, however, subsequent cooling of the gases can give rise to reformation and hence abatement

2 Annex III substances include dioxins, furans, polycyclic aromatic hydrocarbons (PAHs), hexachlorobenzene (HCB), polychlorinated biphenyls (PCBs).

is applied to control atmospheric releases. POPs releases are controlled in thermal processes burning waste to the low levels prescribed within the Waste Incineration Directive, 2000. Abatement used to achieve these limits will transfer the majority of POPs from exhaust gases into solid residues (APC Residues), although only low amounts of POPs are released within bottom ash residues. The disposal route for APC residues typically involves treatment or permanent disposal (e.g. to landfill or deep mine storage) and as such they are removed from the environment. Consequently, thermal treatment of wastes effectively removes POPs from the environment pathways where they may have had an impact.

1.9.3 Further, it is important to note that the Stockholm Convention clearly distinguishes between intentional and unintentional production of POPs: POPs arising as a result of thermal treatment process including waste incineration are classified as unintentional releases. Article 5 of the Stockholm Convention outlines the measures to reduce or eliminate releases of unintentionally produced POPs and promotes the application of best available techniques including compliance with release limit values or performance standards to fulfil the requirements for unintentional releases.

1.9.4 In the UK the EU Regulations, and hence the requirements of the Stockholm Convention are implemented through the Persistent Organic Pollutants Regulations 2007. The 2007 Regulations place a requirement on the Environment Agency to comply with the requirements of Article 6(3) through the environmental permitting process.

1.9.5 In coming to their decision on whether to issue a permit the Environment Agency must be satisfied that Best Available Techniques will be applied, including for the control of POPs; consistent with the Stockholm Convention requirements. On this basis provided that the facility meets BAT the requirements for POPs can be considered to be satisfied.

1.10 Summary

1.10.1 It is clear from the above discussion that the various options for generating heat from the proposed combination of waste materials for energy recovery have relative benefits and disadvantages.

1.10.2 Landfill has been identified for completeness but in terms of providing the required heat or a long term sustainable solution it is clear that this is not a realistic alternative. AD as discussed above is similarly not considered a viable option for providing the heat requirements to the paper mill on the site under consideration and therefore is again not an appropriate solution. Of the remaining options, pyrolysis, gasification and plasma arc gasification solutions are considered technically unproven at the scale proposed.

1.10.3 Given that all of the alternatives discussed above cannot or remain technically unproven to meet the fundamental requirements of the project i.e. supply of heat to the papermill and power security through fuel diversification they were rejected at an early stage and are therefore not discussed further.

1.10.4 In practice, only fluidised bed and moving grate technology are considered feasible at the scale required for the steam requirement of the mill. These are the main alternatives which have been considered in terms of their relative performance for the project and Table 1 below provides a qualitative comparison in terms of environmental performance:

Table 1: Comparison of Moving Grate and Fluidised Bed Technologies.

Criteria	Moving Grate	Fluidised Bed
Emissions to Air	Abated emissions meet WID, lower levels are achieved at many plant.	Lower NO_x levels than moving grate are achievable, but abatement will still be required to guarantee WID. Similar performance to Moving Grate for all other pollutants.
Persistent Organic Pollutants	The plant is designed to minimise releases.	Similar to Moving Grate..
Global Warming Potential (GWP)(5)	GWP arises as a result of carbon within the waste material combusting to release CO_2 and release of nitrous oxides associated with the NO_x abatement (although this is not directly associated with the main technology).	Similar to Moving Grate.
Emissions to Water	Most process waters are recirculated within the process, minimal volumes released and impacts not significant.	Similar to Moving Grate
Residue Generation	Produces bottom ash (<3% carbon) and APC residues.	Produces similar overall quantities of residues for disposal, but a larger proportion of the residue would be hazardous.
Odour	Odour management typically avoids nuisance.	Similar to Moving Grate.
Noise	With appropriate abatement noise can be successfully be controlled.	Similar to Moving Grate.
Visual Impacts	Building and stack heights are key visual effects	Higher impact from building which is typically higher. Stack height similar to moving grate.
Other	Proven technology with a large number of operational facilities. Efficiency >60% with CHP	Some operational experience, with mixed performance. Similar efficiency expected (assuming no further fuel preparation required)

(1) Review of BAT for New Incineration Issues; Part 1 Waste Pyrolysis and Gasification Activities. P4-100/TR, Environment Agency, 2001.

(2) Advanced Thermal Treatment of Municipal Solid Waste, DEFRA, 2005.

1.10.5 In terms of environmental performance both options are considered to have a similar environmental performance. Given that both options have similar environmental performance the selection of moving grate technology has been made on the basis of reliability given that the Kemsley Papermill is a continuous operation.

1.11 References

1 Advanced Thermal Treatment of Municipal Solid Waste, DEFRA, 2005

2 Energy from Waste: A good practice guide, November 2003, The Chartered Institute of Waste Management.

3 The Viability of Advanced Thermal Treatment of MSW in the UK, March 2004, Fitchner Consulting Engineers Limited.

Sustainable Energy Plant, Sittingbourne

Transport Assessment

Client: RPS Leeds

RPS
Planning and Development
St Anne's House
Oxford Square
Oxford Street
Newbury
Berkshire
RG14 1JQ

Telephone: 01635 279000 Facsimile: 01635 279050

RPS Ref: BRB/kam/JNY6360-02B

Date: 10 December 2009

Author Print:…B Bamber……………..	Author Signature: ………………….	Date:…10.12.09…………….
Authorised for use Print:…C Coleman…………..	Authorised for use Signature:…………………….	Date:…10.12.09..…………..

CONTENTS

FIGURES:

APPENDICES:

SECTION 1: INTRODUCTION

1.1 This Transport Assessment has been prepared by RPS Planning and Development to assess the transport implications resulting from the proposed development of a Sustainable Energy Plant serving and on land adjacent to the Kemsley Paper Mill, Sittingbourne, Kent (the site). The report has been prepared in accordance with the scope of assessments agreed during informal discussions with Highways Officers at Kent County Council.

1.2 The applicant, St Regis is proposing to develop a Sustainable Energy Plant in conjunction with E.ON with an annual throughput of approximately 500,000 to 550,000 tonnes of treated Commercial and Industrial (C&I) waste, municipal solid waste (MSW), and Solid Recovered Fuel (SRF). The proposed development will secure the generation of sustainable energy at the plant, which in turn will support the economic viability of the paper mill.

1.3 Section 2 of this report details the existing site situation including the highway network, road safety, public transport services, facilities for pedestrians and cyclists and existing traffic flows.

1.4 Relevant planning policies are set out in Section 3. The development proposals are set out in Section 4 whilst Section 5 details the transport impact of the proposed development. Section 6 outlines the proposed mitigation measures to modify any potential traffic impacts.

1.5 A summary and conclusions are set out in Section 7, which concludes that there are no reasons relating to highways and transport for not permitting the proposed development.

SECTION 2: EXISTING SITUATION

2.1 Existing Site

2.1.1 The proposed site is located to the north of Sittingbourne on the Sittingbourne Relief Road (Swale Way), Kemsley as shown in **Figure 1.** The site is bounded by Kemsley Paper Mill to the west, Ridham Avenue to the south, Barge Way to the north and The Swale to the east as shown in **Figure 2**.

2.1.2 The site lies adjacent to the line of a dismantled rail line that formerly connected with the branch line between Sittingbourne and the Isle of Sheppey. No evidence of this rail line is now visible in the vicinity of the site. An existing narrow gauge rail line runs from a point to the south-east of the existing paper mill to the south-west into Sittingbourne. This was formerly used to transport materials between the existing Kemsley paper mill and another paper mill in Sittingbourne. The line is now used for informal and recreational purposes.

2.1.3 The A249 is located approximately 2km to the north and west of the site and is accessed via Swale Way. The A249 connects with both the A2 west of Sittingbourne and the M2 at Junction 5 approximately 8km south of the site. To the north, the A249 provides access to the Isle of Sheppey.

2.1.4 Vehicular access to the site is taken via Ridham Avenue that runs along the southern boundary of the existing Kemsley Paper Mill.

2.2 Pedestrian Routes

2.2.1 When the first section of the Sittingbourne Relief Road (also known as the Milton and Kemsley Distributor Road) was constructed, Ridham Avenue was closed to vehicular traffic at a point immediately west of the new roundabout linking Ridham Avenue with the Relief Road. The route remains open for pedestrians and links to the eastern residential area of Kemsley. An on-site pedestrian footpath, which is not a public right of way, currently routes around the south of the Kemsley Paper Mill from the Kemsley Paper Mill visitor car park and gatehouse to the EON CHP Plant.

2.2.2 Shared pedestrian/cycle paths run along the western side of Swale Way and the northern side of Barge Way.

2.2.3 The Saxon Shore Way, a long distance footpath follows the shore of the Swale to the east of the site. This continues north towards Chertney Marshes and further to Gillingham. To the south it links into Sittingbourne and continues east towards Faversham. The route is not lit and is not generally surfaced.

2.3 Cycle Routes

2.3.1 **Figure 3** identifies the existing network of cycle routes in the vicinity of Kemsley. The site is within close proximity to on and off road cycle routes which link to the wider Kemsley and Sittingbourne area. A National Cycle Network traffic free route is provided alongside the Kemsley Marsh Drain to the south west of the site which leads to a National Cycle Network on road route provided along the B2005 Grovehurst Road from Sittingbourne to Queenborough. This on road cycle route provides a direct link to Kemsley Railway Station. An additional National Cycle Network traffic free cycle route is proposed to be implemented from Milton Creek to Kemsley Marsh linking with Kemsley Marsh Drain and the B2005.

2.3.2 The quiet nature and low traffic speeds of the roads to the south west of the site linking to Kemsley, are conducive to cycling. Cycling is not currently permitted on the existing Mill site for health and safety reasons.

2.4 Public Transport Provision

2.4.1 A summary of the bus services in the vicinity of the site is shown on **Figure 4**. Figure 4 also shows the location of bus stops within close proximity to the site and Kemsley railway station.

2.4.2 Bus stops are located approximately 900m west of the site on Ridham Avenue which are served by bus service number 347 which provides a direct link to Sittingbourne town centre. The journey time from Kemsley to Sittingbourne is approximately 20 minutes and the service operates 4 buses per hour throughout the day. Additional bus stops are located on Grovehurst Road approximately 1.5km west of the site. These bus stops are served by service numbers 320, 322, 323, 324, 336, 338, 339, and 347. These bus services are summarised in **Table 1.**

Table 1: Summary of Bus Services

No.	Operator	Route	Service Frequencies (per hour)			
			Monday - Friday			
			AM Peak	Off Peak	PM Peak	Evening
347	Arriva Medway Towns	Kemsley-Sittingbourne	4	4	4	4
322	Chalkwell Garage and Coach Hire	Sittingbourne-Elmley	2	1 service only	-	-
323	Chalkwell Garage and Coach Hire	Sittingbourne-Sheerness	2 services per day			
324	Chalkwell Garage and Coach Hire	Canterbury-Sheerness	1 service per day Wednesday and Friday only			
336	Arriva Kent and Sussex	Maidstone-Leysdown on Sea	1 service per day Tuesday and Friday only			
338	Arriva Kent and Sussex	Leysdown on Sea-Chatham	1 service per day Monday only			
339	Arriva Kent and Sussex	Leysdown on Sea-Hempstead Valley	1 service per day Thursday only			

2.4.3 Kemsley Railway Station is located approximately 1.8km west of the site on Grovehurst Road. A summary of the rail services from Kemsley Rail Station can be found in **Table 2**.

Table 2: Summary of Rail Services

Operator	Route	Service Frequencies (per hour)			
		AM Peak	Off Peak	PM Peak	Evening
Southeastern	London Victoria-Chatham-Gillingham-Sittingbourne-Sheerness-Faversham-Canterbury East- Dover-Margate-Ramsgate	3	2	3	3

2.4.4 Southeastern Trains operate all services from Kemsley Rail Station. Kemsley station has regular services to London Victoria with a service frequency of three trains per hour during the morning peak with a journey time of approximately one hour and ten minutes. Stations served on the routes include Sittingbourne, Sheerness, Faversham and Canterbury.

2.5 Existing Highway Network

2.5.1 The site is located approximately 3 km north-east of Sittingbourne Town Centre and approximately 2km to the south-east of the A249. The local transport network surrounding the site is shown in **Figure 2**.

2.5.2 The Kemsley Paper Mill site is accessed via a secure entry gate at the southern entrance via Ridham Avenue. The on-site access road is approximately 7.5 metres in width, reducing to 3.8 metres in width at three locations where width restrictions are present. A pedestrian footpath is present on the southern side of the access road and routes from the visitor car park to the EON CHP Plant to the north east of the site. The minimum width of this footway is around 1.2m. Steps are present in some places. The maximum speed limit on site is 10mph, reducing to 5 mph adjacent to the fire station.

2.5.3 Ridham Avenue connects with the first section of the Sittingbourne Relief Road (Swale Way) at a roundabout west of the Paper Mill. Prior to the implementation of the Relief Road vehicular access to the existing Paper Mill was via Ridham Avenue. Vehicular traffic can no longer access the western section of Ridham Avenue from the Relief Road, however, a 4m wide, lit, shared use pedestrian and cycle route connects the Relief Road with Ridham Avenue to the west.

2.5.4 The Relief Road is a high quality, wide, single carriageway, approximately 7.5 metres is width, with one lane in each direction. The Relief Road is well lit and has a wide, approximately 3.4 metre in width, shared use pedestrian/cycle path on its western side. A speed limit of 40mph exists along the Relief Road.

2.5.5 North of the Paper Mill a roundabout connects the Relief Road to Barge Way that routes around the northern side of the Paper Mill and continues to the north to connect with the A249 west of the Isle of Sheppey. Barge Way is a high quality, wide, single carriageway, approximately 7.5 metres in width, with one lane in each direction. Barge Way is well lit and has a wide, approximately 3.4 metres in width, shared use pedestrian/cycle path on its northern side. Barge Way narrows to approximately 7.4 metres in width at the junction with the private access road to the north of the site, and the shared use footway reduces to approximately 3.0 metres in width. A speed limit of 40 mph exists along Barge Way. The Paper Mill site can be accessed from the north via a secure gated entry point, approximately 6 metres in width, on the northern section of Barge Way.

2.5.6 To the north of the site, Barge Way connects with a private road, providing access to businesses, including storage and distribution and bulk aggregates, along this route before connecting to an unclassified road at the junction with Ridham Docks. The unclassified road is a single track carriageway which provides access to the A249. The unclassified road varies in width and is approximately 4.8m wide at its narrowest point. The road is unlit and is subject to a speed limit of 20mph. Passing places are present along this route in order to allow HGVs to pass. A height restriction of 14 feet and 6 inches exists under the bridge at the northern end of this road. The bridge carries the former A249 and the rail line connecting to the Isle of Sheppey. A new section of the A249 has been constructed over recent years over a new bridge over the Swale.

2.6 Northern Relief Road

2.6.1 The first section of the Sittingbourne Northern Relief Road from the southern roundabout of the A249 'Dumbbell' junction north of Kemsley as far south as the Paper Mill was opened in January 2005. This section of the Distributor Road is known as Swale Way and provides a direct, high quality link between Ridham Avenue (the Paper Mill) and the A249 Trunk Road.

2.6.2 The purpose of the Northern Distributor Road is to relieve the A2 that runs east to west through Sittingbourne and currently operates at capacity during some periods of the day. It is planned that Swale Way will be continued to the south-east over Milton Creek to connect, in the first instance, over Milton Creek to the industrial areas to the north-east of Sittingbourne and later to connect with the A2 at Bapchild, east of Sittingbourne. The first part of the scheme (the link over the Creek) has Local Transport Plan provisional funding of £29m and Sustainable Communities provisional funding of £10.4m from Government and a developer contribution. It is due to be completed in 2011.

2.7 Road Safety

2.7.1 Personal Injury Accident (PIA) data has been obtained from Kent County Council for the surrounding local road network for the most recently available three year period (01/04/2006 to 31/03/2009). The study area includes Ridham Avenue, Sittingbourne Relief Road, Barge Way, the A249 junction with the B2005 at Iwade, the A2 junction with the A249 and the M2 junction 5. A summary of the location and severity of these accidents is shown in **Figure 5**.

2.7.2 During the three year period there were a total of 45 personal injury accidents in the study area of which five resulted in serious injury and 40 resulted in slight injury. There were no fatal injury accidents in the study area during the three year period. Of the total injury accidents nine involved HGVs.

2.7.3 During the three year period there were no injury accidents on the local transport network within the immediate vicinity of the site including Ridham Avenue, the Northern Relief Road and Barge Way.

2.7.4 During the three year period there were 40 PIAs at the junction between the M2 junction 5 and the A249, of which four resulted in serious injury and 36 resulted in slight injury. Of the four serious injury accidents two involved the driver/rider losing control of the vehicle and one involved a result of a driver failing to break in time to avoid a rear end collision. One serious injury accident involved a rider braking sharply to avoid the vehicle in front. Of the 36 slight injury accidents, 13 involved a driver or rider losing control of the vehicle and nine involved a driver or rider failing to break in time resulting in a rear end collision. Vehicles attempting to change lane was the principal contributory factor to seven of the 36 slight injury accidents. Of the 40 PIAs at the junction between the M2 junction 5 and the A249, nine involved a HGV and seven involved a motorcycle. None of the serious injury accidents involved an HGV.

2.7.5 During the three year period there were five injury accidents at the southern roundabout at the dumb-bell junction between the B2005 and the A249 resulting in one serious injury and four slight injuries. None of the injury accidents involved an HGV.

2.7.6 The serious injury accident involved a pedestrian running into the path of oncoming vehicle without looking. Of the slight injury accidents, two involved dangerous or aggressive driving and one involved a driver failing to break resulting in a rear end collision. The remaining injury accident involved a driver losing control of the vehicle.

2.7.7 There were no PIAs on the northern roundabout of the junction at Iwade during the three year period.

2.7.8 It is concluded from the review of PIAs that there are no specific road safety issues within the vicinity of the site that might be exacerbated as a result of the proposed development.

2.8 Traffic Flows

2.8.1 The existing 24 hour daily light and heavy vehicle traffic flows on the local highway network surrounding the site, including the A249 and the A2 have been derived from the Sittingbourne SATURN model which assumes the presence of the Northern Relief Road. The SATURN model has been created on behalf of Kent County Council (KCC) and is owned by KCC. At present, the model has been run for the years 2011, 2016, 2021 and 2026 making outputs, in terms of background traffic flows across the network, readily available for these years.

2.8.2 The output from the SATURN model is only available as daily flows. Additional sources of traffic data have been used to derive peak hour flows on the following links:

- Swale Way (existing section of Northern Relief Road)
- Barge Way
- B2005 south-east of the Swale Way junction

- A249 east and west of Swale Way junction
- A2 east and west of the A249
- M2 north and south of Junction 5.
- A249 west of the M2

2.8.3 The 24 hour daily modelled traffic flows on the A249 and local highway network surrounding the site, have been factored to peak hour flows using the observed traffic flow data for Swale Way obtained from Kent County Council. Peak hour traffic flows around junction 5 of the M2 have been derived from existing observed hourly flows on the M2.

2.8.4 The existing daily light and heavy vehicle traffic flows at the M2 junction 5 have been derived from the most recently observed traffic flows obtained from the Highways Agency. This traffic flow data does not take account of the presence of the Northern Relief Road

2.8.5 Daily, AM and PM peak hour base traffic flows for 2011 including the Milton Creek crossing are shown in **Figure 6**.

2.9 Committed Development

2.9.1 Kent County Council Highway Authority (KCCHA) have confirmed that the traffic flows provided by the SATURN model incorporate all relevant committed development. This model has been tested at the Milton Creek crossing Public Inquiry and it is understood that the Inspector at this Inquiry concluded that the SATURN model was reliable and fit for purpose.

SECTION 3: POLICY CONTEXT

3.1 Introduction

3.1.1 The site will be developed in accordance with appropriate Planning Policy and Guidance, at a national, regional and local level. The key documents reviewed in relation to the proposals are outlined below.

3.2 National Planning Guidance

Planning Policy Guidance 13: Transport

3.2.1 The objectives of PPG13: Transport are to integrate planning and transport at a national, regional, strategic and local level to promote more sustainable transport choices for both people and for moving freight, to promote accessibility and to reduce the need to travel – especially by car.

3.2.2 The site is considered to be in a location with good access to local communities, and Sittingbourne town centre. This is consistent with paragraph 6 which states that Local Authorities should:

> **"Ensure that development comprising jobs… and services offers realistic choice of access to public transport, walking, and cycling."**

3.2.3 This is also consistent with paragraph 19 which states:

> **"A key planning objective is to ensure that jobs, facilities and services are accessible by public transport."**

3.2.4 Furthermore PPG13 seeks to ensure that land-use and transport planning are well integrated and redevelopment of the site is therefore consistent with paragraph 20 which requires local authorities to:

> **"Locate day to day facilities which need to be near their clients in local and rural service centres."**

3.2.5 The site is also consistent with paragraph 45.2 of PPG13 which states that:

> **"Where possible, locate developments generating substantial freight movements…away from congested central areas and residential areas and ensure adequate access to trunk roads".**

Planning Policy Statement 1: Delivering Sustainable Development

3.2.6 The objectives of PPS1 are to ensure that sustainable development is pursued in an integrated manner. Within paragraph 27 it is stated that development should:

> **"Reduce the need to travel and encourage accessible public transport provision to secure more sustainable patterns of transport development."**

3.2.7 These key national policy objectives are critical for determining the suitability of any development, including the proposals for the SEP at Sittingbourne. They therefore form the basis for developing the transport strategy for the Site and it is considered that the development proposals are consistent with national policy.

3.3 Regional Transport Strategy

The South East Plan

3.3.1 The South East Plan, adopted in May 2009 forms the Regional Spatial Strategy (RSS) for the South East Region and provides a long term spatial framework for growth and development within the region until 2026. The Plan aims to achieve more sustainable development across the region and will guide the direction of development and the function that different localities will assume, with the aim of balancing economic and housing growth with concerns regarding environmental protection and climate change.

3.3.2 Transport infrastructure is a significant influence to the growth and development of a region and as such a Regional Transport Strategy (RTS) has been established within the South East Plan. The RTS provides the context within which other relevant regional transport strategies, including those of the South East England Development Agency (SEEDA and the Highways Agency (HA)) should be developed. It also provides the context within which Local Development Frameworks should be developed and Local Transport Authorities should produce their Local Transport Plans.

3.3.3 The overall vision of the RTS as outlined in paragraph 8.5 is to deliver:

> **"A high quality transport system to act as a catalyst for continued economic growth and provide for an improved quality of life for all in a sustainable and socially inclusive manner…"**

3.3.4 The overall vision of the RTS is translated into a set of regionally specific transport objectives which aim to encourage the use of sustainable transport modes and reduce reliance on travel by car. Accordingly, the RTS seeks to:

> **"…foster social inclusion by re-balancing the structure and use of the transport system. In particular, bringing forward measures that encourage modal shift to more sustainable modes and significantly improve the attractiveness of local public transport services, walking and cycling."**

3.3.5 The proposed site is considered to be in a sustainable location, in that it is intended that fuel will be derived from municipal and domestic waste sources within the south-east and in particular, Kent. This is consistent with Policy T1 of the RTS which seeks to:

> **"Encourage development that is located and designed to reduce average journey lengths."**

3.4 Local Transport Policy

3.4.1 National policy on transport and land use establishes broad, policy objectives that reflect the Government's aspirations for integrating land development and transport. The role of local government is to develop strategies based on specific local social and spatial requirements, which deliver on national aspirations.

3.4.2 Local strategy with respect to land use and transport is articulated in the following statutory documents, prepared by the relevant planning and highway authorities and which comprise:

- Kent's second Local Transport Plan 2006-2011
- Swale Borough Council Local Plan 2008- 2021 (to be replaced by Local Development Framework)

3.4.3 These documents are developed in consultation with local stakeholders and form a framework within which local development proposals should sit.

Kent's Second Local Transport Plan

3.4.4 The second Local Transport Plan (LTP2) for Kent provides a strategic framework for the delivery of local transport across the County for a five year period from 2006-2011. The overarching vision of Kent's LTP2 is to reduce dependency on the private car and promote sustainable transport choices by ensuring:

> ***"…good, safe accessibility to jobs and services for all sections of the community in Kent, and to improve the environment and health of the community by reducing congestion and pollution, widening the choice of transport available, and by developing public transport, walking and cycling.".***

3.4.5 Policy UKG2 – Road Freight, states that:

> **"Kent County Council will work with partners to ensure that road freight operations are undertaken with minimal social and environmental impact"**

3.4.6 The site is consistent with paragraph 8.42 of Kent's LTP2 which states that Kent County Council will:

> **"On Development Control and in partnership with District Councils, closely consider the impacts of significant increases in road freight vehicles, especially HGVs, and where proposals are not well related to the primary or secondary route network and, if appropriate, to the rail network, advise refusal of such development proposal(s)".**

3.4.7 The policies and programmes set out in LTP2 are formulated such as to facilitate an efficient and sustainable pattern of movement and create an environment within which people can enjoy a higher quality of life.

Swale Borough Council Local Plan

3.4.8 The Swale Borough Local Plan, adopted in 2008, provides a strategic strategy for growth and development in Swale and offers guidance and controls for proposed development across the Borough. The Local Plan will be progressively replaced by the Local Development Framework (LDF). However, the Plan has been 'saved' for three years since it's adoption in 2008 and therefore will not be replaced by the LDF until 2011. It is possible that after 2011, some existing policies within the local plan will continue to be saved.

3.4.9 In terms of transport, the Local Plan reflects the objectives of Kent's LTP and aims to achieve:

> **"…a more sustainable pattern of development by: providing a better balance between the provision of jobs and houses; locating new development closer to facilities and public transport; and bringing forward transport initiatives."**

3.4.10 Policy SP1 of the Local Plan aims to encourage sustainable development which is self sufficient and well located with respect to surrounding local areas and human need. Policy SP1 states that development proposals should:

> **"Be located to promote the provision of transport choices other that the car."**

3.4.11 Policy SP6 of the Local Plan aims to integrate land use and transport planning to ensure that sufficient infrastructure is available to facilitate development. The site is consistent with Policy SP6 which states that the Borough planning policies will:

> **"Ensure that new developments are planned and located so as to be close to good public transport, housing, jobs, local services and local amenity and the principal highway network… [and] permit well-planned and coordinated renewable energy schemes."**

Swale Borough Council Local Development Framework

3.4.12 The Planning and Compulsory Purchase Act 2004 introduced a new local planning process, comprising a folder of local development plan documents entitled the Local Development Framework (LDF). The LDF will gradually replace the Swale Borough Council Local Plan and will contain a number of Local Development Documents including a Core Strategy, and Supplementary Planning Documents.

3.4.13 The LDF Core Strategy is currently in the initial stages of development and it is anticipated that the Core Strategy, which will replace Local Plan policies, will be adopted in April 2012.

Kent Waste Local Plan

3.4.14 The Kent Waste Local Plan (WLP), adopted in 1998, outlines, at a strategic level, the strategy and policies for the management of waste and location of waste facilities across the County for the period up to 2011. The Planning and Compulsory Purchase Act 2004 introduced a new two-tiered planning system which means that the WLP is in the process of being replaced by a Waste Development Framework. However, certain policies included within the WLP have been saved for three years since 2007, on instruction from the Secretary of State for Communities and Local Government, and will not be replaced until 2010.

3.4.15 Policy W11 – Waste to Energy by Incineration, of the WLP has been saved for three years since 2007 and states that:

> **"The following locations have the potential for a waste to energy plant adjacent to…The Swale at Kemsley. Proposals at these and other locations will be examined against the following considerations…Whether the site would have, or is planned to have, ready accessibility to the primary or secondary route network…"**

Kent Waste Development Framework

3.4.16 Kent County Council is preparing a Waste Development Framework (WDF), which will replace the adopted Waste Local Plan. The WDF will outline the preferred spatial location of sites for waste management uses within the Kent County Council area (excluding Medway). It will cover the period to 2021 and will focus on household, commercial and industrial, and construction and demolition wastes. A consultation and publication date has not, as yet, been finalised.

3.5 Policy Conclusion

3.5.1 It is considered that the proposals are consistent with policies relating to transport and highways at the national, regional and local levels since the site lies within walking and cycling distance of residential areas and public transport services.

Additionally, the site is well located in respect to the strategic freight network and in relation to the local communities it is intended to serve.

SECTION 4: PROPOSED DEVELOPMENT

4.1 General

4.1.1 The proposed site layout is shown in drawing attached as **Appendix 1**. Details of access arrangements are shown in **Figure 7**.

4.1.2 The site occupies an area of around 7 Ha east of the Kemsley Paper Mill. The existing E.ON operated CHP plant adjacent to the Paper Mill is designed to generate around 80MW of electricity and 200MW of steam which is supplied to the Kemsley Mill. The proposed sustainable energy plant will have a throughput of 550,000 tonnes per annum (tpa) and will produce up to 50MW of electricity and improve the overall sustainability of energy use at the site by using the steam from the proposed plant in the paper making process displacing some of the steam generated from fossil fuel sources.

4.1.3 In summary, the development will comprise:

- A Sustainable Energy Plant with a throughput of approximately 500,000 to 550,000 tonnes per annum (tpa);
- An ash treatment facility to stabilise up to 165,000 tpa of boiler ash;
- Ancillary development including internal roads, parking, weighbridge, and water attenuation schemes;
- Tanks, fuel tanks, fencing, landscaping and offices;
- The facility will use combustible pre treated non hazardous waste including commercial and industrial waste, municipal solid waste and solid recovered fuel (SRF) as the fuel source.

4.1.4 It is expected that pre treated waste will be from commercial and municipal sources originating within the south-east of England and in particular, Kent. The plant will operate 24 hours a day, 365 days per year with occasional closures for routine maintenance.

4.1.5 In addition to the 500,000 to 550,000 tonnes of waste transported to the plant there will also be a requirement for a number of reagents; Hydrated Lime, Activated Carbon and Urea or Ammonia Reaction products

4.1.6 The facility is expected to generate some 138,000 tonnes of ash, though for the purposes of this assessment a worst case of 165,000 tonnes per annum of bottom ash is assumed. This will be treated, stabilized and converted to aggregate at the ash processing facility. The aggregate will be transported off site for use elsewhere.

4.1.7 The site will employ 50 full-time staff operating on a combination of daytime and shift working. The shifts are expected to be 07:00-14:00, 14:00-22:00 and 22:00-07:00. The maximum number of staff on site at any one time is expected to be around 12.

4.2 <u>Site Access</u>

4.2.1 HGV and disabled staff access will be via the existing Kemsley Paper Mill northern access. Staff driving to the site will park at the existing Mill car park and walk to the site (see below). Cyclists will also access the site via the existing Mill car park. Pedestrians will access the site via Ridham Avenue and the existing Paper Mill southern access along the southern and eastern Mill perimeter path. The length of the pedestrian route from the Mill car park to the site is around 650m.

4.2.2 **Figure 8** shows the swept paths of heavy vehicles circulating within the site. This demonstrates that the site is able to accommodate the expected HGV deliveries.

4.2.3 HGVs will arrive at the Kemsley Mill northern access gate. After a security check they will be allowed through the access control. If necessary they will be temporarily held within a marshalling area south of the access point. The vehicles will proceed into the proposed site as shown in **Figure 8**. A waiting area is provided adjacent to the inbound vehicle lane. HGVs will be called forward to the weighbridge and will then proceed directly to the loading or unloading areas as appropriate. The vehicles will then leave via the weighbridge. No HGVs are expected to park for any length of time within the operational part of the site.

4.3 Parking

4.3.1 Staff driving to the site will use the existing car park at the Kemsley Paper Mill site. This car park currently has a capacity for approximately 550 vehicle spaces for use by staff, visitors and contractors. The existing Kemsley Mill car park is not currently used to capacity.

4.3.2 There are no vehicle parking standard guidelines published by Kent County Council relating to a SEP. The vast majority of parking will be shared with the existing Kemsley Paper Mill. Within the site there will be 5 disabled spaces.

4.3.3 Cycle parking facilities are provided within the existing Kemsley Mill car park.

4.3.4 The site has been designed to allow the safe manoeuvring and parking of the maximum number of HGVs expected to be present on the site at any one time with the ability to marshal traffic into the site from a proposed holding area at the northern exit of the Kemsley Paper Mill site.

4.4 Peak Hour and Daily Staff Movements

4.4.1 Over a 24 hour period there will be a maximum of 58 person movements at the proposed development. This number is based on three shifts of seven staff plus up to eight staff working office hours.

4.4.2 Since the shifts do not start or end during the peak hours it is expected that the peak number of staff movements during the peak hours will be 8 arrivals during the AM peak hour and 8 departures during the PM peak hour.

4.5 Mode Share of Travel to Work Trips

4.5.1 Information relating to the existing mode share of journeys to and from work places in Kemsley has been derived from census data and is summarised in **Table 3**. This also includes the application of the existing mode share to the peak hour and daily staff trip generation:

Table 3: Mode Share (Kemsley Travel to Work)

		2-Way Trips		
Mode	**% Mode Share***	**AM Peak**	**PM Peak**	**Daily**
Car driver	80.0%	6	6	46
Car passenger	4.5%	1	1	3
Bus	2.1%	0	0	1
Train	1.4%	0	0	1
Motorcycle	4.7%	1	1	3
Pedal Cycle	3.2%	0	0	2
Walk	3.9%	0	0	2
Other	0.2%	0	0	0
Total	**100.0%**	**8**	**8**	**58**

* Based on existing mode share for work trips within Kemsley ward.

4.6 Distribution of Staff Trips

4.6.1 Census data has been used to derive the distribution of staff trips associated with the proposed development. This is shown in **Figure 9**, detailed in Appendix 2 and summarised in **Table 4**:

Table 4: Distribution of Staff Traffic

Link	All People	% Distribution
A249	104	6.7%
A249/A2 east	94	6.0%
A249/A2 west	219	14.1%
A249/M2 east	36	2.3%
A249/M2 west	51	3.3%
Barge Way	183	11.8%
Swale Way/ B2005	869	55.8%
Total	**1556**	**100.0%**

4.6.2 It can be seen that the over half of all staff traffic (55.8%) will travel to and from the site from Kemsley along the B2005 and Swale Way. Approximately 11.8% of staff traffic will travel to and from the north of the site from the Isle of Sheppey along Barge Way. Only a small proportion of staff traffic (5.6%) will travel to and from the site from the M2 junction 5.

4.7 Assignment of Staff Car Movements

4.7.1 Peak hour and daily staff vehicle movements have been assigned to the highway network in accordance with the distribution set out in **Table 4** above and are shown in **Figure 10**.

4.8 Daily HGV Movements

4.8.1 The number of HGV movements associated with the proposed development has been derived on the basis of the following assumptions:

Import of Waste

- Annual import of waste: 550,000 tonnes;
- Average HGV load of 20 tonnes;
- Giving, 27,500 HGVs per annum or 55,000 HGV movements per annum;

- Waste deliveries Monday-Friday and Saturday morning (5.5 days per week or 287 days per year); and
- Average of 192 HGV movements per day (96 movements Saturday)

Export of Ash/Aggregate

- Maximum annual export of ash/ aggregate: 165,000 tonnes;
- Average HGV load of 20 tonnes;
- Giving 8,250 HGVs per annum or 16,500 HGV movements per annum;
- Ash removals Monday-Friday and Saturday morning (5.5 days per week or 287 days per year); and
- Average of 58 HGV movements per day (29 movements Saturday)

Reagent Transport

- Assume 4 HGVs per day or 8 HGV movements per day.

4.9 Total Daily HGV Movements

4.9.1 On the basis of the above, the average number of HGV movements assuming the maximum amount of fuel deliveries per year, will be 258 HGV movements per day.

4.10 Distribution and Assignment of HGV Movements

4.10.1 The distribution of HGVs has been estimated on the basis of the relative distribution of possible waste sources throughout the south-east of England. In order to test a worst case it has been assumed that no waste will be sourced from the Isle of Sheppey:

Table 5: Distribution and Assignment of HGV Movements

Source of Waste	Estimated %	Daily HGV Movements	Route to/from Site
North of London	60%	155	M2 North
South of London	30%	77	A249 West
Kent (SE of Site)	10%	26	M2 South
Total	**100%**	**258**	

4.10.2 The assignment of daily HGV movements is shown on **Figure 10**.

4.11 Peak Hour HGV Movements

4.11.1 On the basis that HGV movements are distributed evenly over a 12 hour weekday day (06:00-18:00) the peak hour HGV movements generated by the site will amount to 22 2-way movements per weekday. These flows are also shown in **Figure 10**.

4.12 Summary of Site Vehicle Generation

4.12.1 **Table 6** summarises the peak hour and daily vehicle trip generation of the proposed site:

Table 6: Peak Hour Staff Vehicle and HGV Movements

Vehicle Type	AM			PM			24 hour		
	Arrive	Depart	**Total**	Arrive	Depart	**Total**	Arrive	Depart	**Total**
Staff Cars	6	0	**6**	0	6	**6**	23	23	**46**
HGVs	11	11	**22**	11	11	**22**	129	129	**258**
Total Vehicles	17	11	**28**	11	17	**28**	152	152	**304**

4.12.2 **Table 7** summarises the site generated traffic on the local highway network:

Table 7: Site Generated Traffic on Local Network (2-Way Flows)

	AM Peak			**PM Peak**			**24 Hour**		
Link	Cars	HGVs	**Total**	Cars	HGVs	**Total**	Cars	HGVs	**Total**
Swale Way	6	22	**28**	6	22	**28**	41	258	**299**
Barge Way	0	22	**22**	0	22	**22**	0	258	**258**
A249 East of Swale Way	0	0	**0**	0	0	**0**	0	0	**0**
A249 West of Swale Way	2	22	**24**	2	22	**24**	15	258	**273**
M2 Junction 5 East	0	2	**2**	0	2	**2**	1	26	**27**
M2 Junction 5 West	0	13	**13**	0	13	**13**	2	155	**157**

SECTION 5: TRANSPORT IMPACT OF PROPOSED DEVELOPMENT

5.1 Future Year Base Flows

5.1.1 The earliest that the site could become operational is 2014. The modelled 2011 base flows on the local highway network shown in **Figure 6** have been factored to 2014 using the modelled growth rates from 2011 to 2026 on Swale Way, the A249 and the A2 in the situation with the Creek Crossing completed. This indicates a modelled growth in traffic between 0.5% and 11.3% between 2011 and 2014 on the various links close to the site. Traffic flows around the M2 junction have been derived from 2016 modelled flows factored back to 2014 using the National Road Traffic Forecast of Low Growth (NRTF low). Traffic flows on barge Way have been derived from 2009 surveys factored to 2014 using NRTF low growth. The resulting 24 hour, AM peak and PM peak hour traffic flows on the local network are shown in **Figure 11**.

5.1.2 **Table 8** summarises the 2014 AM and PM peak hour and daily traffic flows on the local highway network without development traffic:

Table 8: 2014 Traffic Flows without Development

Link	AM Peak			PM Peak			24 Hour		
	Cars	HGVs	Total	Cars	HGVs	Total	Cars	HGVs	Total
Swale Way	1,175	224	1,398	1,374	262	1,635	14,875	2,833	17,709
Barge way	248	132	380	301	69	370	2,897	1,445	4,342
A249 East of Swale Way	2,956	292	3,248	3,457	342	3,799	37,435	3,702	41,137
A249 West of Swale Way	2,782	416	3,198	3,253	486	3,740	35,233	5,265	40,498
M2 Junction 5 East	4,048	635	4,683	4,734	743	5,477	51,268	8,043	59,311
M2 Junction 5 West	4,911	812	5,723	5,743	949	6,693	62,195	10,281	72,476

5.1.3 **Figure 12** shows 2014 traffic flows with development traffic on the local highway network and M2 junction 5. **Table 9** summarises the 2014 traffic flows on the local highway network with development:

Table 9: 2014 Traffic Flows with Development

Link	AM Peak			PM Peak			24 Hour		
	Cars	HGVs	Total	Cars	HGVs	Total	Cars	HGVs	Total
Swale Way	1,180	245	1,425	1,379	283	1,662	14,916	3,091	18,008
Barge Way	248	154	402	301	91	392	2,897	1,703	4,600
A249 East of Swale Way	2,956	292	3,248	3,457	342	3,799	37,435	3,702	41,137
A249 West of Swale Way	2,784	437	3,221	3,256	508	3,763	35,248	5,523	40,771
M2 Junction 5 East	4,048	637	4,685	4,734	745	5,479	51,269	8,069	59,338
M2 Junction 5 West	4,911	825	5,736	5,743	962	6,706	62,196	10,436	72,633

5.1.4 **Figure 13** summarises the % impact of development traffic on the local highway network in 2014. **Table 10** expresses development traffic predicted on the local highway network in terms of % increases:

Table 10: % Increases in Traffic Flows

Link	AM Peak			PM Peak			24 Hour		
	Cars	HGVs	Total	Cars	HGVs	Total	Cars	HGVs	Total
Swale Way	0.5%	9.6%	1.9%	0.4%	8.2%	1.7%	0.3%	9.1%	1.7%
Barge Way	0.0%	16.2%	5.7%	0.0%	31.1%	5.8%	0.0%	17.9%	5.9%
A249 East of Swale Way	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A249 West of Swale Way	0.1%	5.2%	0.7%	0.1%	4.4%	0.6%	0.0%	4.9%	0.7%
M2 Junction 5 East	0.0%	0.3%	0.0%	0.0%	0.3%	0.0%	0.0%	0.3%	0.0%
M2 Junction 5 West	0.0%	1.6%	0.2%	0.0%	1.4%	0.2%	0.0%	1.5%	0.2%

5.1.5 It can be seen that the greatest impact of the development is predicted to be on Barge Way with total traffic % increases in flows of between 5.7% and 5.9% during the peak hour and daily periods. On Swale Way the increases in total flows vary between 1.7% and 1.9% during peak hour and daily periods. The % impact on the A249 west of Swale Way is predicted to be under 1% during the peak hours and on a daily basis. The level of impact on all other links is predicted to be less than 0.5%. This level of impact is well within normal day to day variations in traffic flows and will have a negligible impact in terms of changes in queues, delays or journey times.

5.1.6 In terms of HGV movements the % impacts are higher. On Barge Way there are increases in HGV movements of between 16.2% and 31.1% during peak hour and daily periods. On Swale Way the increases in HGV movements are under 10% and on the A249 south of the Swale Way junction the increases are around 5%. On all other links the increases in HGV movements are less than 2%. It should be noted that on the links experiencing the greatest % impacts in terms of HGVs the background HGV flows are small relative to the flows on the strategic network. In absolute terms the number of additional HGV movements (maximum 22 per hour or 258 per day on Barge way and Swale Way) represents one additional movement every 3 minutes. This level of increase is not within recognised bounds of perceptibility

5.1.7 It is concluded that the proposed development will have a negligible impact on the local highway network.

SECTION 6: MITIGATION OF TRANSPORT IMPACT

6.1 The predicted level of highways impact of the proposed development has been shown to be extremely low. It is therefore not considered necessary to provide any mitigation measures in terms of improvements to the local highway network aimed at increasing capacity.

6.2 The record of personal injury road traffic accidents in the vicinity of the site suggests that there are no highway safety reasons for providing specific highway mitigation measures.

6.3 The part of the network that is most affected by the proposed development (Barge Way and Swale Way) comprises modern, purpose built distributor roads designed to accommodate a mixture of car and heavy industrial and commercial traffic. Both Swale Way and Barge Way have been constructed with off-road shared pedestrian/cycle paths that facilitate pedestrian and cycle movements between the site and the adjacent residential areas.

6.4 KCCHA has confirmed that there is no requirement for a Travel Plan associated with this development due to the low level of staffing.

6.5 It is unlikely that any HGVs will travel through local residential areas or other sensitive areas. For the benefit of Kemsley Paper Mill site operations, it will be necessary to have time booking arrangements with the delivery providers. It would be possible to influence the routes taken by the delivery providers when accessing and exiting the site. However, given the location of the site in relation to the strategic highway network, it is considered unnecessary to introduce routeing agreements for HGV traffic.

6.6 The assessments carried out above are based on worst case assumptions in terms of HGV movements during the peak hours. Given the low level of impact predicted at these times it is considered unnecessary to introduce restrictions on delivery hours for capacity reasons. Whether restrictions are considered necessary on other grounds will be assessed elsewhere.

SECTION 7: SUMMARY AND CONCLUSION

7.1 This Transport Assessment has been prepared by RPS Planning and Development to assess the transport implications resulting from the proposed development of a Sustainable Energy Plant on land adjacent to the Kemsley Paper Mill, Sittingbourne, Kent.

7.2 The plant will have an annual throughput of 550,000 tonnes of treated Commercial and Industrial (C&I) waste, municipal solid waste (MSW), and Solid Recovered Fuel (SRF). It has been calculated that on the basis of all fuel imports and residue export by road, the site could generate up to 258 HGV movements per day. In addition it is expected that staff members will make up to 46 car movements per day. During the AM and PM peak hours the site could generate up to 22 HGV movements and 6 car movements.

7.3 It is proposed to gain access to the site from the existing Kemsley Mill northern access that connects with Barge Way. This will be used by HGVs and a small number of staff cars including disabled staff. The majority of staff arriving by car will access the site by parking in the existing Kemsley Mill staff car park and walk to the site via the southern and eastern Mill site perimeter footpath. Those travelling to the site by public transport, on foot and by bicycle will also access the site via the car park route.

7.4 An assessment of the record of personal injury road traffic accidents on the local highway network suggest that there are no specific deficiencies that could be exacerbated by the proposed development.

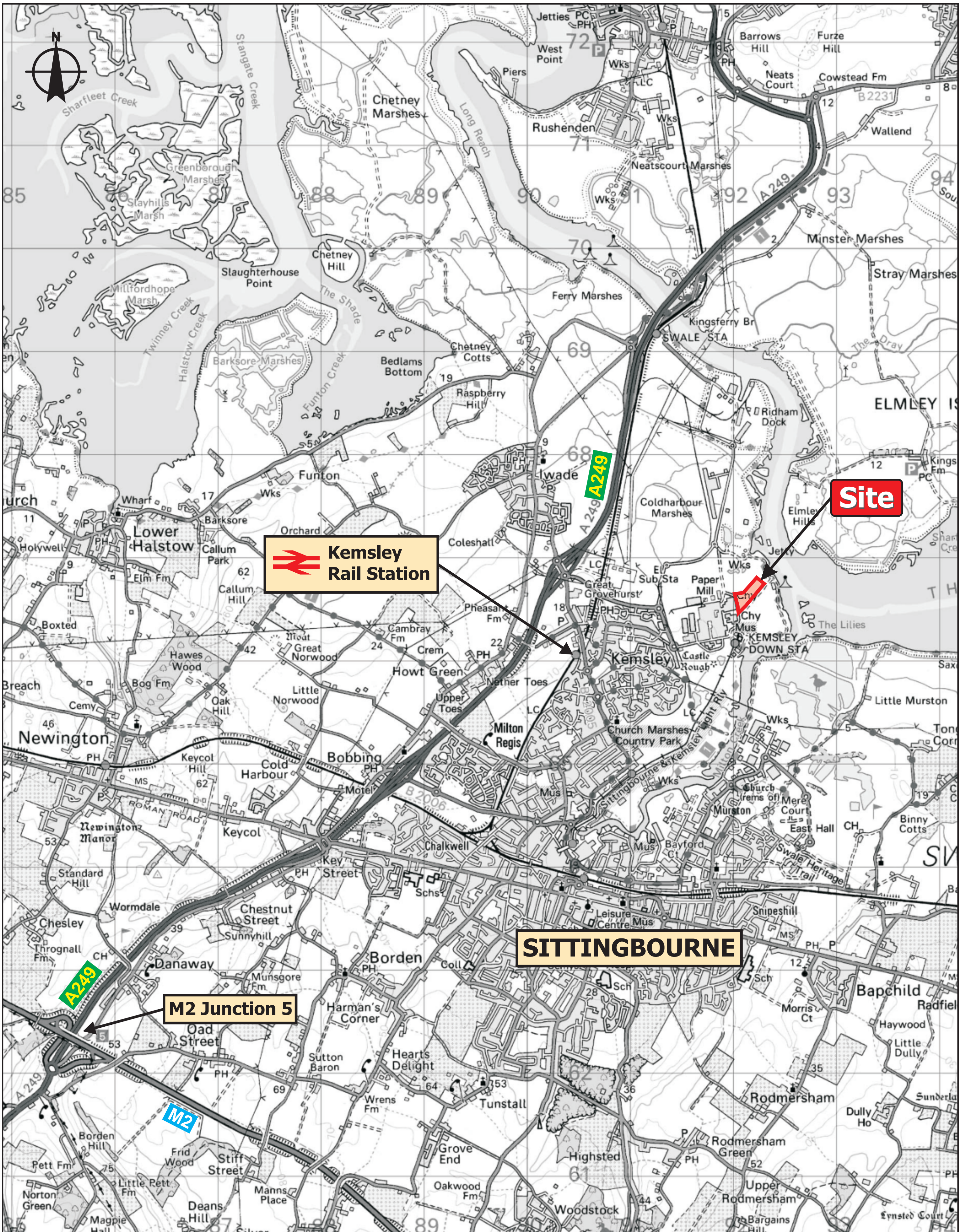
7.5 The route between the site and the A249 includes Swale Way and Barge Way. These recently constructed high quality distributor roads have been designed to carry mixed industrial traffic and are provided with off-road shared pedestrian/cycle paths to link to the surrounding residential areas.

7.6 An assessment of the level of impact of the proposed development on the surrounding highway network indicates that with the exception of Barge Way and Swale Way the site generated traffic will lead to increases in 2-way link flows on the local highway network of around 1% or, in most cases significantly less than this. It is concluded that no mitigation measures are required to increase the capacity of the local highway network to accommodate site traffic.

7.7 Kent County Council Highway Authority has confirmed that no Travel Plan is required to accompany this application. The results of the assessment of the level of highway impact of the proposed development suggest that no further mitigation measures are required to deal with safety or capacity issues associated with the proposals.

7.8 It is concluded that there are no transport or highways reasons for objecting to the proposed development.

FIGURES



RPS stREGIS e.on

Project:
SUSTAINABLE ENERGY PLANT, SITTINGBOURNE

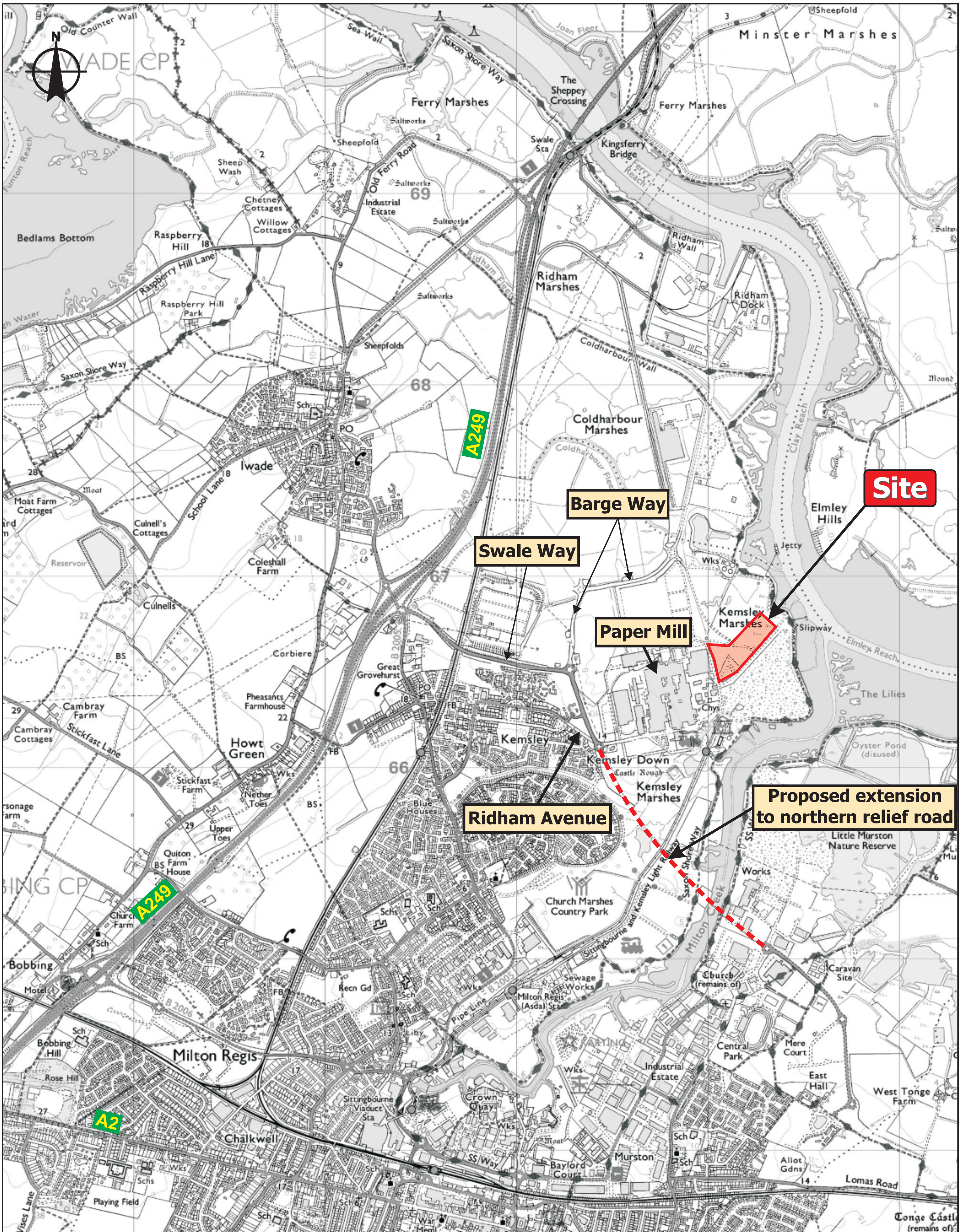
Title:
SITE LOCATION PLAN

Date: **JULY 09** Scale: **NTS** Rev:

Drwg. No: **JNY6360-02** Drawn: **AB** Checked: **BRB**

Figure No: **1**

Transport



Project:

SUSTAINALE ENERGY PLANT, SITTINGBOURNE

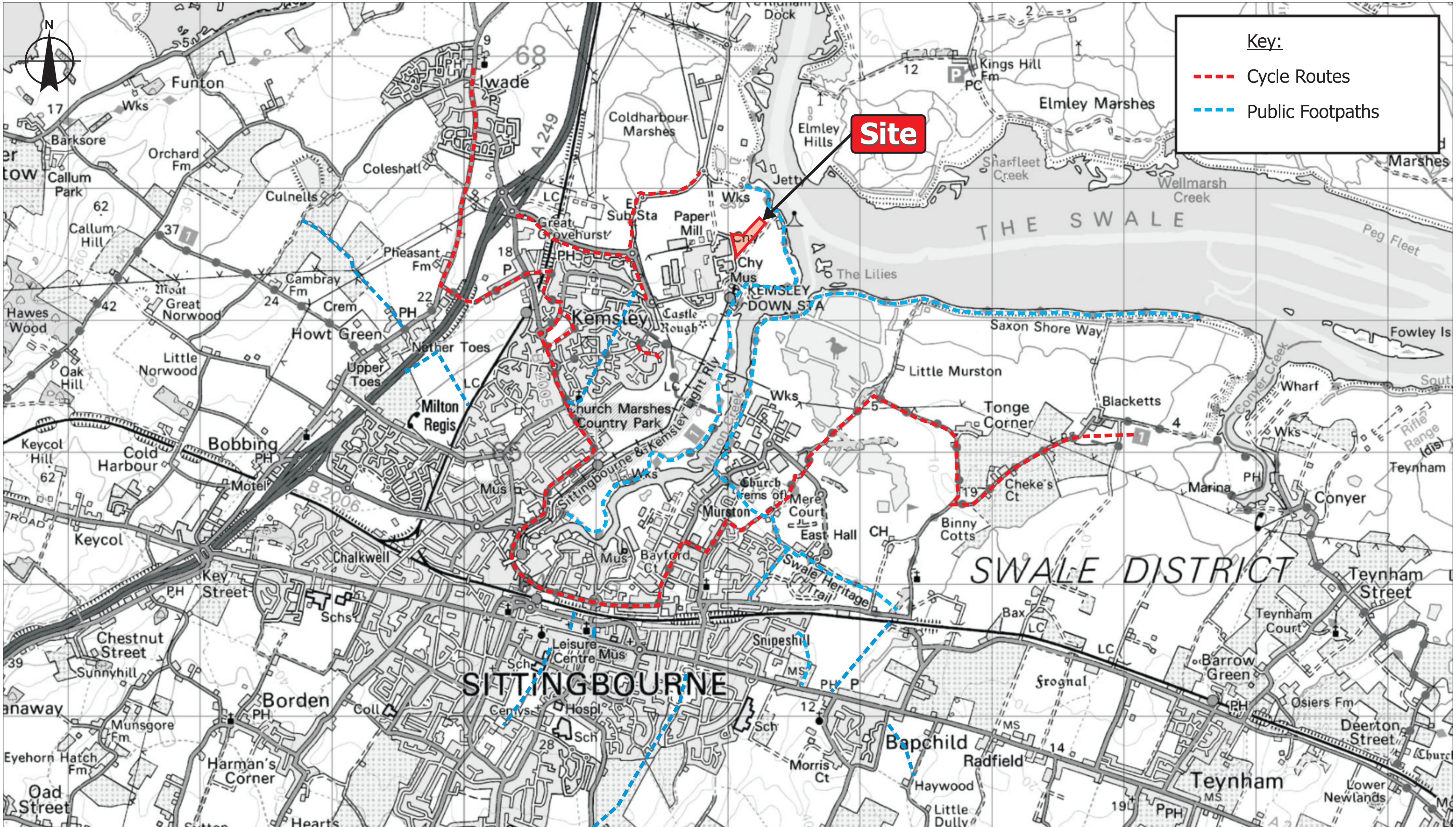
Title:

LOCAL HIGHWAY NETWORK

Date: **JULY 09**	Scale: **NTS**	Rev:
Drwg. No: **JNY6360-03**	Drawn: **AB**	Checked: **BRB**

Figure No: **2**

Transport



Project:

SUSTAINABLE ENERGY PLANT, SITTINGBOURNE

Title:

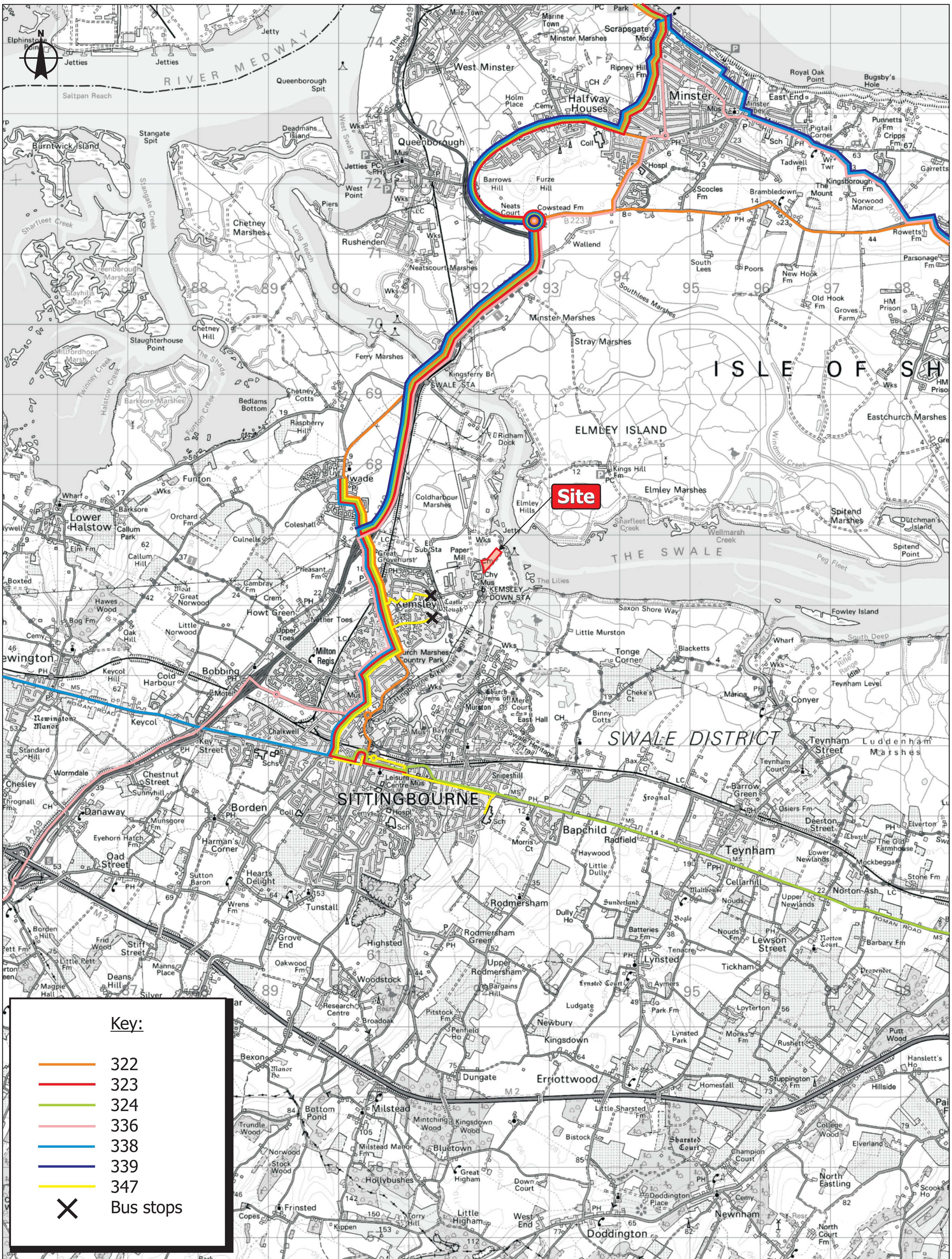
CYCLE ROUTES

Figure No:

3

Date: JULY 09	Scale: NTS	Rev:
Drwg. No: JNY6360-04	Drawn: AB	Checked: BRB

Transport



RPS stRegis e·on

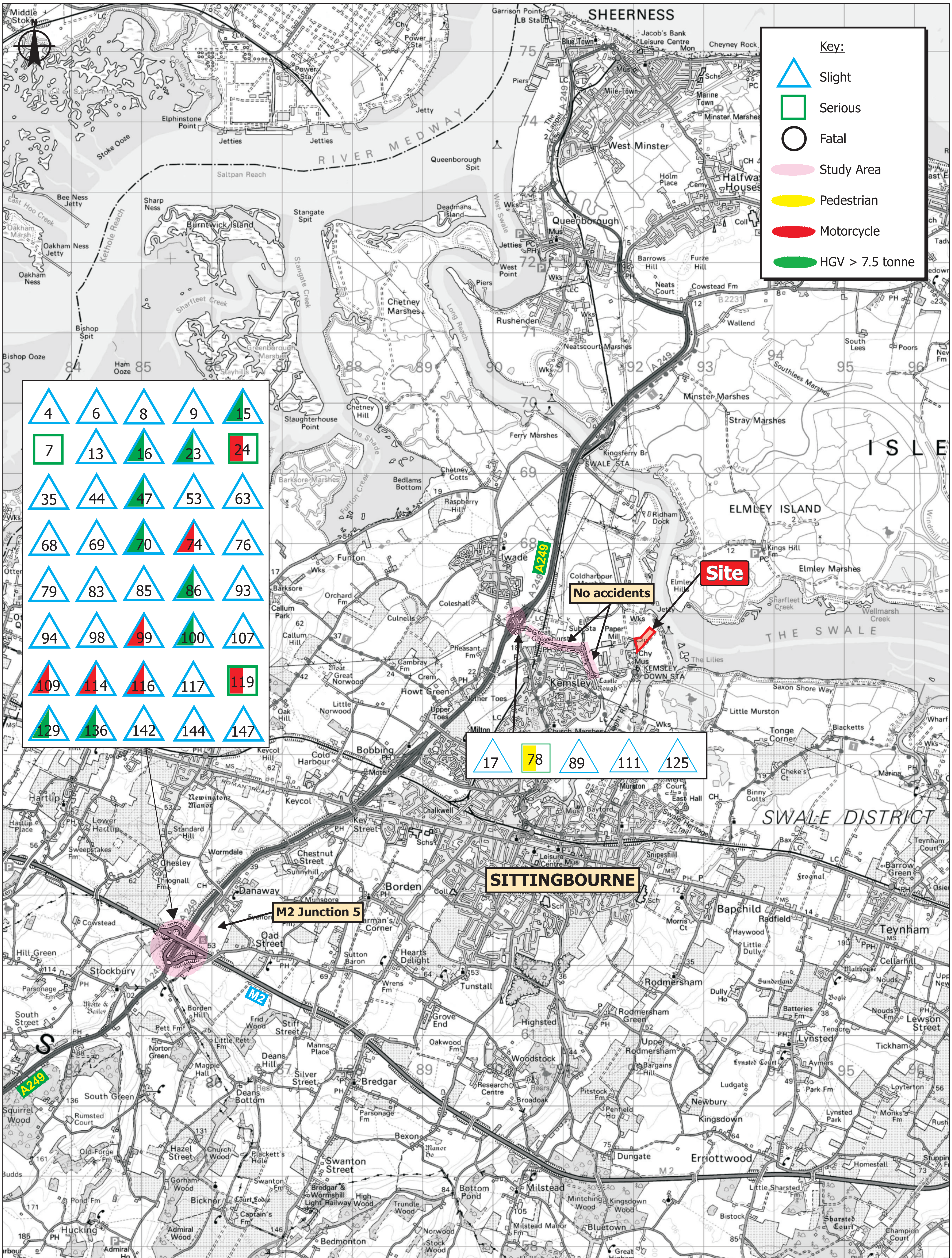
Project:
SUSTAINABLE ENERGY PLANT, SITTINGBOURNE

Title:
BUS ROUTES

Date: **JULY 09**	Scale: **NTS**	Rev:
Drwg. No: **JNY6360-05**	Drawn: **AB**	Checked: **BRB**

Figure No:
4

Transport



Project:
SUSTAINABLE ENERGY PLANT, SITTINGBOURNE

Title:
PIA DATA

Date: **JULY 09** Scale: **NTS** Rev:

Drwg. No: **JNY6360-06** Drawn: **AB** Checked: **BRB**

Figure No:
5

Transport

N

A249

	cars	HGV	tot
24hr	36622	3621.96	40244
AM	2891.66	285.989	3177.65
PM	3381.75	334.459	3716.21

	cars	HGV	tot
24hr	33822.1	5053.88	38876
AM	2670.58	399.053	3069.64
PM	3123.2	466.685	3589.89

	cars	HGV	tot
24hr	13362.7	2545.28	15908
AM	1055.12	200.974	1256.09
PM	1233.94	235.036	1468.98

	cars	HGV	tot
24hr	2802	1398	4199
AM	239	128	368
PM	292	67	358

B2005

Barge Way

SITE

Swale Way

	cars	HGV	tot
24hr	14967.4	1126.58	16094
AM	1181.82	88.9544	1270.78
PM	1382.12	104.031	1486.15

	cars	HGV	tot
24hr	20038	1279.02	21317
AM	1582.19	100.991	1683.18
PM	1850.35	118.107	1968.45

A249

32685 4412.48(site26)
32809 4757.31(site3816)

	cars	HGV	tot
24hr	56324.2	9169.78	65494
AM	4416.6	719.037	5135.63
PM	4598.29	748.618	5346.91

	cars	HGV	tot
24hr	26336	1681.02	28017
AM	2079.48	132.733	2212.21
PM	2431.92	155.229	2587.14

	cars	HGV	tot
24hr	51048.6	6309.38	57358
AM	4030.78	498.187	4528.97
PM	4713.93	582.62	5296.55

A2

Peak Hour Factors

	cars	HGV	tot
AM	8%	8%	8%
PM	9%	9%	9%

Peak hour flows derived from data sent by Sheila Brooke (Jacobson behalf of KCC) via email dated 01/10/09

A249

	cars	HGV	tot
24hr	51400.2	6942.84	58343
AM	3942.15	532.482	4474.63
PM	4140.45	559.268	4699.71

	cars	HGV	tot
24hr			
AM			
PM			

29183 3501.96 (site19)
29160 3440.88 (site20)

M2

24 Hour flows from 'AADT2011Flows_DS1toRPSSept09.xls' from Jacobs 04/09/09

red=2009 from 'HA2016.xls' from Jacobs (AWT) Note: Observed flows(no relief road)
M2 J5 Flows maybe revised if data can be extracted from SATURN Model

Barge Way Flows from 2009 ATC:

	NRTF Low
2009	1.14412
2011	1.17128
2009-2011	**1.02374**

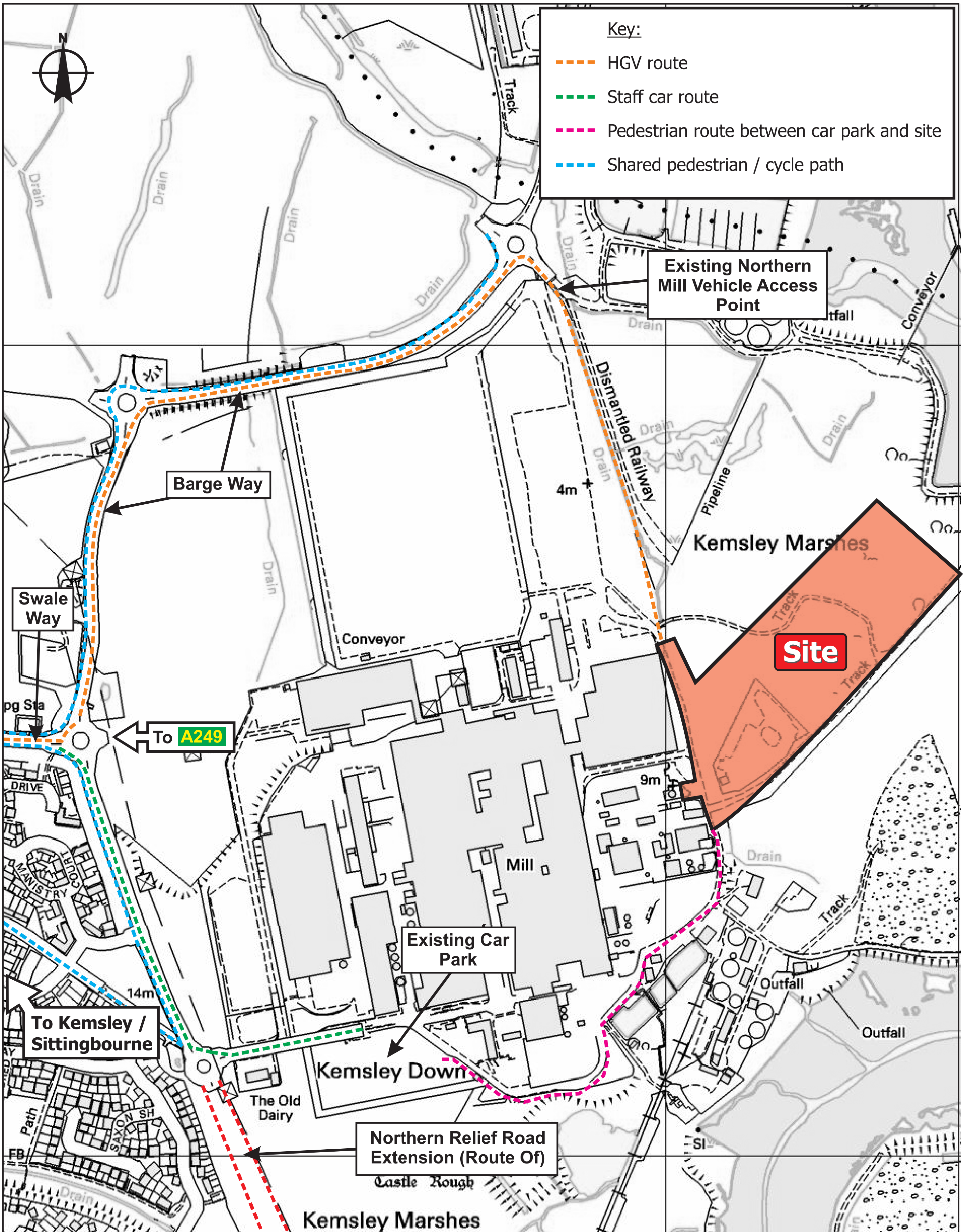
	AM Peak			PM Peak			24 Hour		
Link	Cars	HGVs	Total	Cars	HGVs	Total	Cars	HGVs	Total
Swale Way	1055	201	1256	1234	235	1469	13363	2545	15908
Barge Way	239	128	368	292	67	358	2802	1398	4199
A249 East of Swale Way	2892	286	3178	3382	334	3716	36622	3622	40244
A249 West of Swale Way	2671	399	3070	3123	467	3590	33822	5054	38876
M2 Junction 5 East	3942	532	4475	4140	559	4700	51400	6943	58343
M2 Junction 5 West	4417	719	5136	4598	749	5347	56324	9170	65494

RPS stRegis e·on

Project:
SUSTAINABLE ENERGY PLANT, SITTINGBOURNE
Title:
2011 BASE FLOWS

Date: **NOV 09** Scale: **NTS** Rev:
Drwg. No: **JNY6360-10** Drawn: **DF** Checked: **BRB**
Figure No: **6**

Transport



Project:
SUSTAINABLE ENERGY PLANT, SITTINGBOURNE

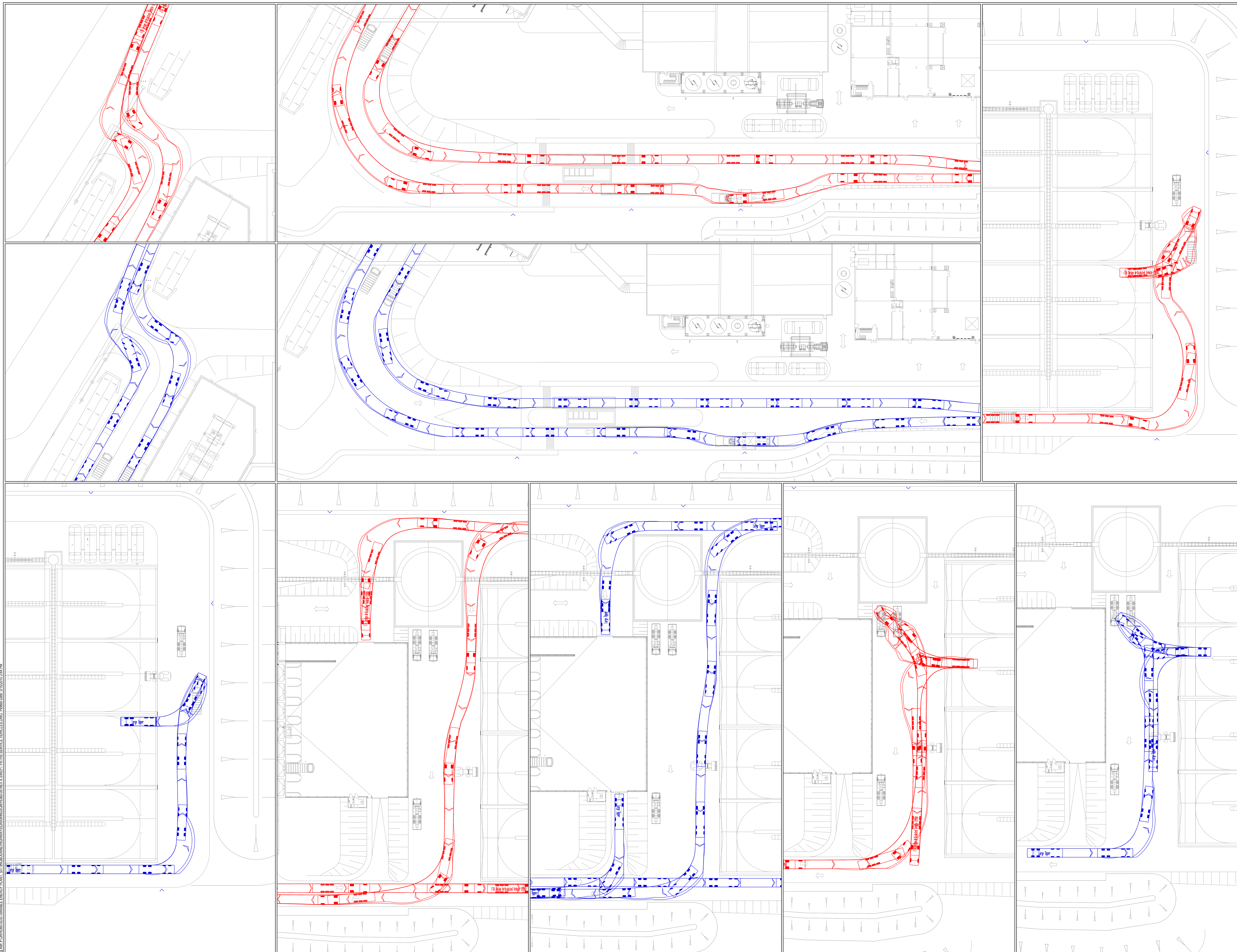
Title:
ACCESS ARRANGEMENTS

Date: **NOV 2009** Scale: **NTS** Rev:

Drwg. No: **JNY6360-08** Drawn: **MW** Checked: **BRB**

Figure No: **7**

Transport



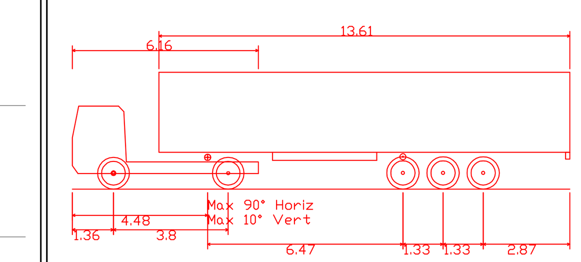
NOTES

1. If this drawing has been received electronically it is the recipients responsibility to print the document to the correct scale.

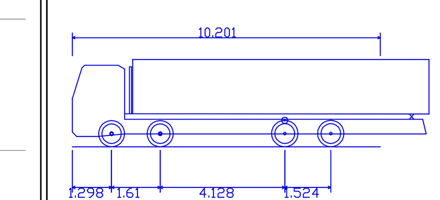
2. All dimensions are in metres unless stated otherwise. It is recommended that information is not scaled off this drawing.

3. This drawing should be read in conjunction with all other relevant drawings and specifications.

4. Site layout taken from EEW AG drawing 103-000-00-Z-0003-2.



FTA Design Articulated Vehicle (1998)	
Overall Length	16.480m
Overall Width	2.550m
Overall Body Height	3.870m
Min Body Ground Clearance	0.515m
Max Track Width	2.470m
Lock to Lock Time	3.00 sec
Kerb to Kerb Turning Radius	6.550m



Large Tipper	
Overall Length	10.201m
Overall Width	2.500m
Overall Body Height	2.893m
Min Body Ground Clearance	0.343m
Max Track Width	2.500m
Lock to Lock Time	6.00 sec
Kerb to Kerb Turning Radius	11.550m

rev	amendments	by	ckd	date
A	Site layout updated and swept paths amended to suit	AB	SM	Dec 09

RPS

St Anne's House
Oxford Square, Oxford Street
Newbury, Berkshire
RG14 1JQ

T +44 (0) 1635 279 000
F +44 (0) 1635 279 050
W www.rpsgroup.com
E rpsne@rpsgroup.com

Client: ST REGIS / e.on

Project: Sustainable Energy Plant, Sittingbourne

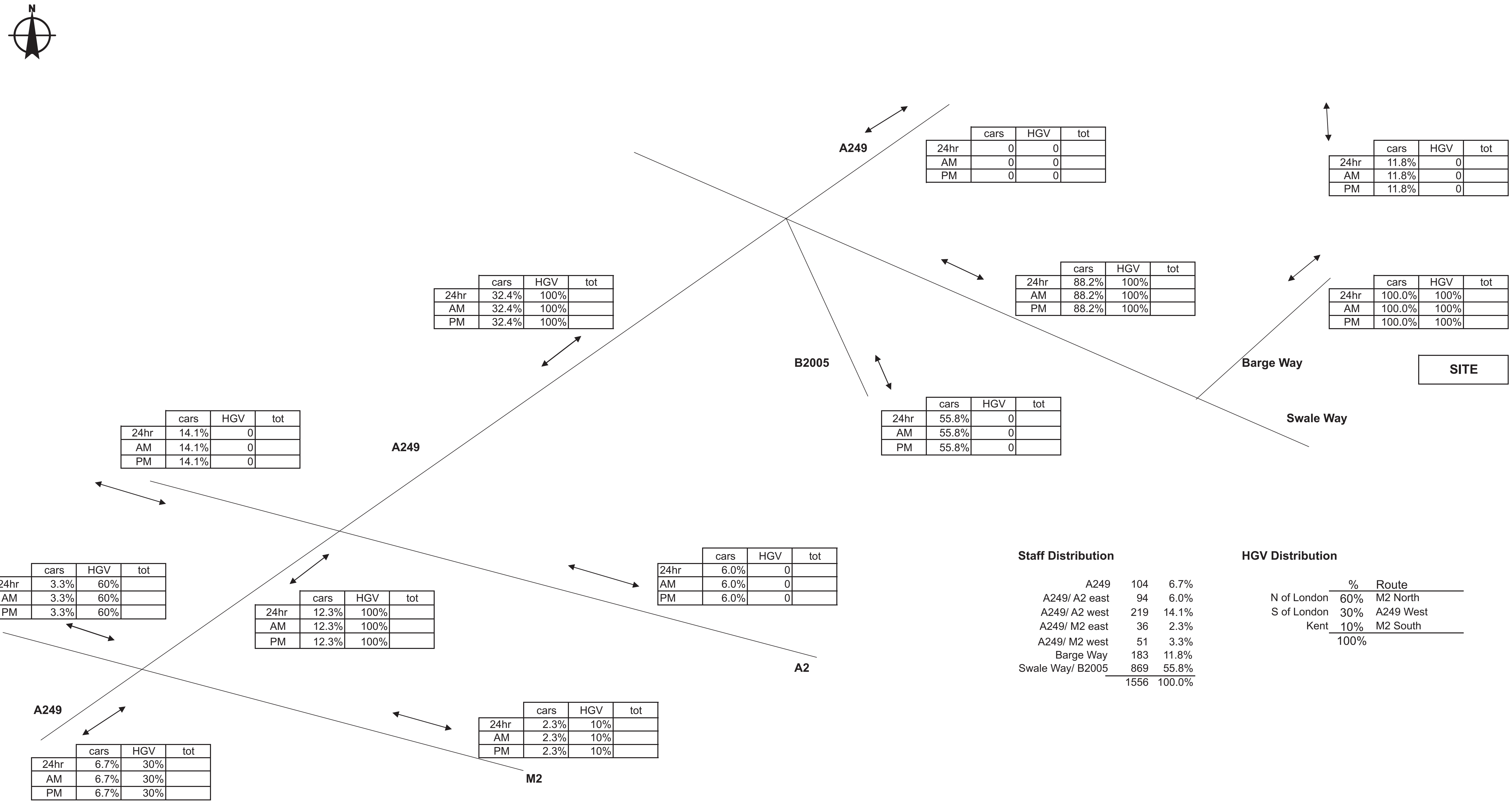
Title: Swept Paths of Service Vehicles Figure 8

Drawing Status	Date Created	Drawing Scale
FOR INFORMATION	11.11.2009	1:500

Drawing Size	Project Leader	Drawn By	Initial Review
A1	BRB	SM	BRB

Drawing Number	Rev
JNY6360-09	A

Transport



	cars	HGV	tot
24hr	0	0	
AM	0	0	
PM	0	0	

	cars	HGV	tot
24hr	11.8%	0	
AM	11.8%	0	
PM	11.8%	0	

	cars	HGV	tot
24hr	88.2%	100%	
AM	88.2%	100%	
PM	88.2%	100%	

	cars	HGV	tot
24hr	100.0%	100%	
AM	100.0%	100%	
PM	100.0%	100%	

	cars	HGV	tot
24hr	32.4%	100%	
AM	32.4%	100%	
PM	32.4%	100%	

	cars	HGV	tot
24hr	55.8%	0	
AM	55.8%	0	
PM	55.8%	0	

	cars	HGV	tot
24hr	14.1%	0	
AM	14.1%	0	
PM	14.1%	0	

	cars	HGV	tot
24hr	6.0%	0	
AM	6.0%	0	
PM	6.0%	0	

	cars	HGV	tot
24hr	3.3%	60%	
AM	3.3%	60%	
PM	3.3%	60%	

	cars	HGV	tot
24hr	12.3%	100%	
AM	12.3%	100%	
PM	12.3%	100%	

	cars	HGV	tot
24hr	2.3%	10%	
AM	2.3%	10%	
PM	2.3%	10%	

	cars	HGV	tot
24hr	6.7%	30%	
AM	6.7%	30%	
PM	6.7%	30%	

Staff Distribution

A249	104	6.7%
A249/ A2 east	94	6.0%
A249/ A2 west	219	14.1%
A249/ M2 east	36	2.3%
A249/ M2 west	51	3.3%
Barge Way	183	11.8%
Swale Way/ B2005	869	55.8%
	1556	100.0%

HGV Distribution

	%	Route
N of London	60%	M2 North
S of London	30%	A249 West
Kent	10%	M2 South
	100%	

RPS | St Regis | e·on

Date: NOV 09 | Scale: NTS | Rev:

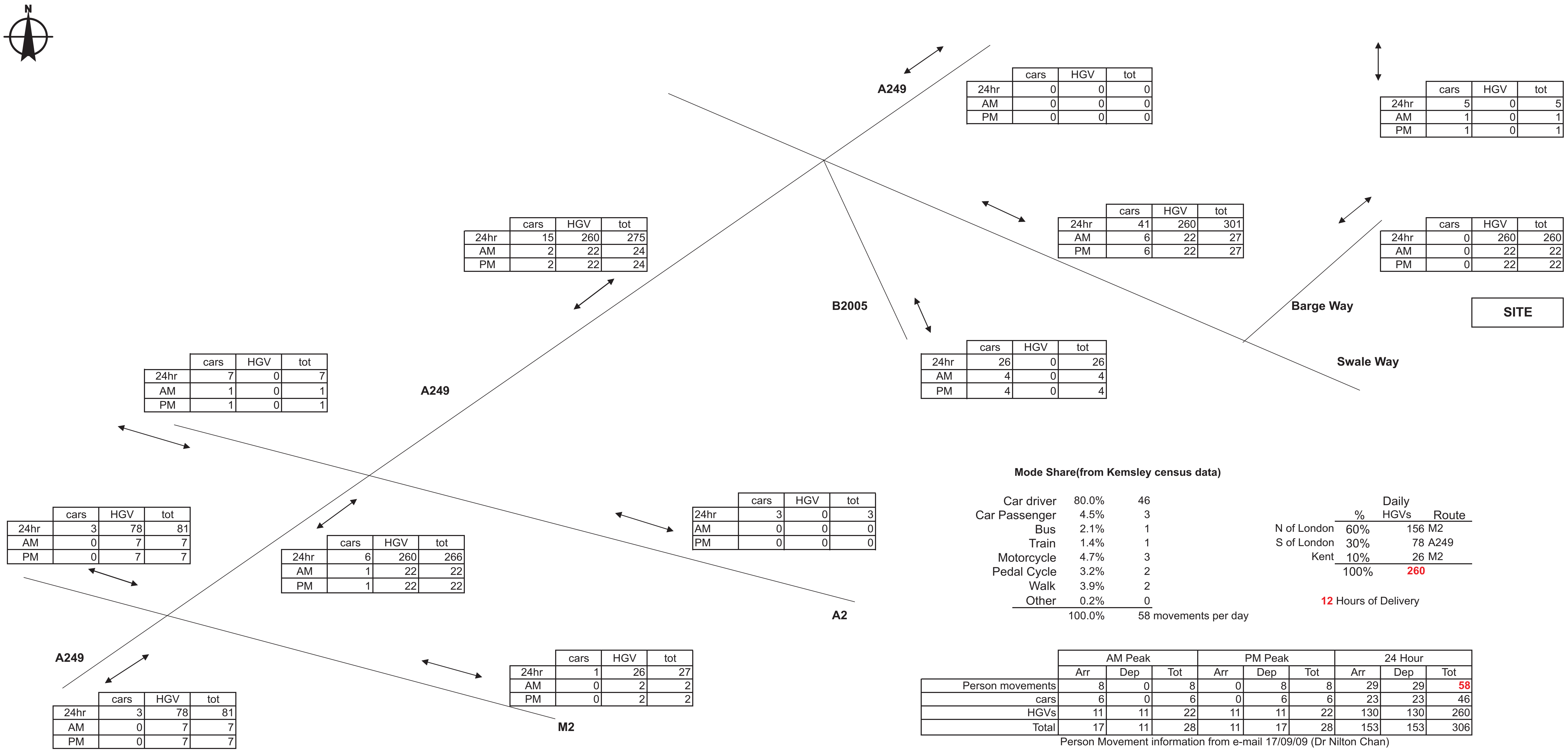
Drwg. No: JNY6360-16 | Drawn: DF | Checked: BRB

Project:
SUSTAINABLE ENERGY PLANT, SITTINGBOURNE

Title:
DISTRIBUTION PERCENTAGES

Figure No:
9

Transport



	cars	HGV	tot
24hr	0	0	0
AM	0	0	0
PM	0	0	0

	cars	HGV	tot
24hr	5	0	5
AM	1	0	1
PM	1	0	1

	cars	HGV	tot
24hr	15	260	275
AM	2	22	24
PM	2	22	24

	cars	HGV	tot
24hr	41	260	301
AM	6	22	27
PM	6	22	27

	cars	HGV	tot
24hr	0	260	260
AM	0	22	22
PM	0	22	22

	cars	HGV	tot
24hr	26	0	26
AM	4	0	4
PM	4	0	4

	cars	HGV	tot
24hr	7	0	7
AM	1	0	1
PM	1	0	1

	cars	HGV	tot
24hr	3	78	81
AM	0	7	7
PM	0	7	7

	cars	HGV	tot
24hr	6	260	266
AM	1	22	22
PM	1	22	22

	cars	HGV	tot
24hr	3	0	3
AM	0	0	0
PM	0	0	0

	cars	HGV	tot
24hr	1	26	27
AM	0	2	2
PM	0	2	2

	cars	HGV	tot
24hr	3	78	81
AM	0	7	7
PM	0	7	7

Mode Share(from Kemsley census data)

Car driver	80.0%	46
Car Passenger	4.5%	3
Bus	2.1%	1
Train	1.4%	1
Motorcycle	4.7%	3
Pedal Cycle	3.2%	2
Walk	3.9%	2
Other	0.2%	0
	100.0%	58 movements per day

	%	Daily HGVs	Route
N of London	60%	156	M2
S of London	30%	78	A249
Kent	10%	26	M2
	100%	260	

12 Hours of Delivery

	AM Peak			PM Peak			24 Hour		
	Arr	Dep	Tot	Arr	Dep	Tot	Arr	Dep	Tot
Person movements	8	0	8	0	8	8	29	29	58
cars	6	0	6	0	6	6	23	23	46
HGVs	11	11	22	11	11	22	130	130	260
Total	17	11	28	11	17	28	153	153	306

Person Movement information from e-mail 17/09/09 (Dr Nilton Chan)

	AMPeak			PMPeak			24Hour		
Link	Cars	HGVs	Total	Cars	HGVs	Total	Cars	HGVs	Total
Swale Way	6	22	27	6	22	27	41	260	301
Barge Way	0	22	22	0	22	22	0	260	260
A249 East of Swale Way	0	0	0	0	0	0	0	0	0
A249 West of Swale Way	2	22	24	2	22	24	15	260	275
M2 Junction 5 East	0	2	2	0	2	2	1	26	27
M2 Junction 5 West	0	13	13	0	13	13	2	156	158

RPS stRegis e·on

Project: **SUSTAINABLE ENERGY PLANT, SITTINGBOURNE**

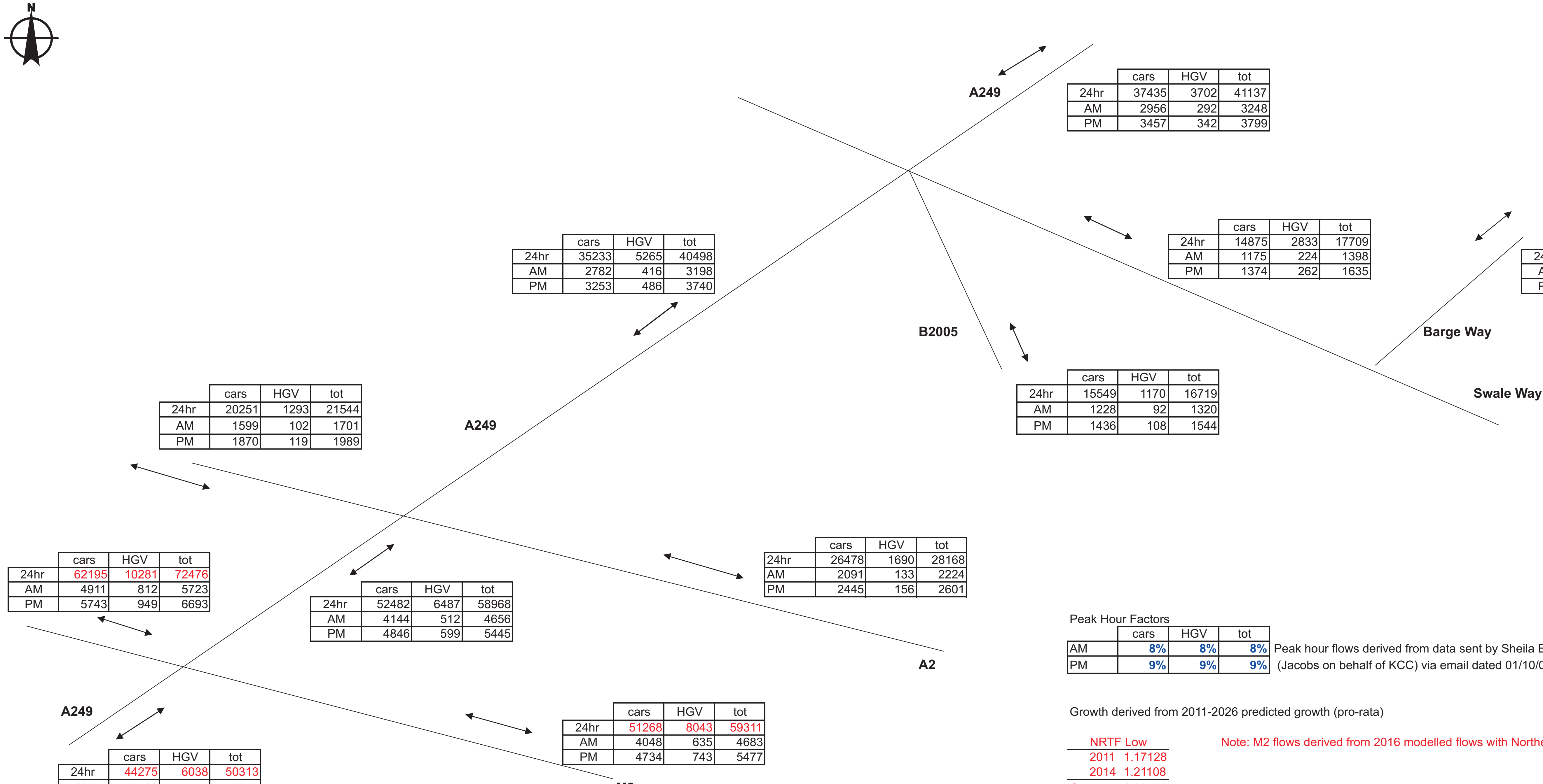
Title: **DEVELOPMENT TRAFFIC FLOWS**

Figure No: **10**

Date: **NOV 09** Scale: **NTS** Rev: **A**

Drwg. No: **JNY6360-13** Drawn: **DF** Checked: **BRB**

Transport



A249 (north-east, east of Swale Way)

	cars	HGV	tot
24hr	37435	3702	41137
AM	2956	292	3248
PM	3457	342	3799

Swale Way

	cars	HGV	tot
24hr	14875	2833	17709
AM	1175	224	1398
PM	1374	262	1635

Barge Way

	cars	HGV	tot
24hr	2897	1445	4342
AM	248	132	380
PM	301	69	370

A249 (west of Swale Way)

	cars	HGV	tot
24hr	35233	5265	40498
AM	2782	416	3198
PM	3253	486	3740

B2005

	cars	HGV	tot
24hr	15549	1170	16719
AM	1228	92	1320
PM	1436	108	1544

A2 (west)

	cars	HGV	tot
24hr	20251	1293	21544
AM	1599	102	1701
PM	1870	119	1989

A2 (east)

	cars	HGV	tot
24hr	26478	1690	28168
AM	2091	133	2224
PM	2445	156	2601

M2 (west)

	cars	HGV	tot
24hr	62195	10281	72476
AM	4911	812	5723
PM	5743	949	6693

A249 (between A2 and M2)

	cars	HGV	tot
24hr	52482	6487	58968
AM	4144	512	4656
PM	4846	599	5445

M2 (east)

	cars	HGV	tot
24hr	51268	8043	59311
AM	4048	635	4683
PM	4734	743	5477

A249 (south of M2)

	cars	HGV	tot
24hr	44275	6038	50313
AM	3496	477	3973
PM	4088	558	4646

Peak Hour Factors

	cars	HGV	tot
AM	8%	8%	8%
PM	9%	9%	9%

Peak hour flows derived from data sent by Sheila Brooke (Jacobs on behalf of KCC) via email dated 01/10/09

Growth derived from 2011-2026 predicted growth (pro-rata)

NRTF Low	
2011	1.17128
2014	1.21108
Growth	**1.03398**

Note: M2 flows derived from 2016 modelled flows with Northern Relief Road

Link	AM Peak			PM Peak			24 Hour		
	Cars	HGVs	Total	Cars	HGVs	Total	Cars	HGVs	Total
Swale Way	1,175	224	1,398	1,374	262	1,635	14,875	2,833	17,709
Barge Way	248	132	380	301	69	370	2,897	1,445	4,342
A249 East of Swale Way	2,956	292	3,248	3,457	342	3,799	37,435	3,702	41,137
A249 West of Swale Way	2,782	416	3,198	3,253	486	3,740	35,233	5,265	40,498
M2 Junction 5 East	4,048	635	4,683	4,734	743	5,477	51,268	8,043	59,311
M2 Junction 5 West	4,911	812	5,723	5,743	949	6,693	62,195	10,281	72,476

RPS stRegis e.on

Project: **SUSTAINABLE ENERGY PLANT, SITTINGBOURNE**

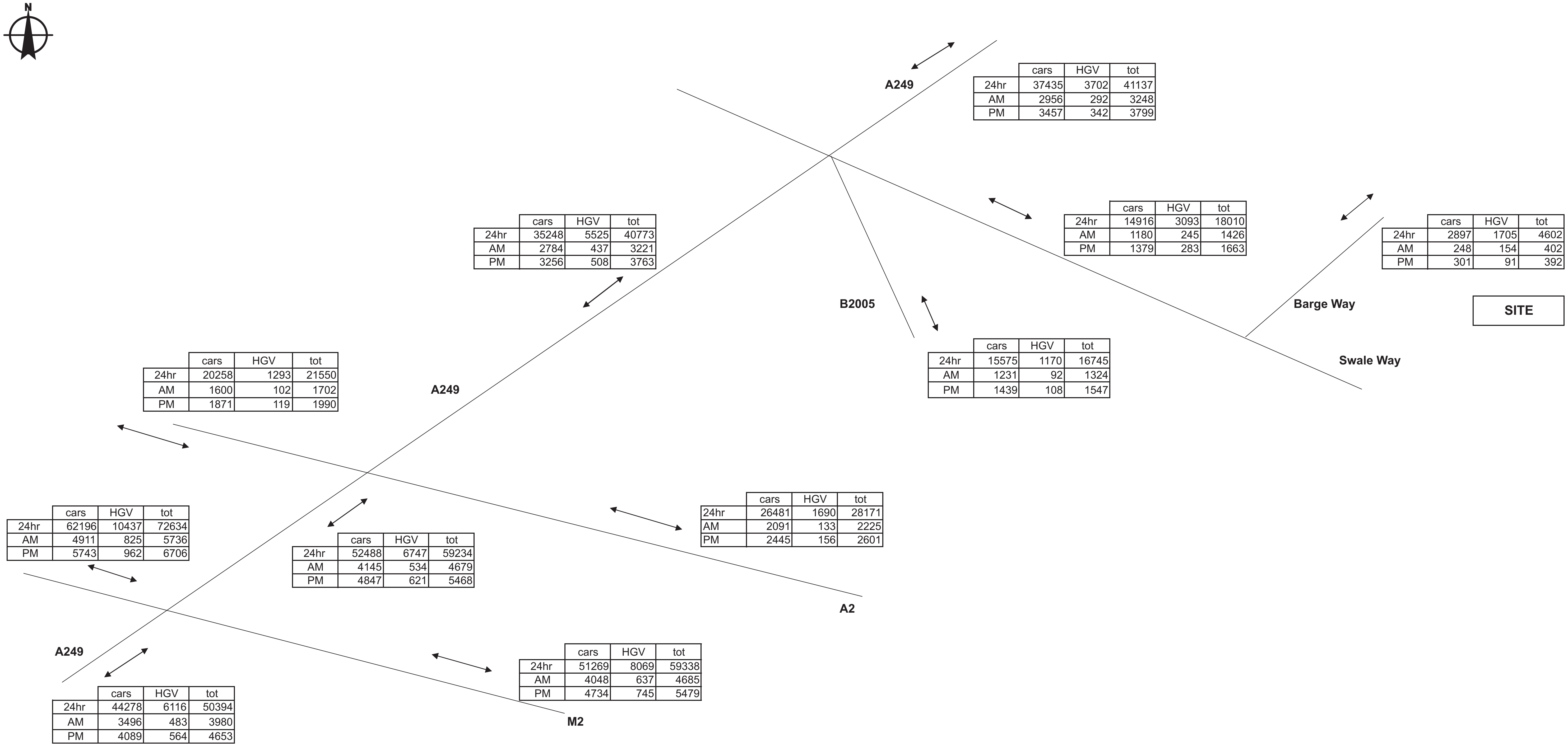
Title: **2014 BASE FLOWS**

Date: **NOV 09** Scale: **NTS** Rev:

Drwg. No: **JNY6360-12** Drawn: **DF** Checked: **BRB**

Figure No: **11**

Transport



	cars	HGV	tot
24hr	37435	3702	41137
AM	2956	292	3248
PM	3457	342	3799

	cars	HGV	tot
24hr	14916	3093	18010
AM	1180	245	1426
PM	1379	283	1663

	cars	HGV	tot
24hr	2897	1705	4602
AM	248	154	402
PM	301	91	392

	cars	HGV	tot
24hr	35248	5525	40773
AM	2784	437	3221
PM	3256	508	3763

	cars	HGV	tot
24hr	15575	1170	16745
AM	1231	92	1324
PM	1439	108	1547

	cars	HGV	tot
24hr	20258	1293	21550
AM	1600	102	1702
PM	1871	119	1990

	cars	HGV	tot
24hr	26481	1690	28171
AM	2091	133	2225
PM	2445	156	2601

	cars	HGV	tot
24hr	62196	10437	72634
AM	4911	825	5736
PM	5743	962	6706

	cars	HGV	tot
24hr	52488	6747	59234
AM	4145	534	4679
PM	4847	621	5468

	cars	HGV	tot
24hr	51269	8069	59338
AM	4048	637	4685
PM	4734	745	5479

	cars	HGV	tot
24hr	44278	6116	50394
AM	3496	483	3980
PM	4089	564	4653

	AM Peak			PM Peak			24 Hour		
Link	Cars	HGVs	Total	Cars	HGVs	Total	Cars	HGVs	Total
Swale Way	1,180	245	1,426	1,379	283	1,663	14,916	3,093	18,010
Barge Way	248	154	402	301	91	392	2,897	1,705	4,602
A249 East of Swale Way	2,956	292	3,248	3,457	342	3,799	37,435	3,702	41,137
A249 West of Swale Way	2,784	437	3,221	3,256	508	3,763	35,248	5,525	40,773
M2 Junction 5 East	4,048	637	4,685	4,734	745	5,479	51,269	8,069	59,338
M2 Junction 5 West	4,911	825	5,736	5,743	962	6,706	62,196	10,437	72,634

RPS stRegis e·on

Project:
SUSTAINABLE ENERGY PLANT, SITTINGBOURNE

Title:
2014 BASE + DEVELOPMENT FLOWS

Date: **NOV 09** Scale: **NTS** Rev: **A**

Drwg. No: **JNY6360-14** Drawn: **DF** Checked: **BRB**

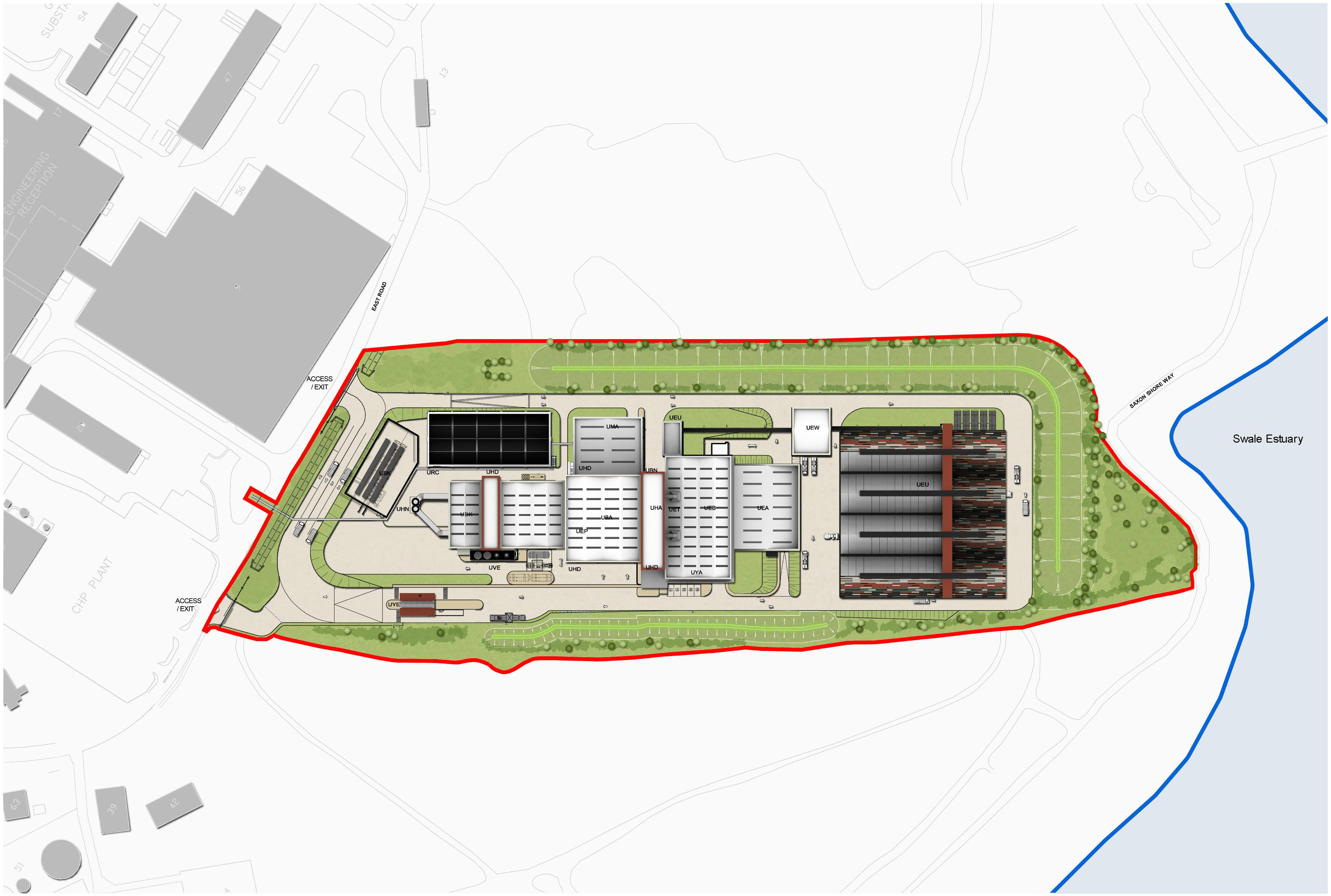
Figure No:
12

Transport

APPENDICES

APPENDIX 1

Proposed Site Layout (Drawing No. 16315/A1/P/0100A))



notes :

1. If this drawing has been received electronically it is the recipients responsibility to print the document to the correct scale.
2. All dimensions are in millimetres unless stated otherwise. It is recommended that information is not scaled off this drawing.
3. This drawing should be read in conjunction with all other relevant drawings and specifications.

10m SCALE 1:1000

KEY	
UBA	Switchgear building
UBN	Structure for emergency power generating sets
UEA	Structure for unloading solid fuels
UEB	Structure for storage of solid fuels
UEC	Controlling area
UEP	Residue silo
UET	Bottom ash storage
UEU	Structure for bottom ash transport
UEW	Structure for combustion residues handling
UHA	Boiler house
UHD	Staircase
UHN	Stack
UMA	Steam turbine building
URC	Structure for air cooled condenser
UVC	Structure for flue gas treatment
UVE	Structure for reagent supply
UYA	Office and staff amenities building
UYE	Gate house
UBK	Transformer

Note: Reference to OS of existing paper mill provided by St Regis Paper Mill in DWG format and topographical survey provided by Eon.

N

Land Ownership Boundary (blue)	
Proposed Development Boundary (red)	

Drawing for PLANNING purposes only

rev	amendments	by	ckd	date
E	E.ON logo added.	KRy	PRP	15.02.10
D	Roof plan updated. Transformer confirmed as external.	AJL	PRP	21.01.10
C	Surrounding site context and site gates added. Existing OS and colours altered.	SMG	PRP	08.12.09
B	Entrance Clarified. Red line boundary confirmed. Critical dimensions added.	AJL	PRP	02.12.09
A	Boundary confirmed, swale extent reduced	PRP	RS	19.11.09

RPS

Sherwood House
Sherwood Avenue
Newark, Nottinghamshire
NG24 1QQ

T +44 (0) 1636 605 700
F +44 (0) 1636 610 696
W www.rpsgroup.com
E rpsnewark@rpsgroup.com

Client
St Regis e·on

Project
Kemsley Sustainable Energy Plant

Title
Proposed Site Layout

Drawing Status	Date Created	Drawing Scale
Preliminary	November 2009	1:1000
Project Leader	Drawn By	Initial Review
RS	AJL	PRP

Drawing Number
16315 / A1 / P / 0100 E

Rev

FIGURE 4.3

APPENDIX 2

Calculation of Staff Distribution

				Total: All p	Total: Full-	Total: Not f	Total: Not f	Works or s	Works or s	Works or s	Works or s	Undergrou	Undergrou	Undergrou	Undergrou	Train: All p	Train: Full-	Train: Not f	Train: Not f	Bus, minib	Bus, minib	Bus, minib	Bus, minib	Taxi: All pe	Taxi: Full-t	Taxi: Not fu	Taxi: Not fu	Car – drive	Car – drive	Car – drive	Car – drive	Car – pass	Car – pass	Car – pass	Car – pass	Motorcycle	Motorcycle	Motorcycle	Motorcycle	Bicycle: All	Bicycle: Fu	Bicycle: No	Bicycle: No	On foot: Al	On foot: Fu	On foot: No	On foot: No	Other: All p	Other: Full-	Other: Not	Other: Not
00BGGG	29UMGM	Millwall	Tower Hamlets	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00LCNU	29UMGM	Luton and Wayfield	Medway	8	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00LCNN	29UMGM	Chatham Central	Medway	12	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	9	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00LCNY	29UMGM	Rainham Central	Medway	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00LCNW	29UMGM	Peninsula	Medway	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00LCNR	29UMGM	Gillingham South	Medway	18	0	15	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0	15	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00LCNZ	29UMGM	Rainham North	Medway	13	0	10	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	7	3	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
00LCPA	29UMGM	Rainham South	Medway	10	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	7	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
00LCNQ	29UMGM	Gillingham North	Medway	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00LCNS	29UMGM	Hempstead and Wigmore	Medway	7	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
00LCNT	29UMGM	Lordswood and Capstone	Medway	7	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17UCGD	29UMGM	Bolsover North West	Bolsover	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00ADGN	29UMGM	Falconwood and Welling	Bexley	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00ADGF	29UMGM	Christchurch	Bexley	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UCGJ	29UMGM	Greenhill and Eddington	Canterbury	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UCGF	29UMGM	Chartham and Stone Street	Canterbury	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UBJH	29UMGM	Weald East	Ashford	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UCGM	29UMGM	Herne and Broomfield	Canterbury	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UBJF	29UMGM	Washford	Ashford	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UDGB	29UMGM	Brent	Dartford	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UCGZ	29UMGM	Tankerton	Canterbury	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UCGU	29UMGM	St Stephens	Canterbury	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UCGT	29UMGM	Reculver	Canterbury	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UCGH	29UMGM	Gorrell	Canterbury	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UCGG	29UMGM	Chestfield and Swalecliffe	Canterbury	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UCGW	29UMGM	Seasalter	Canterbury	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UCGC	29UMGM	Barham Downs	Canterbury	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0
29UCGN	29UMGM	Heron	Canterbury	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UBJL	29UMGM	Wye	Ashford	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40UEHD	29UMGM	Taunton Manor and Wilton	Taunton Deane	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UBHX	29UMGM	Saxon Shore	Ashford	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UBHR	29UMGM	North Willesborough	Ashford	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UBHH	29UMGM	Downs West	Ashford	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34UEGN	29UMGM	St Mary's	Kettering	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18ULGG	29UMGM	Lew Valley	West Devon	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UMGJ	29UMGM	Grove	Swale	47	0	41	6	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	41	0	35	6	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
29UMGY	29UMGM	Sheerness West	Swale	27	0	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0	18	0	3	0	3	0	3	0	3	0	0	0	0	0	3	0	3	0	0	0	0	0
29UMGR	29UMGM	Murston	Swale	65	0	62	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52	0	49	3	6	0	6	0	3	0	3	0	4	0	4	0	0	0	0	0	0	0	0	0
29UMGP	29UMGM	Milton Regis	Swale	81	0	72	9	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	54	0	48	6	3	0	3	0	3	0	3	0	9	0	9	0	9	0	6	3	0	0	0	0
29UMGM	29UMGM	Kemsley	Swale	514	6	413	95	240	3	176	61	0	0	0	0	12	0	12	0	8	3	5	0	3	0	3	0	194	0	167	27	17	0	17	0	3	0	3	0	12	0	12	0	25	0	18	7	0	0	0	0
29UMGX	29UMGM	Sheerness East	Swale	34	0	31	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28	0	25	3	3	0	3	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
29UMGL	29UMGM	Iwade and Lower Halstow	Swale	12	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	9	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
29UMGW	29UMGM	St Michaels	Swale	35	0	26	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29	0	23	6	0	0	0	0	0	0	0	0	6	0	3	3	0	0	0	0	0	0	0	0
29UMGQ	29UMGM	Minster Cliffs	Swale	21	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0	18	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
29UMGH	29UMGM	East Downs	Swale	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UMGK	29UMGM	Hartlip, Newington and Upchurch	Swale	21	0	21	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	12	0	12	0	0	0	0	0	3	0	3	0	0	0	0	0	3	0	3	0	0	0	0	0
29UMGN	29UMGM	Leysdown and Warden	Swale	11	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	8	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
29UMGD	29UMGM	Borden	Swale	19	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	13	0	3	0	3	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0
29UMGG	29UMGM	Davington Priory	Swale	3	0	3	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UMGC	29UMGM	Abbey	Swale	9	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UMGE	29UMGM	Boughton and Courtenay	Swale	10	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	7	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
29UMGF	29UMGM	Chalkwel	Swale	57	6	48	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	38	0	35	3	3	3	0	0	5	0	5	0	0	0	0	0	8	3	5	0	0	0	0	0
29UMGS	29UMGM	Queenborough and Halfway	Swale	48	0	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	0	42	0	0	0	0	0	3	0	3	0	3	0	3	0	0	0	0	0	0	0	0	0
29UMGT	29UMGM	Roman	Swale	58	0	50	8	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	52	0	44	8	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29ULGC	29UMGM	Dymchurch and St Mary's Bay	Shepway	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UMGU	29UMGM	St Ann's	Swale	15	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0	12	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0
29UPHM	29UMGM	Burham, Eccles and Wouldham	Tonbridge and Malling	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UNGN	29UMGM	Dane Valley	Thanet	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UPJC	29UMGM	Larkfield South	Tonbridge and Malling	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UMHB	29UMGM	Watling	Swale	7	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UMHD	29UMGM	Woodstock	Swale	38	0	35	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	0	27	3	3	0	3	0	0	0	0	0	5	0	5	0	0	0	0	0	0	0	0	0
29UNGW	29UMGM	Northwood	Thanet	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UMHA	29UMGM	Teynham and Lynsted	Swale	23	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	20	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UPHK	29UMGM	Blue Bell Hill and Walderslade	Tonbridge and Malling	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UPJE	29UMGM	Snodland East	Tonbridge and Malling	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UNGQ	29UMGM	Garlinge	Thanet	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UMGZ	29UMGM	Sheppey Central	Swale	42	0	42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	0	36	0	3	0	3	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
29UPHS	29UMGM	East Malling	Tonbridge and Malling	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UNGX	29UMGM	St Peters	Thanet	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UMHC	29UMGM	West Downs	Swale	9	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00FBNG	29UMGM	Bridlington South	East Riding of Yorkshire	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00FBNM	29UMGM	East Wolds and Coastal	East Riding of Yorkshire	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00LCPC	29UMGM	Rochester East	Medway	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00LCPG	29UMGM	Strood Rura	Medway	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00LCPF	29UMGM	Strood North	Medway	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00LCPL	29UMGM	Watling	Medway	15	0	12	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0	9	3	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
00LCPD	29UMGM	Rochester South and Horsted	Medway	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

00LCPB	29UMGM	River	Medway	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00LCPH	29UMGM	Strood South	Medway	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
00LCPK	29UMGM	Walderslade	Medway	8	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00LCPJ	29UMGM	Twydall	Medway	16	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	0	0	0	0	0	11	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UHHA	29UMGM	North	Maidstone	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UHGS	29UMGM	Harrietsham and Lenham	Maidstone	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UHGT	29UMGM	Headcorn	Maidstone	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UHHB	29UMGM	North Downs	Maidstone	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UHGN	29UMGM	Detling and Thurnham	Maidstone	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UHHH	29UMGM	Sutton Valence and Langley	Maidstone	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
29UKGX	29UMGM	Hartley and Hodsoll Street	Sevenoaks	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UHGW	29UMGM	High Street	Maidstone	6	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UHGK	29UMGM	Boxley	Maidstone	8	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UHGL	29UMGM	Bridge	Maidstone	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UKGN	29UMGM	Crockenhill and Well Hill	Sevenoaks	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UHGQ	29UMGM	East	Maidstone	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UHGP	29UMGM	Downswood and Otham	Maidstone	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UGGL	29UMGM	Singlewel	Gravesham	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UHGF	29UMGM	Allington	Maidstone	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UGGP	29UMGM	Woodlands	Gravesham	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UHGH	29UMGM	Bearsted	Maidstone	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UGGJ	29UMGM	Riverview	Gravesham	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UGGG	29UMGM	Pelham	Gravesham	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29UGGN	29UMGM	Whitehill	Gravesham	6	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38UEHD	29UMGM	Kingston Bagpuize with Southmoor	Vale of White Horse	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				1556	12	1381	163	240	3	176	61	0	0	0	0	18	0	18	0	28	3	25	0	3	0	3	0	1050	0	967	83	59	3	50	6	62	0	62	0	42	0	39	3	51	3	38	10	3	0	3	0
				Total: All p	Total: Full-	Total: Not f	Total: Not f	Works or s	Works or s	Works or s	Works or s	Undergrou	Undergrou	Undergrou	Undergrou	Train: All p	Train: Full-	Train: Not f	Train: Not f	Bus, minib	Bus, minib	Bus, minib	Bus, minib	Taxi: All pe	Taxi: Full-ti	Taxi: Not fu	Taxi: Not fu	Car – drive	Car – drive	Car – drive	Car – drive	Car – pass	Car – pass	Car – pass	Car – pass	Motorcycle	Motorcycle	Motorcycle	Motorcycle	Bicycle: All	Bicycle: Fu	Bicycle: No	Bicycle: No	On foot: Al	On foot: Fu	On foot: No	On foot: No	Other: All p	Other: Full	Other: Not	Other: Not

Car driver	1050	80.0%
Car Passenger	59	4.5%
Bus	28	2.1%
Train	18	1.4%
Motorcycle	62	4.7%
Pedal Cycle	42	3.2%
Walk	51	3.9%
Other	3	0.2%
	1313	100.0%

RPS

Development of a Sustainable Energy Plant.

St Regis Paper Mill, Kemsley

On behalf of St. Regis Paper Mill Co and E ON Energy from Waste Limited.

Environmental Statement

Appendix 7.1:

Air and Climate

Prepared by: Guido Pellizzaro   Checked by: Fiona Prismall

34 Lisbon Street
Leeds
LS1 4LX

Tel 0113 220 6190
Fax 0113 243 9161
Email rpsld@rpsgroup.com

RPS Planning & Development

Contents

Tables, Figures & Appendices

Tables

Figures

7 Air and Climate

7.1 Background

7.1.1 A detailed air quality assessment of the potential impacts of emissions generated during the construction and operation of the proposed SEP at Swale Lane, Sittingbourne has been undertaken as part of the Environmental Impact Assessment (EIA) process. The results have been compared against relevant UK and EU air quality objective and limit values, as well as relevant Environmental Agency (EA) Environmental Assessment Levels (EALs).

7.1.2 Chapter 7.1 of the Environmental Statement (ES) describes the results of the air quality assessment carried out in support of the EIA. This document contains further technical information relevant to that assessment.

Key Atmospheric Emissions

7.1.2 The principal source of operational emissions to atmosphere from the SEP will be gases exhausted from the stack after abatement in the flue gas treatment system. Other potential sources of emissions include dust and emissions from traffic accessing the site and the cumulative effects from emissions at the existing Kemsley Paper Mill. A brief description of the key pollutants and their behaviour in the atmosphere is provided in the following sections.

Oxides of Nitrogen

7.1.3 Oxides of nitrogen (NO_x) is the collective term used to describe a mixture of nitric oxide (NO) and nitrogen dioxide (NO_2). These are formed as a result of high temperature combustion of atmospheric and fuel nitrogen. The main sources of NO_x in the UK are road traffic and power generation.

7.1.4 During the process of combustion, atmospheric and fuel nitrogen are partially oxidised via a series of complex reactions to NO_x. The process is dependant on the temperature, pressure, oxygen concentration and residence time of the combustion gases in the combustion zone. Most NO_x exhausting from a combustion process is in the form of NO, which is a colourless and tasteless gas. NO is readily oxidised to NO_2, a more harmful form of NO_x, by chemical reaction with ozone and other chemicals in the atmosphere. NO_2 is a yellowish-orange to reddish-brown gas with a pungent, irritating odour and is a strong oxidant.

Particulate

7.1.5 Particulate matter is a complex mixture of organic and inorganic solid substances suspended in the atmosphere. Primary sources are numerous and include power stations, other industrial processes, road transport, domestic coal burning and trans-boundary pollution. Secondary particulate, in the form of aerosols, attrition of natural materials and sea spray, are significant contributors to the overall atmospheric loading of particulates. In urban areas, road traffic is generally the greatest source of particulate matter, although localised effects are also associated with construction and demolition activity.

Sulphur Dioxide

7.1.6 Sulphur dioxide (SO_2) is formed by the combustion of sulphur-containing fuel. SO_2 is a major contributor to acid deposition.

Carbon Monoxide

7.1.7 Carbon monoxide (CO) is a colourless, odourless gas produced by the incomplete combustion of carbon-based fuels and by biological and industrial processes. The major source of carbon monoxide is traffic, particularly in urban areas. CO is produced under conditions of inefficient combustion, is rapidly dispersed away from the source and is relatively inert over the timescales relevant for its dispersion.

Hydrogen Chloride

7.1.8 The major sources of hydrogen chloride (HCl) emissions are coal combustion and waste incineration. The decline in coal use and the installation of Flue Gas Desulphurisation (FGD) at remaining coal-fired power stations (HCl is typically captured preferentially to SO_2 by FGD absorbents) has resulted in a decline in HCl emissions of up to 55% since 1970.

Heavy Metals

7.1.9 Assessment of metals is required, as the SEP will be regulated under Directive 2000/76/EC. The intake of metals via inhalation is very small in comparison with the intake via food. The natural range of many metals in soils is very wide.

Hydrocarbons

7.1.10 Hydrocarbons can be emitted in both gaseous and liquid forms. Car exhaust emissions containing both uncombusted fuel and incompletely combusted fuel are the most significant source in most locations. Hydrocarbons are relatively inert over the timescales relevant for local pollution effects but are reactive over longer timescales in photochemical reactions. Individual compounds of interest within this class of pollutants include benzene and 1,3-butadiene.

Polycyclic Aromatic Hydrocarbons

7.1.11 Polycyclic Aromatic Hydrocarbons (PAHs) are a group of semi-volatile compounds that are formed by incomplete combustion of carbon-containing fuel. Some PAHs have been identified as carcinogenic, mutagenic or teratogenic. As there are numerous compounds classified as PAHs, the potential effect of PAHS is commonly assessed against an indicator compound in the group benzo(a)pyrene.

Dioxins and Furans

7.1.12 Polychlorinated dibenzo-p-dioxins (PCDDs) or “dioxins” and the closely related polychlorinated dibenzofurans (PCDFs) or “furans” constitute a group of chemicals that are found ubiquitously in the environment at low levels. PCDDs and PCDFs have a number of recognised sources among which are their formation as by-products of chemical processes such as the manufacture of wood preservatives and herbicides, the smelting of copper and scrap metal, the recovery of plastic coated wire, fireworks and natural combustion such as forest fires. More commonly, they are found in combustion products, the ash, stack effluents, water and other process fluids from the combustion of coal, wood, municipal and industrial waste. PCDDs and PCDFs can enter the soil system through atmospheric deposition from combustion processes.

Polychlorinated Biphenyls

7.1.13 Polychlorinated Biphenyls (PCBs) are a class of organic compounds with 1 to 10 chlorine atoms. Low quantities of PCBs are found in most municipal waste streams. Wastes with elevated proportions of PCBs generally only arise from specific PCB collection and destruction programmes.

Persistent Organic Pollutants

7.1.14 The AEA UK Emissions of Air Pollutants 1970 to 2006 [1] summarises the 2006 UK emissions of Persistent Organic Pollutants (POPs) as follows: 1,209 tonnes PAHs (USEPA 16), 197 g I-TEQ PCDD/F (grams of ‘toxic equivalent’ of dioxins & furans) and 1.00 tonnes PCBs. Emissions from all three of these pollutant groups have decreased significantly since 1990. Emissions in 2006 equate to decreases of 84%, 83% and 85% on the 1990 emissions, for PAHS, PCDD/Fs and PCBs respectively. A summary of calculated changes in emissions between 1990 and 2006 is shown in Figure A.1.

Carbon Dioxide

7.1.15 Carbon dioxide (CO_2) is formed by combustion of fuels and emissions are dependant on the carbon content of the fuel. CO_2 does not give rise to local health effects in ambient concentrations, but it is a significant contributor to the global warming effect. This process allows incoming radiation to pass through the Earth’s atmosphere but prevents much of the outgoing radiation from escaping to outer space.

Road Traffic Emissions

7.1.16 The key emissions associated with road traffic in the context of local air quality and health impacts are nitrogen dioxide (NO_2) and suspended particles (as PM_{10}). Emissions of total nitrogen oxide (NO_x) from motor vehicle exhausts comprise nitric oxide (NO) and NO_2. NO oxidises in the atmosphere to form NO_2. NO_x can affect sensitive vegetation directly and contribute to regional acid deposition.

7.1.17 In addition to these pollutants, motor vehicles also emit carbon monoxide, benzene, 1,3-butadiene, unburnt hydrocarbons and various greenhouse gases including CO_2. However, the air quality traffic assessment is limited to the key traffic-related pollutants, NO_2 and PM_{10}.

7.2 Legislation and Planning Context

European Legislation

7.2.1 The European Union Framework Directive 1996/62/EC [2] on ambient air quality assessment and management came into force in November 1996 and had to be implemented by Member States, including the UK, by May 1998. The Directive aims to protect human health and the environment by avoiding, reducing or preventing harmful concentrations of air pollutants. As a Framework Directive it requires the Commission to propose and set "Daughter" Directives prescribing air quality limit values and alert thresholds together with guidance on monitoring and measurement of individual pollutants.

7.2.2 In the late 1990s, the Clean Air for Europe (CAFE) programme was established with a view to combine the air quality directives into a new single directive. On 21 September 2005, the European Commission adopted the Thematic Strategy on Air Quality proposed under the CAFE programme.

7.2.3 The main aims of the Thematic Strategy were to address the following:

- the need for an holistic approach to preventing air pollution;
- the evidence that particles with a mean aerodynamic diameter of less than 2.5 µm, $PM_{2.5}$, are potentially more hazardous than larger particles. The current limit values are for particles with a mean aerodynamic diameter of less than 10 µm, PM_{10}; and
- the current limit value based system requires Member States to reduce levels of pollutants in a relatively small number of highly localised 'hot-spots' rather than a general reduction in exposure. Effort and investment may be misplaced if pollutant levels are reduced in locations where the sources of pollution do not give rise to significant health or environmental concerns.

7.2.4 A new EU Directive 2008/50/EC [3], replacing all previous directives delivers the aims of the Strategy. The new Directive is to be implemented by Member States by June 2010. Where the Directive establishes limit values, a two stage approach is adopted. A lower limit value applies at Stage 2, allowing the Member States to demonstrate progress towards meeting the limit value over time. The new Directive makes provision for the:

- withdrawal of the Stage 2 2010 PM_{10} indicative limit values and the opportunity to apply for an extension to the existing target dates for achievement of the limit values;
- introduction of a 'national exposure reduction target' to the average of annual-mean $PM_{2.5}$ concentrations measured at urban background locations throughout the territory of a Member State by up to 20% between 2010 and 2020 with the actual reduction dependent on the initial concentration;
- introduction of an 'exposure concentration obligation' based on the average of annual-mean $PM_{2.5}$ concentrations measured at urban background locations throughout the territory of a Member State of 20 $\mu g.m^{-3}$ to be met by 2015;
- introduction of a target value for annual-mean $PM_{2.5}$ of 25 $\mu g.m^{-3}$ to be met by 1 January 2010; and
- introduction of a Stage 1 limit value for annual-mean $PM_{2.5}$ of 25 $\mu g.m^{-3}$ to be met by 1 January 2015 and an indicative Stage 2 limit value of 20 $\mu g.m^{-3}$ to be met 1 January 2020. Results from the Consultation have not yet been published.

National Legislation

Air Quality Standards Regulations

7.2.5 The Air Quality Standards Regulations 2007 [4] implement limit values prescribed by the EU Directive 1996/62/EC and the relevant Daughter Directives within England. The limit values are legally binding and the Secretary of State, on behalf of the UK Government, is responsible for their implementation.

UK Air Quality Strategy

7.2.6 The original UK Air Quality Strategy (AQS) [5] was published in January 2000 and described the Government's strategy for improving air quality in the UK. One of the key aspects of the strategy was the setting of air quality objectives for eight pollutants, namely benzene, 1,3-butadiene, ozone, carbon monoxide, lead, nitrogen dioxide, particulates and sulphur dioxide. The objectives are statements of policy intentions made by the UK Government and its Devolved Administrations. The AQS objectives are based on the evidence supporting the identification of the limit values and, in some instances, are more onerous than the requirements established by the limit values.

7.2.7 The Government announced tighter objectives for particulates, benzene and carbon monoxide and a new objective for polycyclic aromatic hydrocarbons in an Addendum to the AQS [6], published in February 2003. The Addendum included new provisional objectives for particulates in addition to existing objectives within the 2000 Strategy.

7.2.8 The current UK AQS [7] was published in July 2007 and updates the original strategy to set out new objectives for local authorities in undertaking their local air quality management duties.

7.2.9 The provisional objectives for PM_{10} are removed from the current AQS. Objectives in the current AQS are in some cases more onerous than the limit values set out within the relevant EU Directives, Daughter Directives and the Air Quality Standards Regulations 2007. In addition, objectives have been established for a wider range of pollutants.

7.2.10 Under the Environment Act 1995, local authorities have a duty to review and assess local air quality within their administrative area. The Review & Assessment (R&A) process requires local authorities to undertake a phased assessment to identify any areas likely to experience exceedences of the air quality objectives. Any location likely to exceed the objectives must be designated an Air Quality Management Area (AQMA) and an Air Quality Action Plan (AQAP) must be prepared and implemented, with the aim of achieving the objectives in the designated area.

7.2.11 It is expected that local air quality management in the UK will be assessed and controlled under the above framework for the foreseeable future. For the purposes of this assessment, the limit values set out in the Air Quality Standards Regulations 2007 and the objective levels specified under the current UK AQS have been used.

National Policy Guidance – Air Quality

7.2.12 Policy Guidance: Local Air Quality Management LAQM.PG(09) [8] is designed to assist local authorities with their local air quality management duties. This guidance is intended to enable local authorities to improve on the service they already provide in tackling poor air quality. The guidance emphasises the “importance of developing integrated policies between local authority departments, local strategic partners and other organisations in tackling air pollution“

National Policy Guidance – Planning, Waste and Pollution Control

7.2.13 Specified waste management facilities are regulated under the new Environmental Permitting Regulations 2008, which as of 6 April 2008, bring under one regulatory regime those facilities that formerly fell under the Waste Management Licensing Regulations 1994 or the Pollution Prevention and Control (PPC) Regulations 2000.

7.2.14 Government Planning Policy Statement 23, Planning and Pollution Control (PPS23) [9] offers guidance to local authorities on the relationship between controls over development under planning law, and controls under the above described pollution control legislation. It updates and replaces the earlier Planning Policy Guidance 23 (PPG23) and takes into account the AQS, the system of LAQM under Part IV of the Environment Act 1995 and climate change.

7.2.15 PPS23 states that any air quality consideration that relates to land use and its development is capable of being a material planning consideration. The weight given to air quality in deciding the application will depend on such factors as: the severity of the impacts on air quality; the air quality in the area surrounding the proposed development; the length of time people are likely to be exposed; and the positive benefits provided through other material considerations.

7.2.16 PPS23 sets out those circumstances where air quality may be a material issue for planning applications and provides guidance to planning authorities on making these decisions. It states that air quality is likely to be particularly important where:

- the development is proposed inside, or adjacent to, an Air Quality Management Area (AQMA) as designated under Part IV of the Environment Act 1995;
- the development could in itself result in the designation of an AQMA; and/or
- to grant planning permission would conflict with, or render unworkable, elements of a local authority's air quality action plan.

7.2.17 However, not all planning applications for developments inside or adjacent to AQMAs should be refused if developments would result in a deterioration of local air quality. Local Planning Authorities (LPAs), transport authorities and pollution control authorities should explore the possibility of securing mitigation measures that would allow the proposal to proceed and therefore all applications should be supported by such information as is necessary to allow a full consideration of the impact of the proposal on the air quality of the area.

7.2.18 In considering planning applications for waste management facilities Waste Planning Authorities (WPAs) should consider the likely impact on the local environment and on amenity. Annex E of PPS10 (Planning for Sustainable Waste Management) lists the factors that WPAs should consider, which includes odour and air emissions/dust.

Regional Planning Policy

7.2.19 The Regional Spatial Strategy for the South East [10] sets out the long term spatial planning framework for the region over the period to- 2026. Policy NRM9 concerns the management of air quality:

Strategies, plans, programmes and planning proposals should contribute to sustaining the current downward trend in air pollution in the region. This will include seeking improvements in air quality so that there is a significant reduction in the number of days of medium and high air pollution by 2026. Local development documents and development control can help to achieve improvements in local air quality through:

i. ensuring consistency with Air Quality Management Plans
ii. reducing the environmental impacts of transport, congestion management, and support the use of cleaner transport fuels
iii. mitigating the impact of development and reduce exposure to poor air quality through design, particularly for residential development in areas which already, or are likely to, exceed national air quality objectives
iv. encouraging the use of best practice during construction activities to reduce the levels of dust and other pollutants
v. assessing the potential impacts of new development and increased traffic levels on internationally designated nature conservation sites, and adopt avoidance and mitigation measures to address these impacts.

7.2.20 Policy W15: Hazardous and other specialist waste facilities specify:

The regional planning body, and the South East Regional Technical Advisory Body for waste, through the Hazardous Waste Task Group will maintain guidance on regional hazardous waste management requirements. Current priority needs include:
i. hazardous waste landfill capacity, particularly to serve the needs of the south and south-east of the region
ii. treatment facilities for air pollution control residues (from combustion facilities)
iii. supported by a network of transfer facilities
iv. a sub-regional network of contaminated C&D waste treatment facilities
v. a sub-regional network of landfill cells for stabilised non-reactive hazardous wastes.
Waste development documents will :
vi. identify and safeguard sites for storage, treatment and remediation of contaminated soils and demolition waste
vii. identify criteria for the determination of large scale specialist hazardous waste facilities
viii. assess available landfill provision and, where necessary, encourage the creation of a protective cell for stable hazardous waste.

7.2.21 Policy W5: Targets for diversion from landfill states:

A substantial increase in recovery of waste and a commensurate reduction in landfill is required in the region.

Waste planning authorities (WPAs) should ensure that policies and proposals are in place to contribute to the delivery of these targets, and waste management companies should take them into account in their commercial decisions. The optimal management solution will vary according to the individual material resource streams and local circumstances and will usually involve one or more of the following processes:

- *re-use*
- *recycling*
- *mechanical and/or biological processing (to recover materials and produce compost,*
- *soil conditioner or inert residue)*
- *thermal treatment (to recover energy)*
- *priority will be given to processes higher up this waste hierarchy.*

WPAs should continue to provide sufficient landfill capacity to process residues and waste that cannot practicably be recovered.

7.2.22 In relation to the management of waste Policy W7 identifies:

Waste planning authorities (WPAs) will provide for an appropriate mix of development opportunities to support the waste management facilities required to achieve the targets set out in this strategy.

In bringing forward and safeguarding sites for waste management facilities, WPAs should consider the type, size and mix of facilities that will be required, taking into account:

- *activities requiring largely open sites, such as aggregate recycling and open windrow composting*
- *activities of an industrial nature dealing with largely segregated materials and requiring enclosed premises, such as materials recovery facilities, dis-assembly and re-manufacturing plants, and reprocessing industries*
- *activities dealing with mixed materials requiring enclosed industrial premises, such as mechanical-biological treatment, anaerobic digestion and energy from waste facilities*
- *hybrid activities requiring sites with buildings and open storage areas, including re-use facilities and enclosed composting systems.*

In areas of major new developments consideration should be given to identifying sites for integrated resource recovery facilities and new resource parks accommodating a mix of activities where they meet environmental, technical and operational objectives.

7.2.23 Policy W12: Other Recovery and Diversion Technologies states:

The regional planning body, SEEDA, the Environment Agency and the regional partners will promote and encourage the development and demonstration of anaerobic digestion and advanced recovery technologies that will be expected to make a growing contribution towards the delivery of the regional targets for recovery, diversion from landfill, and renewable energy generation over the period of the Plan.

Waste development documents and municipal waste management strategies should only include energy from waste as part of an integrated approach to management. All proposed waste facilities should:

i. operate to the required pollution control standard
ii. include measures to ensure that appropriate materials are recycled, composted and recovered where this has not been carried out elsewhere.

Proposed thermal facilities should, wherever possible, aim to incorporate combined generation and distribution of heat and power.

Local Planning Policy

Kent Waste Local Plan

7.2.24 The Kent Waste Local Plan [11] was adopted in March 1998 and provides a framework for development and land-use planning up to 2011. It contains policies for waste management developments and identifies potential sites for different waste management uses.

7.2.25 In September 2004, the Planning & Compulsory Purchase Act introduced a new development plan system intended to streamline the local planning process. Under the new system, the Local Plan will be replaced by a Local Development Framework (LDF). However, the Kent Waste Local Plan will remain in place until replacement policies are developed. The following policy, W11, relates to the proposed development:

The following locations have the potential for a waste to energy plant adjacent to:-

(i) the medway at halling
(ii) the medway at kingsnorth

(iii) the swale at kemsley

(iv) the stour at richborough

Proposals at these and other locations will be examined against the following considerations:-

- *(a) whether the site is within a major established or committed industrial or industrial type area*
- *(b) whether the proposed development would cause significant harm to residential amenities due to noise, dust, smell or visual impact*
- *(c) whether the site would have, or is planned to have, ready accessibility to the primary or secondary route network and could be either rail or water linked*
- *(d) whether the proposed development would be unduly obtrusive in the landscape*
- *(e) whether the impact on the natural environment would be minimised*
- *(f) whether the proposed development would use undeveloped land*
- *(g) whether the proposed development would deal with ash residues as an integral part of the operation by disposing of them according to the following order of priority:-*
  - *(i) re-use; or,*
  - *(ii) deposit on site; or, if no such facility is available*
  - *(iii) removal by making use of rail or river transport; or*
  - *(iv) deposit on land at an acceptable location as close as possible to the site*

Kent Joint Municipal Waste Management Strategy

7.2.26 The Municipal Waste Management Strategy [12] was adopted in April 2007 as part of the Kent Waste Partnership. The purpose of the Strategy is to set out how municipal solid waste is managed over the next 20 years. The following policies are applicable to this development:

Policy1 - The KWP will encourage the conservation of resources through the use in Kent of materials and energy recovered from wastes produced in Kent. It will aim to influence other areas of public policy and service delivery to support this agenda.

Policy 14 – A timely procurement programme will be implemented to provide sufficient capacity for Kent to continue to meet its statutory targets for the diversion of biodegradable municipal waste.

Swale Borough Local Plan

7.2.27 The Swale Borough Local Plan First was adopted by Swale Borough Council (SBC) on 20th February 2008 [13]. This supersedes the Swale Borough Local Plan 2000 and forms part of the statutory development for the Borough.

7.2.28 A key priority of the existing Local Plan is to reduce noise pollution and improve the quality of air, land and water. The following policies relate to air pollution:

Policy E1: General Development Criteria states:

The Borough Council expects all development proposals to:

1. *accord with the policies and proposals of the Plan unless material considerations indicate otherwise;*
2. *include information sufficient to enable the Council to determine the application;*
3. *respond positively by reflecting the positive characteristics and features of the site and locality;*
4. *accord with adopted Supplementary Planning Documents;*
5. *protect and enhance the natural and built environments;*
6. *be both well sited and of a scale, design and appearance, that is appropriate to the location with a high standard of landscaping;*
7. *meet the highest standards of accessibility and inclusion so that all potential users, regardless of disability, age or gender can use them safely and easily;*
8. *cause no demonstrable harm to residential amenity and other sensitive uses or areas;*
9. *provide safe vehicular access, convenient routes and facilities for pedestrians and cyclists and, where appropriate, enhanced public transport facilities and services;*
10. *integrate security and safety measures within their design and layout; and*
11. *provide parking and servicing facilities in accordance with the County Council's standards.*

Policy E2: Pollution states:

All development proposals will minimise and mitigate pollution impacts. Development proposals will not be permitted that would, individually or cumulatively, give rise to pollution significantly adversely affecting the following:

- *human health;*
- *residential amenity;*
- *flora and fauna;*
- *areas or buildings of architectural or historic interest;*

- *rural areas; and*
- *water supply sources, groundwater aquifers, or local hydrology.*

7.3 Dispersion Modelling

Dispersion Model Selection

7.3.1 A number of commercially available dispersion models are able to predict ground level concentrations of pollutants resulting from emissions from elevated point sources. No commercially available dispersion model is wholly accurate and all models will produce variations in results under certain conditions. This assessment uses the detailed dispersion model ADMS 4.1.

7.3.2 ADMS 4.1 (the Atmospheric Dispersion Modelling System) is a practical dispersion model developed by Cambridge Environmental Research Consultants (CERC) that models a wide range of buoyant and passive releases to atmosphere either individually or in combination.

7.3.3 ADMS brings together the results of recent research on dispersion modelling. The model calculates the mean concentration over flat terrain and also allows for the effect of plume rise, complex terrain, buildings, radioactive decay and deposition. The model has been subject to extensive validation.

7.3.4 ADMS comprises a number of individual modules each representing one of the processes contributing to dispersion or an aspect of data input and output. Amongst the features of ADMS are:

- an up-to-date dispersion model in which the boundary layer structure is characterised by the height of the boundary layer and the Monin-Obukhov length, a length scale dependent on the friction velocity and the heat flux at the surface. This approach allows the vertical structure of the boundary layer, and hence concentrations, to be calculated more accurately than does the use of Pasquill-Gifford stability categories, which have been used in many previous models (e.g. ISCST3). The restriction implied by the Pasquill-Gifford approach that the dispersion parameters are independent of height is avoided. In ADMS the concentration distribution is Gaussian in stable and neutral conditions, but the vertical distribution is non-Gaussian in convective conditions, to take account of the skewed structure of the vertical component of turbulence;
- a number of complex modules including the effects of plume rise, complex terrain, coastlines, concentration fluctuations, radioactive decay and buildings; and
- a facility to calculate long-term averages of hourly mean concentration, dry and wet deposition fluxes and radioactivity, and percentiles of hourly mean concentrations, from either statistical meteorological data or hourly average data

Dispersion Model Setup

Meteorological Data

7.3.5 The most important meteorological parameters governing the atmospheric dispersion of pollutants are wind direction, wind speed and atmospheric stability as described below:

- Wind direction determines the sector of the compass into which the plume is dispersed.
- Wind speed affects the distance that the plume travels over time and can affect plume dispersion horizontally by increasing the initial dilution of pollutants, and vertically by inhibiting plume rise.
- Atmospheric stability is a measure of the turbulence of the air, and particularly of its vertical motion. It therefore affects the spread of the plume as it travels away from the source. New generation dispersion models, such as ADMS, use a parameter known as the Monin-Obukhov length that, together with the wind speed, describes the stability of the atmosphere.

7.3.6 For meteorological data to be suitable for dispersion modelling purposes, a number of meteorological parameters need to be measured on an hourly basis. These parameters include wind speed, wind direction, cloud cover and temperature. There are only a limited number of sites where the required meteorological measurements are made.

7.3.7 The year of meteorological data that is used for a modelling assessment can have a significant effect on source contribution concentrations. Dispersion model simulations were performed for emissions from the SEP using five years of data from Gravesend (approximately 40 km north west of the site) between 2004 and 2008. This meteorological station was recommended as the most representative by the Meteorological Office.

7.3.8 Wind roses have been produced for each of the years of meteorological data used in this assessment and are shown in Figure A2.

Terrain

7.3.9 The presence of elevated terrain can significantly affect (usually increase) ground level concentrations of pollutants emitted from elevated sources such as stacks, by reducing the distance between the plume centre line and ground level, as well as increasing turbulence and hence, plume mixing. Although terrain in the surrounding area is not considered likely to give rise to significant effects, terrain data have been included in the dispersion model for completeness.

Surface Roughness

7.3.10 The roughness of the terrain over which a plume passes can have a significant effect on dispersion by altering the velocity profile with height, and the degree of atmospheric turbulence. This is accounted for by a parameter called the surface roughness length.

7.3.11 To account for the mixed rural and urban nature of the immediate vicinity of the proposed site, a surface roughness length of 0.5 m has been assigned during the meteorological processing in ADMS.

Building Wake Effects

7.3.12 The movement of air over and around buildings generates areas of flow circulation, which can lead to increased ground level concentrations in the building wakes. Where building heights are greater than about 30 - 40% of the stack height, downwash effects can be significant. The dominant structure (i.e. that most likely to promote local turbulence) is Building B. The dimensions of the buildings included within the model are listed in Table 7.1.

Table 7.1: Dimensions of Buildings Included Within the Dispersion Model

Building	National Grid Reference of Building Centre	Height (m) in AOD$^{(a)}$	Length (m)	Width (m)	Angle (^{0}) from North
Building B*	592168, 166606	49	51.4	45.8	45
Building A	592110, 166576	37	77.3	65.3	45
Deaerator	592033, 166422	25	25	9	90
Control Block	592028, 166392	15	30	36	0
GT House 1	592003, 166384	16	22	8	0
GT House 2	591987, 166378	16	22	8	0
Package Boilers	591949, 166368	13	35	35	0
PRW Storage Plant	51939, 166446	20	15	60	0
FBC Boiler House	591973, 166413	28	26	15	90
Fabric Filters	591922, 166421	18	10	4	90

Note: * Selected as the main building in ADMS
(a) Above Ordance Datum

Roads Modelling

Model Verification

7.3.13 The method used within this assessment is consistent with the verification process set out in LAQM.TG(09). The process requires a comparison of the monitored NO_x road contribution with the modelled NO_x road contribution.

7.3.14 Following the comparison of monitored and modelled concentrations, an adjustment factor may be determined, based on the relationship between the monitored and modelled road contributions, and applied to predicted concentrations.

Roadside Monitoring

7.3.15 Roadside monitoring sites include the influence of road sources and are therefore not representative of background concentrations. Available data from 19 roadside diffusion tubes are presented in Table 7.2:

Table 7.2: Passively Monitored Roadside Annual-mean NO_2 Concentrations ($\mu g.m^{-3}$)

Site ID	X	Y	Annual-mean		
			2006	2007	2008
SW15	587968	164224	31.1	31.7	39.3
SW16	588122	164122	41.4	44.7	58.5
SW17	589799	163863	28.0	29.8	34.2
SW19	585907	164794	33.6	36.8	36.0
SW21	595277	162420	28.1	30.7	46.0
SW35	585962	164779	59.3	54.2	65.3
SW37	585868	164803	42.2	42.8	48.3
SW38	585784	164834	40.6	41.1	43.3
SW39/48/49	590359	164408	N/D	39.6	46.8
SW42/43/44	585936	164788	56.3	57.2	64.0
SW45	585992	164772	42.9	47.9	53.5
SW53/54/55	591404	163472	N/D	44.8	50.9
SW56	591451	163465	N/D	54.7	64.0
SW57	591448	163482	N/D	42.9	46.9
Min			28.0	29.8	34.2
Max			59.3	57.2	65.3

Note: ND = No Data

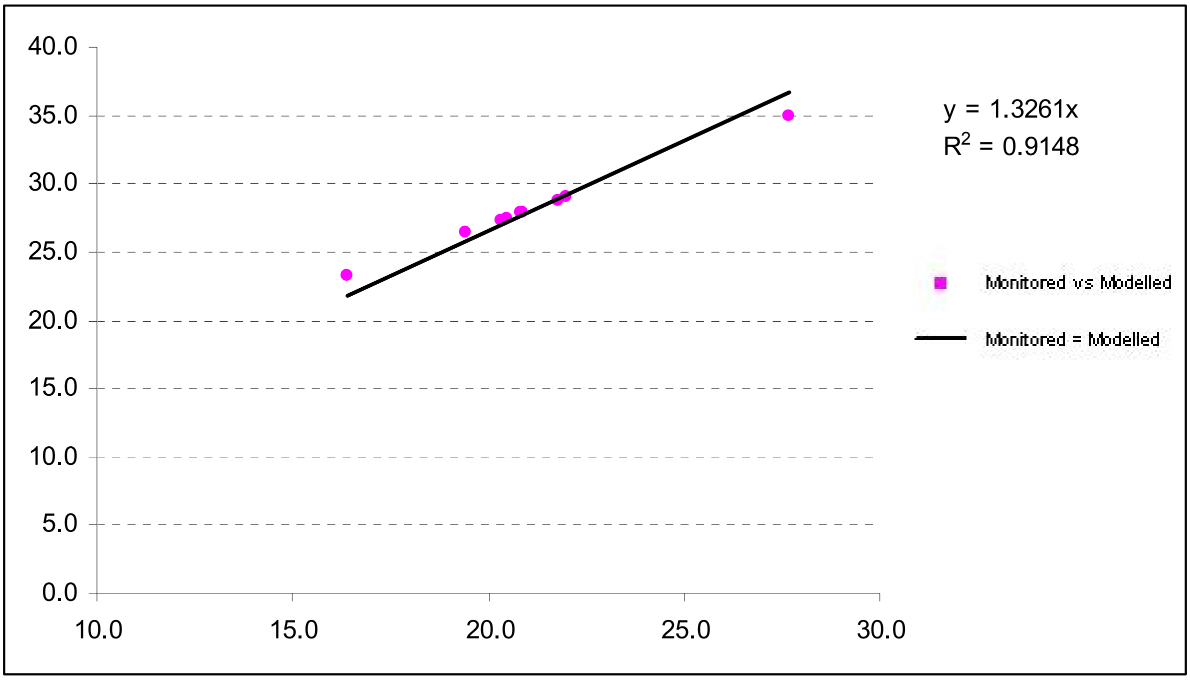
Results of the Model Verification

7.3.16 Annual-mean NO_x concentrations in 2011 have been predicted at the above diffusion tubes, using the method set out in the Air Quality Chapter. Predicted annual-mean NO_X road contributions have been calculated and compared with the predicted monitored road contribution of NO_x, derived from the monitored data and the NO_2 to NO_x calculator provided in TG09. The results are tabulated in Table 7.3 and presented in Graph 7.1.

Table 7.3: Comparison on Monitored and Modelled Annual-mean Concentrations ($\mu g.m^{-3}$)

Diffusion Tube	Monitored Roadside NO_x Contribution	Modelled Roadside NO_x Contribution
SW15	27.7	34.9
SW16	21.8	28.8
SW17	22.0	29.0
SW19	20.9	27.9
SW21	16.4	23.3
SW37	20.3	27.3
SW45	20.8	27.8
SW53/54/55	20.5	27.5
SW56	19.4	26.4

Graph 7.1: Comparison of Monitored and Modelled Annual-Mean Concentrations (µg.m^{-3})



Note: R^2 is a statistical measure of how well a regression line approximates real data points; R^2 = 1.0 or 100% indicates a perfect fit. R = [covariance (x,y)] / [(Standard Deviation of x) x (Standard Deviation of y)]

7.3.17 The trend line of y=x suggests that the model is under-predicting by a factor of 1.3261, while the R2 value for this 'line of best fit' is 0.9148 (91.48%) which represents a strong relationship suggesting that for the predicted values require correction. A factor of 1.3261 has been applied to the predicted annual-mean road-related concentrations to correct the modelled concentrations relative to the monitored results.

7.4 Baseline Conditions

Overview

7.4.1 Information on air quality in the UK is available from a variety of sources including local authorities, national network monitoring sites and other published sources.

7.4.2 For the purposes of this assessment, data have been obtained from Swale Borough Council (SBC), Maidstone Borough Council (MBC), Ashford Borough Council (ABC), Canterbury City Council (CCC), Medway Council (MC), the National Air Quality Information Archive (NAQIA), the UK Nitric Acid Monitoring Network [14] and a report by the Expert Panel on Air Quality

Standards (EPAQS) [15]. Additional data have also been taken from project-specific local monitoring.

7.4.3 Where possible, data have been obtained from monitoring sites which are classified as ‘urban background’. Pollutant levels at urban background monitoring sites are considered to be broadly representative of ambient background conditions and are therefore suitable for the purposes of deriving ambient air quality concentrations.

Local Review and Assessment of Air Quality

Swale Borough Council [16]

7.4.4 SBC completed the first round of its Review and Assessment (R&A) process between 1998 and 2001 this concluded that the Air Quality Strategy (AQS) objectives for all pollutants would be met by the relevant target dates.

7.4.5 Between 2002 and 2005, the second round of the R&A process identified an exceedence of the NO_2 objective along the A2 at Ospringe.

7.4.6 Following the third round of review and assessment the council declared an AQMA along the High Street and London Road in Newington.

Maidstone Borough Council [17]

7.4.7 The first round of the R&A processes were undertaken between 1998 and 2001. This concluded it was necessary to declare an AQMA between Junctions 6 and 7 of the M20 due to road traffic emissions.

7.4.8 Following a second R&A, between 2002 and 2003, it was likely annual-mean NO_2 concentrations along main roads in the Town Centre would not meet the relevant air quality objective. In 2005, a further AQMA incorporating all main roads was declared.

7.4.9 In 2008 the above AQMAs were revoked and a new AQMA was declared incorporating the whole of Maidstone conurbation and between junctions 7 and 8 of the M20.

Ashford Borough Council [18]

7.4.10 ABC completed the first rounds of its R&A process between 1998 and 2001. The first rounds of the assessment concluded that all pollutants would meet the relevant air quality objectives.

7.4.11 The 2003 USA concluded that a Detailed Assessment (DA) was required for PM_{10} due to road traffic emissions from the M20 between Junction 9 and 10. The 2004 DA, an Updating and

Screening Assessment completed in 2006, and the 2007 Progress Report (PR) concluded that the objectives for all pollutants would be met.

7.4.12 There are currently no designated AQMAs within the borough.

Canterbury City Council [19]

7.4.13 CCC completed the first round of its R&A process in 2002, concluding that the AQS objectives for all pollutants would be met by the relevant target dates.

7.4.14 The 2004 PR and 2005 DA concluded the annual-mean objective for NO_2 may not be met at Broad Street and Sturry Road. In April 2006 the Council declared an AQMA; incorporating parts of Broad Street and Military Road.

Medway Council [20]

7.4.15 The first R&A process identified that NO_2 and PM_{10} concentrations would not meet the relevant air quality objectives in the council. As such in 2002 an AQMA was declared along major roads.

7.4.16 In 2002 a further R&A was undertaken; this identified that NO_2 and PM_{10} would be exceeded in areas outside of the original AQMA. In 2004, the original AQMA was revoked and a new AQMA declared to include Chatham Centre, Cuxton Road, Frindsbury Road, Maidstone Road, Rochester Centre and Strood Centre.

7.4.17 The USAs and DAs have confirmed the results from the previous R&As. No additional amendment of the AQMA has been required.

Background Monitoring

7.4.18 Urban-background monitoring is carried out at locations away from the local influence of emission sources and measured concentrations are therefore broadly representative of residential areas within large conurbations. Monitoring at locations classified as urban background may be considered as appropriate sources of data for the purposes of describing baseline air quality. Background monitoring data from various sources has been reviewed to ensure a robust assessment of ambient conditions (AC). The background data considered in this assessment are set out in the following section.

Project Specific Monitoring

7.4.19 RPS commissioned AEA Group to undertake a three-month air quality monitoring survey to ascertain the current conditions at the Kemsley Paper Mill, from April to June 2008. Pollutant monitored includes, polycyclic aromatic hydrocarbons (PAHs), dioxins, polychlorinated biphenyls (PCB) and a range of metals (arsenic (As), cadmium (Cd), cobalt (Co), chromium (Cr), copper (Cu), mercury (Hg), manganese (Mn), molybdenum (Mo), nickel (Ni), lead (Pb), antimony (Sb), thallium (Tl), vanadium (V) and zinc (Zn).

7.4.20 One low volume PM_{10} sampler was set up to collect particulate material on filters over two week sample periods. The filters were bulked to provide monthly samples, which were then analysed for metals content, in accordance with the BS EN 14902 method.

7.4.21 The second high volume sampler was set up to collect both the particulate and vapour-phase for PAHs, dioxins and PCBs over two week periods. The samples were bulked into two quarterly (3 month) samples for analysis. The analysis of dioxin and PCB was undertaken using a UKAS-accredited analytical method, based on and compliant with EN 1948-3:2006. The prepared samples for measuring dioxin were transferred to GC vials and analysed for all congeners and total homologue groups using a Hewlett Packard 5890 GC and Micromass Autospec X HRMS operating at a resolution of 10,000. The prepared samples for measuring PCB were run on a Hewlett-Packard 6890/5973 gas chromatograph-mass spectrometer operating in selected ion monitoring (SIM) mode. Prepared samples for measuring PAH were run using an Agilent 6890/5973 GC-MS equipped with a 30 m DB-5ms 0.25 µm film capillary column.

7.4.22 From March 2008 to February 2009, NO_x, NO_2 and SO_2 were passively sampled at eight urban sites using diffusion tubes. The diffusion tubes were supplied and analysed by Gradko Environmental laboratory. In addition to the eight sites triplicate tubes were co-located with the Swale Sheerness continuous monitor in order for the result of the monitoring to be corrected for any bias.

7.4.23 Table 7.4 summarises the monitoring locations (as national grid references) and details of pollutants monitored and the results of the monitoring are presented in the following sub sections.

Table 7.4: Details of Monitoring Locations					
Type	Location	Grid Reference		Distance to Site (km)	Monitored Pollutants
		X	Y		
Continuous Analyser	Kemsley Paper Mill	592106	166359	0.0	PAHs, dioxins, PCBs, As, Cd, Cr ,Co, Cu, Hg, Mn, Mo, Ni, Pb, Sb, Tl, V, Zn
Diffusion Tube	Swale Sheerness – A	591845	174774	8.1	NO_x, NO_2, SO_2
	Swale Sheerness – B	591845	174774	8.1	NO_x, NO_2, SO_2
	Swale Sheerness – C	591845	174774	8.1	NO_x, NO_2, SO_2
	Hillside, Rushenden	590757	171221	4.7	NO_x, NO_2, SO_2
	Waincourt, Minster	594309	172133	5.7	NO_x, NO_2, SO_2
	St George, Minster	596117	172651	7.3	NO_x, NO_2, SO_2
	Nature Reserve	593867	168048	2.2	NO_x, NO_2, SO_2
	Springvale, Iwade	589927	167665	2.3	NO_x, NO_2, SO_2
	Beauvoir, Kemsley	590975	166157	1.1	NO_x, NO_2, SO_2
	Forge, Milton Regis	590216	164799	2.4	NO_x, NO_2, SO_2
	Oak Road, Murston	592192	164423	2.0	NO_x, NO_2, SO_2

Results of Diffusion Tube Monitoring

7.4.24 The results of the diffusion tube monitoring are presented in Table 7.5 .

Concentrations (µg.m^{-3}) Measured during the 12-month Monitoring Survey									
Site	Annual-Mean NO_x Concentrations			Annual-Mean NO_2 Concentrations			Annual-Mean SO_2 Concentrations		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
Swale Sheerness – A	12.8	52.3	33.7	22.0	41.8	31.6	1.6	5.5	3.4
Swale Sheerness – B	18.7	53.9	37.1	21.2	43.3	31.0	2.1	5.9	3.6
Swale Sheerness – C	25.9	56.9	39.7	22.0	43.5	32.3	1	5.4	3.2
Hillside, Rushenden	18.5	40.4	27.0	11.7	35.4	23.7	1.4	5.8	5.8
Waincourt, Minster	17.7	40.7	29.9	9.7	35.9	25.3	1.3	21	2.4
St George, Minster	9.6	46.1	24.2	13.8	32.5	22.5	1	4.6	2.5
Nature Reserve	10.5	58.9	29.8	3.6	33	21.0	1	4.2	2.0
Springvale, Iwade	10.9	79.3	28.7	1.2	33.2	19.0	1.7	4.3	2.8
Beauvoir, Kemsley	12.9	40.6	28.9	15.4	40	28.9	0.9	4	2.3
Forge, Milton Regis	21.9	53	31.0	15.7	40.1	27.5	1.3	3.5	2.1
Oak Road, Murston	5.1	51.1	26.7	0.2	37.5	22.6	1.2	4	2.3

7.4.25 The annual-mean results in 2008 range between 24.2 and 39.7 µg.m^{-3} for NO_x; between 19.0 and 32.3 µg.m^{-3} for NO_2 and between 2.0 to 5.8 for SO_2. The one-year diffusion monitoring study concluded that there is unlikely to be any exceedance of the relevant air quality strategy objectives for NO_x, NO_2 or SO_2.

7.4.26 LAQM.TG(09) [8] makes provision for the calculation of a bias adjustment factor for diffusion tube results, where diffusion tubes are co-located with a continuous analyser. The three diffusion tubes at Swale Sheerness A, B and C have been compared with the Swale continuous analyser. Using the ‘precision and accuary’ calculator, supplied within the suite of tools accompanying LAQM.TG(90), a bias adjustment factor of 0.92 has been derived, This suggests that the diffusion tubes are marginally over-reading The results presented in the table above are therefore conservative.

Results of Metals Monitoring

7.4.27 The levels of metal in the monthly air samples for the 3-month monitoring period are presented in Table 7.5. Due to the very small quantities of these compounds, the concentration are expressed in femtograms per cubic metre ($fg.m^{-3}$), where 1 femtogram = 1 x 10^{-15} grams.

Table 7.5: Metal Concentrations ($ng.m^{-3}$) Measured During 3-month Monitoring Survey

Metal	Sampling Period				Defra Data 2007		
	1	2	3	Period Mean	Average	Minimum	Maximum
As	1.3	0.92	0.71	0.97	1.0	0.4	1.7
Cd	0.17	0.30	0.14	0.21	0.4	0.08	1.0
Co	<0.009	0.13	0.19	0.11	-	-	-
Cr	<0.5	1.5	4.9	2.3	5.7	1.0	32
Cu	4.4	4.8	5.8	5.0	17	2.0	48
Hg	<0.1	<0.1	<0.1	<0.1	-	-	-
Mn	4.7	8.3	7.2	6.7	8.7	1.4	32
Ni	1.7	5.0	3.0	3.2	4.3	0.5	21
Pb	19	13	13	15	16	3.5	61
Sb	1.5	1.1	1.5	1.4	-	-	-
Tl	0.11	0.092	0.060	0.086	-	-	-
V	4.8	12	5.1	7.4	2.8	1.0	6.4
Zn	27	29	22	26	63	7.0	488

7.4.28 The concentrations of metals from the three months monitoring, indicate that there is unlikely to be any exceedances of the relevant regulations or air quality strategy objectives.

Results of Dioxins and Furans Monitoring

7.4.29 The quarterly results of the 3-month monitoring period are presented in Table 7.6. Due to the very small quantities of these compounds, the concentration are expressed in femtograms per cubic metre ($fg.m^{-3}$), where 1 femtogram = 1 x 10^{-15} grams.

Table 7.6: Dioxins, Furans and PAHs (including Benzo(a)pyrene fraction) Concentrations (fg I-TEQ .m^{-3}) Measured during 3-month Monitoring Survey

Pollutant		Month		
		1	2	3
Dioxins	2378 Tetra CDD	0.30	1.5	0.30
	12378 Penta CDD	0.18	3.6	0.59
	123478 Hexa CDD	0.17	0.12	0.13
	123678 Hexa CDD	0.21	0.14	0.15
	1237879 Hexa Cdd	0.24	0.12	0.12
	1234678 Hepta CDD	0.78	0.22	0.39
	OCDD Octa CDD	0.19	0.006	0.16
Furans	2378 Tetra CDF	0.01	0.09	0.19
	12378 Penta CDF	0.04	0.08	0.15
	23478 Penta CDF	0.53	0.29	1.8
	123478 Hexa CDF	0.67	0.03	1.1
	123678 Hexa CDF	0.84	0.07	0.42
	234678 Hexa CDF	1.3	0.20	1.1
	123789 Hexa CDF	0.48	0.08	0.06
	1234678 Hepta CDF	0.33	0.008	0.33
	1234789 Hepta CDF	0.007	0.02	0.02
	OCDF Octa CDF	0.02	0.001	0.01
Dioxin	**Upper Bound**	**1.9**	**5.5**	**1.2**
Furan	**Upper Bound**	**4.2**	**0.6**	**5.2**
Total D&F	**Upper Bound**	**6.1**	**6.1**	**6.4**

7.4.30 Whilst there are no air quality limit values for dioxins, the monitoring shows that the average level recorded on site are lower than the current defra sites, and that the levels of metals on site are relatively low.

Local Authority Monitoring

Swale Borough Council

7.4.31 SBC undertakes continuous air quality monitoring at three locations within its district, with an urban background monitor at Swale Sheerness, located 8.1 km from the proposed site. Concentrations are provided in Table 7.7.

Table 7.7: Monitored Concentrations at Swale Sheerness (µg.m^{-3})

Pollutant	Year		
	2006	2007	2008
NO_x	43.1	ND	39.8
NO_2	26.4	ND	23.4
PM_{10}	21.7	ND	29.4
SO_2	2.2	ND	2.0

Note: ND = No Data

7.4.32 SBC operate a network of NO_2 diffusion tubes at thirty two locations across the district. Of these sites one is classified as an urban background location, and is presented in Table 7.8.

Table 7.8: NO_2 Diffusion Tube Data from SBC's Urban Background Sites (µg.m^{-3})

Site Name	National Grid Reference		Approx. Distance to Site (km)	Annual Mean Concentration (µg.m-3)		
	X	Y		2005	2006	2007
Richmond Street	592800	174500	7.9	23.0	27.5	24.6

Maidstone Borough Council

7.4.33 MBC passively monitor NO_2 at two urban background locations. The 2007 data collected in these locations are presented in Table 7.9.

Table 7.9: NO_2 Diffusion Tube Data from MBC's Urban Background Sites (µg.m^{-3})

Site Name	National Grid Reference		Approx. Distance to Site (km)	Annual Mean Concentration (µg.m^{-3})
	X	Y		
Mote Park	577410	155166	18.6	30.5
Scrubbs Lane	574770	155774	20.4	27.2

Ashford Borough Council

7.4.34 Although ABC does not undertake continuous air quality monitoring within its district, it does operate a network of NO_2 diffusion tubes at eleven locations across the council. Two of these sites are classified as urban background locations. Table 7.10 presents the data obtained from these diffusion tubes.

Table 7.10: NO_2 Diffusion Tube Data from Ashford's Urban Background Sites (µg.m^{-3})

Site Name	National Grid Reference		Approx. Distance to Site (km)	Annual Mean Concentration (µg.m^{-3})		
	X	Y		2006	2007	2008
Queens Street	600976	142547	25.5	30.2	24.8	23.7
Churchyard	601021	142754	25.3	25.0	22.1	20.2

Canterbury City Council

7.4.35 As part of the UK's Automatic Urban and Rural Network (AURN), CCC operate an urban background continuous monitor at Chaucer School, 25.7 km from the site. Concentrations are provided in Table 7.11

Table 7.11: Monitored Concentrations at Chaucer School (µg.m^{-3})							
Site Name	National Grid Reference		Approx. Distance to Site (km)	Pollutant	Annual Mean Concentration (µg.m^{-3})		
	X	Y			2006	2007	2008
Chaucer School	616200	157300	25.7	NO_x	29.0	30.8	31.0
				NO_2	18.0	17.8	17.0
				PM_{10}	24.0	22.5	22.6

7.4.36 In addition CCC passively monitors NO_2 concentrations at four locations in the city. These have been summarised in Table 7.12.

Table 7.12: NO_2 Diffusion Tube Data from CCC's Urban Background Sites (µg.m^{-3})								
Site Name	National Grid Reference		Approx. Distance to Site (km)	Annual Mean Concentration (µg.m^{-3})				
	X	Y		2004	2005	2006	2007	2008
Brockenhurst Close	614313	158994	23.3	12.6	16.2	Sites Discontinued		
Winchester Gardens	615274	156872	25.0	14.0	17.0			
Blean Woods	611534	160782	20.1	8.5	10.7			
Chaucer School AURN site	616200	157300	25.7	ND	17.1	19.8	18.7	16.8

Note: ND = No Data

Medway Council

7.4.37 MC operates an urban background continuous monitor in its district at Luton, for both NO_2 and PM_{10}. Urban background concentrations are monitored at Chatham, approximately 14.7 km from the site. Concentrations are presented in Table 7.13.

Table 7.13: Monitored Concentrations at Chatham, Luton (µg.m^{-3})							
Site Name	National Grid Reference		Approx. Distance to Site (km)	Pollutant	Annual Mean Concentration (µg.m^{-3})		
	X	Y			2005	2006	2007
Luton School, Chatham	577100	166600	14.8	NO_x	42.6	36.6	-
				NO_2	25.0	24.3	26.0
				PM_{10}	20.0	17.6	23.0

7.4.38 In addition to the continuous monitor at Luton, Medway operate a range of diffusion tubes, with three monitoring sites classed as urban background concentrations. Annual mean NO_2 concentrations are shown in Table 7.14.

Table 7.14: NO_2 Diffusion Tube Data from MC's Urban Background Sites (μg.m^{-3})

Site Name	National Grid Reference		Approx. Distance to Site (km)	Annual Mean Concentration (μg.m^{-3})				
	X	Y		2004	2005	2006	2007	2008
Luton School	577100	166600	14.8	18.0	20.9	27.7	24.1	21.7
Long Catlis Road	580800	164300	11.4	16.7	20.0	26.1	-	-
St Albans Rd	571500	168600	20.5	-	32.2	-	33	-

National Air Quality Information Archive Data

Estimated and Projected Background Pollutant Concentrations

7.4.39 The NAQIA provides estimates of pollution concentrations of NO_x, NO_2, PM_{10} and $PM_{2.5}$ across the UK at a resolution of 1 km^2 from 2006 to 2020 and provides the source contribution from different sources such as road, industry, domestic, air craft and rail contribution.

7.4.40 The total annual-mean NO_x and PM_{10} concentrations associated with all sources have been extracted for the grid square encompassing the proposed development site (NGR 592500, 166500) and the contributions to annual-mean NO_x and PM_{10} concentrations associated with road-related sources and industrial source inside this grid square have been deducted from the total concentrations in the grid square (to avoid double counting the modelled road and industrial contribution) to determine the relevant background pollutant concentrations.

7.4.41 The NAQIA also provides data for SO_2, benzene, 1,3-butadiene and CO for the years 2001, 2003 and 2010. Since no projection calculator is available from the NAQIA for these pollutants, background concentrations are assumed to be static.

7.4.42 The annual-mean background concentrations obtained from NAQIA are provided in Table 7.15 for comparison with other available monitoring data.

Table 7.15: NAQIA Mapped Background Concentrations (μg.m^{-3})

Year	Pollutant							
	NO_x	NO_2	PM_{10}	$PM_{2.5}$	SO_2	Benzene	1,3-Butadiene	CO
2007	19.5	15.3	16.9	11.4	6.8	0.4	0.1	0.3

2008	18.7	14.8	16.7	11.3	6.8	0.4	0.1	0.3
2009	18.0	13.6	16.5	11.2	6.8	0.4	0.1	0.3
2010	17.2	13.1	16.4	11.0	6.8	0.4	0.1	0.3
2011	16.8	13.0	16.3	11.0	6.8	0.4	0.1	0.3

Monitoring Data from the TOMPs Network

7.4.43 Dioxins and furans data are available from seven sites in the UK as part of the Toxic Organic Micropollutants (TOMPs) network. The closest site is London which is approximately 63 km from Kemsley. The London site has been excluded as an appropriate background location as the urban site is not representative of the application location. It is considered that the most representative site is Stoke Ferry. Table 7.16 presents available data for all sites.

Table 7.16: Annual-mean Concentrations of Dioxins and Furans at UK Sites

Site	Approx. Distance to Site (km)	Dioxins and Furans (fg (TEQ).m-3) (a)		
		2006	2007	2008
Manchester	305	19	18	19
London	63	6	7	11
Stoke Ferry	134	7	6	Discontinued
Middlesborough	380	17	18	24
High Muffle	346	0.5	1	2
Hazelrigg	379	27	7	4
Auhencorth	420	-	-	6
Manchester	305	19	18	19

Notes: (a) - The Dioxin TEQ values are best-case estimates. In samples in which a congener is not detected during analysis, the value used in calculating concentrations is zero. Concentrations of 17 of the most toxic dioxins including tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) are measured at each site.

7.4.44 Polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs) data are also available from the nine sites that form part of the TOMPs network. As above the closest site that measures PAHs and PCBs (excluding London) is Stoke Ferry.

7.4.45 Table 7.20 and Table 7.21 present the last five available years of monitoring data for PAHs (benzo(a)pyrene) and PCBs at all sites.

Table 7.17: Annual-Mean Concentrations (ng.m^{-3}) of Polycyclic Aromatic Hydrocarbons							
Site	Approx. Distance to Site (km)	Year					
		2002	2003	2004	2005	2006	Average
Ashington	452	0.15	0.19	0.15	0.16	-	0.16
Belfast	573	0.13	0.08	0.15	0.27	0.14	0.15
Birmingham 1	219	0.13	0.16	-	-	-	0.15
Birmingham 2	235	-	-	-	0.12	0.12	0.12
Bolsover	252	0.24	0.45	0.22	0.23	0.12	0.25
Brent	73	-	0.14	0.10	0.11	0.12	0.12
Bromley	56	0.25	0.21	0.19	0.17	0.11	0.19
Cardiff 2	278	0.06	0.07	0.09	0.076	0.06	0.07
Edinburgh	573	-	-	0.04	0.05	0.039	0.04
Glasgow	599	0.12	0.06	0.07	0.10	0.062	0.08
Hazelrigg	379	0.05	0.04	<0.020	<0.021	0.11	0.07
High Muffles	346	0.04	0.05	<0.026	<0.025	0.036	0.04
Holyhead	426	0.18	0.14	-	-	-	0.16
Hove	88	-	0.10	0.09	0.10	0.074	0.09
Kinlochleven	703	0.38	0.21	0.32	0.31	0.22	0.29
Leeds 1	312	0.18	0.21	-	-	-	0.20
Leeds 2	312	-	-	-	0.17	0.13	0.15
Lisburn	400	0.65	0.96	0.62	0.61	0.44	0.66
London	63	0.13	0.12	<0.076	<0.081	0.11	0.12
Manchester	311	0.17	0.24	0.11	0.10	0.14	0.15
Middlesbrough	380	0.21	0.24	0.14	0.18	0.28	0.21
Newcastle	436	0.12	0.16	0.06	0.08	0.088	0.10
Newport	257	0.19	0.11	0.10	0.10	0.078	0.12
Port Talbot	314	0.34	0.47	0.29	0.41	0.29	0.36
Scunthorpe 1	264	1.35	1.26	-	-	-	1.31
Scunthorpe 2	264	-	-	0.56	0.95	0.76	0.76
Speke	329	0.14	0.10	0.10	0.078	0.14	0.11
Stoke Ferry	134	0.08	0.08	<0.043	0.06	0.14	0.09

7.5.1 The maximum annual-mean concentrations of PAHs measured at Stoke Ferry TOMPs site is 0.14 ng.m^{-3} in 2006, which is higher than the previous years.

Table 7.18: Annual-Mean Concentrations (pg.m^{-3}) of Polychlorinated Biphenyls			
Site	Approx. Distance to Site (km)	Year	
		2005	2006
Hazelrigg	379	104.4	37.0
High Muffles	346	41.1	58.3
London	63	384.9	132.4
Manchester	311	363.5	239.5
Middlesbrough	380	96.2	85.9
Stoke Ferry	134	44.0	60.1

7.4.46 The annual-mean concentrations of PCBs measured at all TOMP sites are well below the Environment Agency's long-term EAL of 0.2 µg.m^{-3} (200,000 pg.m^{-3}).

Hydrogen Chloride

7.4.47 HCl is monitored as part of the Nitric Acid Monitoring Network, which forms part of the Acid Deposition Monitoring Network. The nitric acid network was established in 1999 and covers 12 rural sites across the UK. Table 7.19 presents data from these sites from 1999 to 2002. Defra reports that total HCl emissions fell by 89 per cent between 1990 and 2004.

7.4.48 The closest site to the proposed development site is Barcombe Mills.

Table 7.19: Hydrogen Chloride Annual Mean Concentration (µg.m^{-3})

Site	1999	2000	2001	2002	2003	2004	2005
Bush OTC	0.41	0.27	0.21	0.17	0.27	0.28	0.27
Glensaugh	0.39	0.31	0.31	0.3	0.37	0.32	0.14
Rothamsted	0.54	0.47	0.33	0.29	0.47	0.35	0.32
Strathvaich Dam	0.32	0.24	0.19	0.21	0.22	0.23	0.26
Eskdalemuir	0.21	0.21	0.19	0.18	0.26	0.14	0.10
High Muffles	0.39	0.36	0.32	0.25	0.27	0.25	0.25
Stoke Ferry	0.55	0.42	0.34	0.35	0.44	0.36	0.40
Yarner Wood	0.39	0.27	0.44	0.29	0.40	0.26	0.25
Barcombe Mills	-	0.34	0.42	0.41	0.39	0.41	0.29
Sutton Bonington	0.5	0.47	0.33	0.35	0.40	0.39	0.31
Lough Navar	0.13	0.19	0.13	0.11	0.13	0.14	0.10
Cwmystwyth	0.35	0.21	0.26	0.19	0.33	0.28	-

Hydrogen Fluoride

7.4.49 The Expert Panel on Air Quality Standards (EPAQS) was set up in 1991 to provide independent advice on air quality issues. In 2005 it published a draft report entitled 'Guidelines for halogen and hydrogen halides in ambient air for protecting human health against acute irritancy effects' . The report noted that only a small number of measurements of ambient concentrations of hydrogen fluoride have been made in the UK. All of these have been made in the vicinity of three industrial plants. Many samples were below the limit of detection; however, measurable values were in the range 0.05 to 3.5 µg.m^{-3} as approximate monthly averages.

7.4.50 The report concluded that it would be reasonable to expect maximum 1 hour mean hydrogen fluoride concentrations to reach about 2.46 µg.m^{-3} at rural sites exposed to power station plumes as compared with its suggested appropriate short term guideline of 0.16 µg.m^{-3}.

Ammonia

7.4.51 Background concentrations of ammonia are monitored by the Centre for Ecology and Hydrology (CEH) as part of the Ammonia Monitoring Network. The nearest monitoring location is Detling, and concentrations are presented in Table 7.20.

Table 7.20: Annual Mean Ammonia Concentrations ($\mu g.m^{-3}$) at Detling	
Year	**Concentrations of NH_3**
2006	1.26
2007	1.08
2008	1.07

Monitoring Data from the Lead and Multi-Element Monitoring Network

7.4.52 Monitoring for lead and other metals has been carried out at a number of locations in the UK since 1976 as part of the Lead and Multi-Element Networks. The closest monitoring site to the proposed site is Detling which is approximately 16 km southwest of the application site. The Detling station has a number of gaps within the monitoring. Where there is missing values, data for the remaining metals have been supplemented from an average of the other monitoring sites recorded throughout the UK, with the exception of Sheffield, London, Manchester and Cardiff. These sites have been excluded as they are urban locations not representative of the application site. The supplemented values will give a conservative background values for the application site as it still includes urban areas where metal concentrations are expected to be higher than the application site. These data are presented in Table 7.21.

Table 7.21: Background Metals Monitoring						
Element	**Year**					
	2004	**2005**	**2006**	**2007**	**2008**	**Max**
As	1.0	0.3	1.1	0.9	0.6	1.1
Cd	0.2	0.1	0.2	0.5	0.4	0.5
Cr	13.3	0.3	6.3[(a)]	5.4	1.8	13.3
Cu	5.2	3.3	18.0[(a)]	14.9	12.4	14.9
Fe	182.7	333.8[(a)]	370.9[(a)]	335.7	390	390
Mn	3.6	2.1	9.9[(a)]	8.6	14.7	14.7
Ni	2.1	1.3	3.0	3.1	3.1	3.1
Pb	10.0	11.8	11.0	17.0	17.6	17.6
V	2.8	3.8	2.8[(a)]	2.3	1.8	3.8
Zn	10.7	16.8	119.0[(a)]	73.3	90.1	90.1
Hg(a)	0.7	1.5	1.8	0.5	0.1	1.8

(a) Average of background monitoring stations
Annual-average Hg concentrations include both the vapour and particulate phase.

7.4.53 Additional data is collected as part of the Centre for Ecology and Hydrology (CEH) Heavy Metals Monitoring Network [21] at rural sites. This data had been used to provide additional information for cobalt and antimony. Information from this network is only available up to 2005.

7.4.54 Table 7.22 presents the monitored annual-mean concentrations for 2004 and 2005 at Detling.

Table 7.22: Annual Mean Sb and Co Concentrations ($ng.m^{-3}$) at Detling		
Element	**Year**	
	2004	**2005**
Sb	1.96	0.58
Co	0.02	0.03

7.4.55 The maximum monitored concentration for Sb was 1.96 $ng.m^{-3}$ and for Co, 0.03 $ng.m^{-3}$.

Summary of Annual-Mean (Long-term) Background Concentrations

NO_x and NO_2

7.4.56 The project specific NO_2 monitoring was selected to determine existing concentrations in the vicinity of the site at nearby sensitive receptors. Project-specific annual-mean NO_2 data in 2008 ranged from 19.0 and 32.3 $\mu g.m^{-3}$, with the highest concentration of 32.3 $\mu g.m^{-3}$ recorded at Swale Sheerness continuous analyser.

7.4.57 The annual-mean NO_2 concentrations recorded by SBC's continuous analyser at Swale Sheerness ranged from 23.4 to 26.4 $\mu g.m^{-3}$. The 2008 concentration of 23.4 $\mu g.m^{-3}$ monitored continuously at Swale was greater than five of the nine background concentrations monitored using diffusion tubes and greater than the NAQIA estimates.

PM_{10}

7.4.58 The annual-mean PM_{10} concentration monitored at Swale ranged from 20.0 to 29.4 $\mu g.m^{-3}$, well above the NAQIA estimates for this pollutant.

SO_2

7.4.59 From a review of the monitoring data within this report, the highest annual-mean SO_2 is from the NAQIA in 2001, with a value of 6.79 $\mu g.m^{-3}$. Since no projection calculator is available from the NAQIA, background concentrations are assumed to be static and could potentially be $\mu g.m^{-3}$unrealistic. Annual-mean SO_2 concentrations monitored at SBC's Sheerness monitor range between 2.0 to 4.9 $\mu g.m^{-3}$. Representative of the site, annual-mean SO_2 concentrations for 2008 have been assumed.

Co

7.4.60 In the absence of monitored data in the area, the NAQIA data for CO, with a value of 0.272 $\mu g.m^{-3}$ have been used within the assessment.

NH_3

7.4.61 Ammonia monitoring results for Detling, the closest site to the proposed development, range between 1.26 to 1.07 µg.m^{-3}, and have been used within this assessment.

HCl

7.4.62 Background concentrations of HCl have been derived from Barcombe Mills, the closet site to the proposed development. Annual-mean concentrations for the most recent year of 2005, have been used within assessment.

HF

7.4.63 Background concentrations of HF have been derived from the Expert Panel on Air Quality Standards (EPAQS) report published in 2005 [15].

Metals, Dioxin and Furans, PAHS and PCBs

7.4.64 Background metals, from project specific monitoring (albeit a three-month average) have been assumed to be representative of annual-mean concentrations for a conservative assessment.

7.4.65 The three-month monitoring of dioxin and furans is similar to the TOMPS data. As the on—site monitoring has been undertaken for less than a full year, the TOMPS network for dioxin and furans, PAHs and PCBs has been assumed within the assessment. Due to uncertainty in the Stoke Ferry 2006 data, the average concentrations have been used.

Summary of Short-term Background Concentrations for all Pollutants

7.4.66 Generally, for the purposes of air quality assessment of elevated point sources, a conservative assumption is to use the 90th percentile of the short-term observations as the background level during the assessment of short-term (e.g. maximum hourly) effects. This is approximately equivalent to twice the annual-mean.

7.4.67 Twice the annual-mean has therefore been used to account for ambient concentrations for the purposes of this assessment, except for PM_{10} and $PM_{2.5}$ as shortest averaging period required for consideration is daily average.

7.4.68 The total short term pollutant concentrations have been estimated as twice the average of the highest annual-mean concentrations measured or projected for each pollutant added to the short-term (8 hourly average or less) modelled value.

7.4.69 The total long-term pollutant concentrations have been estimated as the highest annual or daily mean concentrations measured or projected for each pollutant added to the long-term modelled value. Table 7.23 summarises the background concentrations assumed for this assessment and provides the source of the data.

Table 7.23: Summary of Assumed Background Concentrations (μg.m^{-3})

Pollutant	2011		2014		Data Source
	Short-term[b]	Long-term	Short-term[b]	Long-term	
NO_x	71.4	35.7	66.4	33.2	Swale Sheerness
NO_2	42.6	21.3	38.0	19.0	
PM_{10}	(a)	28.7	(a)	28.3	
SO_2	4.0	2.0	4.0	2.0	
CO	540	270	540	270	NAQIA
$PM_{2.5}$	(a)	11.0	(a)	10.7	
HCl	0.6	0.3	0.6	0.3	CEH Nitric Acid Monitoring Network
HF	4.92	2.46	4.92	2.46	Monitoring data – EPAQS 2005
As	2.0 x 10^{-3}	1.0 x 10^{-3}	2.0 x 10^{-3}	1.0 x 10^{-3}	Project Specific Monitoring
Cd	0.4 x 10^{-3}	0.2 x 10^{-3}	0.4 x 10^{-3}	0.2 x 10^{-3}	
Cr	4.6 x 10^{-3}	2.3 x 10^{-3}	4.6 x 10^{-3}	2.3 x 10^{-3}	
Cu	10.0 x 10^{-3}	5.0 x 10^{-3}	10.0 x 10^{-3}	5.0 x 10^{-3}	
Pb	30 x 10^{-3}	15 x 10^{-3}	30 x 10^{-3}	15 x 10^{-3}	
Mn	13.4 x 10^{-3}	6.7 x 10^{-3}	13.4 x 10^{-3}	6.7 x 10^{-3}	
Hg	0.2 x 10^{-3}	0.1 x 10^{-3}	0.2 x 10^{-3}	0.1 x 10^{-3}	
Ni	6.4 x 10^{-3}	3.2 x 10^{-3}	6.4 x 10^{-3}	3.2 x 10^{-3}	
V	14.8 x 10^{-3}	7.4 x 10^{-3}	14.8 x 10^{-3}	7.4 x 10^{-3}	
Tl	0.02 x 10^{-3}	0.01 x 10^{-3}	0.02 x 10^{-3}	0.01 x 10^{-3}	
Sb	2.8 x 10^{-3}	1.4 x 10^{-3}	2.8 x 10^{-3}	1.4 x 10^{-3}	
Co	0.2 x 10^{-3}	0.1 x 10^{-3}	0.2 x 10^{-3}	0.1 x 10^{-3}	
Dioxins & Furans	6 fg (TEQ) m^{-3}				TOMPS
PAHs	0.09 ng.m^{-3}				
PCBs	60.1 pg.m^{-3}				
NH_3	2.2	1.1	2.2	1.1	Monitoring data - CEH

Note: [a] No short-term background concentration required for PM_{10} or $PM_{2.5}$ as shortest averaging period required for consideration is daily average.
[b] Short term background data approximately equate to the 90th percentile, which is approximately equivalent to 2 x the annual mean.

7.5 Stack Height Determination

Introduction

7.5.2 This section presents a stack height determination undertaken for the SEP. The underlying principle of air pollution control is to:

- minimise the release of pollutants to the atmosphere; and
- promote sufficient dispersion and dilution of released pollutants within the atmosphere.

7.5.3 The first part of this principle is controlling emissions at sources through abatement techniques. These are well established and are documented in the Environmental Statement for the SEP. The second part is the determination of the optimum release conditions, including stack height determination to ensure that subsequent ground level concentrations of the released pollutants remain within acceptable limits.

7.5.4 The objective of the stack height determination is to establish at what chimney height local building wake effects are no longer significant thereby ensuring the adequate dispersion of pollutants. A determinant of the chimney height is therefore the local building height.

7.5.5 For the purposes of planning, the stack height determination has been based on a 49 m high main building.

7.5.6 On the basis of the above, the stack height determination considers:

- a unit emission rate of 1 $g.s^{-1}$ enabling the influence of meteorological conditions to be determined;
- all averaging periods relevant to the air quality assessment;
- a range of all likely meteorological conditions through the use of five years of hourly sequential meteorological data from a representative measuring station (Gravesend Meteorological Station).

Methodology

7.5.7 Emissions data are summarised in Chapter 7.1. Simulations have been run in ADMS4.1 with terrain incorporated in the model to determine what stack height is required to overcome local building wake effects.

7.5.8 The model was run assuming stack heights of 55 m to 100 m at 5 m intervals. Results were obtained for all relevant averaging periods to this assessment.

7.5.9 The dispersion modelling for the purposes of stack height determination assumed a domain of 10 km by 10 km centred on the proposed SEP with a grid spacing of 200 m. Results are reported for the maximum affected location. This is considered a robust and conservative approach.

Results

7.5.10 The predicted maximum contributions for all averaging periods and stack heights considered are plotted in Figure A.3.

7.5.11 ADMS results illustrate that, depending on the averaging period, for stack heights below 90 m local building wake effects are more pronounced. There is an approximately linear decrease in predicted ground level concentrations between 55 m and 90 m, above which ground level contributions do not reduce materially with increasing stack height.

7.5.12 A stack height of 90 m is considered appropriate. The stack height would be subject to agreement with EA when EPR permitting for the SEP is progressed in the future, but is considered to be robust for the purposes of the EIA.

7.6 Identification and Evaluation of Likely Significant Effects

Stack Emissions

Short-term and Long-term EU Emission Limits

7.7.1 Detailed modelling results for ADMS for each year of meteorological data modelled are presented in the following tables. Ground level concentrations for short-term EU Directive emission limits are shown in Table 7.24 while modelled concentrations at long-term EU Directive emission limits are shown in Table 7.25. Predicted concentrations at long-term emission limits at identified receptors are presented in Table 7.26.

Table 7.24: Maximum Process Contributions (µg.m^{-3}) at Short-Term EU Directive Emission Limits

Pollutant	Averaging Period	EQS	2004	2005	2006	2007	2008	Max
NO_2	1 hour 99.79th percentile	200	28.1	27.9	28.5	28.4	28.3	28.5
SO_2	15 minute 99.9th percentile	266	43.0	42.6	43.5	43.6	43.5	43.6
	1 hour 99.73rd percentile	350	42.2	41.7	42.6	42.4	42.7	42.7
HCl	1 hour maximum	750	12.9	12.5	12.8	12.9	12.6	12.9
HF	1 hour maximum	160	0.8	0.8	0.8	0.8	0.8	0.8

Table 7.25: Predicted Maximum Process Contributions (µg.m-3) at Long-Term EU Directive Emission Limits								
Pollutant	**Averaging Period**	**EQS**	**2004**	**2005**	**2006**	**2007**	**2008**	**Max**
PM_{10}	24 hour (90.41st percentile)	50	0.4	0.4	0.5	0.6	0.5	0.6
	Annual	18	0.15	0.12	0.14	0.14	0.15	0.15
HCl	1 hour (maximum)	750	2.15	2.08	2.13	2.15	2.10	2.15
	Annual	20	0.12	0.12	0.14	0.14	0.15	0.15
HF	1 hour (maximum)	160	021	021	0.21	0.22	0.21	0.22
SO_2	15 minute (99.90th percentile)	266	8.6	8.4	9.0	9.0	8.8	9.0
	1 hour (99.73rd percentile)	350	10.0	9.8	10.1	10.1	10.1	10.1
	24 hour (99.18th percentile)	125	7.0	5.8	7.2	6.2	6.0	7.2
	Annual	50	0.6	0.6	0.7	0.7	0.7	0.7
NO_2	1 hour (99.79th percentile)	200	14.0	14.0	14.3	14.2	14.1	14.3
	Annual	40	1.7	1.6	1.9	2.1	2.1	2.1
CO	8 hour (maximum daily running)	10,000	9.6	9.5	9.8	9.6	9.3	9.8
	Annual	350	0.60	0.59	0.71	0.72	0.75	0.75
Cd	1 hour (maximum)	1.5	5.38×10^{-3}	5.21×10^{-3}	5.35×10^{-3}	5.39×10^{-3}	5.26×10^{-3}	5.39×10^{-3}
	Annual	0.005	3.07×10^{-4}	2.97×10^{-4}	3.56×10^{-4}	3.59×10^{-4}	3.76×10^{-4}	3.76×10^{-4}
Ti	1 hour (maximum)	30	5.38×10^{-3}	5.21×10^{-3}	5.35×10^{-3}	5.39×10^{-3}	5.26×10^{-3}	5.39×10^{-3}
	Annual	1	3.07×10^{-4}	2.97×10^{-4}	3.56×10^{-4}	3.59×10^{-4}	3.76×10^{-4}	3.76×10^{-4}
Hg	1 hour (maximum)	7.5	1.08×10^{-2}	1.04×10^{-2}	1.07×10^{-2}	1.08×10^{-2}	1.05×10^{-2}	1.08×10^{-2}
	Annual	0.25	6.14×10^{-4}	5.93×10^{-4}	7.12×10^{-4}	7.18×10^{-4}	7.51×10^{-4}	7.51×10^{-4}
Sb	1 hour (maximum)	150	1.20×10^{-2}	1.16×10^{-2}	1.19×10^{-2}	1.20×10^{-2}	1.17×10^{-2}	1.20×10^{-2}
	Annual	5	6.82×10^{-4}	6.59×10^{-4}	7.91×10^{-4}	7.97×10^{-4}	8.35×10^{-4}	8.35×10^{-4}
As	1 hour (maximum)	15	5.25×10^{-3}	5.08×10^{-3}	5.22×10^{-3}	5.26×10^{-3}	5.13×10^{-3}	5.26×10^{-3}
	Annual	0.2	2.99×10^{-4}	2.89E x 10^{-4}	3.47×10^{-4}	3.50×10^{-4}	3.66×10^{-4}	3.66×10^{-4}
Cr	1 hour (maximum)	3	2.64×10^{-2}	2.55×10^{-2}	2.62×10^{-2}	2.64×10^{-2}	2.58×10^{-2}	2.64×10^{-2}
	Annual	0.1	1.50×10^{-3}	1.46×10^{-3}	1.75×10^{-3}	1.76×10^{-3}	1.84×10^{-3}	1.84×10^{-3}
Co	1 hour (maximum)	6	1.20×10^{-2}	1.16×10^{-2}	1.19×10^{-2}	1.20×10^{-2}	1.17×10^{-2}	1.20×10^{-2}
	Annual	0.2	6.82×10^{-4}	6.59×10^{-4}	7.91×10^{-4}	7.97×10^{-4}	8.35×10^{-4}	8.35×10^{-4}
Cu	1 hour (maximum)	60	1.15×10^{-2}	1.11×10^{-2}	1.14×10^{-2}	1.15×10^{-2}	1.13×10^{-2}	1.15×10^{-2}
	Annual	2	6.56×10^{-4}	6.35×10^{-4}	7.62×10^{-4}	7.68×10^{-4}	8.04×10^{-4}	8.04×10^{-4}
Pb	Annual	0.5	2.15×10^{-3}	2.08×10^{-3}	2.50×10^{-3}	2.52×10^{-3}	2.63×10^{-3}	2.63×10^{-3}
Mn	1 hour (maximum)	1500	1.20×10^{-2}	1.16 x	1.19 x	1.20 x	1.17 x	1.20 x

				10^{-2}	10^{-2}	10^{-2}	10^{-2}	10^{-2}
	Annual	1	6.82×10^{-4}	6.59×10^{-4}	7.91×10^{-4}	7.97×10^{-4}	8.35×10^{-4}	8.35×10^{-4}
Ni	1 hour (maximum)	30	2.67×10^{-2}	2.59×10^{-2}	2.66×10^{-2}	2.68×10^{-2}	2.61×10^{-2}	2.68×10^{-2}
	Annual	1	1.52×10^{-3}	1.47×10^{-3}	1.77×10^{-3}	1.78×10^{-3}	1.87×10^{-3}	1.87 x 10-3
V	1 hour (maximum)	5	1.20×10^{-2}	1.16×10^{-2}	1.19×10^{-2}	1.20×10^{-2}	1.17×10^{-2}	1.20×10^{-2}
	Annual	1	6.82×10^{-4}	6.59×10^{-4}	7.91×10^{-4}	7.97×10^{-4}	8.35×10^{-4}	8.35×10^{-4}
Dioxins & Furans	Annual	-	1.23×10^{-9}	1.19×10^{-9}	1.42×10^{-9}	1.42×10^{-9}	1.50×10^{-9}	1.50×10^{-9}
Ammonia	1 hour (maximum)	2500	1.08	1.04	1.07	1.08	1.05	1.08
	Annual	180	0.06	0.06	0.07	0.07	0.08	0.08
PAHs (B[a]P)	Annual	0.00025	1.25×10^{-5}	1.21×10^{-5}	1.45×10^{-5}	1.46×10^{-5}	1.53×10^{-5}	1.53×10^{-5}
	1 hour (maximum)	6	2.19×10^{-4}	2.12×10^{-4}	2.17×10^{-4}	2.19×10^{-4}	2.14×10^{-4}	2.19×10^{-4}
PCBs	Annual	0.2	6.16×10^{-5}	5.95×10^{-5}	7.15×10^{-5}	7.20×10^{-5}	7.54×10^{-5}	7.54×10^{-5}

Note: PC – Process Contribution; EQS – Environmental Quality Standard

Table 7.26: Predicted Maximum Process Contributions (µg.m-3) at Identified Receptors Modelled at Long-Term EU Directive Emission Limits

Pollutant	Averaging Period	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15	Max
PM_{10}	24 hour (90.41st percentile)	0.16	0.16	0.13	0.06	0.05	0.10	0.07	0.03	0.03	0.04	0.03	0.02	0.02	0.02	0.02	0.16
	Annual	0.05	0.03	0.03	0.03	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.05
HCl	1 hour (maximum)	1.77	1.26	0.99	1.04	1.01	0.78	0.71	0.63	0.82	0.62	0.41	0.44	0.33	0.35	0.43	1.77
	Annual	0.05	0.04	0.03	0.03	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.05
HF	1 hour (maximum)	0.18	0.13	0.10	0.10	0.10	0.08	0.07	0.06	0.08	0.06	0.04	0.04	0.03	0.03	0.04	0.18
SO_2	15 minute (99.90th percentile)	7.34	5.32	3.38	3.27	2.67	1.77	1.20	0.84	1.21	0.93	0.56	0.48	0.51	0.41	0.55	7.34
	1 hour (99.73rd percentile)	8.33	5.55	3.88	4.44	4.13	2.71	2.40	1.66	2.01	1.50	1.08	1.15	0.87	1.02	0.93	8.33
	24 hour (99.18th percentile)	5.04	2.66	2.07	2.29	1.81	1.34	0.80	0.60	0.66	0.45	0.39	0.29	0.23	0.27	0.22	5.04
	Annual	0.27	0.17	0.14	0.14	0.10	0.11	0.07	0.05	0.05	0.04	0.04	0.02	0.02	0.02	0.02	0.27
NO_2	1 hour (99.79th percentile)	11.76	8.04	5.48	6.28	5.94	3.89	3.53	2.40	2.88	2.23	1.57	1.67	1.24	1.48	1.47	0.16
	Annual	0.76	0.49	0.39	0.38	0.28	0.32	0.21	0.13	0.13	0.12	0.10	0.06	0.07	0.07	0.06	0.05
CO	8 hour (maximum daily running)	8.30	5.83	3.57	4.35	3.25	2.20	1.63	1.14	1.67	1.05	0.91	0.82	0.60	0.76	0.72	11.76
	Annual	0.27	0.18	0.14	0.13	0.10	0.11	0.07	0.05	0.05	0.04	0.04	0.02	0.02	0.02	0.02	0.76
Cd	1 hour (maximum)	4.45×10^{-3}	3.16×10^{-3}	2.49×10^{-3}	2.60×10^{-3}	2.54×10^{-3}	1.95×10^{-3}	1.79×10^{-3}	1.58×10^{-3}	2.07×10^{-3}	1.55×10^{-3}	1.03×10^{-3}	1.09 x 10-3	8.31×10^{-4}	8.71×10^{-4}	1.08×10^{-3}	8.30
	Annual	1.62×10^{-4}	1.02 x 10-4 x 10^{-5}	8.13×10^{-5}	7.74×10^{-5}	5.67×10^{-5}	6.55×10^{-5}	4.23×10^{-5}	2.56×10^{-5}	2.78×10^{-5}	2.50×10^{-5}	2.0×10^{-5}	1.13×10^{-5}	1.39×10^{-5}	1.37×10^{-5}	1.15×10^{-5}	1.62×10^{-4}
Tl	1 hour (maximum)	4.45×10^{-3}	3.16×10^{-3}	2.49×10^{-3}	2.60×10^{-3}	2.54×10^{-3}	1.95×10^{-3}	1.79×10^{-3}	1.58×10^{-3}	2.07×10^{-3}	1.55×10^{-3}	1.03×10^{-3}	1.09×10^{-3}	8.31×10^{-4}	8.71×10^{-4}	1.08×10^{-3}	4.45×10^{-3}
	Annual	1.62×10^{-4}	1.02×10^{-4}	8.13×10^{-5}	7.74×10^{-5}	5.67×10^{-5}	6.55×10^{-5}	4.23×10^{-5}	2.56×10^{-5}	2.78×10^{-5}	2.50×10^{-5}	2.01×10^{-5}	1.13×10^{-5}	1.39×10^{-5}	1.37×10^{-5}	1.15×10^{-5}	1.62×10^{-4}
Hg	1 hour (maximum)	8.89×10^{-3}	6.33×10^{-3}	4.98×10^{-3}	5.21×10^{-3}	5.08×10^{-3}	3.90×10^{-3}	3.58×10^{-3}	3.15×10^{-3}	4.14×10^{-3}	3.09×10^{-3}	2.06×10^{-3}	2.19×10^{-3}	1.66×10^{-3}	1.74×10^{-3}	2.17×10^{-3}	4.45×10^{-3}
	Annual	2.72×10^{-4}	1.76×10^{-4}	1.38×10^{-4}	1.34×10^{-4}	9.99×10^{-5}	1.13×10^{-7}	7.40×10^{-5}	4.54×10^{-5}	4.73×10^{-5}	4.38×10^{-5}	3.56×10^{-5}	2.01×10^{-5}	2.46×10^{-5}	2.43×10^{-5}	2.0×10^{-5}	1.62×10^{-4}
Sb	1 hour (maximum)	9.88×10^{-3}	7.03×10^{-3}	5.54×10^{-3}	5.78×10^{-3}	5.65×10^{-3}	4.33×10^{-3}	3.98×10^{-3}	3.51×10^{-3}	4.60×10^{-3}	3.44×10^{-3}	2.29×10^{-3}	2.43×10^{-3}	1.85×10^{-3}	1.94×10^{-3}	2.41×10^{-3}	8.89×10^{-3}
	Annual	3.02×10^{-4}	1.96×10^{-4}	1.53×10^{-4}	1.49×10^{-4}	1.11×10^{-4}	1.26×10^{-4}	8.22×10^{-5}	5.04×10^{-5}	5.25×10^{-5}	4.86×10^{-5}	3.95×10^{-5}	2.24×10^{-5}	2.74×10^{-5}	2.70×10^{-5}	2.30×10^{-5}	2.72×10^{-4}
As	1 hour (maximum)	4.34×10^{-3}	3.09×10^{-3}	2.43×10^{-3}	2.54×10^{-3}	2.4×10^{-3}	1.90×10^{-3}	1.75×10^{-3}	1.54×10^{-3}	2.02×10^{-3}	1.51×10^{-3}	1.00×10^{-3}	1.07×10^{-3}	8.10×10^{-4}	8.49×10^{-4}	1.06×10^{-3}	9.8×10^{-3}
	Annual	1.32×10^{-4}	8.59×10^{-5}	6.71×10^{-5}	6.54×10^{-5}	4.87×10^{-5}	5.51×10^{-5}	3.61×10^{-5}	2.21×10^{-5}	2.30×10^{-5}	2.13×10^{-5}	1.73×10^{-5}	9.82×10^{-6}	1.20×10^{-5}	1.18×10^{-5}	1.01×10^{-5}	3.02×10^{-4}
Pb	Annual	2.18×10^{-2}	1.55×10^{-2}	1.22×10^{-2}	1.28×10^{-2}	1.25×10^{-2}	9.56×10^{-3}	8.79×10^{-3}	7.74×10^{-3}	1.01×10^{-2}	7.59×10^{-3}	5.05×10^{-3}	5.37×10^{-3}	4.08×10^{-3}	4.27×10^{-3}	5.31×10^{-3}	4.34×10^{-2}
Cr	1 hour (maximum)	6.66×10^{-4}	4.32×10^{-4}	3.38×10^{-4}	3.29×10^{-4}	2.45×10^{-4}	2.77×10^{-4}	1.81×10^{-4}	1.11×10^{-4}	1.16×10^{-4}	1.07×10^{-4}	8.73×10^{-5}	4.94×10^{-5}	6.05×10^{-5}	5.95×10^{-5}	5.07×10^{-5}	1.32×10^{-4}
	Annual	9.88×10^{-3}	7.03×10^{-3}	5.54×10^{-3}	5.78×10^{-3}	5.65×10^{-3}	4.33×10^{-3}	3.98×10^{-3}	3.51×10^{-3}	4.60×10^{-3}	3.44×10^{-3}	2.29×10^{-3}	2.43×10^{-3}	1.85×10^{-3}	1.94×10^{-3}	2.41×10^{-3}	2.18×10^{-2}
Co	1 hour (maximum)	3.02×10^{-4}	1.96×10^{-4}	1.53×10^{-4}	1.49×10^{-4}	1.11×10^{-4}	1.26×10^{-4}	8.22×10^{-5}	5.04×10^{-5}	5.25×10^{-5}	4.86×10^{-5}	3.95×10^{-5}	2.24×10^{-5}	2.74×10^{-5}	2.70×10^{-5}	2.30×10^{-5}	6.6×10^{-4}
	Annual	9.51×10^{-3}	6.77×10^{-3}	5.33×10^{-3}	5.57×10^{-3}	5.44×10^{-3}	4.17×10^{-3}	3.83×10^{-3}	3.38×10^{-3}	4.42×10^{-3}	3.31×10^{-3}	2.20×10^{-3}	2.34×10^{-3}	1.78×10^{-3}	1.86×10^{-3}	2.32×10^{-3}	9.8×10^{-3}
Cu	1 hour (maximum)	2.91×10^{-4}	1.89×10^{-4}	1.47×10^{-4}	1.44×10^{-4}	1.07×10^{-4}	1.21×10^{-4}	7.91×10^{-5}	4.85×10^{-5}	5.06×10^{-5}	4.68×10^{-5}	3.81×10^{-5}	2.15×10^{-5}	2.64×10^{-5}	2.60×10^{-5}	2.21×10^{-5}	3.02×10^{-4}

	Annual	9.52×10^{-4}	6.18 x 10-4	4.83×10^{-4}	4.71×10^{-4}	3.50×10^{-4}	3.97×10^{-4}	2.59×10^{-3}	1.59×10^{-4}	1.66×10^{-4}	1.53×10^{-4}	1.25×10^{-4}	7.06×10^{-5}	8.64×10^{-5}	8.51×10^{-5}	7.25×10^{-5}	9.51 x 10-3
Mn	1 hour (maximum)	9.88×10^{-3}	7.03 x 10-3	5.54×10^{-3}	5.78×10^{-3}	5.65×10^{-3}	4.33×10^{-3}	3.98×10^{-3}	3.51×10^{-3}	4.60×10^{-3}	3.44×10^{-3}	2.29×10^{-3}	2.43×10^{-3}	1.85×10^{-3}	1.94×10^{-3}	2.41×10^{-3}	2.91 x 10-4
	Annual	3.02×10^{-4}	1.96 x 10-4	1.53×10^{-4}	1.49×10^{-4}	1.11×10^{-4}	1.26×10^{-4}	8.22×10^{-5}	5.04×10^{-5}	5.25×10^{-5}	4.86×10^{-5}	3.95×10^{-5}	2.24×10^{-5}	2.74×10^{-5}	2.70×10^{-5}	2.30×10^{-5}	9.52 x 10-4
Ni	1 hour (maximum)	2.21×10^{-2}	1.57 x 10-2	1.24×10^{-2}	1.29×10^{-2}	1.26×10^{-2}	9.67×10^{-3}	8.90×10^{-3}	7.83×10^{-3}	1.03×10^{-2}	7.68×10^{-3}	5.12×10^{-3}	5.43×10^{-3}	4.13×10^{-3}	4.33×10^{-3}	5.38×10^{-3}	9.88 x 10-3
	Annual	6.74×10^{-4}	4.38 x 10-4	3.42×10^{-4}	3.33×10^{-4}	2.48×10^{-4}	2.81×10^{-4}	1.84×10^{-4}	1.13×10^{-4}	1.17×10^{-4}	1.09×10^{-4}	8.83×10^{-5}	5.00×10^{-5}	6.12×10^{-5}	6.03×10^{-5}	5.13×10^{-5}	3.02 x 10-4
V	1 hour (maximum)	9.88×10^{-3}	7.03 x 10-3	5.54×10^{-3}	5.78×10^{-3}	5.65×10^{-3}	4.33×10^{-3}	3.98×10^{-3}	3.51×10^{-3}	4.60×10^{-3}	3.44×10^{-3}	2.29×10^{-3}	2.43×10^{-3}	1.85×10^{-3}	1.94×10^{-3}	2.41×10^{-3}	2.21 x 10-2
	Annual	3.02×10^{-4}	1.96 x 10-4	1.53×10^{-4}	1.4×10^{-4}	1.11×10^{-4}	1.26×10^{-4}	8.22×10^{-5}	5.04×10^{-5}	5.25×10^{-5}	4.86×10^{-5}	3.95×10^{-5}	2.24×10^{-5}	2.74×10^{-5}	2.70×10^{-5}	2.30×10^{-5}	6.74 x 10-4
Dioxins & Furans	Annual	5.43×10^{-10}	3.52E-10	2.75×10^{-4}	2.68×10^{-10}	2.00×10^{-10}	2.26×10^{-10}	1.48×10^{-10}	9.07×10^{-11}	9.45×10^{-11}	8.75×10^{-11}	7.11×10^{-11}	4.03×10^{-11}	4.93×10^{-11}	4.85×10^{-11}	4.13×10^{-11}	9.88×10^{-11}
Ammonia	1 hour (maximum)	0.89	0.63	0.50	0.52	0.51	0.39	0.36	0.32	0.41	0.31	0.21	0.22	0.17	0.17	0.22	3.02 x 10-4
	Annual	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.43×10^{-10}
PAHs (B(a)P)	Annual	5.52×10^{-6}	3.58 x 10-6	2.80×10^{-6}	2.73×10^{-6}	2.03×10^{-6}	2.3×10^{-6}	1.50×10^{-6}	9.22×10^{-7}	9.61×10^{-7}	8.89×10^{-7}	7.23×10^{-7}	4.09×10^{-7}	5.01×10^{-7}	4.93×10^{-7}	4.20×10^{-7}	0.89
PCBs	1 hour (maximum)	8.92×10^{-4}	6.35 x 10-4	5.00×10^{-4}	5.22×10^{-4}	5.10×10^{-4}	3.91×10^{-4}	3.60×10^{-4}	3.17×10^{-4}	4.15×10^{-4}	3.10×10^{-4}	2.07×10^{-4}	2.20×10^{-4}	1.67×10^{-4}	1.75×10^{-4}	2.17×10^{-4}	0.03
	Annual	2.72×10^{-5}	1.77 x 10-5	1.38×10^{-5}	1.35×10^{-5}	1.00×10^{-5}	1.13×10^{-5}	7.42×10^{-6}	4.55×10^{-6}	4.74×10^{-6}	4.39×10^{-6}	3.57×10^{-6}	2.02×10^{-6}	2.47×10^{-6}	2.44×10^{-6}	2.08×10^{-6}	5.52×10^{-6}

Metal Deposition

7.8.1 The maximum deposition rates for all receptors (sensitive receptors and the whole modelling domain) are compared against the relevant deposition EALs in Table 7.27. The results for the modelling of metal deposition at identified human health receptors are presented in Table 7.28. The results indicate that deposition rates are within all relevant EALs for deposition to land.

Table 7.27: Maximum Metal Deposition ($mg.m^{-2}.d^{-1}$) Process Contributions (PC)

Pollutant	Maximum Deposition Rate EAL	Maximum Deposition Across Model Domain	PC as a % of the EAL
Arsenic (As)	0.02	3.16×10^{-4}	1.58
Cadmium (Cd)	0.009	4.66×10^{-3}	51.74
Chromium (Cr)	1.5	1.59×10^{-3}	0.11
Copper (Cu)	0.25	6.95×10^{-4}	0.28
Lead (Pb)	1.1	2.27×10^{-3}	0.21
Mercury (Hg)	0.004	1.62×10^{-3}	1.47
Nickel (Ni)	0.11	1.88×10^{-3}	47.07

Table 7.28: Predicted Metal Deposition Contributions at Receptors

Receptor	Cd	Hg	As	Cr	Cu	Pb	Ni
R1	1.40×10^{-4}	6.80×10^{-4}	5.75×10^{-4}	5.75×10^{-4}	2.51×10^{-4}	8.23×10^{-4}	5.82×10^{-4}
R2	8.81×10^{-5}	4.42×10^{-4}	3.73×10^{-4}	3.73×10^{-4}	1.63×10^{-4}	5.34×10^{-4}	3.78×10^{-4}
R3	7.02×10^{-5}	3.45×10^{-4}	2.9×10^{-4}	2.92×10^{-4}	1.27×10^{-4}	4.17×10^{-4}	2.95×10^{-4}
R4	6.69×10^{-5}	3.36×10^{-4}	2.84×10^{-4}	2.84×10^{-4}	1.24×10^{-4}	4.07×10^{-4}	2.88×10^{-4}
R5	4.90×10^{-5}	2.50×10^{-4}	2.12×10^{-4}	2.12×10^{-4}	9.24×10^{-5}	3.03×10^{-4}	2.14×10^{-4}
R6	5.66×10^{-5}	2.83×10^{-4}	2.40×10^{-4}	2.40×10^{-4}	1.05×10^{-4}	3.43×10^{-4}	2.43×10^{-4}
R7	3.66×10^{-5}	1.85×10^{-4}	1.57×10^{-4}	1.57×10^{-4}	6.84×10^{-5}	2.24×10^{-4}	1.59×10^{-4}
R8	2.21×10^{-5}	1.14×10^{-4}	9.61×10^{-5}	9.61×10^{-5}	4.19×10^{-5}	1.37×10^{-4}	9.73 x 10-5
R9	2.40×10^{-5}	1.18×10^{-4}	1.00×10^{-4}	1.00×10^{-4}	4.37×10^{-5}	1.43×10^{-4}	1.01×10^{-4}
R10	2.16×10^{-5}	1.10×10^{-4}	9.27×10^{-5}	9.27×10^{-5}	4.05×10^{-5}	1.33×10^{-4}	9.39×10^{-5}
R11	1.73E$\times 10^{-5}$	8.91×10^{-5}	7.54×10^{-5}	7.54×10^{-5}	3.29×10^{-5}	1.08×10^{-4}	7.63×10^{-5}
R12	9.80×10^{-6}	5.04×10^{-5}	4.27×10^{-5}	4.27×10^{-5}	1.86×10^{-5}	6.10×10^{-5}	4.32×10^{-5}
R13	1.20×10^{-5}	6.18×10^{-5}	5.22×10^{-5}	5.22×10^{-5}	2.28×10^{-5}	7.47×10^{-5}	5.29×10^{-5}
R14	1.18×10^{-5}	6.08×10^{-5}	5.15×10^{-5}	5.15 x 10-^{5}	2.24×10^{-5}	7.35×10^{-5}	5.21×10^{-5}
R15	9.95×10^{-6}	5.18×10^{-5}	4.38×10^{-5}	4.38×10^{-5}	1.91×10^{-5}	6.26×10^{-5}	4.44×10^{-5}

Dioxin and Furan Deposition

7.8.2 The results for the modelling of dioxin and furan deposition at sensitive receptors and the maximum deposition across the whole modelling domain (including the grid receptors) are presented in Table 7.29. The results of the dioxin and furan deposition modelling have been used as the inputs for undertaking the HHRA assessment as summarised in the Air Quality Chapter and fully detailed in Chapter 7. The following list presents the key to the individual congener results presented in the table:

- A: 2,3,7,8-TCDD
- B: 1,2,3,7,8-PeCDD
- C: 1,2,3,4,7,8-HxCDD
- D: 1,2,3,7,8,9-HxCDD
- E: 1,2,3,6,7,8-HxCDD
- F: 1,2,3,4,6,7,8-HpCDD
- G: OCDD
- H: 2,3,7,8-TCDF
- I: 2,3,4,7,8-PeCDF
- J: 1,2,3,7,8-PeCDF
- K: 1,2,3,4,7,8-HxCDF
- L: 1,2,3,7,8,9-HxCDF
- M: 1,2,3,6,7,8-HxCDF
- N: 2,3,4,6,7,8-HxCDF
- O: 1,2,3,4,6,7,8-HpCDF
- P: 1,2,3,4,7,8,9-HpCDF
- Q: OCDF

Table 7.29: Predicted Maximum Dioxin / Furan Deposition Contributions ($mg.m^{-2}.d^{-1}$)

Receptor	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
R1	4.7×10^{-20}	3.8×10^{-19}	4.4×10^{-19}	3.2×10^{-19}	3.9E-19	2.6×10^{-18}	6.0×10^{-18}	4.1×10^{-19}	8.2×10^{-19}	4.2×10^{-19}	3.3×10^{-18}	6.3×10^{-20}	1.2×10^{-8}	1.3×10^{-8}	6.6×10^{-18}	6.5×10^{-19}	5.4×10^{-18}
R2	3.0×10^{-20}	2.4×10^{-19}	2.8×10^{-19}	2.1×10^{-19}	2.5E-19	1.7×10^{-18}	3.9×10^{-18}	2.6×10^{-19}	5.3×10^{-19}	2.7×10^{-19}	2.2×10^{-18}	4.1×10^{-20}	7.9×10^{-19}	8.5×10^{-19}	4.3×10^{-18}	4.2×10^{-19}	3.5×10^{-18}
R3	2.4×10^{-20}	1.9×10^{-19}	2.2×10^{-19}	1.6×10^{-19}	2.0E-19	1.3×10^{-18}	3.1×10^{-18}	2.1×10^{-19}	4.1×10^{-19}	2.1×10^{-19}	1.7×10^{-18}	3.2×10^{-20}	6.2×10^{-19}	6.7×10^{-19}	3.4×10^{-18}	3.3×10^{-19}	2.8×10^{-18}
R4	2.3×10^{-20}	1.9×10^{-19}	2.2×10^{-19}	1.6×10^{-19}	1.9E-19	1.3×10^{-18}	3.0×10^{-18}	2.0×10^{-19}	4.0×10^{-19}	2.1×10^{-19}	1.6×10^{-18}	3.1×10^{-20}	6.0×10^{-19}	6.5×10^{-19}	3.3×10^{-18}	3.2×10^{-19}	2.7×10^{-18}
R5	1.7×10^{-20}	1.4×10^{-19}	1.6×10^{-19}	1.2×10^{-19}	1.4E-19	9.4×10^{-19}	2.2×10^{-18}	1.5×10^{-19}	3.0×10^{-19}	1.6×10^{-19}	1.2×10^{-18}	2.3×10^{-20}	4.5×10^{-19}	4.8×10^{-19}	2.4×10^{-18}	2.4×10^{-19}	2×10^{-18}
R6	1.9×10^{-20}	1.6×10^{-19}	1.8×10^{-19}	1.3×10^{-19}	1.6E-19	1.1×10^{-18}	2.5×10^{-18}	1.7×10^{-19}	3.4×10^{-19}	1.8×10^{-19}	1.4×10^{-18}	2.6×10^{-20}	5.1×10^{-19}	5.5×10^{-19}	2.8×10^{-18}	2.7×10^{-19}	2.2×10^{-18}
R7	1.3×10^{-20}	1.0×10^{-19}	1.2×10^{-19}	8.6×10^{-20}	1.1E-19	7.0×10^{-19}	1.6×10^{-18}	1.1×10^{-19}	2.2×10^{-19}	1.2×10^{-19}	9.0×10^{-19}	1.7×10^{-20}	3.3×10^{-19}	3.6×10^{-19}	1.8×10^{-18}	1.8×10^{-19}	1.5×10^{-18}
R8	7.8×10^{-21}	6.3×10^{-20}	7.3×10^{-20}	5.3×10^{-20}	6.6×10^{-20}	4.3×10^{-19}	1.0×10^{-18}	6.8×10^{-20}	1.4×10^{-19}	7.1×10^{-20}	5.5×10^{-19}	1.1×10^{-20}	2.0×10^{-19}	2.2×10^{-19}	1.1×10^{-18}	1.1×10^{-19}	9.0×10^{-19}
R9	8.1×10^{-21}	6.6×10^{-20}	7.6×10^{-20}	5.5×10^{-20}	6.8×10^{-20}	4.5×10^{-19}	1.1×10^{-18}	7.1×10^{-20}	1.4×10^{-19}	7.4×10^{-20}	5.8×10^{-19}	1.1×10^{-20}	2.1×10^{-19}	2.3×10^{-19}	1.1×10^{-18}	1.1×10^{-19}	9.4×10^{-19}
R10	7.5×10^{-21}	6.1×10^{-20}	7.1×10^{-20}	5.1×10^{-20}	6.3×10^{-20}	4.1×10^{-19}	9.7×10^{-19}	6.6×10^{-20}	1.3×10^{-19}	6.8×10^{-20}	5.4×10^{-19}	1.0×10^{-20}	2.0×10^{-19}	2.1×10^{-19}	1.1×10^{-18}	1.0×10^{-19}	8.8×10^{-19}
R11	6.1×10^{-21}	4.9×10^{-20}	5.7×10^{-20}	4.2×10^{-20}	5.1×10^{-20}	3.4×10^{-19}	7.9×10^{-19}	5.3×10^{-20}	1.1×10^{-19}	5.5×10^{-20}	4.4×10^{-19}	8.3×10^{-21}	1.6×10^{-19}	1.7×10^{-19}	8.7×10^{-19}	8.5×10^{-20}	7.1×10^{-19}
R12	3.5×10^{-21}	2.8×10^{-20}	3.2×10^{-20}	2.4×10^{-20}	2.9×10^{-20}	1.9×10^{-19}	4.5×10^{-19}	3.0×10^{-20}	6.0×10^{-20}	3.1×10^{-20}	2.5×10^{-19}	4.7×10^{-21}	$9. \times 10^{-20}$	9.7×10^{-20}	4.9×10^{-19}	4.8×10^{-20}	4.0×10^{-19}
R13	4.2×10^{-21}	3.4×10^{-20}	4.0×10^{-20}	2.9×10^{-20}	3.6×10^{-20}	2.3×10^{-19}	5.5×10^{-19}	3.7×10^{-20}	7.4×10^{-20}	3.8×10^{-20}	3.0×10^{-19}	5.8×10^{-21}	1.1×10^{-19}	1.2×10^{-19}	6.0×10^{-19}	5.9×10^{-20}	4.9×10^{-19}
R14	4.2×10^{-21}	3.4×10^{-20}	3.9×10^{-20}	2.8×10^{-20}	3.5×10^{-20}	2.3×10^{-19}	5.4×10^{-19}	3.6×10^{-20}	7.3×10^{-20}	3.8×10^{-20}	3.0×10^{-19}	5.7×10^{-21}	1.1×10^{-19}	1.2×10^{-19}	5.9×10^{-19}	5.8×10^{-20}	4.9×10^{-19}
R15	3.6×10^{-21}	2.9×10^{-20}	3.3×10^{-20}	2.4×10^{-20}	3.0×10^{-20}	2.0×10^{-19}	4.6×10^{-19}	3.1×10^{-20}	6.2×10^{-20}	3.2×10^{-20}	2.5×10^{-19}	4.8×10^{-21}	9.3×10^{-20}	1.0×10^{-19}	5.1×10^{-19}	$4.\ 1 \times 10^{-20}$	4.1×10^{-19}
Max of Model Domain	1.3×10^{-19}	1.0×10^{-18}	1.2×10^{-18}	8.8×10^{-19}	1.1×10^{-18}	7.1×10^{-18}	1.7×10^{-17}	1.1×10^{-18}	2.3×10^{-18}	1.2×10^{-18}	9.2×10^{-18}	1.8×10^{-19}	3.4×10^{-18}	3.6×10^{-18}	1.8×10^{-17}	1.8×10^{-18}	1.5E-17

Cumulative Modelling

7.8.3 Table 7.30 details the modelled ground-level concentrations from the proposed SEP, which has been assessed in combination with the existing Kemsley Paper Mill. Table 7.30 provides the full five years of modelled cumulative emissions from the SEP and the Kemsley Paper Mill operations. The maximum concentration has been calculated through cumulative dispersion modelling whereby all sources are run in a single model and the point of maximum ground level concentration, when the emission from each stack is combined, is predicted for each pollutant.

Table 7.30: Predicted Maximum Process Contributions (µg.m^{-3}) from the Proposed SEP and the existing Kemsley Paper Mill at Long-Term EU Directive Emission Limits

Pollutant	Averaging Period	EQS	2004	2005	2006	2007	2008	Max
PM_{10}	24 hour (90.41st percentile)	50	0.52	0.50	0.59	0.69	0.63	0.69
	Annual	18	0.14	0.14	0.16	0.16	0.17	0.17
HCl	1 hour (maximum)	750	2.33	2.21	2.28	2.25	2.24	2.33
	Annual	20	0.14	0.14	0.16	0.16	0.17	0.17
HF	1 hour (maximum)	160	0.23	0.22	0.23	0.23	0.22	0.23
SO_2	15 minute (99.90th percentile)	266	9.1	8.9	9.5	9.6	9.6	9.6
	1 hour (99.73rd percentile)	350	10.5	10.4	10.6	10.7	10.6	10.7
	24 hour (99.18th percentile)	125	7.5	6.4	7.8	6.8	6.6	7.8
	Annual	50	0.7	0.7	0..8	0.8	0.9	0.9
NO_2	1 hour (99.79th percentile)	200	22.97	23.01	23.32	23.34	23.33	23.34
	Annual	40	3.09	3.04	3.51	3.53	3.79	3.79
CO	8 hour (maximum daily running)	10,000	32.03	32.52	34.69	31.36	32.54	34.69
	Annual	350	2.49	2.45	2.80	2.82	3.08	3.08
Cd	1 hour (maximum)	1.5	5.83 x 10^{-3}	5.53 x 10^{-3}	5.72 x 10^{-3}	5.65 x 10^{-3}	5.63 x 10^{-3}	5.83 x 10^{-3}
	Annual	0.005	3.52X 10^{-4}	3.45 x 10^{-4}	4.03 x 10^{-4}	4.04 x 10^{-4}	4.28 x 10^{-4}	4.28 x 10^{-4}
Ti	1 hour (maximum)	30	5.83 x 10^{-3}	5.53 x 10^{-3}	5.72 x 10^{-3}	5.65 x 10^{-3}	5.63 x 10^{-3}	5.83 x 10^{-3}
	Annual	1	3.52 x 10^{-4}	3.45 x 10^{-4}	4.03 x 10^{-4}	4.04 x 10^{-4}	4.28 x 10^{-4}	4.28 x 10^{-4}
Hg	1 hour (maximum)	7.5	1.17 x 10^{-2}	1.11 x 10^{-2}	1.14 x 10^{-2}	1.13 x 10^{-2}	1.13 x 10^{-2}	1.17 x 10^{-2}
	Annual	0.25	7.04 x 10^{-4}	6.89 x 10^{-4}	8.05 x 10^{-4}	8.09 x 10^{-4}	8.55 x 10^{-4}	8.55 x 10^{-4}
Sb	1 hour (maximum)	150	1.30 x 10^{-2}	1.23 x 10^{-2}	1.27 x 10^{-2}	1.25 x 10^{-2}	1.25 x 10^{-2}	1.30 x 10^{-2}
	Annual	5	7.82 x 10^{-4}	7.66 x 10^{-4}	8.95 x 10^{-4}	8.99 x 10^{-4}	9.50 x 10^{-4}	9.50 x 10^{-4}
As	1 hour (maximum)	15	5.68 x 10^{-3}	5.39 x 10^{-3}	5.58 x 10^{-3}	5.51 x 10^{-3}	5.49 x 10^{-3}	5.68 x 10^{-3}
	Annual	0.2	3.43 x 10^{-4}	3.36 x 10^{-4}	3.93 x 10^{-4}	3.94 x 10^{-4}	4.17 x 10^{-4}	4.17 x 10^{-4}
Cr	1 hour (maximum)	3	2.86 x 10^{-2}	2.71 x	2.81 x	2.77 x	2.76 x	2.86 x 10^{-2}

				10^{-2}	10^{-2}	10^{-2}	10^{-2}	
	Annual	0.1	1.73×10^{-3}	1.69×10^{-3}	1.98×10^{-3}	1.98×10^{-3}	2.10×10^{-3}	2.10×10^{-3}
Co	1 hour (maximum)	6	1.30×10^{-2}	1.23×10^{-2}	1.27×10^{-2}	1.25×10^{-2}	1.25×10^{-2}	1.30×10^{-2}
	Annual	0.2	7.82×10^{-4}	7.66×10^{-4}	8.95×10^{-4}	8.99×10^{-4}	9.50×10^{-4}	9.50×10^{-4}
Cu	1 hour (maximum)	60	1.25×10^{-2}	1.18×10^{-2}	1.23×10^{-2}	1.21×10^{-2}	1.20×10^{-2}	1.25×10^{-2}
	Annual	2	7.53×10^{-4}	7.38×10^{-4}	8.62×10^{-4}	8.66×10^{-4}	9.15×10^{-4}	9.15×10^{-4}
Pb	Annual	0.5	2.47×10^{-3}	2.42×10^{-3}	2.82×10^{-3}	2.84×10^{-3}	3.00×10^{-3}	3.00×10^{-3}
Mn	1 hour (maximum)	1500	1.30×10^{-2}	1.23×10^{-2}	1.27×10^{-2}	1.25×10^{-2}	1.25×10^{-2}	1.30×10^{-2}
	Annual	1	7.82×10^{-4}	7.66×10^{-4}	8.95×10^{-4}	8.99×10^{-4}	9.50×10^{-4}	9.50×10^{-4}
Ni	1 hour (maximum)	30	2.89×10^{-2}	2.75×10^{-2}	2.84×10^{-2}	2.80×10^{-2}	2.79×10^{-2}	2.89×10^{-2}
	Annual	1	1.75×10^{-3}	1.71×10^{-3}	2.00×10^{-3}	2.01×10^{-3}	2.12×10^{-3}	2.12×10^{-3}
V	1 hour (maximum)	5	1.30×10^{-2}	1.23×10^{-2}	1.27×10^{-2}	1.25×10^{-2}	1.25×10^{-2}	1.30×10^{-2}
	Annual	1	7.82×10^{-4}	7.66×10^{-4}	8.95×10^{-4}	8.99×10^{-4}	9.50×10^{-4}	9.50×10^{-4}
Dioxins & Furans	Annual	-	1.41 x 10-9	1.38 x 10-9	1.61 x 10-9	1.61 x 10-9	1.71 x 10-9	1.7 x 10-9
Ammonia	1 hour (maximum)	2500	1.17	1.11	1.14	1.13	1.13	1.17
	Annual	180	0.07	0.07	0.08	0.08	0.09	0.09
PAHs (B[a]P)	Annual	0.00025	1.43×10^{-5}	1.40×10^{-5}	1.63×10^{-5}	1.64×10^{-5}	1.73×10^{-5}	1.73E
	1 hour (maximum)	6	2.37×10^{-4}	2.25×10^{-4}	2.32×10^{-4}	2.29×10^{-4}	2.29×10^{-4}	2.37E
PCBs	Annual	0.2	7.06×10^{-5}	6.91×10^{-5}	8.08×10^{-5}	8.12×10^{-5}	8.58×10^{-5}	8.58×10^{-5}

7.7 References

[1] AEA UK Emissions Inventory Team, UK Emissions of Air Pollutants 1970 to 2006, October 2008.

[2] Directive 1996/62/EC of 27 September 1996 on ambient air quality assessment and management

[3] Directive 2008/50/EC of 21 May 2008 on ambient air quality and cleaner air for Europe.

[4] The Air Quality Standards Regulation (2007), Statutory Instrument 2007 No. 64.

[5]The Air Quality (England) Regulations (2000), Statutory Instrument 2000 No. 928

[6] Defra (2003), The Air Quality Strategy for England, Scotland, Wales and Northern Ireland: Working Together for Clean Air - Addendum.

[7] Defra (2007), The Air Quality Strategy for England, Scotland, Wales and Northern Ireland: Working Together for Clean Air. Volume 1.

[8] Defra (2009), Local Air Quality Management – Policy Guidance PG(09).

[9] ODPM (2004), Planning Policy Statement 23: Planning and Pollution Control.

[10] South East England Regional Assembly (2009), The South East Plan

[11] Kent County Council (1998) Kent Waste Local Plan

[12] Kent County Council (2007) Kent Joint Municipal Waste Management Strategy

[13] Swale Borough Council (2008), Swale Borough Council, Local Plan

[14] UK Nitric Acid Monitoring Network

[15] Defra (2005), Expert Panel on Air Quality Standards: guidelines for halogen and hydrogen halides in ambient air for protecting human health against acute irritancy effects. Draft consultation document.

[16] Swale Borough Council (SBC)

- (2001) Review and Assessment.
- (2003) Updating and Screening Assessment
- (2004) Progress Report
- (2005) Detailed Assessment
- (2008) Annual Progress Report

[17] Maidstone Borough Council (MBC)

- (2003) Updating and Screening Assessment
- (2004) Detailed Assessment
- (2005) Air Quality Action Plan
- (2006) Further Assessment

[18] Ashford Borough Council

- (2003) Updating and Screening Assessment
- (2005) Progress Report
- (2006) Updating and Screening Assessment
- (2007) Progress Report
- (2008) Progress Report

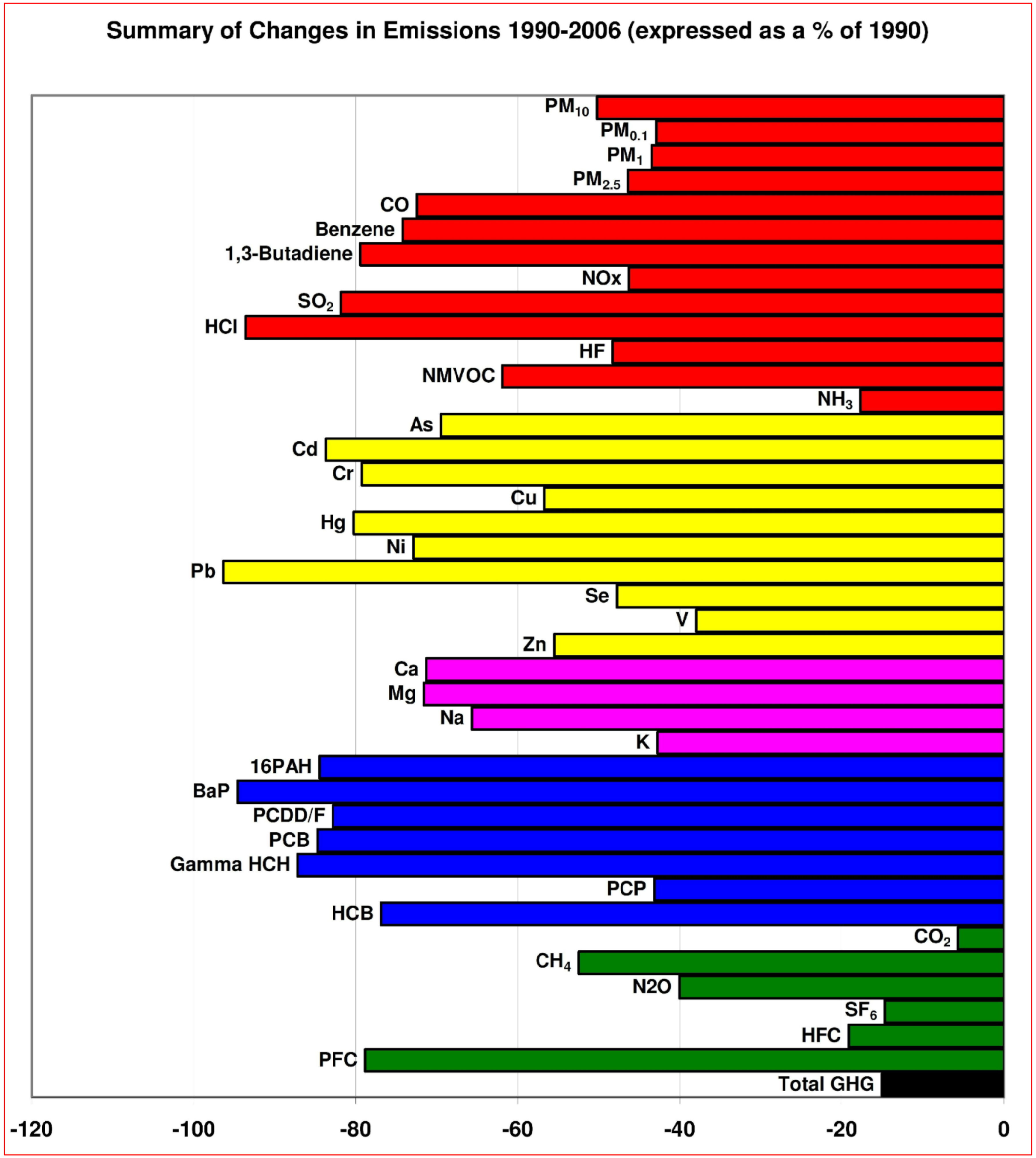
[19] Canterbury City Council

- (2003) Updating and Screening Assessment
- (2005) Detailed Assessment
- (2006) Updating and Screening Assessment
- (2007) Progress Report

[20] Medway Council

- (2005) Air Quality Action Plan
- (2006) Updating Screening Assessment
- (2007) progress Report

[21] Centre for Ecology and Hydrology (2006), UK Heavy Metal Monitoring Network – Project No. EPG 1/3/204.



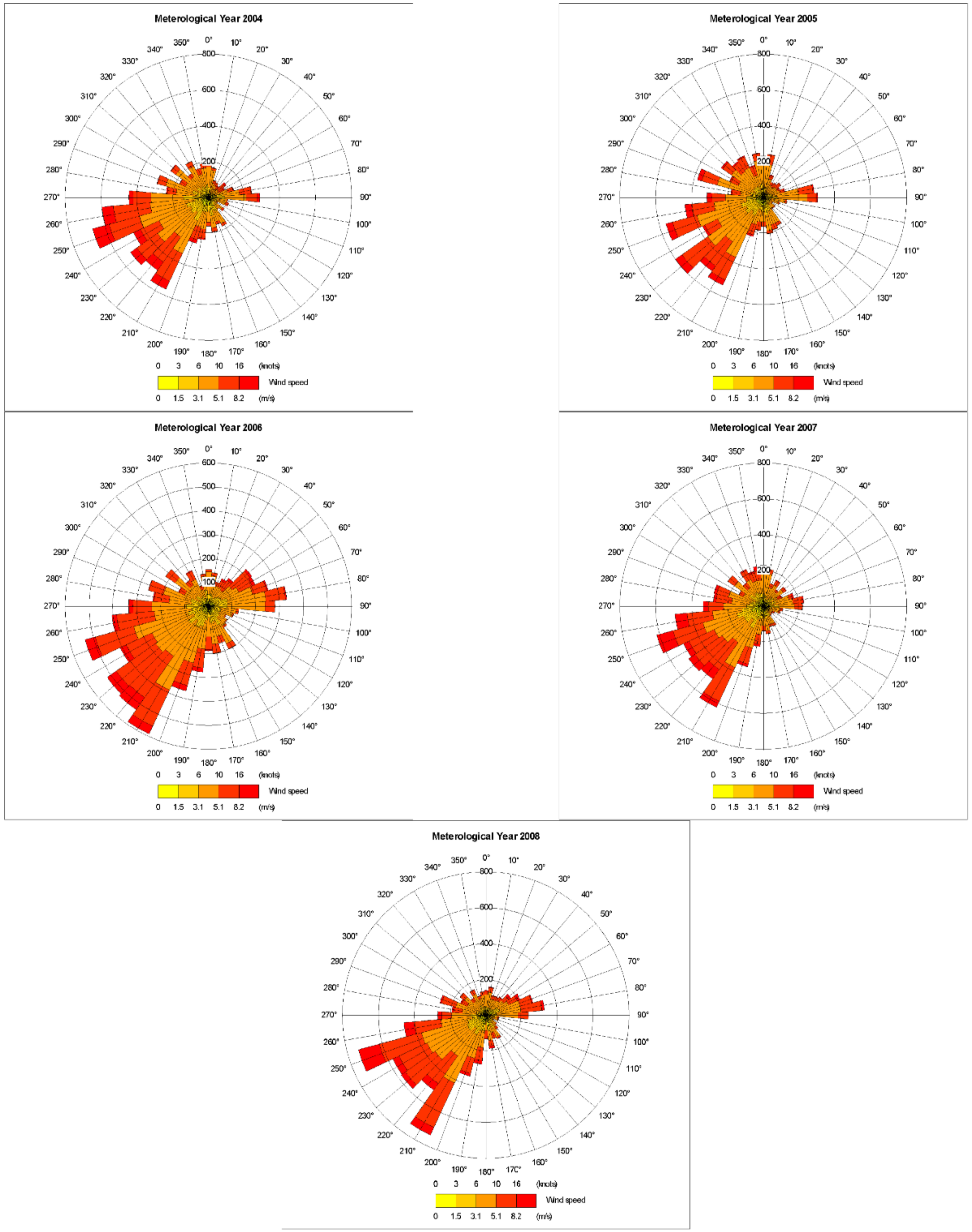
RPS
3RD FLOOR
34 LISBON ST.
LEEDS
LS1 4LX
TEL: 0113 220 6190
FAX: 0113 243 9161

THIS DRAWING IS NOT TO BE SCALED ALL DIMENSIONS TO BE CHECKED ON SITE DISCREPANCIES, AMBIGUITIES AND/OR OMISSIONS BETWEEN THIS DRAWING AND INFORMATION GIVEN ELSEWHERE MUST BE REPORTED IMMEDIATELY TO THIS OFFICE FOR CLARIFICATION BEFORE PROCEEDING

PROJECT
Kemsley Sustainable Energy Plant

TITLE
Changes in Emissions Between 1990 and 2006

SCALE	DRAWN BY
Not to Scale	GP
DATE	CHECKED
December 2009	DS
CAD FILE	
PROJECT NUMBER	DRAWING NUMBER / REV
JAS5438	Figure A.1



RPS
3RD FLOOR
34 LISBON ST.
LEEDS
LS1 4LX
TEL: 0113 220 6190
FAX: 0113 243 9161

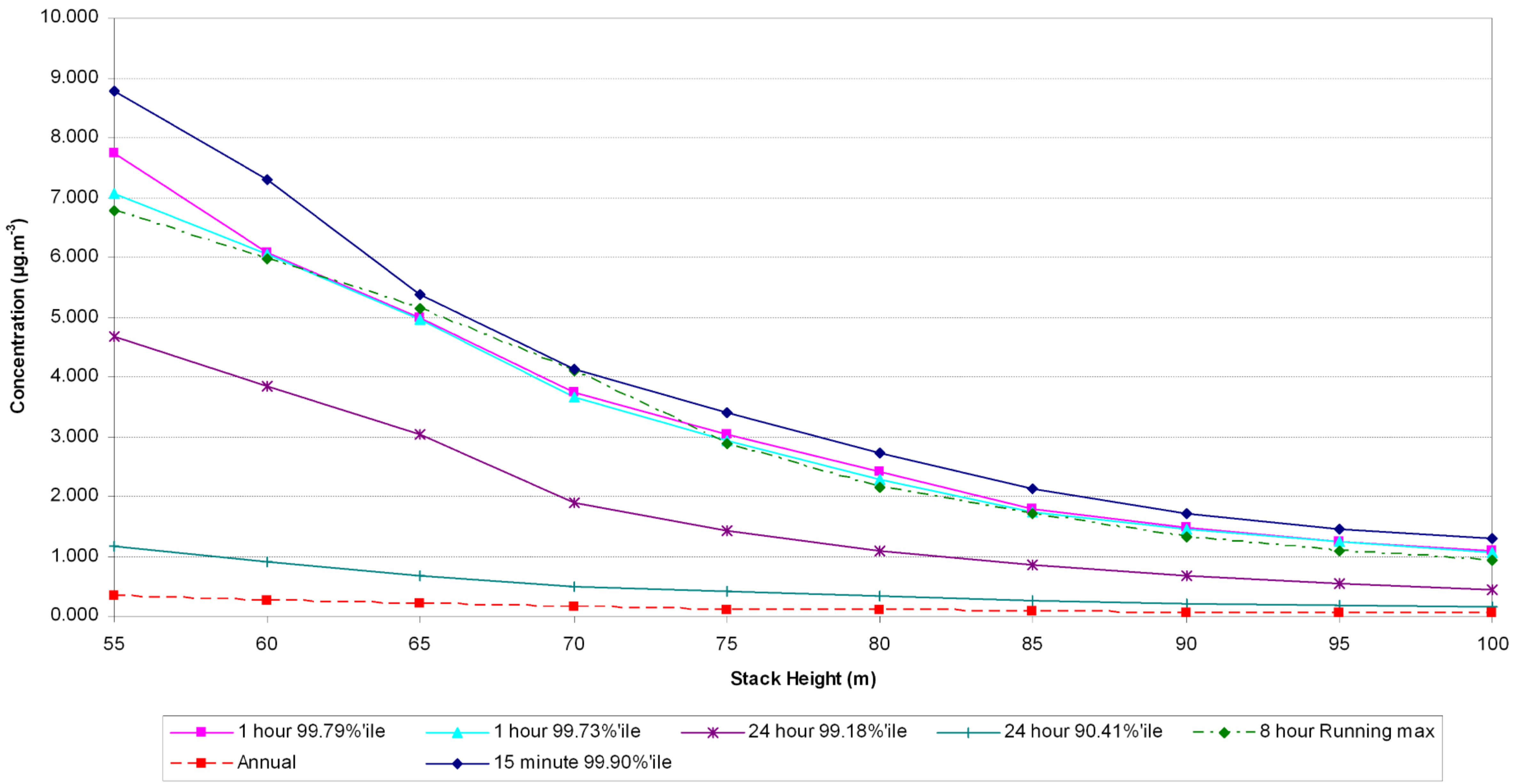
THIS DRAWING IS NOT TO BE SCALED ALL DIMENSIONS TO BE CHECKED ON SITE DISCREPANCIES, AMBIGUITIES AND/OR OMISSIONS BETWEEN THIS DRAWING AND INFORMATION GIVEN ELSEWHERE MUST BE REPORTED IMMEDIATELY TO THIS OFFICE FOR CLARIFICATION BEFORE PROCEEDING

PROJECT
Kemsley Sustainable Energy Plant

TITLE
Gravesend Meteorological Data
Windroses

SCALE	DRAWN BY	
Not to Scale	GP	
DATE	CHECKED	
December 2009	DS	
CAD FILE		
PROJECT NUMBER	DRAWING NUMBER	REV
JAS5438	Figure A.2	

©RPS



RPS

3RD FLOOR
34 LISBON ST.
LEEDS
LS1 4LX
TEL: 0113 220 6190
FAX: 0113 243 9161

THIS DRAWING IS NOT TO BE SCALED. ALL DIMENSIONS TO BE CHECKED ON SITE. DISCREPANCIES, AMBIGUITIES AND/OR OMISSIONS BETWEEN THIS DRAWING AND INFORMATION GIVEN ELSEWHERE MUST BE REPORTED IMMEDIATELY TO THIS OFFICE FOR CLARIFICATION BEFORE PROCEEDING

PROJECT
Kemsley Sustainable Energy Plant

TITLE
Predicted Contributions for Varying Stack Heights. ADMS modelling at a unit emission rate.

SCALE Not to Scale	DRAWN BY GP
DATE December 2009	CHECKED DS
CAD FILE	
PROJECT NUMBER JAS5438	DRAWING NUMBER Figure A.3
	REV

©RPS

Human Health Risk Assessment

Kemsley Sustainable Energy Plant

St Regis Paper Company Ltd and E.ON Energy from Waste UK Ltd

Quality Management

Prepared by:	Liz Williams	Senior Consultant
Prepared by:	Dr. Ahlim Hashm	Technical director
Authorised by:	Dr. Ahlim Hashm	Technical director
Date:	November 2009	
Revision:	0.0	
Project Number:	BES0276	
Document Reference:	BES0276R	

RPS Planning and Development Ltd. Registered in England No. 02947164
Centurion Court, 85 Milton Park, Abingdon, Oxfordshire, OX14 4RYA Member of the RPS Group Plc

RPS Planning and Development
Park House
Greyfriars Road
Cardiff
CF10 3AF
T: +44 (0) 2920 668662
F: +44 (0) 2920 668622
E: rpsca@rpsgroup.com
W: www.rpsgroup.com

ISO 14001
EMS 70824

FS 32940

Contents

Tables

Drawings

Appendices

1 Introduction

1.1 Background

A detailed human health risk assessment to identify potential health risks associated with exposure to emissions from the proposed Sustainable Energy Plant (SEP) at Kemsley has been completed in line with best practice methodologies.

1.2 Scope of Work

This assessment evaluates the possible effects on the health of populations likely to be exposed to emissions from the proposed SEP. The geographic scope of the study is based on the closest receptors within an approximate 10 km radius for residential, farmer, fisher and industrial receptors where the most significant deposition is generally observed. Defra 2004[1] considered that 1 km radius from the source of emission is a suitable range for assessment of health from dispersion modelling.

Considering that the assessment is related to exposure through direct inhalation of affected air, and indirect exposure through ingestion of affected food, locally grown on soil impacted by the emission through deposition and accumulation, the only relevant sources of emission from the proposed SEP considered in this assessment are the stacks emissions. The substances emitted from the stacks (termed hereafter the contaminants of potential concern COPC) can be considered under the following categories:

- Substances for which any effects are likely to be acute. These effects tend to occur shortly after exposure. These can be subdivided into two groups
  - Acid gases, such as sulphur dioxide, nitrogen dioxide, hydrochloric and hydrofluoric acids,
  - Other substances, such as carbon monoxide, and fine particulate matter.
- Chemicals for which any effects are likely to be chronic. These effects tend to arise from prolonged exposure. The chemicals can be subdivided into two groups:
  - Metals
  - Semi-volatile and non-volatile organic chemicals such as dioxins and furans, benzo(a)pyrene (BaP)and polychlorinated biphenyls (PCBs)

Exposure to the contaminants of potential concern can be by a variety of possible exposure pathways including direct exposure by inhalation of gases and fine particulates, and indirect exposure following the deposition of trace contaminants to land and water and subsequent transfer by biogeochemical processes through soils, water and vegetation into the food chain. The assessment has evaluated potential impacts on human health from the proposed SEP's emissions, both in terms of the long-term inhalation, and the overall long-term exposure through additional viable routes such as the food chain. Therefore the assessment was carried out on persistent substances that have the potential to accumulate in the environment over the emission life of the SEP. These include all the above listed chemicals for which effects are likely to be chronic.

In accordance with the recommended UK tiered approach to risk assessment, this site assessment has first considered worst-case scenarios for all receptors in assuming multiple exposure conditions where all pathways of exposure in each land use scenario were considered to be viable. Some of these assumptions are both extremely conservative and also very unlikely. These worst case assumptions have been used in the first instance as part of a screening study, to identify receptors that can be excluded from further assessment. Receptors failing the screening assessment are considered in further detail, with the exposure assumptions refined to reflect a more realistic exposure scenario, as appropriate.

2 Methodology

2.1 Background

In its review of environmental and health effects of waste management, the Department for Environment, Food and Rural Affairs' (Defra)[1] reported that a direct measurement of exposure attributable to facilities such as that proposed by St Regis Paper Company Ltd and E.ON Energy from Waste UK Ltd cannot be made due to the complexity of the pollutant mixture, the possibility of exposure through multiple pathways, wider environmental and lifestyle influences and the generally non-specific health outcomes.

In order to manage the difficulties of directly measuring effects and to provide a predictive analysis, the assessment was based on modelling the various exposure routes, applying outputs from the air quality assessment and factoring in the influence of the local meteorological conditions and characteristics such as stack height, velocity and temperature. Such modelling acts as a means of establishing a worst-case exposure attributable to the source as the basis of the health assessment.

Exposure to emissions from such facilities can be through a number of pathways, with the inhalation and the food chain being the most critical. For certain persistent pollutants, such as trace metals, dioxins and furans, benzo(a)pyrene and polychlorinated biphenyls the cumulative indirect exposure via the ingestion of contaminated food is of paramount importance. Therefore potential exposure through this important pathway has been accounted for in addition to the inhalation.

In the absence of an equivalent UK method, the Industrial Risk Assessment Program-Human Health (IRAP-h View - version 4.0), which is based on the United States Environment Protection Agency (USEPA) Human Health Risk Assessment Protocol (HHRAP 2005), has been used to calculate the transport and fate of trace contaminants emitted in the stack exhaust gases. The default exposure parameters and toxicological data were replaced by those recommended by DEFRA and the Environment Agency's Science reports SC050021/SR3[2] (updates and replaces the CLR10, 2002[3]) and R&D Publication TOX reports[4,5,6,7,8,9,10]. This is based on the recommendation of the DEFRA and the Environment Agency's Science reports SC050021/SR2[11] (update and replaces the CLR9 2002[12]) which requires that when selecting appropriate toxicological data, UK proclamations should be given preference. It also requires that, where available, UK data should be used for the derivation of background exposure.

These modified parameters include averaging times for carcinogens and non-carcinogens, body weight, consumption and inhalation rates, exposure frequencies and durations. The only UK source that reported values for mixing depths is the UK GasSim model manual. The recommended values are 50 cm and 5cm for tilled and non-tilled soils respectively. In this assessment, the USEPA default values of 20 and 2 cm soil mixing depths were used being more conservative than the GasSim model values.

The level of exposure to trace metals, dioxins and furans emitted from the proposed SEP has been quantified at selected sensitive receptors within the vicinity of the site. In residential locations, the key exposure pathways have included the ingestion of soils and home-grown produce. On agricultural premises, potential exposure through the ingestion of home-grown produce, ingestion of beef, milk, pork, poultry and eggs, produced at farms within the vicinity of the site has been included, as appropriate. Ingestion of fish from local fisheries including ingestion of shellfish from the Swale was also included as an additional pathway of exposure for the local residents.

A search of all fishing waters within a 10 km radius of the site was undertaken, the results of which are presented within Annex C. A large number of water bodies that support fish were identified. Only the following were identified as sources of fish for human consumption:

- The Swale including
- The Milton Creek
- The Long Reach
- Millen Water Fly Fishery, Iwade

As surface water abstractions for drinking were not identified (from EA records) within 10km of the proposed SEP, this pathway of exposure was not included.

Throughout this assessment, where there is some uncertainty in respect of the data, a precautionary approach (conservative) has been used to estimate the possible risks from exposure to emissions from the proposed SEP. The purpose of this approach is to ensure that full allowance is made for any uncertainties in the interpretation of the data provided in order to be protective of human health.

2.2 Approach to Risk Assessment

The DEFRA common framework[13] providing general guidance for risk assessment and management has been used as the founding principle for the assessment and appraisal of potential impact on human health from the proposed SEP.

This common framework includes guidelines setting out the basic principles which the regulatory authorities would normally intend to use in the assessment and management of environmental risks and which are recommended for all public-domain risk assessments. They are intended to provide decision-makers, practitioners and the public with a consistent language and approach for environmental risk assessment and management.

The guidelines provide a tiered approach to environmental risk assessment and management where the level of effort put into assessing each risk is proportionate to its priority (in relation to other risks) and its complexity (in relation to an understanding of the likely impacts).

The staged approach developed for this project, consistent with the current UK risk assessment guidelines is presented in the following sub-sections.

2.2.1 Stage 1 Development of Conceptual Model of the Site

The risk assessment procedure utilises the source-pathway-receptor concept in constructing a Site Conceptual Model (SCM) and assessing potential risks. The source-pathway-receptor 'pollutant linkage' scenario provides a useful basis for generating a site conceptual model, which can be used to identify critical pathways on which a quantitative analysis may be undertaken. The SCM establishes, in a qualitative manner, the following:

- Principal sources of contamination on the site - emissions from the proposed development
- Contaminants of potential concern - The European Parliament Directive WID 2000/76/EC list of pollutants in addition to other relevant organic pollutants
- Behaviour of contaminants within contaminated media – i.e., airborne, deposited on soils, taken up by home grown vegetables and other agricultural products
- All relevant receptors;
- Location of potential exposure points;

- Plausible pathways connecting sources of contamination and sensitive receptors; accidental ingestion of soil and contaminated home grown produce and other routes of exposure through the food chain.

2.2.2 Stage 2: Hazard Identification

This includes identification of:

- the type and spatial distribution of hazardous substances;
- the media containing such hazardous materials;
- the concentration of the hazardous substance in the identified media;
- exposure scenarios, whether residential, agricultural, etc;
- exposure routes - ingestion of soil, ingestion of beef, etc; and
- exposure factors for each scenario and route.

2.2.3 Stage 3 Hazard/Risk Characterisation and Assessment

This includes:

- identifying the toxicity of the identified contaminants of concern with relevance to chronic exposures;
- identification of the nature of the potential effect; and
- calculation of the magnitude of risks/ derivation of risk-based criteria using a site specific risk assessment model to evaluate the significance of harm from exposure to identified contaminants of concern with consideration to sensitive receptors.

2.2.4 Stage 4 Risk Control and Management

At stage 4 of the assessment, strategies to control and manage potential risks through appropriate mitigation measures are identified if needed. This may be achieved through the management of the source or the exposure pathways to prevent the exposure of the receptors, where needed.

3 Risk Assessment

3.1 The Site Conceptual Model

The development of a site conceptual model (SCM) is the first stage of the risk assessment. The model is used to identify the potential sources, critical pathways and receptors that require assessment as described in the following paragraphs.

3.1.1 Sources

For the purpose of assessing potential health impact associated with the effect of emissions from the proposed SEP, the stacks are the only relevant source of emission from the proposed SEP. The European Directive 2000/76/EC (WID) prescribes air emission limits for the following pollutants:

- oxides of nitrogen (NO_x);
- sulphur dioxide SO_2;
- particles;
- carbon monoxide;
- hydrogen chloride;
- hydrogen fluoride;
- dioxins and furans;
- group 1 metals;
- group 2 metals; and
- group 3 metals.

Only the metals and dioxins of the above list are considered to be of relevance to long-term exposure (chronic). Group 1 metals includes cadmium and thallium and their compounds, group 2 includes mercury and its compounds while group 3 includes antimony, arsenic, lead, chromium, cobalt, copper, manganese, nickel, vanadium and their compounds. Some of these metals, such as cobalt, copper, manganese and vanadium, were excluded from this assessment on the basis that they pose little or no risk and as such were not included in the EPA HHRAP COPC database.

All contaminants that were deemed by the UK Department for Environment, Food and Rural Affairs and the Environment Agency as priority contaminants (CLR8 2002[14]) were considered in the assessment. These include cadmium, mercury in the form of mercuric chloride and mercury vapour, arsenic, chromium (hexavalent and other chromiums), lead, antimony, dioxins and furans. Despite its absence from the UK list of priority contaminants and hence the absence of UK toxicological data, thallium was considered in the assessment due to its high toxicity. A review has been undertaken to identify any available toxicological data for thallium and none was found in current literature. The USEPA Risk Assessment Information System (RAIS) had previously provided a list of toxicological data for the different thallium compounds. These have been withdrawn recently. The ASTDR has also removed their provisional values due to uncertainties associated with thallium toxicity assessment. In the absence of current toxicological data on thallium, the withdrawn USEPA values were considered for an indicative assessment. The most conservative of the USEPA previously reported values (lowest allowable Reference Dose-RfD- of 8.0E-05 mg/kgbw-day) was used in the model.

Although the European Directive 2000/76/EC (WID), does not prescribes air emission limits for PCBs and benzo(a)pyrene, these were included in the assessment due to the commonly raised concern about these chemicals and their likely presence in the emission. The emission values used for these chemicals were based on the long-term emission concentrations taken from the Integrated Pollution Prevention and Control (IPCC) Reference Document on the Best Available Techniques for Waste Incineration

The annual rates of air concentrations and depositions of the metals and dioxins/furans were estimated through air dispersion modelling using ADMS. Details on the modelling approach are presented in the air quality Chapter. The air parameters are presented in Annex A.

The emissions for the stacks are presented in Table 3-1 and Table 3-2.

Table 3-1 Emission of Metals

Metal Group	Metals	K2 - Emission Conc – group total ($mg.m^{-3}$)*	Stack K2 Emission Rate ($g.s^{-1}$)	K3 - Emission Conc – group total ($mg.m^{-3}$)*	Stack K3 Emission Rate ($g.s^{-1}$)
Group 1	Cadmium	0.05	3.00E-04	0.0015#	1.18E-04
	Thallium		3.00E-04		1.18E-04
Group 2	Mercury	0.05	1.45E-04^	0.0015#	2.36E-04

Group 3	Antimony	0.5	2.62E-04**	0.5	3.07E-04**
	Arsenic		2.62E-04**		3.07E-04**
	Chromium-total		1.32E-03**		1.55E-03**
	Lead		1.88E-03**		2.21E-03**
	Nickel		1.33E-03**		1.56E-03**

* Normalised

** Emission rate based on percentage of NAEI typical emission rates per metal

^ Emission rate based on typical NAEI mercury emission for incinerator burning MSW (2007)

Emission rate based on typical emission rates for similar plant

Table 3-2 Emission of Dioxins and Other Organics

Congener	Annual Mean Emission Conc (ng.m^{-3})*	Annual Mean Emission Conc) (mg.m^{-3})*	Stack K2 Emission Rate (g.s^{-1})	Stack K3 Emission Rate (g.s^{-1})
2,3,7,8-TCDD	3.1E-03	3.1E-09	3.33E-11	4.88E-10
1,2,3,7,8-PeCDD	2.5E-02	2.5E-08	2.68E-10	3.94E-09
1,2,3,4,7,8-HxCDD	2.9E-02	2.9E-08	3.11E-10	4.57E-09
1,2,3,7,8,9-HxCDD	2.1E-02	2.1E-08	2.25E-10	3.31E-09
1,2,3,6,7,8-HxCDD	2.6E-02	2.6-E08	2.79E-10	4.09E-09
1,2,3,4,6,7,8-HpCDD	1.7E-01	1.7E-07	1.82E-09	2.68E-08
OCDD	4.0E-01	4.0E-07	4.29E-09	6.30E-08
2,3,7,8-TCDF	2.7E-02	2.7E-08	2.90E-10	4.25E-09
2,3,4,7,8-PeCDF	5.4E-02	5.4E-08	5.79E-10	8.50E-09
1,2,3,7,8-PeCDF	2.8E-02	2.8E-08	3.00E-10	4.41E-09
1,2,3,4,7,8-HxCDF	2.2E-01	2.2E-07	2.36E-09	3.46E-08
1,2,3,7,8,9-HxCDF	4.2E-03	4.2E-09	4.51E-11	6.61E-10
1,2,3,6,7,8-HxCDF	8.1E-02	8.1E-08	8.69E-10	1.28E-08
2,3,4,6,7,8-HxCDF	8.7E-02	8.7E-08	9.34E-10	1.37E-08
1,2,3,4,6,7,8-HpCDF	4.4E-01	4.4E-07	4.72E-09	6.93E-08
1,2,3,4,7,8,9-HpCDF	4.3E-02	4.3E-08	4.61E-10	6.77E-09
OCDF	3.6E-01	3.6E-07	3.86E-09	5.67E-08
Total (ng I-TEQ m^{-3})	1.0E-01	1.0E-07	1.07E-09	1.57E-08
BaP	-		1.07E-05	1.57E-04
PCBs**	-	5.00E-03 – K2	5.37E-05	-
		1.10E-09 – K3	-	1.73E-10

* Normalised

** In the absence of information on the constituents of the total PCBs, the USEPA methodology for selecting a surrogate compound was used in the modelling

3.1.2 Receptors

It is generally recommended that for human health risk assessment, resources for characterising the exposure setting should initially be focused on the areas surrounding the emission sources and extending out to about 3 km, where the most significant deposition has been generally observed. Such area may be extended where sensitive receptors have not been identified within the selected domain but are known to be present further afield within about 10 km of the source. For this assessment the 10 km radius was considered in the assessment. It should be noted however that all types of sensitive receptors with regards to human health, have been identified within the 3 km radius. The air dispersion modelling plots also showed that the highest air and deposition concentrations are within this selected radius.

The purpose of characterising the exposure setting is to identify current human activities or land uses that provide the basis for evaluation of recommended exposure scenarios that may result due to exposure to emissions from the sources

IRAP-h View allows the digitisation of areas of concern where risk receptors and exposure scenarios can be selected for evaluation. Once an area has been defined, the model identifies, within each of the specified areas, all the grid nodes with the highest yearly averages for each modelled air parameter (e.g., air concentration, dry deposition, wet deposition) for each phase (e.g., vapour, particle, particle-bound) to each emission source. This will result in the selection of one or more receptor grid nodes as the location of one or more exposure scenario locations that meet the following criteria:

- Highest vapour phase air concentration
- Highest vapour phase dry deposition rate
- Highest vapour phase wet deposition rate
- Highest particle phase air concentration
- Highest particle phase dry deposition rate
- Highest particle phase wet deposition rate
- Highest particle-bound phase air concentration
- Highest particle-bound phase dry deposition rate
- Highest particle-bound phase wet deposition rate

The closest urban and rural residential areas surrounding the sites where the most significant deposition is anticipated to occur were selected as presented in Figure 1. The models selected between 1-3 receptor grid nodes in each of the selected areas presenting the highest annual air parameters. Each of the model's selected grid node receptors was assigned the most sensitive exposure scenario based on its land use from the map observation. Where there was uncertainty with respect to the land use scenario, the most sensitive was used. Twenty four risk receptor areas including residential, industrial and farms were selected. The model identified 48 grid node receptors with the highest air parameters. These included 27 farms, 17 residential and 4 industrial receptors. Following modelling, the worst residential receptor was modelled as a fisher man and fisher child. The assessment of this receptor was repeated for all water bodies considered in the assessment. The fish eater exposure scenario is made up of the exposure pathways through which a child receptor may be exposed in an urban or nonfarm rural setting where fish is the main source of protein in the receptor diet. Table 3-3 below presents the different areas and their selected receptors based on the ADMS dispersion modelling results. The IRAP-h View model does not allow the modelling of industrial receptors due to their lower sensitivity. However, 4 industrial receptors were selected for this assessment due to their close proximity to the sources. They were modelled as adult residential receptors using UK industrial receptor exposure parameters. The main aim of the industrial assessment is to include potential exposure of breast feeding infants through the exposure of their working mothers.

Table 3-3 List of Receptors

Receptor area	Grid node receptors	NGR--x (1)	NGR—y (1)	Bearing	Receptor area	Grid node receptors
RI_1	RCPTR_1	590600	165960	W	Kemsley	Residential
	RCPTR_2	591260	166320	W	Kemsley	Residential
RI_2	RCPTR_3	590420	166560	W	Great Grovehurst Farm	Farm
	RCPTR_4	590600	166560	W	Great Grovehurst Farm	Farm
RI_3	RCPTR_5	589340	165300	W	Quinton Farm	Farm
	RCPTR_6	590420	166260	W	Quinton Farm	Farm
RI_4	RCPTR_7	590120	166140	W	West Kemsley	Residential
	RCPTR_8	590540	166260	W	West Kemsley	Residential
RI_5	RCPTR_9	589100	164040	SW	Milton Regis	Residential
	RCPTR_10	590540	166020	SW	Milton Regis	Residential
RI_6	RCPTR_11	592220	164400	S	Meres Court Farm	Farm
	RCPTR_12	592580	164820	S	Meres Court Farm	Farm
RI_7	RCPTR_13	591200	163740	S	Snipeshill	Residential

Receptor area	Grid node receptors	NGR--x (1)	NGR—y (1)	Bearing	Receptor area	Grid node receptors
	RCPTR_14	591920	164460	S	Snipeshill	Residential
RI_8	RCPTR_15	590420	164220	SW	Sittingbourne	Industrial
	RCPTR_16	591920	165540	SW	Sittingbourne	Industrial
RI_9	RCPTR_17	592700	164160	SE	West Tonge Farm	Farm
	RCPTR_18	592760	164580	SE	West Tonge Farm	Farm
RI_10	RCPTR_19	593420	164040	SE	St Giles Houses	Residential
	RCPTR_20	593420	164100	SE	St Giles Houses	Residential
RI_11	RCPTR_21	594020	164820	SE	Chekes Court	Residential
	RCPTR_22	594020	164880	SE	Chekes Court	Residential
RI_12	RCPTR_23	593720	164220	SE	Wilford Court Farm	Farm
	RCPTR_24	593780	165120	SE	Wilford Court Farm	Farm
RI_13	RCPTR_25	593420	163680	SE	Bunces / Bax Farm	Farm
	RCPTR_26	593780	164700	SE	Bunces / Bax Farm	Farm
RI_14	RCPTR_27	593180	165420	E	Tonge Corner Farm	Farm
	RCPTR_28	593480	166140	E	Tonge Corner Farm	Farm
RI_15	RCPTR_29	589400	167700	NW	Iwade	Residential
	RCPTR_30	590180	167220	NW	Iwade	Residential
	RCPTR_31	590240	167220	NW	Iwade	Residential
RI_16	RCPTR_32	589100	165540	W	Howt Green	Residential
	RCPTR_33	589880	166200	W	Howt Green	Residential
RI_17	RCPTR_34	589100	165900	W	Stickfast Farm	Farm
	RCPTR_35	589460	166020	W	Stickfast Farm	Farm
RI_18	RCPTR_36	589100	166140	W	Cambray Farm	Farm
	RCPTR_37	589220	166200	W	Cambray Farm	Farm
RI_19	RCPTR_38	589100	166980	W	Coleshall Farm	Farm
	RCPTR_39	590180	166860	W	Coleshall Farm	Farm
RI_20	RCPTR_40	589100	166620	W	Pheasant Farm	Farm
	RCPTR_41	590000	166320	W	Pheasant Farm	Farm
RI_21	RCPTR_42	590120	167820	NW	Street Farm	Farm
	RCPTR_43	590300	167040	NW	Street Farm	Farm
RI_22	RCPTR_44	590780	166680	N	Coldharbour Marshes	Industrial
	RCPTR_45	592340	166800	N	Coldharbour Marshes	Industrial
RI_23	RCPTR_46	591620	169320	NE	Kings Hill Farmland	Farm
	RCPTR_47	592640	167100	NE	Kings Hill Farmland	Farm
RI_24	RCPTR_48	593720	167880	NE	Kings Hill Farm	Farm

For residential, fish eater and farmer scenarios, in accordance with the UK guidelines as published in SC050021/SR2[11], the critical receptor is considered to be a female child aged 0-6.

3.1.3 Pathways of Exposure

The two primary pathways of exposure considered in this assessment are inhalation and ingestion.

On the basis of the significance of exposure and consequently risks associated with the exposure, the following pathways were identified as the relevant pathways of exposure:

- Inhalation
- Ingestion of soil
- Ingestion of locally produced food

Exposure through food consumption from the following products were considered:

- Home-grown produce - all farms and residential properties
- Eggs produced and used on receptor farms - all farms
- Chicken produced and used on receptor farms - all farms
- Beef produced and used on receptor farms - all farms
- Pork produced and used on receptor farms - all farms
- Milk produced and used on receptor farms - all farms
- Breast milk – all residential, farm and industrial receptors
- Fish from local lakes, streams and estuary - worst resident

It should be noted that not all pathways of exposure considered in this assessment are likely to apply to any one receptor and therefore the assessment is likely to be very conservative.

Potential exposure through the ingestion of drinking water requires the contamination of the local drinking water sources. The USEPA HHRAP includes the ingestion of locally abstracted surface water as a potential pathway of exposure to allow for modelling of special sites where such pathway of exposure is likely to be of potential concern. The ingestion of groundwater as a potential source of exposure is not considered a feasible pathway of exposure for this location and therefore is not included in the assessment procedure.

No surface water abstraction points for drinking water were identified within 10 km of the site (the most impacted area). Therefore, potential exposure through this pathway was not considered in this assessment.

3.1.4 Hazard Identification

Hazard identification aims to identify contaminants of concern, their distribution in the different media and consequently their levels of exposure. In the absence of UK protocols for estimating the level of human exposure to COPCs through all relevant pathways of exposure, the USEPA "Human Health Risk Assessment Protocol HHRAP 2005"[15] was used to estimate all exposures utilising the predicted air concentration and depositions rates provided by the air dispersion modelling. UK data were used for consumption of home grown vegetables in residential land use while US data for consumption of other foodstuffs were included in the exposure modelling.

Estimation of COOC Concentration in Media

The IRAP-h View model used for the assessment is equipped with a database of physical and chemical parameters used to calculate the media concentrations for all relevant COPCs. These are chemical specific values based on current international knowledge of chemicals.

In addition to the default values, which were used for this assessment, site-specific data are required for some of the parameters. These include the following:

- annual average evapotranspiration;
- annual average precipitation;
- annual average runoff; and
- annual average wind velocity.

The above data for the subject site were acquired from the MET office (MORECS data-Square 163 - averages for the years 1971-2000) as follows:

- Actual evaporation (the amount of water which is removed from the (crop+soil) combination into the air – 48.48 cm/year)
- Annual average rain fall – 54.06 cm/year
- Hydrologically effective rainfall / Runoff. The sum of rainfall less evaporation is known as the hydrologically effective rainfall, including that recharge to groundwater and flow to rivers (runoff). – 5.46 cm/year)

The IRAP-h View model calculates the average annual volume of water available for generating leachate as the mass balance of all water inputs (includes precipitation and irrigation) and outputs (runoff and evaporation) from the area under consideration. A Standard Percentage Runoff (SPR) for each receptor was estimated based on the Hydrology of Soil Types (HOST) classification which prescribes a dominant soil type for the UK based on a 1km^2 grid. Under the HOST classification each 1km^2 may contain up to seven separate HOST classifications, therefore a weighted average was taken to provide a HOST value for each 1km^2. The FEH Digital Terrain Model (DTM) was used to determine a SPR which delineates all topographical (fresh water) catchments >0.5km^2 for any point in the UK based on a DTM grid spacing of 50m. The 1km^2 HOST data is also incorporated within the DTM. Therefore for any topographical catchment identified an average SPR value was provided. The smallest topographical catchment within which each of the receptors was contained was selected to provide a typical SPR value. In addition a sensitivity analysis was undertaken to determine the variability of SPR within each identified catchment.

Average wind velocity was calculated form the meteorological data used in the air dispersion modelling and was found to be 3.28 m/s based on the local met data used for the air dispersion modelling.

Concentration in Soil

COPC concentrations in soil are calculated from the wet and dry deposition of particulates and vapour to the soil. Soil conditions such as pH, structure, organic matter content and moisture content will affect the distribution and mobility of contaminants. Losses from the soil by mechanisms such as leaching, erosion, runoff, degradation and volatilisation may reduce the concentrations of COPC in soil over time. These are utilised in the model, where appropriate, by using rates that depend on the physical and chemical characteristics of the soil.

Concentration in Produce

Indirect exposure resulting from ingestion of produce depends on the total concentration of COPCs in the leaves, fruit, and tuber portions of the plant.

Due to general differences in contamination mechanisms, it is generally recommended to separate produce into two broad categories for the purposes of risk assessment: above-ground produce and below-ground produce. In addition, above-ground produce can be further subdivided into exposed and protected above-ground produce.

Above-ground exposed produce is typically assumed to be contaminated by the following main mechanisms:

- direct deposition of particles — wet and dry deposition of particle phase COPCs on the leaves and fruits of plants;
- vapour transfer uptake of vapour phase COPCs by plants through their foliage; and
- root uptake of COPCs available from the soil and their transfer to the above-ground portions of the plant.

The USEPA recommends calculation of the total COPC concentration in above-ground exposed produce as the sum of contamination occurring through all of these mechanisms. However, edible portions of above-ground protected produce, such as peas and corn, are enclosed within an outer covering. They are therefore protected from contamination from deposition and vapour transfer. Root uptake of COPCs is the primary mechanism through which above-ground protected produce becomes contaminated.

Concentration in Beef and Milk

It is generally recommended by USEPA that COPC concentrations are estimated in beef tissue and milk products on the basis of the amount of COPCs that cattle consume through their diet. The human health risk assessment (HHRA) assumes that the cattle's diet consists of:

- forage (primarily pasture grass and hay); and
- silage (forage that has been stored and fermented), and
- grain.

Additional contamination may occur through the cattle ingestion of soil. The HHRA calculates the total COPC concentration in the feed items (e.g., forage, silage, and grain) as a sum of contamination occurring through the following mechanisms:

- direct deposition of particles – wet and dry deposition of particle phase COPCs onto forage and silage;
- vapour transfer - uptake of vapour phase COPCs by plants through their foliage; and

- root uptake - root uptake of COPCs available from the soil and their transfer to the above-ground portions of forage, silage, and grain.

It is also assumed, as recommended by the USEPA, that 100 percent of the plant materials eaten by cattle are grown on soil contaminated by emission sources. This is likely to be a highly pessimistic assumption for UK farming practice. COPC concentrations in forage and silage result from deposition onto exposed plant surfaces; the same is assumed for above-ground produce.

COPC concentration in beef tissue is calculated from the daily amount of a COPC that is consumed by cattle through the ingestion of contaminated feed items (plant) and soil by including biotransfer and metabolism factors. These transform the daily animal intake of a COPC (mg/day) into an animal COPC tissue concentration (mg COPC/kg tissue).

The metabolism factor (MF) estimates the amount of COPC that remains in fat and muscle. In the absence of data to support the derivation of chemical-specific MFs, a conservative MF of 1.0 is recommended by the USEPA HHRAP. For all chemicals considered in this assessment a MF of 1.0 was used.

Soil bio-availability (Bs) is the ratio between bioconcentrations for soil and vegetation. The efficiency of transfer from soil may differ from the efficiency of transfer from plant material for some COPCs. If the transfer efficiency is lower for soils, then the ratio would be less than 1.0. If it is equal to or greater than that of vegetation, the Bs value would be equal to or greater than 1.0. A value of 1.0 is recommended by USEPA and was used for calculating all the above-presented concentrations.

Data used for calculating the concentration of COPCs in each media and the human ingestion rates for different food are presented in Annex B.

COPC concentration in milk is calculated from the daily amount of a COPC that is consumed by dairy cattle through the ingestion of contaminated feed items (plant) and soil by including biotransfer and metabolism factors to transform the daily animal intake of a COPC (mg/day) into an animal COPC milk concentration (mg COPC/kg milk).

Concentration in Pork

COPC concentrations in pork tissue are estimated on the basis of the amount of COPCs that swine consume through a diet consisting of silage and grain. Additional COPC contamination of pork tissue may occur through their ingestion of soil.

Concentration in Poultry and Egg

Estimates of the COPC concentrations in chicken and eggs are based on the amount of COPCs that chickens consume through ingestion of grain and soil. The HHRA assumes that chickens are husbanded in a manner that allows contact with soil, i.e. free range. Consequently, chickens are assumed to consume 10 percent of their diet as soil, consistent with the study by Stephens et al, 1995[16]. Although highly unlikely in practice, for the screening assessment it is assumed, as recommended, that the remainder of the diet (90 percent) consists of grain grown at the exposure scenario location. Therefore, it was appropriate to assume that 100 percent of the grain consumed is contaminated.

Concentration in Surface Water and Fish

COPC concentrations in fish are estimated on the basis of the amount of COPCs in surface water. Mechanisms considered in determining COPC loading of the water column include direct deposition, runoff from impervious surfaces within the watershed, runoff from pervious surfaces within watershed, soil erosion over the total watershed, and direct diffusion of vapour phase COPCs into the surface water and internal transformation of compounds chemically or biologically. The extent of a watershed is identified by topographic highs that result in downslope drainage into the water body. The total concentration of each COPC partitions between the sediment and the water column. Partitioning between water and sediment varies with the COPC. The adopted USEPA HHRAP methodology uses the Universal Soil Loss Equation (USLE) and a sediment delivery ratio to estimate the rate of soil erosion from the watershed. The soil loss estimation requires site specific information relating to factors such as rainfall (erosivity), erodibility, cover management and supporting practice factor. Conservative default values and alternatively likely ranges were provided by the methodology.

For instant, where area specific data are not available, a supporting practice factor of 1 is used which conservatively represents the absence of any erosion or runoff control measures.

A rang of 50-300 yr-1 is used by USEPA for the erosivity factor with 50 for the arid areas and 300 for wet areas. The latter generates the worst concentration of COPC in surface water. The upper value in the range was used as a worst case scenario.

An erodibility value of 0.36 ton/acre is proposed by USEPA based on a soil organic matter content of 1 percent and commonly recommended to be chosen as representative of a whole watershed area, not just one specific small location.

A range of values up to 0.1 for a cover management factor reflect vegetation cover such as pasture grass; values from 0.1 to 0.7 reflect agricultural row crops; and a value of 1 reflects bare soil. USEPA recommended a value of 0.1 for both grass and agricultural crops to be representative of a whole watershed, not just a specific area such as agricultural field. A value of 0.1 is used in this assessment.

The recommended equations for estimating surface water concentrations include a sediment mass balance, in which the amount of sediment assumed to be buried and lost from the water body is equal to the difference between the amount of soil introduced to the water body by erosion and the amount of suspended solids lost in downstream flow. The total water column concentration is the sum of the COPC concentration dissolved in water and the COPC concentration associated with suspended solids. Details on the method used for the derivation of water bodies are provided in Annex C.

Quantifying Exposure

Calculating COPC-specific exposure rates for each exposure pathway involves estimation of certain factors such as the media concentration and consumption rates.

Plant consumption rates for the residential scenario were obtained from EA report SC050021/SR3[2].

In the absence of UK data for consumption rates of other than soil and home grown vegetables, these were estimated based on the recommendations and default values provided by the USEPA as discussed in previous sections. These are presented in Annex B.

3.1.5 Hazard/ Risk Characterisation and Assessment

Risk characterisation involves combining the exposure quantities and the toxicity benchmarks to calculate the excess lifetime cancer risks and non-cancer risk for each of the pathways and receptors

Cancer risk from exposure to emissions is the probability that a human receptor will develop cancer, based on a unique set of exposure, model, and toxicity assumptions. For example, a risk of 1E-05 is interpreted to mean that an individual has up to a one in 100,000 chance of developing cancer during their lifetime from the evaluated exposure.

The current UK approach, for assessment of risk to human health, is based on the utilisation of the Index Dose (ID) for evaluating the level of risk for non-threshold effects including cancer risk. According to the Science report-SC050021/SR2[11] “Human health toxicological assessment of contaminants in Soil” replacing the withdrawn CLR9[12], two current approaches are adopted for deriving an Index Dose for non-threshold effects. These include the derivation of ID by Bench Mark Dose (BMD) modelling of the tumour data and application of a large default uncertainty factor of 10,000 to the critical $BMDL_{10}$ (i.e. lower confidence limit of the benchmark dose which results in a 10% excess in incidence of cancer in a group of animals). Alternative approaches may be used, including quantitative dose-response modelling of suitable human cancer data while acknowledging the imprecision of quantitative estimates of cancer risk. In such case, the ID should be based on estimates of the dose corresponding to an excess lifetime cancer risk of 1 in 100,000 (10E-5).

All the available UK toxicological reports provided within the framework of contaminated land risk assessment at the time of this assessment are based on derivation of ID using the second approach as described in the CLR9[12] report.

The current UK position is that the risk level of 1E-05 is used for all carcinogenic contaminants considered in this assessment except for arsenic where a value of 1E-03 is used for the oral exposure pathway (Science report SC050021/TOX 1)[7] and chromium where a value of 1E-04 is used for the inhalation pathway (R&D Publication TOX 4).

Furthermore, current UK guidance recommends the use of alternative approaches such as the Margin of Exposure (MoE) for contaminants where the carcinogenic level of risk is derived from animal studies such as benzo(a)pyrene (BaP). In the absence of formal confirmation from DEFRA and the EA regarding the approach to be adopted for BaP, both the ID and the MoE approaches will be used

The USEPA model utilised for this assessment does not recognise the use of ID for carcinogenic assessment. Therefore RPS has converted UK IDs into equivalent slope factors to manipulate the model for UK toxicological data. The default results from the model are therefore presented in the form of the probability of risk (i.e., 1E-05). To present the results in a form compatible with the UK methodology, the ratio of the exposure to the health criteria (UK IDs) are also presented in the results section of this document.

The term “Hazard Quotient” is used in the IRAP model to describe the risk associated with the potential for developing non-cancer health effects as a result of exposure to

COPC. The hazard quotient is not a probability but rather a comparison of a receptor's potential exposure relative to a standard exposure level. The standard exposure level is calculated over a similar exposure period and is estimated to pose no unacceptable risk in terms of adverse health effects to potential receptors.

Quantitatively Estimating Hazard Quotients and Cancer Risks

Standard risk assessment models assume that, for most chemicals with non-cancer effects, the non-cancer effects exhibit a threshold response. This means, there is a level of exposure below which no adverse effects will be observed. The default approaches used by the model to assess the potential for health effects associated with a threshold relationship involve:

- comparing an estimate of ingested exposure to a Tolerable Daily Intake (TDI) for oral exposure (the term Reference Dose (RfD) is used in the US toxicological reports to describe it);
- comparing an estimated chemical-specific air concentration to the Reference Concentration (RfC) for direct inhalation exposures.

A Tolerable Daily Intake TDI is a daily oral intake rate that is estimated to pose no unacceptable risk of adverse health effects, even to sensitive populations over a specific exposure duration, while RfC is an estimated daily concentration of a chemical in air, the exposure to which over a specific exposure duration poses no unacceptable risk of adverse health effects, even to sensitive populations.

As discussed above, the cancer risk estimates represent the probability that an individual will develop cancer over a lifetime as a result of a specific exposure to a carcinogenic chemical. Based on the ID approach, assessment of the potential for health effects is carried out by comparing the estimate of exposure to the index dose associated with a specified acceptable level of risk (1E-05).

The UK approach to risk assessment from land contamination for non-carcinogen compounds is based on the health criteria with consideration given to potential background exposure through other sources such as food and water. Where background exposure is equal to or greater than 50% of the health criterion or is unknown, 50% of the health criterion is used as the acceptable level from exposure to land contamination with the remaining 50% left to other sources to allow for exposure through the ingestion of food, water and other sources.

The background exposure through the inhalation pathway was considered within this risk assessment for all the threshold compounds by deducting the mean daily intake from the tolerable daily intake for inhalation. Considering that the most sensitive receptors are the farmers who are presumed to be self-sufficient and producing most of their food items on the farm, the background exposure through the ingestion pathway from food was not added to the total exposure to avoid double counting.

Baseline land quality, especially the background level of COPCs within the locality of the SEP, is an unknown quantity which it is not practically feasible to quantify at a receptor scale. This is due to the very heterogeneous nature of the soil as a natural media caused by geological and anthropogenic influence from the varying use of land over time.

Consequently, potential contribution to the COPCs intake from soil background contamination is taken into consideration in a qualitative manner. This is done by presenting the concentration of soil contamination caused by the identified sources for the assessment alongside the soil concentrations considered to be acceptable (UK soil guideline values) and assess the significance of the sources contribution to the total. Also current UK rural and urban soil concentration of the assessed contaminants as provided in "The UK Soil and Herbage pollutant Survey, EA 2007) were used as indicative of the background soil contamination level to predict the final soil concentration at receptors.

Risk Assessment

The risk assessment presented in this report has followed the following elements of work:

- estimates of the combined cancer risks and non-cancer (Hazard Quotients) for all identified receptors
- estimates of risk and hazards associated with exposure to relevant COPCs
- estimates of risk and hazards associated with pathways of exposure
- compare air concentrations with UK relevant air quality criteria
- estimates of blood levels associated with exposure to lead
- evaluation of infant exposure via breast milk to COPCs with appropriate biotransfer factors

- estimates of the soil concentrations at most affected receptors to compare with urban and rural soil concentrations and with UK Soil Guide Values
- estimates of the concentrations of certain metals in food items such as milk, meat and vegetables and compare them with national standards.

The total cancer risk and total hazard quotient estimated by the model, based on the air dispersion modelling prediction of air concentrations and depositions by ADMS for maximum emissions from the proposed SEP for all identified receptors are presented in Table 3-4 and Table 3-5 below.

Table 3-4 Risk Summary for All Resident Receptors

Receptor Name	Ratio of Combined Exposures to Relevant HCV for Cancer Risk	Total Cancer Risk Presented as a Probability	Total Hazard Quotient
RCPTR_1	1.26E-01	1.26E-06	1.07E-02
RCPTR_10	1.31E-01	1.31E-06	1.12E-02
RCPTR_13	4.14E-02	4.14E-07	3.51E-03
RCPTR_14	7.15E-02	7.15E-07	6.10E-03
RCPTR_19	5.15E-02	5.15E-07	4.31E-03
RCPTR_2 residential	2.20E-01	2.20E-06	1.87E-02
RCPTR_2* The Swale	2.39E-01	2.39E-06	1.29E-01
RCPTR_2* Milton Creek	2.71E-01	2.71E-06	3.58E-01
RCPTR_2* Long Reach	2.29E-01	2.29E-06	8.28E-02
RCPTR_2* Millen Water	2.72E-01	2.72E-06	9.64E-01
RCPTR_20	5.27E-02	5.27E-07	4.41E-03
RCPTR_21	6.47E-02	6.47E-07	5.45E-03
RCPTR_22	6.60E-02	6.60E-07	5.56E-03
RCPTR_29	2.31E-02	2.31E-07	1.93E-03
RCPTR_30	3.54E-02	3.54E-07	2.98E-03
RCPTR_31	3.54E-02	3.54E-07	2.98E-03
RCPTR_32	5.90E-02	5.90E-07	4.92E-03
RCPTR_33	1.05E-01	1.05E-06	8.81E-03
RCPTR_7	1.17E-01	1.17E-06	9.88E-03
RCPTR_8	1.50E-01	1.50E-06	1.27E-02

Receptor Name	Ratio of Combined Exposures to Relevant HCV for Cancer Risk	Total Cancer Risk Presented as a Probability	Total Hazard Quotient
RCPTR_9	3.24E-02	3.24E-07	2.69E-03

* Resident with their main protein diet assumed to be fish/shellfish wholly sourced from the specified water courses

Table 3-5 Risk Summary for All Farm Receptors

Receptor Name	Ratio of Combined Exposures to Relevant HCV for Cancer Risk	Total Cancer Risk Presented as a Probability	Total Hazard Quotient
RCPTR_11	1.19E-01	1.19E-06	3.53E-02
RCPTR_12	1.40E-01	1.40E-06	4.16E-02
RCPTR_17	9.84E-02	9.84E-07	2.94E-02
RCPTR_18	1.21E-01	1.21E-06	3.59E-02
RCPTR_23	9.31E-02	9.31E-07	2.78E-02
RCPTR_24	1.34E-01	1.34E-06	3.97E-02
RCPTR_25	7.98E-02	7.98E-07	2.39E-02
RCPTR_26	1.13E-01	1.13E-06	3.36E-02
RCPTR_27	1.76E-01	1.76E-06	5.19E-02
RCPTR_28	2.67E-01	2.67E-06	7.94E-02
RCPTR_3	1.87E-01	1.87E-06	5.62E-02
RCPTR_34	1.29E-01	1.29E-06	3.86E-02
RCPTR_35	1.51E-01	1.51E-06	4.51E-02
RCPTR_36	1.36E-01	1.36E-06	4.07E-02
RCPTR_37	1.42E-01	1.42E-06	4.24E-02
RCPTR_38	7.59E-02	7.59E-07	2.29E-02
RCPTR_39	1.04E-01	1.04E-06	3.11E-02
RCPTR_4	2.02E-01	2.02E-06	6.05E-02
RCPTR_40	1.10E-01	1.10E-06	3.32E-02
RCPTR_41	1.93E-01	1.93E-06	5.76E-02
RCPTR_42	3.95E-02	3.95E-07	1.18E-02
RCPTR_43	7.87E-02	7.87E-07	2.35E-02
RCPTR_46	1.55E-02	1.55E-07	1.41E-02
RCPTR_47	2.67E-01	2.67E-06	2.38E-01
RCPTR_48	2.63E-01	2.63E-06	2.46E-02
RCPTR_5	9.24E-02	9.24E-07	2.78E-02
RCPTR_6	2.46E-01	2.46E-06	7.29E-02

The presented values in the above tables provide the cumulative cancer risk from all contaminants for all pathways of exposure combined together. Therefore they cannot be compared with acceptable criteria applicable to exposure to individual compounds (with the exception of compounds that are considered to have cumulative effects such as the different congeners of dioxins and furans) and to one pathway of exposure, unless the health effect is systemic.

As stated in Section 3.1.5 of this report, a range of risk values between 1E-05 –1E-03 for cancer risk and a hazard index of 1 is used in the UK for assessment of individual contaminants.

It can be seen from the above results that the highest identified cancer risk and non-cancer risk (hazard index) for residential receptors are in the location of receptor 2 (sourcing their fish from the Millen Water) while the highest identified cancer risk and hazard index for a farmer receptor are in the location of receptors 47 / 48. Due to the presence of grazing land next to the Kings Hill farm, it was considered feasible that the cattle grazing on this land are reared by this particular farm and therefore their products could be used by its occupants. Therefore scenario for Kings Hill farm is split between RCPTR_48 which represents the farm property and yard and RCPTR_46 and RCPTR_47 which represent land on which cattle are free to graze. Therefore the risks from the different pathways of exposure including those related to the farm property and yard and those related to the grazing land are added to predict the most conservative scenario. The predicted risks at RCPTR_47 were found to be greater than that at RCPTR_46. Therefore the risk values from the former were used to combine with the risk associated with the farmland identified at RCPTR_48. These receptors will be discussed in further detail.

The cancer risks (expressed as a probability and as ratios of exposures to the health criteria -Index Doses) and the non-cancer risk (expressed as hazard quotients which represent the ratio of exposure to the health criteria -tolerable daily intake) for individual compounds for the most affected residential and farmer receptors are presented in Table 3-6, Table 3-7 and Table 3-8. The fish eater scenario was modelled in the location of the most affected residential receptor. The results for Millen water, being the scenario giving the worst level of risk, are presented within Table 3-6, Table 3-7 and Table 3-8. The results for The Swale (considered to be a more significant source for production of fish) are presented within Annex C.

The cancer risk as a probability is provided for the combined risk from all pathways of exposure (values in brackets) for each compound, while the ratio of exposure to the index dose is provided for individual pathways below it. For non-cancer risk, the combined risk from all pathways of exposure is provided (in brackets) with the hazard quotient for each pathway provided below it.

Table 3-6 Cancer Risk for Metals & BaP

		Receptor 2 residential		Receptor 47 / 48 farmer		Receptor 2 fish eater	
COPC	**HCV (mg/kg-day)**	**Exposure (mg/kg-day)**	**Total Cancer Risk ***	**Exposure (mg/kg-day)**	**Total Cancer Risk ***	**Exposure (mg/kg-day)**	**Total Cancer Risk ***
Arsenic			(1.02E-07)		(1.38E-06)		(1.27E-07)
Ingestion	3.0E-04	1.92E-08	6.40E-05	4.04E-07	1.35E-03	2.67E-08	8.90E-05
Inhalation	2.0E-06	7.57E-09	3.79E-03	6.65E-09	3.33E-03	7.57E-09	3.79E-03
Chromium, hexavalent			(1.90E-06)		(1.67E-06)		(1.90E-06)
Ingestion	-	-	-	-	-	-	-
Inhalation	1.0E-06	1.90E-08	1.90E-02	1.67E-08	1.67E-02	1.90E-08	1.90E-02
Benzo(a)pyrene			(1.93E-07)		(2.26E-06)		(6.92E-07)
Ingestion	2.0E-05	4.54E-09	2.27E-04	4.08E-06	2.04E-01	1.00E-06	5.00E-02
Inhalation	7.0E-08	1.34E-09	1.91E-02	1.53E-09	2.19E-02	1.34E-09	1.91E-02

Table 3-7 Non-Cancer Risk for Metals

		Receptor 2 residential		Receptor 47 / 48 farmer		Receptor 2 fish eater	
COPC	**HCV (mg/kg-day)**	**Exposure (mg/kg-day)**	**Total Hazard Quotient ****	**Exposure (mg/kg-day)**	**Total Hazard Quotient ****	**Exposure (mg/kg-day)**	**Total Hazard Quotient ****
Antimony			(1.90E-05)		(1.75E-05)		(2.54E-05)
Ingestion	4.0E-04	1.67E-11	4.18E-08	3.69E-10	9.23E-07	2.61E-09	6.53E-06
Inhalation	4.0E-04	7.57E-09	1.89E-05	6.65E-09	1.66E-05	7.57E-09	1.89E-05
Cadmium			(6.20E-03)		(5.43E-03)		(6.34E-03)
Ingestion	3.6E-04	1.79E-08	4.96E-05	1.89E-07	5.26E-04	6.91E-08	1.92E-04
Inhalation	1.14E-06	7.03E-09	6.17E-03	5.60E-09	4.91E-03	7.03E-09	6.17E-03
Chromium			(1.41E-07)		(6.23E-06)		(2.07E-07)
Ingestion	1.5	1.92E-07	1.28E-07	9.32E-06	6.21E-06	2.92E-07	1.95E-07
Inhalation	1.514	1.90E-08	1.25E-08	1.67E-08	1.10E-08	1.90E-08	1.25E-08
Chromium, hexavalent			(6.41E-05)		(3.13E-03)		(4.66E-04)
Ingestion	3.0E-03	1.92E-07	6.41E-05	9.40E-06	3.13E-03	1.40E-06	4.66E-04

		Receptor 2 residential		Receptor 47 / 48 farmer		Receptor 2 fish eater	
COPC	HCV (mg/kg-day)	Exposure (mg/kg-day)	Total Hazard Quotient **	Exposure (mg/kg-day)	Total Hazard Quotient **	Exposure (mg/kg-day)	Total Hazard Quotient **
Inhalation	-	-	-	-	-	-	-
Lead			(1.23E-03)		(2.45E-03)		(1.23E-03)
Ingestion	3.57E-03	1.39E-07	3.89E-05	5.01E-06	1.40E-03	1.39E-07	3.89E-05
Inhalation	4.57E-05	5.45E-08	1.19E-03	4.78E-08	1.05E-03	5.45E-08	1.19E-03
Mercuric chloride			(1.08E-04)		(7.87E-04)		(1.08E-04)
Ingestion	2.0E-03	1.37E-07	6.85E-05	1.50E-06	7.50E-04	1.37E-07	6.85E-05
Inhalation	5.7E-05	2.24E-09	3.93E-05	2.04E-09	3.58E-05	2.24E-09	3.93E-05
Mercury			(1.64E-07)		(1.49E-07)		(1.64E-07)
Ingestion	-	-	-	-	-	-	-
Inhalation	5.7E-05	9.35E-12	1.64E-07	8.53E-12	1.49E-07	9.35E-12	1.64E-07
Methyl mercury			(1.42E-05)		(9.89E-05)		(4.73E-01)
Ingestion	2.3E-04	3.28E-09	1.42E-05	2.27E-08	9.89E-05	1.09E-04	4.73E-01
Inhalation	-	-	-	-	-	-	-
Nickel			(7.95E-03)		(7.97E-03)		(7.95E-03)
Ingestion	1.2E-02	9.77E-08	8.15E-06	1.20E-05	9.98E-04	1.02E-07	8.50E-06
Inhalation	4.86E-06	3.86E-08	7.954E-03	3.39E-08	6.91E-03	3.86E-08	7.95E-03
Thallium (I)			(1.61E-03)		(7.68E-02)		(3.63E-01)
Ingestion	8.0E-05	1.29E-07	1.61E-03	6.14E-06	7.68E-02	2.91E-05	3.63E-01
Inhalation	-	-	-	-	-	-	-

Table 3-8 Non-Cancer Risk for Dioxins and Furans & PCBs

		Receptor 2 residential		Receptor 47 / 48 farmer		Receptor 2 fish eater	
COPC	HCV (mg/kg-day)	Exposure (mg/kg-day)	Total Hazard Quotient **	Exposure (mg/kg-day)	Total Hazard Quotient **	Exposure (mg/kg-day)	Total Hazard Quotient **
HeptaCDD, 1,2,3,4,6,7,8			(2.17E-05)		(9.76E-04)		(4.20E-05)
Ingestion	2.0E-07	4.00E-12	2.00E-05	1.95E-10	9.75E-04	8.06E-12	4.03E-05
Inhalation	1.3E-07	2.27E-13	1.75E-06	2.59E-13	1.99E-06	2.27E-13	1.75E-06
HeptaCDF, 1,2,3,4,6,7,8			(5.63E-05)		(4.74E-03)		(1.09E-04)
Ingestion	2.0E-07	1.04E-11	5.20E-05	9.46E-10	4.73E-03	2.09E-11	1.05E-04
Inhalation	1.3E-07	5.88E-13	4.52E-06	6.71E-13	5.16E-06	5.88E-13	4.52E-06

		Receptor 2 residential		Receptor 47 / 48 farmer		Receptor 2 fish eater	
COPC	HCV (mg/kg-day)	Exposure (mg/kg-day)	Total Hazard Quotient **	Exposure (mg/kg-day)	Total Hazard Quotient **	Exposure (mg/kg-day)	Total Hazard Quotient **
HeptaCDF, 1,2,3,4,7,8,9			(5.50E-06)		(5.82E-04)		(1.06E-05)
Ingestion	2.0E-07	1.01E-12	5.05E-06	1.16E-10	5.80E-04	2.04E-12	1.02E-05
Inhalation	1.3E-07	5.75E-14	4.42E-07	6.56E-14	5.05E-07	5.75E-14	4.42E-07
HexaCDD, 1,2,3,4,7,8			(3.70E-05)		(2.18E-03)		(3.14E-04)
Ingestion	2.0E-08	6.81E-13	3.41E-05	4.35E-11	2.18E-03	6.22E-12	3.11E-04
Inhalation	1.3E-08	3.87E-14	2.98E-06	4.43E-14	3.41E-06	3.87E-14	2.98E-06
HexaCDD, 1,2,3,6,7,8			(3.31E-05)		(3.16E-03)		(2.80E-04)
Ingestion	2.0E-08	6.09E-13	3.05E-05	6.31E-11	3.16E-03	5.55E-12	2.78E-04
Inhalation	1.3E-08	3.47E-14	2.67E-06	3.97E-14	3.05E-06	3.47E-14	2.67E-06
HexaCDD, 1,2,3,7,8,9			(2.68E-05)		(2.45E-03)		(2.26E-04)
Ingestion	2.0E-08	4.92E-13	2.46E-05	4.89E-11	2.45E-03	4.48E-12	2.24E-04
Inhalation	1.3E-08	2.81E-14	2.16E-06	3.20E-14	2.46E-06	2.81E-14	2.16E-06
HexaCDF, 1,2,3,4,7,8			(2.80E-04)		(3.14E-02)		(2.37E-03)
Ingestion	2.0E-08	5.15E-12	2.58E-04	6.28E-10	3.14E-02	4.70E-11	2.35E-03
Inhalation	1.3E-08	2.94E-13	2.26E-05	3.36E-13	2.58E-05	2.94E-13	2.26E-05
HexaCDF, 1,2,3,6,7,8			(1.03E-04)		(1.16E-02)		(8.75E-04)
Ingestion	2.0E-08	1.90E-12	9.50E-05	2.32E-10	1.16E-02	1.73E-11	8.65E-04
Inhalation	1.3E-08	1.08E-13	8.31E-06	1.24E-13	9.54E-06	1.08E-13	8.31E-06
HexaCDF, 1,2,3,7,8,9			(5.33E-06)		(6.12E-04)		(4.53E-05)
Ingestion	2.0E-08	9.79E-14	4.90E-06	1.22E-11	6.10E-04	8.97E-13	4.49E-05
Inhalation	1.3E-08	5.61E-15	4.32E-07	6.41E-15	4.93E-07	5.61E-15	4.32E-07
HexaCDF, 2,3,4,6,7,8			(1.11E-04)		(1.25E-02)		(9.39E-04)
Ingestion	2.0E-08	2.04E-12	1.02E-04	2.49E-10	1.25E-02	1.86E-11	9.30E-04
Inhalation	1.3E-08	1.16E-13	8.92E-06	1.33E-13	1.02E-05	1.16E-13	8.92E-06
OctaCDD, 1,2,3,4,6,7,8,9			(1.53E-06)		(5.59E-05)		(1.56E-06)
Ingestion	6.67E-06	9.41E-12	1.41E-06	3.72E-10	5.58E-05	9.60E-12	1.44E-06
Inhalation	4.33E-06	5.34E-13	1.23E-07	6.10E-13	1.41E-07	5.34E-13	1.23E-07
OctaCDF, 1,2,3,4,6,7,8,9			(1.38E-06)		(6.29E-05)		(1.41E-06)
Ingestion	6.67E-06	8.48E-12	1.27E-06	4.19E-10	6.28E-05	8.65E-12	1.30E06
Inhalation	4.33E-06	4.81E-13	1.11E-07	5.49E-13	1.27E-07	4.81E-13	1.11E-07
PentaCDD, 1,2,3,7,8			(3.17E-04)		(4.95E-02)		(5.64E-03)
Ingestion	2.0E-09	5.85E-13	2.93E-04	9.88E-11	4.94E-02	1.12E-11	5.60E-03
Inhalation	1.3E-09	3.34E-14	2.57E-05	3.81E-14	2.93E-05	3.34E-14	2.57E-05
PentaCDF, 1,2,3,7,8			(1.04E-05)		(1.34E-03)		(1.90E-04)
Ingestion	6.67E-08	6.38E-13	9.57E-06	8.89E-11	1.33E-03	1.26E-11	1.89E-04

		Receptor 2 residential		Receptor 47 / 48 farmer		Receptor 2 fish eater	
COPC	HCV (mg/kg-day)	Exposure (mg/kg-day)	Total Hazard Quotient **	Exposure (mg/kg-day)	Total Hazard Quotient **	Exposure (mg/kg-day)	Total Hazard Quotient **
Inhalation	4.33E-08	3.74E-14	8.64E-07	4.27E-14	9.86E-07	3.74E-14	8.64E-07
PentaCDF, 2,3,4,7,8			(2.03E-04)		(3.03E-02)		(3.66E-03)
Ingestion	6.67E-09	1.24E-12	1.86E-04	2.02E-10	3.03E-02	2.43E-11	3.64E-03
Inhalation	4.33E-09	7.22E-14	1.67E-05	8.24E-14	1.90E-05	7.22E-14	1.67E-05
TetraCDD, 2,3,7,8			(3.48E-05)		(3.93E-03)		(6.60E-04)
Ingestion	2.0E-09	6.33E-14	3.17E-05	7.86E-12	3.93E-03	1.31E-12	6.55E-04
Inhalation	1.3E-09	4.14E-15	3.18E-06	4.73E-15	3.64E-06	4.14E-15	3.18E-06
TetraCDF, 2,3,7,8			(3.08E-05)		(3.89E-03)		(5.82E-04)
Ingestion	2.0E-08	5.60E-13	2.80E-05	7.78E-11	3.89E-03	1.16E-11	5.80E-04
Inhalation	1.3E-08	3.61E-14	2.78E-06	4.12E-14	3.17E-06	3.61E-14	2.78E-06
PCBs			(2.76E-04)		(6.37E-03)		(9.49E-02)
Ingestion	6.67E-05	1.67E-08	2.50E-04	4.24E-07	6.36E-03	6.33E-06	9.49E-02
Inhalation	4.33E-05	1.11E-09	2.56E-05	8.19E-10	1.89E-05	1.11E-09	2.56E-05
Sum of Dioxins & Furans & PCBs TEQ	2.0E-09	3.02E-12	1.55E-03	3.31E-10	1.65E-01	2.22E-10	1.11E-01

*values in brackets are the combined cancer risk (all pathways of exposure) expressed as a probability

** values in brackets are the combined non-cancer risk (all pathways of exposure)

It can be seen from the above results that for all the assessed compounds, the non-threshold and threshold risks are significantly below their target levels. Expressed as a probability, all cancer risks are well below the target level of 1E-05 for all contaminants, 1E-03 for the ingestion pathway for arsenic and 1E-04 for the inhalation pathway for hexavalent chromium VI. This is confirmed by the ratio of exposure to the index dose values being significantly lower than the target level of 1 for all contaminants. Similarly the hazard quotients for all contaminants that have a threshold effect were significantly below the target level of 1.

The highest cancer risk was associated with BaP in the location of receptor 2 (fish eater). The ratio of exposure to the index dose for the combined exposure from inhalation and ingestion is 6.92E-02, with the ingestion contributing 5.00E-02 and the inhalation contributing 1.91E-02, all significantly lower than the target level of 1.

Expressed as a probability, the combined cancer risk is estimated to be 6.92E-07, significantly lower than that the target level of 1E-05 for a combined risk of BaP.

The highest cancer risk from metals was associated with chromium in the location of receptor 2. The ratio of exposure to the Index Dose through the inhalation pathways was estimated to be 1.90E-02, significantly lower than the target level of 1.

Expressed as a probability, the cancer risk is estimated to be 1.90E-06, significantly lower than that the target level of 1E-04 for inhalation of chromium.

The second highest cancer risk from metals is associated with arsenic in the location of combined receptors 47/48. Arsenic has carcinogenic effect in both ingestion and inhalation pathways. The ratio of exposure to the index dose is 1.35E-03 through the ingestion pathway and 3.33E-03 through the inhalation pathway respectively. Both are all significantly lower than the target level of 1

Expressed as a probability, the combined cancer risk from arsenic is estimated to be 1.38E-06, including a risk value of 1.35E-06 from ingestion and 3.33E-08 from inhalation, both significantly lower than the target level of 1E-03 and 1E-05 respectively.

The highest non-cancer risk was associated with methyl mercury in the location of receptors 2 modelled as a fish eater. The hazard quotient was estimated to be 4.73E-01, lower than the target level of 1.

The highest non-cancer risk from metals was associated with thallium in the location of receptors 2 modelled as a fish eater. The hazard quotient was estimated to be 3.63E-01, lower than the target level of 1. Thallium has also provided the worst risk for farmer receptor at a hazard quotient of 7.68E-02, significantly lower than the target level of 1. It is of note that provisional toxicological data was formerly available from USEPA, however this data has now been withdrawn due to the uncertainty relating to their derivation. In order to provide a comprehensive assessment thallium is still included within our modelling assessment.

The highest non-cancer risk from dioxins was associated with PentaCDD, 1,2,3,7,8- in the location of the combined receptors 47/48. The hazard quotient through the ingestion pathway was estimated to be 4.95E-02 which is significantly lower than the target level of 1. The hazard quotient for the combined risk from all dioxins and furans and dioxin-like PCBs (based on the TEQ) is also significantly lower than the target level of 1 at a value of 1.65E-01.

The quotients from PCBs at receptor 2 modelled as a fish eater (assumed to comprise entirely of dioxin-like PCBs (PCB 118 and 123))[17] were predicted to be 9.49E-02 and

2.56E-05 for the ingestion and inhalation respectively with the combined hazard index estimated to be 9.49E-02, lower than the target level of 1.

It should be borne in mind that the above presented exposure scenario for receptor (47/48-farmer) and receptor (2-fish eater) represents a highly implausible situation in which all exposure assumptions are chosen to represent a worst case scenario and should therefore be considered as an extreme view of the risk to health. However and despite the numerous highly conservative assumptions, as can be seen from the above presented results, all hazard indices and cancer risks are well below their target levels and therefore it is very unlikely that exposure to emission from the SEP would cause an adverse health risk.

Benzo(a)Pyrene

As discussed in Section 3.1.5, an alternative approach to the above discussed method for estimating cancer risk from exposure to BaP, was proposed in the form of Margin of Exposure.

In accordance with the SR2[11], when an established health criteria value is not available or where values are based on animal studies (as is the case with benzo(a)pyrene), a non-quantitative approach to risk assessment can be used to provide an indication of the level of concern for human health. One such approach detailed is the Margin of Exposure Approach (MoE). This compares the anticipated human exposure of a contaminant from a source to a benchmark dose level (BMDL). The BMDLx is defined as the dose that corresponds to a specific change (x%) in an adverse response compared to the response in untreated animals. The benchmark dose (BMD) is determined by modelling a dose-response curve in the region of the dose-response relationship where biologically observable data are available. To take experimental uncertainty into consideration the $BMDL_{10}$ is recommended (i.e. lower confidence limit of the benchmark dose which results in a 10% excess in incidence of cancer in a group of animals).

Publications by UK agencies identified papers published by the Committee on Carcinogenicity of Chemicals in Food, Consumer Products and the Environment (COC)[18]. This summarises the research of two animal studies (Culp et al and Kroese et al) and the COC applied the benchmark dose method to these studies to determine BMDL values. This generated $BMDL_{10}$ values ranging from 0.52 to 4.82 mg/kg/day, although the majority of studies recorded values greater than 2 mg/kg/day. At present, the lower value of 0.52 mg/kg/day has been chosen as the $BMDL_{10}$ value for risk assessment.

The MoE ratio is calculated by dividing the total exposure by the $BMDL_{10}$.

The COC details in their research the following in relation to MoE ratios:

- <10,000 – may pose a risk
- 10,000 to 1,000,000 – unlikely to pose a risk
- >1,000,000 – highly unlikely to pose a risk

The total exposure for the worst receptor at farm receptor 47 / 48 using ADMS for benzo(a)pyrene is 4.08E-03 µg/kg-day.

Using the $BMDL_{10}$ of 520 µg/kg/day (lowest generated BMDL) an MoE ratio of 127,421 is calculated. This corresponds to an MoE band of 'unlikely to pose a risk'.

To demonstrate the contributions from the different pathways of exposure, Table 3-9 below presents the hazard quotient and cancer risk for the most affected resident and farmer receptors for each of the relevant pathways.

Table 3-9 Summary of Risk and Hazard to Highest Child Farmer and Resident Receptors-by Pathway

Receptor Name	Cancer Risk		Hazard Quotient	
	receptor 2 residential*-	receptor 47 / 48 farmer	receptor 2 residential*	receptor 47/ 48 farmer
Inhalation	2.13E-06	1.92E-06	1.55E-02	1.31E-02
Ingestion of produce	6.54E-08	7.05E-07	5.14E-04	5.92E-03
Ingestion of beef	0.00E+00	4.69E-07	0.00E+00	4.16E-02
Ingestion of chicken	0.00E+00	4.13E-11	0.00E+00	3.54E-05
Ingestion of drinking water	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ingestion of eggs	0.00E+00	2.83E-11	0.00E+00	2.53E-05
Ingestion of fish	5.24E-07	0.00E+00	9.45E-01	0.00E+00
Ingestion of milk	0.00E+00	2.20E-06	0.00E+00	1.96E-01
Ingestion of pork	0.00E+00	3.47E-09	0.00E+00	1.01E-03
Ingestion of soil	9.81E-10	1.99E-09	2.76E-03	4.52E-03
Total	2.72E-06	5.30E-06	9.64E-01	2.62E-01

* Based on ingestion of fish from the Millen water.

It can be seen from the above that certain pathways such as the ingestion of milk contribute more significantly than other pathways of exposure to the total cancer and non-cancer in a farm land use scenario. The inhalation pathway was found to be the main risk driver for total cancer risk in the residential land use while the ingestion of fish is the main contributor to the non-cancer risk. All risks from each and all pathways of exposure combined are lower than the target levels in spite of the extremely conservative assumption regarding the viability of all pathways of exposure. Some of these pathways are non-existent at the assessed closest farm to the SEP. Therefore the likely level of risk is likely to be below the presented values.

Infant Exposure to Dioxins and Furans and Dioxin-like PCBs through Breast Milk

IRAP-h View calculates the exposure through breast milk by calculating infant exposures, and risks associated with such exposures for 2,3,7,8-TCDD TEQ.

There are no UK or USEPA target levels for acceptable infant exposure. However, one approach USEPA has taken to evaluate whether dioxins and furans are likely to cause significant health effects is to compare estimated TEQ exposures to national average background exposure levels (1pg TEQ/kg/day for adults and 60pg TEQ/kg/day for nursing infants). The average background level of dioxins and furans in breast milk is 25ppt of 2,3,7,8-TCDD TEQ. After normalisation for infant body weight, this breast milk concentration of 25ppt TEQ results in an average, background intake for the infant of 93 pg/kg-day of 2,3,7,8-TCDD TEQ. Accordingly, USEPA recommended that if exposures due to a SEP's emissions during the exposure duration of concern are low compared to background exposures, then the emissions are not expected to cause an increase in the adverse health effects.

The Department for Environment, Food and Rural Affairs (DEFRA) and the EA R&D Science report SC050021/ TOX 12, reported a UK background adult's exposure of 0.7 pg WHO-TEQ/kg-day. The Former Ministry of Agriculture, Forestry and Fish eateries (MAFF) calculated dietary intake by breast-fed infants to be 170 pg WHO-TEQ/kg-day at two months, dropping to 39 pg WHO-TEQ/kg-day at 10 months in 1993-1994. A pilot study of breast milk samples carried out in Yorkshire in 2001-2002 provided more recent data on the dietary intake of dioxins and PCBs by breast-fed infants, although the accuracy of this data is unclear according to the above referenced report. The upper bound mean daily intakes were estimated to be 72 pg WHO-TEQ /kg-day at 2-3 months and 19 pg WHO-TEQ /kg-day at 8-10 months, indicating that intakes of dioxins and PCBs by breast-fed infants may have dropped by over 50% since 1993-1994 survey.

Despite the high intakes of dioxins experienced by nursing infants (about 100-fold those of an adult), the impact of breast-feeding on infant body burden of dioxin is markedly less dramatic due to the short period over which it occurs.

Table 3-10 below presents the infant ADD pg/kg-day for the most affected residential (RECPTR 2) and farm receptor (RECPTR 48) in addition to the selected industrial receptors. All of the estimated values at all receptors are well below the USEPA background level of 60 pg/kg/day and the UK infant background exposures discussed above with the highest being 9.11E+00 in the location of receptor 2 modelled as an adult fisherman consuming fish caught from Millen Water.

Table 3-10 Infant ADD pg/kg-day for Each Receptor

Receptor Name	ADD pg/kg/day
RCPTR_2	2.105E+00 – The Swale 9.108E+00 – Millen Water
RCPTR_15	1.553E-03
RCPTR_16	3.712E-03
RCPTR_44	3.563E-03
RCPTR_45	1.315E-02
RCPTR_48	1.614E-01

Based on the above presented data the proposed SEP will not pose a significant risk via the ingestion of breast milk even at the most affected receptors.

Air concentration

Although potential risks from exposure to emissions from the SEP through the inhalation pathway have been presented and discussed above, further comparisons between the predicted concentrations at sensitive receptors and acceptable air concentrations are presented in Table 3-11 and Table 3-12 below for residential and farmer receptors respectively.

Table 3-11 Air Concentration at Residential Receptor 2

COPC	Air Concentration (µg/m^3)	Relevant Environmental Criteria
Antimony	2.65E-05	5 µg/m^3 [d]
Benzo(a)pyrene	4.68E-06	0.25 ng/m^3 [a]
Chromium	6.67E-05	0.2 µg/m^3 [c]

COPC	Air Concentration (μg/m^3)	Relevant Environmental Criteria
Chromium, hexavalent	6.67E-05	0.2 μg/m^3 [c]
Lead	1.91E-04	0.25 μg/m^3 [a]
Arsenic	2.65E-05	3 ng/m^3 [c]
Cadmium	2.46E-05	5 ng/m^3 [b]
Mercury	3.27E-08	0.25 μg/m^3 [d]
Mercuric chloride	7.83E-06	0.25 μg/m^3 [d]
Nickel	1.35E-04	20 ng/m^3 [b/c]
Thallium	2.46E-05	1 μg/m^3 [d]

[a] National air quality objective (The Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007)

[b] Target value (Air Quality Standards Regulations 2007)

[c] Air quality guideline value (Expert Panel on Air Quality Standards, Metals and Metalloids 2009)

[d] Long term EAL (Horizontal Guidance Note IPPC H1)

Table 3-12 Air Concentration at Farmer Receptor 48

COPC	Air Concentration (μg/m^3)	Relevant Environmental Criteria
Antimony	2.33E-05	5 μg/m^3 [d]
Benzo(a)pyrene	5.34E-06	0.25 ng/m^3 [a]
Chromium	5.86E-05	0.2 μg/m^3 [c]
Chromium, hexavalent	5.86E-05	0.2 μg/m^3 [c]
Lead	1.67E-04	0.25 μg/m^3 [a]
Arsenic	2.33E-05	3 ng/m^3 [c]
Cadmium	1.96E-05	5 ng/m^3 [b]
Mercury	2.98E-08	0.25 μg/m^3 [d]
Mercuric chloride	7.15E-06	0.25 μg/m^3 [d]
Nickel	1.19E-04	20 ng/m^3 [b/c]
Thallium	1.96E-05	1 μg/m^3 [d]

[a] National air quality objective (The Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007)

[b] Target value (Air Quality Standards Regulations 2007)

[c] Air quality guideline value (Expert Panel on Air Quality Standards, Metals and Metalloids 2009)

[d] Long term EAL (Horizontal Guidance Note IPPC H1)

It can be seen from the above presented results that all the air concentrations are significantly below their target level at all receptors.

Cumulative Lead

Estimates of the potential health effects of exposure to lead are commonly assessed in relation to lead concentration in blood. DEFRA and the EA provided a soil guideline value of 450mg/kg of lead that is considered not to increase the blood concentration to greater than the acceptable level. The UK annual mean air quality objective for lead is currently 0.25µg/m3. Table 3-13 and Table 3-14 below present the model predicted maximum soil concentration and the air concentration of lead at different receptors.

Table 3-13 Lead Concentrations in Soil and Air at Resident Receptors

Receptor Name	Maximum Soil Concentration (mg/kg)	Air Concentration (µg/m^3)
RCPTR_1	2.78E-05	1.09E-04
RCPTR_10	2.90E-05	1.14E-04
RCPTR_13	9.15E-06	3.58E-05
RCPTR_14	1.59E-05	6.20E-05
RCPTR_19	1.13E-05	4.41E-05
RCPTR_2	4.87E-05	1.91E-04
RCPTR_20	1.15E-05	4.51E-05
RCPTR_21	1.42E-05	5.57E-05
RCPTR_22	1.45E-05	5.68E-05
RCPTR_29	5.06E-06	1.98E-05
RCPTR_30	7.78E-06	3.04E-05
RCPTR_31	7.78E-06	3.04E-05
RCPTR_32	1.29E-05	5.05E-05
RCPTR_33	2.30E-05	9.02E-05
RCPTR_7	2.58E-05	1.01E-04
RCPTR_8	3.31E-05	1.30E-04
RCPTR_9	7.06E-06	2.77E-05

Table 3-14 Lead Concentrations in Soil and Air at Farmer Receptors

Receptor Name	Maximum Soil Concentration (mg/kg)	Air Concentration (µg/m^3)
RCPTR_11	1.49E-05	5.83E-05
RCPTR_12	1.75E-05	6.86E-05
RCPTR_17	1.22E-05	4.76E-05
RCPTR_18	1.50E-05	5.88E-05
RCPTR_23	1.15E-05	4.52E-05
RCPTR_24	1.67E-05	6.55E-05
RCPTR_25	9.82E-06	3.84E-05
RCPTR_26	1.42E-05	5.56E-05
RCPTR_27	2.25E-05	8.80E-05
RCPTR_28	3.32E-05	1.30E-04
RCPTR_3	2.30E-05	8.99E-05
RCPTR_34	1.59E-05	6.21E-05

Receptor Name	Maximum Soil Concentration (mg/kg)	Air Concentration (µg/m^3)
RCPTR_35	1.87E-05	7.31E-05
RCPTR_36	1.67E-05	6.54E-05
RCPTR_37	1.74E-05	6.81E-05
RCPTR_38	9.24E-06	3.62E-05
RCPTR_39	1.27E-05	4.97E-05
RCPTR_4	2.48E-05	9.69E-05
RCPTR_40	1.34E-05	5.26E-05
RCPTR_41	2.39E-05	9.35E-05
RCPTR_42	4.94E-06	1.93E-05
RCPTR_43	9.76E-06	3.82E-05
RCPTR_46	7.58E-06	2.96E-05
RCPTR_47	1.22E-04	4.76E-04
RCPTR_48	4.28E-05	1.67E-04
RCPTR_5	1.13E-05	4.43E-05
RCPTR_6	3.08E-05	1.20E-04

It can be seen from the above presented results that both the soil and air concentrations are significantly below their target level at all receptors.

Soil Concentration

As discussed in Section 3.1.5.1 of this report, the background level of COPCs within the locality of the proposed SEP is an unknown quantity and is not practically feasible to quantify at receptor's scale. Table 3-15 and Table 3-16 below present the very low predicted concentrations of soil contamination caused by the identified sources in comparison to the soil concentrations considered to be acceptable (UK soil guideline values) and UK rural and urban soil concentration of the assessed contaminants as provided in "The UK Soil and Herbage pollutant Survey, EA 2007)". These values are based on the highest air data values as predicted by the dispersion modelling for the most affected receptors 2 and 48 for each land use scenario.

Table 3-15 Soil Concentration in the Location of Receptor 2

Determinand	Predicted Soil Level Mean (mg/kg)	Rural Soil Level Mean (mg/kg)	Urban Soil Level Mean (mg/kg)	SGV** (mg/kg)
Arsenic	7.09E-09	10.9	11.0	32
Cadmium	4.22E-07	0.39	0.44	10
Chromium (total)*	2.67E-02	34.4	34.3	130
Lead	4.87E-05	52.5	110	450

Determinand	Predicted Soil Level Mean (mg/kg)	Rural Soil Level Mean (mg/kg)	Urban Soil Level Mean (mg/kg)	SGV** (mg/kg)
Mercury	- 1.76E-04 8.67E-03	0.13	0.35	1-elmental 11-methyl 170-inorganic
Nickel	2.49E-06	21.1	28.19	130
Dioxins/furans & Dioxin-like PCBs	1.92E-01 (ng/kg) TEQ	4.70 (ng/kg) TEQ	9.19 (ng/kg) TEQ	8 µg/kg
Benzo(a)pyrene	2.61E-04	0.215	0.878	1.2-4.0

*Total Chromium: Chromium (1.3344E-02), Chromium hexavalent (1.3344E-02); ** for residential scenario.

Table 3-16 Soil Concentration in the Location of Receptor 48

Determinand	Predicted Soil Level Mean (mg/kg)	Rural Soil Level Mean (mg/kg)	Urban Soil Level Mean (mg/kg)	SGV** (mg/kg)
Arsenic	6.23E-09	10.9	11.0	32
Cadmium	3.37E-07	0.39	0.44	10
Chromium (total)*	2.34E-02	34.4	34.3	130
Lead	4.28E-05	52.5	110	450
Mercury (total)**	- 1.61E-04 7.91E-03	0.13	0.35	1-elmental 11-methyl 170-inorganic
Nickel	2.19E-06	21.1	28.19	130
Dioxins/furans	2.04E-01 (ng/kg) TEQ	4.70 (ng/kg) TEQ	9.19 (ng/kg) TEQ	8 µg/kg
Benzo(a)pyrene	2.98E-04	0.215	0.878	1.2-4.0

*Total Chromium: Chromium (1.1722E-02), Chromium hexavalent (1.1722E-02); ** for residential scenario.

Food Concentration

The maximum levels for certain contaminants in foodstuffs as reported in Commission Regulations (EC) No 1881/2006 are enforced by The Contaminants in Food (England) Regulations 2007. The draft Contaminants in Food (England) Regulations 2009 seeks to implement the enforcement of Commission Regulations (EC) Nos. 565/2008 & 629/2008 which amends (EC) No 1881/2006. These are presented in Table 3-17 in comparison to those predicted by the model at the most affected receptors.

Table 3-17 Food Concentration

	Maximum Level (mg/kg) wet weight	Model Predicted Maximum Level
Lead		
Cow milk	2.0E-02	1.51E-04
Meat/Poultry	1.0E-01	1.20E-04
Lowest acceptable for cereals, vegetables and fruits	1.0E-01	1.50E-03
Cadmium		
Meat/Poultry	5.0E-02	5.68E-06
Lowest acceptable for cereals, vegetables and fruits	5.0E-02	1.93E-04
Fish	1.0E-01	5.82E-05
Mercury		
Fish	0.5-1.0	1.24E-01
BaP		
Fish	2.0E-03	1.21E-03
Dioxins and Furans & PCB TEQ		
Fish (Dioxins and Furans)	4.0E-03	3.33E-08
Fish (Dioxins, Furans & PCBs)	8.0E-03	2.48E-07

* Using the recommended TEF for the prevailing PCBs congeners (Ref [17])

As can be seen from Table 3-17, the predicted concentration in meat, poultry and produce produced in the area, are lower than the UK standard for all relevant COPCs. Values for other contaminants for the above presented food items are not available.

4 Summary and Conclusions

An assessment concerned with the evaluation of possible effects on the health of humans due to emissions from the proposed SEP at Kemsley was undertaken. This was focused on Contaminants of Potential Concern (COPC) including metals, dioxins, benzo(a)pyrene and polychlorinated biphenyls for which any effects are likely to be chronic arising from prolonged exposure.

Potential secondary exposures, following the deposition of these COPC through the ingestion of affected soils, home-grown produce, beef, milk, pork, poultry, eggs and fish at receptors within the vicinity of the site were also considered in the assessment.

In the absence of UK protocols for this type of assessment, the USEPA methodology "Human Health Risk Assessment Protocol 2005" was used utilising the commercial software IRAP-h View. The USEPA default exposure parameters and toxicological data were replaced by those recommended by DEFRA and the EA reports SC050021/SR3 and R&D Publication TOX reports where available.

The DEFRA common framework for risk assessment and management was used as the guidelines for the assessment and appraisal of potential impact on human health from the proposed SEP.

A simplified conceptual model was built for the site identifying all viable sources, receptors and pathways of exposure relevant to each of the receptors. In the absence of specific information in relation to the nature of the local receptors, all default pathways of exposure were assumed to exist, for each receptor scenario, to screen receptors with potentially significant exposure and consequently greater risks.

Contaminants of potential concern (COPC) concentrations in the different receiving media were calculated from the particle phase and vapour phase air concentrations and deposition to the soil and surface water courses. The estimated concentrations were based on a number of conservative assumptions to ensure that worst-case scenarios were assessed.

To identify the level of potential risk from exposure to each COPC in all relevant pathways of exposure, the hazard quotients for each medium were calculated. Potential cancer risk was also estimated and compared with relevant acceptable risk levels.

The hazard quotients for all compounds in the residential and farm land uses for the most affected receptors are lower than target level of 1. The cancer risks for all residential and farmer receptors are significantly lower than their relevant target levels. Therefore potential health impact on both residential and farmer receptors are not considered of potential significance.

It was, therefore, concluded that potential exposure to the SEP emission with consideration to background exposure, where appropriate, will not pose unacceptable risk to the residential or farmer receptors identified in the vicinity of the proposed SEP.

References

[1] Defra, 2004. Review of Environmental and Health Effects of Waste Management: Municipal Soiid Waste and Similar Wastes.

[2] Environment Agency, 2009. “Updated technical background to the CLEA model”. Science Report SC050021/SR3.

[3] Defra and The Environment Agency, 2002.The Contaminated Land Exposure Assessment (CLEA) Model: Technical Basis and Algorithms, R&D Publication CLR10.

[4] Environment Agency, May 2009. “Contaminants in soil: updated collation of toxicological data and intake values for humans. Nickel”. Science report SC050021/Tox 8.

[5] Defra and the Environment Agency, 2002. “Contaminants in Soil: Collation of Toxicological Data an Intake Values for Humans. Chromium”. R&D Publication TOX 4.

[6] Defra and the Environment Agency, 2002. “Contaminants in Soil: Collation of Toxicological Data an Intake Values for Humans. Lead”. R&D Publication TOX 6.

[7] Environment Agency, May 2009. “Contaminants in soil: updated collation of toxicological data and intake values for humans. Inorganic arsenic”. Science report SC050021/Tox 1.

[8] Environment Agency, June 2009. “Contaminants in soil: updated collation of toxicological data and intake values for humans. Cadmium”. Science report SC050021/Tox 3.

[9] Environment Agency, March 2009. “Contaminants in soil: updated collation of toxicological data and intake values for humans. Mercury”. Science report SC050021.

[10] Environment Agency, September 2009. “Contaminants in soil: updated collation of toxicological data and intake values for humans. Dioxins, furans and dioxin-like PCBs”. Science report SC050021/Tox 12.

[11] Environment Agency, 2009.”Human health toxicological assessment of contaminants in soil”. Science Report – Final SC050021/SR2.

[12] Defra and The Environment Agency, 2002.Contaminats in Soil: Collation of Toxicological Data and Intake Values for Humans, R&D Publication CLR9.

[13] Defra, 2000. Guidelines for Environmental Risk Assessment and Management.

[14] Defra and The Environment Agency, 2002. Potential Contaminants for the Assessment of Land, R&D Publication CLR8.

[15] U.S. EPA-OSW. 2005. Human Health Risk Assessment Protocol (HHRAP) (EPA530-R-05-006).

[16] Stephens, R.D., M. Petreas and G.H. Hayward, 1995. “Biotransfer and Bioaccumulation of Dioxins and Furans from Soil: Chickens as a Model for Foraging Animals.” The Science of the Total Environment. 175: 253-273. July 20.

[17] Environment Agency. PCB and PAH Releases from Incineration and Power Generation Processes. R&D Technical Report P4-053, Patrick H Dyke.

[18] Further Consideration of the MOE Approach. CC/07/14 2007 & Further Consideration of the MOE

Approach for Communicating the Risks of Exposure to Genotoxic Carcinogens. CC/07/08 2007.

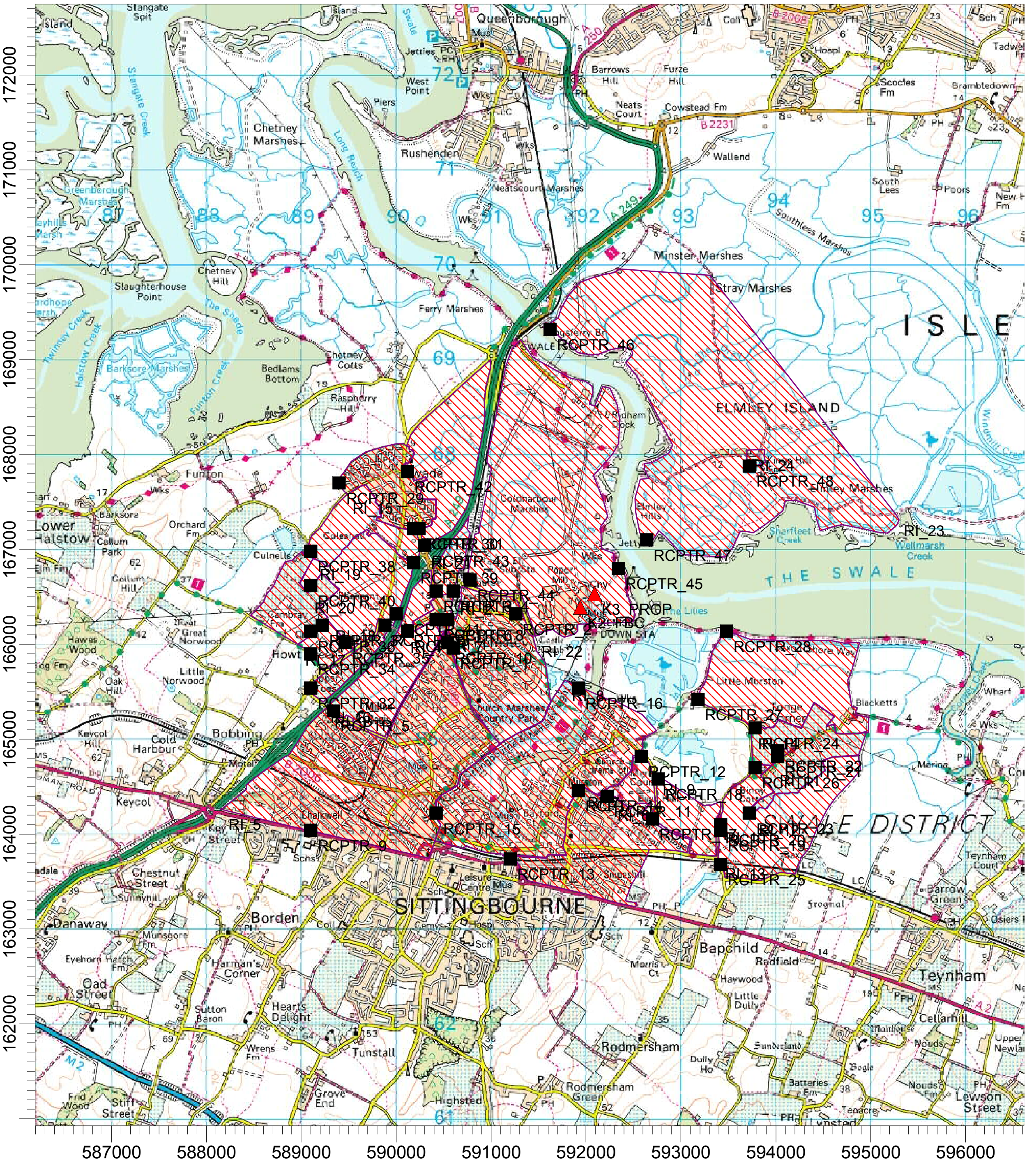
Bibliography

[1] Environment Agency. Where to go fishing. The 2009/10 guide to more than 220 coarse and game fisheries in your local area. Kent and East Sussex.

Drawings

PROJECT TITLE:

Figure 1 - Receptors



COMMENTS:

Red Hatching = Selected Receptor Areas
Boxes = Discrete Receptors (located at maxima concentrations identified by the model)
Red Triangle = Source

COMPANY NAME:

RPS

MODELER:

A Hashm

SCALE: 1:65,388

0 2 km

DATE:

25/11/2009

PROJECT NO.:

BES0276

PROJECT TITLE:

Figure 2 - Surface Watercourses

COMMENTS:

COMPANY NAME:

RPS

MODELER:

A Hashm

SCALE: 1:76,930

0 2 km

DATE:

25/11/2009

PROJECT NO.:

BES0276

Appendices

Annex A

RECEPTOR :	RCPTR_1	UTM X:	590,600.00	UTM Y:	165,960.00

Based on Receptor I.D. : RI_1

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.0407	cyp	ug-s/g-m^3
Air concentration - particle bound	0.0407	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.0407	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.0407	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.03516	dydp	s/m^2 year
Dry deposition - particle bound	0.03516	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.03516	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.10198	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.0145	cyp	ug-s/g-m^3
Air concentration - particle bound	0.0145	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.0145	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.0145	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01253	dydp	s/m^2 year
Dry deposition - particle bound	0.01253	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01253	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.03634	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_10	UTM X:	590,540.00	UTM Y:	166,020.00

Based on Receptor I.D. : RI_5

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.0427	cyp	ug-s/g-m^3
Air concentration - particle bound	0.0427	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.0427	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.0427	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.0369	dydp	s/m^2 year
Dry deposition - particle bound	0.0369	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.0369	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.107	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.01502	cyp	ug-s/g-m^3
Air concentration - particle bound	0.01502	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.01502	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.01502	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01298	dydp	s/m^2 year
Dry deposition - particle bound	0.01298	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01298	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.03764	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_11	UTM X:	592,220.00	UTM Y:	164,400.00

Based on Receptor I.D. : RI_6

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.02147	cyp	ug-s/g-m^3
Air concentration - particle bound	0.02147	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.02147	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.02147	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01855	dydp	s/m^2 year
Dry deposition - particle bound	0.01855	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01855	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.05379	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00809	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00809	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00809	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00809	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00699	dydp	s/m^2 year
Dry deposition - particle bound	0.00699	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00699	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.02027	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_12	UTM X:	592,580.00	UTM Y:	164,820.00

Based on Receptor I.D. : RI_6

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.02526	cyp	ug-s/g-m^3
Air concentration - particle bound	0.02526	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.02526	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.02526	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.02182	dydp	s/m^2 year
Dry deposition - particle bound	0.02182	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.02182	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.06329	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00955	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00955	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00955	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00955	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00825	dydp	s/m^2 year
Dry deposition - particle bound	0.00825	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00825	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.02392	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_13	UTM X:	591,200.00	UTM Y:	163,740.00

Based on Receptor I.D. : RI_7

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.01337	cyp	ug-s/g-m^3
Air concentration - particle bound	0.01337	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.01337	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.01337	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01155	dydp	s/m^2 year
Dry deposition - particle bound	0.01155	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01155	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.03351	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00482	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00482	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00482	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00482	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00417	dydp	s/m^2 year
Dry deposition - particle bound	0.00417	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00417	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.01208	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_14	UTM X:	591,920.00	UTM Y:	164,460.00

Based on Receptor I.D. : RI_7

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.02362	cyp	ug-s/g-m^3
Air concentration - particle bound	0.02362	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.02362	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.02362	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.02041	dydp	s/m^2 year
Dry deposition - particle bound	0.02041	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.02041	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.05919	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00796	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00796	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00796	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00796	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00688	dydp	s/m^2 year
Dry deposition - particle bound	0.00688	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00688	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.01994	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_15	UTM X:	590,420.00	UTM Y:	164,220.00

Based on Receptor I.D. : RI_8

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.01198	cyp	ug-s/g-m^3
Air concentration - particle bound	0.01198	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.01198	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.01198	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01035	dydp	s/m^2 year
Dry deposition - particle bound	0.01035	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01035	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.03002	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00533	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00533	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00533	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00533	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.0046	dydp	s/m^2 year
Dry deposition - particle bound	0.0046	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.0046	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.01335	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR : RCPTR_16 UTM X: 591,920.00 UTM Y: 165,540.00

Based on Receptor I.D. : RI_8

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.04633	cyp	ug-s/g-m^3
Air concentration - particle bound	0.04633	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.04633	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.04633	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.04003	dydp	s/m^2 year
Dry deposition - particle bound	0.04003	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.04003	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.11607	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00973	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00973	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00973	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00973	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00841	dydp	s/m^2 year
Dry deposition - particle bound	0.00841	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00841	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.02439	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_17	UTM X:	592,700.00	UTM Y:	164,160.00

Based on Receptor I.D. : RI_9

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.01703	cyp	ug-s/g-m^3
Air concentration - particle bound	0.01703	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.01703	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.01703	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01472	dydp	s/m^2 year
Dry deposition - particle bound	0.01472	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01472	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.04268	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00706	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00706	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00706	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00706	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.0061	dydp	s/m^2 year
Dry deposition - particle bound	0.0061	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.0061	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.01768	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_18	UTM X:	592,760.00	UTM Y:	164,580.00

Based on Receptor I.D. : RI_9

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.02136	cyp	ug-s/g-m^3
Air concentration - particle bound	0.02136	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.02136	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.02136	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01845	dydp	s/m^2 year
Dry deposition - particle bound	0.01845	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01845	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.05352	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00843	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00843	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00843	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00843	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00728	dydp	s/m^2 year
Dry deposition - particle bound	0.00728	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00728	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.02111	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_19	UTM X:	593,420.00	UTM Y:	164,040.00

Based on Receptor I.D. : RI_10

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.01566	cyp	ug-s/g-m^3
Air concentration - particle bound	0.01566	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.01566	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.01566	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01353	dydp	s/m^2 year
Dry deposition - particle bound	0.01353	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01353	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.03924	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00665	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00665	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00665	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00665	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00574	dydp	s/m^2 year
Dry deposition - particle bound	0.00574	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00574	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.01666	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR : RCPTR_2 UTM X: 591,260.00 UTM Y: 166,320.00

Based on Receptor I.D. : RI_1

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.07222	cyp	ug-s/g-m^3
Air concentration - particle bound	0.07222	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.07222	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.07222	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.06239	dydp	s/m^2 year
Dry deposition - particle bound	0.06239	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.06239	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.18095	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.02478	cyp	ug-s/g-m^3
Air concentration - particle bound	0.02478	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.02478	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.02478	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.02141	dydp	s/m^2 year
Dry deposition - particle bound	0.02141	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.02141	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.06209	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_20	UTM X:	593,420.00	UTM Y:	164,100.00

Based on Receptor I.D. : RI_10

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.01604	cyp	ug-s/g-m^3
Air concentration - particle bound	0.01604	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.01604	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.01604	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01386	dydp	s/m^2 year
Dry deposition - particle bound	0.01386	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01386	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.04018	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00678	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00678	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00678	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00678	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00586	dydp	s/m^2 year
Dry deposition - particle bound	0.00586	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00586	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.017	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	**RCPTR_21**	**UTM X:**	**594,020.00**	**UTM Y:**	**164,820.00**

Based on Receptor I.D. : RI_11

SOURCE: **K2_FBC**

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.02032	cyp	ug-s/g-m^3
Air concentration - particle bound	0.02032	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.02032	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.02032	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01755	dydp	s/m^2 year
Dry deposition - particle bound	0.01755	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01755	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.0509	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: **K3_PROP**

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00792	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00792	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00792	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00792	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00684	dydp	s/m^2 year
Dry deposition - particle bound	0.00684	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00684	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.01984	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_22	UTM X:	594,020.00	UTM Y:	164,880.00

Based on Receptor I.D. : RI_11

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.02067	cyp	ug-s/g-m^3
Air concentration - particle bound	0.02067	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.02067	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.02067	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01786	dydp	s/m^2 year
Dry deposition - particle bound	0.01786	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01786	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.05179	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00811	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00811	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00811	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00811	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00701	dydp	s/m^2 year
Dry deposition - particle bound	0.00701	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00701	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.02032	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_23	UTM X:	593,720.00	UTM Y:	164,220.00

Based on Receptor I.D. : RI_12

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.0162	cyp	ug-s/g-m^3
Air concentration - particle bound	0.0162	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.0162	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.0162	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01399	dydp	s/m^2 year
Dry deposition - particle bound	0.01399	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01399	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.04058	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00665	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00665	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00665	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00665	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00575	dydp	s/m^2 year
Dry deposition - particle bound	0.00575	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00575	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.01667	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_24	UTM X:	593,780.00	UTM Y:	165,120.00

Based on Receptor I.D. : RI_12

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.02401	cyp	ug-s/g-m^3
Air concentration - particle bound	0.02401	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.02401	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.02401	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.02075	dydp	s/m^2 year
Dry deposition - particle bound	0.02075	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.02075	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.06017	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00919	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00919	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00919	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00919	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00794	dydp	s/m^2 year
Dry deposition - particle bound	0.00794	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00794	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.02302	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR : RCPTR_25 UTM X: 593,420.00 UTM Y: 163,680.00

Based on Receptor I.D. : RI_13

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.01353	cyp	ug-s/g-m^3
Air concentration - particle bound	0.01353	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.01353	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.01353	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01169	dydp	s/m^2 year
Dry deposition - particle bound	0.01169	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01169	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.03391	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00587	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00587	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00587	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00587	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00507	dydp	s/m^2 year
Dry deposition - particle bound	0.00507	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00507	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.01472	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_26	UTM X:	593,780.00	UTM Y:	164,700.00

Based on Receptor I.D. : RI_13

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.02051	cyp	ug-s/g-m^3
Air concentration - particle bound	0.02051	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.02051	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.02051	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01772	dydp	s/m^2 year
Dry deposition - particle bound	0.01772	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01772	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.05138	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00769	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00769	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00769	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00769	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00664	dydp	s/m^2 year
Dry deposition - particle bound	0.00664	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00664	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.01926	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_27	UTM X:	593,180.00	UTM Y:	165,420.00

Based on Receptor I.D. : RI_14

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.03374	cyp	ug-s/g-m^3
Air concentration - particle bound	0.03374	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.03374	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.03374	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.02915	dydp	s/m^2 year
Dry deposition - particle bound	0.02915	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.02915	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.08454	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.01109	cyp	ug-s/g-m^3
Air concentration - particle bound	0.01109	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.01109	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.01109	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00958	dydp	s/m^2 year
Dry deposition - particle bound	0.00958	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00958	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.02778	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_28	UTM X:	593,480.00	UTM Y:	166,140.00

Based on Receptor I.D. : RI_14

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.04726	cyp	ug-s/g-m^3
Air concentration - particle bound	0.04726	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.04726	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.04726	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.04083	dydp	s/m^2 year
Dry deposition - particle bound	0.04083	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.04083	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.11841	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.01862	cyp	ug-s/g-m^3
Air concentration - particle bound	0.01862	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.01862	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.01862	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01609	dydp	s/m^2 year
Dry deposition - particle bound	0.01609	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01609	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.04666	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_29	UTM X:	589,400.00	UTM Y:	167,700.00

Based on Receptor I.D. : RI_15

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.007	cyp	ug-s/g-m^3
Air concentration - particle bound	0.007	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.007	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.007	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00605	dydp	s/m^2 year
Dry deposition - particle bound	0.00605	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00605	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.01753	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.003	cyp	ug-s/g-m^3
Air concentration - particle bound	0.003	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.003	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.003	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00259	dydp	s/m^2 year
Dry deposition - particle bound	0.00259	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00259	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.0075	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_3	UTM X:	590,420.00	UTM Y:	166,560.00

Based on Receptor I.D. : RI_2

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.03142	cyp	ug-s/g-m^3
Air concentration - particle bound	0.03142	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.03142	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.03142	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.02715	dydp	s/m^2 year
Dry deposition - particle bound	0.02715	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.02715	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.07873	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.01394	cyp	ug-s/g-m^3
Air concentration - particle bound	0.01394	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.01394	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.01394	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01204	dydp	s/m^2 year
Dry deposition - particle bound	0.01204	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01204	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.03492	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR : RCPTR_30 UTM X: 590,180.00 UTM Y: 167,220.00

Based on Receptor I.D. : RI_15

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.01098	cyp	ug-s/g-m^3
Air concentration - particle bound	0.01098	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.01098	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.01098	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00949	dydp	s/m^2 year
Dry deposition - particle bound	0.00949	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00949	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.02751	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00443	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00443	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00443	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00443	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00382	dydp	s/m^2 year
Dry deposition - particle bound	0.00382	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00382	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.01109	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_31	UTM X:	590,240.00	UTM Y:	167,220.00

Based on Receptor I.D. : RI_15

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.011	cyp	ug-s/g-m^3
Air concentration - particle bound	0.011	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.011	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.011	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.0095	dydp	s/m^2 year
Dry deposition - particle bound	0.0095	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.0095	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.02756	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00441	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00441	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00441	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00441	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00381	dydp	s/m^2 year
Dry deposition - particle bound	0.00381	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00381	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.01104	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR : RCPTR_32 UTM X: 589,100.00 UTM Y: 165,540.00

Based on Receptor I.D. : RI_16

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.01773	cyp	ug-s/g-m^3
Air concentration - particle bound	0.01773	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.01773	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.01773	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01532	dydp	s/m^2 year
Dry deposition - particle bound	0.01532	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01532	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.04442	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00775	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00775	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00775	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00775	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.0067	dydp	s/m^2 year
Dry deposition - particle bound	0.0067	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.0067	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.01942	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_33	UTM X:	589,880.00	UTM Y:	166,200.00

Based on Receptor I.D. : RI_16

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.03251	cyp	ug-s/g-m^3
Air concentration - particle bound	0.03251	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.03251	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.03251	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.02809	dydp	s/m^2 year
Dry deposition - particle bound	0.02809	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.02809	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.08147	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.01314	cyp	ug-s/g-m^3
Air concentration - particle bound	0.01314	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.01314	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.01314	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01135	dydp	s/m^2 year
Dry deposition - particle bound	0.01135	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01135	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.03292	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_34	UTM X:	589,100.00	UTM Y:	165,900.00

Based on Receptor I.D. : RI_17

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.02193	cyp	ug-s/g-m^3
Air concentration - particle bound	0.02193	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.02193	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.02193	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01894	dydp	s/m^2 year
Dry deposition - particle bound	0.01894	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01894	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.05494	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00946	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00946	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00946	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00946	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00818	dydp	s/m^2 year
Dry deposition - particle bound	0.00818	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00818	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.02371	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_35	UTM X:	589,460.00	UTM Y:	166,020.00

Based on Receptor I.D. : RI_17

SOURCE: **K2_FBC**

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.02608	cyp	ug-s/g-m^3
Air concentration - particle bound	0.02608	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.02608	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.02608	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.02253	dydp	s/m^2 year
Dry deposition - particle bound	0.02253	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.02253	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.06535	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: **K3_PROP**

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.01087	cyp	ug-s/g-m^3
Air concentration - particle bound	0.01087	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.01087	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.01087	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00939	dydp	s/m^2 year
Dry deposition - particle bound	0.00939	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00939	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.02723	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_36	UTM X:	589,100.00	UTM Y:	166,140.00

Based on Receptor I.D. : RI_18

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.02294	cyp	ug-s/g-m^3
Air concentration - particle bound	0.02294	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.02294	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.02294	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01982	dydp	s/m^2 year
Dry deposition - particle bound	0.01982	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01982	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.05748	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.01006	cyp	ug-s/g-m^3
Air concentration - particle bound	0.01006	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.01006	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.01006	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00869	dydp	s/m^2 year
Dry deposition - particle bound	0.00869	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00869	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.0252	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_37	UTM X:	589,220.00	UTM Y:	166,200.00

Based on Receptor I.D. : RI_18

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.02395	cyp	ug-s/g-m^3
Air concentration - particle bound	0.02395	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.02395	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.02395	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.02069	dydp	s/m^2 year
Dry deposition - particle bound	0.02069	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.02069	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.06001	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.01044	cyp	ug-s/g-m^3
Air concentration - particle bound	0.01044	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.01044	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.01044	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00902	dydp	s/m^2 year
Dry deposition - particle bound	0.00902	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00902	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.02616	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	**RCPTR_38**	**UTM X:**	**589,100.00**	**UTM Y:**	**166,980.00**

Based on Receptor I.D. : RI_19

SOURCE: **K2_FBC**

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.01237	cyp	ug-s/g-m^3
Air concentration - particle bound	0.01237	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.01237	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.01237	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01069	dydp	s/m^2 year
Dry deposition - particle bound	0.01069	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01069	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.03099	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: **K3_PROP**

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00584	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00584	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00584	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00584	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00504	dydp	s/m^2 year
Dry deposition - particle bound	0.00504	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00504	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.01463	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_39	UTM X:	590,180.00	UTM Y:	166,860.00

Based on Receptor I.D. : RI_19

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.01731	cyp	ug-s/g-m^3
Air concentration - particle bound	0.01731	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.01731	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.01731	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01496	dydp	s/m^2 year
Dry deposition - particle bound	0.01496	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01496	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.04337	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00774	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00774	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00774	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00774	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00669	dydp	s/m^2 year
Dry deposition - particle bound	0.00669	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00669	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.0194	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_4	UTM X:	590,600.00	UTM Y:	166,560.00

Based on Receptor I.D. : RI_2

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.03384	cyp	ug-s/g-m^3
Air concentration - particle bound	0.03384	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.03384	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.03384	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.02924	dydp	s/m^2 year
Dry deposition - particle bound	0.02924	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.02924	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.08479	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.01504	cyp	ug-s/g-m^3
Air concentration - particle bound	0.01504	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.01504	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.01504	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01299	dydp	s/m^2 year
Dry deposition - particle bound	0.01299	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01299	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.03767	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_40	UTM X:	589,100.00	UTM Y:	166,620.00

Based on Receptor I.D. : RI_20

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.01801	cyp	ug-s/g-m^3
Air concentration - particle bound	0.01801	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.01801	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.01801	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01556	dydp	s/m^2 year
Dry deposition - particle bound	0.01556	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01556	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.04513	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00846	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00846	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00846	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00846	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00731	dydp	s/m^2 year
Dry deposition - particle bound	0.00731	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00731	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.0212	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_41	UTM X:	590,000.00	UTM Y:	166,320.00

Based on Receptor I.D. : RI_20

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.03352	cyp	ug-s/g-m^3
Air concentration - particle bound	0.03352	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.03352	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.03352	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.02896	dydp	s/m^2 year
Dry deposition - particle bound	0.02896	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.02896	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.08398	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.01378	cyp	ug-s/g-m^3
Air concentration - particle bound	0.01378	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.01378	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.01378	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01191	dydp	s/m^2 year
Dry deposition - particle bound	0.01191	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01191	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.03453	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_42	UTM X:	590,120.00	UTM Y:	167,820.00

Based on Receptor I.D. : RI_21

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00706	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00706	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00706	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00706	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.0061	dydp	s/m^2 year
Dry deposition - particle bound	0.0061	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.0061	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.0177	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00273	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00273	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00273	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00273	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00236	dydp	s/m^2 year
Dry deposition - particle bound	0.00236	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00236	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.00683	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_43	UTM X:	590,300.00	UTM Y:	167,040.00

Based on Receptor I.D. : RI_21

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.01374	cyp	ug-s/g-m^3
Air concentration - particle bound	0.01374	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.01374	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.01374	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01187	dydp	s/m^2 year
Dry deposition - particle bound	0.01187	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01187	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.03442	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00559	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00559	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00559	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00559	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00483	dydp	s/m^2 year
Dry deposition - particle bound	0.00483	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00483	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.01402	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_44	UTM X:	590,780.00	UTM Y:	166,680.00

Based on Receptor I.D. : RI_22

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.02681	cyp	ug-s/g-m^3
Air concentration - particle bound	0.02681	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.02681	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.02681	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.02316	dydp	s/m^2 year
Dry deposition - particle bound	0.02316	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.02316	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.06717	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.01233	cyp	ug-s/g-m^3
Air concentration - particle bound	0.01233	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.01233	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.01233	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01065	dydp	s/m^2 year
Dry deposition - particle bound	0.01065	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01065	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.0309	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_45	UTM X:	592,340.00	UTM Y:	166,800.00

Based on Receptor I.D. : RI_22

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.23801	cyp	ug-s/g-m^3
Air concentration - particle bound	0.23801	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.23801	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.23801	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.20564	dydp	s/m^2 year
Dry deposition - particle bound	0.20564	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.20564	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.59637	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.02203	cyp	ug-s/g-m^3
Air concentration - particle bound	0.02203	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.02203	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.02203	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01904	dydp	s/m^2 year
Dry deposition - particle bound	0.01904	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01904	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.05521	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_46	UTM X:	591,620.00	UTM Y:	169,320.00

Based on Receptor I.D. : RI_23

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.01041	cyp	ug-s/g-m^3
Air concentration - particle bound	0.01041	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.01041	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.01041	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.009	dydp	s/m^2 year
Dry deposition - particle bound	0.009	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.009	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.02609	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00454	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00454	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00454	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00454	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00393	dydp	s/m^2 year
Dry deposition - particle bound	0.00393	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00393	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.01138	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_47	UTM X:	592,640.00	UTM Y:	167,100.00

Based on Receptor I.D. : RI_23

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.15629	cyp	ug-s/g-m^3
Air concentration - particle bound	0.15629	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.15629	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.15629	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.13504	dydp	s/m^2 year
Dry deposition - particle bound	0.13504	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.13504	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.39161	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.08232	cyp	ug-s/g-m^3
Air concentration - particle bound	0.08232	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.08232	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.08232	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.07113	dydp	s/m^2 year
Dry deposition - particle bound	0.07113	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.07113	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.20627	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_48	UTM X:	593,720.00	UTM Y:	167,880.00

Based on Receptor I.D. : RI_24

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.05344	cyp	ug-s/g-m^3
Air concentration - particle bound	0.05344	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.05344	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.05344	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.04618	dydp	s/m^2 year
Dry deposition - particle bound	0.04618	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.04618	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.13391	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.03028	cyp	ug-s/g-m^3
Air concentration - particle bound	0.03028	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.03028	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.03028	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.02616	dydp	s/m^2 year
Dry deposition - particle bound	0.02616	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.02616	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.07586	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_5	UTM X:	589,340.00	UTM Y:	165,300.00

Based on Receptor I.D. : RI_3

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.01539	cyp	ug-s/g-m^3
Air concentration - particle bound	0.01539	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.01539	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.01539	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.0133	dydp	s/m^2 year
Dry deposition - particle bound	0.0133	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.0133	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.03857	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00694	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00694	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00694	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00694	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.006	dydp	s/m^2 year
Dry deposition - particle bound	0.006	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.006	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.01739	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_6	UTM X:	590,420.00	UTM Y:	166,260.00

Based on Receptor I.D. : RI_3

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.04441	cyp	ug-s/g-m^3
Air concentration - particle bound	0.04441	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.04441	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.04441	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.03837	dydp	s/m^2 year
Dry deposition - particle bound	0.03837	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.03837	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.11128	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.0167	cyp	ug-s/g-m^3
Air concentration - particle bound	0.0167	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.0167	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.0167	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01443	dydp	s/m^2 year
Dry deposition - particle bound	0.01443	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01443	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.04186	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_7	UTM X:	590,120.00	UTM Y:	166,140.00

Based on Receptor I.D. : RI_4

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.03699	cyp	ug-s/g-m^3
Air concentration - particle bound	0.03699	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.03699	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.03699	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.03196	dydp	s/m^2 year
Dry deposition - particle bound	0.03196	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.03196	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.09269	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.01419	cyp	ug-s/g-m^3
Air concentration - particle bound	0.01419	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.01419	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.01419	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01226	dydp	s/m^2 year
Dry deposition - particle bound	0.01226	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01226	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.03554	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_8	UTM X:	590,540.00	UTM Y:	166,260.00

Based on Receptor I.D. : RI_4

SOURCE: **K2_FBC**

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.04814	cyp	ug-s/g-m^3
Air concentration - particle bound	0.04814	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.04814	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.04814	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.04159	dydp	s/m^2 year
Dry deposition - particle bound	0.04159	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.04159	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.12061	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: **K3_PROP**

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.01765	cyp	ug-s/g-m^3
Air concentration - particle bound	0.01765	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.01765	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.01765	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.01525	dydp	s/m^2 year
Dry deposition - particle bound	0.01525	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.01525	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.04421	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

RECEPTOR :	RCPTR_9	UTM X:	589,100.00	UTM Y:	164,040.00

Based on Receptor I.D. : RI_5

SOURCE: K2_FBC

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00944	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00944	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00944	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00944	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00815	dydp	s/m^2 year
Dry deposition - particle bound	0.00815	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00815	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.02365	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

SOURCE: K3_PROP

AIR PARAMETER DESCRIPTION	VALUE	SYMBOL	UNITS
Hourly air concentration - particle phase	0	chp	ug-s/g-m^3
Hourly air concentration - particle bound	0	chp_pb	ug-s/g-m^3
Hourly air concentration - vapor phase	0	chv	ug-s/g-m^3
Hourly air concentration - vapor phase hg	0	chv_hg	ug-s/g-m^3
Air concentration - particle phase	0.00448	cyp	ug-s/g-m^3
Air concentration - particle bound	0.00448	cyp_pb	ug-s/g-m^3
Air concentration - vapor phase	0.00448	cyv	ug-s/g-m^3
Air concentration - vapor phase hg	0.00448	cyv_hg	ug-s/g-m^3
Dry deposition - particle phase	0.00387	dydp	s/m^2 year
Dry deposition - particle bound	0.00387	dydp_pb	s/m^2 year
Dry deposition - vapor phase	0.00387	dydv	s/m^2 year
Dry deposition - vapor phase hg	0.01124	dydv_hg	s/m^2 year
Wet deposition - particle phase	0	dywp	s/m^2 year
Wet deposition - particle bound	0	dywp_pb	s/m^2 year
Wet deposition - vapor phase	0	dywv	s/m^2 year
Wet deposition - vapor phase hg	0	dywv_hg	s/m^2 year

Annex B

SITE PARAMETER	VALUE	SYMBOL	UNITS
Soil dry bulk density	1.5	bd	g/cm^3
Forage fraction grown on contam. soil eaten by CATTLE	1.0	beef_fi_forage	
Grain fraction grown on contam. soil eaten by CATTLE	1.0	beef_fi_grain	
Silage fraction grown on contam. eaten by CATTLE	1.0	beef_fi_silage	
Qty of forage eaten by CATTLE each day	8.8	beef_qp_forage	kg DW/day
Qty of grain eaten by CATTLE each day	0.47	beef_qp_grain	kg DW/day
Qty of silage eaten by CATTLE each day	2.5	beef_qp_silage	kg DW/day
Grain fraction grown on contam. soil eaten by CHICKEN	1.0	chick_fi_grain	
Qty of grain eaten by CHICKEN each day	0.2	chick_qp_grain	kg DW/day
Average annual evapotranspiration	48.48	e_v	cm/yr
Fish lipid content	0.07	f_lipid	
Fraction of CHICKEN's diet that is soil	0.1	fd_chicken	
Universal gas constant	8.205e-5	gas_r	atm-m^3/mol-K
Average annual irrigation	0.0	i	cm/yr
Plant surface loss coefficient	18	kp	yr^-1
Fraction of mercury emissions NOT lost to the global cycle	0.48	merc_q_corr	
Fraction of mercury speciated into methyl mercury in produce	0.22	mercmethyl_ag	
Fraction of mercury speciated into methyl mercury in soil	0.02	mercmethyl_sc	
Forage fraction grown contam. soil, eaten by MILK CATTLE	1.0	milk_fi_forage	
Grain fraction grown contam. soil, eaten by MILK CATTLE	1.0	milk_fi_grain	
Silage fraction grown contam. soil, eaten by MILK CATTLE	1.0	milk_fi_silage	
Qty of forage eaten by MILK CATTLE each day	13.2	milk_qp_forage	kg DW/day
Qty of grain eaten by MILK CATTLE each day	3.0	milk_qp_grain	kg DW/day
Qty of silage eaten by MILK CATTLE each day	4.1	milk_qp_silage	kg DW/day

SITE PARAMETER	VALUE	SYMBOL	UNITS
Averaging time	1	milkfat_at	yr
Body weight of infant	9.4	milfat_bw_infant	kg
Exposure duration of infant to breast milk	1	milkfat_ed	yr
Proportion of ingested dioxin that is stored in fat	0.9	milkfat_f1	
Proportion of mothers weight that is fat	0.3	milkfat_f2	
Fraction of fat in breast milk	0.04	milkfat_f3	
Fraction of ingested contaminant that is absorbed	0.9	milkfat_f4	
Half-life of dioxin in adults	2555	milkfat_h	days
Ingestion rate of breast milk	0.688	milkfat_ir_milk	kg/day
Viscosity of air corresponding to air temp.	1.81e-04	mu_a	g/cm-s
Average annual precipitation	54.06	p	cm/yr
Fraction of silage grown on contam. soil and eaten by PIGS	1.0	pork_fi_silage	
Qty of grain eaten by PIGS each day	3.3	pork_qp_grain	kg DW/day
Qty of silage eaten by PIGS each day	1.4	pork_qp_silage	kg DW/day
Qty of soil eaten by CATTLE	0.5	qs_beef	kg/day
Qty of soil eaten by CHICKEN	0.022	qs_chick	kg/day
Qty of soil eaten by DAIRY CATTLE	0.4	qs_milk	kg/day
Qty of soil eaten by PIGS	0.37	qs_pork	kg/day
Average annual runoff	2.73	r	cm/yr
Density of air	1.2e-3	rho_a	g/cm^3
Solids particle density	2.7	rho_s	g/cm^3
Interception fraction - edible portion ABOVEGROUND	0.39	rp	
Interception fraction - edible portion FORAGE --	0.5	rp_forage	
Interception fraction - edible portion SILAGE --	0.46	rp_silage	
Ambient air temperature	298	t	K
Temperature correction factor --	1.026	theta	
Soil volumetric water content	0.2	theta_s	mL/cm^3
Length of plant expos. to depos. - ABOVEGROUND	0.16	tp	Yr
Length of plant expos. to depos. - FORAGE	0.12	tp_forage	Yr
Length of plant expos. to depos. - SILAGE	0.16	tp_silage	Yr
Dry deposition velocity	0.5	vdv	cm/s

SITE PARAMETER	VALUE	SYMBOL	UNITS
Dry deposition velocity for mercury	2.9	vdv_hg	cm/s
Wind velocity	3.28	w	m/s
Yield/standing crop biomass - edible portion ABOVEGROUND	2.24	yp	kg DW/m^2
Yield/standing crop biomass - edible portion FORAGE	0.24	yp_forage	kg DW/m^2
Yield/standing crop biomass - edible portion SILAGE	0.8	yp_silage kg	DW/m^2
Soil mixing zone depth	2	z	cm
Soil mixing zone depth for produce	20	z_p	cm

	Resident Adult	Resident Child	Farmer Adult	Farmer Child	Fisher Adult	Fisher Child	Units
Averaging time for carcinogens	30	6	40	6	30	6	yr
Averaging time for noncarcinogens	30	6	40	6	30	6	yr
Consumption rate of BEEF	0	0	0.00122	0.00075	0	0	kg/kg-day FW
Body weight	70	13.3	70	15	70	13.3	Kg
Consumption rate of POULTRY	0	0	0.00066	0.00045	0	0	kg/kg-day FW
Consumption rate of ABOVEGROUND PRODUCE	0.00032	0.0000926	0.00047	0.00113	0.00032	0.0000926	kg/kg-day DW
Consumption rate of BELOWGROUND PRODUCE	0.00014	0.0000413	0.00017	0.00028	0.00014	0.0000413	kg/kg-day DW
Consumption rate of DRINKING WATER	0.0	0.0	0.0	0.0	0.0	0.0	L/day
Consumption rate of PROTECTED ABOVEGROUND PRODUCE0	0.00061	0.0	0.00064	0.00157	0.00061	0.0	kg/kg-day DW
Consumption rate of SOIL	0.0001	0.0001	0.0001	0.0002	0.0001	0.0001	kg/d
Exposure duration	30	6	40	6	30	6	yr
Exposure frequency	365	365	365	365	365	365	day/yr
Consumption rate of EGGS	0	0	0.00075	0.00054	0	0	kg/kg-day FW
Fraction of contaminated ABOVEGROUND PRODUCE	1	1	1	1	1	1	--
Fraction of contaminated DRINKING WATER	1	1	1	1	1	1	--
Fraction contaminated SOIL	1	1	1	1	1	1	--
Consumption rate of FISH	0	0	0	0	0.00125	0.00088	kg/kg-day FW
Fraction of contaminated FISH	1	1	1	1	1	1	--
Inhalation exposure duration	30	6	40	6	30	6	Yr
Inhalation exposure frequency	365	365	365	365	365	365	day/yr
Inhalation exposure	24	24	24	24	24	24	hr/day

	Resident Adult	Resident Child	Farmer Adult	Farmer Child	Fisher Adult	Fisher Child	Units
time							
Fraction of contaminated BEEF	1	1	1	1	1	1	--
Fraction of contaminated POULTRY	1	1	1	1	1	1	--
Fraction of contaminated EGGS	1	1	1	1	1	1	--
Fraction of contaminated MILK	1	1	1	1	1	1	--
Fraction of contaminated PORK	1	1	1	1	1	1	--
Inhalation rate	0.83	0.49	0.83	0.49	0.83	0.49	m^3/hr
Consumption rate of MILK	0	0	0.01367	0.02268	0	0	kg/kg-day FW
Consumption rate of PORK	0	0	0.00055	0.00042	0	0	kg/kg-day FW
Time period at the beginning of combustion	0	0	0	0	0	0	Yr
Length of exposure duration	30	6	40	6	30	6	Yr

Annex C

Fisheries Data

The following fisheries (located within a 10km radius of the site) were identified by the Environment Agency:

- Horsham Lake, Upchurch
- Mid Kent Fisheries – Three Lakes, Faversham
- Stones Fishing Lakes, Sheerness

Verbal communication with the above fisheries identified all as operating on a 'catch and release' basis only.

The following additional fisheries were identified from an internet based search and local knowledge:

- Bax Farm Fishers, Teynham
- Sittingbourne Lakes, Murston
- Millen Water Fishery, Iwade
- The School Pool, Faversham
- Bracher Pool, Faversham
- Bysing Wood Lake, Faversham

Verbal communication with all but Sittingbourne Lakes and Millen Water Fishery identified the fisheries as operating on a 'catch and release' basis only. No contact information was sourced for Sittingbourne Lakes however the lakes are reported as having being polluted through fly-tipping and other anti-social behaviour.

Verbal communication with Millen Water Fishery identified the fishery as having the potential for fish to be taken for consumption (mainly rainbow trout). The Fishery imposes a maximum limit of 2 fish per session and 4 per week for consumption. The water depth was estimated at 8-10'.

The Swale was identified as being used for recreational fishing as well as having a number of shellfisheries. Three shellfish waters were identified in the study area by the Environment Agency:

- No. 25 Swale Central
- No.26 Swale East

- No.27 Sheppey

The 2007/2008 Food Safety Enforcement Business Plan classified all beds on the Swale as class B under the Food Safety (Live Bivalve Molluscs and Other Shellfish) Regulations 1992 (i.e. molluscs that may be marketed for human consumption after purification).

Estimating Flow Rates and Velocities of Water Courses

A brief description of the method used to calculate the flow rate, velocity and depth for the tidal receptors listed below is provided in this section.

- The Swale,
- Long Reach and
- Milton Creek, is provided below:

Two channels per reach listed above were generated using LiDAR data. Interpolation was undertaken where some limited areas of missing data were present.

In order to represent a 'typical' tidal range tide level data for mean high water neaps (4.81m) and mean low water neaps (1.55m) were obtained for Sheerness from Proudman Oceanographic Laboratory at

http://www.pol.ac.uk/ntslf/hilo.php?port=sheerness

The 1D hydraulic flood modelling package HEC_RAS was used to derive the water body parameters. For the actual mean peak respective neap levels the velocity and flow are assumed to be effectively zero. In order to represent estuary conditions as the tide comes in a 50%conditrion scenario was modelled whereby the water level in each estuary is 50% of the respective neap levels. HEC-RAS was used to simulate the flow and velocity required to achieve each 50% condition based on a measured channel gradient.

		50% condition
Mean High Water Neaps (m AODN)	4.81	2.41
Mean Low Water Neaps (m AODN)	1.55	0.78

	MHWN	50% Condition	MLWN	50% Condition
The Swale	**4.81**	**2.41**	**1.55**	**0.78**
Average Water Column Depth (m)	5.09	2.67	2.055	1.16
Flow (m^3s^{-1})	0	4125	0	850
Velocity (m/s)	0	1.4	0	0.7
Milton Creek	**4.81**	**2.41**	**1.55**	**0.78**
Average Water Column Depth (m)	3.345	1.61	1.745	1.25
Flow (m^3s^{-1})	0	131	0	41
Velocity (m/s)	0	0.815	0	0.71
Long Reach	**4.81**	**2.41**	**1.55**	**0.78**
Average Water Column Depth (m)	5.07	2.845	2.3	2.38
Flow (m^3s^{-1})	0	775	0	348
Velocity (m/s)	0	0.655	0	0.58

For Millen Water Fishery the volumetric flow rate was calculated by multiplying the watershed area by one-half of the local average annual surface runoff.

Watershed Selection

The watersheds for the Swale, Milton Creek, Long Reach and Millen Water Fishery were taken primarily from the Flood Estimation Handbook (FEH) CD-ROM v2. This package gives the descriptors, including area, for UK watershed catchments of an area greater than $0.5km^2$. The reported watersheds for the larger catchments of the above rivers include only the watershed present within the defined boundary area of the study. Where smaller catchments are present within the study area which are under $0.5km^2$, and therefore not included in FEH, the boundary of the catchment was defined by the local topography as shown on Ordnance Survey maps.

The Impervious Water Shed Area

The impervious areas of the watersheds were derived through a combination of measurement and addition of a percentage impervious factor for the watershed. The urban areas within catchments were measured from Ordnance Survey data. An additional 1% of catchment area was added for impervious areas which lay outside the urban areas.

The Swale Modelling Results

Cancer Risk for Metals and BaP

		Receptor 2 fish eater	
COPC	HCV (mg/kg-day)	Exposure (mg/kg-day)	Total Cancer Risk *
Arsenic			(1.06E-07)
Ingestion	3.0E-04	2.06E-08	6.87E-05
Inhalation	2.0E-06	7.57E-09	3.79E-03
Chromium, hexavalent			(1.90E-06)
Ingestion	-	-	-
Inhalation	1.0E-06	1.90E-08	1.90E-02
Benzo(a)pyrene			(3.75E-07)
Ingestion	2.0E-05	3.69E-07	1.85E-02
Inhalation	7.0E-08	1.34E-09	1.91E-02

Non Cancer Risk for Metals

		Receptor 2 fish eater	
COPC	HCV (mg/kg-day)	Exposure (mg/kg-day)	Total Hazard Quotient **
Antimony			(2.01E-05)
Ingestion	4.0E-04	4.85E-10	1.21E-06
Inhalation	4.0E-04	7.57E-09	1.89E-05
Cadmium			(6.22E-03)
Ingestion	3.6E-04	2.74E-08	7.61E-05
Inhalation	1.14E-06	7.03E-09	6.17E-03
Chromium			(1.42E-07)
Ingestion	1.5	1.93E-07	1.29E-07
Inhalation	1.514	1.90E-08	1.25E-08
Chromium, hexavalent			(6.42E-05)
Ingestion	3.0E-03	1.93E-07	6.42E-05
Inhalation	-	-	-
Lead			(1.23E-03)
Ingestion	3.57E-03	1.39E-07	3.89E-05

		Receptor 2 fish eater	
COPC	HCV (mg/kg-day)	Exposure (mg/kg-day)	Total Hazard Quotient **
Inhalation	4.57E-05	5.45E-08	1.19E-03
Mercuric chloride			(1.08E-04)
Ingestion	2.0E-03	1.37E-07	6.85E-05
Inhalation	5.7E-05	2.24E-09	3.93E-05
Mercury			(1.64E-07)
Ingestion	-	-	-
Inhalation	5.7E-05	9.35E-12	1.64E-07
Methyl mercury			(8.15E-02)
Ingestion	2.3E-04	1.87E-05	8.15E-02
Inhalation	-	-	-
Nickel			(7.95E-03)
Ingestion	1.2E-02	1.02E-07	8.50E-06
Inhalation	4.9E-06	3.86E-08	7.88E-03
Thallium (I)			(5.48E-03)
Ingestion	8.0E-05	4.38E-07	5.48E-03
Inhalation	-	-	-

Non Cancer Risk for Dioxins & Furans & PCBs

		Receptor 2 fish eater	
COPC	HCV (mg/kg-day)	Exposure (mg/kg-day)	Total Hazard Quotient **
HeptaCDD, 1,2,3,4,6,7,8			(2.95E-05)
Ingestion	2.0E-07	5.55E-12	2.78E-05
Inhalation	1.3E-07	2.27E-13	1.75E-06
HeptaCDF, 1,2,3,4,6,7,8			(7.46E-06)
Ingestion	2.0E-07	1.40E-11	7.00E-05
Inhalation	1.3E-07	5.88E-13	4.52E-06
HeptaCDF, 1,2,3,4,7,8,9			(7.29E-06)
Ingestion	2.0E-07	1.37E-12	6.85E-06
Inhalation	1.3E-07	5.75E-14	4.42E-07
HexaCDD, 1,2,3,4,7,8			(1.41E-04)
Ingestion	2.0E-08	2.76E-12	1.38E-04
Inhalation	1.3E-08	3.87E-14	2.98E-06

		Receptor 2 fish eater	
COPC	**HCV (mg/kg-day)**	**Exposure (mg/kg-day)**	**Total Hazard Quotient ****
HexaCDD, 1,2,3,6,7,8			(1.17E-04)
Ingestion	2.0E-08	2.28E-12	1.14E-04
Inhalation	1.3E-08	3.47E-14	2.67E-06
HexaCDD, 1,2,3,7,8,9			(9.42E-05)
Ingestion	2.0E-08	1.84E-12	9.20E-05
Inhalation	1.3E-08	2.81E-14	2.16E-06
HexaCDF, 1,2,3,4,7,8			(8.95E-04)
Ingestion	2.0E-08	1.75E-11	8.75E-04
Inhalation	1.3E-08	2.94E-13	2.26E-05
HexaCDF, 1,2,3,6,7,8			(3.30E-04)
Ingestion	2.0E-08	6.44E-12	3.22E-04
Inhalation	1.3E-08	1.08E-13	8.31E-06
HexaCDF, 1,2,3,7,8,9			(1.71E-05)
Ingestion	2.0E-08	3.33E-13	1.67E-05
Inhalation	1.3E-08	5.61E-15	4.32E-07
HexaCDF, 2,3,4,6,7,8			(3.54E-04)
Ingestion	2.0E-08	6.91E-12	3.46E-04
Inhalation	1.3E-08	1.16E-13	8.92E-06
OctaCDD, 1,2,3,4,6,7,8,9			(1.55E-06)
Ingestion	6.67E-06	9.48E-12	1.42E-06
Inhalation	4.33E-06	5.34E-13	1.23E-07
OctaCDF, 1,2,3,4,6,7,8,9			(1.39E-06)
Ingestion	6.67E-06	8.55E-12	1.28E06
Inhalation	4.33E-06	4.81E-13	1.11E-07
PentaCDD, 1,2,3,7,8			(1.50E-03)
Ingestion	2.0E-09	2.94E-12	1.47E-03
Inhalation	1.3E-09	3.34E-14	2.57E-05
PentaCDF, 1,2,3,7,8			(5.61E-05)
Ingestion	6.67E-08	3.68E-12	5.52E-05
Inhalation	4.33E-08	3.74E-14	8.64E-07
PentaCDF, 2,3,4,7,8			(8.57E-04)
Ingestion	6.67E-09	5.60E-12	8.40E-04
Inhalation	4.33E-09	7.22E-14	1.67E-05
TetraCDD, 2,3,7,8			(1.97E-04)
Ingestion	2.0E-09	3.88E-13	1.94E-04
Inhalation	1.3E-09	4.14E-15	3.18E-06
TetraCDF, 2,3,7,8			(9.03E-05)

		Receptor 2 fish eater	
COPC	**HCV (mg/kg-day)**	**Exposure (mg/kg-day)**	**Total Hazard Quotient ****
Ingestion	2.0E-08	1.75E-12	8.75E-05
Inhalation	1.3E-08	3.61E-14	2.78E-06
PCBs			(2.15E-02)
Ingestion	6.67E-05	1.43E-06	2.14E-02
Inhalation	4.33E-05	1.11E-09	2.56E-05
Sum of Dioxins & Furans & Dioxin-like PCBs TEQ	2.0E-09	5.23E-11	2.62E-02

Appendix 8.1 – Planning Policy

South East Plan Regional Spatial Strategy for the South East of England, May 2009

POLICY CC6: SUSTAINABLE COMMUNITIES AND CHARACTER OF THE ENVIRONMENT

Actions and decisions associated with the development and use of land will actively promote the creation of sustainable and distinctive communities. This will be achieved by developing and implementing a local shared vision which:

i. respects, and where appropriate enhances, the character and distinctiveness of settlements and landscapes throughout the region

ii. uses innovative design processes to create a high quality built environment which promotes a sense of place. This will include consideration of accessibility, social inclusion, the need for environmentally sensitive development and crime reduction

POLICY CC8: GREEN INFRASTRUCTURE

Local authorities and partners will work together to plan, provide and manage connected and substantial networks of accessible multi-functional green space. Networks should be planned to include both existing and new green infrastructure. They need to be planned and managed to deliver the widest range of linked environmental and social benefits including conserving and enhancing biodiversity as well as landscape, recreation, water management, social and cultural benefits to underpin individual and community health and 'well being'. They will be created and managed as a framework of green spaces and other natural features that will boost the sustainable development of settlements and increase the environmental capacity of the locality and region as a whole, helping communities to be more resilient to the effects of climate change.

The provisions of this policy apply region-wide. However, the successful designation and management of green infrastructure will be particularly important in areas designated as regional hubs, where growth may impact on sites of international nature conservation importance(14)or where there is a need to enhance the existing environmental capacity of an area.

POLICY NRM8: COASTAL MANAGEMENT

An integrated approach to the management and planning in coastal areas will be pursued.

Appropriate social, economic and environmental objectives should be taken into account in relevant plans. The dynamic nature and character of the coast should be managed through enhanced collaboration between organisations and across administrative boundaries. In the development and implementation of local development documents and other strategies, local authorities and other agencies should:

i. plan for climate change and forecast effects on the coastal zone

ii. promote and establish cross-border and cross-sectoral arrangements to facilitate an integrated approach to coastal management. This will include the conservation and enhancement of the most valuable habitats and environments (natural and built), the development and management of public access, recreation and tourism potential, and identification and management of development and commercial opportunities.

    This will be within the context of flood risk management and coastal protection measures contained in Catchment Management Plans, Shoreline Management Plans, Coastal Defence Strategies, Catchment Flood Management Plans, Estuary Management Plans, Harbour Management Plans and River Basin Management Plans

iii. identify opportunities for, and ensure that development does not prejudice options for managed realignment, significantly affect sediment inputs and transport, lead to an increase in flood risk or preclude the delivery of sustainable flood risk management solutions in the future

iv. avoid built development on the undeveloped coastline unless it specifically requires a rural coastal location, meets the sequential test set out in Planning Policy Statement 25: *Development and Flood Risk* and does not adversely affect environmental, cultural and recreational resources. In particular, development must not compromise the ability to preserve the interest features of Natura 2000 sites through managed retreat of coastal habitats in response to sea level rise

v. prevent development on unstable land or areas at risk of erosion, as identified in Shoreline Management Plans

vi. realise opportunities for sustainable coastal defences which enhance the region's wildlife, and fisheries, especially where this will contribute to the achievement of regional and national biodiversity targets and help meet the requirement of the Habitats Directive

vii. consider whether permission for development should be time-limited to ensure the minimisation of risk to life and property in the long term but allow economic and social benefits to be gained in the short term.

POLICY C3: AREAS OF OUTSTANDING NATURAL BEAUTY

High priority will be given to conservation and enhancement of natural beauty in the region's Areas of Outstanding Natural Beauty (AONBs) and planning decisions should have regard to their setting. Proposals for development should be considered in that context. Positive land management policies should be developed to sustain the areas' landscape quality. In drafting local development documents, local planning authorities should have regard to statutory AONB Management Plans.

In considering proposals for development, the emphasis should be on small-scale proposals that are sustainably located and designed. Proposals which support the economies and social well being of the AONBs and their communities, including affordable housing schemes, will be encouraged provided that they do not conflict with the aim of conserving and enhancing natural beauty.

POLICY C4: LANDSCAPE AND COUNTRYSIDE MANAGEMENT

Outside nationally designated landscapes, positive and high quality management of the region's open countryside will be encouraged and supported by local authorities and other organisations, agencies, land managers, the private sector and local communities, through a combination of planning policies, grant aid and other measures.

In particular, planning authorities and other agencies in their plans and programmes should recognise, and aim to protect and enhance, the diversity and local distinctiveness of the region's landscape, informed by landscape character assessment.

Positive land management is particularly needed around the edge of London and in other areas subject to most growth and change. In such areas long-term goals for landscape conservation and renewal and habitat improvement should be set, and full advantage taken of agri-environmental funding and other management tools.

Local authorities should develop criteria-based policies to ensure that all development respects and enhances local landscape character, securing appropriate mitigation where damage to local landscape character cannot be avoided.

POLICY C5: MANAGING THE RURAL-URBAN FRINGE

Local development documents should:

i. identify issues and opportunities that require action to deliver a sustainable multi-functional rural-urban fringe, using the key functions set out in Box BE1 (see Chapter 12) as a checklist

ii. plan positively for facilities connected with the sustainable management of urban areas

iii. identify any parts of the rural-urban fringe around settlements that are currently or potentially subject to dereliction.

To ensure action will be taken local authorities should:

i. ensure better management of the rural-urban fringe, including where applicable Green Belt, by working with neighbouring planning authorities and partners in developing and implementing strategies and action plans for rural-urban fringe areas

ii. target positive management on areas where urban extensions are planned including engaging local communities and landowners to ensure early consideration is given to landscape and biodiversity enhancement, woodland management, recreation provision and access routes.

POLICY C6: COUNTRYSIDE ACCESS AND RIGHTS OF WAY MANAGEMENT

Through Rights of Way Improvement Plans and other measures, local authorities should encourage access to the countryside, taking full advantage of the Countryside and Rights of Way Act 2000, particularly by:

i. maintaining, enhancing and promoting the Public Rights of Way system, and permissive and longer distance routes, to facilitate access within, to and from the countryside for visitors and all members of the local community

ii. identifying opportunities and planning for routes within and between settlements, seeking to reduce car use for shorter journeys

iii. where possible, making new routes multi-functional to allow for benefits for multiple users and contribute to the wider objectives of green infrastructure

iv. on Natura 2000 and Ramsar wetland sites with an identified risk of adverse impact from recreational use or other urbanisation impact (including air pollution), promote appropriate access and other management measures (both pedestrian and vehicle), to avoid such risks.

POLICY C7: THE RIVER THAMES CORRIDOR

Riparian local authorities should work together, and with other stakeholders, to establish a coordinated policy framework for the river and its valley corridor through their local development frameworks to reflect their environmental, heritage and recreational value through both rural and urban areas, Taking account of the Thames River Basin Management Plan, local authorities should work together with other agencies to:

i. maintain and enhance the landscapes and waterscapes of the River Thames Corridor, in terms of their scenic and conservation value and their overall amenity

ii. conserve and enhance the nature conservation resources of the River Thames Corridor through the protection and management of its diverse plant and animal species, habitats (including wildlife networks) and geological features

iii. provide accessible facilities and opportunities for countryside and river-related recreation

iv. take account of the setting of the river in exercising their normal development control duties. Where the river passes through urban areas, local authorities should, working together where necessary:

i. make provision for riverside open spaces and access routes

ii. protect and improve scenic views of the river and from the river, especially where they contain significant natural or built heritage features

iii. ensure a high quality of sympathetic design of new developments within sight of the river

iv. seek the conservation and improvement of the historic built environment that is part of the river's heritage and setting.

Local authorities should:

i. ensure that new development does not restrict or endanger navigation on the river

ii. seek to secure the protection and improvement of existing river-related infrastructure that is necessary for the sustainable development and use of the river

iii. guard land for river-related businesses that support sport and leisure use of the river

iv. encourage the sustainable use of the river.

BE1: MANAGEMENT FOR AN URBAN RENAISSANCE

Research has identified five pillars of urban renaissance, all of which should reinforce each other within the overall objective of raising quality of life.(1) Each applies equally to settlements of all sizes, from small market towns to suburban neighbourhoods and large cities. These principles should be reflected in local management of urban renaissance initiatives. They are:
Good Governance – Bringing together the local community, their elected representatives, businesses and developers to deliver an agreed vision for an area. This vision should be established through community strategies and delivered through the local development framework.

Good governance requires co-ordinating agencies and investment to work towards common goals. This includes co-ordinating the timely delivery of key infrastructure and services to support new development, such as health care, education, public open space, community safety, public transport and affordable housing. It also means pooling and developing design, delivery and management skills and sharing good practice wherever possible. A current good practice example of a local authority working with local people and businesses to deliver an agreed vision is Bracknell Forest Council's work with its Regeneration Partnership to redevelop the town centre.

Achieving Design Excellence – Pursuing creative solutions to respect the character and charm of our unique and historic settlements, and by working to improve the existing urban fabric. This means a design-led approach to new development so that it complements and supports the area around it, and results in varied, attractive, safe and accessible towns, suburbs and villages where people and businesses want to be. The revitalisation of the historic dockyards at Chatham and Portsmouth are just two current examples of this in action within the region.

Promoting Economic Strength - Attracting investment, through improvements to the appeal and accessibility of the built environment. Initiatives can include developing attractions and amenities in town centres, refurbishing and redeveloping existing buildings and land, supporting the evening economy, encouraging public/private partnership and supporting job creation. A current good example of new development bringing economic and other benefits to an area through a partnership of private and public bodies is the development of the Oracle Centre in Reading, which has provided a mix of uses on a derelict site in the town centre.

Environmental Responsibility - Appreciating the contribution which high quality public realm, private gardens, open spaces, streets, squares and green corridors can make to urban areas, reducing land take, managing traffic in a way that puts people before cars and creating and protecting safe, tranquil and accessible streets and open space. Environmental responsibility also results in new buildings which meet high environmental standards and initiatives to plan for the efficient use of energy – for example, Woking Borough Council's recent initiatives to install green energy systems and combined heat and power plant in the town.

Social Well-being and Inclusion - Developing spaces to meet the needs and aspirations of everyone, particularly in the parts of the region suffering from decline. This requires steps to ensure that communities engage with, influence and manage the delivery of local services and green infrastructure in a way that widens opportunities for all, and concerted effort to plan for a mix of housing types and tenures and tackle problems of existing unfit housing stock. Promoting inclusion and well being into the design of services and infrastructure in new development considers the need to help reduce crime and encourage healthy living. A current example of an area working successfully to change its role and image is Brighton, which has prevented the threat of decline by improvements to its environment and the careful planning of complementary new development, attracting people, business and visitors.

1 *Living Places: Urban Renaissance in the South East*, URBED for Government Office for the South East, 2000

Kent Thames Gateway Sub-regional Strategy Area

Policy KTG 10: Green Initiatives

In order to take forward "Greening the Gateway" in North Kent through the concept of "functional green and blue space":

The development management and use of the countryside, urban green spaces and areas requiring flood management should be co-ordinated by the responsible organisations. Provision should be made for green-grid networks, recreation and public access, and enhancement of landscapes, habitats and the environment.

Countryside initiatives should compliment the areas of growth, and recognise that it is a predominantly working landscape. They should define the important points of separation between settlements and the green edges to be actively managed, and identify the connections between the urban "green grid" and the rural area.

Development should be of the highest standards of design, and adopt best practice in the use of sustainable techniques.

Swale Borough Local Plan, February 2008

Policy SP1

Sustainable Development

In meeting the development needs of the Borough, proposals should accord with principles of sustainable development that increase local self-sufficiency, satisfy human needs, and provide a robust, adaptable and enhanced environment. Development proposals should:

1. avoid detrimental impact on the long term welfare of areas of environmental importance, minimise their impact generally upon the environment, including those factors contributing to global climate change, and seek out opportunities to enhance environmental quality;

2. promote the more efficient use of previously-developed land, the existing building stock, and other land within urban areas for urban and rural regeneration, including housing, mixed-uses and community needs;

3. ensure that proper and timely provision is made for physical, social and community infrastructure;

4. provide a range and mix of housing types, including affordable housing;

5. provide for sustainable economic growth to support efficient, competitive, diverse and innovative business, commercial and industrial sectors;

6. support existing and provide new or diversified local services;

7. promote ways to reduce energy and water use and increase use of renewable resources, including locally sourced and sustainable building materials;

8. be located so as to provide the opportunity to live, work and use local services and facilities in such a way that can reduce the need to travel, particularly by car;

9. be located to promote the provision of transport choices other than the car;

10. be of a high quality design that respects local distinctiveness and promotes healthy and safe environments; and

11. promote human health and well-being.

POLICY SP2

Environment

In order to provide a robust, adaptable and enhanced environment, planning policies and development proposals will protect and enhance the special features of the visual, aural, ecological, historical, atmospheric and hydrological environments of the Borough and promote good design in its widest sense. Development will avoid adverse environmental impact, but where there remains an incompatibility between development and environmental protection, and development needs are judged to be the greater, the Council will require adverse impacts to be minimized and mitigated. Where a planning decision would result in significant harm to biodiversity interests, which cannot be prevented or adequately mitigated against, appropriate compensation measures will be sought.

POLICY TG1

Thames Gateway Planning Area

Within the Thames Gateway Planning Area, scales of development are set commensurate with its strategic contribution to meeting the environmental, employment, and housing objectives within the Gateway area as a whole. Development will be supported by the timely provision of adequate community and transport infrastructure. Land that is of importance to agriculture, landscape, biodiversity or settlement separation, will be protected from unnecessary development. Within this planning area, within the identified Area Action Plans and elsewhere, the following planning priorities will be pursued:

1. to secure the implementation of already identified major employment sites at Queenborough and in north and north east Sittingbourne;

2. to diversify the quality of local employment, with mixed-use developments within the existing urban areas and identifying the Kent Science Park as a focus for technology based businesses, in particular life sciences;

3. to raise the standard of the environment through high quality design, the better management of environmental resources and the creation of a network of accessible open spaces (a green-grid);

4. the use of previously-developed and other land within the existing urban areas for new housing and, where appropriate, mixed-uses. On Sheppey, all new housing sites will be provided on such land during the Local Plan period;

5. to limit greenfield land releases for housing to existing committed sites around Sittingbourne and Minster, and to new sites at Iwade, so as to make more efficient use of land to maximise community gain and provide sustainable patterns of development, and, where appropriate, to phase such additional housing to ensure their timely release;

6. to provide essential new transport infrastructure necessary to assist economic development, urban regeneration and address town centre congestion, in particular by the completion of the Sittingbourne Northern Relief Road and the Rushenden Link Road;

7. the consolidation of Sittingbourne as the main centre for employment, shopping and services, whilst ensuring that Sheerness and local centres continue to be able to provide for local needs;

8. the provision of sites for further secondary and Further Education provision at Sittingbourne and a Family Centre at Sheerness;

9. to increase local self-sufficiency in the rural communities by protecting and permitting services and facilities, and by initiatives to diversify the rural economy; and

10. to effectively manage the risk of flooding.

POLICY E1

General Development Criteria

The Borough Council expects all development proposals to:

1. accord with the policies and proposals of the Plan unless material considerations indicate otherwise;

2. include information sufficient to enable the Council to determine the application;

3. respond positively by reflecting the positive characteristics and features of the site and locality;

4. accord with adopted Supplementary Planning Documents;

5. protect and enhance the natural and built environments;

6. be both well sited and of a scale, design and appearance, that is appropriate to the location with a high standard of landscaping;

7. meet the highest standards of accessibility and inclusion so that all potential users, regardless of disability, age or gender can use them safely and easily;

8. cause no demonstrable harm to residential amenity and other sensitive uses or areas;

9. provide safe vehicular access, convenient routes and facilities for pedestrians and cyclists and, where appropriate, enhanced public transport facilities and services;

10. integrate security and safety measures within their design and layout; and

11. provide parking and servicing facilities in accordance with the County Council's standards.

POLICY E6

The Countryside

The quality, character and amenity value of the wider countryside of the Borough, which is all the land falling outside the built-up area boundaries as defined on the Proposals Map Insets, will be protected and where possible enhanced. Development proposals will only be permitted when:

1. it is demonstrated to be necessary for agriculture, sustainable forestry or the winning of minerals; or

2. it is the re-use or adaptation of an existing rural building, in accordance with Policy RC1 & Policy RC6; or

3. it provides a service that enables existing rural communities to meet their essential needs locally, in accordance with Policy RC2; or

4. it relates to the acceptable rebuilding, or modest extension, of a dwelling currently in residential use in accordance with Policy RC4; or

5. it relates to a site for affordable housing in accordance with Policy RC3; or

6. it relates to a site for gypsies or travelling showpersons in accordance with Policy H4; or

7. it relates to a change of use to garden land in accordance with Policy RC10; or

8. it provides for necessary community infrastructure; or

9. it is a site allocated in the Local Plan.

POLICY E9

Protecting the Quality and Character of the Borough's Landscape

The quality, character and amenity value of the wider landscape of the Borough will be protected and, where possible, enhanced. Within the designated areas shown on the Proposals Map, priority will be given to their protection as follows:

1. in the Kent Downs Area of Outstanding Natural Beauty (AONB), the priority is the long-term conservation and enhancement of natural beauty (including landscape, wildlife, and geological features) of this national asset over other planning considerations. Suitably located and designed development necessary to facilitate the economic and social well-being of the area and its communities, will be permitted, whilst major developments will not be permitted unless there is a proven national interest and no suitable alternative sites;

2. in the North Downs, Blean Woods and North Kent Marshes Special Landscape Areas (SLAs), the priority is the long-term protection and enhancement of the quality of the landscape of these county assets, whilst having regard to the economic and social well being of their communities; and

3. in the Areas of High Landscape Value (AHLV), the priority is the protection and enhancement of the integrity, character and local distinctiveness of these Borough assets, whilst considering the needs of local communities.

Within the countryside and rural settlements, the Borough Council will expect development proposals to:

a. be informed by and sympathetic to local landscape character and quality;

b. consider the guidelines contained in the Council’s Landscape Character Assessment and Guidelines Supplementary Planning Document, so as to contribute to the restoration, creation, reinforcement and conservation, as appropriate, of the landscape likely to be affected;

c. safeguard or enhance landscape elements that contribute to the distinctiveness of the locality or the Borough;

d. remove features which detract from the character of the landscape; and

e. minimise the adverse impacts of development upon landscape character.

POLICY E13

The Coastal Zone and Undeveloped Coast

1 Development proposals will only be permitted within those developed areas of the coast falling within the defined built-up areas, as shown on the Proposals Map, or in areas where the enhancement of derelict or despoiled land at the coast would result. Where the Borough Council is satisfied that development would require a location outside the built-up area within the Coastal Zone, as shown on the Proposals Map, proposals will protect, conserve and, where appropriate, enhance the landscape, environmental quality, biodiversity and recreational opportunities of the coast, whilst respecting those natural processes such as flooding, erosion and sea level rise that influence the Zone.

2 At or adjacent to the undeveloped coast, subject to 1. above, development proposals will not be permitted that would have a significant adverse impact on the unspoilt scenic quality, scientific value or biodiversity value of the location.

POLICY E17

Historic Parks and Gardens

The Borough Council will seek to protect registered Historic Parks and Gardens, as shown on the Proposals Map, or which are registered during the Plan period. Development that would adversely affect the landscape character, layout and features of a Historic Park and Garden, or its setting, will not be permitted.

POLICY E19

Achieving High Quality Design and Distinctiveness

The Borough Council expects development to be of high quality design. Development proposals should respond positively to the following:

1 creating safe, accessible, comfortable, varied and attractive places;

2 enriching the qualities of the existing environment by promoting and reinforcing local distinctiveness and strengthening the sense of place;

3 making safe connections physically and visually both to and within developments, particularly through use of landscape design, open space to retain and create green corridors for pedestrians, cyclists, and plants and animals;

4 making efficient and prudent use of natural resources, including sensitively utilising landscape, landform, biodiversity and climate to maximise energy conservation and amenity;

5 providing native (regional or local) plant species for soft landscaping and hard landscaping, surface and boundary treatments that respond positively to the character of the locality.

6 providing features and management intended to encourage biodiversity;

7 providing a mix of uses through building form, use, tenure and densities;

8 providing development that is appropriate to its context in respect of scale, height and massing, both in relation to its surroundings, and its individual details;

9 making best use of texture, colour, pattern and durability of materials;

10 ensuring the long-term maintenance and management of buildings, spaces, features and social infrastructure;

11 achieving flexibility to respond to future changes in use, lifestyle and demography; and

12 maximising opportunities for including sustainable design and construction techniques including the use of recyclable materials and sustainable drainage systems, and minimising waste.

POLICY E21

Sustainable Design & Build

The use of innovative and high quality low-impact design and build techniques will be supported on sites considered acceptable by this Local Plan. To encourage resource conservation, the Borough Council will expect development proposals to incorporate sustainable design and build measures into the detailed design of new development in its use of siting, design, materials, and landscaping. For development proposals, the Council will advocate the meeting of the Building Research Establishment Environmental Assessment Method standard of ‘good’ as a minimum.

POLICY AAP8

Land around Milton Creek

An Area Action Plan is designated on land around Milton Creek, as shown on the Proposals Map. The land within the Area Action Plan is allocated for a mixed-use development comprising at least 1,000 new homes, retail and leisure development of a scale and form necessary to deliver step-change to Sittingbourne, including associated community facilities, public open space, and environmental enhancements and new business/office opportunities of an appropriate scale and form.

Development will take place in accordance with an overall Master Plan for the AAP, to be prepared by the Borough Council in consultation with developers/landowners. The Master Plan will also include the whole area covered by Policy B27. The Master Plan will ensure a co-ordinated approach to development that will regenerate this part of the urban environment to complement, and link with, the rest of the town centre, including by the provision of enhanced pedestrian and cycle links.

The Borough Council will require development to be of the highest standard of design. Where possible, it should reflect, and take advantage of, the area’s creekside location, and address: the risk of flooding; the need to protect and enhance existing important areas of the natural and built environment; and further the objectives of increasing biodiversity and green space within the area.

To ensure a balanced community with access to jobs, facilities and an adequate transport network, new development will be phased alongside provision of the Sittingbourne Northern Relief Road and other infrastructure, community facilities and the provision of new employment opportunities both on-site and elsewhere.

KEMSLEY PAPER MILL

Lighting Assessment Report

RPS Gregory

CONTENTS

1.0 Introduction

Kemsley Paper mill is located to the north of the village of Kemsley, 3km from Sittingbourne.

St Regis Paper Company are proposing a number of changes and developments at the mill and have commissioned this lighting study to record the extent of the existing external lighting and it's effects on the local community and environment so that it can be used as a base line for any future changes to be assessed against.

The land around the mill is flat, with the Swale Estuary and marshy areas of ecological importance to the east and areas of scrub to the west. There are few prominent natural features in the area, although the Swale Estuary to the east is a designated Special Landscape Area.

The area is dominated by a number of other large industrial facilities. There are extensive depots and docks to the north and a recently built distribution depot to the north-west. In addition a large amount of land in the area has outline planning permission for additional employment development. The nearest housing to the site is Kemsley village, to the south-west. The area immediately around the majority of the site has a predominantly industrial character which will increase as further development occurs in the vicinity of the site.

One of the future developments being considered is the construction of an effluent treatment plant to replace the aerobic system used at present. This would be on a site 750 metres to the north-east of the main paper mill and immediately to the west of an existing aerobic treatment facility. To the north lie three lagoons, two of which are fitted with aeration towers, but only one lagoon is fit for purpose and currently used. The Swale Estuary runs to the east of the site, across which are flat marshy areas of the Isle of Sheppey. To the south lie the Kemsley mill and an area of open land close to the existing aerobic facility where there are also proposals for a Sustainable Energy Plant.

General

The UK has long been proud of having well-lit roads and public areas. Lighting helps to promote security, reduce road accidents permit outdoor activities to be undertaken at night and enhance the environment. There is no doubt that exterior lighting brings many benefits and considerable personal convenience to those living and working in the countryside today.

However, in recent years there has been growing recognition that excessive, poorly designed and badly aimed lighting may have adverse effects. Excessive lighting shuts out the splendour of the night sky, and Glare from excessively bright or poorly aimed lights can cause glare destroy privacy and blur the distinction between urban and rural areas.

Wildlife also suffers by light pollution although their reactions may differ. The ecological effects of artificial lighting are still poorly understood so it’s very important for the lighting within sensitive areas to adopt a precautionary approach to see a mitigation of potential lighting impacts, especially close to sites of high conservation value or to known populations of rare species.

Actually assessing the impact lighting has on bird life is difficult since we are unsure as to what their adaptive process is, what we do know is that birds have a similar visual illuminance range to that of humans i.e. they can carry out visual tasks between 0.5 lux and 60,000 lux. We also know that they react to dynamic level changes seeing it as a threat. That said they are also very quick to ascertain the level of threat in a situation and quickly acclimatise to the prevailing conditions. That is why we can see large population of birds flying around built up areas and living in city centres. Another example of their resilience can be seen at airports where audible systems are used to scare the birds away from the runway but the birds can quickly realise the extent of the risk and may be seen a short time later actually sitting on the system speakers. So increased levels of illumination providing it is designed and installed in a sensitive way should not necessarily cause harm to the bird population at large.

2.0 Terms and Definitions used within the report

For the purposes of this assessment, the following terms and definitions will be used.

Glare is an interference with visual perception caused by an uncomfortably bright light source or reflection; i.e. like a form of visual noise.

In its simplest form, glare is a consequence of the normally helpful capability of the human eye to *adapt* to different light levels. In the case of glare, the eye adapts to the high level of the glare source, which makes it hard to perceive details in the now "too dark" work area.

Direct Glare is glare resulting from high luminance (bright) sources in the visual environment that are directly visible from a viewer's position. Examples can be a sunlit surface inside or outside a building, or an insufficiently shielded luminaire.

Reflected Glare or Veiling Reflection is a reflection of incident light that partially or totally obscures the details to be seen on a surface by reducing the contrast.

Discomfort Glare is glare which is distracting or uncomfortable, which interferes with the perception of visual information required to satisfy biological needs, but which does not significantly reduce the ability to see information needed for activities.

Disability Glare is glare which reduces the ability to perceive the visual information needed for a particular activity.

Illuminance is the amount of light actually falling on a surface and is measured in lumens per square metre or lux, 1 lumen per square metre= 1 lux.

Light is energy in the form of radiation that forms part of the electromagnetic spectrum visible to the eye.

Lumens (lm) is the measurement value used to quantify the amount of radiation being emitted towards a surface

Luminance is commonly but wrongly described as brightness it is the light that is reflected from a surface and is measured in candelas per square metre (cd/m^2)

3.0 Survey and assessment

A lighting survey and assessment was carried out on 13th and 14th October 2009 between the hours of 19.00 and 22.00 to determine the existing light levels from a number of observation points at or close to the site boundary lines and at selected vantage points in the surrounding area.

In order to collect the data the following laboratory calibrated light meter was used to record lux levels.

Chauvin Arnoux CA 813 digital lightmeter. Calibrated on 27/03/09 (Certificate of Calibration attached)

Additionally, a photographic record was taken both during the evening surveys and daytime, to illustrate this report.

13th October

During the first evening, horizontal illumination levels were recorded at 1 metre above floor level at various locations. The sun had set and there was no recordable sky luminance by the time of commencement of the survey. The luminance readings were taken as follows:

1) Along the perimeter of Ridham Road from the security gate towards the vehicle wash.

2) In the vicinity of the high lighting masts used to illuminate the trailer parking area.

3) At the perimeters of the waste stacking area, close to the thermal and security camera towers.

4) Along the perimeter of East Road.

5) Along the track leading to the Sewage Plant.

6) Close to the effluent pumphouse.

7) Along the road to the south of the Stock Preparation Plant.

8) In the south-west corner of the car park.

9) To the west of the RCF Waste Paper Plant and Warehouse.

A photographic record of the site was taken from locations along Swale Way and Barge Way.

14th October

During daylight hours a photographic record was taken around the site together with views of the site from the following locations:

1) Church Marshes Country Park.

2) Between Little Murston Nature Reserve and Tonge Corner.

3) Road leading to Ridham Dock.

During the second evening the site was viewed from the various locations above and a photographic record was made.

Luminance readings were taken together with a photographic record around the existing secondary treatment plant. Once again, the sun had set and there was no recordable sky luminance by the time of taking the readings.

4.0 Lighting Levels

The lighting levels recorded during the night time surveys are recorded in the following table. The locations are annotated on the site plan contained in Appendix 1.

Reading No.	Location	Luminance (Lux)
1	Ridham Road, between security gate and vehicle parking area	0.4
2	Ridham Road, opposite vehicle parking area	2.5
3	Ridham Road, below street lighting column	24
4	Ridham Road, near vehicle wash	15
5	Corner of road to south-east of vehicle wash	1
6	Vehicle Parking, below lighting towers	30
7	Vehicle Parking, below lighting towers	24
8	Waste Stacking Area, below lighting tower	43
9	Waste Stacking Area, behind lighting tower close to bushes	0.7
10	Waste Stacking Area, below lighting tower by Distributor Road	60
11	Waste Stacking Area, beyond lighting tower on edge of Distributor Road	48
12	Distributor Road lighting, away from effects of Waste Stacking Area lighting towers	14
13	East Road, at side of Warehouse	0.06
14	East Road, at side of Warehouse adjacent lighting column	47
15	East Road, at side of CHP plant	1.25
16	On track between Effluent Treatment Plant and Sewage Plant	1.35
17	At perimeter fence beyond Effluent Treatment Plant	1.1
18	By road to south-east of Stock Preparation Plant	15.7
19	By road to south of Stock Preparation Plant	6.5
20	By road to south-west of Stock Preparation Plant	6.8
21	Behind recycling area	0.3
22	South-west corner of car park	1.35
23	South-west corner of RCF Waste Paper Plant	1.5
24	North-west corner of RCF Waste Paper Plant	0.06
25	West side of Warehouse	0.2
26	West of Secondary Effluent Plant	0.3

27	South of Secondary Effluent Plant	0.12
28	Vertical reading at 1M above ground along south-east of Secondary Effluent Treatment Plant	1.3
29	North-east of Secondary Effluent Plant	0.3

5.0 Photographs

The photographs taken on and around the site and reproduced in this report are listed in the table below. The locations from where the photographs were taken are annotated on the site plane drawing and map contained in Appendices 2 and 3.

Photograph No.	Description	Time	Direction
1	View on site towards buildings indicating mixture of lighting types	Night	South
2	Towards Waste Stacking Area showing lighting towers	Night	West
3	Edge of vehicle parking area	Night	North
4	Secondary Treatment Plant viewed from main site	Night	North-east
5	Towards CHP Plant	Night	West
6	Along East Road with buildings to left	Night	North
7	Site buildings	Night	North-west
8	View of site from south-west corner of car park	Night	North-east
9	Towards warehouse	Night	North-east
10	View of site from Barge Way	Night	South-east
11	View of site from Barge Way	Night	East
12	View of site from Barge Way	Night	North-east
13	View of site (Zoom)	Night	East
14	View of site (Wide-angle)	Night	East
15	Morrisons distribution centre	Night	North-west
16	View of whole site from edge of Church Marshes Country Park	Day	North
17	View of whole site from edge of Little Murson Nature Reserve	Day	North-west
18	View of whole site from approach road to Ridham dock	Day	South
19	View of main site from Secondary Treatment Plant	Day	South-west
20	Along perimeter line of Ridham Road	Day	North
21	Along perimeter line of Ridham Road	Day	South
22	West side boundary of Waste Stacking Area	Day	North
23	West side boundary of RCF Waste Paper Plant	Day	North

24	View of site from Barge Way	Day	North-east
Photograph No.	Description	Time	Direction
25	View of site from Barge Way	Day	South-east
26	View of site from Barge Way	Day	East
27	View of site from Barge Way	Day	North-east
28	Perimeter of site along northern distributor road	Day	West
29	Morrisons distribution centre	Day	North-west
30	Towards Waste Stacking Area from northern distributor road	Day	South-east
31	View of whole site from edge of Little Murson Nature Reserve	Night	North-west
32	View of whole site from edge of Church Marshes Country Park	Night	North
33	View of main site from Secondary Treatment Plant	Night	South-west
34	View of Waste Stacking Area from Secondary Treatment Plant	Night	West
35	Along the perimeter of the Secondary Treatment Plant	Night	North-West
36	View of whole site and Morrisons distribution centre (to right) from approach road to Ridham dock	Night	South

6.0 Commentary/analysis of readings

The mill site has grown and been adapted over the course of a number of years and the external lighting reflects this. There are a number of different types and styles of luminaires including high towers with clusters of discharge flood and area luminaires, single luminaire columns, street lighting columns, building mounted flood and amenity lighting.

Light level readings 1-7 & 28

Lighting levels as high as 30 lux were recorded in the vehicle parking area (reading nos. 6 & 7) and 24 lux immediately adjacent the street lighting columns (reading no. 3), however due to the photometric parameters of the luminaires, the levels fall significantly to no more than 2.5 lux at the perimeter of Ridham Road (reading nos. 1, 2 & 5).

Photograph nos. 20 and 21 show that beyond the perimeter line of Ridham Road there are a line of bushes and trees which offer screening so that none of the light reaching the perimeter of Ridham Road will spill onto the ground. However, there was some light spill from the high lighting towers evident on bushes surrounding the effluent treatment plant, recorded at 1.3 lux (reading no 28). To get this into perspective, this is no more than would have been recorded if there had been a visible moon at the time of survey and horizontally, the reading was only 0.12 lux (reading no. 27).

Light level readings 8-12

The waste stacking area is illuminated by tower mounted discharge flood lights to a maximum level of 43 lux (reading no. 8 & 10). To the west side of the area there is a line of bushes and trees which offer screening at low level. Close to the bushes the lighting level drops significantly to around 0.7 lux (reading no. 9).

To the north of the waste stacking area at the perimeter of the site and the distributor road, a level of 48 lux was recorded (reading no. 11), some of this is as a result of the street lighting columns along the roadside. To try to determine what the level of contribution from the street lighting was, a reading was taken further along the distributor road and at a similar distance between adjacent columns. This reading was 14 lux (reading no. 12). It was not possible to take readings beyond the distributor road, but there was little noticeable light beyond that normally associated with street lighting, therefore, any light spill from the site was considered insignificant or non-existent.

Light level readings 13-15

On East Road, at the east side of the warehouse there is some lighting attached to the side of the building illuminating the immediate vicinity and street lighting columns along the perimeter of the roadway. Some of the lighting columns were not operation at the time of the survey. Immediately adjacent to a lit column a lighting level of 47 lux was recorded (reading no. 14), however, between columns and away from the light sources the levels dropped to 0.06, 1.25 and 1.35 (reading nos. 13 & 15). It was evident that beyond the immediate areas served by these luminaires, the lighting levels dropped significantly with no noticeable light at the site perimeter (see photograph no. 6).

Light level readings 16-17

There are a few clusters of buildings or plant located away from the main site development which are lit by a mixture of luminaires which tend to provide well controlled lighting in their immediate vicinity. At the site perimeters close to two of these clusters, readings of 1.35 and 1.1 lux were recorded.

Light level readings 18-21

To the south of the main site, the perimeter road and walkway runs alongside the perimeter fence. Readings taken alongside the fencing ranged from 6.5 to 15.7 lux (reading nos. 18, 19 & 20). Beyond the fence line is a row of tress and bushes which acts s a screen so that little if any light from the site spills to the ground beyond.

Light level reading 22

The south-west corner the main car park is at the site boundary where a reading of 1.35 lux was recorded. Beyond the fence line is a mound or bund which is approximated 3m high. This will prevent any light spill beyond.

Light level readings 23-25

To the west of the site, just to the north of the main entrance, there is a vehicle parking area which is lit by discharge flood lights mounted on columns. Behind the column line close to the west perimeter, a reading of 1.35 lux was recorded. It can be seen from photograph no. 24 that the majority of this elevation is screened by high poplar type trees which offer an excellent screen of the buildings and external lighting as well as stopping any spill light at ground level. This tree line can seen to the right hand side of photograph no. 25.

Light level readings 26-27 & 29

The secondary effluent treatment plant is remote from the main site. It is illuminated by flood and street light style luminaires mounted on low columns. Readings were taken at three points just beyond the perimeter fence, the highest of these being 0.3 lux (reading nos. 26, 27 & 29).

7.0 Commentary/analysis of photographs

The mill is located in an area in which there are other industrial developments which are illuminated in a similar manner. When the mill site is viewed from the surrounding roads and vantage points, there is direct glare from some of the site lighting, the intensity of which is dependent upon the type of light source, its location and the effects of the surrounding masking vegetation and landscape. When viewed alongside the other industrial sites, the perception of the glare from the lighting of the mill site is no more obvious than that from the other sites.

Photograph nos. 1, 2 & 3

These photographs show some of the column and mast mounted discharge flood and area type luminaires utilised to illuminate the larger external spaces such as vehicle parking and waste stacking areas.

Photograph nos. 5, 6 & 7

General photographs of the building mounted lighting. No. 6 illustrates that the lighting levels drop significantly with no noticeable light at the site perimeter.

Photograph no. 8

This view from the south-west corner of the car park illustrates that the illumination from the site lighting reduces as the perimeter of the car park and site are reached.

Photograph no. 9

From this photograph it can clearly be seen that the lighting on the west side of the warehouse only illuminates close to the building, however there is visible glare.

Photograph nos. 10, 11, 12, 13 & 14

Glare from the site lighting visible from Barge Way.

Photograph no. 15

The visible glare from the adjacent Morrisons distribution warehouse which is as obvious as that from the mill site.

Photograph nos. 16, 17, 18 & 19

Daylight views of the site from surrounding vantage points.

Photograph nos. 20 & 21

These photographs clearly show the line of trees and bushes along the perimeter of Ridham Road which provide screening so that there is virtually no light spillage beyond the site into the adjacent Kemsley Marshes.

Photograph no. 22

This photograph clearly show the line of trees and bushes along the perimeter of waste stacking area which provide screening so that there is virtually no light spillage beyond the site.

Photograph nos. 23 & 24

The line of poplar type trees which provides a screen along the south of the site can be clearly seen in these photographs.

Photograph nos. 25, 26 & 27

The mill site viewed from Barge Way.

Photograph no. 28

Looking along the Distributor road to the north of the site with the Morrisons distribution warehouse in the centre.

Photograph no. 29

Looking across the fields from the Distributor road to the Morrisons distribution warehouse.

Photograph no. 30

Photograph of the waste stacking area viewed from the Distributor road. The site lighting and the street lighting are clearly visible.

Photograph no. 31

The site viewed at night from a location between Little Murston Nature Reserve and Tonge Corner.

Photograph no. 32

The site viewed at night from the footpath alongside Church Marshes Country Park.

Photograph no. 33

The main site viewed at night from the secondary treatment plant site.

Photograph no. 34

The waste stacking area viewed at night from the secondary treatment plant site.

Photograph no. 35

The edge of the secondary treatment plant site showing the sharp cut-off of the light beyond the perimeter fence.

Photograph no. 36

The main mill site and the Morrisons distribution warehouse (to the right) viewed at night from the approach road to Ridham docks which clearly shows that the glare from the mill site lighting is similar to that from the distribution warehouse.

8.0 Conclusions

The mill site is located in an area where there are a number industrial developments. The areas surrounding the industrial developments are open spaces with a variety of vegetation, marshes, creeks, roads and to the south and west the village of Kemsley.

The external lighting on the site generally provides illuminance within the site boundary. At and beyond the boundaries there is in most cases an insignificant amount of illuminance at ground level.

Where there are public roads running close to the site boundary, the road lighting overshadows any effects from the site lighting, except to the north of the waste stacking area where there is a high mast column on the boundary line which is fitted with luminaires which do not direct the light effectively away from the site boundary.

When the mill site is viewed from the surrounding roads and vantage points direct glare from some of the site lighting is evident, the intensity of which is dependent upon the type of light source, its location and the effects of the surrounding masking vegetation and landscape. However, when viewed alongside the other industrial sites, the perception of the glare from the lighting of the mill site is no more obvious than that from the other sites. The sources of much of the visible glare are mainly building mounted luminaires which angle the light away from the buildings and badly performing or adjusted high mast mounted luminaires.

When future developments on the site are being planned the design of the external lighting should be in accordance with the latest recommendations of the The Chartered Institution of Building Services Engineers (CIBSE), Society of Light and Lighting (SLL) and The Institution of Lighting Engineers (ILE) to ensure that there is as little obtrusive light as possible. This includes direct upward light and spill light. Wherever possible, luminaires mounted on columns located away from buildings and plant with the luminaires directed away from the perimeter of the site and towards the building or plant should be utilised to ensure that there is minimal spill light beyond the perimeter and minimise direct glare.

Kemsley Paper Mill

Lighting Assessment Report

Appendices

Appendix 1
SITE PLAN - LOCATIONS OF LIGHT LEVEL READINGS

Appendix 2
SITE PLAN - LOCATIONS WHERE PHOTOGRAPHS TAKEN

Appendix 3
MAP OF AREA - LOCATIONS WHERE PHOTOGRAPHS TAKEN

Appendix 4
PHOTOGRAPHS

Appendix 5
LIGHTMETER CALIBRATION CERTIFICATE

Kemsley Paper Mill

Lighting Assessment Report

Appendix 1

SITE PLAN - LOCATIONS OF LIGHT LEVEL READINGS

LEGEND

1 - NO.1 Machine
2 - No.2 Machine - Unused
3 - No.3 Machine
4 - No.4 Machine
5 - PM4 Drive Substation
6 - Chemical Plant
7 - Fractionation Substation
8 - Fractionation Plant
9 - Warehouse
10 - DAF Treatment Plant
11 - No.3 M/C Stock Approach
12 - No.1 Prep Plant
13 - Lorry Wash
14 - No.3/4 Paper Store
15 - No.1 Paper Store
16 - Reel Stores
17 - Ex Lorry Sheeting Tunnel
18 - Security Hut (Ridham Road)
19 - Site Compressors
20 - Incinerator Plant
21 - PM3 Machine Room D/E Substation
22 - PM3 Stock Approach Substation
23 - Decker Substation
24 - Pulp Stacking Area
25 - PM4 D/E Substation
26 - Q.C. Laboratory
27 - 'A' & 'B' Line Conveyors
28 - AS400 Room
29 - PM3 & 4 Finishing Room
30 - Fire Pump House
31 - PM3 D/E Substation
32 - Process Rejects Discharge
33 - Colour Mixing Plant
34 - Civil Department
35 - Package Boiler House
36 - Laboratory
37 - Waste Skips
38 - Cable Store
39 - Gas Compound
40 - Engineering Offices
41 - Roll Store
42 - Grovehurst Offices
43 - Charity Skip Area
44 - Pump House
45 - Cable Store
46 - PM3 Drive Substation
47 - Vehicle Workshop
48 - Bridge Substation
49 - Central Substation
50 - Lorry Marshalling Area
51 - Effluent Treatment Plant
52 - Waste Storage Apron
53 - Reel Splitter
54 - Grovehurst 132/33kv Sub Station
55 - Grovehurst Switchroom
56 - Distribution Dept
57 - First Aid
58 - Old Fitting Shop
59 - Hydrapulpers
60 - Secondary Treatment Plant
61 - Radio Isotope Store
62 - Equipment Store
63 - Chemical Store
64 - Sewage Plant
65 - Fire Station
66 - Fitters Mess Room
67 - Storage Silo
68 - Reservoir
69 - Stock Preparation Plant
70 - Effluent Pump House
71 - Accounts Office
72 - 'C' Weighbridge
73 - BT Cabin
74 - Canteen
75 - Weighbridge Office - Security
76 - Stock Prep, Office/Crew Rooms
77 - PM4 Hydraulic Room
78 - Waste Yard Mess Room
79 - Offices - St. Regis Production
80 - Offices - Under Water Tower
81 - Car Park
82 - Starch Plant
83 - Stores
84 - PM3 Winder Sub.
85 - Goods Receiving
86 - Stock Preparation Plant
87 - 'E' Line Conveyor
88 - 'E' Line Tank Farm
89 - Effluent Cooling System

SRK SITE BOUNDARY

0 50 100 METRES

ST REGIS — St. Regis Paper Co. Ltd. Kemsley Paper Mill

Sittingbourne
Kent ME10 2TD
Telephone: (01795) 424391
Fax: (01795) 473692
Telex: 965428 STR KEM G

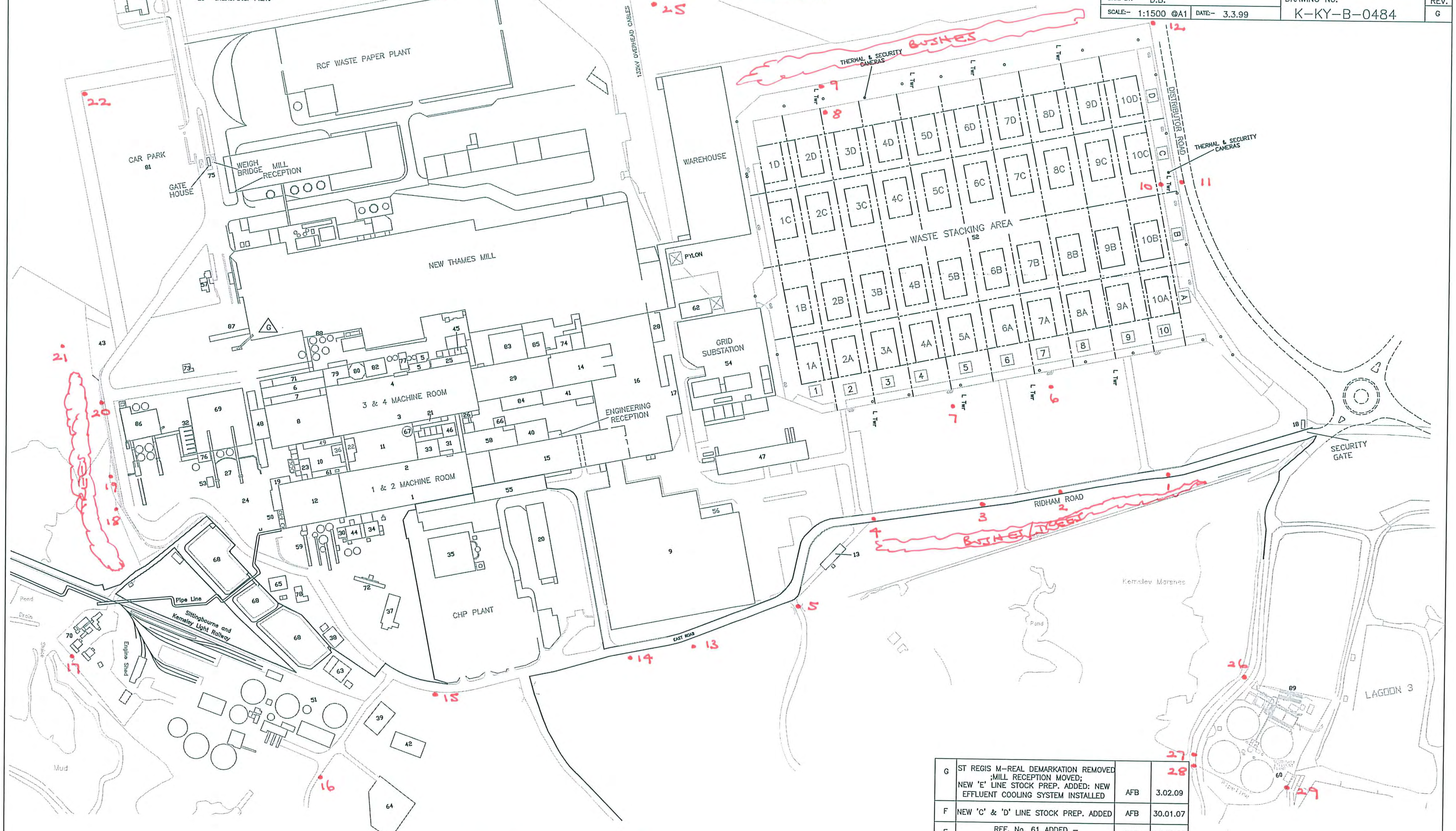
TITLE:- SITE PLAN

LOCATION:- KEMSLEY MILL

DRN. BY:- D.B.

SCALE:- 1:1500 @A1 DATE:- 3.3.99

DRAWING No. K-KY-B-0484 REV. G



G	ST REGIS M-REAL DEMARKATION REMOVED ;MILL RECEPTION MOVED; NEW 'E' LINE STOCK PREP. ADDED: NEW EFFLUENT COOLING SYSTEM INSTALLED	AFB	3.02.09
F	NEW 'C' & 'D' LINE STOCK PREP. ADDED	AFB	30.01.07
E	REF. No. 61 ADDED - RADIO ISOTOPE STORE	DSC	20.02.06
D	NORTHERN BOUNDARY MOVED TO ACCOMODATE DISTRIBUTOR ROAD	RH	29.03.05
C	EFFLUENT TREATMENT MODIFIED	RH	09.02.05
B	EFFLUENT TREATMENT PLANT ADDED	RH	12.01.05
A	SITE BOUNDARY ADDED	RH	10.02.04
No.	REVISION	NAME	DATE

DRAWING No. K-KY-B-0484 REV. G

LOCATIONS OF LIGHT LEVEL READINGS.

Kemsley Paper Mill

Lighting Assessment Report

Appendix 2

SITE PLAN - LOCATIONS WHERE PHOTOGRAPHS TAKEN

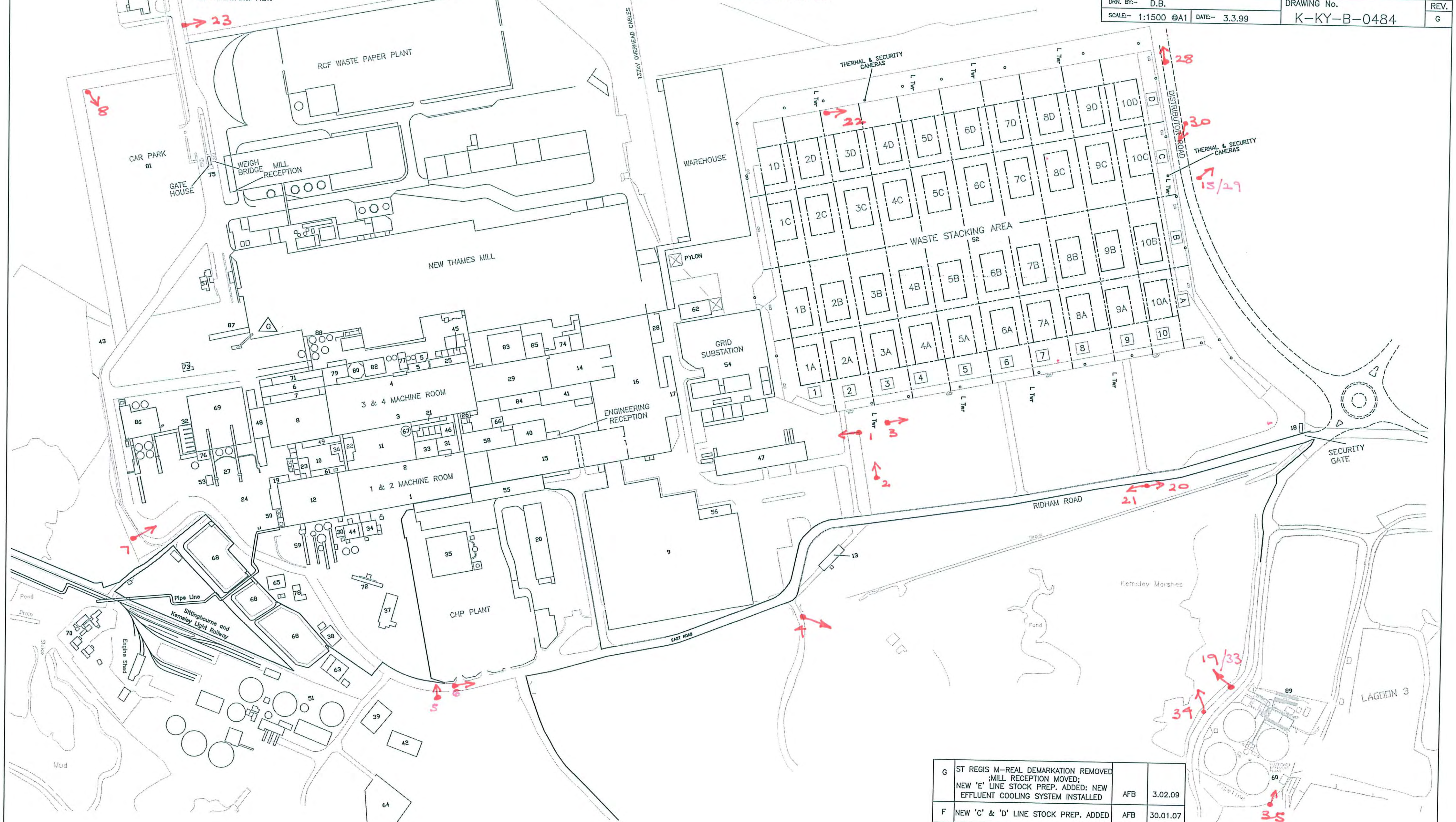
LEGEND

1 – No.1 Machine
2 – No.2 Machine – Unused
3 – No.3 Machine
4 – No.4 Machine
5 – PM4 Drive Substation
6 – Chemical Plant
7 – Fractionation Substation
8 – Fractionation Plant
9 – Warehouse
10 – DAF Treatment Plant
11 – No.3 H/C Stock Approach
12 – No.1 Prep Plant
13 – Lorry Wash
14 – No.3/4 Paper Store
15 – No.1 Paper Store
16 – Reel Stores
17 – Ex Lorry Sheeting Tunnel
18 – Security Hut (Ridham Road)
19 – Site Compressors
20 – Incinerator Plant
21 – PM3 Machine Room D/E Substation
22 – PM3 Stock Approach Substation
23 – Decker Substation
24 – Pulp Stacking Area
25 – PM4 D/E Substation
26 – Q.C. Laboratory
27 – 'A' & 'B' Line Conveyors
28 – AS400 Room
29 – PM3 & 4 Finishing Room
30 – Fire Pump House
31 – PM3 D/E Substation
32 – Process Rejects Discharge
33 – Colour Mixing Plant
34 – Civil Department
35 – Package Boiler House
36 – Laboratory
37 – Waste Skips
38 – Cable Store
39 – Gas Compound
40 – Engineering Offices
41 – Roll Store
42 – Grovehurst Offices
43 – Charity Skip Area
44 – Pump House
45 – Cable Store
46 – PM3 Drive Substation
47 – Vehicle Workshop
48 – Bridge Substation
49 – Central Substation
50 – Lorry Marshalling Area
51 – Effluent Treatment Plant
52 – Waste Storage Apron
53 – Reel Splitter
54 – Grovehurst 132/33kv Sub Station
55 – Grovehurst Switchroom
56 – Distribution Dept
57 – First Aid
58 – Old Fitting Shop
59 – Hydrapulpers
60 – Secondary Treatment Plant
61 – Radio Isotope Store
62 – Equipment Store
63 – Chemical Store
64 – Sewage Plant
65 – Fire Station
66 – Fitters Mess Room
67 – Storage Silo
68 – Reservoir
69 – Stock Preparation Plant
70 – Effluent Pum[illegible]usr
71 – Accounts D[illegible]
72 – 'C' Weighbridge
73 – BT Cabin
74 – Canteen
75 – Weighbridge Office – Security
76 – Stock Prep, Office/Crew Rooms
77 – PM4 Hydraulic Room
78 – Waste Yard Mess Room
79 – Offices – St. Regis Production
80 – Offices – Under Water Tower
81 – Car Park
82 – Starch Plant
83 – Stores
84 – PM3 Winder Sub.
85 – Goods Receiving
86 – Stock Preparation Plant
87 – 'E' Line Conveyor
88 – 'E' Line Tank Farm
89 – Effluent Cooling System

SRK SITE BOUNDARY

0 50 100 METRES

STREGIS	St. Regis Paper Co. Ltd. Kemsley Paper Mill	Sittingbourne Kent ME10 2TD Telephone: (01795) 424391 Fax: (01795) 473692 Telex: 965428 STR KEM G
TITLE:– SITE PLAN		LOCATION:– KEMSLEY MILL
DRN. BY:– D.B.	DRAWING No. K–KY–B–0484	REV. G
SCALE:– 1:1500 @A1	DATE:– 3.3.99	



G	ST REGIS M–REAL DEMARKATION REMOVED ;MILL RECEPTION MOVED; NEW 'E' LINE STOCK PREP. ADDED: NEW EFFLUENT COOLING SYSTEM INSTALLED	AFB	3.02.09
F	NEW 'C' & 'D' LINE STOCK PREP. ADDED	AFB	30.01.07
E	REF. No. 61 ADDED – RADIO ISOTOPE STORE	DSC	20.02.06
D	NORTHERN BOUNDARY MOVED TO ACCOMODATE DISTRIBUTOR ROAD	RH	29.03.05
C	EFFLUENT TREATMENT MODIFIED	RH	09.02.05
B	EFFLUENT TREATMENT PLANT ADDED	RH	12.01.05
A	SITE BOUNDARY ADDED	RH	10.02.04
No.	REVISION	NAME	DATE

DRAWING No. K–KY–B–0484 REV. G

Kemsley Paper Mill

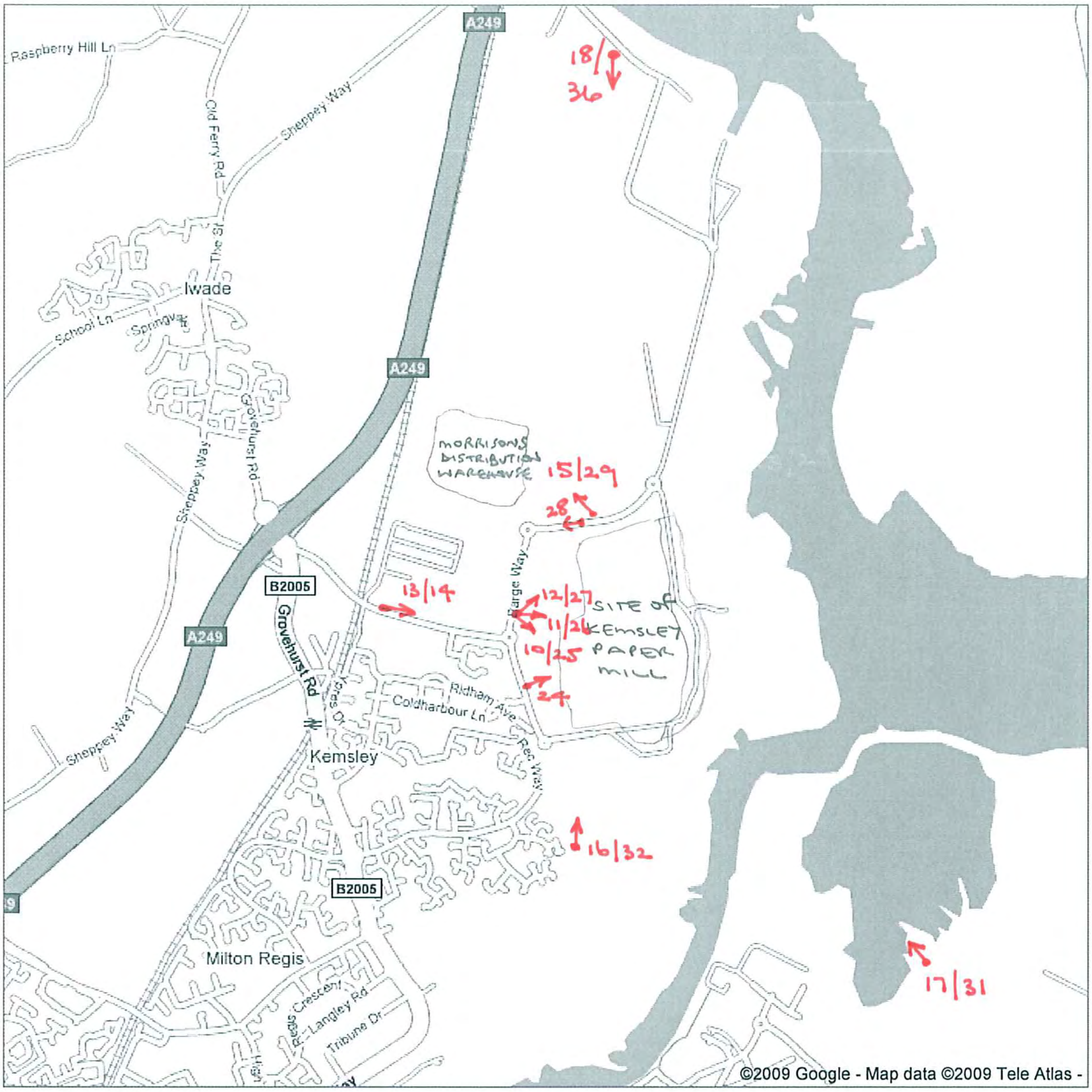
Lighting Assessment Report

Appendix 3

MAP OF AREA - LOCATIONS WHERE PHOTOGRAPHS TAKEN

Google maps UK

Notes LOCATIONS WHERE PHOTOGRAPHS TAKEN



Kemsley Paper Mill

Lighting Assessment Report

Appendix 4

PHOTOGRAPHS

Photograph No. 1

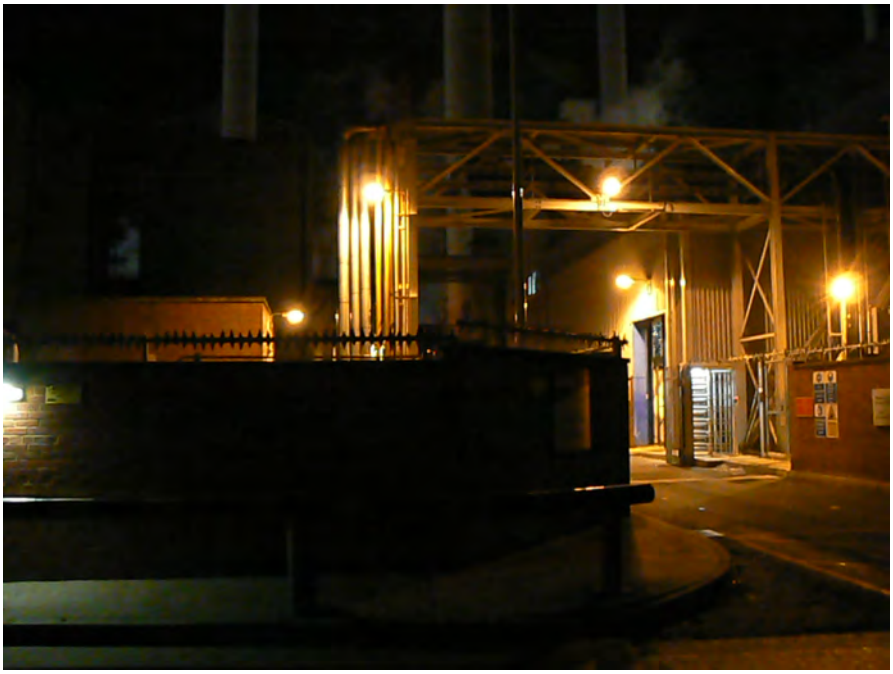
Photograph No. 2

RPS Gregory

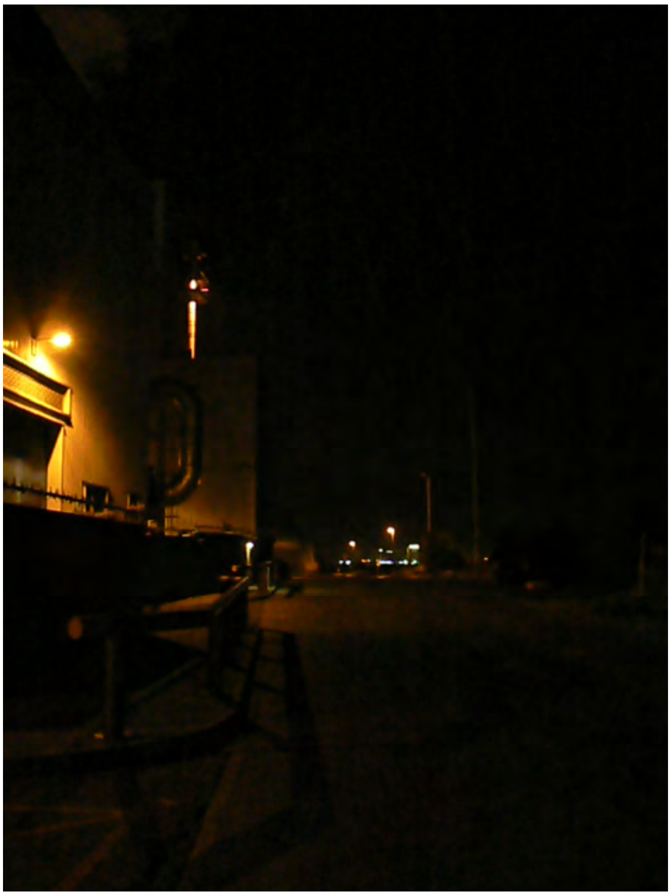
Photograph No. 3

Photograph No. 4

RPS Gregory



Photograph No. 5



Photograph No. 6

Photograph No. 7

Photograph No. 8

Photograph No. 9

Photograph No. 10

Photograph No. 11

Photograph No. 12

Photograph No. 13

Photograph No. 14

Photograph No. 15

Photograph No. 16

Photograph No. 17

Photograph No. 18

RPS Gregory

Photograph No. 19

Photograph No. 20

Photograph No. 21

Photograph No. 22

Photograph No. 23

Photograph No. 24

Photograph No. 25

Photograph No. 26

Photograph No. 27

Photograph No. 28

RPS Gregory

Photograph No. 29

Photograph No. 30

Photograph No. 31

Photograph No. 32

Photograph No. 33

Photograph No. 34

Photograph No. 35

Photograph No. 36

Kemsley Paper Mill

Lighting Assessment Report

Appendix 5

LIGHTMETER CALIBRATION CERTIFICATE

CERTIFICATE OF CALIBRATION

GEL

ISO 9001 REGISTERED FIRM

Glanford Electronics Ltd.

Glanford House,
Exmoor Avenue
Skippingdale Business Park,
Scunthorpe
North Lincolnshire
DN15 8NJ

Telephone: (01724) 289600 Fax: (01724) 289008
Email: info@glanfordelectronics.com **www.glanfordelectronics.com**

CALIBRATION: 101015

Issued to: Inlec UK Ltd.
Stokesley

Instrument Certified: Chauvin Arnoux C.A. 813 Digital Light Meter

Serial No: 133734ZDH

Date in: 25-Mar-09

Cal Date: 27-Mar-09

Date Due: 27-Mar-10

All measurements are traceable to UKAS or National Standards (UK) via the following:

(GEL103) Megatron DL5 Digital Light Meter S/N:E078

Observations/Corrections

No Adjustment

Calibrated at 25 °C 25 %RH

Certified that, unless otherwise stated, the equipment conforms in all respects to manufacturers published specifications at the points measured
Calibrations performed in accordance with our registration to BS EN ISO9001:2000
and the general requirements of BS EN ISO 10012:2003

certifying engineer [redacted] S. Lawrence
J.Taylor
M.Gibson
FORM 12 C. Cowling

CERTIFICATE OF CALIBRATION

GEL

ISO 9001 REGISTERED FIRM

Job No	Page	Of
101015	2	2

Chauvin Arnoux C.A 813 Light - Meter

S/N: 133734ZDH

Input	Indicate	% Error
100.0 Lux	100.0	0.00%
1000 Lux	1002	0.20%
10000 Lux	10027	0.27%

Instrument Specification ± 3% + 10 counts

KELMSLEY PAPER MILL
SUSTAINABLE ENERGY PLANT
LIGHTING IMPACT ASSESSMENT REPORT

Author	Paul Scrafton	Approved	Paul Martin
Date	November 2009	Date	November 2009

Index

1. INTRODUCTION

St Regis and EON Energy from Waste Limited is planning to build a sustainable energy plant to the North East of the existing site at Kelmsley.

Kemsley Paper mill is located to the north of the village of Kemsley, 3km from Sittingbourne.

The land around the mill is flat, with reed beds located to the north of the proposed site and the Swale Estuary and marshy areas with other areas of ecological importance to the east. There are few prominent natural features in the area, although the Swale Estuary to the east is a designated Special Landscape Area.

The area is dominated by a number of other large industrial facilities. There are extensive depots and docks to the north and a recently built distribution depot to the north-west. In addition a large amount of land in the area has outline planning permission for additional employment development. The nearest residential housing to the site is Kemsley village, to the south-west. The area immediately around the majority of the site has a predominantly industrial character which will increase as further development occurs in the vicinity of the site.

2. GENERAL

This report considers the impact of lighting on the surrounding areas both during construction of the plant and on completion under operational conditions.

From the layout drawings we have produced the following:

an operational lighting design incorporating street lighting and flood lighting to provide illumination to roads, car parks and hard standing areas. The area illumination is above 15 lux average which equates to a country road leading to a trunk road and carrying HGV's.

a construction lighting design which provides general illumination of 15 lux average across the entire site. This is achieved using 400W floodlights and, whilst they will be clearly visible from a distance the incident light on the surrounding areas is kept to a minimum.

Plots have been carried out both on site and off-site for the two options and are displayed in the appendix.

3. CONSTRUCTION PERIOD

We have carried out a design for the construction period which provides an average lighting level of 15 lux.

This is to provide general lighting for the area and may not provide sufficient lighting to work under as buildings and structures progress and the lighting is masked.

Task specific lighting would therefore be required, however through careful positioning and planning this should have minimal effect on the areas outside the site.

The luminaires used in the design are Thorn SONPAK LX 400W luminaire mounted at a height of 10m on temporary columns around the site. A total of 32 such fittings would be required to provide the indicated illumination.

Thorn SONPAK LX

4. OPERATIONAL PERIOD

Lighting design has been carried out for the operational period illuminating the streets around the site together with car parks and hard standing areas.

This consists of conventional street lighting fittings mounted on 8m columns around the perimeter of the site, together with floodlights located at 8m on the site buildings.

We have included lighting for areas where there may be some effect on the off-site lighting levels, however we have not included illumination for areas which will provide no contribution to the offsite lighting levels.

The street lighting fitting used is an Urbis ZX12 with a flat glass profile to minimise light spill and upward light fitted with a 70W SON lamp. The floodlight fitting is a Thorn Sonpak LX fitted with a 100W lamp and identical in appearance to the temporary lighting though the luminaire body is smaller..

Urbis ZX12

5. CONCLUSIONS

The internal lighting layouts show that the lighting levels within the site are an average of 15 lux for both the construction period and the Operational time following construction. These are included for information purposes.

The off site lighting plans show that for the construction period the lighting levels will decrease fairly rapidly on moving away from the site boundary.

The construction period drawing indicates that at the north end of the site the lighting levels drop to 1 lux well within the site boundary. Since this is a notional design and the actual requirements are unknown this could be managed throughout the construction period to minimise the overspill.

The lighting will be clearly visible from all directions with the exception of the south west which is shielded by the existing plant. This situation will, however, be temporary for the duration of the construction of the new plant.

The lighting design produced for the final operational plant can be seen to drop to a lighting level of 1 lux again well within the site boundary in the area where the new drainage is being constructed. The street lighting fittings used will be unobtrusive from a distance due to the flat glass construction and downward profile of the light output. Building mounted floodlights have been mounted at low angles to create a similar effect and limit their visibility from a distance.

As a guide bright moonlight is measured in the region of 1 lux.

6. APPENDICES

APPENDIX 1

LSMO389-SK001 Operational Lighting – Off Site Lighting Levels

APPENDIX 2

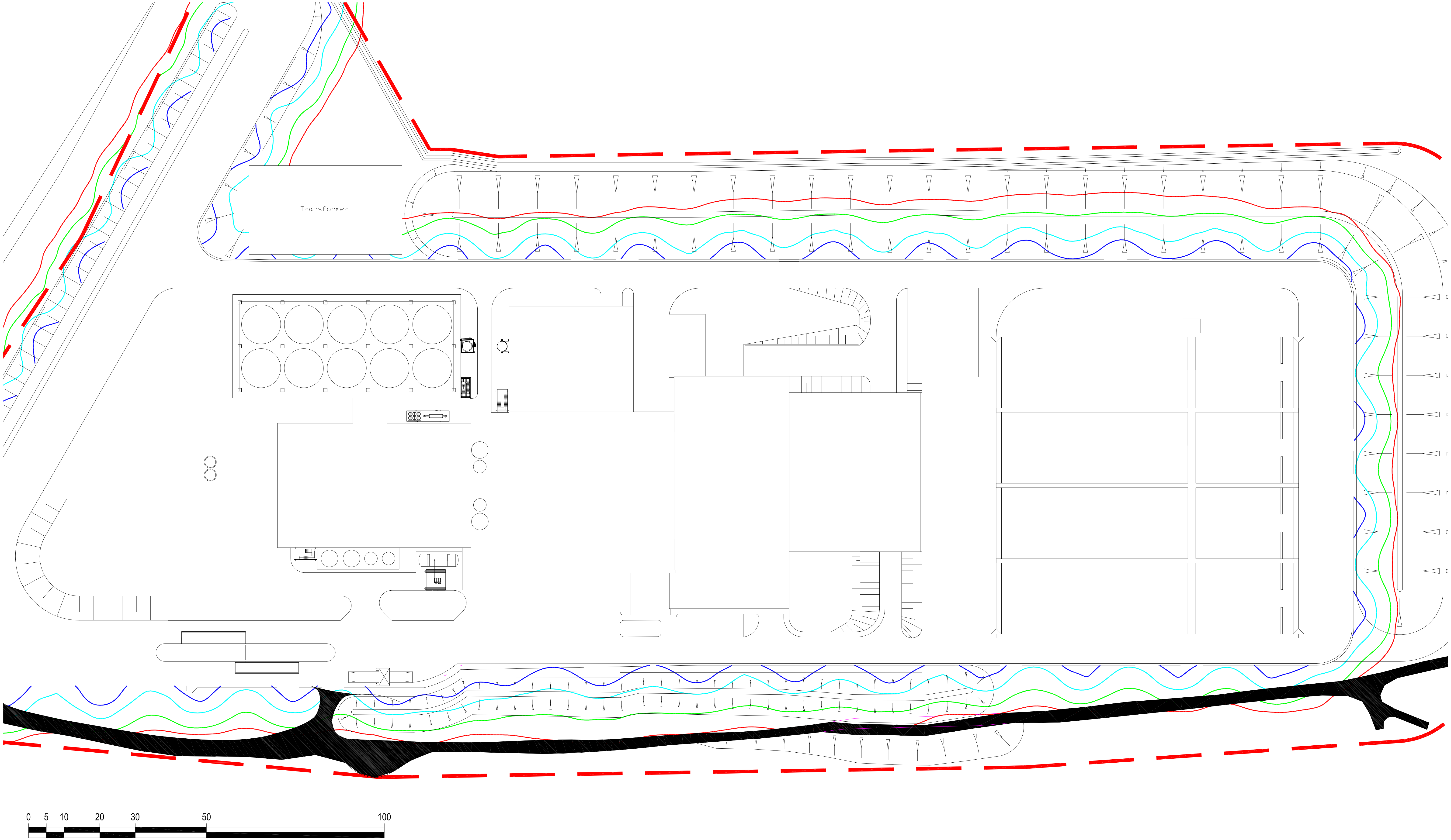
LSMO389-SK002 Operational Lighting – On Site Lighting Levels

APPENDIX 3

LSMO389-SK003 Construction Lighting – Off Site Lighting Levels

APPENDIX 4

LSMO389-SK004 Construction Lighting – On Site Lighting Levels



Do NOT Scale from this Drawing. Work to Figured Dimensions. Dimensions in Millimetres unless Stated Otherwise

Ref.	Detail of Revision	Drawn/ Date	Checked/ Approved

Special Notes

LEGEND

- 1 LUX
- 2 LUX
- 5 LUX
- 10 LUX
- 20 LUX
- SITE BOUNDARY

Architect

Client

Scale@A3 1:1000

Date Nov 09

Issue

Drawn PJS

Checked PM

Approved

Project
Kelmsley Sustainable Energy Plant

Drawing Title
Operational Lighting
Off Site Lighting Levels

Drawing No. LSMO2389-SK001

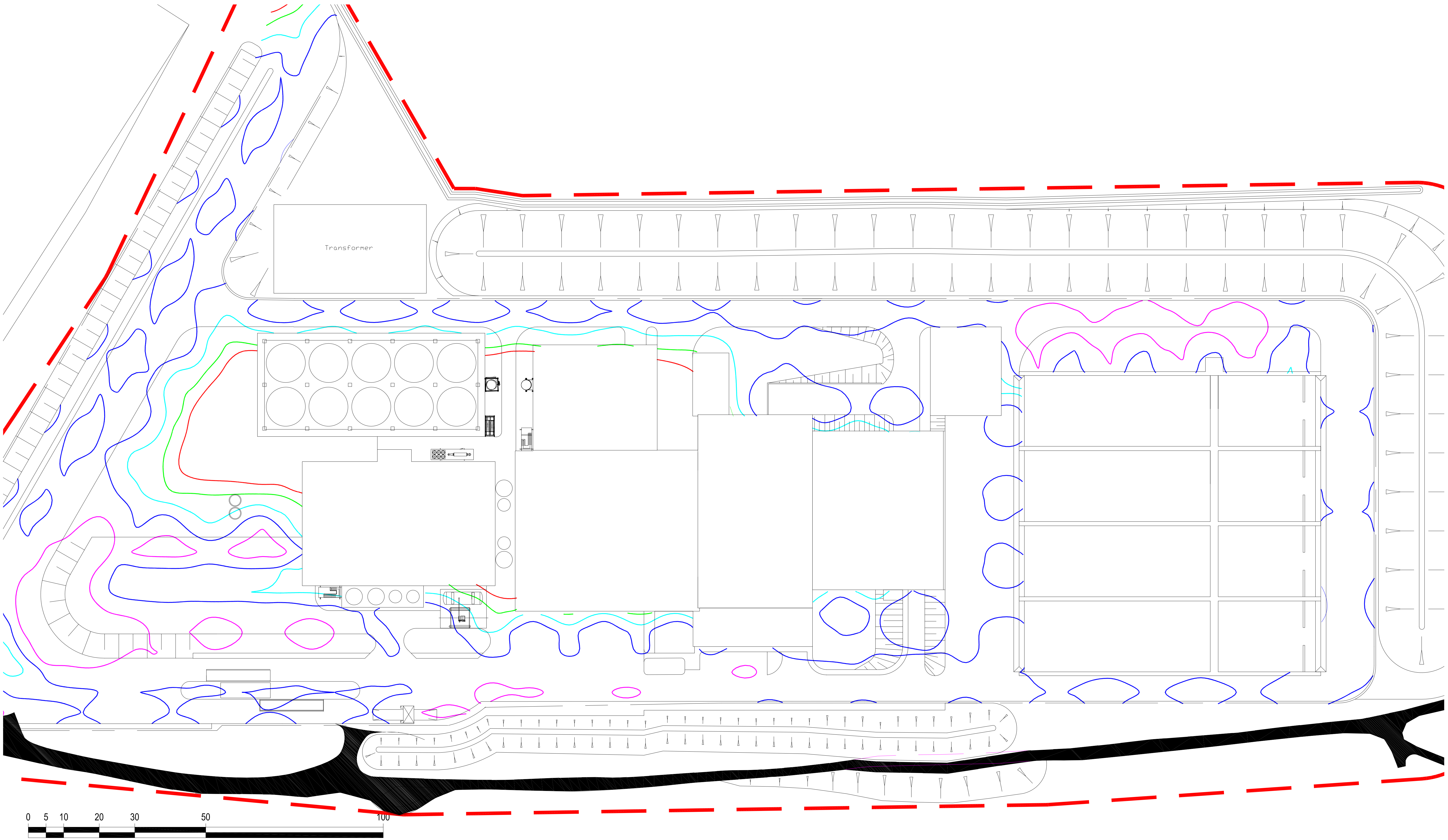
Rev

RPS Gregory

No. 8
Centre 27 Business Park
Leeds
WF17 9TB

Newcastle
Manchester
Birmingham
Leeds
Cardiff

t +44 (0)1924 442888
f +44 (0)1924 359371
e infolee@rwgregory.co.uk
w www.rpsgroup.com



Do NOT Scale from this Drawing. Work to Figured Dimensions. Dimensions in Millimetres unless Stated Otherwise

Ref.	Detail of Revision	Drawn/ Date	Checked/ Approved

Special Notes

LEGEND

- 1 LUX
- 2 LUX
- 5 LUX
- 10 LUX
- 20 LUX
- SITE BOUNDARY

Architect

Client

Scale@A3 1:1000	Date Nov 09	Issue
Drawn PJS	Checked PM	Approved

Project
Kelmsley Sustainable Energy Plant

Drawing Title
Operational Lighting
On-Site Lighting Levels

Drawing No. LSMO2389-SK002

Rev

RPS Gregory

No. 8
Centre 27 Business Park
Leeds
WF17 9TB

Newcastle Leeds
Manchester Cardiff
Birmingham

t +44 (0)1924 442888
f +44 (0)1924 359371
e infolee@rwgregory.co.uk
w www.rpsgroup.com

0 5 10 20 30 50 100

Do NOT Scale from this Drawing. Work to Figured Dimensions. Dimensions in Millimetres unless Stated Otherwise

Ref.	Detail of Revision	Drawn/ Date	Checked/ Approved

Special Notes

LEGEND
1 LUX
2 LUX
5 LUX
10 LUX
20 LUX
SITE BOUNDARY

Architect

Client
RPS Leeds

Scale@A3 1:1000	Date Nov 09	Issue
Drawn PJS	Checked PM	Approved

Project
Kelmsley Sustainable Energy Plant

Drawing Title
Construction Lighting
Off site Lighting levels

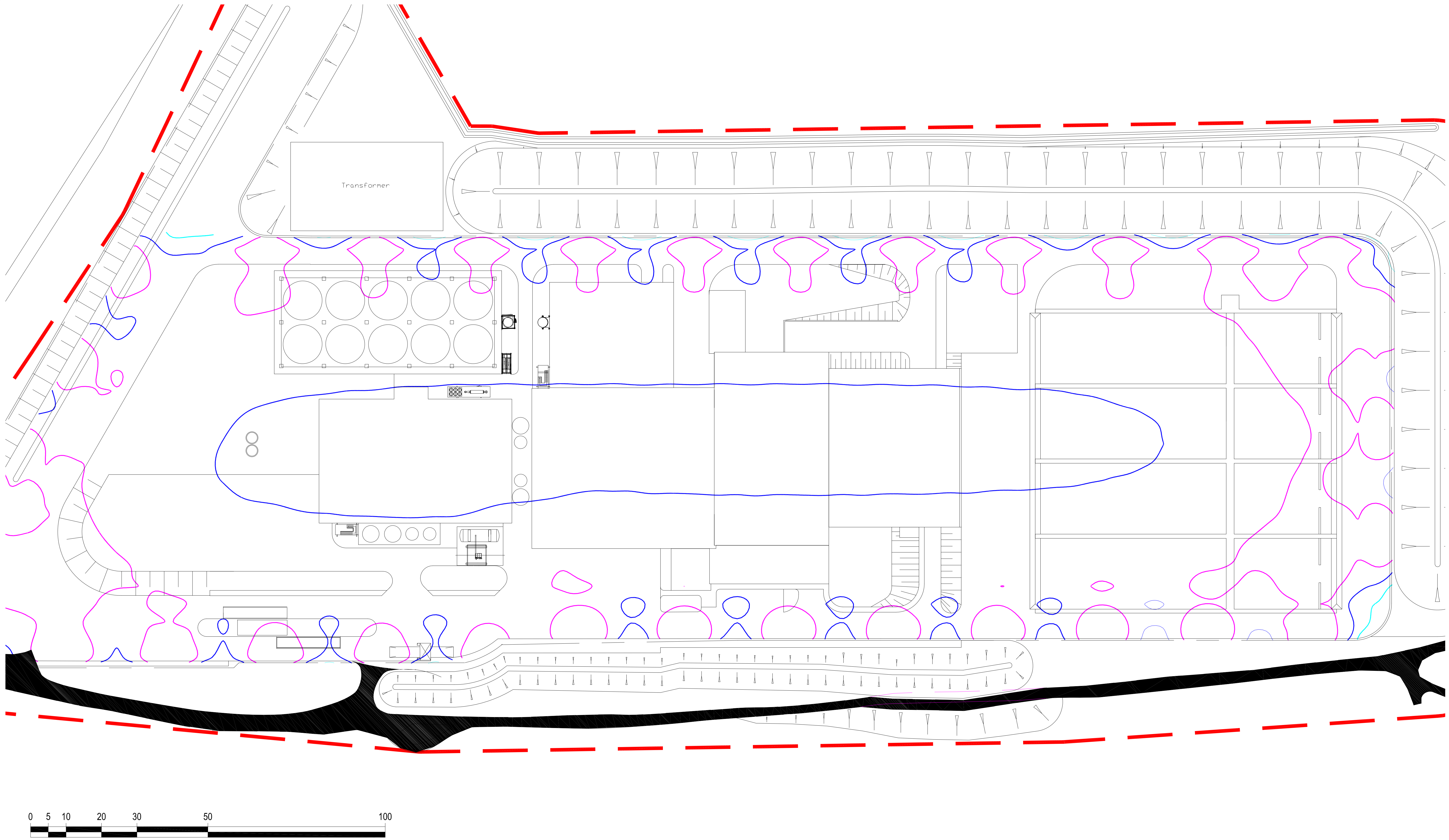
Drawing No. LSMO2389-SK003

Rev

RPS Gregory
No. 8
Centre 27 Business Park
Leeds
WF17 9TB

Newcastle Leeds
Manchester Cardiff
Birmingham

t +44 (0)1924 442888
f +44 (0)1924 359371
e infolee@rwgregory.co.uk
w www.rpsgroup.com



Do NOT Scale from this Drawing. Work to Figured Dimensions. Dimensions in Millimetres unless Stated Otherwise

Ref.	Detail of Revision	Drawn/ Date	Checked/ Approved

Special Notes

LEGEND
- 1 LUX
- 2 LUX
- 5 LUX
- 10 LUX
- 20 LUX
- SITE BOUNDARY

Architect

Client
RPS Leeds

Scale@A3 1:1000 | Date Nov 09 | Issue

Drawn PJS | Checked PM | Approved

Project
Kelmsley Sustainable Energy Plant

Drawing Title
Construction Lighting OnSite Lighting Levels

Drawing No. LSMO2389-SK004 | Rev

RPS Gregory
No. 8
Centre 27 Business Park
Leeds
WF17 9TB

Newcastle Leeds
Manchester Cardiff
Birmingham

t +44 (0)1924 442888
f +44 (0)1924 359371
e infolee@rwgregory.co.uk
w www.rpsgroup.com