Document 3.3 – 2010 Environmental Statement

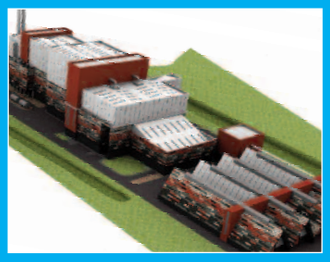
ES Volume 1 - Chapters 1-8

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

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environmental statement 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

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Non-Technical Summary (Standalone Document)

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Glossary

AADT	Annual average daily traffic flow
AC	Ambient Concentration
ACT	Advanced Conversion Facility
ADMN	Acid Deposition Monitoring Network
ADMS	Atmospheric Dispersion Modelling System
AOD	Above Ordnance Datum
APC	Air Pollution Control
APIS	Air Pollution Information System
APPLE	Air Pollution Planning and the Local Environment
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Areas
AQS	Air Quality Strategy
As	Arsenic
ATC	Automatic Traffic Count
ATT	Advanced Thermal Technology
BAT	Best Available Techniques
BATNEEC	Best Available Techniques Not Entailing Excessive Cost
BoCC	Bird of Conservation Concern
BMW	Biodegradable Municipal Waste
BPEO	Best Practicable Environmental Option
BPM	Best Practicable Means
BTO	British Trust for Ornithology
°C	Degrees Celsius (unit of temperature)
Cd	Cadmium
CEMP	Construction Environmental Management Plan
CHP	Combined Heat and Power
CIRIA	The Construction Industry Research and Information Association
CIRIA (C532)	Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors.
CO	Carbon monoxide
Co	Cobalt
CoCP	Code of Construction Practice
COPC	Contaminants of potential concern
Cr	Chromium
CRoW	Countryside and Rights of Way
CS2	Characteristic Situation 2
Cu	Copper
Cumulative effects	the summation of effects that result from changes caused by a development in conjunction with other past, present or reasonably foreseeable actions.
DCMS	Department of Culture, Media and Sport
dB	Decibel
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges
DPD	Development Plan Documents
EALs	Environmental Assessment Levels
EcIA	Ecological Impact Assessment
EfW	Energy from Waste
EIA	Environmental Impact Assessment
EIAG	Environmental Impact Analysis Group
EMS	Environmental Management System
Enhancement	Landscape Improvement through restoration, reconstruction or creation

EPA 1990	Environmental Protection Act 1990
EPAQS	Expert Panel on Air Quality Standards
EPEQS	Environmental Quality Standards
EQS	Environmental Quality Standard
ES	Environmental Statement
EU	European Union
FB	Fluidised Bed
FGCS	Flue Gas Cleaning System
FGT	Flue Gas Treatment
Flood Zone	Likelihood of flooding from rivers or sea.
FRA	Flood Risk Assessment
GAC	Generic assessment criteria
GCN	Great crested newt
GOSE	Government Office of South East
GQA	General Quality Assessment
GSV	Gas Screening Values
GVA	Gross Value Added
H2S	Hydrogen sulphide
HAP	Habitat Action Plan
HCB	Hexachlorobenzene
HCl	Hydrogen chloride
HDV	Heavy Duty Vehicle
HER	Historic Environment Register
HF	Hydrogen fluoride
Hg	Mercury
HGV	Heavy Goods Vehicle
HHRAP 2005	Human Health Risk Assessment Protocol
HLC	Historic Landscape Characterisation
HMIP	Her Majesty's Inspectorate of Pollution
HRA	Hydrogeological Risk Assessment
HRSG	Heat Recovery Steam Generators
IEEM EclA	Institute of Ecology and Environmental Management
IEMA	Institute of Environmental Management and Assessment
IoH124	Institute of Hydrology Report 124
IPPC	Integrated Pollution Prevention and Control
IRAP-h	Industrial Risk Assessment Program-Human Health
JCA	Joint Character Area
JMWMS	Joint Municipal Waste Management Strategy
K	Kelvin (unit of temperature)
km	kilometre
kPa	kilopascal (unit of pressure)
KMWDS	Kent Minerals and Waste Development Scheme
kph	kilometres per hour (unit of speed)
kW	kilowatt
KWLP	Kent Waste Local PLan
LAeqT	Rating Levels
LA90,T	Background Sound Level
LAr,Tr	Field rating level
Landscape Character	the distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape, and how this is perceived by people. It reflects particular combinations of geology, landform, soils, vegetation, land use and human settlement. It creates the particular sense of place of different areas of the landscape.
Landscape character type	a landscape type will have broadly similar patterns of geology, landform, soils, vegetation, land use, settlement and field pattern discernible in maps and field survey records.

Landscape effects	change in the elements, characteristics, character and qualities of the landscape as a result of development. These effects can be positive or negative.
Landscape sensitivity	the extent to which a landscape can accept change of a particular type and scale without unacceptable adverse effects on its character.
LATS	Landfill Allowance Trading Scheme
LBAP	Local Biodiversity Action Plan
LCA	Local character area
LTP2	Local Transport Plan
LWS	Local Wildlife Site
Magnitude	a combination of the scale, extent and duration of an effect
MAFF	Ministry of Agriculture, Forestry and
MBT	Mechanical Biological Treatment
MCC	Manual Classified Counts
MDR	Maximum deposition rate
MEP	Members of European Parliament
Micro Drainage WinDes	Software suite used to calculate surface water runoff rates
Mitigation	measures, including any process, activity or design to avoid , reduce remedy or compensate for adverse landscape and visual effects of a development project.
Mn	Manganese
MSW	Municipal Solid Waste
MWF	Mixed Waste Fuel
6g.m-3	micrograms per cubic metre
mg.m-3	milligrams per cubic metre
N	prefix used to denote a normalised value
NAEI	National Atmospheric Emissions Inventory
NAQIA	National Air Quality Information Archive
NE	Natural England
NERC	Natural Environment and Rural Communities
NGR	National Grid Reference
NH3	Ammonia
Ni	Nickel
NNR	National Nature Reserve
NO2	Nitrogen Dioxide
Nox	Oxides of nitrogen
NRTF	National Road Traffic Forecasts
NSR	Noise sensitive receptor
ODPM	Office of the Deputy Prime Minister
OEMP	Operational Environmental Management Plan
ONS	Office for National Statistics
OS	Ordnance Survey
%	percent
PAH	Polycyclic Aromatic Hydrocarbons
Pb	Lead
PC	Process Contributions
PCBs	Polychlorinated biphenyls
PCDDs – dioxins	Polychlorinated dibenzo-p-dioxins
PCDFs	Polychlorinated dibenzofurans
PCPA	Planning and Compulsory Purchase Act 2004
PCT	Primary Care Trust
PEC	Predicted Environmental Concentrations
PIA	Personal Injury Accident
PM10	Fine particulate matter less than 10 6m in diameter
PM2.5	Fine particulate matter less than 2.5 6m in diameter
PM0.1	Fine particulate matter less than 0.1 6m in diameter
PMP	Project Management Plan
POP	Persistent Organic Pollutant
PPG	Pollution Prevention Guidelines

PPG1	General Guide to the Prevention of Pollution
PPG3	Use and Design of Oil Separators in Surface Water Drainage Systems
PPG 5	Pollution Prevention Guidelines Note 5: Working in, near or liable to affect watercourses
PPG 6	Pollution Prevention Guidelines Note 6: Working at Construction and Demolition Sites
PPG8	Safe Storage and Disposal of Used Oils
PPG13	Planning Policy Guidance 13: Transport
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PUA	Principal Urban Areas
RAIS	Risk Assessment Information System
RCV	Refuse Collection Vehicles
RDF	Refuse Derived Fuel
Receptor	Physical landscape resource, special interest or viewer group that will experience an effect.
RfC	Reference Concentration
RfD	Reference Dose
RSPB	Royal Society for the Protection of Birds
RSS	Regional Spatial Strategy
RSS	The South East Regional Plan
RTAB	Regional Technical Advisory Bodies
RTS	Regional Transport Strategy
SO_2	Sulphur Dioxide
SA	Sustainability Appraisal
SAAR	Standard Average Annual Rainfall
SAC	Special Area of Conservation
SAP	Species Action Plan
Sb	Antimony
SBLP	Swale Borough Local Plan
SCM	Site Conceptual Model
SCR	Selective Catalytic Reduction
SEP	Sustainable Energy Plant
SGVs	Soil guideline values
SMC	Scheduled Monument Consent
SMR	Scheduled Monument Register
SMS	Sustainability Management System
SNCR	Selective Non Catalytic Reduction
SPA	Special Protection Area
SPD	Supplementary Planning Document
SPG	Supplementary Planning Guidance
SPZ	Source Protection Zone, Risk of contamination from activities that might cause pollution in the area.

SRF	Solid Recovered Fuel
SRI	Sound Reduction Index
SSAC	Specific Assessment Criteria
SSSI	Site of Special Scientific Interest
SUDS	Sustainable Drainage System
SWMP	Site Waste Management Plan
TDI	Tolerable Daily Intake
TEQ	Toxic equivalence
TI	Thallium
TOC	Total organic carbon
TOMPS	Toxic Organic Micro-Pollutants
tpa	Tonnes per annum
UK BAP	UK Biodiversity Action Plan
ULSD	Ultra low sulphur tax exempt diesel
USA	Updating and Screening Assessment
USEPA	United States Environment Protection Agency
UXO	Unexploded Ordnance
V	Vanadium
VER	Valued ecological resource/receptor
Visual envelope	Extent of potential visibility to or from a specific area or feature.
VOCs	Volatile Organic Compounds
WCA	Waste Collection Authority
WCS	Waste Core Strategy
WDA	Waste Disposal Authority
WDF	Waste Development Framework
WHO	World Health Organisation
WID	Waste Incineration Directive
WRRH	Waste Reception and Recycling Hall
WS2000	Waste Strategy 2000
WS2007	Waste Strategy 2007
WtE	Waste-to-Energy
ZVI	Zone of visual influence - sometimes referred to as zone of theoretical visibility (ZTV).
ZTV	Zone of Theoretical Visibility
ZVI	Zone of Visual Influence

DEVELOPMENT OF A SUSTAINABLE ENERGY PLANT.

KEMSLEY PAPER MILL, SITTINGBOURNE, KENT

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

ENVIRONMENTAL STATEMENT

CHAPTER 1:

INTRODUCTION

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RPS Planning & Development

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1. Introduction

1.1 Introduction

1.1.1 This document is the Environmental Statement (ES), which has been prepared to accompany the planning application for the construction and operation of a Sustainable Energy Plant (SEP) at the Kemsley Paper Mill, Sittingbourne.

1.1.2 This Statement and the Environmental Impact Assessment (EIA) upon which it is based have been carried out by RPS Consultants (RPS), on behalf of St Regis Paper Company Limited and E.ON Energy from Waste as the co-applicants.

1.1.3 The purpose of this ES is to describe and assess the likely significant environmental effects of the Scheme and to describe any mitigation schemes employed to avoid or ameliorate these impacts.

1.1.4 This Chapter outlines the context and structure of this Environmental Statement

1.2 The Applicants

1.2.1 St Regis Paper Company Limited (St Regis) and E.ON Energy from Waste are co applicants.

1.2.2 St Regis is a wholly owned subsidiary of DS Smith Plc. Kemsley paper mill is owned and operated by St Regis, and produces circa 900,000 tonnes of recycled paper and recycled de-inked, white pulp. Every year, Kemsley paper mill takes around 1.1 million tonnes of waste paper and manufactures it into a range of high quality recycled papers.

1.2.3 The company's infrastructure of four paper mills, a recycling operation (Severnside Recycling), and a Head Office generates a turnover of more than £350 million per annum. Sales are predominantly within the UK market place; however it also has a significant export business. Overall St Regis employs approximately 1,700 people of whom 645 work at Kemsley; there are a further 205 third party contractors working full-time at Kemsley bringing the number of people working at the site to 800.

1.2.4 St. Regis' annual output of recycled paper and pulp products is in the region of 1.2 million tonnes, making it by far the largest papermaker in the UK. The annual input of recovered waste paper is around 1.4 million tonnes, which means it is one of the

biggest recycling operations in Europe. The waste paper is supplied predominantly by Severnside Recycling, which recovers circa 1.8m tonnes annually of waste paper grades in the UK.

1.2.5 Its corrugated grades are supplied to the packaging industry for conversion into card board and boxes. In addition its specialist papers go into many different industries including construction, tissues, food manufacturing, stationery and education. All of its products are 100% recycled and 100% recyclable.

1.2.6 E.ON, the project co developer with St Regis, is a leading power and gas company, employing around 17,000 people in the UK and over 93,000 people worldwide. It generates and distributes electricity, and retails power and gas.

1.2.7 E.ON in the UK is a market leader in combined heat and power, providing its customers with around 600MW of electricity and more than 1,000MW of heat at 13 sites across the country. This includes its existing gas-fired CHP plant at Kemsley Mill.

1.2.8 E.ON Energy from Waste has a strong track record in developing, building and operating sustainable energy plants. The company has a portfolio of plants similar to the one proposed at Kemsley in operation or under construction in Germany, Holland and Luxembourg.

1.2.9 E.ON Energy from Waste's plants operate to the highest technical and environmental standards and in Germany have the capacity to handle nearly five million tonnes of waste per year and to produce 2,600GWh of electricity as well as 2,300GWh of heat.

1.3 The Assessment Team

1.3.1 RPS is an environmental consultancy which provides services to clients on planning and environmental matters throughout the UK and Ireland. The company is one of the largest multidisciplinary environmental consultancies in the country employing some 2100 staff in 60 offices. RPS has been trading for over twenty years, and is the only business in this sector quoted on the London Stock Exchange, having been listed since 1987.

1.3.2 RPS Consultants have considerable experience in waste planning and preparing Environmental Assessments and Statements. The professionals within the company who have assisted in preparing the SEP proposals have been drawn from the following disciplines:

- Town and Country Planning;
- Transport Planning;
- Air Quality Consultancy.
- Ecology and Nature Conservation;
- Hydrology and Hydrogeology;
- Engineering;
- Contaminated Land;
- Acoustics;
- Archaeology;
- Socio-economic assessment; and
- Waste Technology;

1.3.3 RPS has advised both private and public sector clients on a wide range of waste planning projects including landfill projects, waste treatment facilities, composting, civic amenity sites and aggregate recycling plants. RPS has also acted as expert witness on a variety of waste related developments including planning, odour and noise issues. The company also have many years experience in preparing complete Environmental Statements (ES), contributing to ES preparation by others as well as auditing Statements on behalf of local planning authorities.

1.4 The Scheme and Its Context

1.4.1 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 an Energy to Waste 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 its 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.

1.4.2 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.

1.4.3 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.

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

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

1.4.6 The source of those pre treated wastes has 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.

1.4.7 The available data shows that even after the Regional Waste Recycling and Composting targets have been met, There are significant quantities of pre treated waste available both within Kent and London and the South East. The SEP would therefore make a significant contribution to landfill diversion in Kent and the South East. The SEP would also make a significant contribution to meeting the Regional Renewable Energy Target.

1.4.8 The SEP will be developed by E.ON Energy from Waste. It is anticipated that it will be fully operational by 2014, following the civil engineering works associated with the plant construction and the process work involved in the mechanical and electrical equipment installation, fit out and commissioning of the plant.

1.4.9 The proposal assumes that the means of delivery of waste to the site will be by road, though whilst this is demonstrated to be acceptable in highways terms, it is presented as the worst case scenario. The applicant is actively pursuing options for importation of waste to the site via water and/or rail as an alternative if this proves to be practicable and viable, depending on the source of pre treated waste.

1.5 Site Location

1.5.1 The proposal site is located on land adjacent to and immediately north east of the existing Kemsley Paper Mill as indicated in Figure 1.1. The site lies within the ward of Kemsley (0.85km to the south west) and Milton Regis (2.6km to the south west). Sittingbourne is approximately 2.5km south of the proposal site. The town of Maidstone is 19.5km to the south west, and Gillingham is 15km to the west.

1.5.2 The site is accessed from the A249 *via* Swale Way (Western Entrance) or from Swale Way onto Barge Way (Northern Entrance). An internal access road provides access to the proposal site.

1.5.3 Swale Way has a junction with the B2005 (A249 (T) to Sittingbourne) approximately 1.7km west of the site. The A249 (T) (Queensborough to M2) has junctions with both the A2 (Gillingham to Faversham) and M2 (Gillingham to A2) approximately 4.8km and 7.8km south west of the site respectively.

1.5.4 For identification purposes, the Scheme is centred on national grid reference (OS Grid reference 592070, 166551) and its general location is shown in Figure 1.1 in red. Figure 1.2 shows the proposal site within the operational paper mill site. The topography of the site is shown on Figure 1.3 and extent of the paper mill site is shown on Figure 1.4.

1.6 The Role of the Environmental Statement

1.6.1 The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 (hereafter referred to as the 1999 Regulations) specify certain types of development for which EIA is mandatory (Schedule 1 Developments).

1.6.2 Waste Treatment facilities are 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.

1.6.3 The waste fuel throughput of the proposed SEP exceeds 100 tonnes per day. This Environmental Statement is therefore an Environmental Statement for the purposes of the 1999 Regulations.

1.6.4 Schedule 2 of the regulations identifies that Environmental Impact Assessment may be required for Energy industry development. Category 3a '*Industrial installations for the production of electricity, steam and hot water (unless included in Schedule 1)- the area exceeds 0.5 hectares.'*

1.7 The Content of the Environmental Statement

1.7.1 This statement has been prepared in accordance with the 1999 Regulations.

1.7.2 Although there is no statutory provision as to the form of an Environmental Statement (ES), Regulation 2(1) and the associated Schedule 4 of the 1999 Regulations set out the requirements regarding the content of an Environmental Statement. This specifies that the ES must contain the information specified in Part II, and such of the relevant information in Part I as reasonably required to assess the effects of the project and which the developer can reasonably be required to compile. For the avoidance of doubt, the specified information required within Schedule 4 Parts I and II is provided below:

PART I

1. Description of the development, including in particular –

(a) a description of the physical characteristics of the whole development and the land-use requirements during the construction and operational phases;

(b) a description of the main characteristics of the production processes, for instance, nature and quantity of materials used;

(c) an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat radiation, etc.) resulting from the operation of the proposed development.

2. An outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for his choice, taking into account the environmental effects.

3. A description of the aspects of the environment likely to be significantly affected by the proposed development, including, in particular, population, fauna, flora, soil water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the inter-relationship between the above factors.

4. A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-tem, permanent and temporary, positive and negative effects of the development, resulting from:

(a) the existence of the development;

(b) the use of natural resources;

(c) the emission of pollutants, the creation of nuisances and the elimination of waste, and the description of the measures by the applicant of the forecasting methods used to assess the effects on the environment.

5. A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.

6. A non-technical summary of the information provided under paragraphs 1 to 5 of this Part.

7. An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the applicant in compiling the required information.

PART II

1. A description of the development comprising information on the site, design and size of the development.

2. A description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects.

3. The data required to identify and assess the main effects which the development is likely to have on the environment.

4. An outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for his choice, taking into account the environmental

effects.

5. A non-technical summary of the information provided under paragraphs 1 to 4 of this Part.

1.7.3 This Environmental Statement includes all information required under Part II of the Regulations and, where appropriate, the information set out in Part I. The interaction between identified impacts and indirect effects of the proposals is discussed as part of each chapter within this Statement.

1.7.4 Together, the information supplied within the ES is considered to provide a clear understanding of the likely significant effects of the Scheme upon the environment and the mitigation measures proposed to avoid or ameliorate those effects.

1.7.5 General reference has been made to the following documents in preparation of the ES:

- The Department of Environment's "Preparation of Statements for Planning Projects that Require Environmental Assessment: A Good Practice Guide 1995".
- The Institute of Environmental Management and Assessment's "Guidelines for Environmental Impact Assessment", 2004.
- The Department of Transport Design Manual for Roads and Bridges, Volume 11: Environmental Assessment.

1.7.6 The information and knowledge required to undertake the EIA has been acquired from a number of varied sources to ensure that all impacts, whether explicit from the outset or coming to light during the project's development, were assessed. These sources include:

- formal scoping opinion from the Planning Department of Kent County Council
- discussions with statutory consultees;
- review of public files;
- historical and recent site investigations;
- specialist studies;
- expert knowledge from RPS's planning and environmental consultants;
- The knowledge of St Regis Paper Company Limited and that of E.ON Energy from Waste

1.7.7 The scope and organisation of the Environmental Statement are discussed below.

1.8 Scope of the Environmental Statement

1.8.1 The 1999 regulations and associated guidance need to be capable of being applied to all forms of development, and not purely sustainable/waste management facilities. Each development proposal, by virtue of its particular setting, design etc., is unique: the potential impacts associated with one sustainable energy plant may not be the same as the next.

1.8.2 This is recognised in the 1999 Regulations by virtue of Regulation 10, under which the planning authority has a duty, if requested, to give their opinion in writing to the applicant on the information to be provided in the Environmental Statement in the form of a formal 'Scoping Opinion'. The purpose of a scoping exercise is:

- To focus the EIA on the environmental issues and potential impacts which need the most thorough attention;
- To identify those which are unlikely to need detailed study; and
- To provide a means to discuss methods of impact assessment and reach agreement on those most appropriate for the scheme.

1.8.3 Although not legally required by the 1999 Regulations, scoping is an important facet of EIA. This importance was highlighted in paragraph 2.2 of the Department of Environment's Good Practice Guide 24, which states:

"Defining its 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 impact 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 work is too loosely defined, then much time, effort and cost may be spent on pursuing unnecessary detail."

1.8.4 In order to produce an adequate and focused EIA, and in the interests of transparency, a formal Scoping request was submitted to Kent County Council in addition to topic specific consultations with the relevant bodies.

1.8.5 A copy of the scoping request to Kent County Council and resulting 'Scoping Opinions' issued with related consultee responses are included as Appendices 1.1 and 1.2 respectively.

1.8.6 The content of this Environmental Statement is drawn from the Kent County Council response to this scoping exercise, together with other informal consultations and

RPS's considerable experience in preparing planning applications and environmental statements for facilities of this nature.

1.8.7 The key environmental issues which are considered in this Environmental Statement include:

- Traffic and Transportation Issues
- Air Quality (including Human Health Issues)
- Landscape and Visual Impact
- Ecology and Nature Conservation Issues
- Hydrology and Flood Risk
- Hydrogeology and Ground Conditions (including Human Health Issues)
- Noise and Vibration
- Archaeology and Cultural Heritage

1.8.8 Other issues addressed within the Statement include:

- Site History
- Need & Alternatives
- Planning Policy and Context
- Other Amenity Issues
- Socio-Economic Issues

Additional Consultations and Publicity

1.8.9 In addition to the formal scoping request to the planning authority and other topic specific consultations noted above and within specific chapters, St Regis Paper Company Limited and E.ON Energy from Waste have undertaken an extensive programme of stakeholder engagement to ensure that stakeholders were fully informed of the proposals and were given the opportunity to input into the identification of key issues to be addressed through the Environmental Impact Assessment process.

1.8.10 A summary of the process is set out below:

- **Newsletters** - 13,987 newsletters with covering letter issued to local residents and businesses via first class Royal Mail on Thursday 11 June 2009; received Saturday 13 June 2009 and Monday 15 June 2009. A second newsletter with covering letter was circulated in mid November 2009 to a smaller distribution

(6,284 addresses) based on levels of interest and feedback from the first mailing. The distribution area consists of the Swale Borough Council wards of Kemsley and Milton Regis, plus the village of Iwade. Letters and newsletters were also sent to people who had expressed an interest in the project but fell outside the area of the second mailing.

- **Posters -** A4 posters advertising the public exhibitions were displayed from Thursday 18 June 2009 in six locations in Kemsley:
  - Village Stores, Ridham Avenue
  - The Kemsley Arms, Ridham Avenue
  - Kemsley Village Hall, Ridham Avenue
  - Grovehurst Surgery, Grovehurst Rd
  - Pharmacy, Grovehurst Rd
  - Grovehurst Newsagents, Grovehurst Rd

The same locations were used to publicise the second round of exhibitions

- **Other letters -** Letters/emails highlighting/providing update on the project sent to:
  - Swale Borough Council officers.
  - Swale leader and relevant Cabinet members.
  - Swale ward members.
  - Kent County Council ward members.
  - Kent County Council Cabinet members.
  - Local MP.
  - Conservative Parliamentary Candidate.
  - UKTI.
  - Locate in Kent.

- **Website -** www.kemsleyenergy.co.uk went live on 13 June 2009.

- **Press activity -** Press releases issued to:
  - Announce proposals (issued 15 June 2009 to Your Swale, KM Sittingbourne, East Kent Gazette, KM Kent Business, Kent Director, South East Business and Kent on Sunday).
  - Promote public exhibitions (issued 23/6/09 and 24/6/09 to Your Swale, KM Sittingbourne, East Kent Gazette)
  - Follow up on public exhibitions (issued 7/7/09 to Your Swale, KM Sittingbourne, East Kent Gazette)

- Promote second round of exhibitions (issued 16/11/09 to Your Swale, KM Sittingbourne, East Kent Gazette, yourcounty.co.uk and onlykent.co.uk)
- Follow up on second round of public exhibitions (issued 30/11/09 to Your Swale, KM Sittingbourne, East Kent Gazette, yourcounty.co.uk and onlykent.co.uk)

- **Adverts**
  - Adverts to promote the first round of public exhibitions about the proposals appeared in the East Kent Gazette (24 June 2009 and 1 July 2009) and the KM Sittingbourne Extra (19 June 2009 and 26 June 2009).
  - Adverts to promote the second round of public exhibitions about the proposals appeared in the East Kent Gazette (18 and 25 November 2009) and the KM Sittingbourne Extra (18 and 25 November 2009).

- **Exhibitions - Exhibitions -** Project exhibitions where held at Kemsley Village Hall on the 2nd and 3rd of July 2009 and the 26th and 27th of November 2009. A further public exhibition was held in Iwade Village Hall on 13th January 2010

- **Helpline**
  - Free helpline (0800 8815429) went live from 1st June 2009.

- **Correspondence received**
  - Dedicated project email set up – info@kemsleyenergy.co.uk
  - Dedicated project address set up – Kemsley Energy Project, Kemsley Mill, Sittingbourne, Kent, ME10 2TD

1.8.11 A programme of post-application public engagement is now to be undertaken and will include; newsletters, existing facility site visits, briefings for decision makers and influencers.

1.9 Assessment Procedure

Time Frames

1.9.1 The Environmental Impact Assessment has identified a range of potential environmental issues, many of which vary in terms of the length of the time they are significant. The key time frames examined within the assessment can be identified as being:

- **Short term**: It is anticipated that the Construction period to the completion of commissioning;
- **Long Term**: Comprising the **operational phase** for the lifetime of the development.

1.9.2 Identified effects can be temporary; direct or indirect; and positive or negative as follows:

- **Temporary/Permanent effects:** In relation to the different time frames, some of the effects would be temporary, for example site clearance and construction, construction noise and traffic, whilst others would be permanent, such as the impact on landscape.
- **Direct/Indirect effects:** The proposed development would have direct effects upon nearby properties and settlements, together with the environment as a whole in relation to emissions of noise and emissions to air, as well as the changing appearance of the site. Indirect impacts can also occur, largely in relation to the transportation of Commercial and Industrial (C&I) waste, Municipal Solid Waste and Solid Recovered Fuel.
- **Positive/Negative effects:** The proposed development could generate both negative effects and benefits, either by virtue of the proposals themselves or as a result of the mitigation measures proposed. Examples of positive effects could be in considered in terms of carbon reduction, energy distribution and heat provision.

1.9.3 Whilst individual environmental impacts, such as noise or air quality have been considered in individual sections of this environmental statement, there is the potential for one environmental subject area to impact upon another; for instance, increasing the volume of traffic along a stretch of road has implications on the noise climate. Such **combined effects** have been addressed in each of the respective sections within this Environmental Statement.

1.9.4 There is also the potential for unrelated impacts, which themselves are not significant, to collectively generate an overall impact that is unacceptable. For example the sum of minor impacts of noise, odour and traffic could collectively produce a significant overall impact. The various impacts assessed within this environmental statement have been considered collectively and it is concluded that no significant effect would arise.

1.9.5 **Cumulative impacts** 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.

1.9.6 Proposed or possible future third party projects identified include:

Identified by Kent County Council:

- A Formal Scoping Opinion has recently been issued for a site at Ridham Dock for a proposed biomass combined heat and power plant. A planning application for the Countryside Recycling site has been made which already has a MRF and composting facility. Another scheme has also been announced in November 2009, nearer to the dock itself for a 25MW p/h energy from waste process which seeks to manage some 150,000 tonnes per annum of waste wood. At this stage there is insufficient information available about the latter scheme to take account of the proposal quantitatively.

Identified By Swale Borough Council:

- Sittingbourne Town Centre regeneration - major regeneration scheme south and north of the railway line. South of the railway line will include new retail floor space, office, community and learning, open space and residential and will be delivered first. North of the railway line will be the second phase of development to include mainly 1000 residential units with open space, school and other community facilities.
- East Hall Farm – (residential development of circa 800 houses).
- Kent Science Park (4ha expansion and new units).
- Kemsley Industrial Development.
- Iwade Expansion (Residential development of 450 houses).
- Thistle Hill (Residential development of 1750 houses).
- Queenborough and Rushenden Regeneration Project (New residential and mixed use development and employment land development).
- Port of Sheerness (Wind farm, Port expansion).
- Northern Relief Road (New access road to relieve the traffic through Sittingbourne. The first section to Eurolink has been approved and will commence construction in the autumn. The final link to Bapchild will go out to consultation on a preferred route later this year).
- Stones Farm (nr Bapchild to the south of East Hall Farm) has been allocated for housing.
- The Meads (near the A249 in Sittingbourne) and Fulston Manor (to the south of Sittingbourne). The Meads is close to completion with retail space being constructed. Fulston Manor is a 615 unit housing scheme.

1.9.7 A formal scoping exercise has been conducted as part of the EIA process, details of which are discussed in 1.8 above. The extent to which the various assessments have been conducted are based on the scoping response and RPS's extensive experience of similar projects.

1.9.8 A fundamental aspect of any EIA is to determine the baseline environmental conditions prevailing at the application site. These form the benchmark against which predicted changes resultant from the development can be assessed to determine the magnitude of any impact. The baseline conditions have been determined by a number of different methods, including desktop studies, site surveys, use of analytical models and the acquisition of data from third parties.

1.9.9 The individual topic impact assessments have taken into account mitigation and enhancement measures that have been incorporated into the design of the development proposals.

1.9.10 Methodologies for predicting the nature and magnitude of any potential environmental impacts vary according to the subject area. Quantitative methods of assessment can predict values that can be compared against published thresholds and indicative criteria in Government guidance and standards. It is not always possible though to ascribe values to environmental assessments, and thus qualitative assessments are used: such assessments rely on previous experience and professional judgement. The methodologies used for assessing each topic areas are described within the individual assessment chapters.

1.9.11 The potential and residual impacts have been ascertained in accordance with terminology appropriate to the topic specific guidance/regulations. Where these are not available, the following levels of significance have be used:

- Neutral
- Minor
- Moderate
- Major
- Substantial

1.9.12 Where an effect is described as 'neutral' this means that there is no effect or that the significance of any effect is considered to be negligible. All other levels of significance apply to both adverse and beneficial effects.

1.9.13 Finally, if significant environmental impacts are predicted in the EIA process, then the ES provides mitigation measures over and above those already incorporated into the development proposals that can be employed to eliminate or ameliorate the impact to acceptable levels. Mitigation measures can be in the form of changes to operational practice, or changes/additions to the design of the facility. Accordingly, the EIA process forms part of an iterative design process.

1.10 Technical Issues

1.10.1 Technical difficulties encountered and limitations of assessments and how we have dealt with these limitations are detailed within individual chapters and summarised below.

1.10.2 **Traffic:**. No technical issues have been encountered.

1.10.3 **Air Quality:** For the assessment, data have been obtained from a comprehensive range of local and national sources. 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. The approach adopted in defining background pollutant concentrations is considered robust and conservative, and complies with the approach recommended by government guidance.

1.10.4 **Ecology:** No technical issues have been encountered.

1.10.5 **Ground Conditions:** The field work undertaken, including the site walkover, was limited by the ground conditions on site. In areas impenetrable site vegetation hampered field work. Intrusive works were undertaken within the site and to the north west beyond the site boundary.

1.10.6 **Noise Assessment:** It is considered that the data presented are representative of the typical noise climate of both the area and the given locations.

1.10.7 **Archaeological Assessment:** The baseline data sources used in desk based assessments can carry a degree of uncertainty. These include:

- The Sites and Monuments Record can be limited because it depends on random opportunities for research, fieldwork and discovery. This is particularly true in this case, where there have been no pieces of documented archaeological fieldwork having been undertaken within the immediate vicinity of the centre of the application area.
- Documentary sources are rare before the medieval period, and many historic documents are inherently biased. Older primary sources often fail to accurately locate sites and interpretation can be subjective.
- Geotechnical logs that describe made ground do not necessarily preclude the existence of archaeological deposits. Made ground could either be imported/disturbed material of no archaeological value or may actually be archaeological deposits.

1.10.8 **Socio-economic Assessment:** The main limitations of the baseline surveys are that they are based upon the 2001 Census Data and are therefore 8 years old. Information on many of the topics which the census covers is not updated between the Censuses. It is not clear therefore whether the social and economic conditions revealed by the analysis above have changed significantly. However, insofar as the availability of more recent data (for example on unemployment) would enable firm conclusions to be drawn, it is concluded that the baseline conditions will not have fundamentally changed in the intervening period.

1.10.9 **Receptors and Monitoring:** In considering the potential impacts of the proposals on nearby properties, it should be noted that observations and measurements were generally made from public areas (such as rights of way and highways). It is considered that this has not prevented the accurate assessment of potential environmental impacts or the identification of appropriate mitigation measures.

Despite the technical difficulties and limitations outlined above, it is considered that the information contained within this environmental statement is sufficient for the environmental impacts associated with the proposed development to be adequately assessed.

1.11 Organisation of the Environmental Statement

1.11.1 The ES has been prepared in accordance with the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 and comprises the following 6 volumes:

- Non Technical Summary;
- The main ES text (subdivided into Chapters); Volume 1

- The main ES text (subdivided into Chapters); Volume 2
- Supporting Technical Appendices (1 to 8); Volume 1
- Supporting Technical Appendices (9); Volume 2
- Supporting Technical Appendices (10 to 12); Volume 3
- Supporting Technical Appendices (12 to 16); Volume 4

1.11.2 Volumes 1 and 2

The Non Technical Summary has been prepared as a free-standing document. It has been written to enable members of the public, without specialist knowledge, to understand the proposals and their likely effects on the environment. A non-technical summary is specifically required under the EIA Regulations.

The ES considers the impacts of the development on its environment on a subject-by-subject basis. Each subject area is discussed under a separate chapter within which the following matters are addressed where relevant:

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

1.11.3 The individual chapters are summarised below.

1.11.4 **Chapter 1: Introduction;** comprises an introduction setting out the key issues considered and the context of the development proposals, and the general assessment procedures.

1.11.5 **Chapter 2: The Site and Its Setting**; describes the physical and environmental characteristics of the application site and its surrounding environs.

1.11.6 **Chapter 3: Planning History and Policy Context;** describes the planning history of the site and the national, regional and local planning policy context of the proposal;

1.11.7 **Chapter 4: Description of Development;** describes the development proposals for which planning permission is sought and for which the assessments have been carried out. It also provides a summary of estimates, by type and quantity, of expected residues and emissions associated with the development proposals.

1.11.8 **Chapter 5: Needs and Alternatives;** assesses the need for the facility, and the proposed development and alternatives considered .

1.11.9 **Chapter 6: Traffic and Transportation Issues;** assesses the transport and traffic issues associated with the Scheme;

1.11.10 **Chapter 7: Air Quality;** assesses the air quality impacts of construction and operation of the Scheme including consideration of associated human health issues.

1.11.11 **Chapter 8: Landscape and Visual Impact;** assesses the landscape and visual impact issues associated with the Scheme;

1.11.12 **Chapter 9: Ecology and Nature Conservation;** assesses ecology and nature conservation issues associated with the Scheme;

1.11.13 **Chapter 10: Hydrology and Flood Risk;** considers the hydrology and flood risk issues;

1.11.14 **Chapter 11: Hydrogeology and Ground Conditions;** considers the hydrogeology, contamination and geotechnical issues including human health impacts in relation to contamination;

1.11.15 **Chapter 12: Noise and Vibration;** assesses noise climate and likely noise impacts of construction and operation of the facility including road traffic noise associated with the Scheme;

1.11.16 **Chapter 13: Archaeology and Cultural Heritage;** assesses the archaeological and cultural heritage issues associated with the Scheme;

1.11.17 **Chapter 14: Socio Economic Impacts;** assesses the socio-economic issues;

1.11.18 **Chapter 15: Amenity;** assesses impact of the development on the amenity of the area;

1.11.19 **Chapter 16: Summary;** summarises the above sections and draws conclusions regarding the overall effects of the proposed Scheme.

1.12 Definition of Key Terms

1.12.1 The terms 'impacts' and 'effects' are used throughout this statement. They are defined as follows:

- **Impacts:** These are any changes to the environment that are attributable to the development proposal.
- **Effects:** These are the results of the changes on specific receptors or resources.

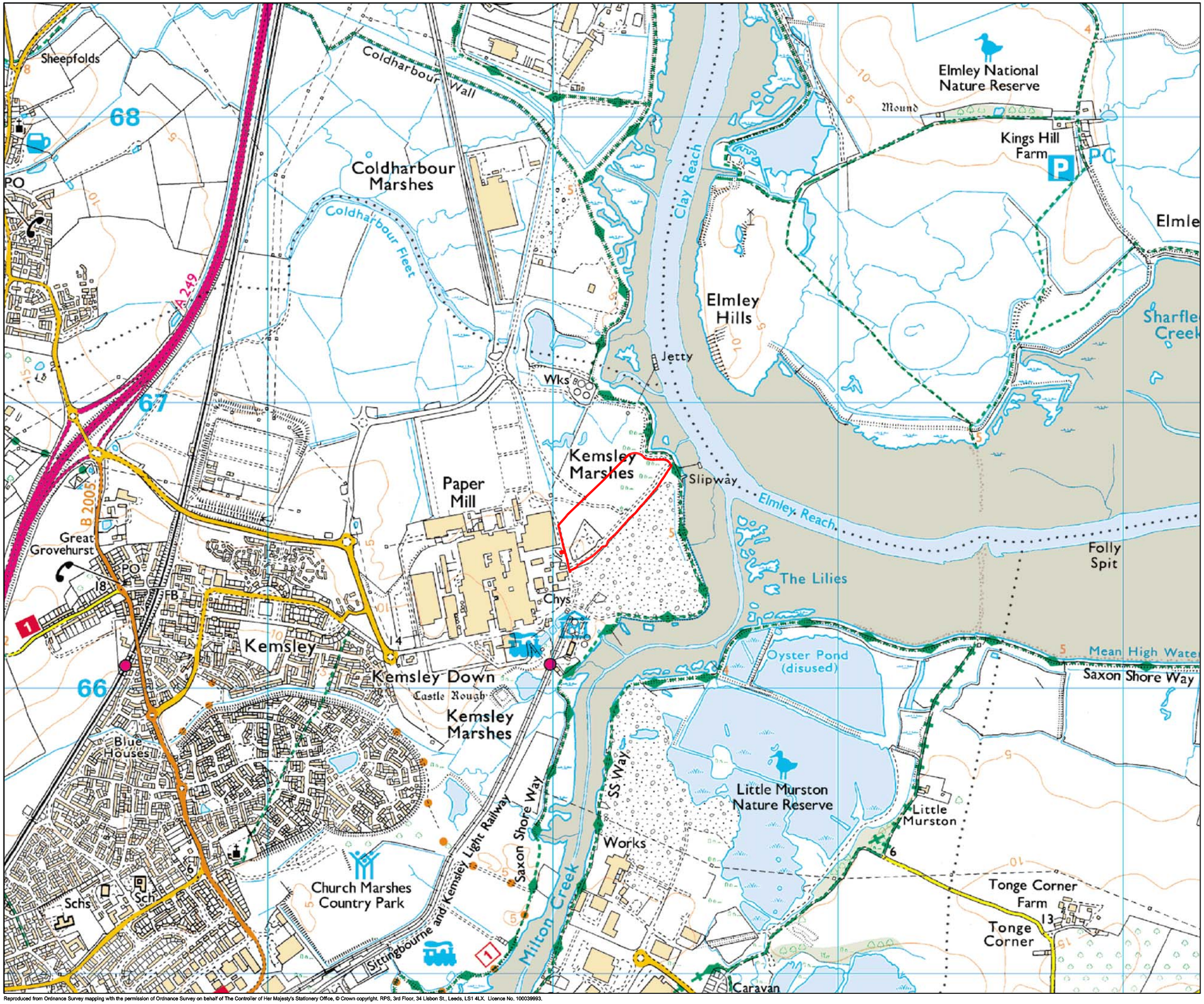
1.12.2 On occasions impacts and effects will be one and the same e.g. land take from an ecologically sensitive area is both an impact and effect. At other times they can be clearly distinguished e.g. an increase in noise levels may be an impact that affects nearby residents and wildlife.

1.12.3 Receptors and resources are defined as:

- **Receptors:** These are the people and the flora and fauna, directly affected by impacts or may be indirectly affected through impacts on their surroundings.
- **Resources:** These are the 'capital assets' of the environment such as habitats, cultural heritage and landscape, which constitute the environment that people and the flora and fauna inhabit.

1.12.4 Key Stakeholders are considered to be:
Kent County Council; Swale Borough Council; Environment Agency; Natural England; Government Office for the South East; Kent Wildlife Trust; RSPB; Health Protection Agency, Primary Care Trust; local residents, businesses, landowners and opposition groups.

1.12.5 Publicity and consultation carried out in relation to the project has sought engagement with these and other community groups.



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PROJECT

Kemsley Sustainable Energy Plant

TITLE

Site Location

SCALE	DRAWN BY
1:10000 @A3	LB
DATE	CHECKED
October 2009	JS
CAD FILE	

PROJECT NUMBER	DRAWING NUMBER	REV
DLE1726	Figure 1.1	

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25m SCALE 1:1250

	Land Ownership Boundary
	Proposed Development Boundary

Note: Reference to OS of existing paper mill provided by St Regis Paper Mill in DWG format and topographical survey provided by Eon.

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rev	amendments	by	chd	date

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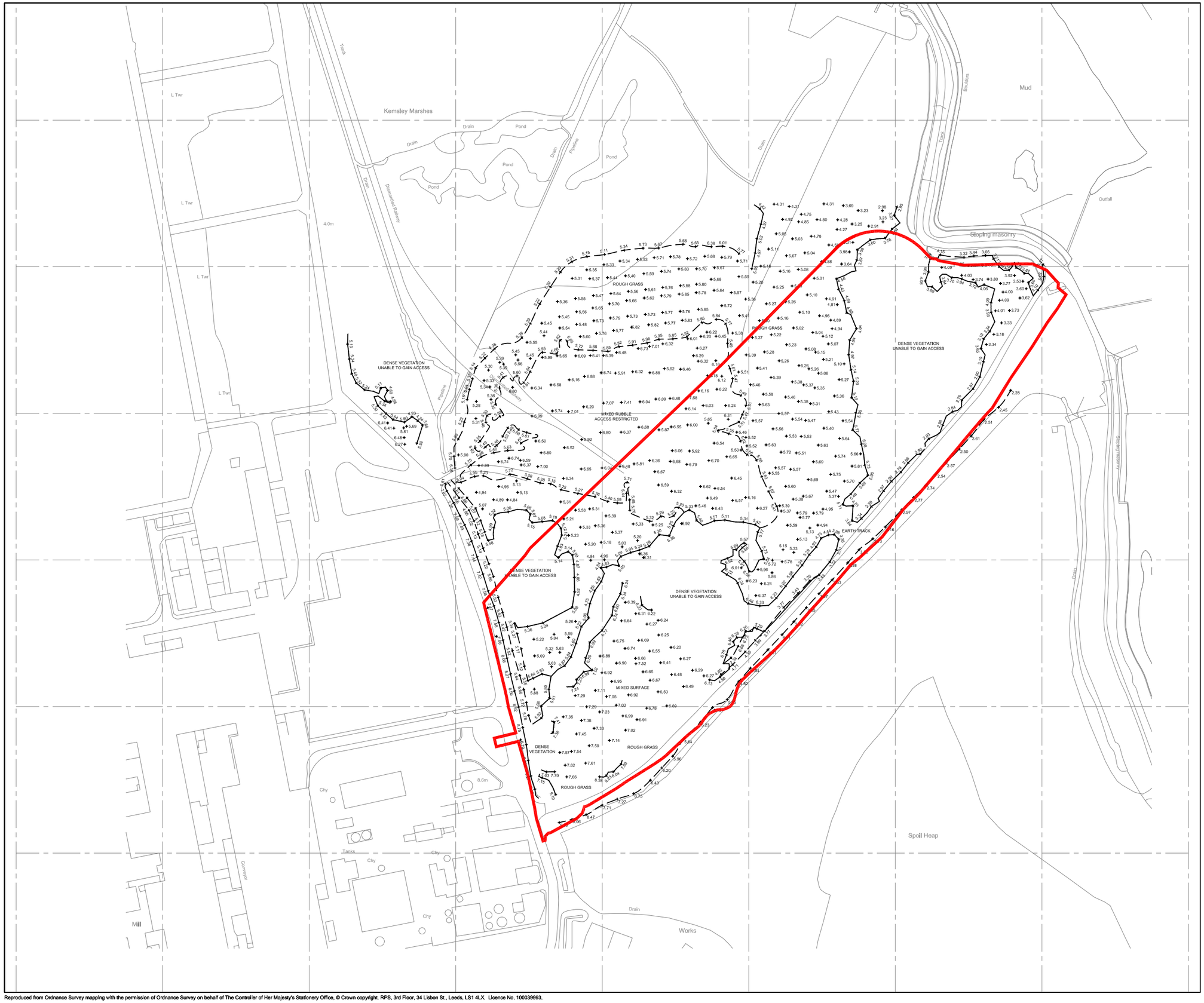
Project: Kemsley Sustainable Energy Plant

Title: Proposal Site

Drawing Status	Date Created	Drawing Scale
Preliminary	March 2010	1:1250
Project Leader	Drawn By	Initial Review
RS	AJL	PRP

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FIGURE 1.2



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6.16 Spot Levels (mAOD)

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PROJECT

Kemsley Sustainable Energy Plant

TITLE

Site Topography

SCALE	DRAWN BY
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DATE	CHECKED
October 2009	JS

CAD FILE

PROJECT NUMBER	DRAWING NUMBER	REV
DLE1726	Figure 1.3	

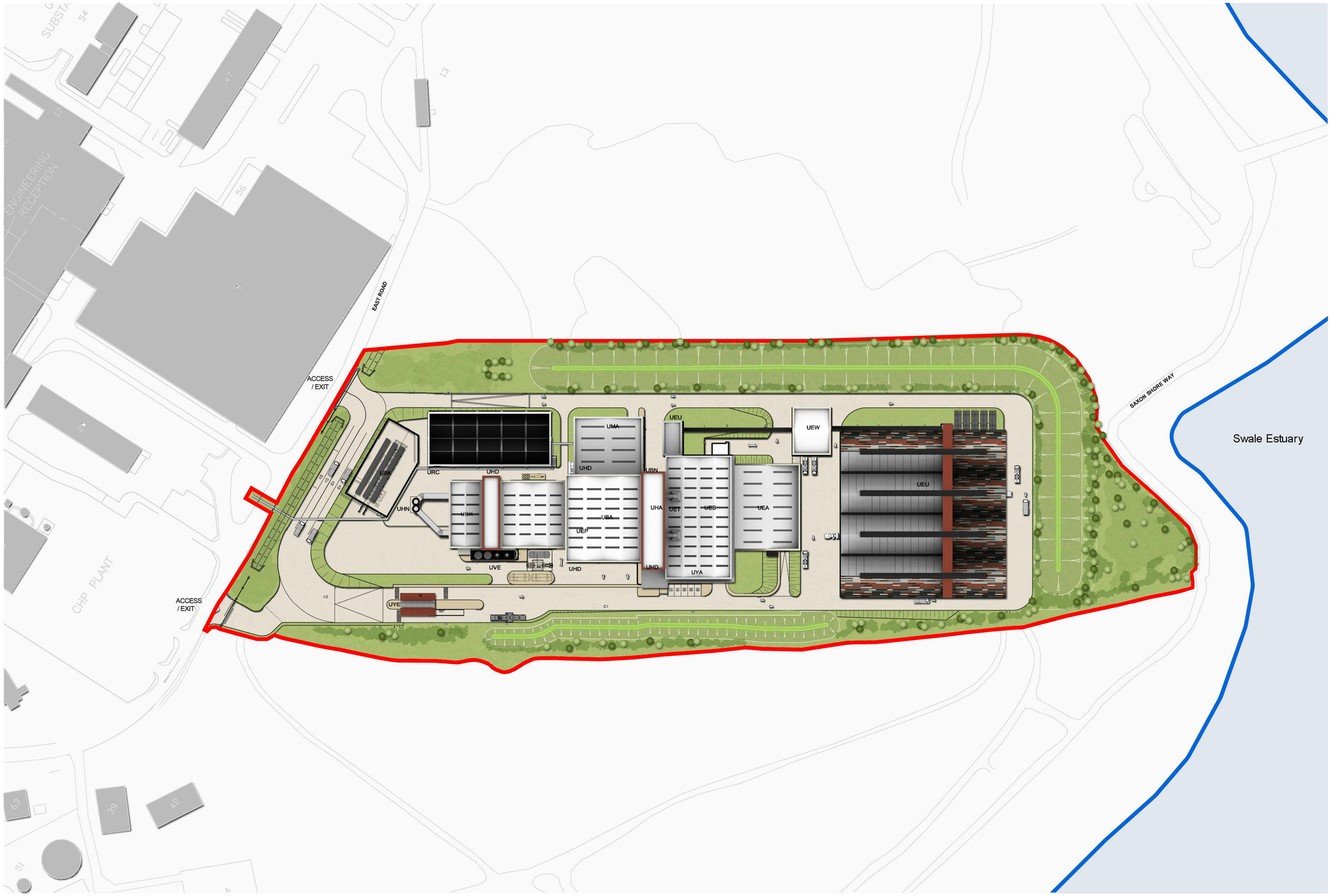
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10m SCALE 1:1000



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
	Proposed Development Boundary

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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

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Client: St Regis / E.ON

Project: Kemsley Sustainable Energy Plant

Title: Proposed Site Layout

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Preliminary	November 2009	1:1000
Project Leader	Drawn By	Initial Review
RS	AJL	PRP

Drawing Number: 16315 / A1 / P / 0100 Rev E

FIGURE 4.3

DEVELOPMENT OF A SUSTAINABLE ENERGY PLANT.

KEMSLEY PAPER MILL, SITTINGBOURNE, KENT

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

ENVIRONMENTAL STATEMENT

CHAPTER 2:

THE SITE AND ITS SETTING

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RPS Planning & Development

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Figure 1.2: Proposal Site
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2 The Site and its Setting

2.1 Introduction

2.1.1 This chapter of the Environmental Statement describes the physical and environmental characteristics of the scheme, site and surrounding environs. Other chapters of the Environmental Statement provide detailed descriptions of the application site in relation to particular environmental topics, providing "baseline" surveys against which the effects of the proposals may be evaluated.

2.2 General Location

2.2.1 The site (OS Grid reference 592070, 16651) is located on land adjacent to and immediately north east of the existing Kemsley Paper Mill as indicated in Figure 1.1. The site lies within the ward of Kemsley (0.85km to the south west) and Milton Regis (2.6km to the south west). Sittingbourne is approximately 2.5km south of the proposal site and is located centrally within north Kent. The town of Maidstone is 19.5km to the south west, and Gillingham is 15km to the west.

2.3 Site Description

2.3.1 The site lies on the industrial northern edge of Sittingbourne, which forms the largest settlement within the district of Swale. Development dates mainly from the 19th and 20th centuries, clustered around the A2 and railway which pass through the centre of the town. The rapidly expanding industrial and commercial district which extends from the edge of Sittingbourne north to Ridham Docks forms the immediate context to the site.

2.3.2 The proposal site extends to some 7.0 hectares of which 4.6 hectares is proposed built development, the extent of which is shown in Figure 1.2.

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

2.3.4 The site is accessed from the A249 *via* Swale Way (Western Entrance) or from Swale Way onto Barge Way (Northern Entrance). An internal access road which runs to the south and east of the paper mill buildings provides access to Swale Way.

2.3.5 The proposed development site has been previously used for temporary storage and as a lay down area, with the wider area to the north comprising areas of reed bed. 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, profiled, capped and levelled and are covered by scrub vegetation and grassland. One tip to the south east of the site remains visible.

2.3.6 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 edge of the site as it runs southwards away from Ridham Dock. The topography of the site is shown on Figure 1.3.

2.4 Access and Right of Way

2.4.1 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. Swale Way (opened in 2005) serves a number of industrial uses in the area including Kemsley Mill, Morrisons, Knauf and Ridham Dock. Swale Way has a junction with the B2005 (A249 (T) to Sittingbourne) approximately 1.7km west of the site. The A249 (T) (Queensborough to M2) has junctions with both the A2 (Gillingham to Faversham) and M2 (Gillingham to A2) approximately 4.8km and 7.8km south west of the site respectively.

2.4.2 There are no public rights of way which cross the site. The closest footpath is the Saxon Shore Way long distance path which follows the top of the sea defences which line The Swale and Milton Creek. The path to the east of the proposal site extends along the Kent coastline throughout the Swale District.

2.5 The Surrounding Area

Residential Areas

2.5.1 There are no residential receptors located adjacent, 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

2.5.2 The land is disturbed and its character is heavily influenced by its location within the urban fringes of Sittingbourne. Consequently the site cannot be defined as wild. However, the adjoining open water, mud flats and salt marshes of the Swale have a wild character and provide a strong contrast to the site and its immediate context.

2.5.3 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 (SSSI), Special Protection Areas (SPAs) and are also internationally designated RAMSAR sites.

2.5.4 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.

2.5.5 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.

2.5.6 The closest area designated for its nature conservation interest is the Milton Creek, Sittingbourne Site of Importance for the Nature Conservation (SINC), a local designation. The SINC is important for the existence of salt marsh, 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

2.5.7 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.

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

- ‘Castle Rough’ Medieval Moated Site
- Murston Old Church, Sittingbourne

2.5.9 Eighteen additional Scheduled Ancient Monuments, 25 Grade 1 and 43 Grade 2* listed buildings are recorded within a 10km radius.

2.6 Landscape Character

Landscape Designations

2.6.1 There are no designated landscapes which lie within the site area. The Swale Borough Local Plan recognises that the coastal landscapes and coastal margins enhance the value of the Borough's landscape. This is supported, in part, by the designation of a Special Landscape Area which extends over the Swale and adjoining coastal landscape. The area includes the Chetney and Greenborough Marshes which adjoin the site and extend along Milton Creek. This area is valued for the open character of its landscape.

2.6.2 Other designated landscapes within the Borough include an Area of High Landscape Value approximately 1km to the south east of the site. This area of landscape lies inland of the marshes and coincides primarily with the Teynham Fruit Belt. The Kent Downs Area of Outstanding Natural Beauty lies on high land approximately 10km to the south east of the site.

Land Use

2.6.3 The majority of the site is currently disused. The southern corner of the site contains a small area of storage for materials and vehicles with associated access tracks. Vegetation on site has occurred through natural colonisation and is unmanaged.

Topography

2.6.4 The proposal site and the majority of its surroundings are relatively flat and lie at approximately 5m AOD within the coastal plain of The Swale estuary. The tidal mud flats and shingle beaches of the Swale lie beyond the sea defences to the east. The restored landfill site immediately to the south rises to approximately 15m high. This man made landform forms an uncharacteristic and distinctive feature in the flat estuarine landscape. The land rises gradually over the Kent plains to the south before rising more steeply to form the North Downs, which rise to approximately 200m AOD 10km to the south.

Vegetation

2.6.5 The site supports a mixed range of ruderal weeds and woody vegetation which have colonised the most of this disused location. Dog rose (Rosa canaina), elder

(Sambucus nigra), hawthorn (Crataegus monogyna) and silver birch (Betula pendula) up to approximately 3m high are scattered sporadically throughout the site.

Views

2.6.6 The site is currently concealed in views from the majority of the settlement of Sittingbourne by industrial development on the edge of the town and the restored landfill mound. To the north of the site, where views are less constrained, the Saxon Shore Way long distance footpath forms the closest visual receptor as it follows the alignment of the sea defences. Views can be gained from a section of path which extends approximately 2km north along the edge of the Swale from the site. The industrial edge of Sittingbourne forms a dominant urban influence within views from this section of the path and may therefore be less attractive to walkers.

2.6.7 Views of the site from the premises along the industrial edge of Sittingbourne would be fragmented by industrial development and gained by people at their place of work. The gently rising, open landscape of the Isle of Sheppey to the north east contains several small settlements, public rights of way and roads which provide views of the site. The industrial townscape of Sittingbourne is visible as an expanse of development along The Swale, of which the site forms a small fragment of disused land.

2.6.8 The Swale forms a transport corridor which defines the edge of Sittingbourne and divides the towns' industrial edge from the salt marsh, mudflats and open water of the estuary at Elmley Reach and Clay Reach. Views from occupants of vessels would be gained towards the site with a backdrop of dominant industry at Kemsley Paper Mill.

Existing Landscape and Townscape Character

2.6.9 The landscape and townscape character context is identified at different levels, with the Countryside Character Initiative (CCI) and English Nature's Natural Areas Map (1999) providing the broader framework to determine the character of the British countryside at a national level. Within the CCI character map, the 15km radius study area lies within Character Areas 81 Greater Thames Estuary, 113 North Kent Plain and 119 North Downs.

Local Landscape Character Assessment

2.6.10 The character of the local landscape within the Borough of Swale has been assessed as part of the Swale Landscape Character Assessment and Guidelines, March 2005. This assessment has identified 42 landscape character areas within the district. Those within 3km of the site include 01 Elmley Marshes, 02 Elmley Island, 06 South

Sheppey Marshes and Mudflats, 11 Chetney and Greenborough Marshes, 12 Lower Halstow Clay Farmlands, 14 Iwade Arable Farmlands, 26 Teynham Fruit Belts and 27 Luddenham and Conyer Marshes.

2.6.11 The proposal site forms part of the Sittingbourne urban area which lies outside any of the landscape character areas identified within the Swale Borough Councils assessment. However, the settlement which lies within the study area can be divided into 2 separate townscape character areas which display distinct characteristics, Sittingbourne Industrial/Commercial and Sittingbourne Residential. The following key characteristics of the townscape areas can be defined as follows;

- Large scale industrial development in flat topography adjoining The Swale.
- Complex skyline of built forms contrasting with strong vertical elements of stacks, pylons and cranes.
- Active, at times visually chaotic, townscape due to operations and construction activities.
- Noisy environment with HGV traffic and noxious odours.
- Smaller scale light industrial and commercial development adjoining Milton Creek.
- Rapidly changing and expanding character area with remnants of past industrial heritage.
- Extensive urban fringe having striking contrast with the adjoining natural landscape of The Swale.
- Linear tree belts and screens and blocks of scrub and woodland surrounding development.

Kent Historic Landscape Characterisation.

2.6.12 The Kent Historic Landscape Characterisation (May 2001) recognises that *"landscape is dynamic and constantly changing in a manner that reflects the immediate preoccupations, future aspirations and past activities of societies and individuals".* Historic landscape characterisation identifies *"characteristic patterns of change and important relics of past change".*

2.6.13 The site lies within Historic Landscape Character Area 17: Northern Horticultural Belt. Within this area the site lies within the Historic Landscape Type 12.4: Large Scale

Industry. At paragraph 4.36 the report states *"Although primarily rural in nature, Kent has a considerable quantity of industrial areas, abandoned or otherwise, which account for 1.78% of the county's land surface. For the most part industrial activity tends to be confined to the areas adjacent to major urban centres, ie. east of Maidstone, although significant groupings can also be found in the coastal areas".* The site is associated with the extensive strip of industrial land uses which form the northern edge of the settlement of Sittingbourne where it adjoins The Swale.

2.7 Planning History

2.7.1 The manufacture of paper in Sittingbourne has taken place for over 300 years. In 1924, Kemsley 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.

2.7.2 The wider Mill site has a long and complex planning history with numerous planning consents having been approved and implemented since the 1970's. There have been other major planning applications locally, but those planning consents considered to be most relevant to this proposed development are summarised in Tables 1 to 4 below:

Table 1: Combined Heat and Power (CHP) Plant

LPA Ref	Year	Description	Decision
SW/92/999	1992	An application made under S.36 of the Electricity Act 1989 for the Construction and operation of a combined heat and power gas turbine generating station.	Approved by the Secretary of State for Trade and Industry 27.08.93
SW/98/0218	1998	Extension to existing CHP plant to deal with paper related wastes from Kemsley and Sittingbourne paper mills (County Matter).	Approved by Kent County Council 23.09.98
SW/00/0031	2000	Application pursuant to SW/98/218 to reduce the design capacity of the combustion plant	Approved by Kent County Council 07.04.00

Table 2: Kemsley Landfill Site

LPA Ref	Year	Description	Decision
SW/76/453	1976	Disposal of rubbish	Approved by Kent County Council 20.09.1977
SW/91/0793	1991	Re-application of planning permission for continued use of land for waste disposal	Approved by Kent County Council 28.01.93
SW/93/626	1993	Recontouring and extension of existing landfill site and restoration.	Approved by Kent County Council 11.04.94
SW/98/1026	1998	Extension of time to the waste disposal operations permitted at the existing Kemsley Landfill from 2003 to 2013.	Approved by Kent County Council 16.03.99

Table 3: Land to the North of Kemsley Mill

LPA Ref	Year	Description	Decision
SW/98/367	1998	Construction of hard standing for the storage of paper bales and overnight lorry parking, associated engineering works and erection of fencing and fire hydrants.	Approved by Swale Borough Council 03.11.98

Table 4: Land at Kemsley Mill

LPA Ref	Year	Description	Decision
SW/94/0064	1994	The construction of a paper recycling facility and associated facilities	Approved by Swale Borough Council 29.04.94
SW/04/1547	2004	Building to house raw material processing equipment and alterations to site perimeter road.	Approved by Swale Borough Council 16.12.04
SW/06/0013	2006	New distribution and transfer enclosure.	Approved by Swale Borough Council 06.01.06
SW/06/0824	2006	Building to house raw material processing equipment and alterations to site perimeter road.	Approved by Swale Borough Council 17.07.06

2.7.3 In September 1977, Kent County Council granted planning permission (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. Applications SW91/0793, SW/93/626 and SW98/1026 have subsequently been granted by Kent County Council for retention of use, recontouring and extension of the landfill site and an extension of time to permit operations at the site from 2003 to 2013 respectively.

2.7.4 On 27 August 1993, the Secretary of State for the Department of Trade and Industry granted permission for the construction and operation of a Combined Heat and Power gas turbine generating station with a capacity of 80MW . 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.

2.7.5 The CHP plant comprises one gas turbine, two waste heat recovery boilers 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.

2.7.6 In April 1994, Swale Borough Council granted planning permission (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.

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

2.7.8 Kent County Council granted planning permission 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.

2.7.10 A further planning permission (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 now lapsed consent related to the area of land on which the new Sustainable Energy Plant is proposed.

2.7.11 In December 2004, Swale Borough Council granted planning permission (reference SW04/1547) for a building to house raw material processing equipment and alterations to the perimeter road. Application SW/06/0824 was for a similar proposal; however the alterations to the existing road went beyond minor alterations to the highway and incorporated a new road layout which skirted existing reservoirs close to the south eastern corner of the site. Application SW/09/0627 (Renewal of planning permission SW/06/0896) was approved in August 2009, enabling the existing car park (currently located to the south of the mill reception) to be extended and improved for disabled and visiting users.

DEVELOPMENT OF A SUSTAINABLE ENERGY PLANT.

KEMSLEY PAPER MILL, SITTINGBOURNE, KENT

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

ENVIRONMENTAL STATEMENT

CHAPTER 3:

PLANNING POLICY FRAMEWORK

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RPS Planning & Development

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Appendix 3.1 Development Plan Policies

3 Planning Policy Framework

3.1 Introduction

3.1.1 This chapter of the Environmental Statement sets out the current planning policy framework relevant to the proposed development.

3.1.2 Rather than assessing the development proposals against the policy framework, the intention of this chapter is to provide the planning policy framework within which the proposals should be considered.

3.1.3 Individual chapters throughout the Environmental Statement assess the proposals within the context of the relevant policies. A detailed assessment against the relevant policies is contained within the Planning Application Supporting Statement.

3.2 Policy Framework

3.2.1 Chapter 1 of this Environmental Statement sets out the statutory requirements for the content of an Environmental Statement (ES). From this, it can be seen that Schedule 4 to the Town and Country Planning (Environmental Impact Assessment) (England and Wales) 1999 (EIA Regulations) does not make any specific reference to the inclusion of an assessment of planning policy. Chapter 6 of the Department of Transport, Local Government and the Regions "Good Practice Guide on the Preparation of Environmental Statements includes sections on 'Policies and Plans'. At paragraph 6.1 it states:

"An ES should include a section on policies and plans which are relevant to the environmental assessment of the development in question. The rationale for this is stated as "The objective is to demonstrate how these policy guidelines have been taken into account in developing the project and compiling the ES, and to provide a picture of the decision making context in which environmental impact will be evaluated."

3.2.2 The Government is committed to a plan led system, with the development plan forming the basis of all planning decisions. Accordingly, policy and plans play an important role in determining any planning application. It is normal practice therefore to include an assessment of policy considerations within the supporting documentation for the planning application. This section provides an overview of the policies that have been considered in undertaking the Environmental Impact Assessment.

3.2.3 This section sets out the broad planning policy framework within which the planning assessment will be undertaken. Planning policies are developed at national, regional and local levels, and for each, the policies considered to be most relevant are detailed below. National policies set out in a series of planning policy guidance notes and planning policy statements, provide a framework within which local planning authorities are required to draw up their development plans and take decisions on individual applications. Development Plans are examined by the Secretary of State to ensure consistency with national guidance and general conformity with regional guidance. Planning Policy Statement 1: Creating Sustainable Communities and Section 38 of the Planning and Compulsory Purchase Act 2004 reaffirms the Government's commitment to the plan led system.

3.2.4 Under this approach applications for planning permission are determined in accordance with the approved development plan, unless material considerations indicate otherwise.

3.2.5 It is not intended to address every aspect of the guidance that could have some bearing on the proposal within this chapter, but rather to identify those matters that are particularly relevant in assessing the compatibility of the proposals with key elements of the policy or guidance.

3.3 Energy & Waste Policy

Introduction

3.3.1 National Policy relating to waste management, like many other matters including Environmental Impact Assessment, is derived from a number of European Directives. These include the Waste Framework Directive (75/442/EEC as amended by 91/156/EEC, 2006/12/EC); the Hazardous Waste Directive (94/31/EEC); the Packing and Packaging Waste Directive (94/62/EEC) and most recently the Landfill Directive (99/31/EC).

3.3.2 Historically, waste strategy has focused on controlling waste disposal to prevent unacceptable harm to human health and the environment. The introduction of the Environmental Protection Act 1990 changed the focus to the management of waste to "cradle to grave", introducing concepts such as Best Available Techniques Not Entailing Excessive Cost (BATNEEC) and "Duty of Care". Most recently, the strategic approach to waste management has been updated through the Landfill Directive (implemented in the Landfill Regulations). This introduced the concept of sustainability into waste management planning. A key aim of the Landfill Directive is to reduce the volumes of biodegradable municipal waste sent to landfill. This European legislation has been translated into National Policy through Waste Strategy 2007.

Waste Framework Directive (75/442/EEC, amended by Directives 91/156, 91/692 and 96/350)

3.3.3 This EU Directive establishes the principle that the essential objective of all provisions relating to waste disposal must be the protection of human health and the environment against harmful effects. It states that the recovery of waste and the re-use of recovered materials should be encouraged in order to conserve natural resources. It also introduces measures designed to implement these principles.

3.3.4 Waste Framework Directive (2006/12/EC) of the European Parliament and of the Council of 5 April 2006 on waste establishes the legislative framework for the handling of waste in the Community. It defines key concepts such as waste recovery and disposal and puts in place the essential requirements for the management of waste such as moving waste up the waste hierarchy. It also establishes major principles such as an obligation to handle waste in a way that does not have a negative impact on the environment and human health, an encouragement to apply the waste hierarchy and, in accordance with the polluter-pays principle, a requirement that the costs of disposing of waste must be borne by the holder of waste, by previous holders or by the producers of the product from which the waste came.

3.3.5 The Common Position adopted by the Council of the European Union (20 December 2007) with a view to the adoption of a Directive of the European Parliament and of the Council on waste and repealing certain Directives relates to the preference of recovery operation over the disposal of waste.

3.3.6 Paragraph 14 of Article 3 defines recovery as:
'any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy.'

3.3.7 Paragraph 18 (Article 3) defines disposal as:
'any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy.'

3.3.8 Article 11 defines the waste hierarchy as follows and states that it should be applied as a guiding principle in waste prevention and management legislation and policy:
a) prevention;
b) preparing for re-use;
c) recycling;

d) other recovery, e.g. energy recovery; and

e) disposal.

3.3.9 When applying the waste hierarchy, measures should be taken to encourage the options that deliver the best overall environmental outcome. This may require specific waste streams departing from the hierarchy where this is justified by life-cycle thinking on the overall impacts of the generation and management of such waste.

3.3.10 The European Parliament's Environment Committee has amended the Waste Framework Directive to allow efficient waste-to-energy plants to be classified as 'recovery' operations rather than disposal. A crucial aim for MEP's (Members of European Parliament) is to reduce the amount of landfill and incineration. MEP's backed the position to classify Waste to Energy as recovery – provided plants meet an energy efficiency standard. The Confederation of European Waste-to- Energy Plants has welcomed this recognition of Waste to Energy's (WTE) place in the waste hierarchy as a better option than landfilling. WTE is essentially the same as Energy from Waste (EfW).

The 1999 Landfill Directive (1999/31/EC)

3.3.11 The 1999 Landfill Directive was introduced in order to prevent, or reduce as far as possible, the negative effects of landfilling waste. It requires Member states to draw up strategies for a reduction in the quantity of 'bio-degradable municipal solid waste' disposed of to landfill.

3.3.12 This is to be achieved in three successive stages, as follows:

- By 2010 to reduce the Biodegradable Municipal Waste (BMW) landfilled to 75% of that produced in 1995;
- By 2013 to reduce the BMW landfilled to 50% of that produced in 1995; and
- By 2020 to reduce the BMW landfilled to 35% of that produced in 1995.

3.3.13 Directly linked to the Landfill Directive is the Landfill Allowance Trading (England) Regulations 2004 as described in the following section.

3.3.14 The Regulations also introduce the concept of pre-treatment of waste. This requires that with immediate effect, any landfill that has been granted its licence since July 2001 must only take waste that is pre-treated. From July 2004, all hazardous sites must only take waste that is pre-treated.

Landfill Allowance Trading Scheme (LATS)

3.3.15 The Landfill Allowance Trading Scheme (LATS) implemented under the Waste and Emissions Trading Act (2003) began on April 1st 2005. It requires a progressive reduction in the amount of Biodegradable Municipal Waste (BMW) landfilled by the UK from 2005/06.

3.3.16 Allowances to deposit BMW to landfill have been allocated by DEFRA to Waste Disposal Authorities for each year until 2020. LATS introduces a degree of flexibility into the system by allowing trading of permits between Waste Disposal Authorities. WDAs also have the opportunity to "bank" and "borrow" permits for future years. However, if, following trading, an authority exceeds their quota, a financial penalty of £150 is enforced for every tonne of biodegradable waste taken to landfill in excess of the permitted allowance.

Directive on Integrated Pollution Prevention and Control (IPPC) (96/61/EC)

3.3.17 This Directive establishes the IPPC process as a means of achieving a high level of protection of the environment, taken as a whole by, in particular, preventing or (where that is not practicable) minimising and controlling emissions into air, water and land. It requires regulators to set permit conditions to achieve a high level of protection for the environment as a whole.

Directive on Waste Incineration (2000/76/EC)

3.3.18 This EU Directive introduced stringent operating conditions and sets minimum technical requirements for waste incineration and co-incineration. The requirements of the Directive have been developed to reflect the ability of these facilities to more cost effectively achieve high standards of emission control in comparison to the 1980s. It covers virtually all waste incineration and co-incineration plants.

3.3.19 The main aim of the Directive is to prevent and limit adverse environmental effects by emissions to air, soil, surface and ground-water, and the resulting risks to human health, from the incineration and co-incineration of waste. It is not of itself concerned with the place of incineration in waste management strategies, but with ensuring that these facilities continue to be appropriately regulated.

Strategic Planning for Sustainable Waste Management: Guidance on Option Development and Appraisal (October 2002).

3.3.20 This guidance was published by the Office of the Deputy Prime Minister (ODPM) in October 2002 and is aimed primarily at the waste Regional Technical Advisory Bodies (RTABs) to assist them in advising on the preparation of Regional Waste Strategies. However, it emphasises the need for significant investment in new and upgraded waste management facilities to achieve the Government's targets for waste recycling/composting and the fact that "waste management is central to the sustainable development agenda". It also endorses an integrated approach and a long-term approach, referred to as a "planning horizon of at least 20 years".

3.3.21 The above legislation is implemented through the Environmental Permitting Regulations 2007, the Waste Strategy for England 2007, and PPS10.

Waste Strategy for England 2007, May 2007

3.3.22 The National Waste Strategy is part of the implementation for England of the requirements within the Framework Directive on Waste, and associated Directives to produce waste management plans. The European Landfill Directive (Council Directive 1999/31/EC) sets targets for the reduction of biodegradable municipal waste sent to landfill. These targets were incorporated into the National Waste Strategy (Waste Strategy 2000).

3.3.23 Since that time the National Waste Strategy has been taken forwards to the Waste Strategy for England 2007 issued in June 2007 as a white paper (WS 2007). This new strategy builds on Waste Strategy 2000 (WS2000) and the progress since then but aims for greater ambition by addressing the key challenges for the future through additional steps.

3.3.24 The Government's key objectives as set out in the strategy are to:

- decouple waste growth (in all sectors) from economic growth and put more emphasis on waste prevention and re-use;
- meet and exceed the Landfill Directive diversion targets for biodegradable municipal waste in 2010, 2013 and 2020;
- increase diversion from landfill of non-municipal waste and secure better integration of treatment for municipal and non-municipal waste;
- secure the investment in infrastructure needed to divert waste from landfill and for the management of hazardous waste; and
- get the most environmental benefit from that investment, through increased recycling of resources and recovery of energy from residual waste using a mix of technologies.

3.3.25 The Strategy reinforces the importance of the waste hierarchy whereby landfill is treated as the option of last resort, with an emphasis upon reduction in waste generation followed by reuse and recycling and recovery of value.

3.3.26 It places a greater focus on waste prevention through a new target to reduce the amount of household waste not re-used, recycled or composted from over 22.2 million tonnes in 2000 by 29% to 15.8 million tonnes in 2010 with an aspiration to reduce it to 12.2 million tonnes in 2020 – a reduction of 45%. This is equivalent to a fall of 50% per person (from 450 kg per person in 2000 to 225 kg in 2020).

3.3.27 Higher national targets than in 2000 have been set for:

- Commercial and waste land filled falling by 20% by 2010 compared to 2004;
- recycling and composting of household waste – at least 40% by 2010, 45% by 2015 and 50% by 2020; and
- recovering value from municipal waste – 53% by 2010, 67% by 2015 and 75% by 2020.

3.3.28 With respect to stimulating investment in waste collection and treatment infrastructure, key new policies within WS2007 (Chapter 5) include*: "Ensuring that Regional Spatial Strategies and local development plans conform to national planning guidance on waste so that the waste infrastructure projects needed to deliver this strategy receive planning approval, while promoting best practice in the way local authorities consult stakeholders on their waste strategies* and *"Developing collection arrangements and the energy market for wood waste which cannot be re-used or recycled".*

3.3.29 With regards to recovering energy from waste, the strategy states, at paragraph 17 of Chapter 5 that*: Recovering energy from waste which cannot sensibly be reused or recycled is an essential component of a well-balanced energy policy".* Paragraph 23 states that: *"Evidence from neighbouring countries, where very high rates of recycling and energy from waste are able to coexist, demonstrates that a vigorous energy from waste policy is compatible with high recycling rates"*.

3.3.30 Guidance on the application of the strategy within the White Paper states: "*There is a particular requirement in the Waste Framework Directive for the waste management plan to identify suitable disposal sites or installations. PPS10 sets out relevant national policies for waste management facilities, including location criteria to inform local planning policy and planning decisions. Local planning authorities in England are reminded of their obligation*

under the Waste Management Licensing Regulations 19945 to produce detailed policies in respect of suitable disposal sites or installations for waste management purposes when producing local development documents, and also their obligation to have regard to national policies and to this strategy. PPS10 provides that local planning authorities should, among other things, identify in development plan documents sites and areas suitable for new or enhanced waste management facilities for the waste management needs of their areas, and, in particular, allocate sites to support the pattern of waste management facilities set out in the RSS (in accordance with the broad locations identified in the RSS)".

3.3.31 WS 2007 highlights that there is a particular requirement in the Waste Framework Directive for the waste management plan to identify suitable waste disposal sites or installations. PPS10 sets out relevant national policies for waste management facilities, including location criteria to inform local planning policy and planning decisions. Local planning authorities in England are reminded of their obligation under the Waste Management Licensing Regulations 1994 to produce detailed policies in respect of suitable disposal sites or installations for waste management purposes when producing local development documents, and also there obligation to have regard to national policies in this strategy. PPS10 provides that local planning authorities should, among other things, identify in development plan documents sites and areas suitable for new or enhanced waste management facilities for the waste management needs of their areas, and, in particular, allocated sites to support the pattern of waste management facilities set out in the RSS (in accordance with the broad locations identified in the RSS).

Energy Policy

EU Renewable Energy Directive (2009/28/EC)

3.3.32 This EU Directive reaffirms the EU's commitment to the development of renewable energy beyond 2010. The directive obliges Member States to:

- Meet the 2020 national renewable energy targets (15% for the UK)
- Introduce measures to meet these targets
- Introduce mandatory requirements for biofuels
- Adopt national action plans setting out adequate measures to achieve the 2020 targets
- Submit bi-annual progress reports to the EU Commission.

3.3.33 It defines "energy from renewable sources" as energy from renewable non-fossil fuels namely wind, solar, aero-thermal, geothermal, hydrothermal and ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas and biogas.

3.3.34 It defines biomass as the biodegradable fraction of products, waste and residues from biological origin from agriculture, as well as the biodegradable fraction of industrial and municipal waste.

Meeting the Energy Challenge: A White Paper May 2007

3.3.35 The Energy White Paper (at paragraphs 5.3.3 and 5.3.4) highlights the importance renewable energy plays in the future security of future energy supplies but also reducing carbon emissions. At paragraph 5.3.44, it highlights the use of the biodegradable fraction of waste as a renewable resource and states that the Renewable Obligation will apply to certain types of energy from waste facility including good quality CHP facilities. Table 5.3.1 identifies energy from waste with CHP as a renewable technology.

3.3.36 Paragraph 5.3.6 acknowledges the EU's binding target for 20% of all energy consumption being renewable by 2020, and the EU's binding target of reducing greenhouse gas emissions by 20% by 2020.

3.3.37 Paragraph 5.3.44 identifies that generating energy from that portion of waste that cannot be prevented, reused, or recycled has both energy and waste policy benefits. It further acknowledges that energy generated either directly from waste or through refused derived fuel has benefits for the security of supply and confirms that the biodegradable fraction of waste is a renewable resource.

3.3.38 The White Paper at paragraphs 5.3.64 to 5.3.70 highlights concerns over the planning process stifling the deployment of renewables, stating: "applicants will no longer have to demonstrate either the overall need for renewable energy or for their particular proposals to be sited in a particular location."

3.3.39 The White Paper (at paragraph 5.3.69) states that the PPS on Climate Change will provide key policies on renewables including steering local authority decision makers not to question the national need for renewables and other low carbon technologies, or to question the need for a specific project to be sited in a particular location. This is carried through to the PPS1 Supplement.

3.3.40 Paragraph 8.2 sets out that there is a significant challenge in delivering new energy infrastructure. In terms of electricity the UK will need between 30-35GW of new generating capacity over the next two decades with two-thirds of this by 2020. In terms of gas, given our increasing reliance on imports, if developers cannot secure permission for electricity generation projects and gas supply infrastructure the UK could be exposed to rising security of supply risk with the potential for energy price increases.

The UK Biomass Strategy, May 2007.

3.3.41 This Strategy was published to complement the Energy White Paper 2007. It sets out that Biomass is a renewable energy source that has the potential to make a valuable contribution to heat and electricity generation as a low carbon, sustainable replacement for fossil fuels. As such the government intends a major expansion in the supply and use of Biomass in the UK, and to maximise the potential of Biomass to contribute to the delivery of the UK's climate change and energy policy goals, and achieve a secure, competitive and affordable supply of fuel.

3.3.42 Paragraph 2.1 confirms that Biomass means any biological material derived from plant or animal matter which can be used for producing heat and/or power. Paragraph 2.3 confirms that Biomass is renewable. Paragraph 2.5 sets out that the use of biomass and other renewables, in place of fossil fuels, offers the prospect of a more diversified energy mix, and that energy security continues to be of increasing importance. It continues that at present 90% of the UK's energy needs are met by fossil fuels and that as the UK's production of Oil, Gas and coal declines it will become increasingly reliant on imports.

3.3.43 Paragraph 3.4 sets out that as part of the strategy to help secure a sustainable increase in UK biomass production there is a need to promote measures to divert waste from landfill including increased energy generation from biodegradable wastes that cannot be sustainably reused or recycled, and from SRF.

3.3.44 Paragraph 3.9 confirms that Biomass has an important role to play in achieving the Governments target of 10% renewable energy by 2010 and 20% by 2020.

The UK Renewable Energy Strategy, July 2009

3.3.45 This strategy sets out how the UK intends to meet its legally binding target to ensure that 15% of our energy comes from renewable sources "almost a seven-fold increase in the share of renewables in scarcely more than an decade". It also sets out that the strategy will tackle climate change by reducing the UK's emissions of carbon dioxide by over 750 million tonnes by 2030. It also promotes the security of energy supply by reducing the overall fossil fuel demand by around 10% and gas imports by 20-30% against what they would have been in 2020. It also sets out to achieve 30% of electricity being generated by renewable including biomass and 12% of heat from renewable including biomass.

3.3.46 Paragraph 1.1 of the Executive Summary sets out that the UK needs to radically increase its use of renewable energy. The reasons for this are:

- The impending threat of dangerous climate change and the need to reduce carbon dioxide and other greenhouse gasses.
- The growth in global demand for energy over the next few decades and the depletion of the North Sea oil and gas resources, mean that there needs to be a rethink on sourcing and using energy. This dictates a need to move towards energy self sufficiency
- To ensure the UK has thriving and robust renewable energy sector in a global low carbon economy

3.3.47 Paragraph 3.6 of the Executive Summary states that: "We will ramp up the supply and use of biomass for heat, power and transport…we will do this by making better use of biomass waste…"

3.3.48 Paragraph 1.1 sets out that the UK needs a radical increase in the use of renewable energy and that this an integral part of the strategy to decarbonise energy production in the UK, to ensure secure and safe energy supplies, spread the costs fairly and to exploit the significant opportunities of the move to a low carbon economy. It sets out in Box1.1 that The Climate Change Act brings with at a binding target to reduce greenhouse gas emissions to 80% below 1990 levels by 2050, and that this requires the Government to set five year carbon budgets which place binding limits on greenhouse gas emissions. The first three carbon budgets require a 34% reduction in greenhouse gas relative to 1990 levels by 2022.

3.3.49 In order to ensure secure and safe energy supplies, this will be realised by achieving the 15% renewable energy target by 2020. It estimates that this will lead to a 10% reduction in overall fossil fuels demand and a 20-30% decrease in demand for gas. It also identifies that the EU Climate and Energy package requires a 20% reduction in greenhouse gas emissions by 2020.

3.3.50 Paragraph 4.121 identifies that that around 30% of the UK renewable energy target could come from bio energy for heat and power and that there is sufficient biomass resource potential in the UK to meet the EU renewable energy target in 2020.

3.3.51 Paragraph 4.130 identifies Waste Biomass as an underused resource which could provide a significant contribution to renewable target and reduce the amount of waste that is landfilled.

The UK Low Carbon Transition Plan: National Strategy for Climate and Energy, July 2009.

3.3.52 This White Paper sets out the UK's transition plan for building a low carbon UK: cutting emissions, maintaining secure energy supplies, maximising economic opportunities and protecting the most vulnerable. It sets out the Government's plan for achieving its 15% renewable target by 2020.

3.3.53 It sets out that in terms of energy security global energy demand is forecast to increase by 45% between 2006 and 2030 with almost 80% of the increase coming from fossil fuels. In 2008 the UK imported 25% of the gas it used and by 2020 this is predicted to rise to 60%, but that the measures in this plan not only will help to decarbonise electricity supplies and increase heat efficiency but will reduce the predicted energy importation to 45%.

3.3.54 The Transition Plan seeks to ensure that around 40% of our electricity comes from low carbon sources by 2020. As part of this plan England's annual waste emissions will be cut by the equivalent of one million tonnes of carbon dioxide by 2020 reducing them by 13% of the 2009 level. The Government will do this by amongst other measures, by putting less waste into landfill and by encouraging greater production of bio energy, particularly from combustion, and may even ban certain types of waste from landfill.

3.4 Planning Policy

Planning Policy Statement 1 (PPS1): Delivering Sustainable Development (2005)

3.4.1 Whereas much of the guidance offered by PPS1 is of general or background relevance to the current proposals, the following specific points are noteworthy:

- Paragraph 3 of PPS1 identifies sustainable development as 'the core principle underpinning planning'.
- Paragraph 12 highlights pre-application discussions between developers and local planning authorities as being 'critically important'. Paragraph 8 reinforces the importance of the development plan in making decisions about development proposals.
- Paragraph 13(ii) requires LPA's to ensure that " development plans contribute to global sustainability by addressing the causes and potential impacts of climate change – through policies which reduce energy use, reduce emissions…., promote

the development of renewable energy and take climate change impacts into account in the location and design of development"

- Paragraph 20 sets out that development plan policies should take account of environmental issues such as "the mitigation of the effects of, and adaptation to, climate change through the reduction of greenhouse gas emissions and the use of renewable energy; …"
- Paragraph 22 sets out that development plan policies should: "seek to minimise the need to consume new resources over the lifetime of the development by making more efficient use or reuse of existing resources, rather than making new demands on the environment; and should seek to promote and encourage, rather than restrict, the use of renewable resources (for example, by the development of renewable energy)." It also sets out that LPA's should encourage the use of Combined Heat and Power.
- Paragraphs 40-44 outline the importance of effective community involvement.
- The PPS1 Supplement presents guidance relating to climate change. This addresses, amongst other things, design for environmental performance, including energy consumption, renewable or low carbon energy supply.

Planning Policy Statement: Planning and Climate Change Supplement to Planning Policy Statement 1

3.4.2 PPS1 sets out the overarching planning policies on the delivery of sustainable development through the planning system. This PPS on climate change supplements PPS1 by setting out how planning should contribute to reducing emissions and stabilising climate change, whilst taking into account the unavoidable consequences. The policies in this PPS take precedence over any policies relating to climate change in other PPS's. Tackling climate change is a key Government priority for the planning system. It sets out how applicants for planning permission should consider how well their proposals for development contribute to the Government's ambition of a low-carbon economy and how well adapted they are for the expected effects of climate change.

3.4.3 Paragraph 9 sets out the Key planning objectives to deliver sustainable development and an appropriate response to climate change. Amongst others, the Key objectives are:

- Make a full contribution to delivering the Government's Climate Change Programme and energy policies and in so doing global sustainability
- Reflect the development needs and interests of communities and enable them to contribute effectively to tackling climate change

- Respond to the concerns of business and encourage competitiveness and technological innovation in mitigating and adapting to climate change

3.4.4 Paragraph 10 sets out that new development should be planned to make good use of opportunities for decentralised and renewable or low carbon energy.

3.4.5 Paragraph 19 sets out that in developing development plan documents LPA's should encourage and not restrict renewable and low carbon energy generation. Paragraph 20 sets out that planning authorities should not require applicants for energy development to demonstrate either the overall need for renewable energy and its distribution, nor question the energy justification for why proposals for such development must be sited in a particular location.

Planning Policy Statement 22 (PPS22): Renewable Energy

3.4.6 PPS22 sets out that for its purposes renewable energy covers biomass including the biodegradable fraction of industrial and municipal waste, and energy from waste.

3.4.7 It sets out a number of Key Principles, including:

- Renewable energy developments should be capable of being accommodated throughout England in locations where technology is viable and environmental, economic, and social impacts can be addressed satisfactorily.
- Regional Spatial Strategies and Local development documents should contain policies designed to promote and encourage, rather than restrict, the development of renewable energy resources…
- The wider environmental and economic benefits of all proposals for renewable energy projects, whatever their scale, are material considerations that should be give significant weight in determining whether proposals should be granted planning permission.

3.4.8 Paragraph 3 sets out that targets should be expressed for regional renewable energy targets for 2010 and 2020. These targets should be reviewed regularly and revised upwards if met. Reaching the renewable energy target is not in itself a reason for refusing planning permission.

3.4.9 Paragraph 24 identifies that in determining planning applications for biomass authorities should recognise that in addition to minimising the impact of traffic by ensuring that developments are located in as close a proximity to the sources of fuel, there are other

considerations (such as connections to the Grid and the potential use of heat generated from the project) which may influence the most suitable locations for such projects.

Draft National Policy Statement for Renewable Energy Infrastructure, November 2009

3.4.10 Although primarily intended to inform decisions by the Infrastructure Planning Commission from March 2010 paragraph 1.2.4 makes it clear that:

"*In England and Wales, this NPS may also be a material consideration in decision making on applications that fall under the Town and Country Planning Act 1990. where relevant, those making decisions on such applications in England should apply the policy and guidance in this NPS as far as practicable"*

3.4.11 Paragraph 2.5.1 sets out that the combustion of biomass for electricity generation is likely to play an increasingly important role in meeting the UK's renewable energy targets. Paragraph 2.5.2 clarifies that the recovery of energy from the combustion of waste, where in accordance with the waste hierarchy, will play an increasingly important role in meeting the UK's energy needs, and that where the waste burned is deemed renewable, this can also contribute to meeting the UK's renewable energy targets. Further, the recovery of energy from the combustion of waste forms an important element of waste management strategies.

3.4.12 In terms of fuels, paragraph 2.5.7 confirms that Biomass is material of recent biological origin derived from plant or animal matter, and that biomass used for heat and power usually falls within one of three categories. One such category is:

"biomass from biodegradable waste and other similar materials; including sewage sludge, animal manure, waste wood from construction, and food waste that would otherwise be disposed of in landfill."

3.4.13 Paragraph 2.5.8 confirms that Energy from Waste plants take fuel that would otherwise be sent to landfill, and that waste can come from municipal or commercial and industrial sources, and that some of this waste may comprise biodegradable waste including Solid Recovered Fuel (SRF).

3.4.14 Paragraph 2.5.18 confirms that waste combustion plants are unlike other electricity power stations in that they have two roles: treatment of waste and recovery of energy.

3.4.15 Paragraph 2.2.53 confirms that waste combustion plants need not disadvantage reuse or recycling initiatives where the proposed development accords with the waste hierarchy. An assessment of the waste combustion plant's conformity with the waste hierarchy and the effect on the relevant regional waste plan should be made. It should set out that extent which the plant and capacity proposed contributes to recovery targets set out in strategies and plans taking into account existing capacity.

3.4.16 Paragraph 2.5.26 identifies that the government's strategy for CHP is set in Section 4.6 of EN1. This states that:

"*To be viable as a CHP plant, a generating station needs to be located close to industrial or domestic customers with heat demands*."

3.4.17 It also acknowledges that for industrial purposes customers are likely to intensive heat uses including paper mills.

Planning Policy Statement 9 (PPS9): Biodiversity and Geological Conservation

3.4.18 Planning Policy Statement 9 (PPS9) sets out planning policies on protection of biodiversity and geological conservation through the planning system. Published in August 2005. It is accompanied by Government Circular 06/05: Biodiversity and Geological Conservation which covers relevant legislative provisions at the international and national level that can impact on planning decisions affecting biodiversity and geological conservation issues and Good Practice Guidance.

3.4.19 The PPS sets out the Government's broad policy objectives in relation to the protection of biodiversity and geological conservation in England through the planning system and its planning policies that will help deliver these objectives. These policies reflect statutory obligations for nature conservation and are firmly based on the principles set out in 'Working with the grain of nature – a biodiversity strategy for England' (DEFRA 2002).

Planning Policy Statement 10 (PPS10): Planning for Sustainable Waste Management PPS10, July 2005

3.4.20 Planning Policy Statement 10: Planning for Sustainable Waste Management (PPS10) was published in July 2005. PPS 10 sets out guidance for all those involved in making decisions about the management of waste and sets out the principles of sustainable waste management driven by the waste hierarchy.

3.4.21 Para. 1 of PPS10 states in this respect:-

"Through more sustainable waste management, moving the management of waste up the 'waste hierarchy' of reduction, reuse, recycling and composting, using waste as a source of energy, and only disposing as a last resort the Government aims to break the link between economic growth and the environmental impact of waste."

3.4.22 It goes on to explain that the planning system is pivotal to the adequate and timely provision of the new facilities that will be needed.

3.4.23 Para 3 of the document sets out the key planning objectives that regional planning authorities should prepare and deliver through their strategies. These are:

- Help deliver sustainable waste management through driving waste management up the waste hierarchy, addressing waste as a resource and looking to disposal as the last option, but one which must be adequately catered for;
- Provide a framework in which communities take more responsibility for their own waste, and enable sufficient and timely provision of waste management facilities to meet the needs of their communities;
- Help implement the national waste strategy, and supporting targets, are consistent with obligations required under European legislation and support and complement other guidance and legal controls such as those set out in the Waste Management Licensing Regulations 1994;
- Help secure the recovery or disposal of waste without endangering human health and without harming the environment, and ensure waste is disposed of in one of the nearest appropriate installations;
- Reflect the concerns and interests of local communities, the needs of waste collection authorities, waste disposal authorities and businesses, and encourage competitiveness.

3.4.24 Paragraph 20 sets out that in searching for suitable sites for waste management facilities planning authorities should consider for opportunities for on site management where waste arises and a broad range of locations including industrial sites, looking for opportunities to co-locate facilities together and with complementary activities.

3.4.25 Annex E of PPS10 sets out locational criteria to test the suitability of sites for waste management activities. These are listed below:-

- Protection of water resources;

- Land instability;
- Visual intrusion;
- Nature conservation;
- Historic environment and built heritage;
- Traffic and access;
- Air emissions, including dust;
- Odours;
- Vermin and birds;
- Noise and vibration;
- Litter; and
- Potential land use conflict.

3.4.26 The evolution of the current scheme in accordance with social, economic and employment considerations has taken place at a time where the planning system is in a period of transition. Section 19 of the Planning and Compulsory Purchase Act 2004 requires local planning authorities to carry out Sustainability Appraisals of proposals within each of their local development documents. PPS 12 states that:

"sustainability appraisal is a systematic and iterative appraisal process, incorporating the requirements of the Strategic Environmental Assessment Directive", where "The purpose of sustainability appraisal is to appraise the social, environmental, and economic effects of the strategies and policies in a local development document from the outset of the preparation process".

PPS10 advises that Regional planning bodies and all planning authorities should, to the extent appropriate to their responsibilities, adhere to the principles in preparing planning strategies including sustainability appraisal (incorporating strategic environmental assessment)".

3.4.27 Sustainability appraisal should be applied so as to shape planning strategies that support the Government's planning objectives. PPS10 further states that *"in considering planning applications for waste management facilities before development plans can be reviewed to reflect this PPS, [waste planning authorities should] have regard to the policies in this PPS as material considerations which may supersede the policies in their development plan. Any refusal of planning permission on grounds of being premature will not be justified unless it accords with the policy in "The Planning System: General Principles".*

3.4.28 The Planning and Compulsory Purchase Act 2004 requires that the Minerals and Waste Development documents be prepared with a view to contributing to sustainable development.

Local Development Frameworks as set out above are to be subject to a process of Sustainability Appraisals and Strategic Environmental Assessment. The first stage in the sustainability appraisal process is the preparation of a Generic Scoping Report, which sets out how the appraisal of documents is to be carried out. The original Scoping Report was published for comment in August 2005. This has now been updated to be in line with Government guidance, new information and the consultation responses.

3.4.29 Paragraph 26 of PPS10 sets out that planning authorities should not concern themselves with the control of processes which are a matter for the pollution control authorities. Paragraph 27 sets out that pollution control is concerned with preventing pollution through the use of measures to prohibit or limit the release of substances to the environment to the lowest practicable. Additionally, it seeks to ensure that air and water quality meets standards that prevent human and environmental impact. Further, planning authorities should work on the assumption that the pollution control regime will be properly applied and enforced.

Planning For Sustainable Waste Management: Companion Guide To Planning Policy Statement 10, June 2006

3.4.30 This guide, published in June 2006, supports the implementation of Planning Policy Statement 10 (PPS10) Planning for Sustainable Waste Management. The Guide provides advice, ideas, examples of current practice and signposts to further information in support of the implementation of Planning Policy Statement 10: Planning for Sustainable Waste Management (PPS10).

Planning Policy Guidance 13 (PPG13): Transport, 2001

3.4.31 PPG13 has the objectives of integrating planning and transport at the national, regional, strategic and local level to promote more sustainable transport choices for both people and for moving freight, promoting accessibility and reducing the need to travel, especially by car.

Planning Policy Guidance 15 (PPG15): Planning and the Historic Environment

3.4.32 PPG15 provides guidance on the role of the planning system in the protection of the historic environment. Early consultation with the local planning authority and English Heritage is identified as important where development proposals may affect historic sites and structures such as listed buildings and conservation

Planning Policy Guidance 16 (PPG16): Archaeology and Planning

3.4.33 This guidance advises on how to preserve and record archaeological remains in the urban and rural environment. The statutory frameworks for protecting remains are outlined and the development control procedure is clearly identified.

Planning Policy Statement 23 - Planning and Pollution Control (PPS23)

3.4.34 PPS23 offers guidance to local authorities on the relationship between controls over development under planning law, and under pollution control legislation. PPS 23 advises that:

- any consideration of the quality of land, air or water and potential impacts arising from development, possibly leading to impacts on health, is capable of being a material planning consideration, in so far as it arises or may arise from or may affect any land use;
- the planning system plays a key role in determining the location of development which may give rise to pollution, either directly or indirectly, and in ensuring that other uses and developments are not, as far as possible, affected by major existing or potential sources of pollution;
- the controls under the planning and pollution control regimes should complement rather than duplicate each other.

3.4.35 It also takes into account the Air Quality Strategy, the system of local air quality management under Part IV of the Environment Act 1995 and climate change.

Planning Policy Guidance Note 24 (PPG24): Planning and Noise, 1994

3.4.36 PPG24 provides guidance to planning authorities on the use of their planning powers to minimise the adverse impacts on noise. PPG24 recognises however that the impact of noise must be balanced against other impacts of development, and states in para. 10:
"Much of the development which is necessary for the creation of jobs and the construction and improvement of essential infrastructure will generate noise. The planning system should not place unjustifiable obstacles in the way of such development."

3.4.37 Paragraph 3 sets out that mitigation measures can be introduced to control the source of, or limit exposure to noise. These include:

*"(i) **engineering:** reduction of noise at point of generation (e.g. by using quiet machines and/or quiet methods of working); containment of noise generated (e.g. by insulating buildings which house machinery and/or providing purpose-built barriers around the site); and protection of surrounding noise-sensitive buildings (e.g. by improving sound insulation in these buildings and/or screening them by purpose built barriers);*

*(ii) **lay-out:** adequate distance between source and noise-sensitive building or area; screening by natural barriers, other buildings, or non-critical rooms in a building;*

*(iii) **administrative:** limiting operating time of source; restricting activities allowed on the site; specifying an acceptable noise limit."*

Planning Policy Statement Note 25 (PPS25): Development and Flood Risk

3.4.38 PPS25 which was published in December 2006 explains how positive planning has an important role in helping to deliver sustainable development and applying the Government's policy on flood risk management. Positive planning avoids and reduces and manages flood risk by taking full account in decisions on plans and applications of present and future flood risk and the wider implications for flood risk of development located outside flood risk areas. The statement sets out the aims of planning policy on development and flood risk are to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to direct development away from the areas at highest risk.

3.4.39 With respect to Risk Based approach and the Sequential Test, paragraph 16 of PPS25 states:

"Local Planning Authorities allocating land in Local development Documents for development should apply the Sequential Test to demonstrate that there are no reasonably available sites in areas with a lower probability of flooding that would be appropriate to the type of development or land use proposed. A sequential approach should be used in areas known to be at a risk from other forms of flooding."

3.4.40 Paragraph 17 states 'In areas at risk of river or sea flooding, preference should be given to locating new development in Flood Zone 1. If there is no reasonably available site in Flood Zone 1, the flood vulnerability of the proposed development can be taken into account in

locating development in Flood Zone 2 and then Flood Zone 3. Within each Flood Zone new development should be directed to sites at the lowest probability of flooding from all sources as indicated by the Strategic Flood Risk Assessment.

3.5 The Statutory Development Plan

3.5.1 Of particular importance in the policy framework is the development plan, which is produced in

accordance with statutory procedures to guide the development and use of land and provide a framework for the determination of individual planning applications.

3.5.2 According to PPS12: Local Development Frameworks (2008):

"3.1 The development plan is made up of the Regional Spatial Strategy (RSS), and Development Plan Documents (DPD) produced by local planning authorities within the local development framework.

i) The Local Development Framework is the collection of local development documents produced by the local planning authority which collectively delivers the spatial planning strategy for its area . The Core Strategy is the key plan within the Local Development Framework."

3.5.3 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).

3.5.4 The policies and supporting context of the development plan are set out within Appendix 3.1

DEVELOPMENT OF A SUSTAINABLE ENERGY PLANT.

KEMSLEY PAPER MILL, SITTINGBOURNE, KENT

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

ENVIRONMENTAL STATEMENT

CHAPTER 4:

DESCRIPTION OF DEVELOPMENT

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4 Description of Development

4.1 Introduction

4.1.1 This Chapter of the Environmental Statement describes the proposed development. This is in accordance with Schedule 4 of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 which provides that Environmental Statements should provide a description of the development. The scheme has been formulated through an iterative process of evaluation including assessment of likely significant effects from the scheme and incorporates mitigation measures.

4.1.2 The layout of the proposed sustainable energy plant together with a description of the power generation and waste management process to be undertaken within the plant is described. The scheme has been designed in accordance with the Construction (Design and Management) Regulations 2007.

4.1.3 In preparing the development proposals, consideration has been given to the following considerations:

- Design
- Ecological and Nature Conservation;
- Hydrology and Flood Risk
- Ground Conditions
- Air Quality and Noise Receptors
- Transport of Fuel feedstock, Raw Materials and Residues.
- Employees
- Visual and Landscape

4.1.4 In summary the development will comprise:

- The capability to generate in excess of 50MWth per hour of steam to the paper mill. Dependent upon its calorific value, the SEP will import as its feed stock approximately 500,000 to 550,000 tonnes per annum of pre treated waste comprising Solid Recovered Fuel waste, Commercial & Industrial waste and Municipal Solid Waste.
- The plant may accept up to approximately 25,000 tonnes per annum of waste plastics from the paper mill (included in the above).
- The plant is a recovery plant under the R1 calculation of the Waste Directive.
- The average net calorific value of 10.5 MJ/kg will fall within the range of 8 MJ/kg to 16 MJ/kg.
- Power generation capability of 48.5 MW of net electricity per hour.

- Grid connection cables to supply generated electricity to the public supply network.
- Two line moving grate with thermal combustion capacity of 100MW per line.
- Two stacks with a height of 90 metres from ground level.
- Waste reception hall and waste storage bunker.
- Waste handling systems and feed hoppers.
- Bottom ash handling.
- Bottom ash storage and maturation facility.
- Flue gas treatment.
- Boiler, steam turbine and air cooled condenser
- Heat extraction system and infrastructure providing connectivity to adjacent paper mill.
- Weighbridge and access arrangements.
- Control room and administration building.
- Transformers
- Site landscaping
- Importation of approximately 20,300m^3 of clean inert fill.

4.1.5 The construction period will be approximately 32 months in duration with an assumed start date in 2011.

4.2 Site Layout

Overview

4.2.1 The proposal site the general location of which is shown on Figure 1.1 extends to approximately 7.0 hectares exclusive of existing site access. The Development site and site plan is illustrated on Figure 4.1. Figure 4.2 illustrates the proposed Building Plan and sets out the proposal components. Figure 4.3 illustrates the proposed Site Layout. Figure 4.4 illustrates the proposed South East elevation of the plant, Figure 4.5 illustrates the proposed north east elevation of the plant, Figure 4.6 illustrates the proposed South west elevation of the plant and Figure 4.7 illustrates the proposed North west elevation of the plant. Figures 4.8 to Figure 4.22.set out the layout and elevations of particular components of the scheme. Figures 4.24 to 4.27 illustrate the drainage components of the scheme. Figures 4.29 to 4.36 show the 3D visualisations of the proposed plant.

In summary the primary features are:

Sustainable Energy Plant

4.2.2 The Sustainable Energy Plant (SEP) building footprint takes up a large part of the site and contains: Reception Hall and Bunker; Boiler House; turbine building; Stacks; Flue Gas

Treatment; Air Cooled Condensers; Bottom ash treatment building; Bottom Ash (BA) building; Offices; Disabled car parking; Landscaping; and Access. The Plant is orientated south west to north east.

Weighbridge

4.2.3 The weighbridge offices are located to the west of the main plant infrastructure.

Access

4.2.4 The proposal site is located on the eastern fringe of the existing Kemsley Paper Mill plant complex. It is proposed to utilise the existing paper mill access infrastructure which serves the site. Access for the SEP by road will be taken from the northern Kemsley Paper Mill access which is some 400 metres to the north. Within the proposal site, provision is made for vehicle circulation. Car parking for staff and visitors (with the exception of disabled parking) is located to the west within the existing arrangements which serve the Kemsley Paper Mill.

Landscaping

4.2.5 Landscaping is principally focused to the west and south west close to the weighbridge.

4.3 Sustainable Energy Plant

Building Description

4.3.1 The overall arrangements for the SEP are shown on Figures **4.2 and 4.3.** Principal Elevations are illustrated on Figure **4.4 to 4.11**. The SEP will be housed within the following principal structures:

- Fuel feedstock reception area and Bunker, Energy Building, Flue Gas Treatment
- Air Cooled Condenser
- Furnace Bottom Ash building
- Double Stack infrastructure to a height of 90 metres.

4.3.2 The waste feedstock reception area and bunker will be located within the east of the main structure. This structure will be fitted with roller shutter doors. The external dimensions will be **22.8m – 12** m in height **45.2** m in width and **35.8** m in length. This element of the building will have a pitched roof with a high level parapet. The bunker within the building envelope will have dimensions of **36.1** m in width **71.6** m and **36** m in depth. Table 4.1 summarises the dimensions.

Table 4.1 Waste Reception Area and Bunker

Component	Length (m)	Width (m)	Elevation (m)
Reception Area	35.8	44.5	22.8 -12
Bunker	32.1	71.6	36.1

4.3.3 The Boiler House Building contains the boiler and the energy building with electrical and utility infrastructure (switchgear building) and is to the west of and is continuous with the Fuel feedstock reception area and bunker. The external dimensions will be up to **50.4** m in height **45.0** m in width and **51.5** m in length. This element of the building will have a pitched roof with a high level parapet. Table 4.2 summarises the dimensions. To the south is the office and staff welfare accommodation, and associated disabled car parking. Within the north of the building is located the steam turbine building.

Table 4.2 Boiler House Building

Component	Length (m)	Width (m)	Elevation (m)
Boiler House	51.5	45.0	22.5 48.0 50.4 (staircase)

4.3.4 The Flue Gas Treatment building contains the flue gas cleaning infrastructure and is to the west of and is continuous with the Energy building. The external dimensions will be **45** m in height **34.7** m in width and **58.9** m in length. This element of the building will have a pitched roof with a high level parapet. Table 4.3 summarises the dimensions.

Table 4.3 Flue Gas Treatment

Component	Length (m)	Width (m)	Elevation (m)
Flue Gas Treatment	58.9	34.7	37 43 45 (staircase)

4.3.5 The Steam Turbine Building contains the turbine off steam condensing infrastructure and is within a separate structure located to the north of the flue gas treatment building. The steam turbine building has dimensions of **35.0** m x **30.0** m x **24** m. Table 4.4 summarises the dimensions.

Table 4.4 Steam Turbine

Component	Length (m)	Width (m)	Elevation (m)
Steam turbine	35	30	24

4.3.6 The Bottom Ash Treatment building is located to the west and adjacent to the bottom ash building and waste reception building. The external dimensions will be **21.7** m in height **20** m in width and **25** m in length. Table 4.5 summarises the dimensions.

Table 4.5 Bottom ash treatment

Component	Length (m)	Width (m)	Elevation (m)
Bottom Ash treatment	25	20	21.7

4.3.7 The external dimensions of the Air Cooled Condenser will be **23.4** m in height **28.4** m in width and **62.1** m in length. Table 4.6 summarises the dimensions.

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Table 4.6 Air Cooled Condenser

Component	Length (m)	Width (m)	Elevation (m)
Air Cooled Condenser	62.1	28.4	23.4

Stacks

4.3.8 Each of the two processing lines will have a single stack with a proposed height of 90 metres from ground level. The stack height has been calculated based upon emission parameters to ensure optimum emission of flue gases and the successful operation of the plant. The stack will be located to the west of the principal plant infrastructure. The centres of the two stacks will be 5.00 metres apart.

4.3.9 Dispersion of pollutants is dependent on a number of factors including local land topography, neighbouring buildings, emission rates and pollutant concentrations, together with the height of the proposed structures. The air quality and plume dispersion modelling used to identify the stack height necessary for optimal dispersion is described in detail in Chapter 7. Table 4.7summarises the dimensions

Table 4.7 Stack

Component	Length (m)	Width (m)	Elevation (m)
Stack (x2)	N/A	3.1Ø	90 metres

Bottom Ash Building

4.3.10 Bottom Ash (BA) building is an independent structure located to the east of the principal plant infrastructure. The building will have a minimum storage capacity of 4 x 9,400m^3 The BA building will provide the necessary covered floor space to enable Incinerator Bottom ash to be laid out and stored to enable maturation of the ash to take place prior to its removal from site. The external dimensions will be **19.7** m in height **85.2** m in width and **84.2** m in length. This element of the building will have a pitched roof form. Figure 4.15 illustrates the building. Table 4.8 summarises the dimensions.

Table 4.8 BA Building

Component	Length (m)	Width (m)	Elevation (m)
BA building	84.2	85.2	19.7

Materials

4.3.9 The SEP side panels will be constructed from profiled steel sheeting in terracotta, merlin grey, hamlet, anthracite and albatross. The upper parts of the façade will be structured in light grey rectangular wirings. The roof will be constructed from steel. The bunker roof will be constructed from concrete. Visualisations of the plant and associated infrastructure are illustrated on Figures 4.29 to 4.36.

Gatehouse and Weighbridge

4.3.10 A gatehouse and weighbridge will be located at the site entrance to the west of the SEP infrastructure to weigh and direct incoming waste fuel carrying and outgoing vehicles. The accommodation will include seating, WC and comfort areas. The external dimensions will be 6.85 m in height 5.59 m in width. Table 4.9 summarises the dimensions of the gatehouse and weighbridge. Figure 4.20 illustrates the gatehouse.

Table 4.9 Gatehouse and Weighbridge

Component	Length (m)	Width (m)	Elevation (m)
Gatehouse	14.5	4.0	3.0
Weighbridge	20	3	0.0 Under floor
Roofing	15	12	5.5

4.3.11 Two twenty metre weighbridges will serve the plant. One dedicated to weighing incoming waste fuel and the other weighing outgoing vehicles. The weighbridges will be flush mounted level with the roadway and without raised kerbs. The layout will allow vehicles that do not

need to be weighed to by pass the weighbridges. Some 70 m of straight section of road is provided on access to allow for queuing of vehicles.

Transformer

4.3.12 A transformer is located to the west of the plant. The external dimensions of the compound will be **3.7** m in height **25** m in width and **43** m in length. Table 4.10 summarises the dimensions of the building. The transformer is illustrated within Figure 4.22.

Table 4.10 Transformer and switchgear area

Component	Length (m)	Width (m)	Elevation (m)
Transformer	43	25	3.7

Vehicle Parking

4.3.13 Vehicle parking spaces will be provided for 5 disabled vehicles. For reasons of overall pedestrian safety and security the main area of car parking provision is that of the Kemsley Paper Mill car park located to the south and west of the complex. The parking area can be seen in Figure 4.1. Here provision for 100 cars for staff and visitors at the SEP is made**.** A walkway between the St Regis car park and the SEP already exists. This walk way provides full separation between the car park and the SEP. Other than for disabled personnel there will be no staff parking on the site. Vehicle parking is only authorised where equipment has to be physically transported.

4.3.14 The proposed level of parking is based on staff numbers (including proposed shift arrangements) together with provision for unannounced regulatory authority visits and assumed visitor numbers.

External Lighting

4.3.15 Site lighting is proposed at all times during construction to ensure safety and security. The construction lighting design will include 32x 400W floodlights with the luminaires mounted at a height of 10m on temporary columns around the Site. Localised task lighting may be required after dark during the construction phase, particularly in the winter months. Lighting will be kept to a minimum with light trespass controlled by appropriate technology and directed away from sensitive receptors. The lighting design will be based on the use of appropriate lighting to provide safe working conditions in all areas of the site whilst minimising light pollution and visual impact on the local environment.

4.3.16 During operation of the proposed development external lighting will be provided to ensure the safety of manoeuvring vehicles and pedestrians about the site. Lighting will provided in the form of flood lighting to all main turning areas and road ways wherever possible fixed to buildings or structures or alternatively on columns.

4.3.17 The lighting will incorporate measures which:

- Minimise the potential for sky glow by reducing the potential for upward reflected light.
- Minimise light spread through directional lighting.
- Use shielding to prevent glare.

4.3.18 Lighting will be generally installed along the walkways and staircases around the process equipment to provide illumination for safe access and operational tasks.

Vehicle Wash Down Area

4.3.19 A vehicle wash down area (utilising a manually operated high pressure water jet unit) will be provided in the southern part of the site for the cleaning of vehicle wheels where necessary prior to leaving site. Effluent from the wash down area will be discharged to foul drainage.

Drainage

4.3.20 The proposed drainage scheme is shown on Figures 4.24 to 4.26 which sets out all the components which will form part of the scheme. These include connection to the public sewer and above and below ground rainwater harvesting and arrangements for surface water management.

Fencing and Security

4.3.21 The site will be fenced using a combination of new 3.0 metres high mesh weld and galvanised grey palisade security fencing. These measures are identified on Figure 4.22. Additional security will be provided by CCTV cameras and intruder alarms.

Landscaping

4.3.22 The SEP will be landscaped in accordance with the scheme set out on Figure 8.22. Landscape proposals comprising tree, scrub and grassland establishment have been incorporated as an integral part of the project. Landscape structure planting would be included along the north west and north east perimeters of the site and would incorporate a band of shrub planting with groups of trees. Native, locally typical species would form a robust mix to filter views of the development and add visual and ecological diversity to the townscape.

4.3.23 The perimeter landscape treatments to the north western and north eastern boundaries work in conjunction with the broad flood attenuation ponds which wrap around the development. Grassland would be established on the gently sloping sides of the ponds. The inner edge of the pond will be planted with scattered trees and shrubs along the top of the slope. Species will include silver birch (Betula pendula), hawthorn (Crataegus monogyna) and dog rose (Rosa canina) in an open mosaic habitat.

4.3.24 A broader continuous band of scrub with clumps of trees would be established on the outer edge of the attenuation pond. Species would include goat willow (Salix caprea), aspen (Populus tremula), field maple (Acer campestre), hazel (Corylus avellana), hawthorn (Crataegus monogyna) and blackthorn (Prunus spinosa). The two linear planting treatments would combine to form a visual screen of vegetation when viewed from surrounding receptors. The base of development, including site activities, will be concealed when the planting becomes established, whilst the upper portions of the development will remain visible. The planting will also add visual diversity to the attenuation ponds.

4.3.25 A wider area of land to the north east of the scheme will be planted with an open mosaic of scrub and rough grassland, with clumps of trees. Scrub will be established on the remaining two boundaries between the site and the landfill and the existing paper mill buildings.

4.3.26 Internal green spaces within the site will receive a simple treatment of grassland and flora with a network of mown paths. Seating areas would be defined by native fruiting trees arranged in geometric shapes to reference north Kent's heritage of orchards and fruit production.

4.4 Process Overview

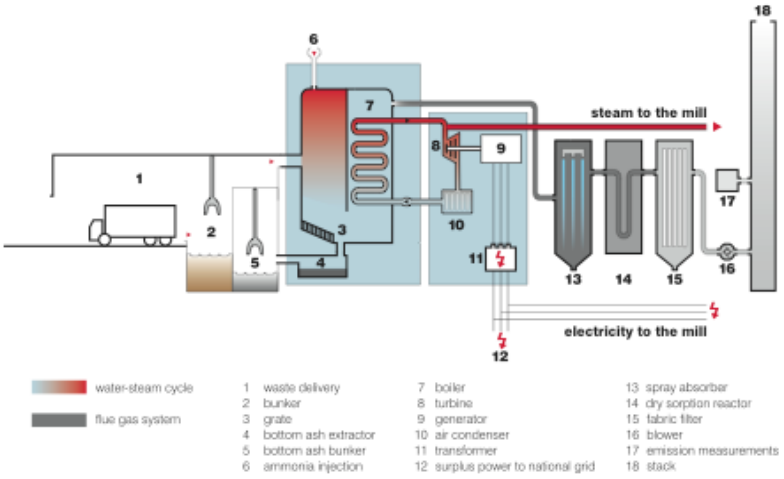
4.4.1 The proposed SEP will utilise proven and tested technology and has been designed to process pre treated waste, where all easily recoverable recyclates have been removed and would otherwise go to landfill, fuel using a two line process. It is assumed that each line will have 90% availability as a result of planned and unplanned downtime. A two line plant provides operational flexibility during periods of maintenance, enabling one line to be shut down whilst the second continues to operate. Down time will be for a period of about 3 weeks per line per year.

4.4.2 Assuming an average calorific value of 10.5 MJ/kg, the plant will generate up to 54 MW gross/ 48.5MW net of electricity (assuming minimum delivery of 50MWth per hour of steam this is 39.5 MWgross/ 34 MW net). The range of likely Calorific Value is the determinant of the quantity of pre treated waste to be imported to the SEP. The electrical energy is generated in

the synchronous generator at a voltage of 10.5kV. This is transformed to a voltage distribution of 400V and to 700V to supply the plant itself. That exported from the plant is fed to the grid via a transformer at 132kV. The plant will produce a minimum of 50MWth per hour of steam which will be fed to Kemsley Paper Mill as an integral part of its energy supply.

4.4.3 A flow diagram of the SEP process is provided in Table 4.11 below.

Table 4.11 Process Flow Diagram



4.4.4 The SEP process equipment will be wholly enclosed within a building. A separate enclosed building will contain the Bottom Ash maturation and storage area. The SEP building will be divided into a number of distinct operational areas all of which relate to function of the overall energy plant process. Elevations which show the location of the main components of the plant within the SEP building are set out within Figures 4.4 to 4.11**.**

Reception Hall and Waste Fuel Bunker

4.4.5 The waste fuel will be delivered to the plant within an enclosed container. The loads will be weighed upon entry to the site at the weighbridge located at the site entrance. The containers/ containerised vehicles will transport the waste fuel to the reception hall using the dedicated circulatory access roads within the site. All containers will be directed to the unloading bay where the waste fuel will be tipped into the bunker. The plant and therefore the bunker is designed to accept up to 3000 tonnes per day. The plant will process waste through the thermal treatment process at a rate of up to 2 x 37 tonnes per hour.

4.4.6 Access to and from the reception hall will be via entrances fitted with fast acting doors which will remain closed unless containerised vehicles are entering or exiting the hall. The floor area within the hall will be periodically washed down to ensure clean operation.

4.4.7 The fuel bunker is accessed from seven gates which are controlled by the crane driver or by a member of staff in the tipping hall to ensure they only open when discharge from a container is to take place. The bunker arrangement takes the form of a rectangular pit set down in to the floor of the reception area. It will have a depth of 7 metres below the general floor level of the plant. The bunker has two main areas. The first, the collection bunker into which the waste fuel will be tipped from the containerised vehicles will have a capacity of 3,456m^3. A permanent barrier provides separation from a larger adjacent stacking bunker which has a capacity of 18,221 m^3. Within the bunkers the waste fuel will be mixed to provide for a regular mix to the plant. Waste fuel is transferred from the collection bunker to the storage by the use of two hydraulic grabs. Here the waste is mixed to provide for a regular quality and is fed to the charging hoppers which in turn feed the grate stoker furnace located within the boiler house.

4.4.8 Operators will monitor the waste fuel flow via an automated weighing system and CCTV system in the control room.

4.4.9 The fuel bunker is ventilated under negative pressure by the primary air fan. During normal operation the exhaust air is fed into the incineration system. During downtime the extracted air is ventilated through a separate activated charcoal filter and discharged through a vent pipe on the roof of the bunker.

Combustion Grate

4.4.10 The combustion grate is where the combustion of the waste fuel takes place. The charging hopper passes into a shaft, the lower part of which is equipped with a double shell and is water cooled. The fuel in this shaft works as a gas tight seal between the combustion chamber and the bunker. Hydraulically driven ram feeders are used to evenly distribute the incinerator charge along its extent and transport it to the grate area. The grate is designed as a multi line sliding grate / feed stoker and longitudinally consists of four separate grate zones. The grate is longitudinally inclined. The grate bars of all zones are cooled by primary air.

4.4.11 The ash hoppers beneath the grate discharge into the water quench of the water based slag extractor. The burnt up slag at the end of the grate falls into the water quench via the bottom ash hopper. A slat conveyor carries ash and slag out of the water quench. The material is transported to the slag bunker via a belt conveyor.

4.4.12 Back up burners fuelled by light fuel oil are located above the grate. The burners allow for start up from a cold state and as a supplementary firing means to ensure a minimum operating temperature of 850 ^oC as necessary.

4.4.13 Primary combustion air will be fed into the furnace through the underside of the grates by a primary air fan. Secondary air will also be injected at high velocity through nozzles positioned in the walls of the combustion chamber above the level of the waste. This will create turbulence, which assists mix the secondary air and combustion gases to achieve complete combustion of the gases. The volume of both primary and secondary air will be regulated by an automatic combustion control system.

4.4.14 The steam generation system is located above the grate. The steam generating environment operates within a pressure of 48bara and 410^{o}C. This minimises chloride corrosion to the heating surfaces. The pipe walls of the first, second and third exhaust flue as well as those of the horizontal flue constitute the evaporator heating surfaces, where at first saturated steam is generated. The horizontal flue contains the convection heating surfaces suspended in the flue gas flow and super heater and feed water heater (Economiser). The flue gas is ventilated from the grate via the four passes in to the flue gas treatment system behind the horizontal flue.

Energy Recovery

4.4.15 Low pressure steam is extracted for use as process steam within the adjacent paper mill. The plant will have a reasonable sized steam turbine with steam inlet conditions of about 410^{o}C/48bara. The steam required in the mill will be used at c. 9bara or at c. 6bara. The steam is fed to the paper mill over a bridge which crosses the site internal road to the west of the proposal site.

Flue Gas Treatment

4.4.16 Combustion gases will be cleaned before they are released to the atmosphere. The flue gas treatment system is a dry conditioned flue gas treatment system. The final configuration and design of the abatement plant will be agreed with the Environment Agency as part of the Environmental Permitting authorisation process. The flue gas treatment system will be designed to be compliant with the EC Waste Incineration Directive, which will be enforced by the Environment Agency through conditions attached to the facilities Environmental Permit. The proposed flue gas treatment process is able to precipitate acid components to a minimum. The flue gas from the grate is denitrified by a process which turns nitrogen oxides (NOX) produced during combustion by non catalytic conversion to nitrogen and steam. The reducing agent used is ammonium hydroxide, which reacts with nitrogen dioxide of the flue gases within a temperature range of 850 - 950^{o}C. Approximately, 20% by weight of the total ash produced by the sustainable energy plant will be in the form of fly ash and reaction product FGT. Thus assuming a 90% load factor it is expected that approximately 28,000 tonnes of fly ash and reaction FGT residue will be produced per annum.

4.4.17 A major aspect of the dry conditioned flue gas treatment system is that it does not generate waste water. The plant consists of the following components.

- Spray absorber
- Dry sorption reactor
- Fabric filter
- Induced draught fan
- Stacks

4.4.18 Within the spray absorber, there is turbulent contact between flue gases and injected water slaked lime which enables pre separation of chloride and sulphur dioxide and the quenching of flue gas by injected water. The cooling down and the increase of the water content provides for an interim formation of a liquid phase at the surface of the dust and salt particles and enhances the performance of the absorption of pollutants in the process which follows.

4.4.19 The activated charcoal, a dry sorption reactor is introduced to the flue gas to separate heavy metals and dioxins and furans by adsorption. Dry hydrated lime is injected also. The solid reaction products leave the dry sorption reactor with the flue gas and are precipitated in the fabric filter downstream in the process. The filter bags are regularly cleaned. Most of the material precipitated in the fabric filter is initially moistened and then re-circulated using screws and mechanical conveyors. The remainder is transported by conveyors to the residue silo where the ash from the boiler flue is also collected. Once collected, the ash will be loaded into sealed containerised vehicles and transported from the site for disposal within a permitted facility.

4.4.20 Clean exhaust gas is directed to the stack by an induced draft fan. An exhaust silencer will control sound emissions at the stack outlet.

Stacks

4.4.21 Each processing line will be served by a stack with a height of 90 metres located at the south western end of the building. The height has been determined through extensive dispersion modelling of emissions and evaluation of the resulting dispersion plumes so that ground level concentrations of key pollutants are maintained within acceptable levels under all operating conditions.

4.4.22 Dispersion of pollutants is dependent upon a number of factors including local land topography, emission rates and pollutant concentrations at the height of the SEP buildings. The air quality and plume dispersion modelling used to identify the chimney height necessary for optimum dispersion is described in detail in Chapter 7: Air Quality. The stacks have been designed to meet all predicted climatic conditions.

Ash Management

4.4.23 Bottom ash (BA) is the cooled burnt-out residue from the combustion process. Around 20% to 25% of the fuel burnt is expected to be converted to bottom ash this equates to 80% of the total ash produced. This equates to up to 138,000 tonnes per annum of bottom ash. Ash from the slag bunker is transported to the slag treatment system using a crane and a belt conveyor. The ash is treated to precipitate iron, non iron metals and un-burnt fuel. The slag is crushed into a graded material. Ferrous and non ferrous metals are recovered with un- burnt matter returned to the fuel bunker. The ash is graded and stored in rows within an enclosed building for a period of three months during which time it maturates. This process enables the bottom ash to hydrate and age which improves its ability to be used for constructional purposes. All maturated bottom ash (slag) will be exported from the site.

Any ash that has not been sold will be treated as a waste product from the process. Bottom Ash, as with other wastes, will need to meet Waste Acceptance criteria testing thresholds before being accepted for landfill (Environment Agency, 2006).

4.5 Waste Types, Inputs Sources and Facility Options

4.5.1 The SEP is designed to process fuel in the form of pre treated waste from the commercial and industrial, and municipal solid waste streams, together with waste Solid Recovered Fuels. The mixed waste stream will have a predicted average net calorific value of 10.5 MJ/kg. The proposal site will seek to attract a wide range of local Commercial and Industrial Wastes.

4.5.2 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. Waste will be brought to the site by HGV vehicles. There is the potential for waste fuel to be transported to the site by the use of both rail and water transportation utilising facilities at the local Ridham Sea Terminals.

4.6 Other materials used and stored on site

4.6.1 A range of chemical substances and hazardous materials will be stored on site associated with the SEP process including urea/ ammonia water (25%), calcium hydroxide and activated carbon, boiler water treatment chemicals, low sulphur fuel oil and oxygen and acetylene bottles. These materials will be stored in accordance with Environment Agency guidance.

4.6.2 The reagent and boiler water treatment chemicals will be stored in suitable storage tanks located within the building infrastructure (stored in the concrete building within the boiler house). Lime and activated carbon will be used within the Flue Gas Treatment process. Storage will be in dedicated steel silos with equipment for filling from a tanker through a sealed pipe work system. Delivery to site will be by bulk powder tanker.

4.6.3 Boiler water treatment chemicals will be used to control water hardness, pH and scaling and will be delivered in sealed containers and stored in the water treatment room. Fuel oil will be used on site for the auxiliary support burners and diesel fuel for mobile plant and equipment. The fuel oil will be stored within a bunded storage tank and the diesel tank is located underground. Portable bottles of oxygen and acetylene gas will be stored on site for welding purposes gas bottles will be kept secure.

4.7 Water Usage, Drainage Treatment and Disposal

4.7.1 The proposal site generally comprises land previously used for storage. The construction and operation of the new development will therefore significantly increase the impermeable area of the site and therefore the volume of the surface water run off from the site.

4.7.2 The overall philosophy for the design of the surface water drainage system for the site development is therefore to manage surface water discharge sustainably and at source and to ensure that discharged waters do not constitute a pollution risk. The drainage philosophy is set out at Appendix 4.3.

4.7.3 The surface water design is shown on Figure 4.25 and sections Figure 4.24 It is shown that all clean surface water from the site is discharged to receiving storage ponds constructed on the northern, eastern and southern perimeters of the site. The storage ponds discharge this water under gravity to the tidal Swale estuary to the north east. Site levels are shown on Figure 4.26. The provision of the constructed ponds will provide an effective and economic way of conveying water to the reed bed habitat from surface water run off. The drainage swale will also provide protection against flooding of the site during rainfall and tidal events.

4.7.4 The perimeter storage swale will be vegetated and will hold, slow down and contribute to treatment of the run off water. The drainage swale will prevent uncontrolled discharge water entering areas of land adjacent to the site. The surface water drainage network incorporates underground water harvesting tanks and pump arrangements to collect water from building roofs. This water will be used for fire water purposes, for toilet flushing, process water and landscape irrigation.

4.7.5 The SEP process is designed to be a net consumer of water and therefore there is no requirement for regular discharge of waste water from the combustion process. Waste waters are however generated from the process in the following areas.

- Water from the boiler drains
- Back flushing water from the de mineralisation plant
- Liquid run off from wash down operations
- Surface water on roads and hard standing
- Rainwater from roofs

4.7.6 The process requires the large scale storage of ash/ slag in a covered lay down area located to the north east of the site. The stored slag will be wet initially and will be moved by loading shovels entering from the adjacent external areas. A raised concrete upstand will be provided on the open sides of the covered laydown area. The run off water from the stockpiles will be collected in slot drains and discharged back to the slag extractor or recirculated on top of the slag stockpiles. Circulation and yard areas immediately adjacent to the laydown areas will be subject to the regular movement of loading shovel vehicles. The runoff from these external areas will be discharged to the surface water system following pre treatment such that it is of suitable quality for discharge to estuary waters. Full retention oil separators and catch and silt traps are included in the layout.

4.7.7 Foul drainage (production of domestic foul waste, process driven waste water, refuelling and vehicle wash down area run off) will discharge to the existing foul sewer located within Ridham Avenue. The remoteness of some of the areas requiring connection to the foul system will require that a pumping station and rising main are provided to discharge foul water to the receiving sewer at self cleansing velocities. The integral system of drainage to the foul drainage as shown on Figure **4.25**.

4.7.8 During construction of the bunker, the integrity of the walls and base will be verified. Further routine visual checks of the bunker will be undertaken following clearance of waste fuel to ensure its integrity is maintained.

4.8 Hours of Operation

4.8.1 Permission is being sought to enable the SEP to operate continuously 24 hours per day, seven days a week. It will operate continuously throughout the year with the exception of planned shut downs and unplanned maintenance. As far as practical, time booking arrangements for waste receipts will be put in place in order to minimise the impact at peak times on the local highways. In respect to the receipt of waste fuel by heavy traffic movements this will as far as possible take place between the following hours:

0700 and 1800 hours Mondays to Fridays
0700 and 1300 hours Saturdays.

4.9 Site Staff

4.9.1 The SEP will employ approximately 50 full time employees comprising operator shift staff, maintenance employees, weighbridge operators, clerical and administrative staff and plant management.

4.9.2 The plant will have 5 shift teams. Each day there will be 3 shifts, operating from 7am to 3pm, 3pm to 11pm and 11pm to 7am. A normal shift team member will work on 3 morning shifts then a day off. Then 3 (second cycle 4) afternoon then 4(second cycle 3) night shifts, then 6 day off. The cycle starts again after the days off.

4.9.3 In addition an average of 100 contractors will be employed for planned shutdowns.

4.9.4 During construction approximately 500 contractors will work at the site.

4.10 Monitoring

4.10.1 The proposed monitoring arrangements are summarised below. These will be agreed in detail through the Environmental Permit administered by the Environment Agency.

Flue Gases

4.10.2 The monitoring of exit flue gases will be achieved through the use of a Continuous Emissions Monitoring System (CEMS) which comprises a sample handling system, analyser unit and logging/reporting equipment. These systems use various analytical technologies to determine the gas composition on a continuous basis.

4.10.3 The components measured will as a minimum be those stipulated by current legislation, together with others required for process control purposes and will comprise particulate, HCI, SO2, NOx, NH3, CO, Hg and O2. The emissions components to be identified and monitored will be specified in the Environmental Permit and will be available to the Environment Agency. The CEMS will have an emergency electrical supply with sufficient capacity to maintain the system for at least 30 minutes in the event of power failure. All monitoring instruments will be regularly calibrated. A standby continuous monitoring system will also be provided that can be switched into operation on either line in the event of a problem with the duty system or whilst maintenance is taking place. Dioxin /Furan and heavy metal sampling will be undertaken in accordance with the Environmental Permit. The

sampling will be carried out by an independent company and is expected to be supplemented by tests carried out by the Environment Agency.

Process Control

4.10.4 The processes taking place throughout the plant will be monitored by an integral computer control system, typically comprising Programmable Logic controllers for the furnace and grate, fuel crane operation, gas cleaning system, bag filter, water treatment plant and turbine generator system.

4.11 Hazard Prevention & Environmental Controls

Fire

4.11.1 Comprehensive fire protection and detection systems will be installed within the facility to prevent fires occurring. In addition to these systems standard health and safety procedures will be put in place. Flammable liquids and chemicals will be kept in sealed containers / tanks within bunded storage areas.

Spillages of Additives

4.11.2 Additives and chemicals will be stored in sealed tanks within bunded storage areas with a capability of containing 110% of the capacity of each storage tank. Additives including lime and activated carbon will be fed into the process automatically and there should be no requirement for human intervention into this process.

Emissions to Air

4.11.3 The potential impacts of the facility's emissions to the atmosphere are discussed in detail in Chapter 7: Air and Climate.

Odour and Dust Suppression

4.11.4 Odour, dust and other potential environmental impacts from the plant will be controlled in accordance with the requirements of the Environment Agency Environmental Permit guidance. Air from the tipping hall has the potential to be odorous, however containment of dust and odour within this area will be achieved through the maintenance of negative pressure in the hall. Further odour suppression control will be introduced should circumstances require this.

4.11.5 Combustion air fans will draw feed air for the combustion process from the waste reception hall into the furnace to feed the combustion process. As a result, any dust or odour from the tipping, mixing, shredding and furnace loading operations will be retained within the waste fuel reception hall or drawn into the furnace where the odour carrying gases will be destroyed by combustion, virtually eliminating the possibility of odour detection outside the facility. Doors will be fitted with automatic door closures where required.

Vermin Control

4.11.6 The main area where vermin (such as rats and flies) could potentially be attracted is the tipping and bunker hall. Waste fuel will not be allowed to accumulate within the tipping hall and the floors will be kept clean through the use of loaders which will collect any spilled waste and deposit it into the waste bunker. In addition to these measures, standard pest control methods will be implemented as part of the Environment Agency permitting procedures.

Noise

Vehicles and reversing alarms

4.11.7 The layout of the facility has been designed such the majority of vehicle reversing actions will take place within the buildings thereby removing the impacts associated with reversing alarms.

Buildings and equipment

4.11.8 Buildings will be fully enclosed and will be insulated where appropriate in order to achieve acceptable noise levels at the closest sensitive receptor locations. Access and exit doors within the plant that are in continuous operation during week days will incorporate rapid closing doors. When not in use the doors will be closed at all times.

4.11.9 All plant and equipment will be located and operated within the confines of the proposed building environment with the exception of the air cooler and the transformer.

4.12 Plant Maintenance and Shutdown

4.12.1 The SEP is expected to operate continuously with both lines in operation throughout the year with the exception of maintenance periods. Typically there will be a three week planned shutdown each year for each line.

4.12.2 During this time there will be no need for any changes to the direct fuel waste delivery pattern to the SEP, as the facility will operate at half capacity, allowing it to process all of the delivered waste. In the unlikely event of an unplanned shutdown of both lines, waste materials would either be transferred or redirected to alternative treatment or disposal facilities elsewhere.

4.12.3 The SEP is carefully designed with sufficient duplicated equipment to ensure a high level of operational availability. All equipment within the SEP will be subjected to a planned and preventative maintenance programme to minimise the occurrence of unplanned shutdowns.

4.13 Operating Conditions

Start Up

4.13.1 This will take place during commissioning of the facility and after each maintenance shutdown period. Prior to start up, all systems and equipment will be checked to ensure they are ready for use. Prior to combustion, auxiliary burners using fuel oil will be used to ensure that the furnace temperature is at least 850ºC. Once the appropriate temperatures have been achieved, the feed hopper and grate are activated and waste fuel fed into the furnace.

4.13.2 Generation of electricity can only begin when sufficient steam at the correct pressure and temperature has been produced. There will be a period of delay between start up and the export of electricity to the local public electricity supply network. During this period the plant will import electrical power through the same cables that are used for export of generated power.

Fire Protection

4.13.3 The SEP will be equipped with a comprehensive fire protection and detection system and will conform to the required health and safety regulations including procedures in the event of a fire. In the bunker hall, remotely operated water cannons will be installed which are capable of covering the entire bunker and feed hoppers. Both an electrical fire pump and a reciprocating engine-driven fire pump will ensure that fire systems are available at all times. The operation of the fire pump will set off an audible alarm in the control room. The firewater tank will be sufficient to provide enough water for at least 2 hours capacity of the pump, giving time for the emergency services to respond.

4.13.4 Fire detection and protection systems will be installed in other areas of the plant, the type of which will be dependent on the nature of the process(es) taking place in any given location. Smoke extractors will also be fitted in all buildings and staircases. Fire detection and protection systems will be installed in all electrical and instrument rooms, and will be tested to current standards.

Failure of a Bag Filter

4.13.5 Failure of a filter bag is an irregular event, which would be detected by monitoring equipment, which sends a warning to the operators in the control room. The bag filters are then tested to locate the faulty bag and this section of the filter is isolated, shut down and the bag replaced. Individual bag failure will not result in an exceedance of the PPC permit limits.

Failure of FGT Equipment

4.13.6 There are various standby items (e.g. a standby atomiser) which can readily be installed to enable the plant to remain operational. If a lime injection system failure were to occur then unspent lime on the filer bags will ensure that the combustion conditions and emissions comply with the PPC permit during an emergency shutdown.

Failure of Other Equipment

4.13.7 The plant has been designed with stand-by systems and redundancy in equipment and this, together with a comprehensive planned maintenance programme to ensure the plant remains operational and in compliance with the Environmental Permit.

Grid Connection Failure

4.13.8 In the event of a failure of the power supply connection to the local public supply network, the facility will operate in island mode, during which the turbine generator will directly supply the required power to sustain operation of the SEP until the supply connection is restored. In the event that operation in island mode is not possible, the facility will switch to an uninterruptible power supply and import power from the power supply network/ CHP, allowing the facility to maintain all critical systems. Under these conditions, a controlled shut down of the facility will be initiated. During this period, all emissions will be monitored and kept within the permitted limits.

Emergency Shutdown

4.13.9 If any incident endangers or is likely to endanger personnel, or there is a risk of serious damage to the facility, an emergency shutdown will be necessary. Prior to the plant becoming operational, precise operating procedures for the various possible scenarios according to the likelihood of incidents in the facility, taking into account the safety of personnel and the equipment will be in place.

4.13.10 In order to rapidly extinguish combustion in an emergency, an emergency shutdown will be initiated and the induced draft fan will be switched off. This would result in the immediate stopping of the combustion air fans, the grate feed and the burner. Staff will ensure that the above actions have been completed, the air dampers under the grate are closed, and the burner fuel oil safety valves are closed.

4.14 Construction

Timescales

4.14.1 An outline general construction programme is provided at Appendix 4.1. Subject to planning permission, release of pre-commencement conditions and contractor mobilisation, it is estimated that the development timescales would likely to be as follows:

- Commence Construction: 2011
- Construction Completion: 2013
- Commissioning: 2013
- Run-in period: completed 2014

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4.14.2 There are two main periods of construction works which will overlap to some degree. These are the civil engineering works associated with the plant construction and the process work involved in the mechanical and electrical equipment installation, fit out and commissioning of the plant.

4.14.3 In practice, some waste will be taken during the commissioning period on an intermittent basis. For the purpose of the EIA, December 2013 has been assumed as the commencement date for waste fuel imports to the site.

Hours

4.14.4 Construction operations will generally take place between the following hours:

- 07:00 – 19:00 Monday to Friday
- 07:00 – 16:00 Saturday and Sundays

4.14.5 However, it is envisaged that non-intrusive activities (such as electrical installations, pipework and similar activities) would be undertaken outside of these hours in order to minimise overall construction time. HGV movements associated with such activities would be insignificant. The construction of the bunker walls has to be a continuous process and will be of 12 -15 weeks in duration. The delivery of concrete and construction using it would be on 24 hours, 7 days per week.

4.14.6 Any intrusive work outside of these hours would be with the prior agreement of the Local Planning Authority, accept in the case of any emergency.

Access

4.14.7 Site access during construction works will be via the existing Ridham Road access which links to Barge Way

Plant

4.14.8 Plant to be used during the construction phase will typically include:

- Tracked Excavators (Excavation and loading)
- Articulated Dump Trucks
- Wheeled Back Hoe Loaders
- Wagons
- Telescopic handlers
- Rollers
- Water Pumps
- Concrete pump
- Generators
- Cement Mixer Truck
- Cranes
- Piling Rig(s)

Operational Practices

4.14.9 The following text sets out the operational practices that will be employed during the construction phase to minimise environmental impacts. In addition to the information presented below, the proposed contractors Common Environmental policies are included at Appendix 4.2.

Erection and Maintenance of Security Fencing (Including Construction Site Signage, where Appropriate)

4.14.10 The construction site boundary will be secured using 2m high fencing system with gated access points onto site at positions off the Ridham Road. There are no public rights of way across the site, therefore during the construction phase of the project there should be no areas that require a public interface.

4.14.11 Site personnel access routes will be segregated from construction vehicular traffic.

Storage of Construction Plant and Materials

4.14.12 During construction, the construction area will be segregated into stores, fuelling area, plant parking and materials. General construction materials and overnight parking of plant will occur within the development site boundary which will be provided with 24hour security. The proposal site itself will be used as a lay down area during construction.

4.14.13 Stores will be positioned to the forefront of the lay down area for easy access for small tools and plant, these will be organised so fire fighting equipment and spill kits are easily accessible.

4.14.14 The storage area will be constructed with a clean stone platform / existing concrete, and timbers/ pallets available for the off loading of materials to ensure that materials remain clean and fit for use.

4.14.15 Materials in need of added protection from the elements will be sheeted when required, this will be assessed as part of the build contractors quality procedures and a materials management plan will be produced for all major items.

4.14.16 Most materials will be transported to the work area as required but for major materials, for example structural steel, deliveries will be co-ordinated so they will be transported on site to the designated live work area and unloaded for immediate erection.

Site Operative and Visitor Parking

4.14.17 Directional signage for the building contractors will be placed in prominent positions off Barge Way directing construction/ visitor's traffic to the existing car park off the main site access road. Once entering the compound a defined route will be in place directing the personnel traffic into the site compound parking area catering for the 100 parking spaces.

4.14.18 Vehicular and pedestrian traffic will be separated using the existing site arrangements to mitigate risk of potential interface incidents. A defined route will be placed to direct the site personnel from the compound to the main construction site, this will be segregated to mitigate risk of collision between pedestrians and vehicles.

Loading and Unloading of Plant and Materials

4.14.19 Construction delivery and plant traffic will be directed by means of prominent signage into the site along the existing site haul road.

4.14.20 On entry to the site a check point, with gateman/security guard in attendance, will be placed with visible signage requesting delivery drivers to sign in and notify site personnel prior to entry into the construction work area.

4.14.21 All loads and tickets will be checked prior to the off loading of materials and plant on site, or within the designated materials laydown area. All off loading activities will be carried out under a permit to work procedure.

Wheel Wash Facilities

4.14.22 A wheel wash facility, located at the exit from the site, will be used during the earlier stages of construction. This is expected to be a bespoke system comprising a self contained unit, an integral pump house and internal settlement collection tank. The platform will be drive on, drive off, complete with a series of sensor controlled steel high pressure water hoses and a power washer hand lance.

Measures to Control the Emission of Dust and Dirt During Construction

4.14.23 Dust and dirt emissions will be monitored by the site engineer on a daily basis dependant on the weather conditions / elements and activities being carried out. To supplement the use of the wheel wash, which will prevent the majority of dust and dirt from being carried onto the public highway, the site access roads and existing approach road will be regularly swept by a mechanical road sweeper as and when required to maintain the roads to an acceptable standard. The prevention of inherent dust on site in dry conditions will be controlled by means of regularly damping down the site using water from a towed sprinkler unit.

4.14.24 Dust control during construction activities which effect workforce involved in specific activities will be risk managed by the building contractor's stringent permit to work risk assessment procedures.

Recycling of Waste

4.14.25 General site waste generated throughout construction will be segregated. This will include waste generated within the site compound and office set up which will be separated between general household type waste generated from the messing facilities and paper waste which will be disposed in designated paper recycling bins.

4.14.26 The waste generated from construction activities will be separated on site in general waste, timber waste and steel waste skips; this will be managed by the contractor and will be removed from site to an appropriate facility for processing. A detailed Waste Minimisation Statement will be submitted to the Waste Planning Authority for approval prior to the commencement of construction works.

Site Specific Procedures

4.14.27 The following site specific procedures will be in place during the construction period:

- all employees will attend a Site Induction (both for construction works and the St Regis site) carried out by the construction contractor on arrival to site. The induction will be project specific emphasising the contractors safety procedures and rules and site plans phasing;
- all employees will have signed onto the contractors Permit to Work/Risk Assessment and will have read and understood the method of work and safety procedures prior to commencing work on site;
- 'Take Time' risk assessments will be completed by each working gang or persons prior to commencing work;
- all plant operatives will be competent trained personnel and carry the required certification (CPCS) in line with the contractors approved list;
- site staff will carry out daily checks as part of safety and quality procedures; and,
- all operatives will be briefed at induction stage on the importance of waste segregation and recycling of materials generated on site.
- An example of the site rules proforma to be implemented is provided in Appendix 4.3

Foul Water

4.14.28 For construction work it is anticipated that the contractor will use a septic tank for sanitary and domestic drainage.

Decommissioning

4.14.29 Planning permission is sought for permanent development on the site and therefore it is not considered necessary to consider the impacts of the decommissioning phase within this Environmental Statement.

4.14.30 In the event that decommissioning becoming necessary, the techniques followed would be undertaken having regard to the following regulations (or their subsequent replacements):

- Building Control Regulations
- Construction (Design and Management) Regulations 2007.
- Integrated Pollution Prevention and Control (IPPC) Regulations.

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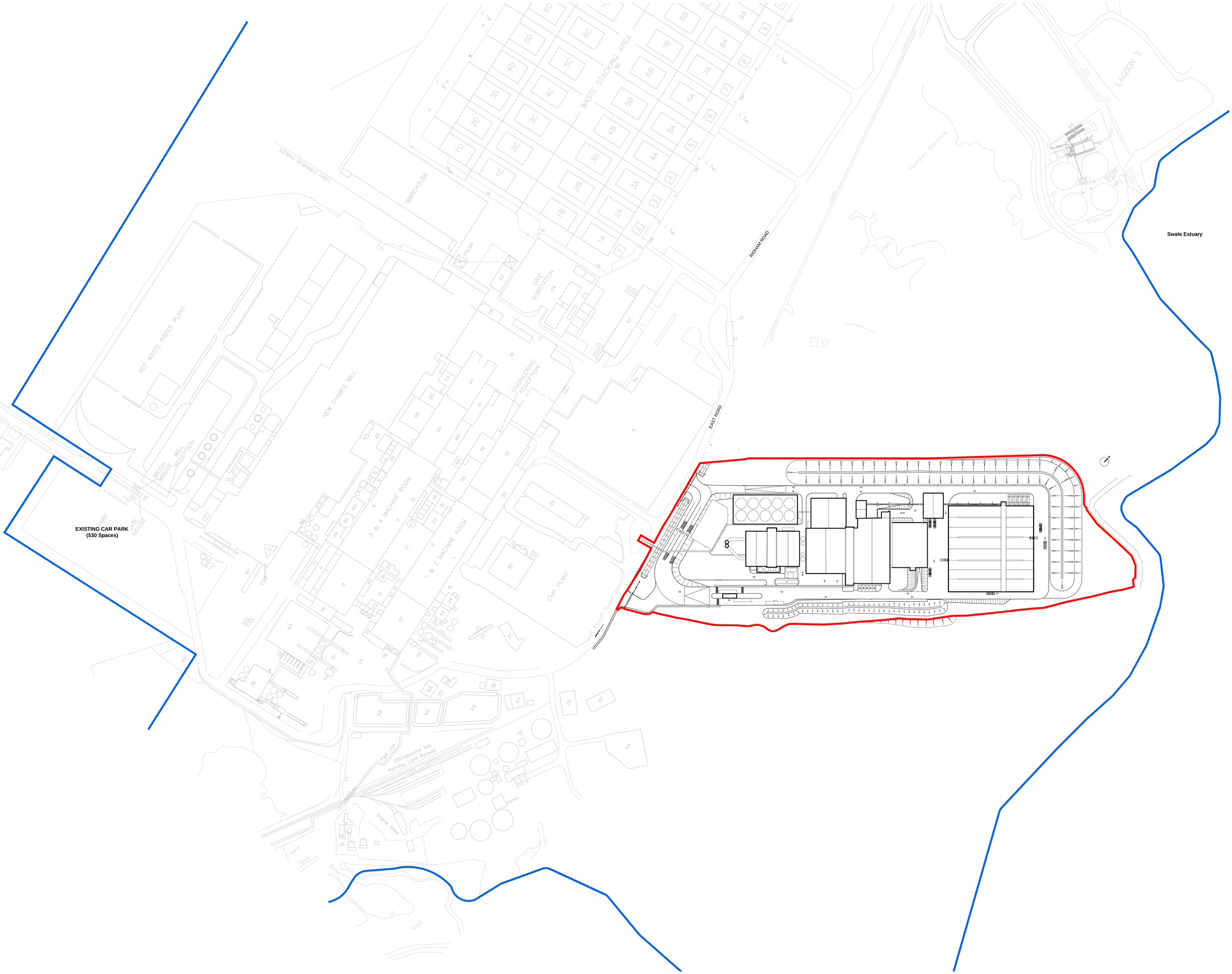
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25m SCALE 1:1250

	Land Ownership Boundary
	Proposed Development Boundary

Note: Reference to OS of existing paper mill provided by St Regis Paper Mill in DWG format and topographical survey provided by Eon.



Drawing for PLANNING purposes only

rev	amendments	by	chd	date
B	Footpath and car park information moved to drawing 16315_P_0065. E.ON logo added.	AJL	PRP	20.01.10
A	Footpath locations added, Saxon Shore Way location amended, general notes added.	SMG	PRP	16.12.09

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Client: St Regis / E.ON

Project: Kemsley Sustainable Energy Plant

Title: Proposed Site Location Plan

Drawing Status	Date Created	Drawing Scale
Preliminary	November 2009	1:1250
Project Leader	Drawn By	Initial Review
RS	AJL	PRP

Drawing Number: 16315 / A0 / P / 0060 Rev B

FIGURE 4.1

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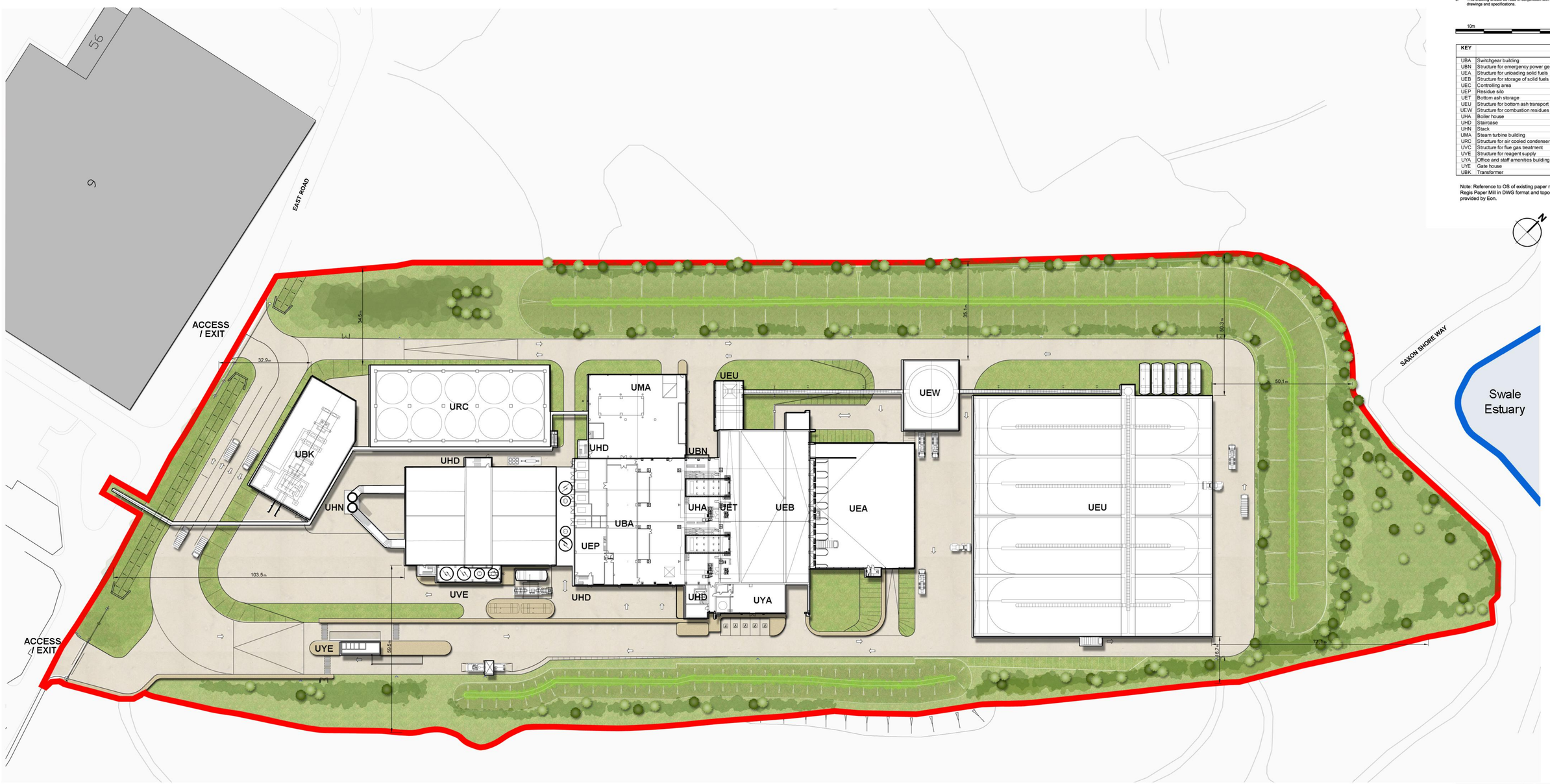
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10m SCALE 1:500

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.



	Land Ownership Boundary
	Proposed Development Boundary

Drawing for PLANNING purposes only

rev	amendments	by	chd	date
D	Eon logo added.	AJL	PRP	17.02.10
C	Surrounding site context and site gates added. Existing OS and colours altered.	SMG	PRP	09.12.09
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

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Client: stREGIS e·on

Project: Kemsley Sustainable Energy Plant

Title: Proposed Building Layout

Drawing Status	Date Created	Drawing Scale
Preliminary	November 2009	1:500
Project Leader	Drawn By	Initial Review
RS	AJL	PRP

Drawing Number: 16315 / A0 / P / 0105 Rev D

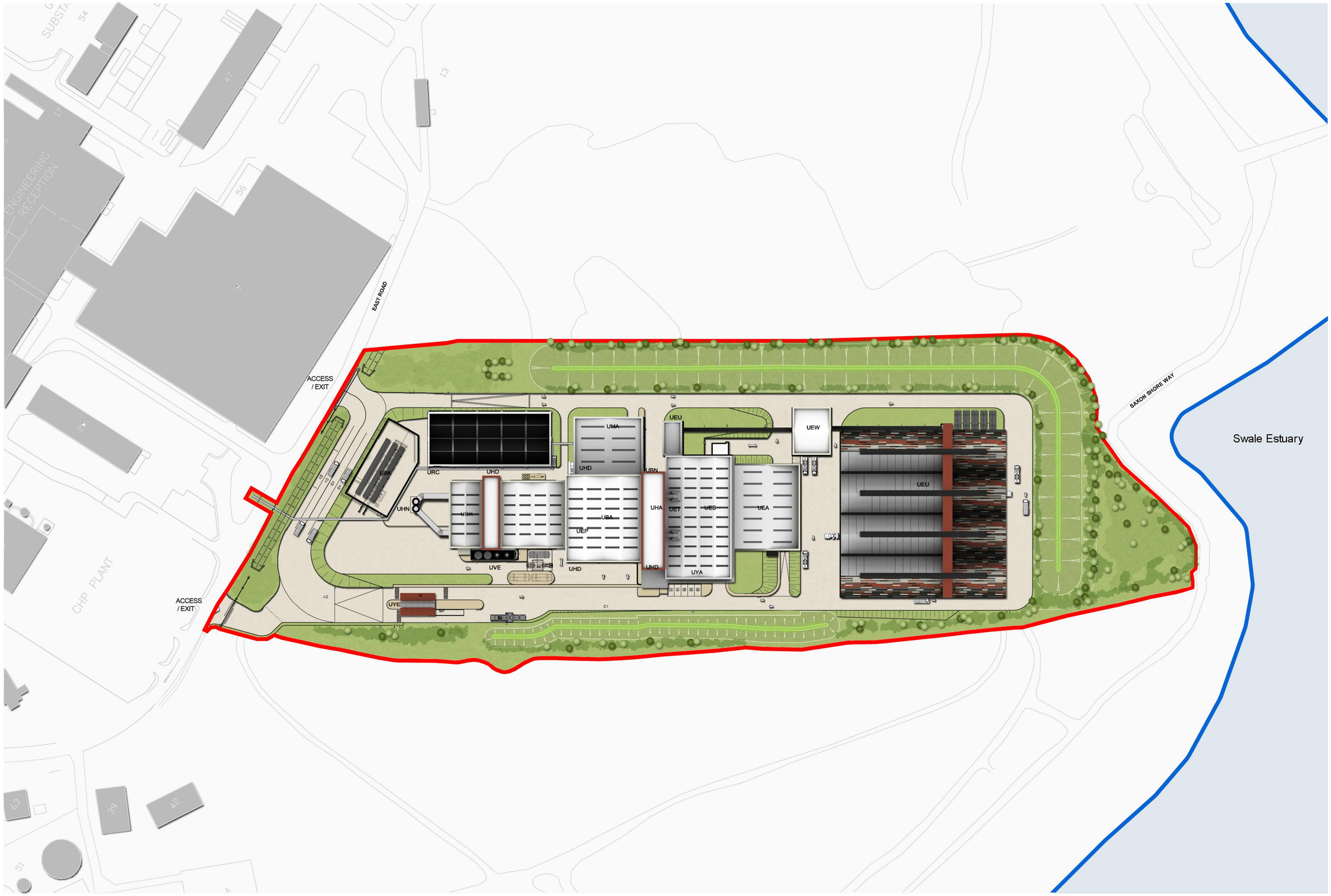
FIGURE 4.2

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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
	Proposed Development Boundary

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

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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

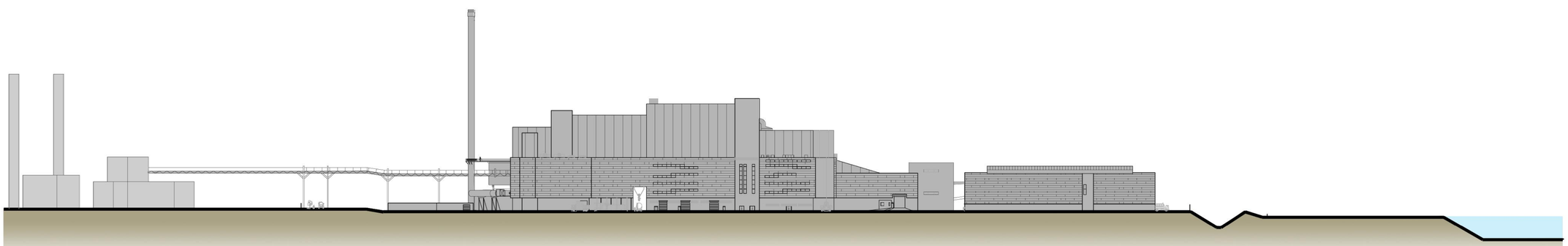
Drawing Number: 16315 / A1 / P / 0100 Rev E

FIGURE 4.3

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SOUTH EAST ELEVATION



Existing Paper Mill
(With Indicative Building Heights)

Proposed Sustainable Energy Plant

Attenuation Pond

Swale Estuary

SOUTH EAST SITE SECTION
1:1000

notes :

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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 1:500

10m SCALE 1:1000

Key:

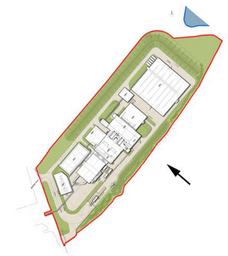
1. Horizontally laid Sinusoidal profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Terracotta' (matt finish) / RAL 040 40 40
2. Vertically laid Flat profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Albatross' / RAL 240 80 05
3. Horizontally laid Flat profile insulated cladding panel with Colorcoat HPS200® Ultra coating, 1000mm deep bands - Colours random mixture 'Terracotta (matt finish) RAL 040 40 40/ Merlin Grey RAL 180 40 05/ Anthracite (matt finish) RAL 7016/ Hamlet RAL 9002
4. Vertically laid Trapezoidal profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Anthracite' (matt finish) / RAL 7016
5. Stack - Colour `Light Grey` / RAL 7035
6. Concrete plinth detail - Colour 'Anthracite'
7. Horizontally laid Flat profile cladding sheet with Colorcoat HPS200® Ultra coating, 1000mm deep bands - Colours random mixture 'Terracotta (matt finish) RAL 040 40 40/ Merlin Grey RAL 180 40 05/ Anthracite (matt finish) RAL 7016/ Hamlet RAL 9002

All **Doors** and **Louvres** to match adjacent cladding colour

Polyester powder coated aluminium **window frames** and **Brise Soleil** - Colour 'Anthracite' (matt finish) / RAL 7016

Metal **external handrails** and **plant support** - Colour 'Anthracite' (matt finish) / RAL 7016 (with contrasting elements to comply with building regulations)

Paladin fencing and gates - Colour 'Anthracite' (matt finish) / RAL 7016



Drawing for PLANNING purposes only

rev	amendments	by	ckd	date
F	Logo confirmed.	AJL	PRP	03.03.10
E	E.ON logo added.	KRy	PRP	15.02.10
D	Stack colour reference amended. Crane area material changed to concrete.	AJL	PRP	18.01.10
C	Key and notes updated and minor amendments to drawing.	SMG	PRP	16.12.09
B	Building levels information clarified. Keyplan Updated. Stack height confirmed.	AJL	PRP	25.11.09
A	Key added. Keyplan updated. Building elements labled.	AJL	PRP	19.11.09

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Client: stREGIS e·on

Project: Kemsley Sustainable Energy Plant

Title: South East Elevation

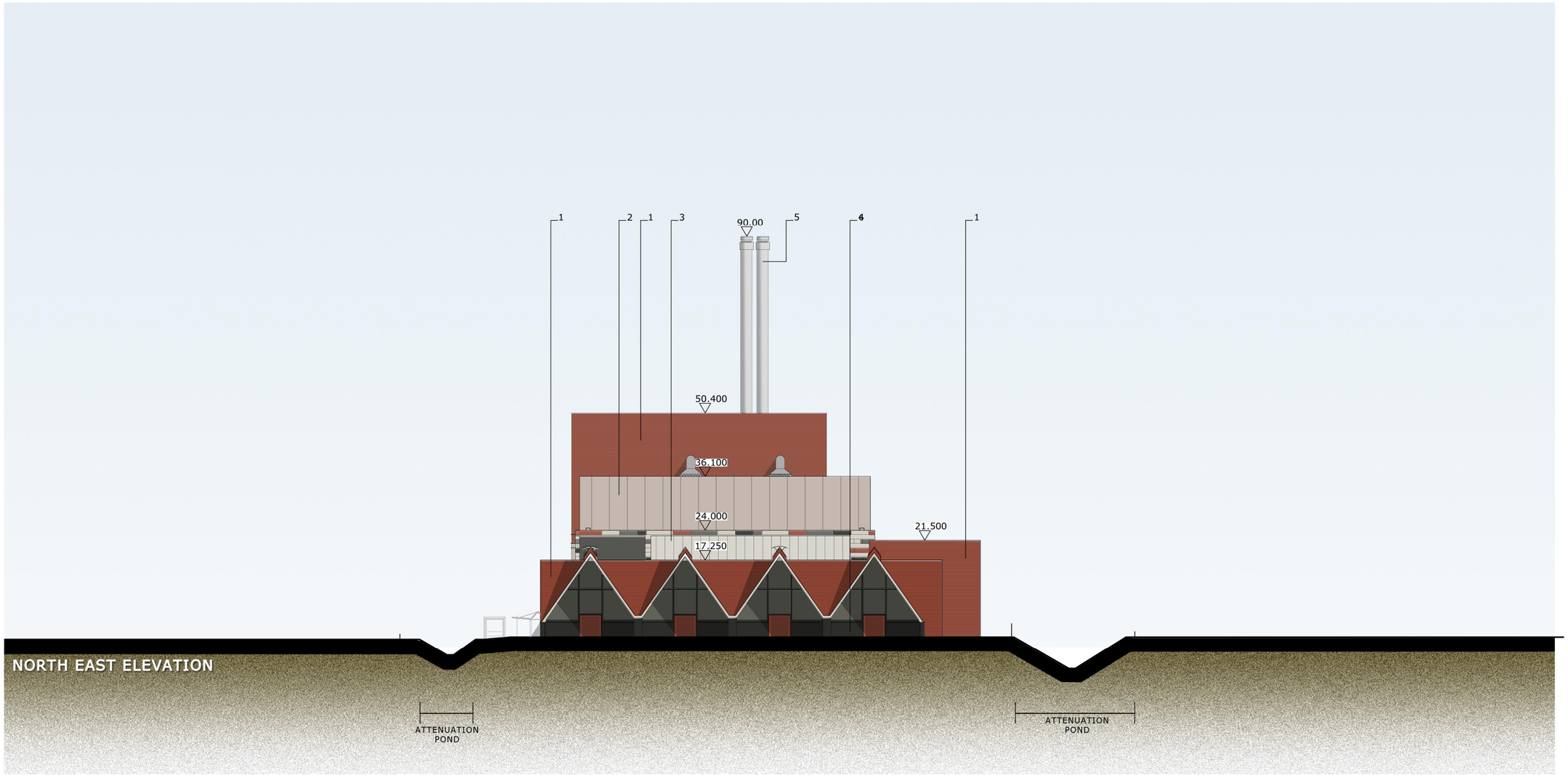
Drawing Status	Date Created	Drawing Scale
Preliminary	11.11.09	1:500
Project Leader	Drawn By	Initial Review
AWY	SMG	RS

Drawing Number: 16315 /A1 / P / 0110 F

Rev: F

FIGURE 4.4

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NORTH EAST ELEVATION

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3. This drawing should be read in conjunction with all other relevant drawings and specifications.

10m SCALE 1:500

Key:

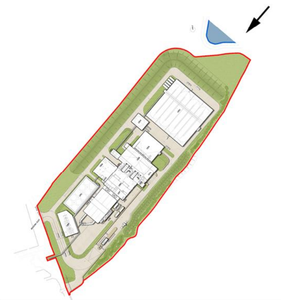
1. Horizontally laid Sinusoidal profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Terracotta' (matt finish) / RAL 040 40 40
2. Vertically laid Flat profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Albatross' / RAL 240 80 05
3. Horizontally laid Flat profile insulated cladding panel with Colorcoat HPS200® Ultra coating, 1000mm deep bands - Colours random mixture 'Terracotta (matt finish) RAL 040 40 40/ Merlin Grey RAL 180 40 05/ Anthracite (matt finish) RAL 7016/ Hamlet RAL 9002
4. Vertically laid Trapezoidal profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Anthracite' (matt finish) / RAL 7016
5. Stack - Colour ' Light Grey ' / RAL 7035
6. Concrete plinth detail - Colour 'Anthracite'
7. Horizontally laid Flat profile cladding sheet with Colorcoat HPS200® Ultra coating, 1000mm deep bands - Colours random mixture 'Terracotta (matt finish) RAL 040 40 40/ Merlin Grey RAL 180 40 05/ Anthracite (matt finish) RAL 7016/ Hamlet RAL 9002

All **Doors** and **Louvres** to match adjacent cladding colour

Polyester powder coated aluminium **window frames** and **Brise Soleil** - Colour 'Anthracite' (matt finish) / RAL 7016

Metal **external handrails** and **plant support** - Colour 'Anthracite' (matt finish) / RAL 7016 (with contrasting elements to comply with building regulations)

Paladin fencing and gates - Colour 'Anthracite' (matt finish) / RAL 7016



Drawing for PLANNING purposes only

rev	amendments	by	ckd	date
E	E.ON logo added. Building extents confirmed.	KRy	PRP	15.02.10
D	Stack colour reference amended. Crane area material changed to concrete. UMA extents confirmed.	AJL	PRP	18.01.10
C	Key updated, Brise Soleil added. Other minor amendments to drawing.	SMG	PRP	17.12.09
B	Elevation altered to show UEB.	AJL	PRP	23.11.09
A	Key added. Keyplan Upadated. Building Elements Labelled.	AJL	PRP	19.11.09

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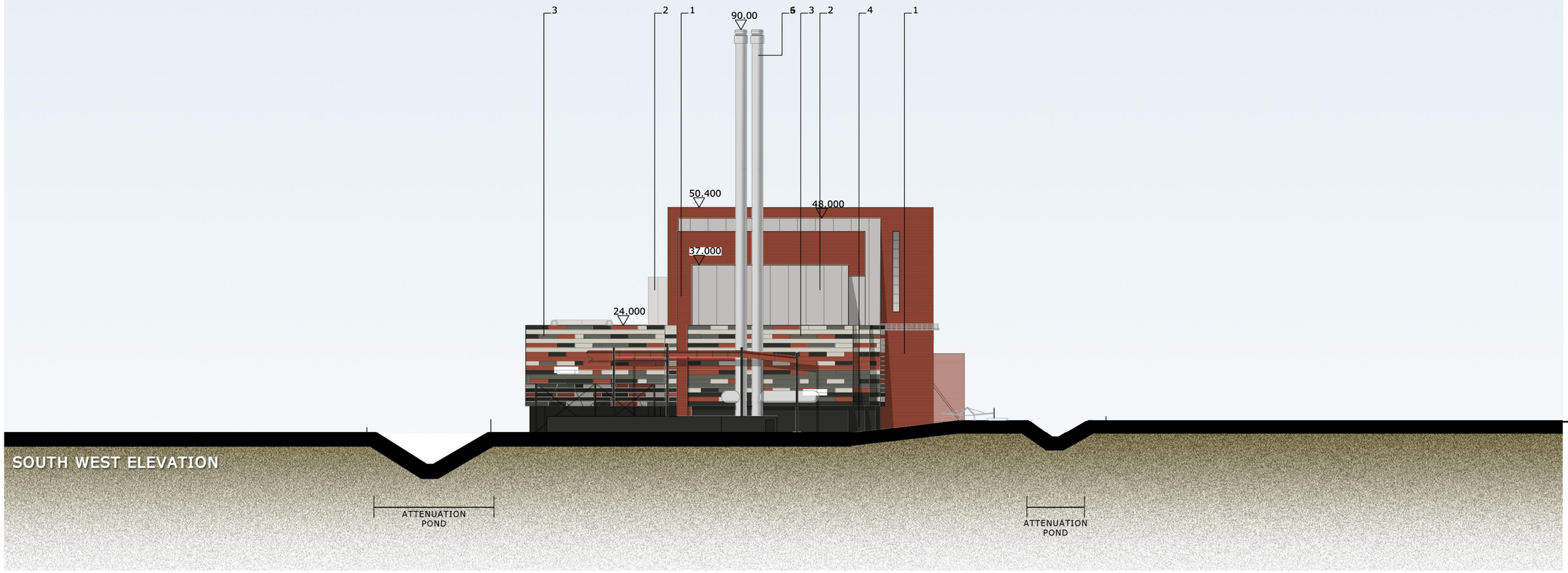
Title: North East Elevation

Drawing Status	Date Created	Drawing Scale
Preliminary	11.11.09	1:500
Project Leader	Drawn By	Initial Review
AWY	SMG	RS

Drawing Number: 16315 / A1 / P / 0111 Rev E

FIGURE 4.5

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10m SCALE 1:500

Key:

1. Horizontally laid Sinusoidal profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Terracotta' (matt finish) / RAL 040 40 40
2. Vertically laid Flat profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Albatross' / RAL 240 80 05
3. Horizontally laid Flat profile insulated cladding panel with Colorcoat HPS200® Ultra coating, 1000mm deep bands - Colours random mixture 'Terracotta (matt finish) RAL 040 40 40/ Merlin Grey RAL 180 40 05/ Anthracite (matt finish) RAL 7016/ Hamlet RAL 9002
4. Vertically laid Trapezoidal profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Anthracite' (matt finish) / RAL 7016
5. Stack - Colour `Light Grey` / RAL 7035
6. Concrete plinth detail - Colour 'Anthracite'
7. Horizontally laid Flat profile cladding sheet with Colorcoat HPS200® Ultra coating, 1000mm deep bands - Colours random mixture 'Terracotta (matt finish) RAL 040 40 40/ Merlin Grey RAL 180 40 05/ Anthracite (matt finish) RAL 7016/ Hamlet RAL 9002

All **Doors** and **Louvres** to match adjacent cladding colour

Polyester powder coated aluminium **window frames** and **Brise Soleil** - Colour 'Anthracite' (matt finish) / RAL 7016

Metal **external handrails** and **plant support** - Colour 'Anthracite' (matt finish) / RAL 7016 (with contrasting elements to comply with building regulations)

Paladin fencing and gates - Colour 'Anthracite' (matt finish) / RAL 7016



Drawing for PLANNING purposes only

rev	amendments	by	ckd	date
F	E.ON logo added. Building extents clarified.	KRy	PRP	15.02.10
E	Stack colour reference amended. UMA extents confirmed.	AJL	PRP	18.01.10
D	Key updated and minor amendments to drawing.	SMG	PRP	17.12.09
C	Building levels information clarified. Key updated. Stack material indicated.	AJL	PRP	25.11.09
B	Key & materials information added.	AJL	PRP	23.11.09
A	Key added. Keyplan Upadated. Building Elements Labelled.	AJL	PRP	19.11.09

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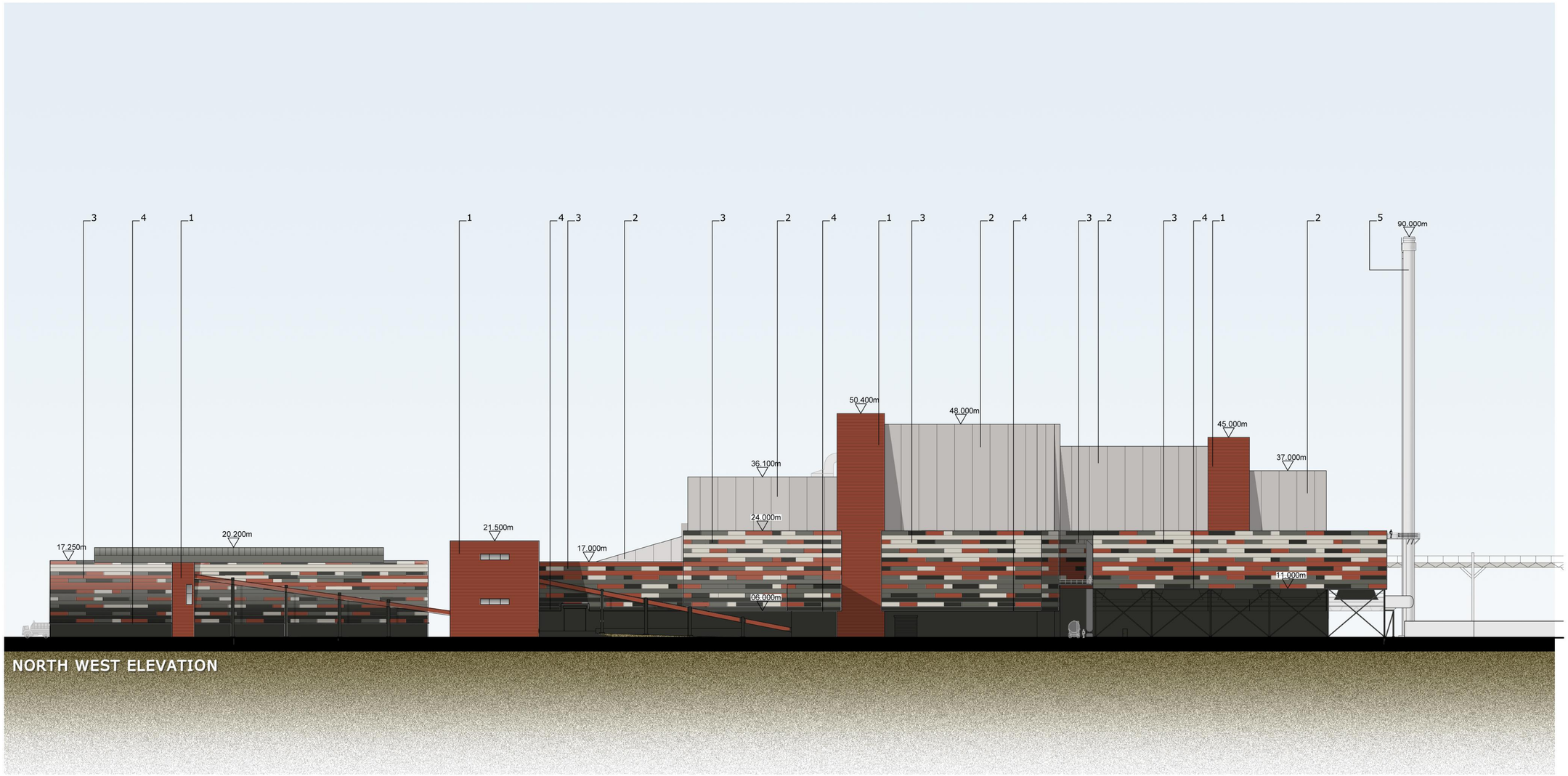
Project: Kemsley Sustainable Energy Plant

Title: South West Elevation

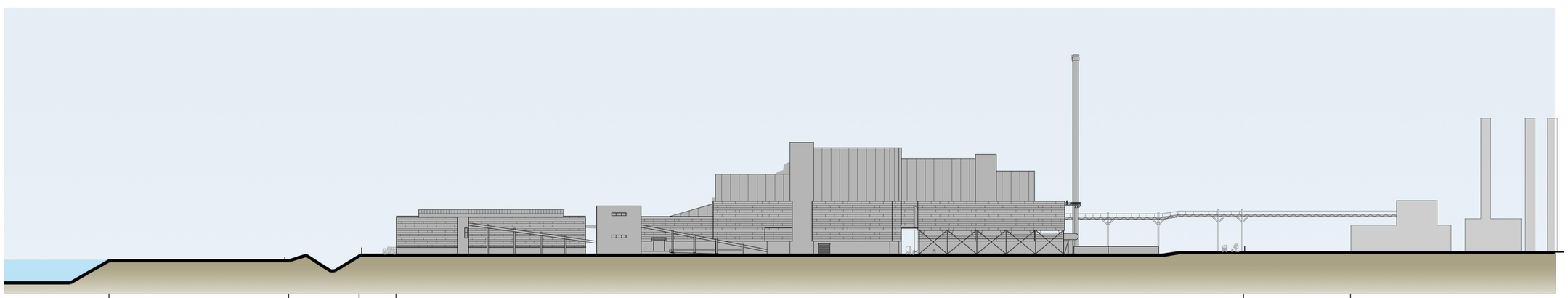
Drawing Status	Date Created	Drawing Scale
Preliminary	11.11.09	1:500
Project Leader	**Drawn By**	**Initial Review**
AWY	SMG	RS

Drawing Number: 16315 / A1 / P / 0112 Rev F

FIGURE 4.6



NORTH WEST ELEVATION



NORTH WEST SITE SECTION
1:1000

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10m SCALE 1:500

10m SCALE 1:1000

Key:

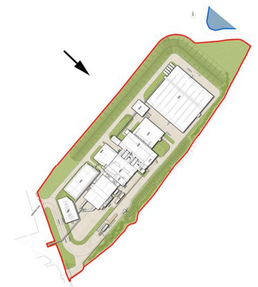
1. Horizontally laid Sinusoidal profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Terracotta' (matt finish) / RAL 040 40 40
2. Vertically laid Flat profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Albatross' / RAL 240 80 05
3. Horizontally laid Flat profile insulated cladding panel with Colorcoat HPS200® Ultra coating, 1000mm deep bands - Colours random mixture 'Terracotta (matt finish) RAL 040 40 40/ Merlin Grey RAL 180 40 05/ Anthracite (matt finish) RAL 7016/ Hamlet RAL 9002
4. Vertically laid Trapezoidal profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Anthracite' (matt finish) / RAL 7016
5. Stack - Colour `Light Grey` / RAL 7035
6. Concrete plinth detail - Colour 'Anthracite'
7. Horizontally laid Flat profile cladding sheet with Colorcoat HPS200® Ultra coating, 1000mm deep bands - Colours random mixture 'Terracotta (matt finish) RAL 040 40 40/ Merlin Grey RAL 180 40 05/ Anthracite (matt finish) RAL 7016/ Hamlet RAL 9002

All **Doors** and **Louvres** to match adjacent cladding colour

Polyester powder coated aluminium **window frames** and **Brise Soleil** - Colour 'Anthracite' (matt finish) / RAL 7016

Metal **external handrails** and **plant support** - Colour 'Anthracite' (matt finish) / RAL 7016 (with contrasting elements to comply with building regulations)

Paladin fencing and gates - Colour 'Anthracite' (matt finish) / RAL 7016



Drawing for PLANNING purposes only

rev	amendments	by	ckd	date
E	E.ON logo added. Building extents clarified.	KRy	PRP	15.02.10
D	Stack colour reference amended.	AJL	PRP	18.01.10
C	Key and notes updated and minor amendments to drawing.	SMG	PRP	17.12.09
B	Building levels information clarified. Keyplan Updated. Stack height confirmed.	AJL	PRP	25.11.09
A	Key added. Keyplan updated. Building elements labled.	AJL	PRP	19.11.09

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Client: stREGIS e·on

Project: Kemsley Sustainable Energy Plant

Title: North West Elevation

Drawing Status	Date Created	Drawing Scale
Preliminary	11.11.09	1:500
Project Leader	Drawn By	Initial Review
AWY	SMG	RS

Drawing Number: 16315 / A1 / P / 0113 Rev E

FIGURE 4.7

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3. This drawing should be read in conjunction with all other relevant drawings and specifications.
4. Internal dimensions to be confirmed at a later stage.

Key:

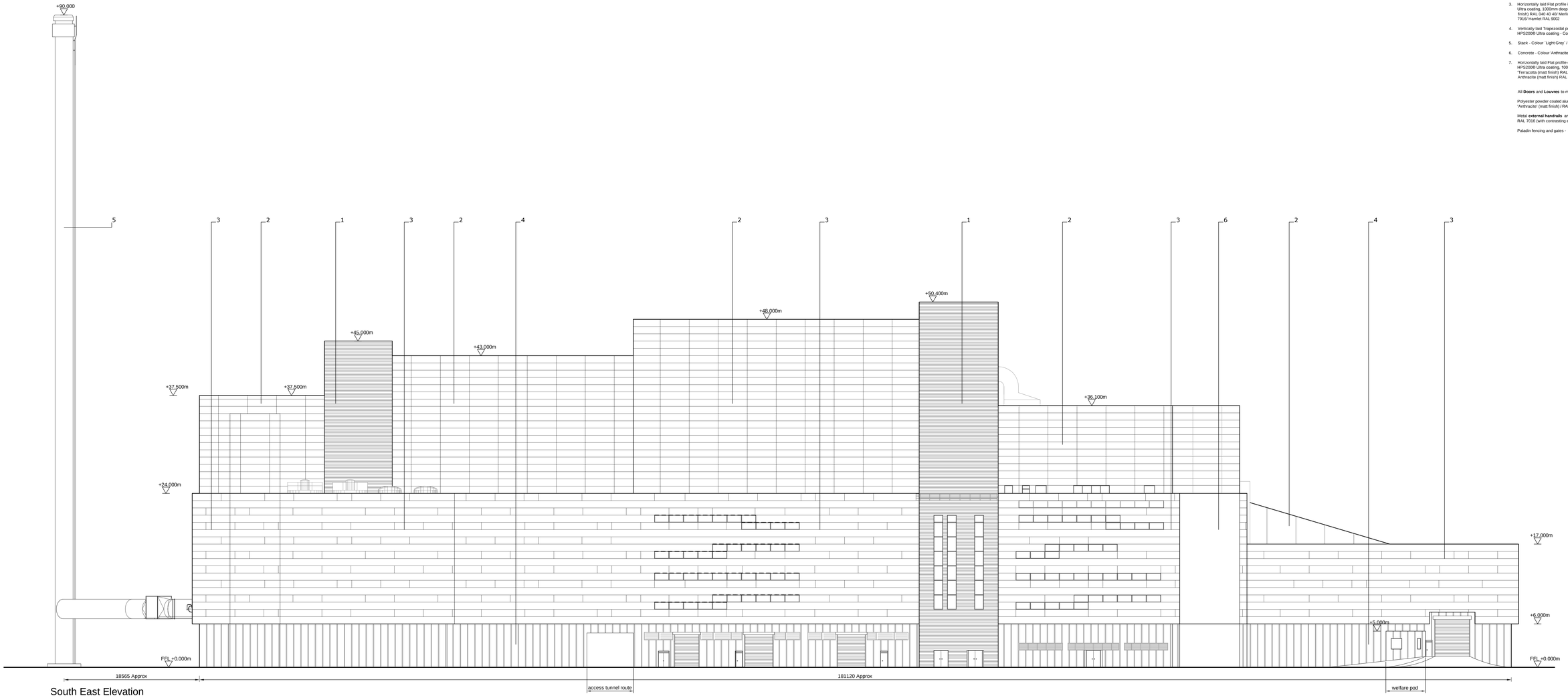
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2. Vertically laid Flat profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Albatross / RAL 240 80 05
3. Horizontally laid Flat profile insulated cladding panel with Colorcoat HPS200® Ultra coating, 1000mm deep bands - Colours random mixture 'Terracotta (matt finish) RAL 040 40 40/ Merlin Grey RAL 180 40 05/ Anthracite (matt finish) RAL 7016/ Hamlet RAL 9002
4. Vertically laid Trapezoidal profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Anthracite' (matt finish) / RAL 7016
5. Stack - Colour ' Light Grey ' / RAL 7035
6. Concrete - Colour 'Anthracite'
7. Horizontally laid Flat profile cladding sheet with Colorcoat HPS200® Ultra coating, 1000mm deep bands - Colours random mixture 'Terracotta (matt finish) RAL 040 40 40/ Merlin Grey RAL 180 40 05/ Anthracite (matt finish) RAL 7016/ Hamlet RAL 9002

All **Doors** and **Louvres** to match adjacent cladding colour

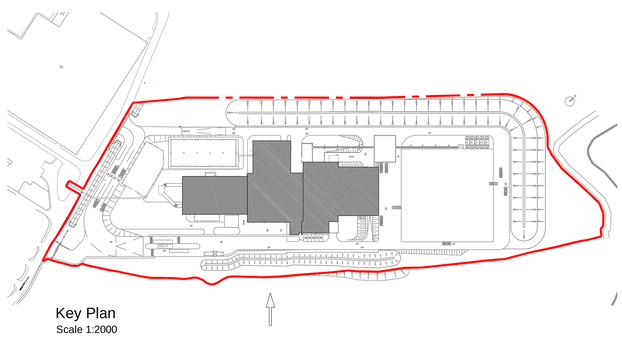
Polyester powder coated aluminium **window frames** and **Brise Soleil** - Colour 'Anthracite' (matt finish) / RAL 7016

Metal **external handrails** and **plant support** - Colour 'Anthracite' (matt finish) / RAL 7016 (with contrasting elements to comply with building regulations)

Paladin fencing and gates - Colour 'Anthracite' (matt finish) / RAL 7016



South East Elevation
Scale 1:200



Key Plan
Scale 1:2000

1m SCALE 1:200

10m SCALE 1:2000

Drawing for PLANNING purposes only

rev	amendments	by	chd	date
B	E.ON logo added. Building extents confirmed.	KRy	PRP	15.02.10
A	Crane area material changed. Keyplan outline clarified.	AJL	PRP	18.01.10

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Project: Kemsley Sustainable Energy Plant

Title: Main Building Proposed South East Elevation

Drawing Status	Date Created	Drawing Scale
Preliminary	23.11.09	1:200
Project Leader	Drawn By	Initial Review
AWY	PRP	RS

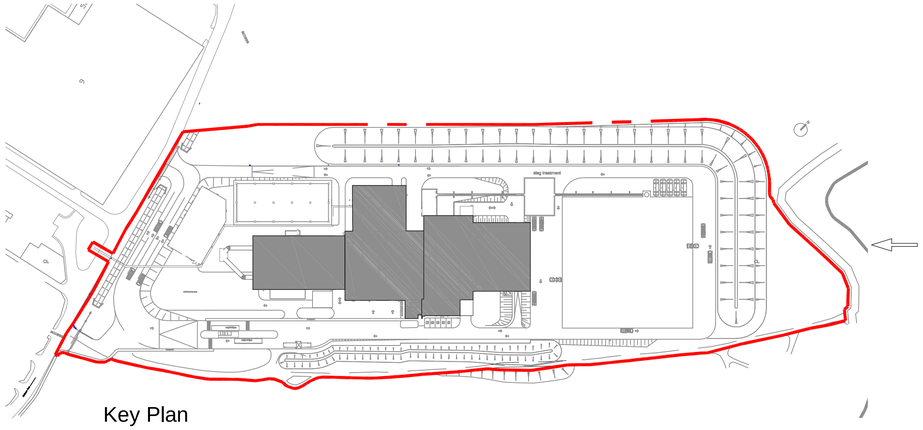
Drawing Number: 16315 / A0 / P / 0125 Rev B

FIGURE 4.8

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3. This drawing should be read in conjunction with all other relevant drawings and specifications.
4. Internal dimensions to be confirmed at a later stage.



Key Plan
Scale 1:2000

Key:

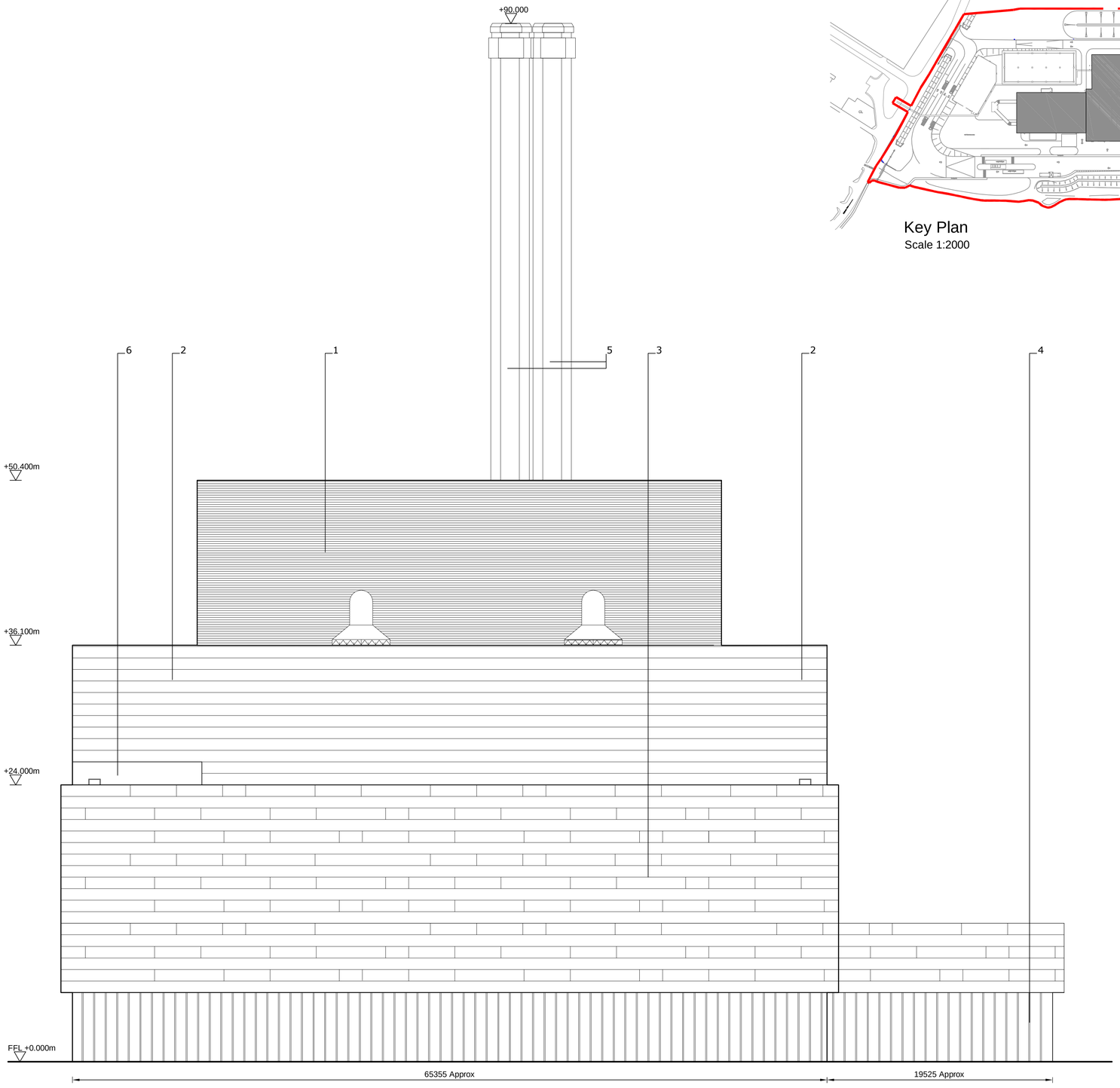
1. Horizontally laid Sinusoidal profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Terracotta' (matt finish) / RAL 040 40 40
2. Vertically laid Flat profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Albatross' / RAL 240 80 05
3. Horizontally laid Flat profile insulated cladding panel with Colorcoat HPS200® Ultra coating, 1000mm deep bands - Colours random mixture 'Terracotta (matt finish) RAL 040 40 40/ Merlin Grey RAL 180 40 05/ Anthracite (matt finish) RAL 7016/ Hamlet RAL 9002
4. Vertically laid Trapezoidal profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Anthracite' (matt finish) / RAL 7016
5. Stack - Colour `Light Grey' / RAL 7035
6. Concrete - Colour 'Anthracite'
7. Horizontally laid Flat profile cladding sheet with Colorcoat HPS200® Ultra coating, 1000mm deep bands - Colours random mixture 'Terracotta (matt finish) RAL 040 40 40/ Merlin Grey RAL 180 40 05/ Anthracite (matt finish) RAL 7016/ Hamlet RAL 9002

All **Doors** and **Louvres** to match adjacent cladding colour

Polyester powder coated aluminium **window frames** and **Brise Soleil** - Colour 'Anthracite' (matt finish) / RAL 7016

Metal **external handrails** and **plant support** - Colour 'Anthracite' (matt finish) / RAL 7016 (with contrasting elements to comply with building regulations)

Paladin fencing and gates - Colour 'Anthracite' (matt finish) / RAL 7016



North East Elevation
Scale 1:200

1m SCALE 1:200

Drawing for PLANNING purposes only

rev	amendments	by	ckd	date
B	E.ON logo added. Building extents confirmed.	KRy	PRP	15.02.10
A	UMA building extents confirmed. Keyplan updated. Stack colour confirmed	AJL	PRP	18.01.10

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Client: stREGIS e·on

Project: Kemsley Sustainable Energy Plant

Title: Main Building
Proposed North East Elevation

Drawing Status	Date Created	Drawing Scale
Preliminary	23.11.09	1:200
Project Leader	Drawn By	Initial Review
AWY	PRP	RS

Drawing Number: 16315 / A1 / P / 0126 B
Rev: B

FIGURE 4.9

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notes :

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3. This drawing should be read in conjunction with all other relevant drawings and specifications.
4. Internal dimensions to be confirmed at a later stage.

Key:

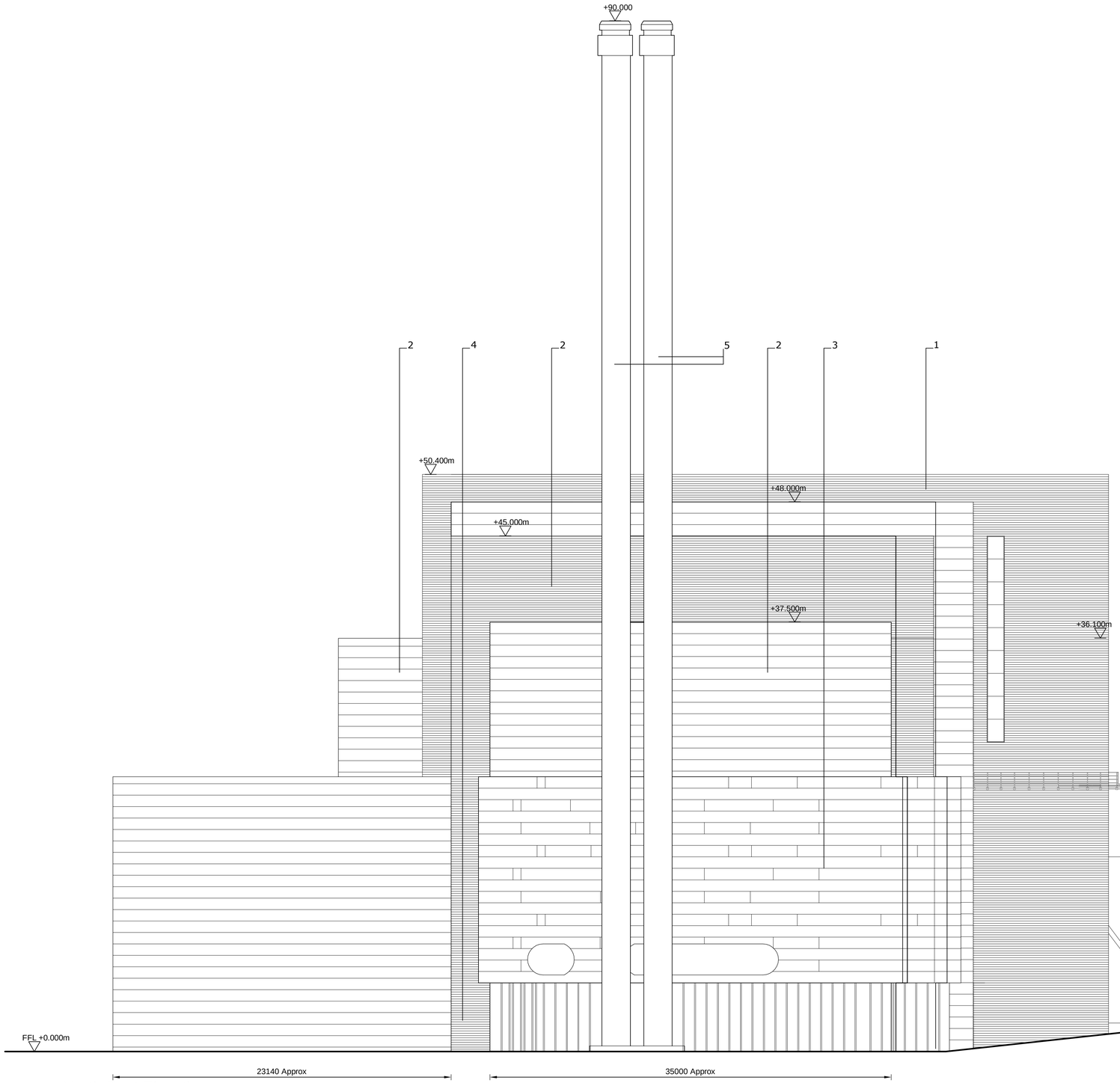
1. Horizontally laid Sinusoidal profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Terracotta' (matt finish) / RAL 040 40 40
2. Vertically laid Flat profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Albatross' / RAL 240 80 05
3. Horizontally laid Flat profile insulated cladding panel with Colorcoat HPS200® Ultra coating, 1000mm deep bands - Colours random mixture 'Terracotta (matt finish) RAL 040 40 40/ Merlin Grey RAL 180 40 05/ Anthracite (matt finish) RAL 7016/ Hamlet RAL 9002
4. Vertically laid Trapezoidal profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Anthracite' (matt finish) / RAL 7016
5. Stack - Colour `Light Grey' / RAL 7035
6. Concrete plinth detail - Colour 'Anthracite'
7. Horizontally laid Flat profile cladding sheet with Colorcoat HPS200® Ultra coating, 1000mm deep bands - Colours random mixture 'Terracotta (matt finish) RAL 040 40 40/ Merlin Grey RAL 180 40 05/ Anthracite (matt finish) RAL 7016/ Hamlet RAL 9002

All **Doors** and **Louvres** to match adjacent cladding colour

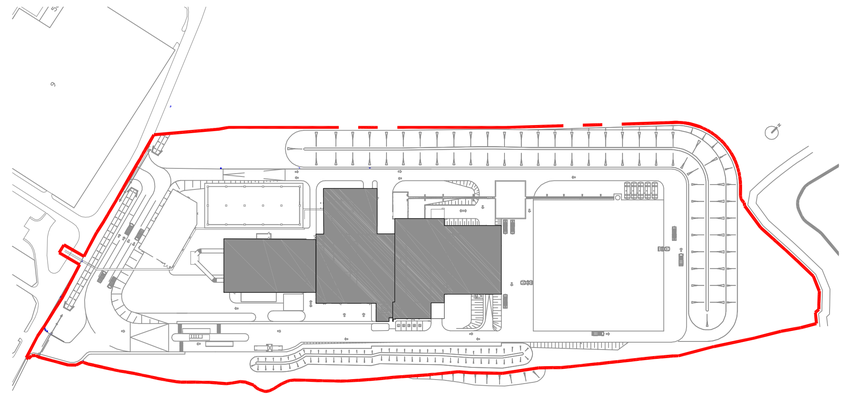
Polyester powder coated aluminium **window frames** and **Brise Soleil** - Colour 'Anthracite' (matt finish) / RAL 7016

Metal **external handrails** and **plant support** - Colour 'Anthracite' (matt finish) / RAL 7016 (with contrasting elements to comply with building regulations)

Paladin fencing and gates - Colour 'Anthracite' (matt finish) / RAL 7016



North East Elevation
Scale 1:200



Key Plan
Scale 1:2000

1m SCALE 1:200

10m SCALE 1:2000

Drawing for PLANNING purposes only

rev	amendments	by	ckd	date
B	E.ON logo added. Building extents confrirmed.	KRy	PRP	15.02.10
A	UMA building extents confirmed. Keyplan updated. Stack colour confirmed	AJL	PRP	18.01.10

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Client: stREGIS e·on

Project: Kemsley Sustainable Energy Plant

Title: Main Building Proposed South West Elevation

Drawing Status	Date Created	Drawing Scale
Preliminary	23.11.09	1:200
Project Leader	Drawn By	Initial Review
AWY	PRP	RS

Drawing Number: 16315 / A1 / P / 0127 Rev B

FIGURE 4.10

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3. This drawing should be read in conjunction with all other relevant drawings and specifications.
4. Internal dimensions to be confirmed at a later stage.

Key:

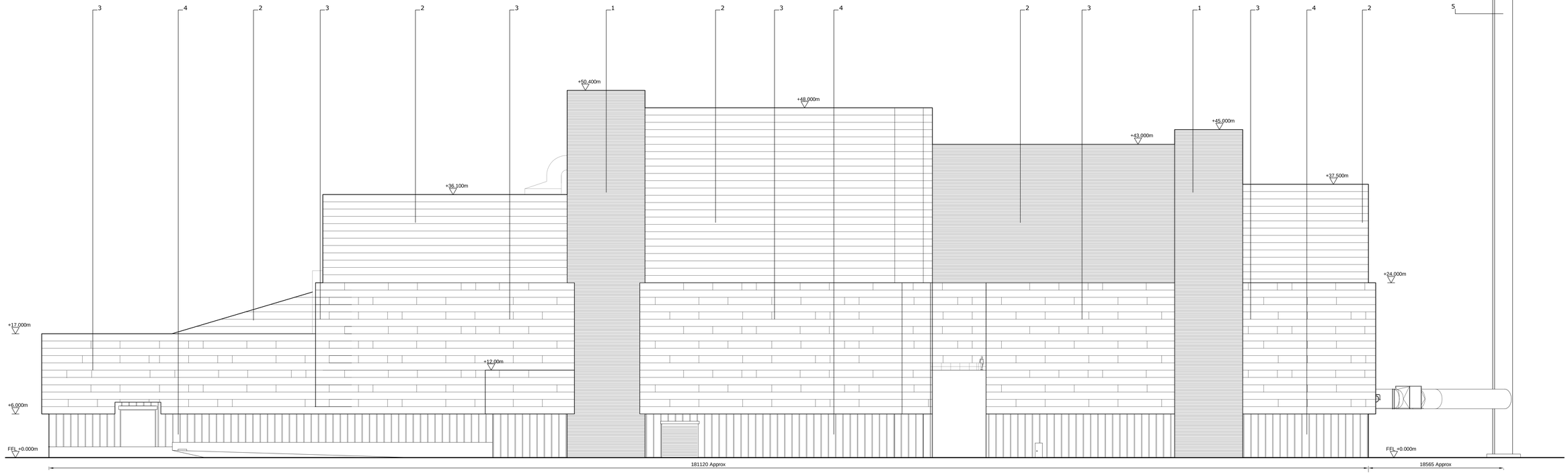
1. Horizontally laid Sinusoidal profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Terracotta' (matt finish) / RAL 040 40 40
2. Vertically laid Flat profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Albatross / RAL 240 80 05
3. Horizontally laid Flat profile insulated cladding panel with Colorcoat HPS200® Ultra coating, 1000mm deep bands - Colours random mixture 'Terracotta (matt finish) RAL 040 40 40/ Merlin Grey RAL 180 40 05/ Anthracite (matt finish) RAL 7016/ Hamlet RAL 9002
4. Vertically laid Trapezoidal profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Anthracite' (matt finish) / RAL 7016
5. Stack - Colour ' Light Grey ' / RAL 7035
6. Concrete plinth detail - Colour 'Anthracite'
7. Horizontally laid Flat profile cladding sheet with Colorcoat HPS200® Ultra coating, 1000mm deep bands - Colours random mixture 'Terracotta (matt finish) RAL 040 40 40/ Merlin Grey RAL 180 40 05/ Anthracite (matt finish) RAL 7016/ Hamlet RAL 9002

All **Doors** and **Louvres** to match adjacent cladding colour

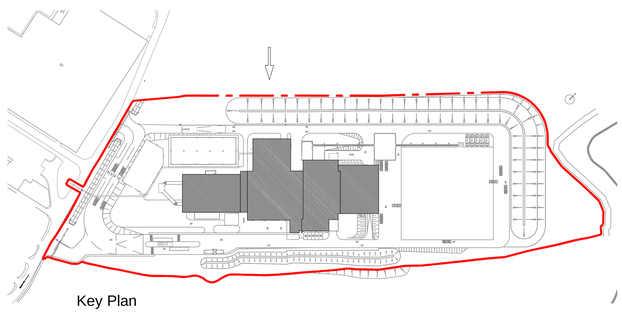
Polyester powder coated aluminium **window frames** and **Brise Soleil** - Colour 'Anthracite' (matt finish) / RAL 7016

Metal **external handrails** and **plant support** - Colour 'Anthracite' (matt finish) / RAL 7016 (with contrasting elements to comply with building regulations)

Paladin fencing and gates - Colour 'Anthracite' (matt finish) / RAL 7016



North West Elevation
Scale 1:200



Key Plan
Scale 1:2000

1m SCALE 1:200

10m SCALE 1:2000

Drawing for PLANNING purposes only

rev	amendments	by	ckd	date
B	E.ON logo added. UEU height confirmed.		KRy	PRP	15.02.10
A	UMA building extents confirmed. Keyplan updated. Stack colour confirmed		A.JL	PRP	18.01.10

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Client: stREGIS e·on

Project: Kemsley Sustainable Energy Plant

Title: Main Building
Proposed North West Elevation

Drawing Status	Date Created	Drawing Scale
Preliminary	23.11.09	1:200
Project Leader	Drawn By	Initial Review
AWY	PRP	RS

Drawing Number: 16315 / A0 / P / 0128 B
Rev: B

FIGURE 4.11

Figure 4.12 Reference not used

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3. This drawing should be read in conjunction with all other relevant drawings and specifications.
4. Internal dimensions to be confirmed at a later stage.

Key:

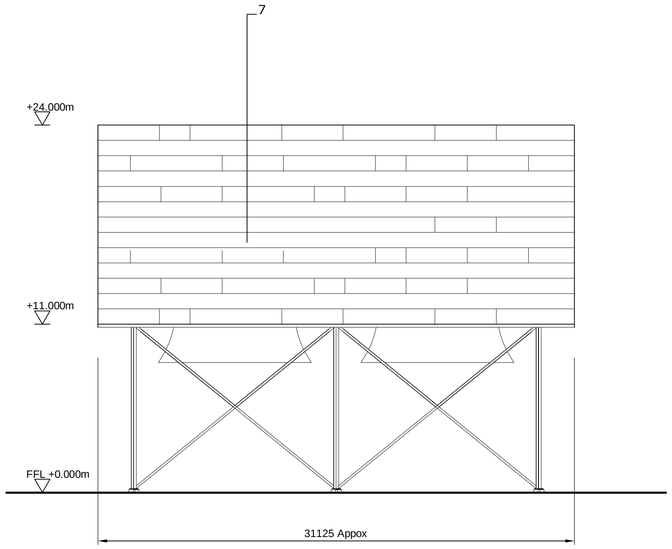
1. Horizontally laid Sinusoidal profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Terracotta' (matt finish) / RAL 040 40 40
2. Vertically laid Flat profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Albatross' / RAL 240 80 05
3. Horizontally laid Flat profile insulated cladding panel with Colorcoat HPS200® Ultra coating, 1000mm deep bands - Colours random mixture 'Terracotta (matt finish) RAL 040 40 40/ Merlin Grey RAL 180 40 05/ Anthracite (matt finish) RAL 7016/ Hamlet RAL 9002
4. Vertically laid Trapezoidal profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Anthracite' (matt finish) / RAL 7016
5. Stack - Colour `Light Grey' / RAL 7035
6. Concrete plinth detail - Colour 'Anthracite'
7. Horizontally laid Flat profile cladding sheet with Colorcoat HPS200® Ultra coating, 1000mm deep bands - Colours random mixture 'Terracotta (matt finish) RAL 040 40 40/ Merlin Grey RAL 180 40 05/ Anthracite (matt finish) RAL 7016/ Hamlet RAL 9002

All **Doors** and **Louvres** to match adjacent cladding colour

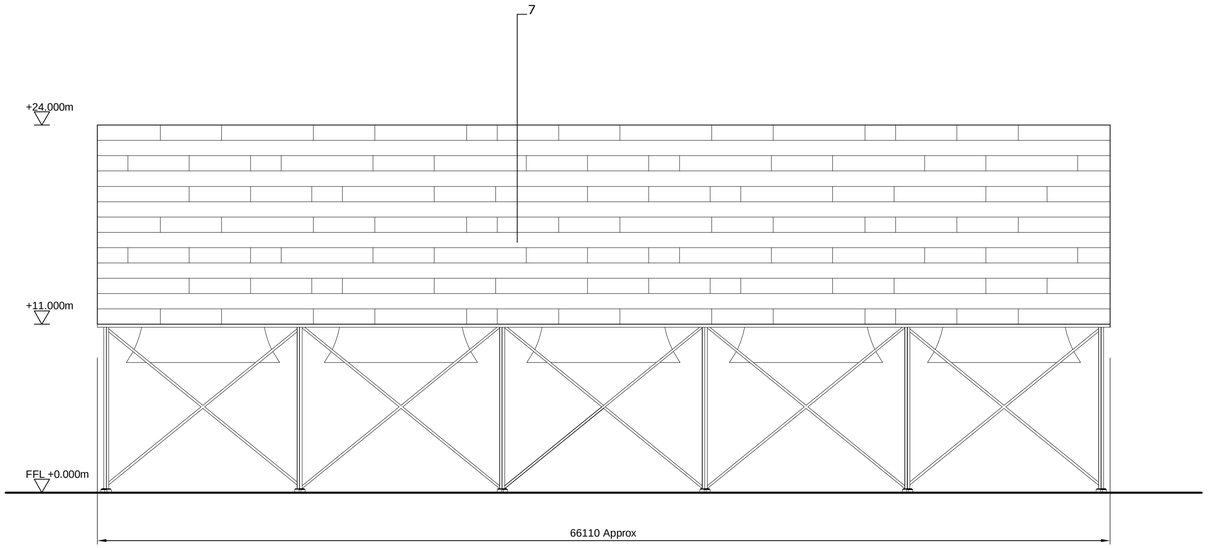
Polyester powder coated aluminium **window frames** and **Brise Soleil** - Colour 'Anthracite' (matt finish) / RAL 7016

Metal **external handrails** and **plant support** - Colour 'Anthracite' (matt finish) / RAL 7016 (with contrasting elements to comply with building regulations)

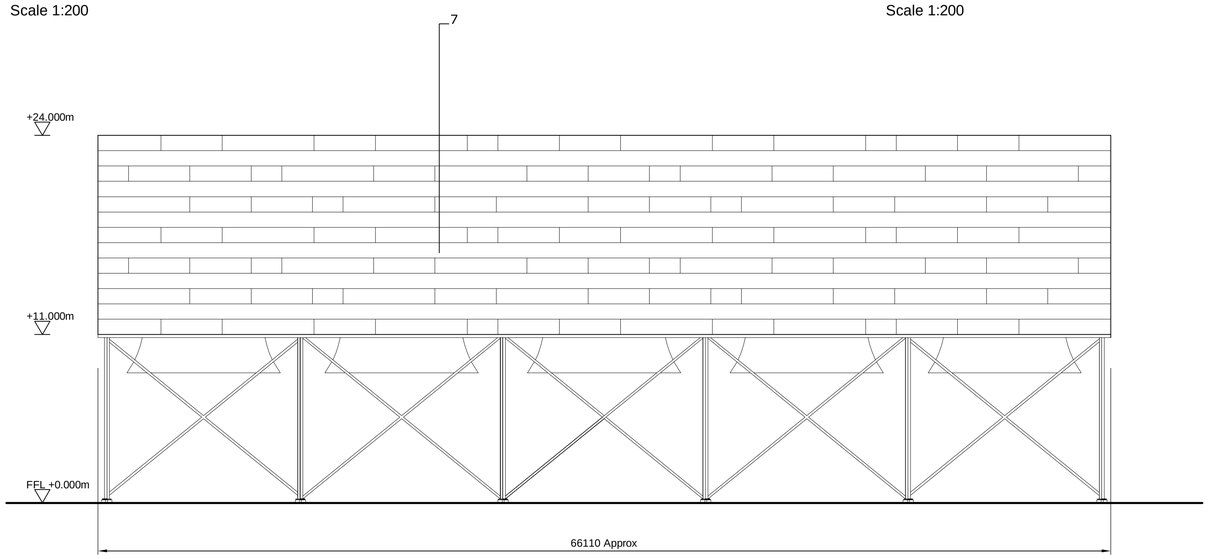
Paladin fencing and gates - Colour 'Anthracite' (matt finish) / RAL 7016



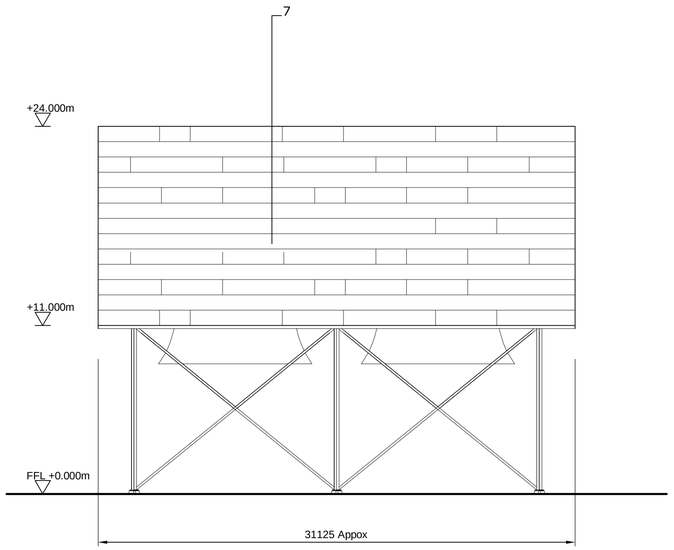
North East Elevation
Scale 1:200



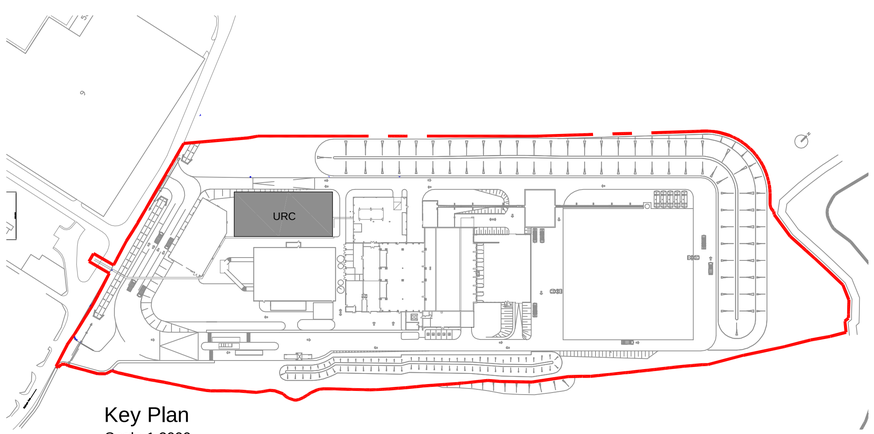
North West Elevation
Scale 1:200



South East Elevation
Scale 1:200



South West Elevation
Scale 1:200



Key Plan
Scale 1:2000

1m SCALE 1:200

10m SCALE 1:2000

Drawing for PLANNING purposes only

rev	amendments	by	ckd	date
B	E.ON logo added.	KRy	PRP	15.02.10
A	Support structure rationalised. Cladding amended to reflect non-insulated cladding sheet.	AL	PRP	15.01.10

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Client: StRegis / E.ON

Project: Kemsley Sustainable Energy Plant

Title: Proposed Structure for Air Cooled Condenser (URC) Elevations

Drawing Status	Date Created	Drawing Scale
Preliminary	23.11.09	1:200
Project Leader	Drawn By	Initial Review
AWY	PRP	RS

Drawing Number: 16315 / A1 / P / 0121 B

Rev: B

FIGURE 4.13

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3. This drawing should be read in conjunction with all other relevant drawings and specifications.
4. Internal dimensions to be confirmed at a later stage.
5. Conveyor shown indicative only. The exact details, size and specification of all ducting, conveyors and other minor plant items to be approved via a planning condition

Key:

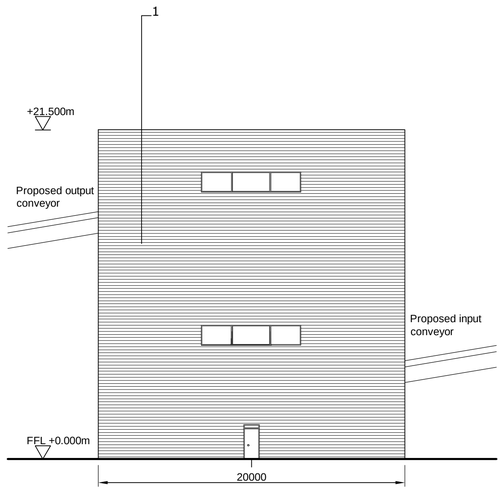
1. Horizontally laid Sinusoidal profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Terracotta' (matt finish) / RAL 040 40 40
2. Vertically laid Flat profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Albatross' / RAL 240 80 05
3. Horizontally laid Flat profile insulated cladding panel with Colorcoat HPS200® Ultra coating, 1000mm deep bands - Colours random mixture 'Terracotta (matt finish) RAL 040 40 40/ Merlin Grey RAL 180 40 05/ Anthracite (matt finish) RAL 7016/ Hamlet RAL 9002
4. Vertically laid Trapezoidal profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Anthracite' (matt finish) / RAL 7016
5. Stack - Colour `Light Grey` / RAL 7035
6. Concrete plinth detail - Colour 'Anthracite'
7. Horizontally laid Flat profile cladding sheet with Colorcoat HPS200® Ultra coating, 1000mm deep bands - Colours random mixture 'Terracotta (matt finish) RAL 040 40 40/ Merlin Grey RAL 180 40 05/ Anthracite (matt finish) RAL 7016/ Hamlet RAL 9002

All **Doors** and **Louvres** to match adjacent cladding colour

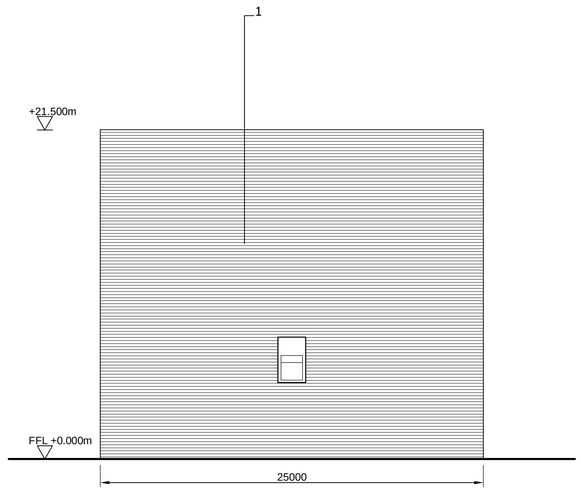
Polyester powder coated aluminium **window frames** and **Brise Soleil** - Colour 'Anthracite' (matt finish) / RAL 7016

Metal **external handrails** and **plant support** - Colour 'Anthracite' (matt finish) / RAL 7016 (with contrasting elements to comply with building regulations)

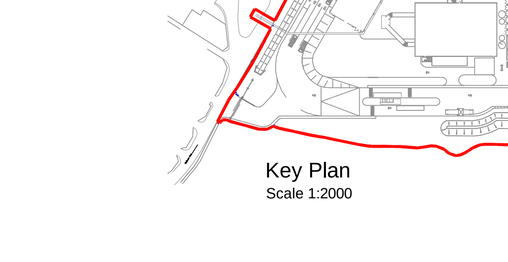
Paladin fencing and gates - Colour 'Anthracite' (matt finish) / RAL 7016



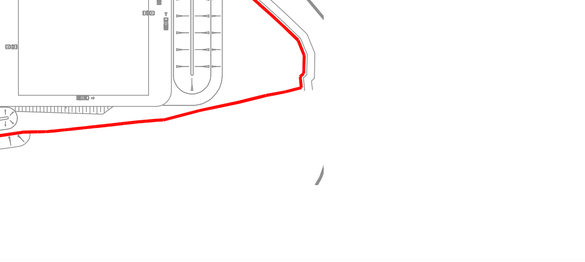
North West Elevation
Scale 1:200



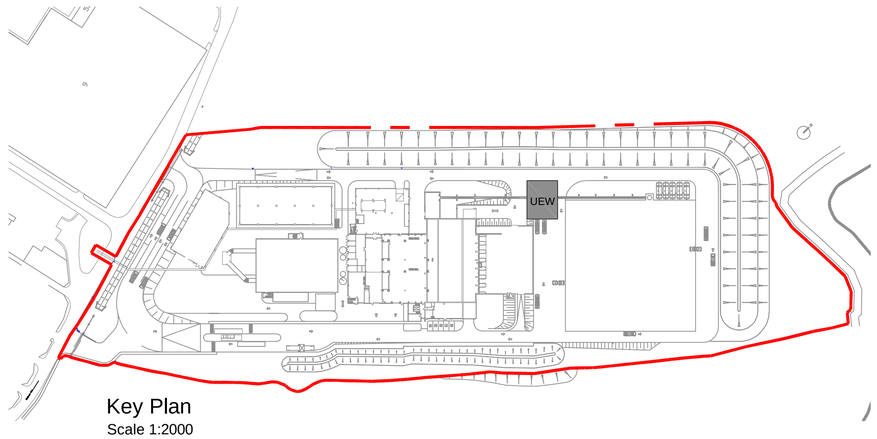
North East Elevation
Scale 1:200



South East Elevation
Scale 1:200



South West Elevation
Scale 1:200



Key Plan
Scale 1:2000

1m SCALE 1:200

10m SCALE 1:2000

Drawing for PLANNING purposes only

rev	amendments	by	ckd	date
B	E.ON logo added.	KRy	PRP	15.02.10
A	Input conveyor location and stack colour updated to suit Eon request.	AJL	PRP	15.01.10

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Client: stREGIS e·on

Project: Kemsley Sustainable Energy Plant

Title: Proposed Stucture for Combustion Residue Handling (UEW) Elevations

Drawing Status	Date Created	Drawing Scale
Preliminary	23.11.09	1:200
Project Leader	Drawn By	Initial Review
AWY	PRP	RS

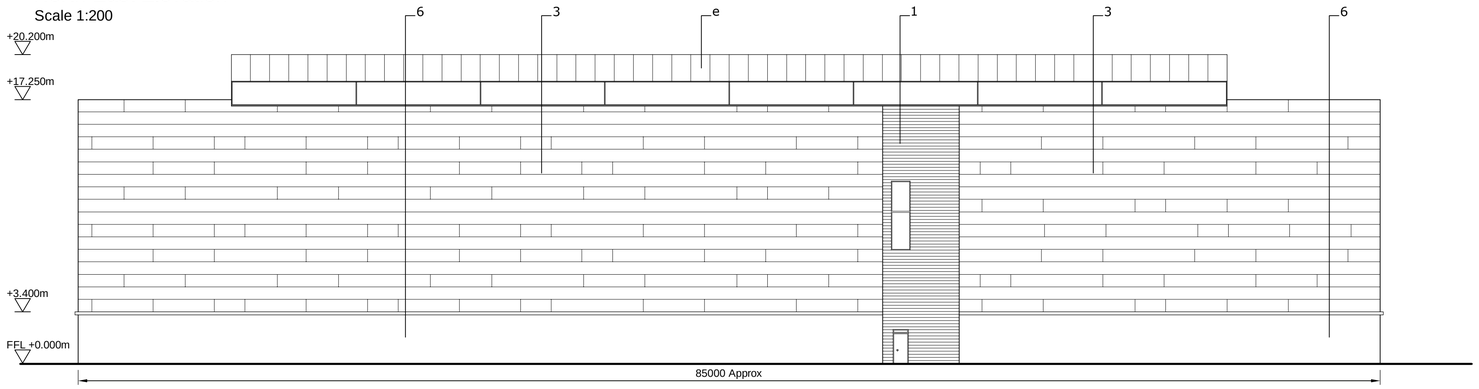
Drawing Number: 16315 / A1 / P / 0122 Rev B

FIGURE 4.14



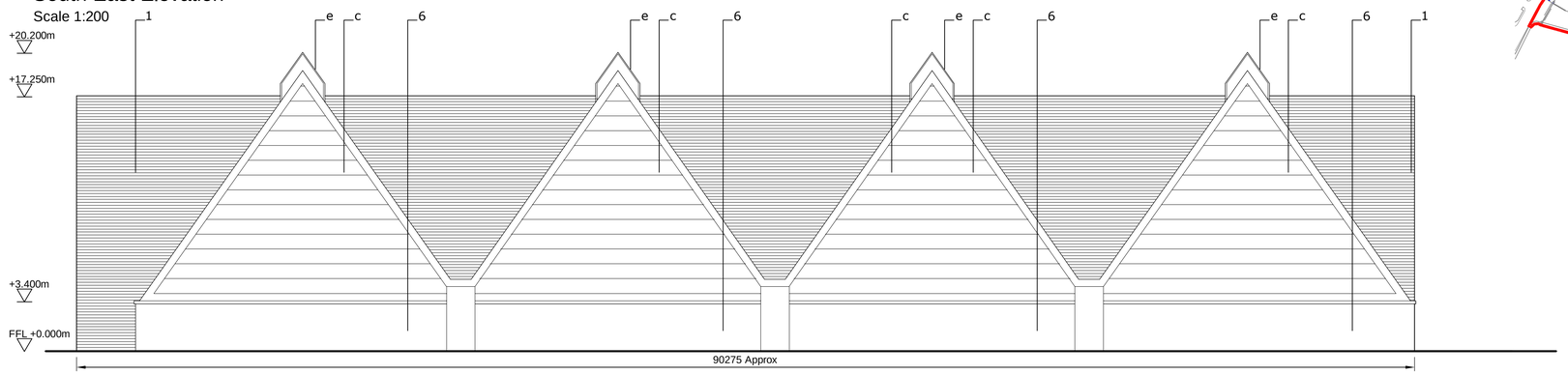
North East Elevation

Scale 1:200



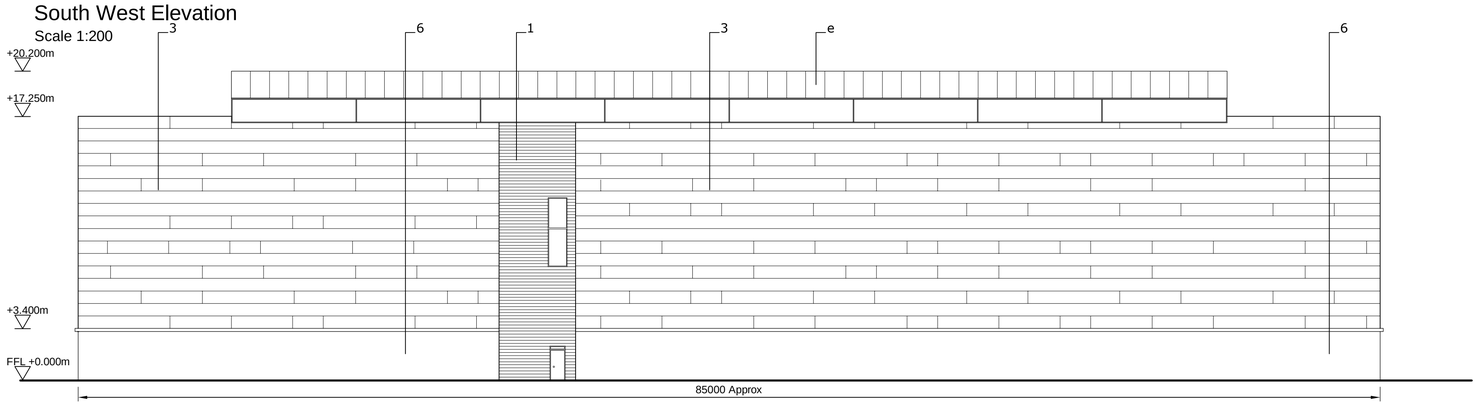
South East Elevation

Scale 1:200



South West Elevation

Scale 1:200



North West Elevation

Scale 1:200

Key:

1. Horizontally laid Sinusoidal profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Terracotta' (matt finish) / RAL 040 40 40
2. Vertically laid Flat profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Albatross' / RAL 240 80 05
3. Horizontally laid Flat profile insulated cladding panel with Colorcoat HPS200® Ultra coating, 1000mm deep bands - Colours random mixture 'Terracotta (matt finish) RAL 040 40 40/ Merlin Grey RAL 180 40 05/ Anthracite (matt finish) RAL 7016/ Hamlet RAL 9002
4. Vertically laid Trapezoidal profile insulated cladding panel with Colorcoat HPS200® Ultra coating - Colour 'Anthracite' (matt finish) / RAL 7016
5. Stack - Colour `Light Grey` / RAL 7035
6. Concrete plinth detail - Colour 'Anthracite'
7. Horizontally laid Flat profile cladding sheet with Colorcoat HPS200® Ultra coating, 1000mm deep bands - Colours random mixture 'Terracotta (matt finish) RAL 040 40 40/ Merlin Grey RAL 180 40 05/ Anthracite (matt finish) RAL 7016/ Hamlet RAL 9002

All **Doors** and **Louvres** to match adjacent cladding colour

Polyester powder coated aluminium **window frames** and **Brise Soleil** - Colour 'Anthracite' (matt finish) / RAL 7016

Metal **external handrails** and **plant support** - Colour 'Anthracite' (matt finish) / RAL 7016 (with contrasting elements to comply with building regulations)

Paladin fencing and gates - Colour 'Anthracite' (matt finish) / RAL 7016

a. Pressed Metal Mullion/Transom Detail - Colour: 'Anthracite'

b. Pressed Metal Flashing Detail and Flat Composite Panel Soffit - Colour: Hamlet

c. Flat compact Panel Infill Detail - Colour `Merlin Grey` / RAL 180 40 05

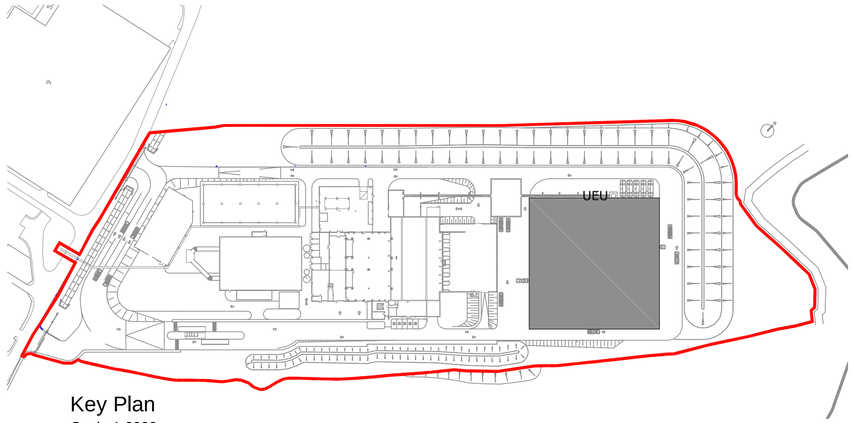
d. 5m x 5m Roller Shutter Door - Colour `Terracotta` (matt finish) / RAL 040 40 40

e. Lantern - Glazed clerestorey with profiled insulated metal roof - Colour ` `Anthracite` (matt finish) / RAL 7016

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3. This drawing should be read in conjunction with all other relevant drawings and specifications.
4. Internal dimensions to be confirmed at a later stage.



Key Plan

Scale 1:2000

1m SCALE 1:200

10m SCALE 1:2000

Drawing for PLANNING purposes only

rev	amendments	by	ckd	date
B	E.ON logo added.	KRy	PRP	15.02.10
A	Mass of building revised to suit plans. Capping detail revised at client request. Plinth base material amended to concrete.	AJL	PRP	15.01.10

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Client: stREGIS e·on

Project: Kemsley Sustainable Energy Plant

Title: Proposed Structure for Bottomash Transport (UEU) Elevations

Drawing Status	Date Created	Drawing Scale
Preliminary	23.11.09	1:200
Project Leader	Drawn By	Initial Review
AWY	PRP	RS

Drawing Number: 16315 / A1 / P / 0123 Rev B

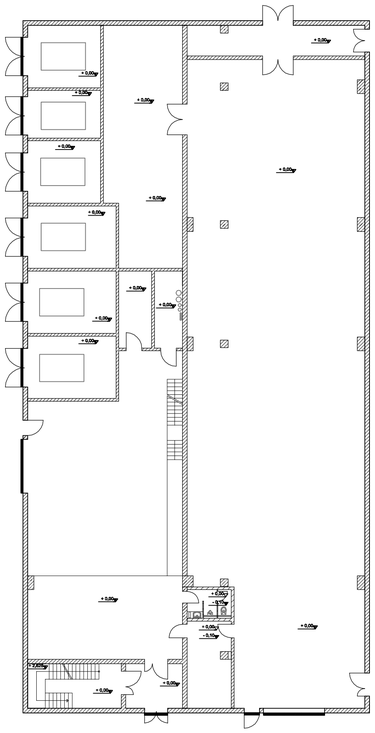
FIGURE 4.15

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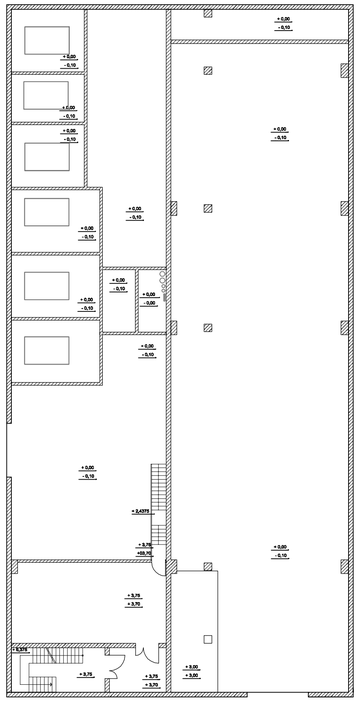
notes :

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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.
4. Internal dimensions to be confirmed at a later date.

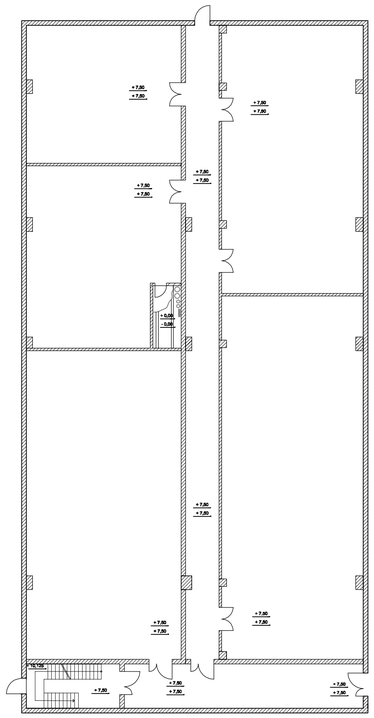
Drawing produced from Schnitt's drawing numbers UBA UYA 1_100_0.00_3.75_7.50_11.00_12.00_14.50_16.50, 18.00_19.50 issued 16/11/2009 by Client, and is shown indicative only, with actual accommodation layouts to be confirmed by Client at a later date.



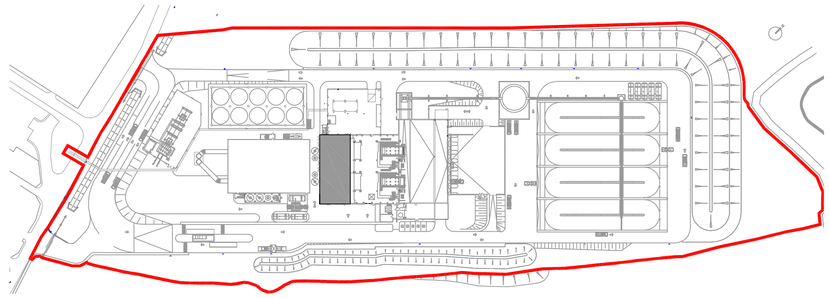
Ground Floor +0000
Scale 1:200



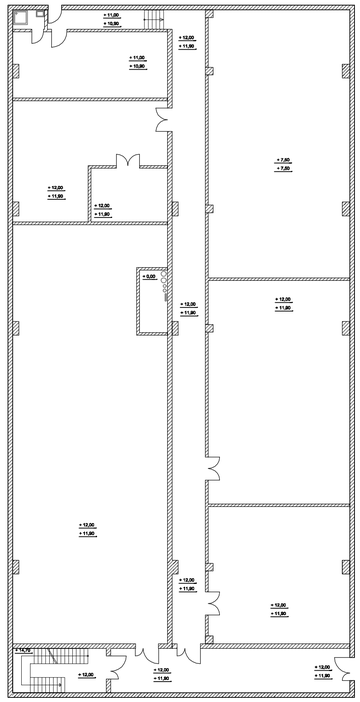
First Floor +3750
Scale 1:200



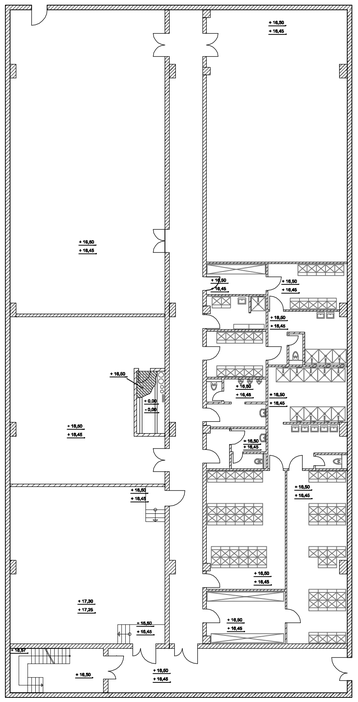
Second Floor +7500
Scale 1:200



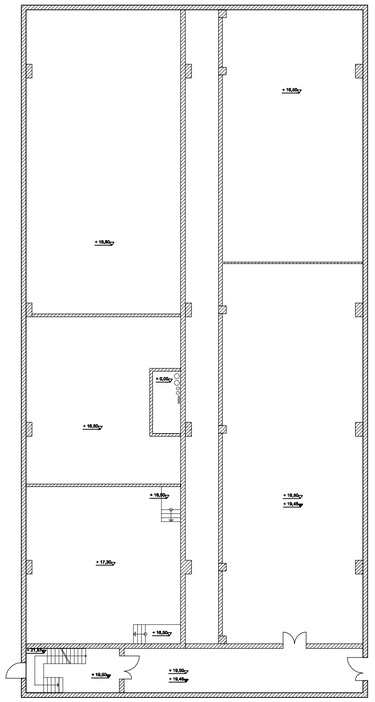
Key Plan
Scale 1:2000



Third Floor +11000
Scale 1:200



Fourth Floor +14500
Scale 1:200



Fifth Floor +18000
Scale 1:200

1m SCALE 1:200

10m SCALE 1:2000

Drawing for PLANNING purposes only

rev	amendments	by	ckd	date
B	E.ON logo added.	KRy	PRP	15.02.10
A	Figure number added. Grid lines removed.	AJL	PRP	20.01.10

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Client: St Regis / E.ON

Project: Kemsley Sustainable Energy Plant

Title: Typical Switch Gear Building (UBA) Floor Plans

Drawing Status	Date Created	Drawing Scale
Preliminary	18.11.09	1:200
Project Leader	Drawn By	Initial Review
AWY	SJLH	PRP

Drawing Number: 16315 / A1 / P / 0170 B
Rev: B

FIGURE 4.16

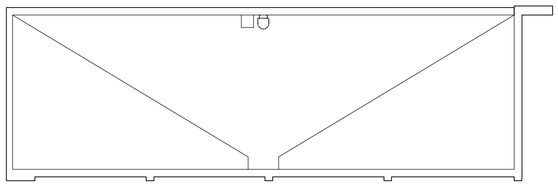
Figure 4.17 Reference not used

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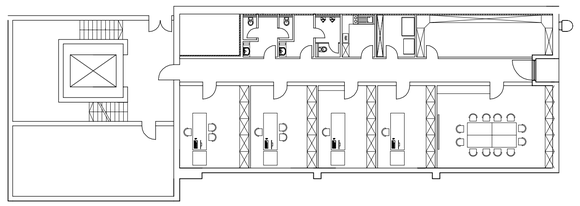
notes :

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4. Internal dimensions to be confirmed at a later date.

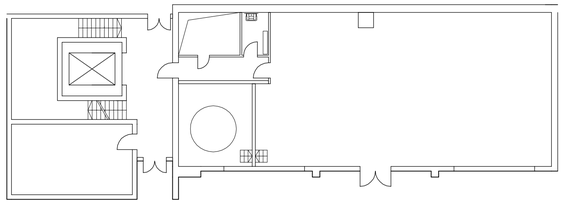
Drawing produced from Schnitt's drawing numbers UYA 1_100 -7.00 & UBA UYA 1_100 0.00, 3.75, 7.50, 11.00, 12.00, 14.50_16.50, 18.00_19.50 & 22.50 issued 16/11/2009 by Client, and is shown indicative only, with actual accommodation layouts to be confirmed by Client at a later date.



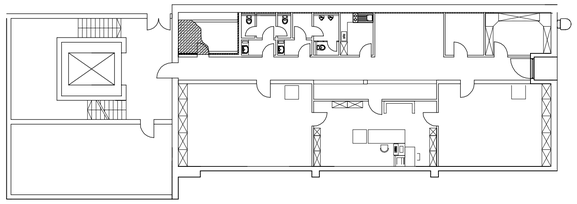
Basement Level
Scale 1:200



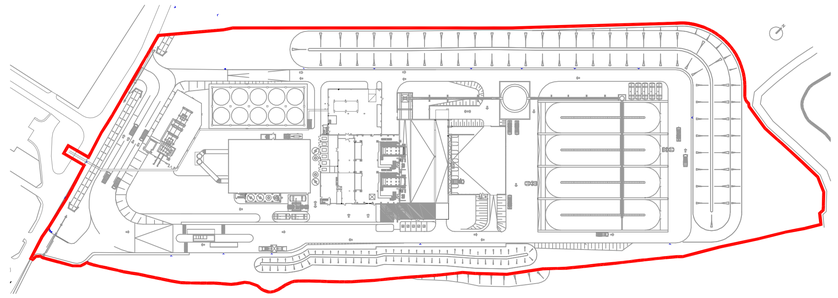
Third Floor
Scale 1:200



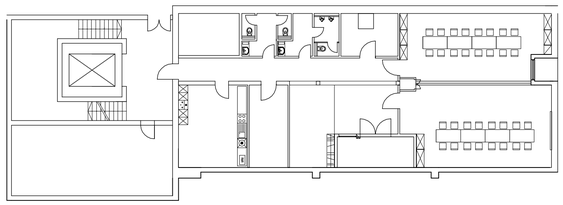
Ground Floor
Scale 1:200



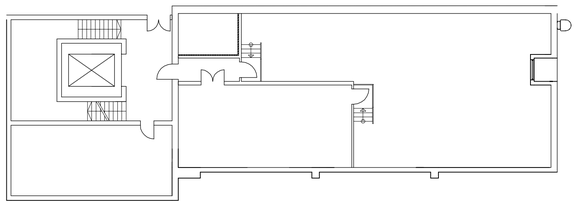
Fourth Floor
Scale 1:200



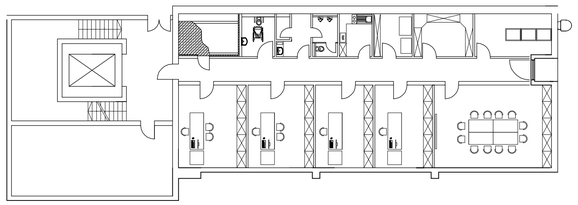
Key Plan
Scale 1:2000



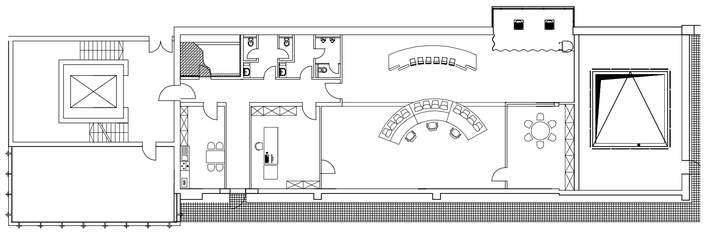
First Floor
Scale 1:200



Fifth Floor
Scale 1:200



Second Floor
Scale 1:200



Sixth Floor
Scale 1:200

1m SCALE 1:200

10m SCALE 1:2000

Drawing for PLANNING purposes only

rev	amendments	by	ckd	date
B	E.ON logo added.	KRy	PRP	15.02.10
A	Floor plans clarified.	AJL	PRP	15.01.10

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Client: StRegis e.on

Project: Kemsley Sustainable Energy Plant

Title: Typical Office and Staff Amenities Building (UYA) Floor Plans

Drawing Status	Date Created	Drawing Scale
Preliminary	18.11.09	1:200
Project Leader	Drawn By	Initial Review
AWY	SJLH	PRP

Drawing Number: 16315 / A1 / P / 0171 B

Rev: B

FIGURE 4.18

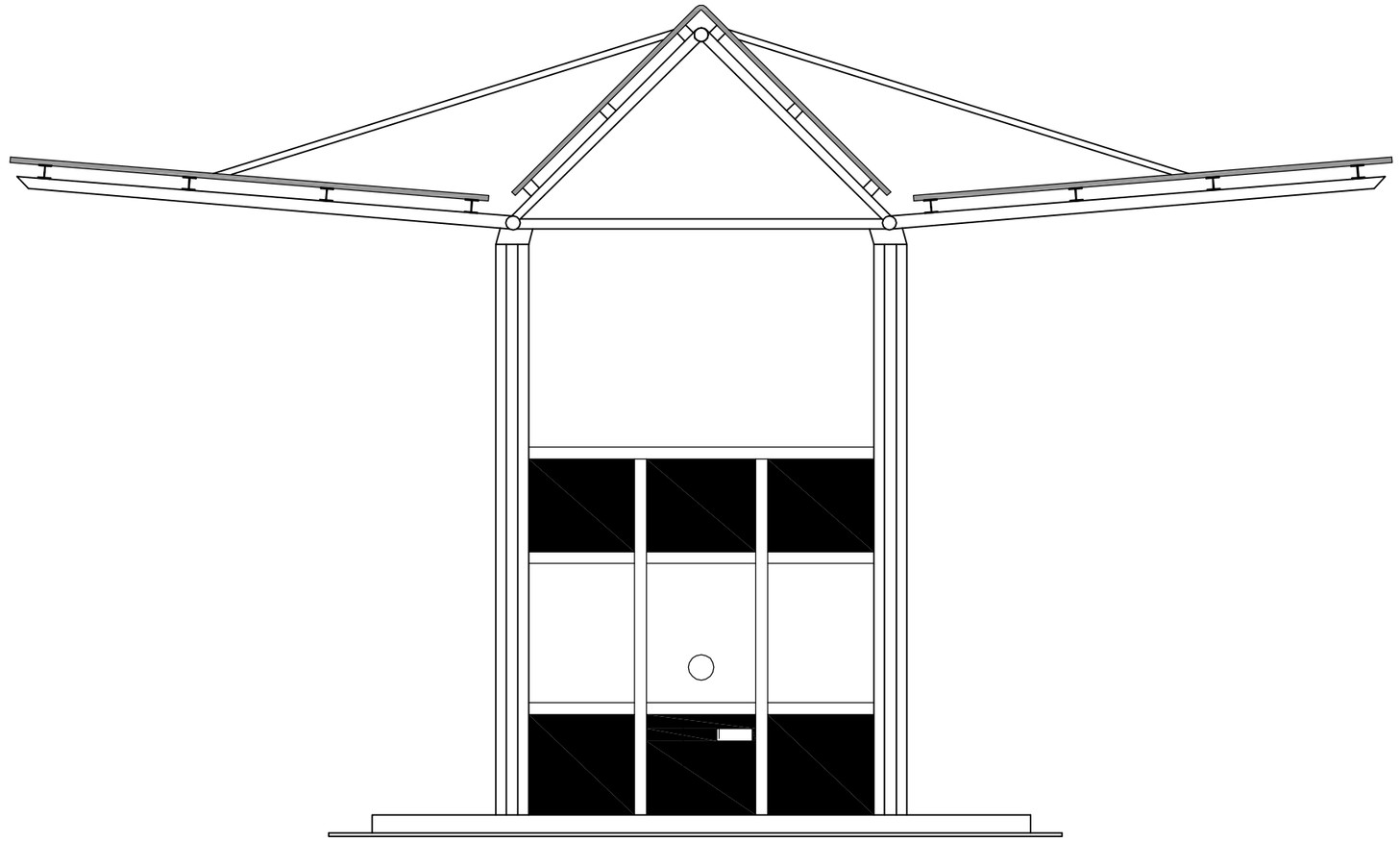
Figure 4.19 Reference not used

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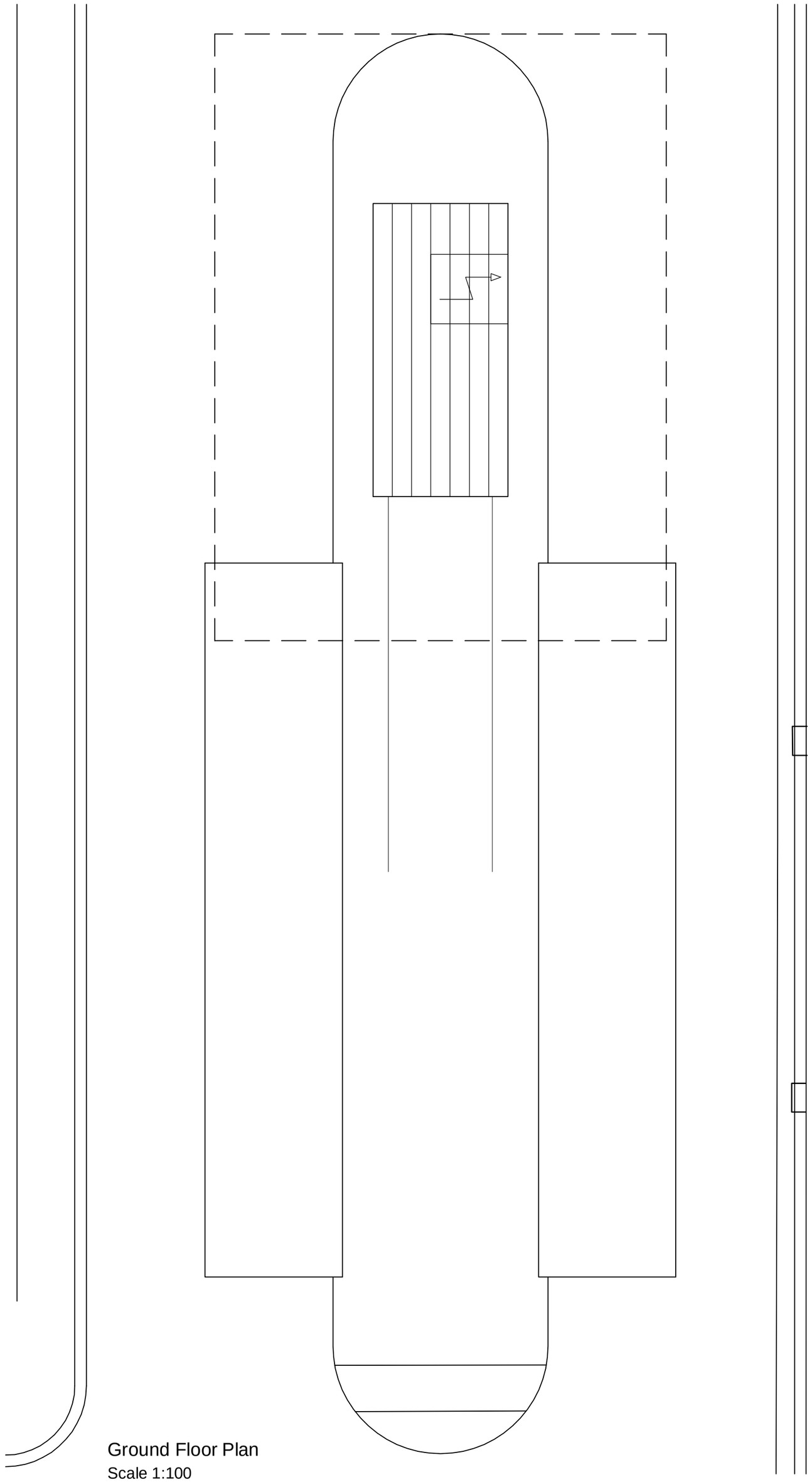
notes :

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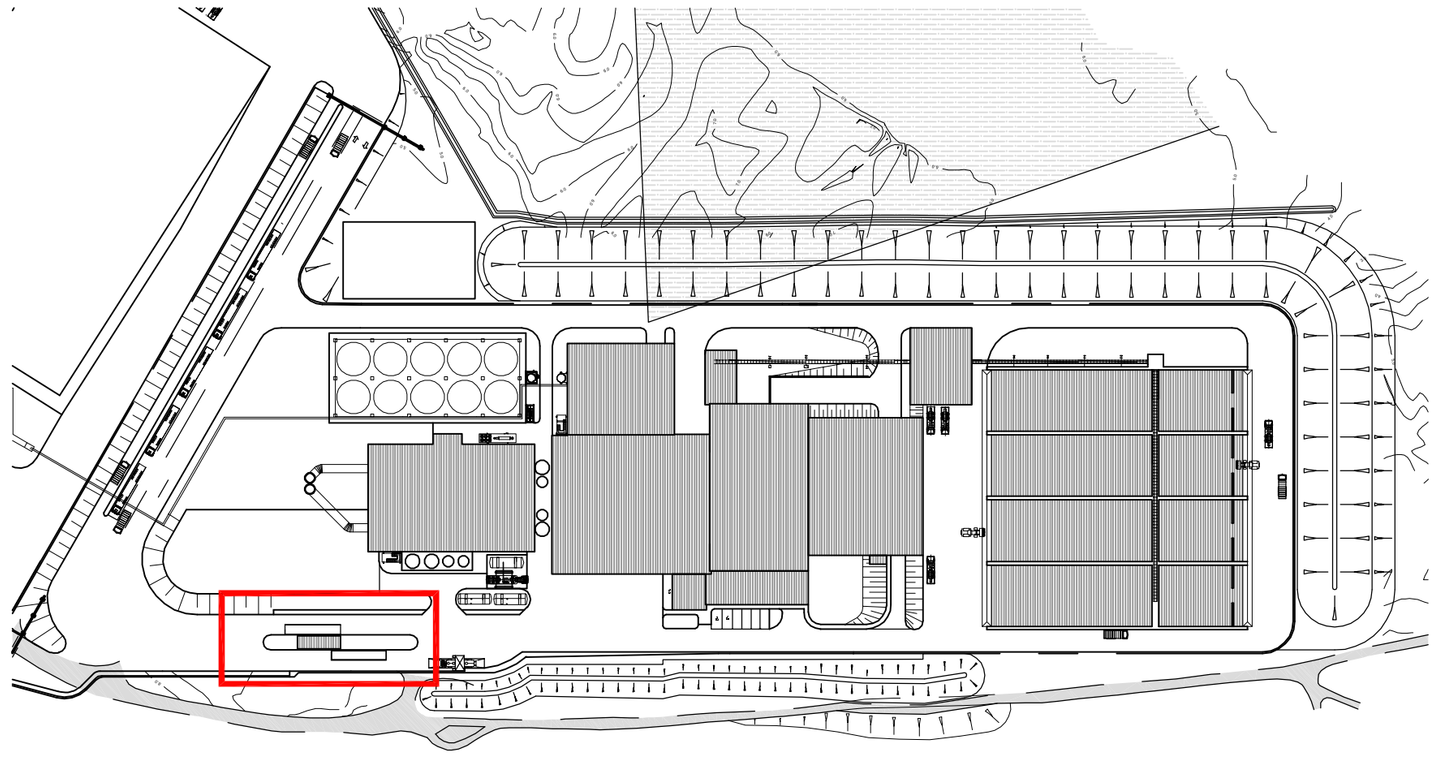
Drawing produced from Sotec's drawing number Ansicht Pförtnerhaus issued 10/11/2009 by Client, and is shown indicative only, with actual accommodation layouts to be confirmed by Client at a later date.



Sectional Elevation
Scale 1:50



Ground Floor Plan
Scale 1:100



Key Plan
Scale 1:2000

1m SCALE 1:50

1m SCALE 1:100

10m SCALE 1:2000

rev	amendments	by	ckd	date

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Client: St Regis / E.ON

Project: Kemsley Sustainable Energy Plant

Title: Proposed Gatehouse Floor Plan

Drawing Status	Date Created	Drawing Scale
Preliminary	23.11.09	As Shown
Project Leader	**Drawn By**	**Initial Review**
AWY	SJLH	PRP

Drawing Number: 16315 / A2 / P / 0172 -

Rev:

FIGURE 4.20

Figure 4.21 Reference not used

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notes :

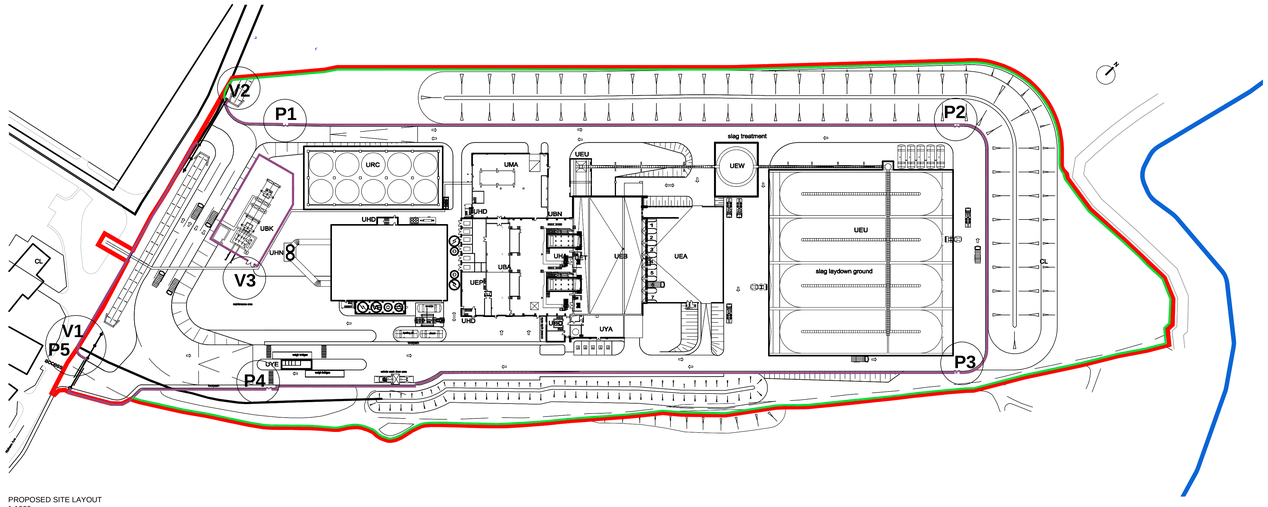
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10m SCALE 1:1000

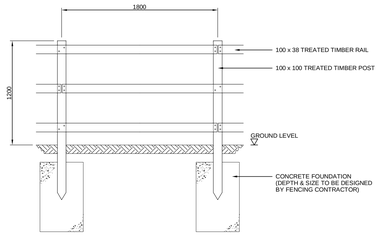
500mm SCALE 1:25

Key	
	Land Ownership Boundary
	Proposed Development Boundary
	Footpath Route (approx 640m)
	1200mm High Treated Timber Traditional Post & Rail Fence
	3000mm High Paladin Fence Colour Anthracite - RAL 7016

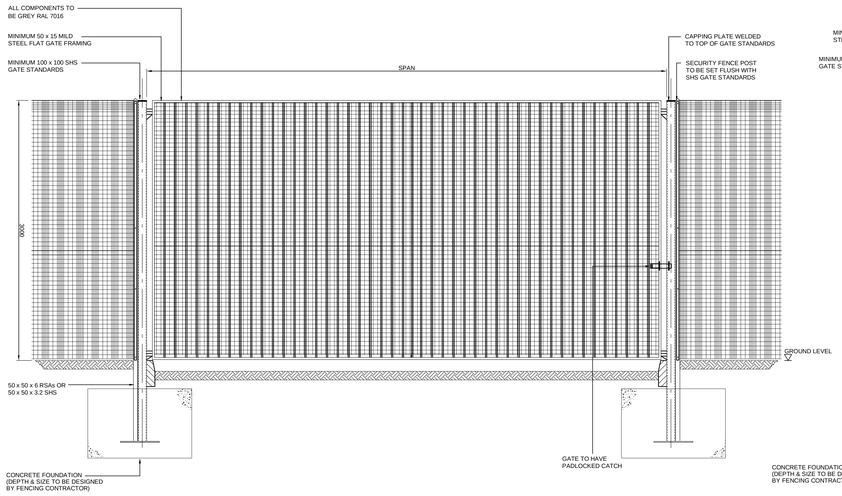
Gate Key		
	Type	Description
	Pedestrian 1-5	Paladin Pedestrian Double Gate 2500mm wide x 3000mm high Colour Anthracite - RAL 7016 Style to match adjacent Fence
	Vehicle 1-3	Paladin Vehicle Gate width to be confirmed 3000mm high Colour Anthracite - RAL 7016



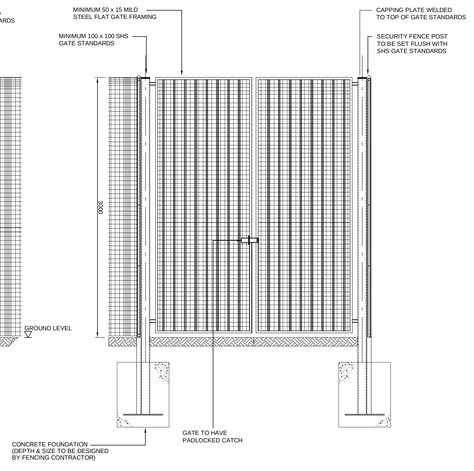
PROPOSED SITE LAYOUT
1:1000



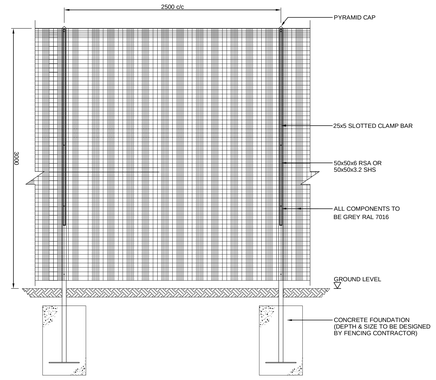
PROPOSED TIMBER POST AND RAIL FENCE DETAIL
1:25



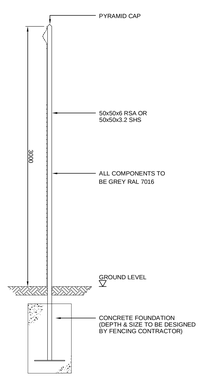
PALADIN VEHICLE GATE DETAIL
1:25



PALADIN PEDESTRIAN GATE DETAIL
1:25



PALADIN FENCE DETAIL
1:25



PALADIN FENCE SECTION
1:25

Drawing for PLANNING purposes only

rev	amendments	by	chd	date
B	Transformer fence and gate indicated. Figure reference added to title block.	AJL	PRP	03.03.10
A	E.ON logo added.	KRy	PRP	15.02.10

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Client: stREGIS e·on

Project: Kemsley Sustainable Energy Plant

Title: Boundary Treatment

Drawing Status	Date Created	Drawing Scale
Preliminary	December 2009	1:25
Project Leader	Drawn By	Initial Review
RS	SMG	PRP

Drawing Number: 16315 / A0 / P / 0106 Rev B

FIGURE 4.22

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25m SCALE 1:1250

	Land Ownership Boundary
	Proposed Development Boundary
	Footpath Route (approx 640m)

Existing Parking Schedule	
Existing Standard Spaces	503 spaces
Existing Accessible Spaces (Based on assumption of 5% provision)	27 spaces
Total Spaces	530 spaces

New Development Requirement	
Standard Spaces	95 spaces (Within Existing Car Park)
Accessible Spaces (Based on assumption of 5% provision)	5 spaces (Adjacent proposed offices)
Total Spaces (Requirement based upon 80 staff and 20 visitors)	100 spaces

Note: Reference to OS of existing paper mill provided by St Regis Paper Mill in DWG format and topographical survey provided by Eon.

EXISTING CAR PARK
(530 Spaces)

ACCESSIBLE PARKING
(5 Spaces)

Swale Estuary

RIDHAM ROAD

EASTY ROAD

Drawing for PLANNING purposes only

rev	amendments	by	ckd	date
B	E.ON logo added.	KRy	PRP	15.02.10
A	Footpath locations added, Saxon Shore Way location amended, general notes added.	SMC	PRP	16.12.09

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Client: stREGIS e·on

Project: Kemsley Sustainable Energy Plant

Title: Main Car Park and Pedestrian Walkway.

Drawing Status	Date Created	Drawing Scale
Preliminary	January 2010	1:1250
Project Leader	Drawn By	Initial Review
RS	AJL	PRP

Drawing Number: 16315 / A0 / P / 0065 B

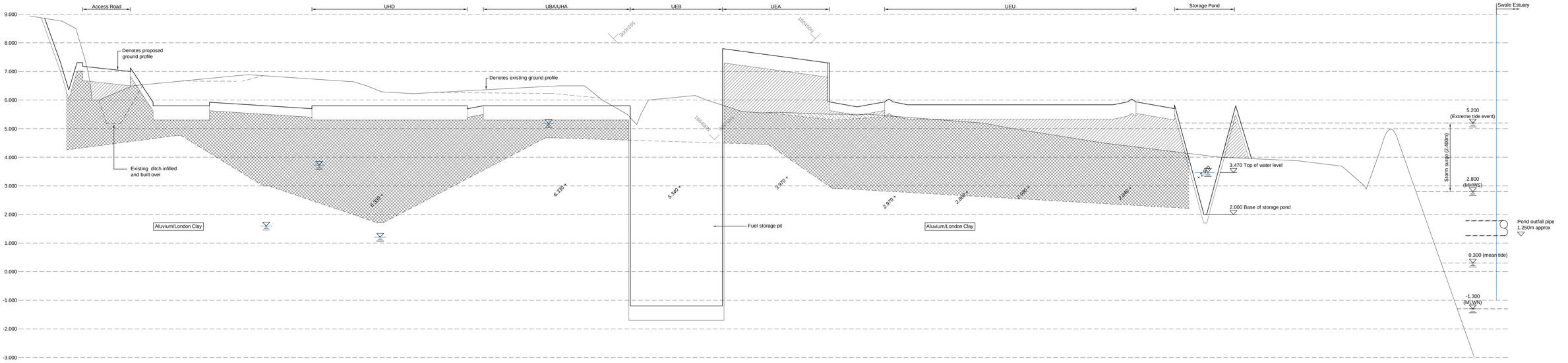
Rev:

FIGURE 4.23

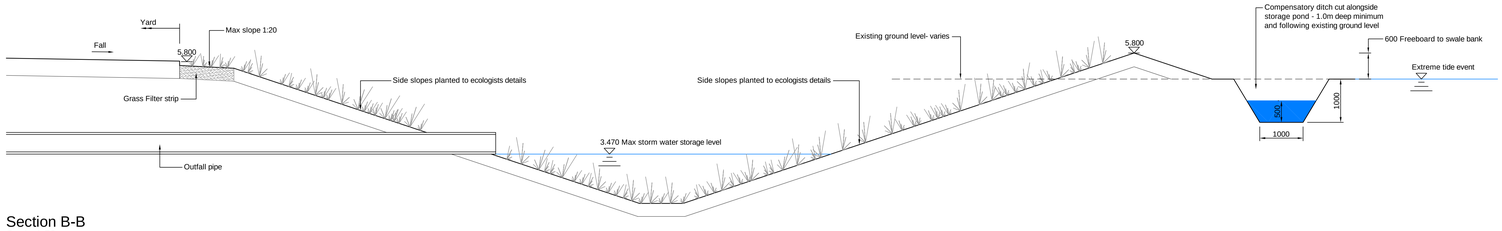
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notes :

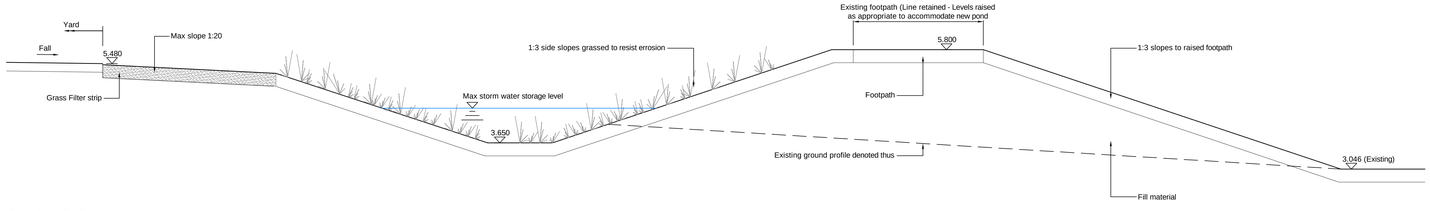
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3. This drawing should be read in conjunction with all other relevant drawings and specifications.



Section A-A
Scale 1:50 Vertical/1:500 Horizontal



Section B-B
Scale 1:50



Section C-C
Scale 1:50

Key

———	Denotes proposed finished level
———	Denotes existing ground level
	Denotes general fill
	Denotes made ground
	Denotes proposed construction thickness
	Denotes ground water strike
MHWS	Denotes mean high water spring tide
MLWN	Denotes mean low water neap tide

10m SCALE 1:500

Drawing for PLANNING purposes only

rev	amendments	by	ckd	date
D	Logos confirmed.	AJL	PRP	03.03.10
C	Drawing figure added. Drawing updated to suit revised site layout.	AKC	ST	24/11/09
B	1. Existing ditch noted as infilled/culverted 2. Pond outfall pipe added. 3. Minor amendents	JDW	RM	04/11/09
A	Compensatory ditch indicated.	AKC	ST	29/10/09

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Client: StRegis / E.ON

Project: Kemsley Sustainable Energy Plant

Title: Site Sections

Drawing Status	Date Created	Drawing Scale
Preliminary	October 2009	1:500
Project Leader	Drawn By	Initial Review
AWY	AKC	ST

Drawing Number: 16315 / A0 / 0200 Rev: D

Figure 4.24

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3. This drawing should be read in conjunction with all other relevant drawings and specifications.

Key:

- Siphonic drainage pipe in building (Roof drainage)
- SD — Primary siphonic downpipe location
- Primary surface water run with manhole
- Denotes headwall
- (v) — Vented cover to siphonic receiving manhole
- FRS — Denotes Class 1 Full Retention Interceptor
- KD — Denotes Kerb drain
- Denotes slot drain with catch pit access point
- Denotes Filter strip
- Denotes Rising main
- Denotes foul drainage run with manhole
- PPS — Denotes pumping station
- CV — Denotes closure valve

Approximate extent of former coal storage area denoted thus

Compensatory ditch cut alongside storage pond - 1.0m deep minimum and following existing ground level

Base of pond at 2.000m A.O.D

Existing ditch to be culverted over length of site

Rain water harvesting tank

Rev D

Assumed existing foul drainage

Pre-Treatment for ash loading areas

Rain water harvesting tank

Pond 1

Pond 2

Outfall structure

Swale Estuary

Concrete bund to slag lay down area denoted thus

Note:
Storage pond outfall to be set to a level of 1.75m AOD to EA approved details/ agreement

Surface Water Drainage Layout
Scale 1:500

KWDS

Total storage volume pond 1 + pond 2 provided = 3200m³

Note:
All drainage inicative/preliminary only - all to be confirmed by detailed deign

Surface Water Drainage Design Assumptions

(i) Site drainage apparatus to discharge freely into storage ponds for all design rainfall events.
(ii) Site drainage designed for no flooding for all design rainfall events up to 1:100 year return periods.
(iii) Storage volume provided is that required for maximum anticipated storm surge spring high tide level of 5.200m A.O.D, storm surge neap high tide level of 4.10m, tide locked discharge period of 9.5 hours Max and maximum storm surge duration of 24 hours.
(iv) Outfall level = 1.75m A.O.D
(v) Drainage layout to be read in conjunction with RPS design philosophy documents

10m SCALE 1:500

Drawing for PLANNING purposes only

rev	amendments	by	chd	date
D	Updated to suit revised site layout. Logos clarified.	AKC	RM	18/01/10
C	Drawing figure added. Updated to suit revised site layout.	AKC	ST	16/12/09
B	Minor amendments	JDW	RM	04/11/09
A	Compensatory ditch indicated.	AKC	ST	29/10/09

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Client: stREGIS e·on

Project: Kemsley Sustainable Energy Plant

Title: Proposed Drainage Layout

Drawing Status	Date Created	Drawing Scale
Preliminary	September 2009	1:500
Project Leader	Drawn By	Initial Review
AWY	AKC	ST

Drawing Number: 16315 / A0 / 0301
Rev: D

Figure 4.25

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notes :

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3. This drawing should be read in conjunction with all other relevant drawings and specifications.



All levels preliminary - TBC by detailed design

Drawing for PLANNING purposes only

rev	amendments	by	ckd	date
B	Levels updated to suit revised site layout. Logos confirmed.	AKC	RM	18/01/10
A	BH 1-3 indicated. Ecological ditch position indicated. Drawing figure added. Levels updated to suit revised site layout.	JDW	RM	16/12/09

Key

- Proposed Level (m A.O.D.)
- Existing Level (m A.O.D.)
- Existing contour
- UEA E.ON building designation
- Fall line
- Slope down

Note:
Existing topographical information obtained from RPS drawing JKK5098-1C

Site layout taken from E.ON drawing: Preliminary 16/09/09

All levels relative to ordinance datum

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Project: Kemsley Sustainable Energy Plant

Title: Proposed Levels/ Site Plan

Drawing Status	Date Created	Drawing Scale
Preliminary	September 2009	1:500
Project Leader	Drawn By	Initial Review
AWY	AKC	ST

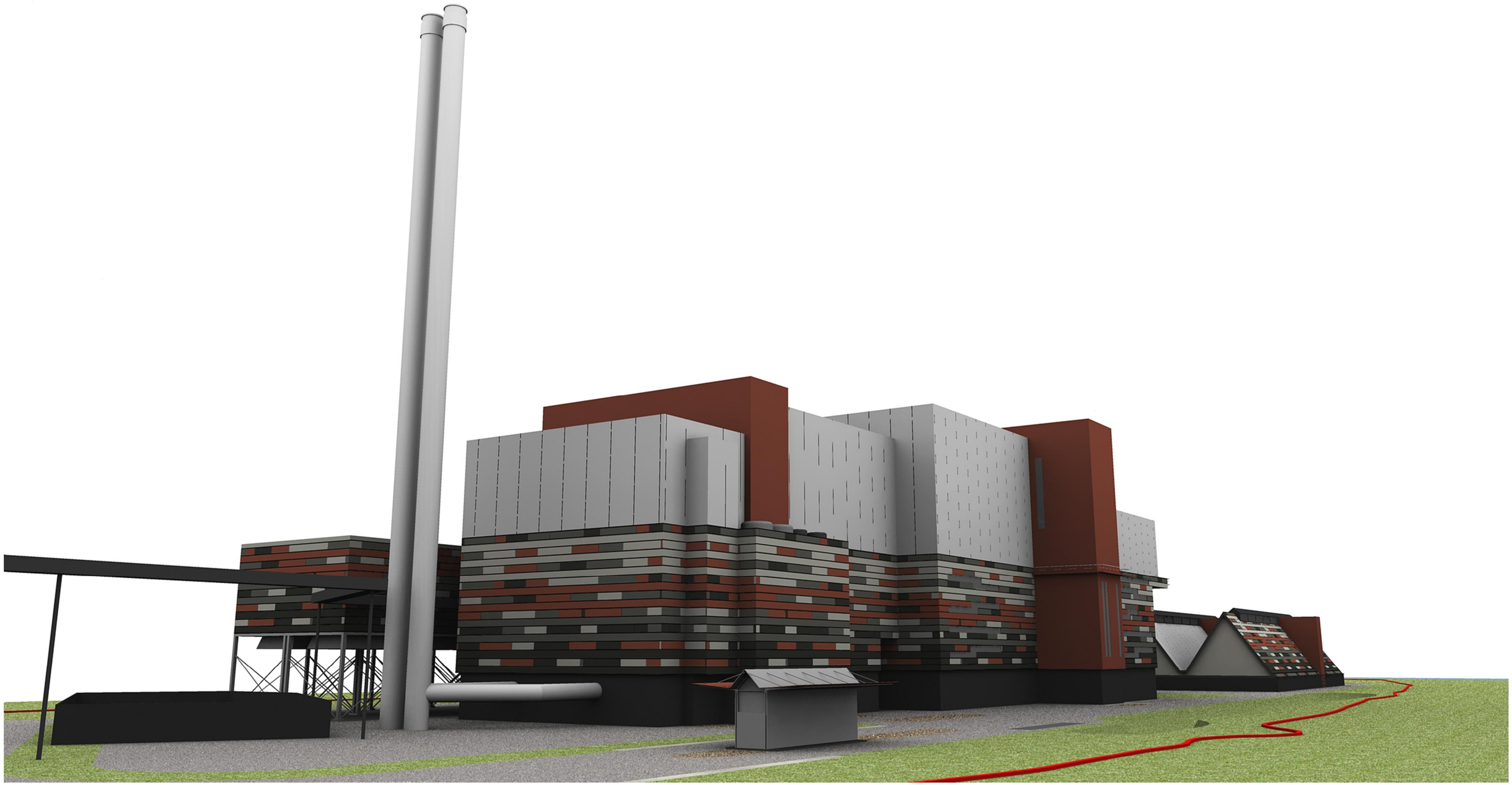
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Figure 4.26

Figure 4.27 Reference not used

Figure 4.28 Reference not used

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FIGURE 4.29

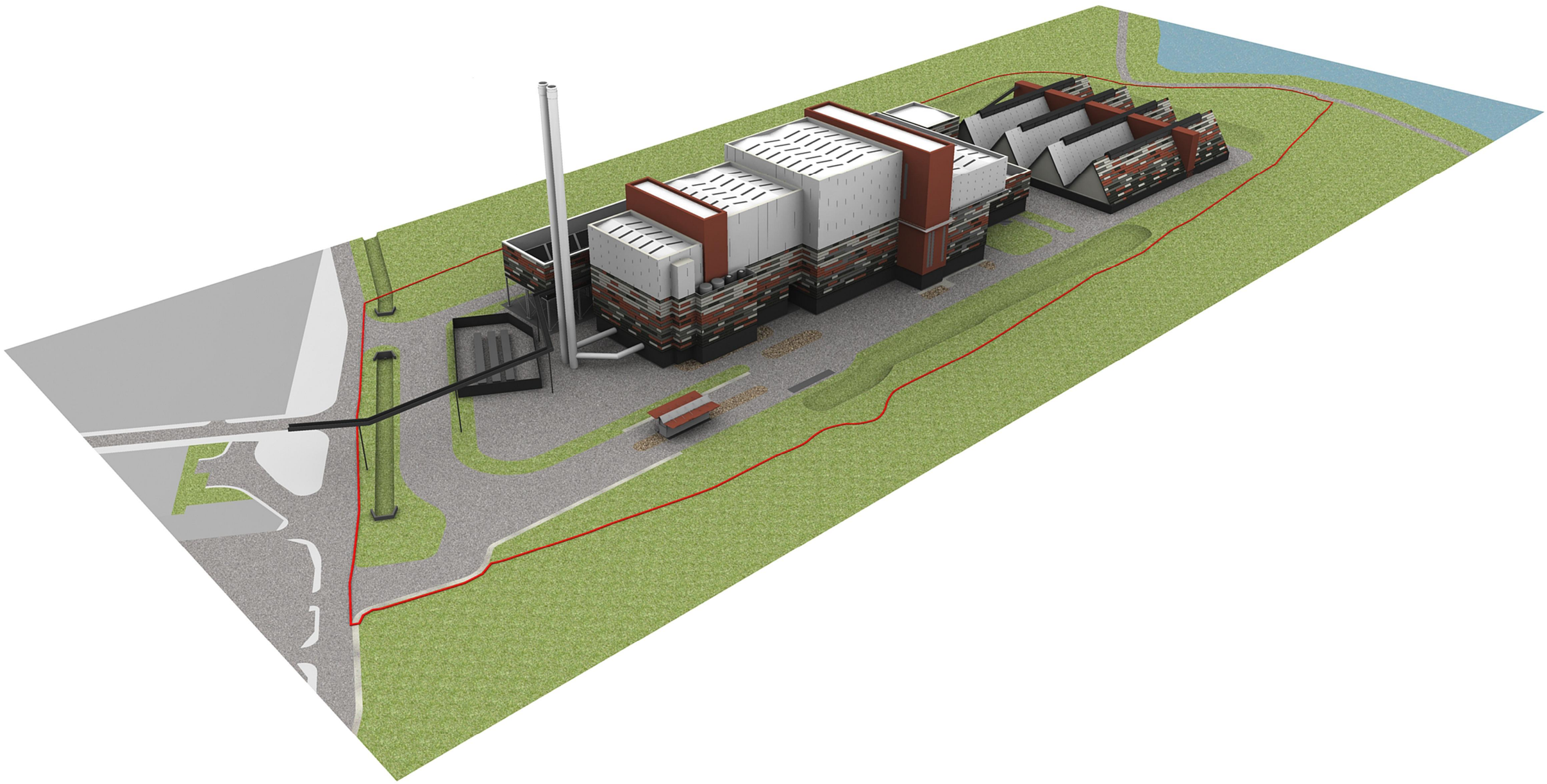
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FIGURE 4.30

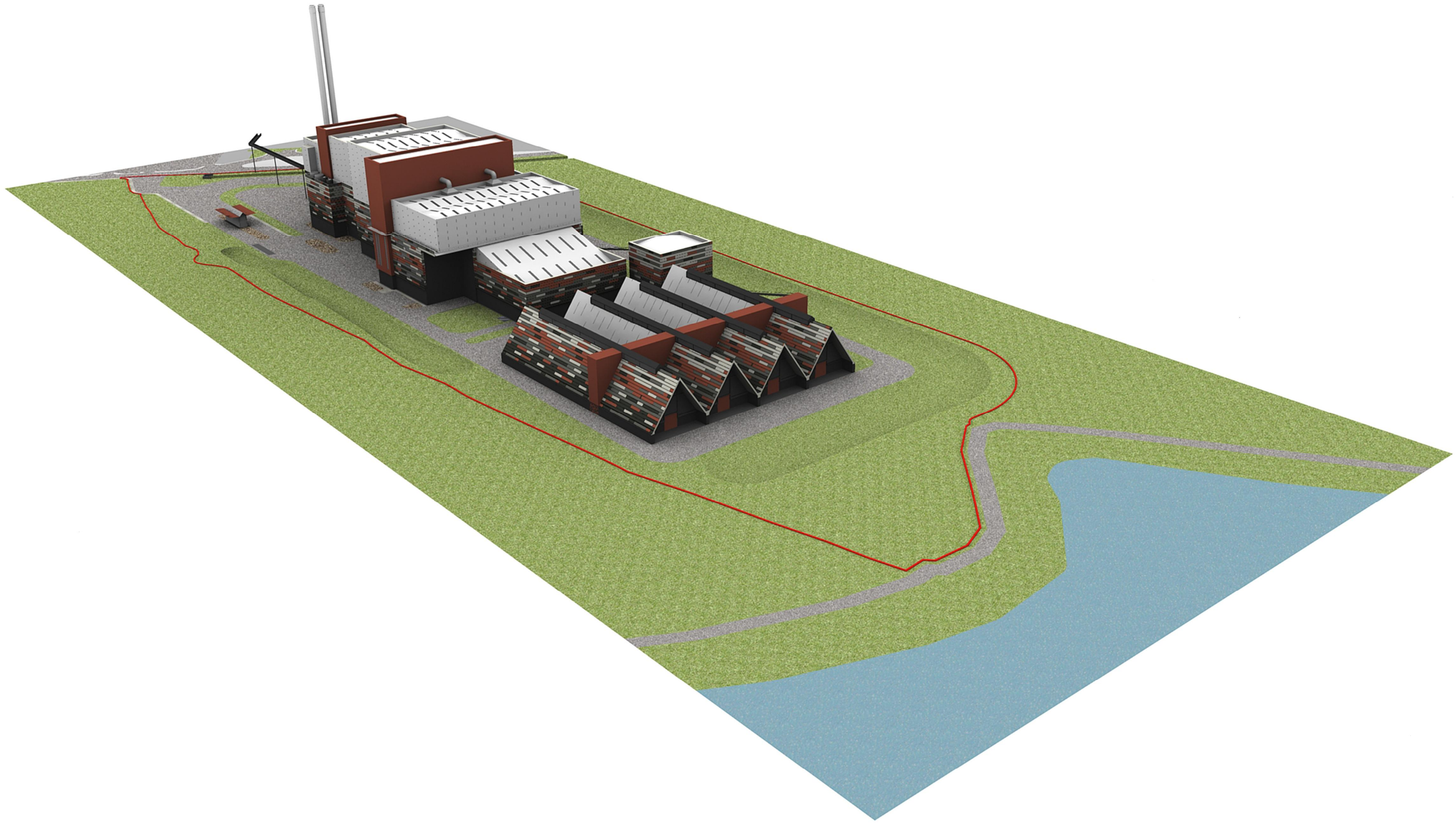
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FIGURE 4.31

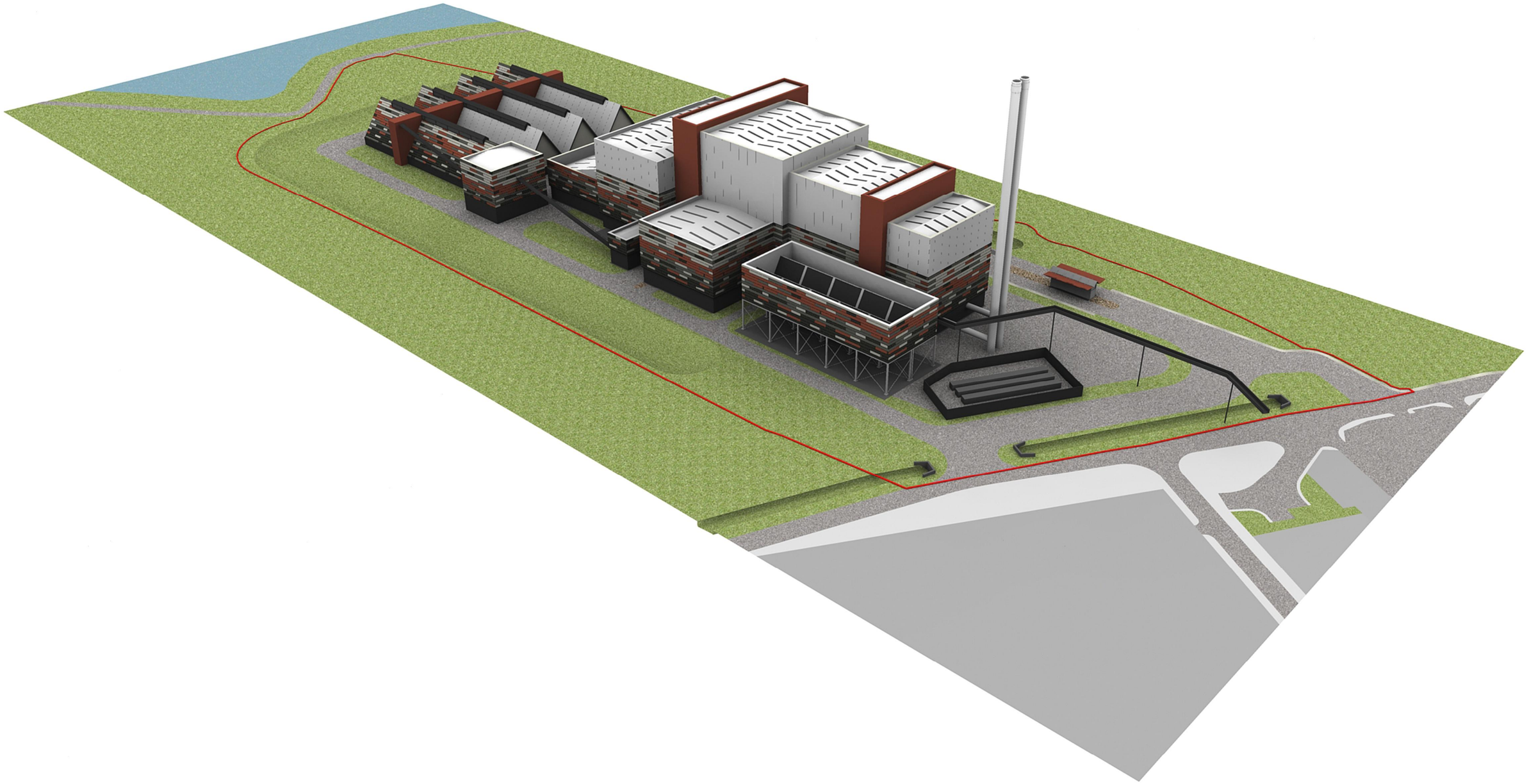
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FIGURE 4.32

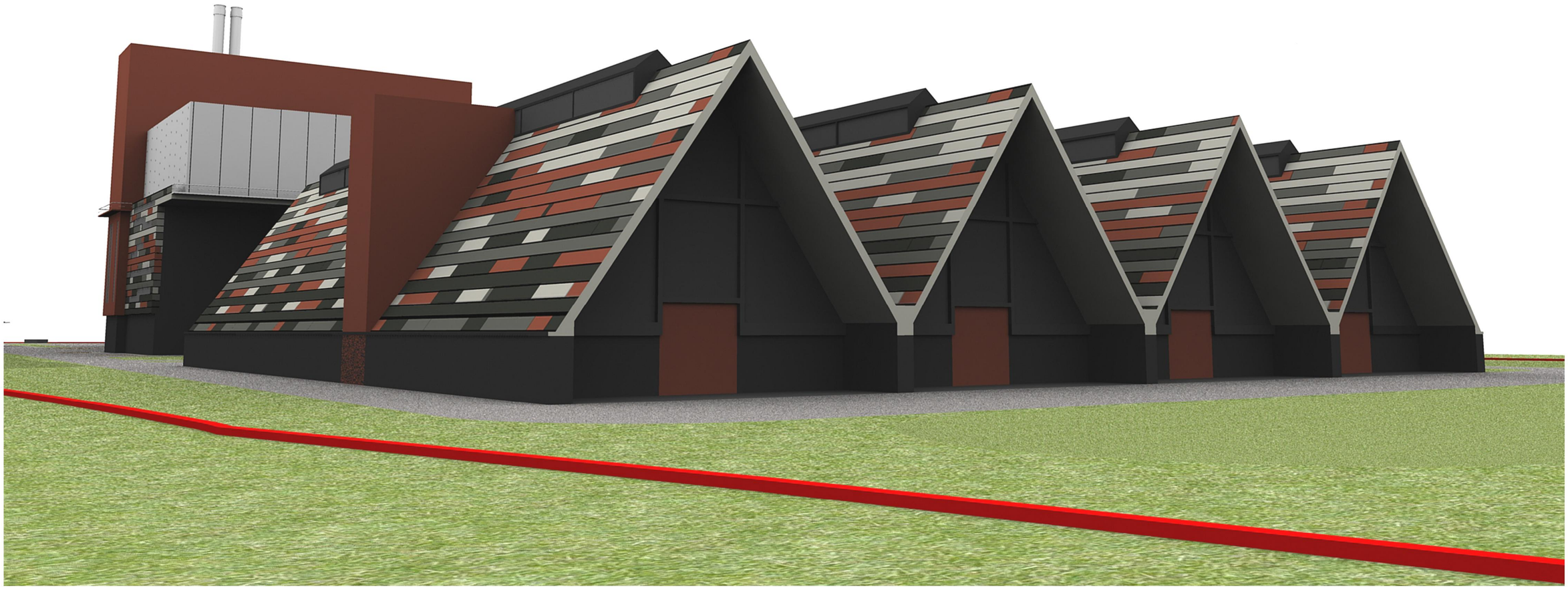
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FIGURE 4.33

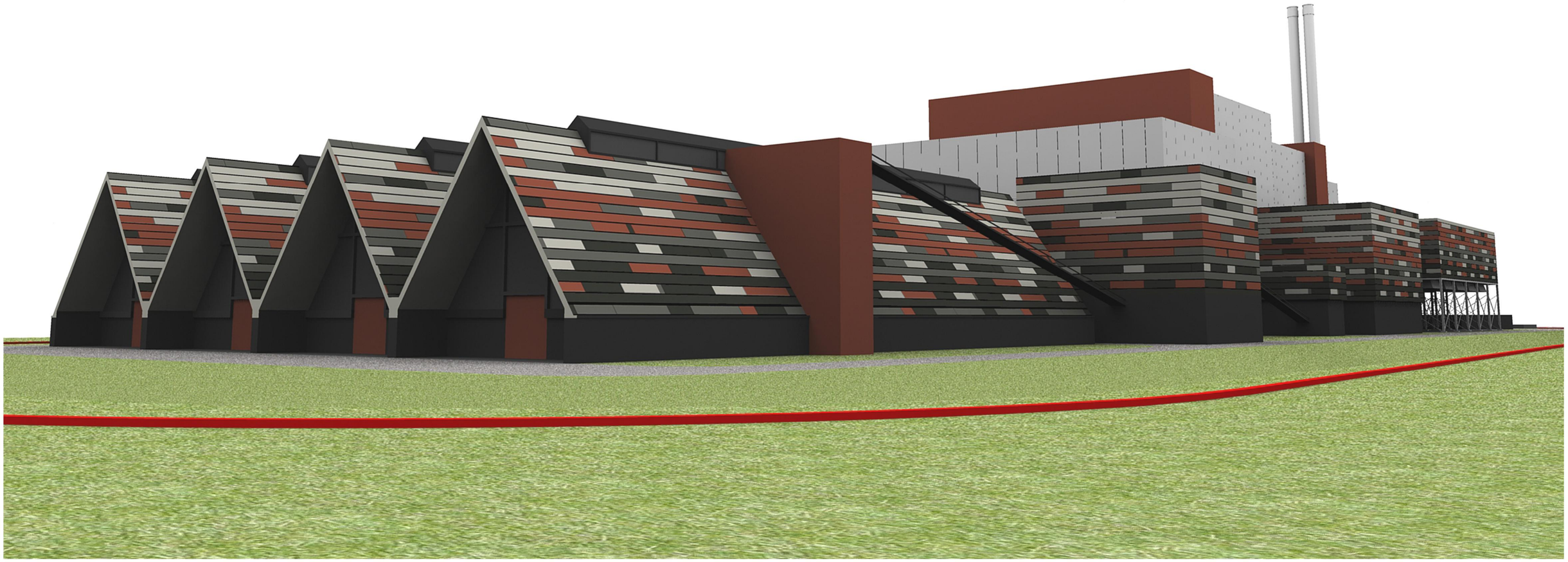
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FIGURE 4.34

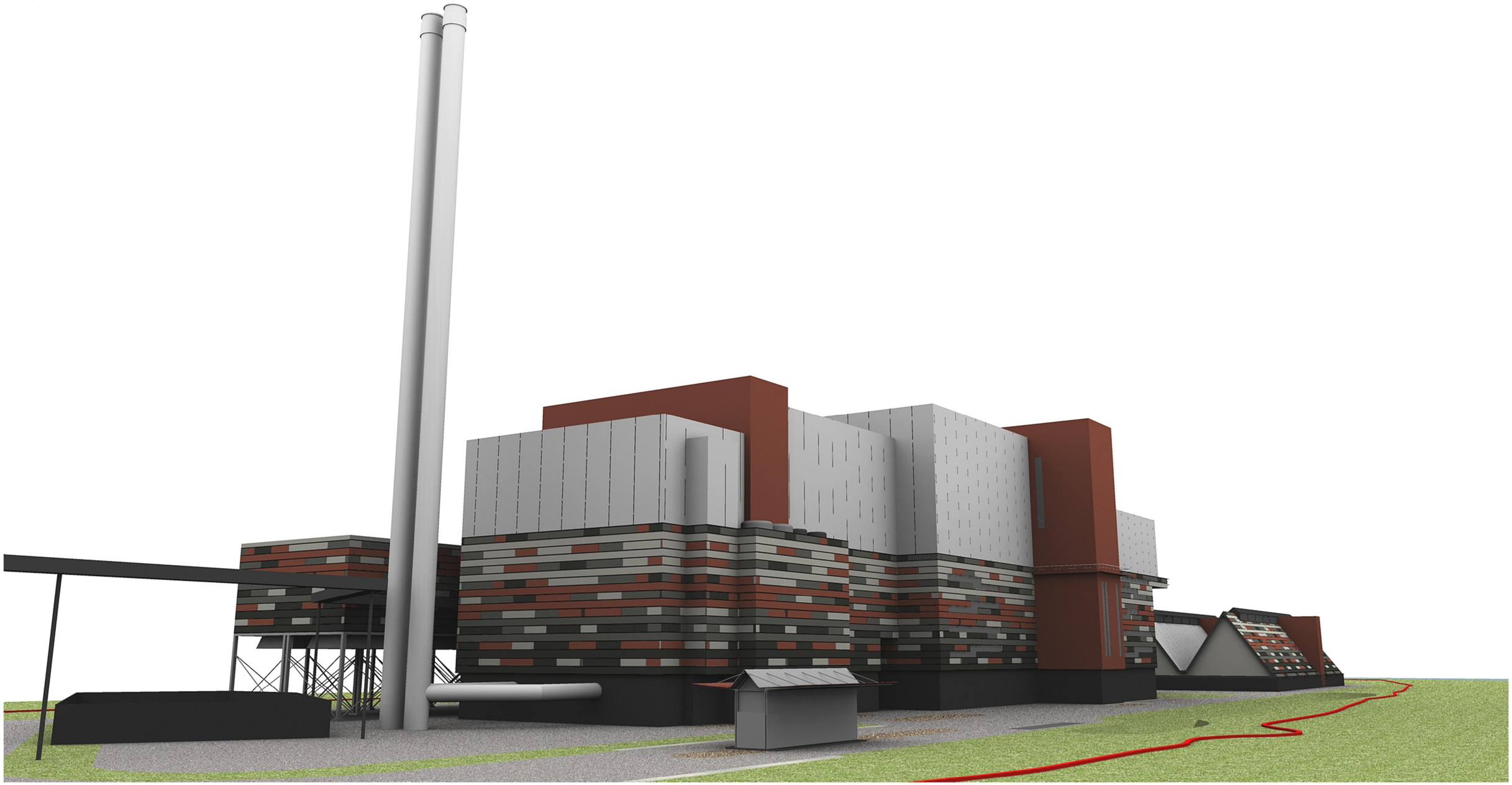
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FIGURE 4.35

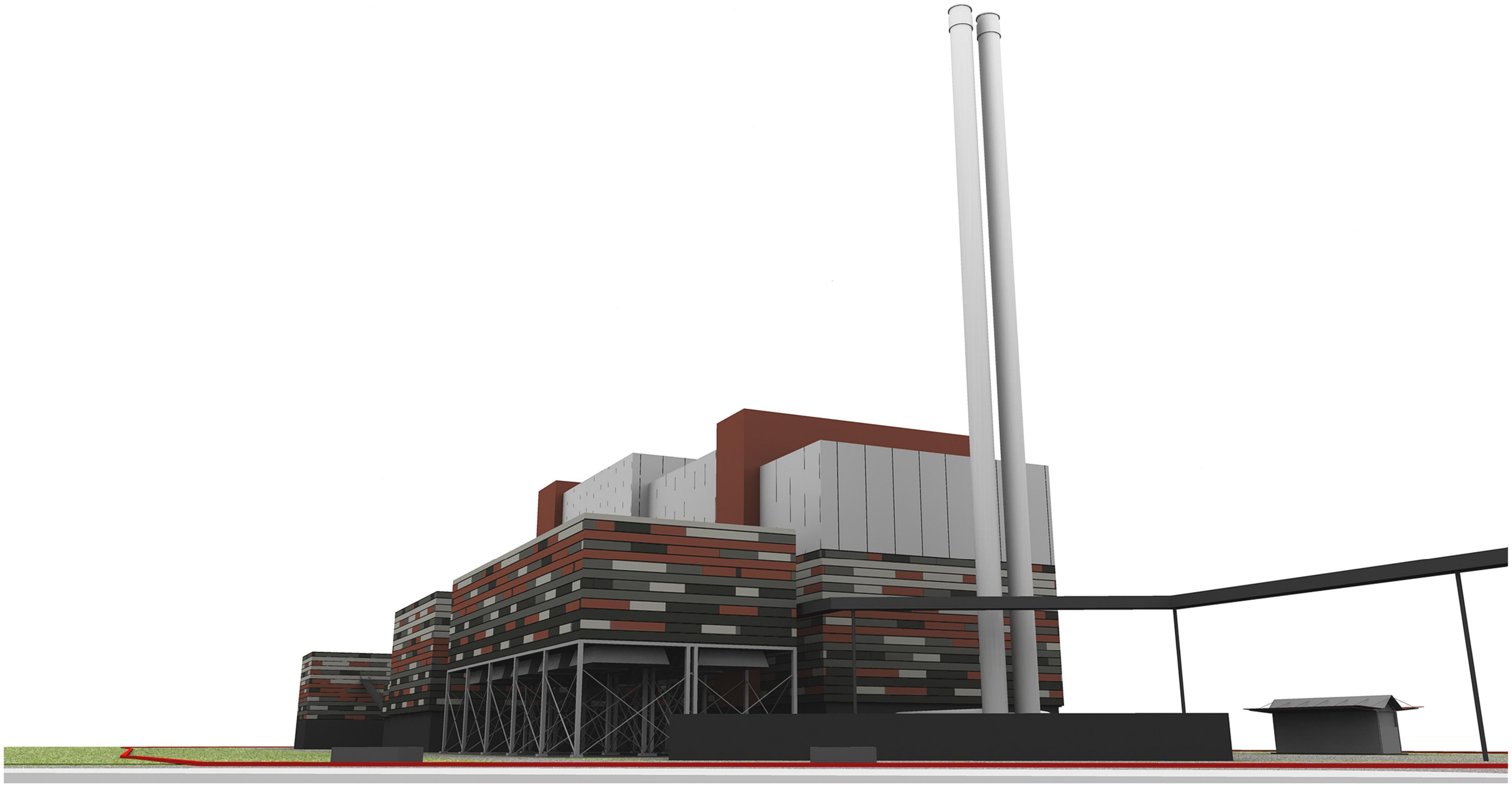
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FIGURE 4.36

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DEVELOPMENT OF A SUSTAINABLE ENERGY PLANT.

KEMSLEY PAPER MILL, SITTINGBOURNE, KENT

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

ENVIRONMENTAL STATEMENT

Chapter 5:

NEED AND ALTERNATIVES

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RPS Planning & Development

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5 Need and Alternatives

5.1 Introduction

5.1.1 This chapter identifies, describes and evaluates the process and decisions underpinning the choice of location, technology and design, which define the proposal. Need and Alternatives have been considered in detail in the preparation of this Environmental Statement (ES) and the formulation of the proposals. In summary, need for the proposed Sustainable Energy Plant (SEP) is demonstrated in terms of:

- Securing a sufficient and reliable energy source for a high intensive energy user
- Significant Contribution to Renewable Energy Targets
- Diversification from fossil to low carbon energy source
- Utilising waste that would otherwise be land filled and managing waste through recovery in the waste hierarchy.

5.1.2 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 from Waste 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 its 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.

5.1.3 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.

5.1.4 The SEP will have 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.

5.1.5 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, together with some of the paper making process rejects from the mill which are currently sent to landfill. The plant may accept up to approximately 25,000 tonnes of waste plastics from the paper mill which would otherwise be landfilled (included within the above).

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

5.1.7 The source of those pre treated wastes has 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.

5.1.8 In this context, the need for the development is demonstrated in the context of the need for energy security, diversification of fuel supply and low carbon energy sources, renewable energy targets and diverting waste from landfill.

5.1.9 In the context of the need for the proposed development, the alternative site appraisal focuses its considerations to sites that could meet this need.

5.2 Need for the Development

5.2.1 Whilst Planning Policy Statement 23: Planning and Pollution Control, at Annex 1 paragraph 1.54, states:

"applicants do not normally have to prove a need for their proposed development, or discuss the merits of alternative sites," Paragraph 1.54 provides that the nature of polluting or potentially polluting developments and the national or regional need for them, or the location of a proposal in an environmentally designated or sensitive area may make the availability, or lack of availability, of suitable alternative sites material to the planning decision.

5.2.2 Paragraph 1.55 provides:

"Environmental Statements, which must accompany applications where EIA is considered necessary, should identify matters that will be relevant to the determination of the application. Where alternatives are considered, they must include an outline of the main options examined by the applicant and an indication of the most important reasons for the choice, taking into account the respective environmental effects and other relevant matters".

5.2.3 Planning Policy Statement 10: Delivering Sustainable Waste Management, in respect to the demonstration of need states: (paragraph 22), "*Development plans form the framework within which decisions on proposals for development are taken. It is important that plans are kept up to date and properly reflect national policy. When proposals are consistent with an up to date development plan, waste planning authorities should not require applicants for new or enhanced waste management facilities to demonstrate a quantative or market need for their proposal*".

Energy

5.2.4 In terms of energy, PPS: Planning and Climate Change (paragraph 20) provides that applicants are not required to demonstrate overall need for renewable energy, nor the need to locate renewable energy in a particular location. That said, there is a clear demonstrable need for the proposed Sustainable Energy Plant, in terms of renewable energy, diversification from fossil fuels, and the needs of the Paper Mill in terms of securing a sufficient and reliable energy supply.

Renewable Energy

5.2.5 EU Directive 2009/28/EC (the Renewable Energy Directive) sets out a mandatory target for the EU to achieve 20% of all its energy from renewable energy sources. In order for the EU to achieve this overall mandatory target the UK must ensure that its own binding target of 15% of its own energy supply comes from renewable energy. The Renewable Energy Strategy puts the enormity of this challenge into context by confirming this represents "almost a seven fold increase in scarcely more than a decade."

5.2.6 In response to meeting this binding target the Renewable Energy Strategy sets out to achieve 30% of all electricity and 12% of all heat to be sourced from renewable energy sources and confirms that there is sufficient biomass resource potential in the UK to meet its 2020 EU renewable energy target.

5.2.7 In respect to meeting the target, the Renewable Energy Strategy sets out the need to use more sustainable bioenergy, and at paragraph 4 of the Executive Summary states "*We will*

ramp up the supply and use of biomass for heat power, and transport….through increasing supply…and making better use of biomass waste". It goes on to state that around 30% of the UK's renewable energy target could come from bioenergy for heat and power.

5.2.8 With respect to this national target PPS22 paragraphs 2 and 3 set out that regional renewable energy targets should be expressed in Regional Spatial Strategy, but that these target should be regularly reviewed and revised upwards if met so long as there is renewable energy resource and environmental capacity.

5.2.9 The South East Plan policy NRM13 sets out that the minimum of installed capacity of renewable energy should be 620MW by 2010 or 5.5% the Regions Electricity Generation Supply, and 1,130MW by 2020 or 10% of the Regions Electricity Generation Supply. The South East Plan policy NRM14 sets out a Renewable Energy Target for Kent of 111MW by 2010 and 154MW by 2016.

Table 5.1 Regional Renewable Energy Targets and Capacity

	SEP 2010 Target (MW)	Predicted 2010 Installed Capacity (MW)	SEP 2016 Target (MW)	SEP 2020 Target (MW)	Overall shortfall in Installed Capacity (MW)
Kent	111	119.57	154	N/A	34.43
South East	620	767.40	895	1,130	362.6

5.2.10 According to South East Energy Statistics in August 2009, the installed capacity for the South East was 767.40 MW and for Kent was 119.57MW. The statistics also show that although the 2010 targets for both the Region and sub Region will be exceeded should all the committed sites (those with planning permission but not built) be installed, the installed capacity will remain significantly short of the respective 2016 (895MW) and 2020 (1,130MW) South East Region target, or the 2016 (154MW) Kent Sub- Region target.

5.2.11 PPS22 confirms at paragraph 3 that reaching the targets is not in itself a reason for refusing planning permission. However, there remains a deficit in renewable energy capacity at both the Regional and Sub-Regional level. The proposed development would therefore make a significant contribution to the National, Regional and Sub-Regional renewable energy requirements. There is therefore a quantifiable need for renewable energy generated by proposed Sustainable Energy Plant.

Diversification from Fossil Fuels

5.2.12 The Climate Change Act 2008 (CCA) sets out a binding target to reduce greenhouse gas emissions to 80% below those of the 1990 levels, by 2050. In order to ensure that the target is achieved the CCA, requires the UK Government to set 5 year carbon budgets which set out binding targets for reduction in green house gas. The first three carbon budgets have been set and require a 34% reduction in green house gas relative to the 1990 level by 2022.

5.2.13 EU Directive 2009/29/EC requires at least a 20% reduction in the EU's greenhouse gas emissions relative to the 1990 level, by 2020.

5.2.14 The UK Biomass Strategy identifies that Biomass is a renewable energy source that has the potential to make a valuable contribution to heat and electricity generation as a low carbon, sustainable replacement for fossil fuels. It also identifies that at present 90% of the UK's energy needs are met by fossil fuels. As such, it sets out the UK Government intends a major expansion in the supply and use of Biomass so as to contribute to the delivery of the UK's climate change and energy policy goals.

5.2.15 The UK Low Carbon Transition Plan sets out to ensure that 40% of all electricity to come from low carbon sources such as Biomass by 2020. It sets out that without intervention by 2020 the UK would need to import 60% of the gas it uses, but that its planned to decarbonise the UK economy through measures including meeting its renewable energy targets, this would reduce the predicted gas imports to 45%; therefore, amongst other measures, renewable energy sources such as biomass would lead to a 15% decline in gas requirements

5.2.16 PPS1: Planning and Climate Change confirms tackling climate change is a key Government policy for the planning system, and that planning authorities should ensure that the Government's Climate Change Programme and energy policy is delivered through spatial strategies.

5.2.17 The proposed Sustainable Energy Plant would ensure that the Paper Mills reliance on fossil fuels is reduced, and therefore, help to reduce the production of greenhouse gas emissions, and in so doing make a significant contribution to the government's targets.

Security of Energy Supply and the Needs of St. Regis.

5.2.18 The UK Low Carbon Transition Plan forecast (page 28) advises that the global energy demand is forecast to increase by 45% between 2006 and 2030, with almost 80% of the increase coming from fossil fuels. In this respect, at present 90% of the UK's energy needs

are met by fossil fuels. In terms of gas, in 2008 the UK imported 25% of that it used. This is predicted to rise to 60% by 2020 owing to increase demand and decreased domestic reserves.

5.2.19 The Renewable Energy Strategy (RES) therefore proposes a radical increase in the use of renewable energy in a move towards energy efficiency and a security of energy supplies, without which the cost of energy would increase or the supply may decrease. The RES (Paragraph 1.7) aims to reduce reliance on imports and reduce the overall fossil fuel demand by 10% and gas imports by 20-30% what they would been in 2020. The UK Low Carbon Transition plan identifies that the increased use of renewable energy could help to reduce the reliance on imported gas from 60% to 45%.

5.2.20 The process at the Kemsley Paper Mill is highly energy intensive currently consuming approximately 55MWh of electricity and 150MWh of heat. The source of this energy is currently a gas-fired Combined Heat and Power plant together with heat provided by an Energy from Waste plant consuming the rejects from the paper making process. At present there is no other source of energy to the plant. The purpose of the proposed SEP is therefore to reduce the Kemsley Paper Mill's plants reliance on the gas-fired CHP plant, and replace some of the heat energy from it with a renewable energy source in the form of biomass fuelled by pre treated waste.

5.2.21 In this context, given the energy intensive nature of the Paper Mill operation, and its current reliance on gas, the proposed SEP is needed to reduce the dependence on a non-renewable energy source the supply of which may not be secure in the long term.

Waste

5.2.22 The proposed SEP would be fuelled through the combustion of pre- treated waste comprising a mixture of Commercial and Industrial, Municipal Solid Waste and Solid Recovered Waste.The power generation capability of the SEP will supply in excess of 50MWth per hour of steam to the paper mill. Dependent upon its calorific value, the SEP will import as its feed stock approximately 500,000 to 550,000 tonnes per annum of pre treated waste comprising Solid Recovered Fuel waste, Commercial & Industrial waste and Municipal Solid Waste, may and may include up to approximately 25,000 tonnes of paper making process rejects from the mill which are currently sent to landfill. The source of those pre treated wastes has yet to be determined. 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.

5.2.23 Planning Policy Statement 10: Delivering Sustainable Waste Management, in respect to the demonstration of need states: (paragraph 22):

"*Development plans form the framework within which decisions on proposals for development are taken. It is important that plans are kept up to date and properly reflect national policy. When proposals are consistent with an up to date development plan, waste planning authorities should not require applicants for new or enhanced waste management facilities to demonstrate a quantitative or market need for their proposal*".

5.2.24 Draft National Policy Statement for Renewable Energy Infrastructure sets out that an assessment of the waste combustions plants conformity with the waste hierarchy and the effect on the relevant regional waste plan should be made.

5.2.25 Article 4 of the Waste Framework Directive 08/98/EC sets out that the following waste hierarchy shall apply as a priority order in waste prevention and management legislation and policy:

- Prevention
- Preparing for re-use
- Recycling
- Other recover e.g. energy recovery; and
- Disposal

5.2.26 The Waste Framework Directive (at Annex II, R1) defines waste recovery operations as those which principally use waste as a fuel or other means to generate energy including incineration facilities using MSW where the facility has an efficiency rating of 65% and over. The proposed development is therefore classified as an energy recovery facility.

5.2.27 The National Waste Strategy is part of the implementation for England of the requirements within the Framework Directive on Waste, and associated Directives to produce waste management plans. The European Landfill Directive (Council Directive 1999/31/EC) sets targets for the reduction of biodegradable municipal waste sent to landfill. These targets were firstly incorporated into the National Waste Strategy (Waste Strategy 2000). Since that time the National Waste Strategy has been taken forwards to the Waste Strategy for England 2007 issued in June 2007.

5.2.28 The Waste Strategy 2007 (WS2007) sets out the Government's key objectives:

- *Decouple waste growth (in all sectors) from economic growth and put more emphasis on waste prevention and re use;*

- *Meet and exceed the Landfill Directive diversion targets for biodegradable municipal waste in 2010, 2013 and 2020;*

- *Increase diversion from landfill of non municipal waste and secure better integration of treatment for municipal and non municipal waste;*

- *Secure the investment in infrastructure needed to divert waste from landfill and for the management of hazardous waste; and,*

- *Get the most environmental benefit from that investment through increased recycling of resources and energy recovery from residual waste using a mix of technologies.*

5.2.29 The WS2007 reinforces the importance of the waste hierarchy whereby landfill is treated as the option of last resort, with an emphasis upon reduction in waste generation followed by reuse and recycling and recovery of value. Despite the hierarchy, the majority of UK waste is still being disposed of through landfill. The WS2007 establishes the following Waste Hierarchy:

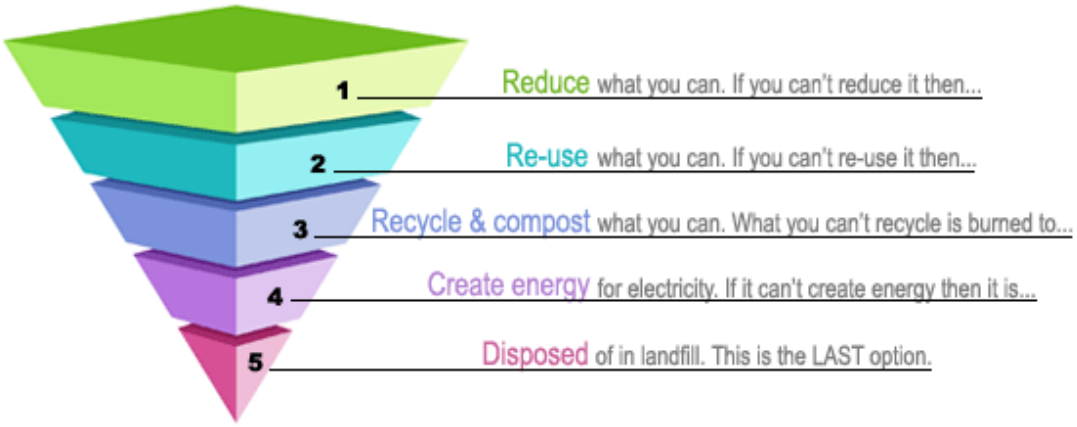


Fig.5.1: Waste Hierarchy

5.2.30 The key landfill targets in WS2007 are:

- *To reduce the amount of industrial and commercial waste land filled to 85% of 1998 levels by 2005,*
- *Commercial and waste land filled falling by 20% by 2010 compared to 2004*
- *To reduce the amount of biodegradable municipal waste that is land filled to 75%, 50% and 35% of 1995 levels by 2010, 2013 and 2020 respectively.*

5.2.31 A key lever is the Landfill Allowance Trading Scheme (LATS). Introduced as part of the Waste and Emissions Trading Act in 2003, a statutory limit on the amount of Biodegradable Municipal Waste (BMW) that can be sent to landfill by waste authorities in each year between 2005 and 2020 has now been imposed. The Landfill Allowances Trading Scheme (LATS) requires all Waste Disposal Authorities to reduce the materials sent to landfill, trade

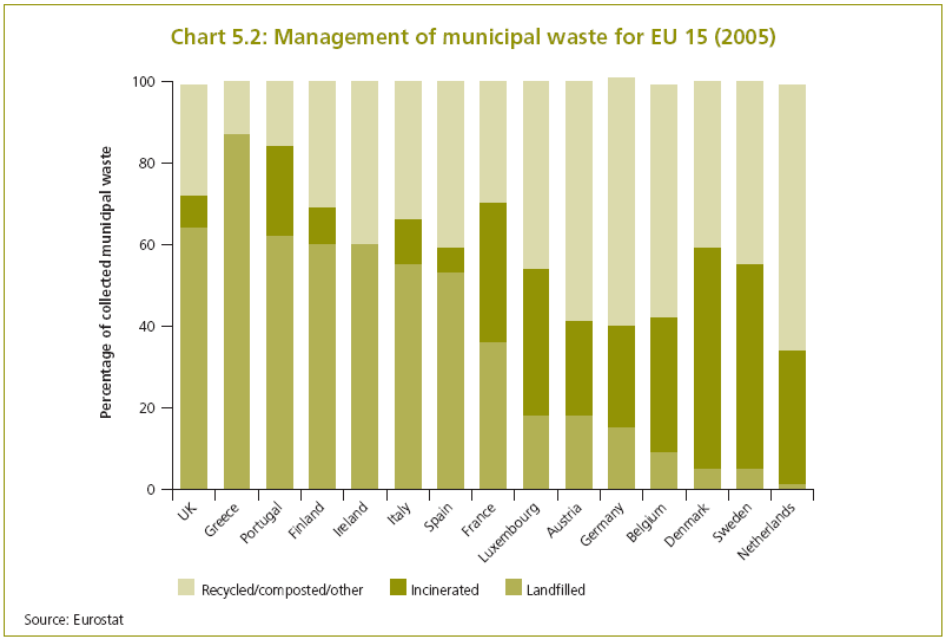
permits with other better performing authorities, or risk a fine of £150 per tonne for any biodegradable municipal waste sent to landfill over the set limit.

5.2.32 Increased national targets were set in WS2007, compared to that of the Waste Strategy 2000:

- *To recover value from 53% of municipal waste by 2010, 67% by 2015, and 75% by 2020;*
- To recycle or compost at least 40% of household waste by 2010, 45% by 2015, and 50% by 2020.

5.2.33 The WS2007 further emphasises:' [Chapter 5 paragraphs 5, 17]:
'*recovering energy from waste which cannot sensibly be reused or recycled is an essential component of a well balanced energy policy*"

5.2.34 However, WS2007 also makes it clear that it is important that energy recovery does not crowd out recycling and the Government points out [Chapter 5 paragraph 23]. It states:
'*evidence from neighbouring countries, where very high rates of recycling and energy from waste are able to coexist, demonstrates that a vigorous energy from waste policy is compatible with high recycling rates*'.(see chart below)



5.2.35 The Regional Spatial Strategy (South East Plan) derives its targets from the Regional Waste Strategy and sets the most stringent targets with respect to the waste hierarchy. As part of the statutory development plan the extent to which development comply with the targets carries considerable weight.

5.2.36 RSS policy W5 sets out the relevant recovery targets (which include the recycling and composting targets), sets out a regional variation of the waste hierarchy, and sets the landfill disposal target for the South East. It 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."

5.2.37 RSS policy W6 sets out the Recycling and Composting target for the South East. It 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."

5.2.38 Tables 5.2 and 5.3 below (derived from *Regional Waste Management Capacity: Survey, Methodology and Monitoring, (modelled Scenario 1 as Updated in February 2009 by ERM Consulting on behalf of SEERA)* show the quantities of C&I and MSW waste that would otherwise have to be disposed of by landfill in both Kent and the South East assuming that there is sufficient recycling and composting capacity to deliver the respective RSS targets. At the present time there is insufficient recycling and composting capacity to deliver the respective RSS targets within both Kent and the South East Region (with the exception of 2010 where a Regional surplus of capacity of approximately 638,700 tonnes per annum is predicted). Accordingly, until the level of capacity is increased there will further waste available than shown in the tables.

Year	MSW Arising (kTPA)	RSS Recycling and Composting Target (%)	Remaining Post-RSS Target MSW (kTPA)	C&I Arising (kTPA)	RSS Recycling and Composting Target (%)	Remaining Post-RSS Target C&I (kTPA)	Total Combined Remaining Post-RSS Target MSW + C&I (kTPA)
2010	839	40	503.4	2,067	50	1,033.5	1,536.9
2015	927	50	463.5	2,282	55	1,026.9	1,490.4
2020	998	55	449.1	2,458	60	983.2	1,432.3
2025	1,076	60	430.4	2,583	65	904	1,334.4

Table 5.2: Potential Landfill Waste Kent

Year	MSW Arising (kTPA)	RSS Recycling and Composting Target (%)	Remaining Post-RSS Target MSW (kTPA)	C&I Arising (kTPA)	RSS Recycling and Composting Target (%)	Remaining Post-RSS Target C&I (kTPA)	Total Combined Remaining Post-RSS Target MSW + C&I (kTPA)
2010	4,737	40	2,842.2	8,983	50	4,491.5	7,333.7
2015	5,230	50	2,615	9,918	55	4,463.1	7,078.1
2020	5,634	55	2,535.3	10,685	60	4,274	6,809.3
2025	6,070	60	2,428	11,230	65	3,930.5	6,358.5

Table 5.3: Potential Landfill Waste South East

5.2.39 Table 5.2 shows that in Kent the amount of waste that would otherwise be landfilled is predicted to be between 1,536,000 (tonnes per annum) in 2010 and 1,334,400 (tonnes per annum) in 2025. Table 5.2 shows that in the South East Region the amount of waste that would otherwise be landfilled is predicted be between 7,333,700 (tonnes per annum) in 2010 and 6,358,500 (tonnes per annum). It is, therefore, considered that there is significant quantity of waste available within Kent and the South East to provide fuel to the proposed SEP, without adversely affecting the waste hierarchy. In accordance with the waste hierarchy the Sustainable Energy Plant is needed to ensure the waste is recovered rather than disposed of to landfill.

5.2.40 The Kent Joint Municipal Waste Management Strategy issued in 2007 notes that in 2005/2006 Kent residents produced approximately 812.830 tonnes of Municipal Solid Waste

(paragraph 2.1). In respect to energy recovery, the Strategy (paragraph 2.4) notes that recovery is the capture of value from residual waste, usually in the form of energy and the Allington Waste management Facility incorporates an energy from waste plant. Kent County Council has agreed a long term contract with the operators Kent Enviropower. Policy 8 states "In conjunction with the management of municipal waste the Kent waste partnership will achieve a minimum level of 40% recycling and composting of household waste by 2012/13 and will seek to exceed this target".

5.2.41 The subtext to Policy 14 notes that there may be opportunities for achieving economies of scale through the co management of MSW with commercial agricultural and other wastes with similar characteristics to MSW. However the strategy seeks to avoid the import of waste into Kent for recovery and disposal.

5.2.42 The Strategy at 4.6.2 notes that a proportion of Kent's MSW will continue to be land filled. Landfill capacity in Kent is in short supply, and will continue to be required for the disposal of residual wastes in the long term. Constraints on landfill capacity may make other treatment routes more attractive for the proportion of MSW that the County could continue to landfill after meeting its statutory obligations. Policy 19 provides '*that where it is cost effective, Kent will exceed its statutory targets for diversion of biodegradable municipal waste from landfill in order to preserve landfill void space in the County. Kent will procure landfill capacity to meet the need for the disposal of residual waste for which recovery capacity is not contracted* '

5.3 Alternatives

5.3.1 The consideration of alternatives stems primarily from 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".

5.3.2 Paragraph 83 of Circular 2/99 which accompanies the Regulations note that:
"Although the Directive and the Regulations do not expressly required the developer to study alternatives the nature of certain developments and their location may make the consideration of alternatives a material consideration…

5.3.3 The following sections address the consideration of alternative sites.

Alternative Sites

5.3.4 An Alternative Site Report has been prepared and is set out within Appendix 5.1. The following section based upon the reporting sets out the methodology and conclusions of the assessment of alternative sites.

Site Selection Criteria

5.3.5 RPS Planning and Development alternative site assessments methodology has been applied for similar proposed developments undertaken across the UK for a range of clients in the waste and energy industry. This methodology reflects recent national planning guidance on site identification contained within Planning Policy statement 10 (PPS10) and its Companion Guide.

5.3.6 However, whilst it is recognised that consideration of location for waste management facilities is to be viewed in the wider context of considerations including, right place, the right time and right technology and communities taking responsibilities for their own waste, this has in addition also to be seen in the context of the viable generation of sustainable energy for the paper mill which has specific locational requirements. This is especially pertinent given that the proposed SEP would utilise waste that would otherwise be landfilled. In addition the SEP will utilise some on site waste arising from the papermaking process. The proposed SEP therefore promotes self sufficiency.

5.3.7 In selecting a suitable site, it has to be demonstrated that it is able to provide a viable point for the delivery of energy to the paper mill, taking into account its actual availability and the intervening land to accommodate the pipeline infrastructure.

5.3.8 In the light of these requirements, the Alternative Site Report focuses on potential and allocated sites identified within the adopted Kent Waste Local Plan and Swale Borough Local Plan, then undertakes a comparative analysis of potentially alternative sites located within 2km of the St Regis 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 environmentally based planning criteria which relate 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.

5.3.9 The proposal site, Kemsley Paper Mill East (8) compared as favourably with the assessment criteria as a number of other sites. Overall, no site compared better with the assessment criteria than the proposed site.

5.3.10 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 concluded that 3 sites (including the proposal site) would be appropriate for the development proposed.

5.3.11 Of the three sites that are appropriate in flood terms, the proposal site performs better than the other two against the remaining assessment criteria.

5.3.12 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.

5.3.13 Firstly, the site as 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 between SEP and the Paper Mill is available immediately with out the need to assemble ownership consent for the pipe line.

5.3.14 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.

5.3.15 In summary, the reasons for the choice of the proposed site 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.

Alternative Technology

5.3.16 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.

5.3.17 Moving grate systems produce two residues, bottom ash and fly ash which is transported to the same silo as the Flue Gas Treatment residues. 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.

5.3.18 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.

Fluidised Bed

5.3.19 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 additional pre-treatment if fluidised bed technology was used.

5.3.20 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.

5.3.21 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.

5.3.22 Additional raw materials are required in the form of sand within the fluidised bed system.

5.3.23 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.

5.3.24 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.

Gasification

5.3.25 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.

5.3.26 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].

5.3.27 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.

5.3.28 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.

5.3.29 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.

5.3.30 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].

5.3.31 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.

5.3.32 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.

5.3.33 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.

Pyrolysis

5.3.34 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].

5.3.35 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].

5.3.36 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.

5.3.37 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.

5.3.38 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.

5.3.39 To obtain consistent gas quality, a less heterogeneous incoming feed stream is required and some pre-treatment is therefore necessary.

Plasma Arc Gasification

5.3.40 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).

5.3.41 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.

5.3.42 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.

5.3.43 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.

5.3.44 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.

Biological Treatment (Anaerobic Digestion (AD))

5.3.45 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.

5.3.46 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 land spreading (although for the digestate fraction this may need pre treatment), incineration or co-mingling with compost.

5.3.47 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.

5.3.48 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).

5.3.49 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.

5.3.50 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.

5.3.51 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.

Landfill

5.3.52 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.

Persistent Organic Pollutants (POPs)

5.3.53 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 [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. The EU POPs Regulations implement amongst other requirements the obligations agreed under the Stockholm Convention on Persistent Organic Pollutants.

5.3.54 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 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.

5.3.55 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.

5.3.56 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

[1] Annex III substances include dioxins, furans, polycyclic aromatic hydrocarbons (PAHs), hexachlorobenzene (HCB), polychlorinated biphenyls (PCBs).

Regulations place a requirement on the Environment Agency to comply with the requirements of Article 6(3) through the environmental permitting process.

5.3.57 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.

Summary

5.3.58 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.

5.3.59 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 and is not discussed further. 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 is again not discussed further.

5.3.60 Of the remaining options, pyrolysis, gasification and plasma arc gasification solutions are considered technically unproven at the scale proposed and have therefore been rejected.

5.3.61 Moving grate and fluidised bed plant are proven technologies at the scale proposed at the Kemsley site and both have operational plant within the UK. For these options there are relative advantages and disadvantages, but overall they are considered to have similar environmental performance.

Alternative Design

5.3.62 National planning policy highlights the importance of good design as a key contributor to providing sustainable solution to new development and working practice. The design of the facility including landscaping has drawn upon a number of considerations including the surrounding landscape context, topography, proposed facility requirements and layout. The views of the local community, and statutory consultees have also been taken into consideration.

5.3.63 The process has necessarily been iterative in nature, responding to technical and environmental impact considerations. The key design aims are summarised as:

- Implementation of high quality and innovative sustainable design;

- Optimisation of the existing ground conditions, topography of the site and surroundings;
- Incorporation of landscape features;
- Provision of new landscape treatment;
- Minimisation of the impacts of the proposed development;
- Achievement of significant environmental improvements.

5.3.64 The design has been guided from the outset by the landscape context, the site configuration, topography and operational needs of the facility rather than by the requirements to satisfy a specific design envelope or criteria.

5.3.65 In particular, the design has evolved through an understanding and appraisal of the landscape context of the site. The subsequent architectural design evolved through an iterative process guided by this, together with consultations with key stakeholders and outputs from the Environmental Impact Assessment work related to the project.

5.3.66 Input from the following key stakeholders has taken place at various stages throughout the evolution of the project and has influenced and shaped the design of the proposals:

- Process Engineers: The RPS architect have worked closely with E.ON, (the process engineers for the facility) and St Regis to ensure that the emerging design would meet technical and operational requirements of the facility.

- Environmental Impact Assessment: Key outputs and findings from the Environmental Impact Assessment work have been fed back to the architect and landscape architect to enable the design to be responsive to the findings of the assessments and to incorporate recommended mitigation measures into the design proposals where appropriate.

- The site is rectangular in shape. The land available within the site has determined the orientation of the proposed facility access point, areas of roadway, drainage and landscape treatment.

5.3.67 The facility infrastructure comprises distinct activities, each having separate and different functions and requirements in terms of space, environment, layout and built-form.

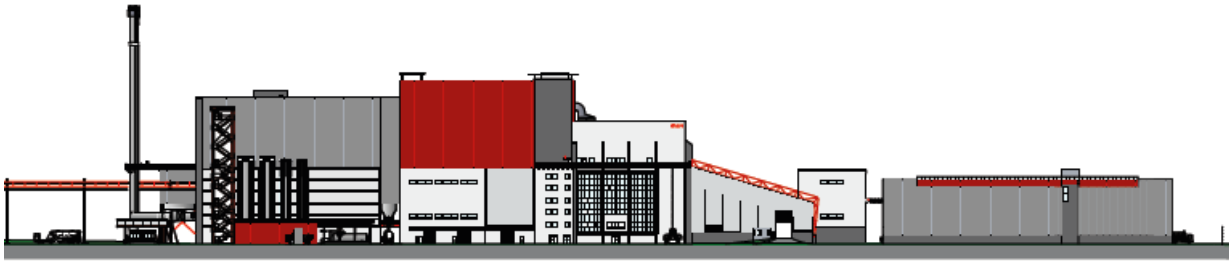
5.3.68 Various plant configurations for the site have been considered to accommodate a fully enclosed operation. Design iterations have been undertaken to arrive at the preferred layout. The proposed layout allows for safe access, rapid turnaround and egress from the site for all vehicles. Buildings have been sited and entrance/ egress routes positioned to maximize the beneficial use of space across the full depth and width of the site. The general arrangement is

orientated to maximize the efficient use of the site in relation to scale, topography and access points.

5.3.69 The site layout is fundamental to the practical and safe working of the facility and following approval of a base layout by the client and process engineer, a number of variations of an initial architectural option was put forward to the local planning office for comment.

5.3.70 There are two distinct approaches to the overall appearance of this type of development. One is to express function in the form of a straightforward building of industrial appearance and the other is to present a different shape so that it appears less angular, more homogenous and thus less industrial in appearance. We appreciate that any attempt to superimpose a different appearance other than to express its bulk and form would result in an increase in its overall height and extent.

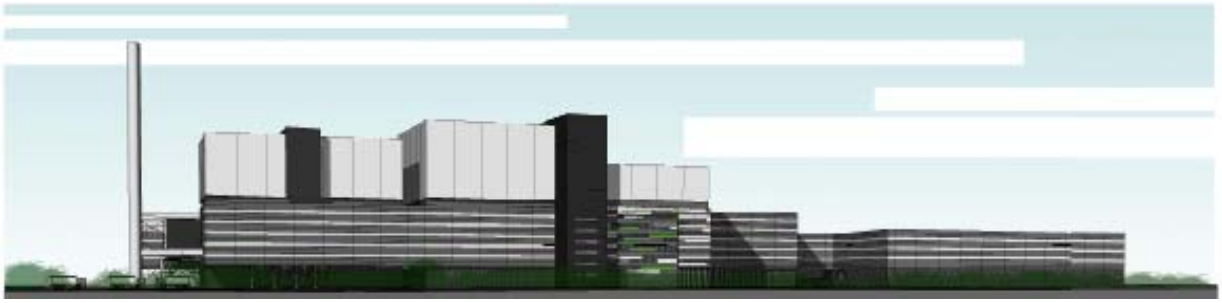
5.3.71 The initial concept proposal introduced additional forms which served to rationalise the building footprint and in turn reduce the amount of irregularity. It was felt that initial proposals where too industrial and a concept above and beyond a utilitarian grey box would be required given the context.



This option shows a more rational building footprint created by the introduction of additional walls. This consequently increases the visual impact of the building particularly the residue storage area.

5.3.72 Additional discussions took place and a decision was made to express the functional forms of the facility rather than conceal them. The design evolved to reduce the visual impact of the ask building as much as possible. Consequently the additional wall elements were removed to reveal the buildings functional form.

5.3.73 The articulation of the elevations would further alter to provide an architectural cohesion throughout the facility and although the client expressed a desire for corporate colours, natural colours were chosen relating to the context. A natural colour scheme was favoured.



The additional walls were removed from the main plant together with the residue storage area creating more functional building forms and a reduction in building height to certain elements.

5.3.74 The choice of colouration has preferred terracotta, albatross, Merlin grey, anthracite and hamlet. This has been used in the surface treatment of the building to minimise potential visual impact.



5.3.75 The finishes have been selected to give variation of texture to reduce the visual impact of the overall mass of the structure. All building materials have been chosen having regard to sustainability considerations. The materials chosen will be of modern, but classic, appearance and will not date. Sustainability has been integral to the design approach and key elements of the development.

5.4 The 'Do Nothing' Scenario

5.4.1 In terms of assessment of environmental impacts it is generally considered best practice to assess impacts against a likely ' Do Nothing' scenario of the proposals not going ahead. In this case, it is not just relating to the continuance of the site being undeveloped. The East of Kemsley Mill site is allocated as a proposed employment site and therefore other employment development is likely to occur. As a worst case, for the purposes of the Environmental Impact Assessment, it is assumed the site would remain as at present.

5.5 Summary and Conclusions

5.5.1 The need appraisal review demonstrates that with respect to need, the proposal conforms to EU Directives, the Government's Energy and Waste Strategies, and Planning Policy Guidance/Statement's, and the Statutory Development Plan.

5.5.2 With respect to energy need, the proposal will provide a secure source of renewable energy to the Paper Mill, help to reduce green house gas emissions, and make a significant contribution to the Regional Renewable Energy Targets.

5.5.3 With respect to the need for sustainable waste management, the proposal will make a significant contribution to diverting waste away from landfill in accordance with the waste hierarchy and make a significant impact in meeting the Regional Target for Landfill diversion.

5.5.4 Given the need to provide energy to the Paper Mill the location of the site was limited by capability and viability. Accordingly, the Alternative Site Report considered ten sites using established methodology compliant with Annex 10 of PPS10. The assessment of alternative sites has shown that the site is suitable in terms of its location and potential environmental effects.

5.5.5 The alternative technology review has highlighted other technologies and their relative merits when compared with Moving Grate Technology. Moving Grate Technology has been chosen as the proposed technology owing it being a proven technology at the scale proposed, and its environmental performance.

5.5.6 The proposed design and layout has evolved through an iterative process that has been informed by the sites landscape setting taking into account the views of key stakeholders and the community, to ensure that the design can accommodate the technical requirements and capacities whilst responding positively to the sites unique setting.

5.6 References

- EU Directive 08/98/EC – 'The Waste Framework Directive'
- EU Directive 2009/28/EC – 'The Renewable Energy Directive'
- The Waste Strategy 2007
- Draft National Policy Statement for Renewable Energy Infrastructure, November 2009

- PPS10: Sustainable Waste Management
- PPS23: Planning and Pollution Control
- PPS22: Renewable Energy
- PPS: Planning and Climate Change – Supplement to PPS1
- The UK Renewable Energy Strategy, July 2009
- The UK Low Carbon Transition Plan, July 2009
- The UK Biomass Strategy, May 2007
- The Kent Joint Municipal Waste Management Strategy
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DEVELOPMENT OF A SUSTAINABLE ENERGY PLANT.

KEMSLEY PAPER MILL, KEMSLEY

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

ENVIRONMENTAL STATEMENT

CHAPTER 6:

TRAFFIC AND TRANSPORT

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6 Traffic and Transport

6.1 Introduction

6.1.1 This chapter of the ES assesses the likely significant impacts of the Proposed Development in terms of Traffic and Transportation and is accompanied by Appendix 6.1 that contains a Transport Assessment (TA) dealing with a number of access, transport and highways issues relating to the proposed development. Relevant figures and appendices are referred to within the TA.

6.1.2 The chapter describes the assessment methodology; the baseline conditions currently existing at the application site and surroundings; the likely significant environmental impacts; the mitigation measures required to prevent, reduce or offset any significant adverse impacts and the likely residual effects after these mitigation measures have been employed. This chapter has been prepared by RPS Planning and Development.

6.2 Legislation and Planning Context

6.2.1 A detailed review of the Development Plan documents and planning context in relation to the development proposals is provided in Chapter 3.

6.2.2 This section identifies those policies that are directly relevant to traffic and transportation issues. An expanded version of this section is attached as Appedix 6.2.

National Policy and Legislation

Planning Policy Guidance Note 13 (PPG13)

6.2.3 National policy on transport is set out in PPG13, Transport. The objectives of this guidance are to integrate planning and transport at the national, regional and local level to:

- Promote more sustainable transport choices for both people and for moving freight.
- Promote accessibility to jobs, shopping, leisure facilities and services by public transport, walking and cycling.
- Reduce the need to travel, especially by car.

6.2.4 With specific reference to freight, PPG13 acknowledges that road transport is likely to remain the main mode for many freight movements and recognises that land use planning can help to promote sustainable distribution, including where feasible, the movement of freight by rail. In this context it advises that, in preparing their development plans and in determining planning applications, local authorities should:

- identify and, where appropriate, protect sites and routes, both existing and potential, which could be critical in developing infrastructure for the movement of freight (such as major freight interchanges including facilities allowing road to rail transfer or for water transport) and ensure that any such disused transport sites and routes are not unnecessarily severed by new developments or transport infrastructure;
- where possible, locate developments generating substantial freight movements such as distribution and warehousing, particularly of bulk goods, away from congested central areas and residential areas, and ensure adequate access to trunk roads;
- promote opportunities for freight generating development to be served by rail or waterways by influencing the location of development and by identifying and where appropriate protecting realistic opportunities for rail or waterway connections to existing manufacturing, distribution and warehousing sites adjacent or close to the rail network, waterways or coastal/estuarial ports.

6.2.5 Where developments are likely to have significant transport implications, PPG13 requires Transport Assessments to be prepared and submitted alongside the relevant applications for development.

Planning Policy Statement 10 (PPS10): Planning for Sustainable Waste Management PPS10, July 2005, and Companion Guide, June 2006

6.2.6 PPS 10 notes that one of the criteria to be considered by waste planning authorities in deciding which sites and areas to identify for waste management facilities is the capacity of existing and potential transport infrastructure to support the sustainable movement of waste, and products arising from resource recovery, seeking when practicable and beneficial to use modes other than road transport.

6.2.7 Annex E sets out the locational criteria to be used in testing the suitability of sites and areas which include consideration of the suitability of the road network and the extent to which access would require reliance on local roads.

Regional and Local Policy and Legislation

Regional Spatial Strategy for South East England

6.2.8 The South East Plan, adopted in May 2009. forms the Regional Spatial Strategy (RSS) for the South East region and provides a framework for investment and development within the South East 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.

6.2.9 Transport infrastructure is a significant influence in 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 should be developed. It also provides the context within which Local Transport Authorities should produce their Local Transport Plans.

6.2.10 The following policy in the RTS relates to transport:

- Policy T1: Reduction of Average Journey Lengths

County Policy and Legislation

6.2.11 Local policy is set out in Kent's second Local Transport Plan 2006-2011, the Swale Borough Council Local Plan 2008-2021 and the Kent Adopted Waste Local Plan. The following policies relate specifically to transport:

Kent's second Local Transport Plan 2006-2011

- Policy UKG2: Road Freight

Swale Borough Council Local Plan 2008- 2021 (to be replaced by Local Development Framework)

- Policy SP1: Sustainable Development
- Policy SP6: Transport and Utilities

Kent Adopted Waste Local Plan

- Policy W11 – Waste to Energy by Incineration

6.3 Assessment Methodology

Relevant Guidance

6.3.1 As a matter of best practice, this assessment has been undertaken based on the relevant guidance on traffic and transportation assessment. This includes:

[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).

6.3.2 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."***

6.3.3 In accordance with the above guidance, this assessment of the environmental effects of traffic is considered for the following criteria:

- Severance
- Driver Delay
- Pedestrian Delay
- Pedestrian Amenity
- Accidents & Safety
- Hazardous Loads
- Dust & Dirt

6.3.4 Part of the assessments included a detailed site inspection of the road network surrounding the site with details of the current geometric layout of the highway, traffic management and regulation orders and general observations of existing road user movements.

6.3.5 Other environmental effects of traffic including air quality and visual impact are considered in other chapters.

Consultations

6.3.6 As detailed in Chapter 1, a formal scoping exercise has been undertaken to inform the scope of the Environmental Assessment. The formal Scoping response is included at Appendix 1.2. The following extract from the official Screening Opinion of the County Council (24 July 2009) identifies transportation issues:

> *"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 the 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 flows to and from the site over a 24 hour period."*

6.3.7 Reference to the points made in the Screening Opinion is made below.

Noise and Vibration

6.3.8 The environmental implications of noise and vibration arising from changes in traffic flow have been separately assessed at Chapter 12.

Visual Effects

6.3.9 The visual effect of traffic is complex and subjective and includes both visual obstruction and visual intrusion. The IEMA Guidelines acknowledge that in the majority of situations the changes in traffic resulting from a development will have little effect. Since the visual effects of traffic associated with the development will be negligible this impact is not considered further.

Severance

6.3.10 Severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery. The term is used to describe a complex series of factors that separate people from places and other people. 'Severance can also result from difficulty in crossing a heavily trafficked road …' [1].

6.3.11 The guidance indicates that severance effects are considered 'slight' in cases that include:

- pedestrian at-grade crossings of new roads carrying below 8,000 vehicles per day (AADT) [2]; or
- changes of traffic flow of less than 30% [1].

Driver Delay

6.3.12 Where highways affected by new development are at or near capacity, the traffic associated with new development can cause or add to vehicle delays. Other sources of delay for non-development traffic can include:

- at the site entrance where there will be additional turning movements;
- on the highways passing the site where there is likely to be additional traffic and the flow might be affected by additional parked cars;
- at other key intersections along the highway which might be affected by increased traffic; and
- at junctions where the ability to find gaps in the traffic may be reduced, thereby lengthening delays.

Pedestrian Delay

6.3.13 Highly trafficked roads and changes to the volume or speed of traffic may affect the ability of people to cross roads. Research has shown a two-way vehicle flow of 1400 vehicles per day (AADT) equates to a 10 second delay in pedestrians crossing a road with no crossing facilities [1].

Pedestrian Amenity

6.3.14 This term is defined as the relative 'pleasantness' of journeys and can be affected by traffic flow, composition, noise and air pollution and includes pedestrian fear and intimidation. The guidance suggests a threshold for significance where traffic flow, or its lorry component, is halved or doubled [1].

6.3.15 Pedestrian amenity also covers what is referred to as fear and intimidation within the IEA guidelines. There are no commonly agreed thresholds for estimating levels of fear and intimidation but this impact is considered dependent on the volume of traffic, its HGV

component, its proximity to people, or the lack of protection or segregation from traffic influenced by factors such as footway width.

Accidents and Safety

6.3.16 It is possible to estimate the effects of increased traffic on accidents and safety from existing accident records, national statistics, the type and quantity of traffic generated, journey lengths and the characteristics of the routes in question.

Hazardous Loads

6.3.17 Some developments may involve transporting hazardous loads by road such as special wastes, toxic materials and chemicals. Where appropriate, the risks associated with accidents on such movements are identified or quantified.

Dust and Dirt

6.3.18 Certain types of development, notably quarrying and the transport of quarried materials, can give rise to deposition of dust and dirt on surrounding roads. The overall impact of this phenomenon normally depends to a large extent on the management practices adopted at the site in question, such as vehicle sheeting and wheel washing. Problems with dust and dirt are unlikely to occur at distances greater than 50m from the road [1].

Methodology

Site Preparation/Construction

6.3.19 It is expected that the level of traffic, particularly heavy vehicles, during the site preparation and construction phases of development will be less than the level of traffic during the operational phase of development. Assessment is therefore limited to the operational phases as a worst case.

On completion

6.3.20 Information relating to the transport movements associated with the operation of the proposed development has been derived from the proposed staff numbers, the proposed staff shift patterns and the need to transport raw materials and by-products to and from the site.

Assessment of Significance

6.3.21 Where the screening test outlined in paragraph 6.3.1 to 6.3.6 identifies that transport effects are potentially significant, a standard approach to expressing the duration, magnitude, direction and location of each effect is applied. The scale of each of these is presented below in Table 6.1, adapted from DMRB HA 205/08.

Table 6.1 Magnitude of Significance	
Negligible	Very minor loss or detrimental alteration to one or more characteristics, features or elements (Adverse). Very minor benefit to or positive addition of one or more characteristics, features or elements (Beneficial).
Minor	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements (Adverse). Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring (Beneficial).
Moderate	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements (Adverse). Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality (Beneficial).
Major	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements (Adverse). Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality (Beneficial).

Cumulative Impacts

6.3.22 A review of proposed or possible future third party projects that may have a cumulative impact with the development proposals has been undertaken and used to inform this Environmental Statement.

6.3.23 In relation to transport, the traffic impact assessment of the proposed development has been undertaken in combination with the Sittingbourne Northern Relief Road. Kent County Council Highway Authority (KCCHA) have confirmed that the traffic flows provided by the Sittingbourne 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.

Limitations of the Assessment

6.3.24 The methodology for assessing the environmental impact of the transport associated with the construction and operation of the proposed development is based on the most recent and

robust information available. It is therefore considered that the assessment methodology contains no significant limitations.

6.4 Baseline Conditions

Site Location

6.4.1 The proposed site is located to the north of Sittingbourne on the Sittingbourne Relief Road (Swale Way), Kemsley**.** 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 1 and 2 of the Transport Assessment included in Appendix 6.1.

The Site

6.4.2 The site lies adjacent to the line of a dismantled railway that formerly connected with the branch line between Sittingbourne and the Isle of Sheppey. Evidence of this rail line is 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 under the operation of the management of the Sittingbourne and Kemsley Light Railway.

6.4.3 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.

6.4.4 Two points of vehicular access are currently available to the existing Kemsley Paper Mill. The southern access is via Ridham Avenue to the south of the mill site and is used by HGVs (including those requiring use of the weighbridge) and staff and visitor cars. The main site car park is provided to the south of the site. The other site access that is less intensively used is located at the north-east corner of the site and is accessed via Barge Way. It is proposed that staff and visitors at the proposed site will use the existing southern access and car park. HGVs accessing the proposed development will use the existing northern access.

Highway Network

6.4.5 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 of the Transport Assessment included in Appendix 6.1.

6.4.6 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. The maximum speed limit on site is 10mph, reducing to 5 mph in certain areas.

6.4.7 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.

6.4.8 The Relief Road is a high quality, wide, single carriageway, approximately 7.5 metres in 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.

6.4.9 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 via a private road. 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.

6.4.10 To the north of the site, Barge Way connects with the 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 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.

Northern Relief Road

6.4.11 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.

6.4.12 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.

Access on Foot

6.4.13 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 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.

6.4.14 Shared pedestrian/cycle paths run along the western side of Swale Way and the northern side of Barge Way.

6.4.15 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.

6.4.16 At present the traffic flows along Ridham Avenue and Barge Way are low and vehicle speeds appear from observation to be generally low.

6.4.17 Paragraph 75 of PPG13: Transport suggests that walking is a suitable alternative to replace car trips for journeys of under 2km. The IHT publication 'Providing for Journeys on Foot' (IHT 2000) suggests acceptable walking distances for various land uses, as set out in Table 6.2.

Table 6.2: Suggested Acceptable Walking Distances			
Definition	**Town Centres (m)**	**Commuting/ Schools (m)**	**Elsewhere (m)**
Desirable	200	500	400
Acceptable	400	1,000	800
Preferred Maximum	800	2,000	1,200

Source: Providing for Journeys on Foot, IHT, 2000

6.4.18 The site lies within 1km of some residential areas to the north of Kemsley. The site also lies within the maximum walking distance of a bus stop.

Cycle Routes

6.4.19 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. Further details of existing cycle routes within the vicinity of the site can be found in Figure 3 of the transport assessment included as Appendix 6.1.

6.4.20 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.

6.4.21 Paragraph 78 of PPG13: Transport suggests cycling has the potential to substitute for shorter car journeys of under 5km. This journey distance would make Kemsley and the majority of Sittingbourne accessible by bicycle.

Buses

6.4.22 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, 322, 323, 324, 336, 338, 339, and 347. These bus services are summarised in Table 6.3.

Table 6.3: 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			

Rail

6.4.23 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 6.4.

Table 6.4: 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

6.4.24 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.

Road Safety

6.4.25 In accordance with 'Guidance on Transport Assessment', published by the Department for Transport in March 2007, Personal injury accident (PIA) statistics have been obtained for the surrounding highway network for the latest available 36 months (three years) between the 1st of April 2006 and the 31st of March 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.

6.4.26 Details of the study are provided in the Transport Assessment attached as Appendix 6.1 along with a summary of the PIAs in terms of their location and severity. As can be seen there were a total of 45 PIAs during the three year period of which five were serious injury accidents and 40 were slight injury accidents. There were no fatal injury accidents in the study area during the study period.

6.4.27 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.

6.4.28 Of the five serious injury accidents within the three year study period one involved a pedestrian at the A249 junction with the B2005 Grovehurst Road and two involved a motorcycle. There were no serious injury accidents during the three year study period that involved a HGV.

6.4.29 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 brake 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 brake 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.

6.4.30 Five injury accidents occurred at the southern roundabout of the A249 dumb-bell junction with the B2005 Grovehurst Road of which one resulted in serious injury as a result of a pedestrian running into the path of oncoming vehicle without looking and four resulted in slight injury. None of the four slight injury accidents involved a pedestrian, cyclist or HGV. There were no PIAs on the northern roundabout of the junction at Iwade during the three year period.

6.4.31 It is concluded that the record of personal injury road traffic accidents does not suggest that there are any deficiencies in the local highway network that could be exacerbated by the proposed development.

Existing Traffic Flows

6.4.32 The existing 24 hour daily light and heavy vehicle traffic flows on the local highway network surrounding the site, including the M2, 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.

6.4.33 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. The assessment area includes 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

6.4.34 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.

6.4.35 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. A summary of the average AM and PM peak hour traffic flows (0800-0900 and 1700-1800) and 24 hour daily traffic flows for the 2011 base year are shown in Table 6.5 below.

Table 6.5 Existing Traffic Flows (2011 base)

Link	AM Peak			PM Peak			24 Hour		
	Cars	HGVs	Total	Cars	HGVs	Total	Cars	HGVs	Total
Swale Way	1,055	201	1,256	1,234	235	1,469	13,363	2,545	15,908
Barge Way	239	128	368	292	67	358	2,802	1,398	4,199
A249 East of Swale Way	2,892	286	3,178	3,382	334	3,716	36,622	3,622	40,244
A249 West of Swale Way	2,671	399	3,070	3,123	467	3,590	33,822	5,054	38,876
M2 Junction 5 East	3,942	532	4,475	4,140	559	4,700	51,400	6,943	58,343
M2 Junction 5 West	4,417	719	5,136	4,598	749	5,347	56,324	9,170	65,494

6.4.36 The average 24 hour two-way daily flow is highest at the M2 junction 5 West at 65,494 vehicles and lowest along Barge Way at 4,199 vehicles. The average peak hour daily traffic flow is highest during the AM and PM peak at the M2 junction 5 West at 5,136 and 5,347 vehicles respectively. The average peak hour daily traffic flow is lowest during the AM and PM peak on Barge Way at 368 and 358 vehicles. The M2 junction 5 West has the highest usage by HGVs.

6.5 Identification and Evaluation of Key Impacts

Site Preparation and Construction

6.5.1 The earliest start date for site preparation is 2011 and construction is expected to last 3 years. During this period it is expected that the number of vehicle movements associated with the site, including HGVs will be lower than during the operation of the site. The assessment of the impact during site operation therefore represents a worst case.

Site Operation

6.5.2 It is explained in the Transport Assessment that it is possible that waste could be transported by water and/or rail thus reducing the number of heavy vehicle movements on the local

highway network. However, for the purposes of assessing possible environmental impacts on a 'worst case' basis it has been assumed that all waste is transported by road. The number of HGV movements associated with the proposed development has been derived on the basis of the following assumptions:

Import of Waste

- Annual delivery 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.

6.5.3 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.

6.5.4 The earliest that the development could be completed and operational is expected to be 2014. The following table summarises the base traffic flows in 2014. These flows take into account the completion of the creek crossing section of the Sittingbourne Northern Relief Road. Details are provided in the Transport Assessment atatched as Appendix 6.1:

Table 6.6 2014 Base Traffic Flows

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	2,782	416	3,198	3,253	486	3,740	35,233	5,265	40,498

Swale Way									
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	10,28	72,476

6.5.5 Traffic flows on the surrounding network (Table 6.6) are highest on M2 junction 5 West with flows of 72,476 vehicles over a 24 hour period and 6,693 during the PM Peak. The M2 junction 5 West also has the highest number of HGV use at 10,281 HGVs over a 24 hour period. Barge Way has the lowest number of vehicles at 4,342 during a 24 hour period.

6.5.6 Table 6.7 summarises the traffic generated by the operational phase of development:

Table 6.7 Operational Traffic Generation 2014

Link	AM Peak			PM Peak			24 Hour		
	Cars	HGVs	Total	Cars	HGVs	Total	Cars	HGVs	Total
Swale Way	6	22	28	6	22	28	41	258	299
Barge Way	6	22	28	6	22	28	46	258	304
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

6.5.7 Over a 24 hour period Barge Way has the greatest number of total vehicles generated during the operational phase at 304 vehicles of which 258 are HGVs. The A249 East of Swale Way is not expected to receive any operational vehicles. During the peak periods Barge Way and Swale Way again receive the most traffic generated during site operation at 28 vehicles, 22 of which is are HGVs.

6.5.8 Table 6.8 summarises the % impact of operational traffic in 2014:

Table 6.8 % Impact of Operational Traffic 2014

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	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Swale Way									
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%

6.5.9 The greatest impact in terms of total traffic flows caused by site operation during a 24hr period will be 5.9% on Barge Way. The highest HGV impact will also be on Barge Way at 17.9%. During the peak hours total flows on Barge Way are predicted to increase by between 5.7% and 5.8%. HGV flows on Barge Way are predicted to increase by between 16.2% and 31.1%. On Swale Way it is predicted that over a 24 hour period the total number of vehicles will increase by 1.7% and the number of HGVs by 9.1%. During peak periods the predicted levels of impact on Swale Way are similar to the daily levels. On the A249 the proposed development will lead to an increase in daily and peak flows of less than 1%. In terms of HGVs the level of impact on the A249 is predicted to be around 5%. The predicted level of imapct on the M2 is between 0.0% and 1.6% in all cases.

6.5.10 The significance of these levels of impact is considered below in terms of the various categories of transport environmental impact.

Cumulative Impacts

6.5.11 The cumulative impacts of committed developments within the vicinity of the site have been incorporated within the above assessments. 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.

Quantification of Impact

6.5.12 All daily traffic flow increases are predicted to be well below the 10% threshold identified by the IEMA which would require further more detailed assessments. However, there are increases of HGVs in excess of 10% during the AM and PM peak period on Barge Way (16.1% and 31.1% respectively). Although the 10% threshold is exceeded on Barge Way, it is not a sensitive area in terms of the criteria for assessing transport environmental impact. The relatively high % impacts also reflect the low background flows on this link. In absolute terms the increases in HGV movements during the peak hours represents one additional HGV

movement every three minutes. The following sections deal with individual environmental effects.

6.5.13 **Noise and Vibration:** The noise and vibration effects of road traffic are assessed in detail in Chapter 12.

6.5.14 **Visual Effects**: Development related traffic would route via existing roads, which already carry existing traffic. The developments will not significantly alter the visual impact of traffic on the road network, with all routes affected currently accommodating all vehicle types.

6.5.15 It is thus considered that the development generated traffic would be of local, permanent negligible significance in terms if visual amenity.

6.5.16 **Severance:** According to the IEMA guidelines a 30% change in traffic flow is likely to produce a 'slight' change in severance, with 'moderate' and 'substantial' changes occurring at 60% and 90% respectively. Severance is only likely to occur on highly trafficked roads and result from the perceived division the road and traffic creates between either side.

6.5.17 The maximum increase in traffic flows occurs on Barge Way where the level of increase is slightly under 6% On all other links the level of increase resulting from the proposed development is less than 2%. It is concluded that the development has no significant environmental impacts in terms of severance.

6.5.18 It should be noted that the area where severance is most likely to occur as a result of the development is across Swale Way between the site and Ridham Avenue west (between residential areas and the employment at the Kemsley Mill and the proposed site). Since all HGV traffic accesses the site via the northern mill access the level of increase in the vicinity of Ridham Avenue will comprise staff car trips only and will therefore be negligible.

6.5.19 It is thus considered that the development generated traffic would be of local, permanent negligible significance in terms of severance.

6.5.20 **Driver Delay:** The predicted levels of increase in flows on the highway network are shown to be less than 1% in all cases with exception of Swale Way and Barge Way. This level of impact is well within typical daily variations in flows. It is therefore concluded that the proposed development will have a negligible impact on driver delay on the local highway network, including at the Swale Way/A249 junction and at the A249/M5 junctions. Details are set out in the Transport Assessment in Appendix 6.1.

6.5.21 It is thus considered that the development generated traffic would be of local, permanent negligible significance in terms of driver delay.

6.5.22 **Pedestrian Delay and Amenity**: There are no significant pedestrian crossings affected by the traffic associated with the proposed development. It is thus considered that the development generated traffic would be of local, permanent negligible significance in terms of pedestrian delay.

6.5.23 It requires a halving or doubling of the HGV component of passing traffic for pedestrian amenity to be affected. The above assessments indicate that there are no points in the network where these levels of change are experienced as a result of the proposed development. It should also be noted that the pedestrian facilities along Swale Way and Barge Way are of a high quality in terms of width and in terms of separation from the carriageway. The level of fear and intimidation associated with the development traffic will therefore be reduced compared with a situation where pedestrians are required to walk closer to passing vehicles. It is thus considered that the development generated traffic would be of local, permanent negligible significance in terms of pedestrian amenity.

6.5.24 **Accidents and Safety:** The evidence outlined above suggests that there are no issues with regards to road safety on the local highway network that may be exacerbated as a result of the proposed development. The new section of the Northern Relief Road and Barge Way, which provide access to the site, are constructed to current design standards and the accident record reflects that these roads that are well designed, safe and lit. It is considered that the traffic generated by the proposed development would not have a material impact on road safety on the local highway network.

6.5.25 It is thus considered that the development generated traffic would be of local, permanent negligible significance in terms of accidents and safety.

6.5.26 **Hazardous Loads**: The Guidelines for the Environmental Assessment of Road Traffic acknowledge, in paragraph 2.4, that most developments would not result in an increase in the number of movements of hazardous or dangerous loads. The proposed development will treat non hazardous waste. If any hazardous wastes are brought to site then these will be stored separately and be removed in accordance with procedures agreed with the Environment Agency. Any hazardous waste which does arrive at the site will therefore be stored, treated, managed and transported in a safe manner and in accordance with current regulations.

6.5.27 It is thus considered that the development generated traffic would be of local, permanent negligible significance in terms of hazardous loads.

6.5.28 **Air Quality**: The effects of road traffic on air quality has been assessed in detail in Chapter 7.

6.5.29 **Dust and Dirt**: Dust and dirt arising from traffic is mainly associated with HGV traffic undertaking particular activities. The extent of any impact of dust and dirt arising from the proposed operations would be dependent upon the management practices adopted on site. Specifically procedures such as washing down of wheels and sheeting of HGVs likely to shed debris prevents the occurrence of dust and dirt spreading from the site to the adjoining road network.

6.5.30 All vehicular routes within the site will be surfaced and it is therefore unlikely that any dust or dirt would arise from traffic generated by the site. The mitigation measures such as wheel washing and vehicle sheeting outlined above will ensure that any dust and dirt that may be generated is controlled. Wheel washing will be particularly important during the construction phase of development when vehicles will be crossing unsurfaced ground. Sheeting will be relevant to both construction and operational phases.

6.5.31 It is thus considered that the development generated traffic would be of local, permanent negligible significance in terms of dust and dirt.

6.6 Design Response and Mitigation

6.6.1 As set out above, the effect of road traffic as a result of the construction and operation of the proposed WTF development is not predicted to have any significant environmental effect. This is based on the assessment guidelines set out by the IEMA in their 'Guidance Note No. 1: Guidelines for the Assessment of Road Traffic'. The increase in total traffic as a result of development is less than the threshold which would require any more detailed assessments.

6.6.2 The Highway Authority has confirmed that there is no need for a Travel Plan for employees at the proposed development given the low level of staffing involved. However, the Highway Authority has expressed a desire for the development to cater for movements on foot and suitable pedestrian routes to and from the site linking to the adjacent site, bus stops and surrounding residential areas have been incorporated into the design.

6.6.3 It is considered that the traffic generated by the proposed development will not be significant and that there is therefore no need for any specific mitigation measures. Notwithstanding this, this does not obviate the need for the on site management of HGV traffic. Feedback from the public exhibitions highlighted the concerns of local residents. The operator will manage vehicle heavy movements to allay those concerns.

6.7 Residual Impact

6.7.1 The above assessments have demonstrated that the traffic generated by proposed development is not considered to be significant. Indeed, in accordance with the IEMA

guidelines, the proposed development is likely to have no significant effect on the adjacent road network and highway users. It is concluded that the proposed development will cause no residual transport environmental impacts.

6.7.2 Table 6.9 contains a summary of the transport environmental impacts of the proposed development.

Table 6.9 Summary of Residual Impacts

Phase	Nature of Effect	Significance	Magnitude of Impact	Duration	Nature	Mitigation/ Enhancement	Residual Impact	Geographical Level of Importance of Issue				
								I	N	R	D	L
Preparation / Construction	**Severance**	Negligible	Minor	Temporary	Adverse	none	Negligible					✓
	Driver Delay	Negligible	Minor	Temporary	Adverse	none	Negligible					✓
	Pedestrian Delay	Negligible	Minor	Temporary	Adverse	none	Negligible					✓
	Pedestrian Ammenity	Negligible	Minor	Temporary	Adverse	none	Negligible					✓
	Accidents and Safety	Negligible	Minor	Temporary	Adverse	none	Negligible					✓
	Hazardous Loads	Negligible	Minor	Temporary	Adverse	none	Negligible					✓
	Dust and Dirt	Negligible	Minor	Temporary	Adverse	none	Negligible					✓
Operation	**Severance**	Negligible	Minor	Permanent	Adverse	none	Negligible					✓
	Driver Delay	Negligible	Minor	Permanent	Adverse	none	Negligible					✓
	Pedestrian Delay	Negligible	Minor	Permanent	Adverse	none	Negligible					✓
	Pedestrian Amenity	Negligible	Minor	Permanent	Adverse	none	Negligible					✓
	Accidents and Safety	Negligible	Minor	Permanent	Adverse	none	Negligible					✓
	Hazardous Loads	Negligible	Minor	Permanent	Adverse	none	Negligible					✓
	Dust and Dirt	Negligible	Minor	Permanent	Adverse	none	Negligible					✓

Key: I: International N: National R: Regional D: District L: Local

6.7.3 It is concluded from the above table that the residual transport environmental impacts associated with the site preparation, construction and operation are, at worst minor, negligible and permanent.

6.7.4 Measures will be put in place for the control of dirt and dust around the site access during the site preparation and construction phases.

6.7.5 The cumulative impacts of committed developments within the vicinity of the site have been incorporated within the above assessments

6.8 Conclusions

6.8.1 The transport impacts of the proposed development have been assessed in accordance with the guidance set out in the IEMA publication Guidelines for the Environmental Assessment of Road Traffic, Guidance Note No. 1 for site preparation, construction and operation.

6.8.2 The assessments undertaken have demonstrated that the proposals would increase daily traffic flows on Barge Way by 5.9%, on Swale Way by 1.7% and on all other links by less than 1%. HGV traffic on Swale Way is predicted to increase by less than 10% on a daily and peak hour basis, by around 5% on the A249 and by less than 2% on the M2. The highest level of impact in terms of HGV traffic is on Barge Way that carries all HGV development traffic. The increase (22 HGVs per hour) represents one additional HGV movement every three minutes.

6.8.3 The assessment of transport environmental impacts assumes that all waste is transported by road. This ensures that a worst case situation is considered. It is possible that waste could be transported by rail or water via Ridham docks thus reducing the number of HGVs on the local highway network.

6.8.4 The above assessments indicate that the overall transport environmental impact of the proposed development will be, at worst, permanent minor adverse with negligible significance.

6.9 References

[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).

DEVELOPMENT OF A SUSTAINABLE ENERGY PLANT.

KEMSLEY PAPER MILL, SITTINGBOURNE , KENT

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

ENVIRONMENTAL STATEMENT

CHAPTER 7:

AIR AND CLIMATE

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7 Air and Climate

7.1 Introduction

Background

7.1.1 This chapter (Chapter 7) of the ES assesses the likely significant impacts of the proposed Sustainable Energy Plant (SEP) in terms of Air Quality and is supported by Appendix 7.1.

7.1.2 The chapter describes the assessment methodology; the baseline conditions currently existing at the application site and surroundings; the likely significant environmental impacts; the mitigation measures required to prevent, reduce or offset any significant adverse impacts and the likely residual effects after these mitigation measures have been employed.

Scope of Air Quality Assessment

7.1.3 The potential air quality effects as a consequence of the construction and operation of the Proposed Development are considered to be:

- **Construction dust effects**: potential dust effects from construction traffic, plant and activities associated with the construction of the SEP;
- **Construction traffic effects**: potential effects of emissions from additional traffic movements generated on the local road network during construction;
- **Operational traffic effects**: potential air quality effects from changes in traffic flow characteristics on the local road network associated with the operation of the proposed SEP;
- **Operational effects (SEP):** potential air quality effects from any pollutant emissions associated with the SEP;
- **Cumulative effects (SEP):** potential air quality effects from the SEP and existing stack emissions associated with the Kemsley Paper Mill; and
- **Cumulative effects (other developments):** a qualitative assessment of the potential air quality effects associated with other developments in proximity to the SEP.

7.1.4 The methods and criteria used to assess the potential air quality effects are described in the following sections. Where likely adverse environmental effects are identified, measures to eliminate, reduce or mitigate those effects are proposed.

Scope of Human Health Risk Assessment

7.1.5 A detailed human health risk assessment (Technical Appendix 7.2) has been completed in line with best practice methodologies to identify any potential health risks associated with exposure to emissions from the proposed SEP. The assessment looked at potential health hazards and risks associated with long-term exposure to emissions from the operation of the SEP and other relevant local sources of emissions. This chapter summarises the results of that assessment.

7.1.6 This assessment is concerned with the evaluation of possible effects on the health of populations likely to be exposed to emissions from the proposed SEP. 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 3km, 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 10km of the source. The geographic scope of the study is based on the closest receptors within an approximate 10km radius around the proposed SEP.

7.1.7 The assessment takes into account both exposure through direct inhalation of affected air and indirect exposure by way of ingestion of affected food that has been grown locally on soil that could be potentially impacted by deposition and accumulation of pollutants. The only relevant source of emissions considered in this assessment is the stack. The chemicals emitted from the stack that have been assumed are those referred to as the contaminants of potential concern (COPC); these can be grouped under the following categories:

- Chemicals for which any effects are likely to be acute, i.e. the effects tend to occur shortly after exposure. The chemicals can be subdivided into two groups:
    - Acids, such as sulphur dioxide, nitrogen dioxide, hydrochloric and hydrofluoric acids; and
    - Other inorganic chemicals such as carbon monoxide, together with fine particulate matter.
- Chemicals for which any effects are likely to be chronic, i.e. the effects tend to arise from prolonged exposure. The chemicals can be subdivided into two groups:
    - Metals; and
    - Semi-volatile and non-volatile organic chemicals such as dioxins and furans.

7.1.8 Because the assessment not only considered exposure from inhalation, but also considered the overall long-term exposure through additional viable routes such as the food chain, the assessment focussed on persistent substances, i.e. those substances that have the potential to accumulate in the environment over the emission time of the SEP.

7.1.9 The recommended UK tiered approach [1] to risk assessment has been used for this site assessment. The first-tier assessment used worst-case scenarios for all receptors: multiple exposure conditions were assumed where all pathways of exposure in each land-use scenario were considered to be viable. The purpose of this conservative assumption for the first tier of the assessment is to screen out all low-sensitivity receptors that can be excluded before examining in further detail.

Potential Emssions to Air

7.1.10 The principal source of operational emissions to the atmosphere from the proposed 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. A brief description of the key pollutants and their behaviour in the atmosphere is provided in the following sections.

Proposed SEP

7.1.11 The combustion of waste at the SEP will give rise to atmospheric emissions of a number of pollutants in low concentrations. These will be strictly limited by European Union (EU) Directive 2000/76/EC [2] and controlled by means of Best Available Techniques (BAT) under an Environmental Permit, which will be regulated by the Environment Agency (EA). These pollutants include:

- Oxides of nitrogen (NO_x);
- Particulates (PM_{10} and $PM_{2.5}$ fractions, which relate to mean aerodynamic particle diameters of less than 10 µm and 2.5 µm respectively. $PM_{2.5}$ is a subset of PM_{10});
- Sulphur dioxide (SO_2);
- Carbon monoxide (CO);
- Hydrogen chloride (HCl);
- Hydrogen fluoride (HF);
- Group 1 metals: cadmium (Cd) and thallium (Tl);
- Group 2 metals: mercury (Hg);
- Group 3 metals: antimony (Sb), arsenic (As), chromium (Cr), cobalt (Co), copper (Cu), lead (Pb), manganese (Mn), nickel (Ni) and vanadium (V);
- Total organic carbon (TOC);

- Polychlorinated dibenzo-p-dioxins (PCDDs – dioxins); and
- Polychlorinated dibenzofurans (PCDFs – furans).

7.1.12 Persistent Organic Pollutants (POPs) are organic compounds that are resistant to natural environmental degradation. Consistent with the requirements of the Stockholm Convention [3] in reducing emissions of POPs, TOC is regulated by application of BAT under Directive 2000/76/EC [2]. In addition, dioxins and furans are POPs specifically regulated under Directive 2000/76/EC. Whilst other POPs, such as polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAHs), are not specifically regulated under Directive 2000/76/EC, they are controlled through the limitation of TOC emissions.

7.1.13 The design and operation of the SEP will be governed by Directive 2000/76/EC, which requires adherence to emission limits for a range of pollutants (see Table 7.1).

7.1.14 Emission limits in the Directive are specified in the form of: half-hourly mean concentrations; daily-mean concentrations; mean concentrations over a period of between 30 minutes and 8 hours; and, for dioxins and furans, mean concentrations evaluated over a period of between six and eight hours. The limits are summarised in Table 7.1

Table 7.1: Relevant Directive 2000/76/EC Air Emission Limit Values

Pollutant	Short-Term Emission Limits ($mg.Nm^{-3}$)	Daily-Mean Emission Limits ($mg.Nm^{-3}$)
Particles	30	10
TOC	20	10
HCl	60	10
HF	4	1
SO_2	200	50
NO_x	400	200
CO	-	50
Group 1 metals [(a)]	-	0.05 [(d)]
Group 2 metals [(b)]	-	0.05 [(d)]
Group 3 metals [(c)]	-	0.5 [(d)]
Dioxins and furans	-	0.0000001 [(e)]

Notes: All concentrations referenced to temperature 273 K, pressure 101.3 kPa, 11% oxygen, dry gas.
(a) Cadmium (Cd) and thallium (Tl).
(b) Mercury (Hg).
(c) Antimony (Sb), arsenic (As), lead (Pb), chromium (Cr), cobalt (Co), copper (Cu), manganese (Mn), nickel (Ni), and vanadium (V).
(d) All average values over a sample period of a minimum of 30 minutes and a maximum of 8 hours.
(e) Average values over a sample period of a minimum of 6 hours and a maximum of 8 hours. The emission limit value refers to the total concentration of dioxins and furans calculated using the concept of toxic equivalence (TEQ).

7.2 Legislation and Planning Context

7.2.1 The following section provides a summary of the relevant legal framework. The Air Quality Technical Appendix 7.1 Section 2 provides a more detailed summary of the relevant legal framework.

EU Directives, UK Air Quality Limit Values and Objectives

7.2.2 The EU Air Quality Directives [4] [5] [6] and UK Air Quality Regulations [7] [8] [9] provide a number of statutory air quality limit values, target values and objectives for relevant pollutants.

7.2.4 The UK Air Quality Strategy (AQS) [7] describes the Government's strategy for improving air quality in the UK. 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 UK Air Quality Regulations 2007. In addition, objectives have been established for a wider range of pollutants. Table 7.2 presents the available air quality objectives and limit values for the pollutants relevant to this assessment.

7.2.5 For pollutants regulated by Directive 2000/76/EC that do not have any statutory Environmental Quality Standards prescribed under current legislation, non-statutory air quality objectives and guidelines have been applied within this assessment. Further assessment criteria in the form of Environmental Assessment Levels (EALs), provided by the Environment Agency (EA) are contained in Horizontal Guidance Note EPR H1 [10].

Table 7.2: Summary of Air Quality Objectives and Limit Values			
Pollutant	**Averaging Period**	**Objectives / Limit Values**	**Not to be exceeded more than (a)**
Oxides of nitrogen (NO_x)	Annual [b] [e]	30 µg.m^{-3}	-
Nitrogen dioxide (NO_2)	1-hour [d]	200 µg.m^{-3}	> 18 times pcy
	Annual [d]	40 µg.m^{-3}	-
Carbon monoxide (CO)	Maximum daily running 8 hour mean [e]	10,000 µg.m^{-3}	-
Sulphur dioxide (SO_2)	15 minute [f]	266 µg.m^{-3}	> 35 times pcy
	1-hour [e]	350 µg.m^{-3}	> 24 times pcy
	24 hour [e]	125 µg.m^{-3}	> 3 times pcy
	Annual [c] [e]	20 µg.m^{-3}	-
Particulate matter (PM_{10})	24 hour [e]	50 µg.m^{-3}	> 35 times pcy
	Annual [e]	40 µg.m^{-3}	-
Particulate matter ($PM_{2.5}$)	Annual	Target of 15% reduction in concentrations at urban background locations	-
	Annual	25 µg.m^{-3}	-
Lead	Annual [e]	0.5 µg.m^{-3}	-
	Annual [f]	0.25 µg.m^{-3}	-
Arsenic (As)	Annual [g]	0.006 µg.m^{-3}	-
Cadmium (Cd)	Annual [g]	0.005 µg.m^{-3}	-
Nickel (Ni)	Annual [g]	0.02 µg.m^{-3}	-
PAHs(as B[a]P equivalent)	Annual [h]	0.00025 µg.m^{-3}	-

Notes:
[a] pcy - per calendar year.
[b] For the protection of vegetation.
[c] For the protection of ecosystems.
[d] The Air Quality Standards Regulations 2007, to be achieved by 01.01.10.
[e] The Air Quality Standards Regulations 2007, no target date.
[f] The Air Quality (England) Regulations 2000 and Air Quality (England) (Amendment) Regulations 2002 for the purposes of local air quality management. Not included in 2007 Regulations.
[g] The Air Quality Standards Regulations 2007, "Target Values" relating to the total content of the relevant pollutant in the PM_{10} fraction. To be achieved by 31.12.12. 'Target Value' means a concentration in the ambient air fixed with the aim of avoiding, preventing or reducing harmful effects on human health and the environment as a whole, to be achieved over a given averaging period. The Directive specifies that meeting the target values "would not" involve measures beyond application of best available techniques (BAT), and in particular "would not lead to the closure of installations".
[h] The Air Quality Strategy 2007, to be achieved by 31.12.10.

7.2.2 Table 7.3 presents the available EALs for the pollutants relevant to this assessment. The long-term EALs refer to an annual-average period, whilst the short-term EALs are applied as 1-hour averaging periods.

Table 7.3: Environmental Assessment Levels (EALs)

Pollutant	Long-term EAL (µg.m^{-3})	Short-term EAL (µg.m^{-3})
Nitrogen dioxide (NO_2)	40 [(a)]	200 [(a)]
Carbon monoxide (CO)	350	10,000 [(a)]
Sulphur dioxide (SO_2)	50	266
Particulates (PM_{10})	40 [(a)]	50 [(a)]
Hydrogen chloride (HCl)	20	750 [(b)]
Hydrogen fluoride (HF)	-	160 [(b)]
Arsenic (As)	0.2	15
Antimony (Sb)	5	150
Cadmium (Cd)	0.005	1.5
Chromium (Cr)	0.1	3
Cobalt (Co)	0.2	6
Copper (fumes) (Cu)	2	60
Copper (dust) (Cu)	10	200
Lead (Pb)	0.25 [(a)]	-
Manganese (Mn)	150	1500
Mercury (Hg)	0.25	7.5
Nickel (Ni)	1	30
Thallium (Tl)	1	30
Vanadium (V)	5	1
PCB	0.2	6
Ammonia (NH_3)	180	2500
Hydrogen Sulphide (H_2S)	140	150 [(c) (d)]

Notes:
(a) See Table 7.2 above for full description of relevant criteria for these pollutants.
(b) Extracted from the Expert Panel on Air Quality Standards (EPAQS) 'guidelines for halogens and hydrogen halides in ambient air for protecting human health against acute irritancy effects'
(c) World Health Organisation WHO, Air quality guidelines 2000 [please consult the reference for the relevant averaging times]
(d) EAL derived from values for 24 hour reference period

7.2.3 Table 7.4 presents available soil quality criteria and maximum deposition rates for the pollutants relevant to this assessment taken from guidance published by the EA. The maximum deposition rate (MDR) is the quantity of pollutant that can be added to the soil daily over 50 years before the selected soil quality criterion is exceeded.

Table 7.4: Maximum Deposition Rates from H1 Guidance

Pollutant	Soil Quality Criteria (µg.m^{-3})	Maximum Deposition Rate (mg.m^{-2}.d^{-1})
Arsenic (As)	50	0.02
Cadmium (Cd)	3	0.009
Chromium (Cr)	400	1.5
Copper (Cu)	80	0.25
Lead (Pb)	300	1.1
Mercury (Hg)	1	0.004
Nickel (Ni)	50	0.11

Local Planning Policy

South East Plan

7.2.4 The Regional Spatial Strategy for the South East [11] sets out the long term spatial planning framework for the region over the period up to 2026. Whilst Policies W15, W5, W7 and W12 are considered applicable to this development, Policy NRM9, the management of air quality, is considered applicable to this chapter:

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.

Kent Waste Local Plan

7.2.5 The Kent Waste Local Plan [12] 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.

7.2.6 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. Policy W11 within this Plan has been considered within the air quality assessment.

Kent Joint Municipal Waste Management Strategy

7.2.7 The Municipal Waste Management Strategy [13] 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. Policies 1 and Policy 14 within the Strategy have been considered within the air quality assessment.

Swale Borough Local Plan

7.2.8 The Swale Borough Local Plan First was adopted by Swale Borough Council (SBC) on 20th February 2008 [14]. This supersedes the Swale Borough Local Plan 2000 and forms part of the statutory development for the Borough.

7.2.9 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 Assessment Methodology

General

7.3.1 The air quality assessment has addressed the following key elements:

- **Construction effects:**
  - Dust emissions from demolition and construction vehicles; and
  - Traffic-related emissions from additional traffic movements generated on the local road network.
- **Operational effects:**
  - Traffic-related emissions from additional traffic movements generated on the local road network;
  - Pollutant emissions from the proposed SEP;
  - Cumulative pollutant emissions from the existing stacks at the Kemsley Paper Mill; and
  - Assessment of Effects on Human Health.

Receptors

7.3.2 The air quality assessment predicts the impacts at locations that could be sensitive to any changes. Such sensitive receptors should be selected where the public is regularly present and likely to be exposed over the averaging period of the objective. LAQM.TG(09) [15] provides examples of exposure limits where the air quality objectives should and should not apply, and these are summarised in Table 7.5.

Table 7.5: Example of Where Air Quality Objectives Apply

Averaging Period	Objectives should apply at:	Objectives should generally not apply at:
Annual-mean	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes etc.	Building façades or offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the buildings façades), or any other location where public exposure is expected to be short-term
24-hour mean	All locations where the annual-mean objective would apply, together with hotels. Gardens of residential properties.	Kerbside sites (as opposed to locations at the buildings façade), or any other location where public exposure is expect to be short-term.
1-hour mean	All locations where the annual and 24-hour mean would apply. Kerbside sites (e.g. pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations to which the public might reasonably be expected to spend 1-hour or longer	Kerbside sites where the public would not be expected to have regular access

7.3.3 The operational effects from operational traffic and stack emissions of the proposed development have been assessed at the façades of these existing receptors in the surrounding area where changes in pollutant concentrations from the proposed development are expected to be greatest.

7.3.4 These receptor locations are given in Table 7.6 and illustrated in Figure 7.1.

Table 7.6: Modelled Sensitive Receptors and Grid Coordinates for the Assessment

Receptor ID*	Description	X (m)	Y (m)
1	Recreation Way	591391	166087
2	Swale Road	590967	166509
3	Grovehurst Road, Bramblefield	590404	166463
4	Grovehurst Road, Kemsley	590746	165486
5	Saffron Way, Kemsley	590924	165184
6	Howt Green	589762	165887
7	Lorimar Court, Milton Regis	589256	165287
8	Key Street	588127	164204
9	The Westlands School	588855	163953
10	Museum, East Street	591165	163568
11	Boyces Hill, Newington	584437	165225
12	M2, Bredgar	588203	160829
13	Stuppington Farm	597167	159333
14	A249, South Green	584146	160880
15	M2, Cowstead	584481	163112

Note: m = metres
* modelled at 1.5m above ground level

Methodology – Assessment of Dust from Construction Activity

7.3.5 Potential nuisance from the deposition of construction dust is likely to be the most significant issue in relation to local air quality effects during the construction phase.

7.3.6 By convention, the assessment of construction dust is normally confined to a qualitative evaluation of the likelihood that emissions may give rise to some perceptible nuisance. This is often defined on the basis of the distance from construction works of sensitive receptors such as residential properties. There are no residential properties identified within 100 m of the proposed construction area.

7.3.7 A Best Practice Guide (BPG) on the control of dust and emissions from construction and demolition has been produced by the Mayor of London, in association with the Air Pollution Planning and the Local Environment (APPLE) working group, comprising participants from the Greater London Authority and the Association of London [16]. The BPG is designed to inform the planning process and assist developers in understanding the methods to control dust and emissions from construction and demolition activities.

7.3.8 Although the proposed development is located outside of London, the approach set out within the BPG has been adopted for this assessment as it represents the most comprehensive and robust guidance currently available.

Significance Criteria for Assessment of Construction-Phase Effects

7.3.9 In accordance with the BPG, the proposed development has been evaluated to determine whether the construction phase is likely to cause significant air quality effects. Construction activities have been assessed against the overarching criteria provided in Table 7.7.

Table 7.7: Construction Phase Impact Assessment Significance Criteria
Low Risk Sites
Development of up to 1,000 square metres of land; and
Development of one property and up to a maximum of ten; and
Potential for emissions and dust to have an infrequent impact on sensitive receptors.
Medium Risk Sites
Development of between 1,000 and 15,000 square metres of land; and
Development of between ten to 150 properties; and
Potential for emissions and dust to have an intermittent or likely impact on sensitive receptors.
High Risk Sites
Development of over 15,000 square metres of land; or
Development of over 150 properties; or
Potential for emissions and dust to have significant impact on sensitive receptors

7.3.10 Where risks have been identified, mitigation measures are proposed that are consistent with the level of risk assessed. The BPG advises that by evaluating proposed construction and demolition activity, complaints relating to nuisance are likely to be reduced.

Methodology – Assessment of Construction Traffic Effects

7.3.11 Construction of the proposed SEP will generate traffic, comprising contractors' vehicles and Heavy Goods Vehicles (HGVs), diggers, and other diesel-powered vehicles which will result in emissions of nitrogen oxides, particles and other combustion-related pollutants.

7.3.12 Construction traffic flows are anticipated to be lower than operational traffic flows (with significantly lower numbers of HGVs). Therefore, any changes in traffic flow characteristics during the construction phase and consequential changes in pollutant concentrations at properties near to roads will be less than those associated with the operational phase.

7.3.13 Emissions of combustion-related pollutants from construction traffic are expected to be negligible in terms of the effect on local air quality, due to the low vehicle numbers, and are therefore not considered quantitatively within this assessment. Nonetheless, good practice mitigation measures such as appropriate traffic control systems will be put in place

Methodology – Assessment of Operational Effects (Stack Emissions)

Outline

7.3.14 The approach to the assessment of emissions from the plant has involved the following key elements:

- Establishing the background Ambient Concentration (AC) – this has been carried out by considering the local Air Quality Review & Assessment findings, local monitoring and National Air Quality Information Archive (NAQIA) projections in the vicinity of the proposed site.
- Predicting the Process Contributions (PC) from the SEP in isolation – this has been carried out by quantitative prediction of the effects from stack emissions using the "new generation" Gaussian dispersion model ADMS 4.1.
- Assessment of the resulting Predicted Environmental Concentrations (PEC) – the Process Contributions have been added to the background Ambient Concentrations.
- Assessment of the Cumulative PEC and PC associated with the existing Kemsley Paper Mill and other developments

7.3.15 A summary of the baseline air quality relevant to this assessment is presented in Section 7.4. A discussion of the reference sources for the baseline air quality is included in the Air Quality Technical Appendix 7.1, Section 4.

7.3.16 The quantitative assessment takes a conservative approach by assuming that the emissions from the SEP are at the limits set out in Directive 2000/76/EC [2]. The quantitative assessment includes consideration of two operational scenarios:

- Scenario 1: Operation of proposed SEP assuming emissions at the short-term (half-hourly average) limits; and
- Scenario 2: Operation of proposed SEP assuming emissions at the long-term (daily-average) limits.

7.3.17 Scenario 1 represents the worst-case scenario for the short-term effects from the proposed SEP, while Scenario 2 represents the worst-case scenario for the long-term effects. Both these scenarios are deemed worst-case as they assume that the proposed SEP will operate at the limits set out in Directive 2000/76/EC. In reality the proposed SEP is expected to operate below these limits.

Dispersion Model Selection

7.3.18 A number of commercially available dispersion models are able to predict ground level concentrations arising from emissions to atmosphere from elevated point sources. No dispersion model is wholly accurate and all models will produce variations in results under certain conditions.

7.3.19 Modelling has been undertaken using ADMS 4.1 a version of the ADMS (Atmospheric Dispersion Modelling System) developed by Cambridge Environmental Research Consultants (CERC) that models a wide range of buoyant and passive releases to atmosphere either individually or in combination. ADMS 4.1 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.

7.3.20 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:

a) 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.

b) A number of complex modules including the effects of plume rise, complex terrain, coastlines, concentration fluctuations, radioactive decay and buildings.

C) 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.

7.3.21 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.

7.3.22 The details of the terrain, surface roughness and buildings included in the model setup are detailed in the Air Quality Technical Appendix 7.1, Section 3.

Emissions Rates and Parameters

Stack Characteristics

7.3.23 The Air Quality Technical Appendix 7.1, Section 7 includes an assessment of a range of stack heights to establish at what chimney height the local building wake effects cease to be significant, thereby ensuring the adequate dispersion of pollutants. A conservative basis was adopted for the treatment of building downwash effects during this exercise. That assessment concluded a 90 m stack height for the Sustainable Energy Plant (SEP) is appropriate and resulting ground level concentrations were assessed to confirm that this stack height was adequate.

7.3.24 For the purposes of this assessment for those pollutants having only one emission limit (for a single averaging period), the SEP has been assumed to operate at that limit. Where more than one limit exists for a pollutant, the half-hourly mean emission concentration limit has been used to calculate short-term (less than 24-hour average) peak ground-level concentrations. The daily mean emission concentration limit has been used for these pollutants to calculate long-term (greater than 24-hour average) mean ground-level concentrations.

7.3.25 The emission characteristics for the proposed SEP and the existing gas-fired CHP and the fluidised bed combustor, included in the detailed modelling study are summarised in Table 7.8.

Table 7.8: Stack Emission Parameters

Parameter	Unit	K1	K2	K3
Stack Height	m	75	72	90
Number of stacks	-	1	1	2*
Diameter	m	3.6	1.4	4
Efflux Velocity	$m.s^{-1}$	18.6	14.9	15.0
Efflux Temperature	^{o}C	100	160	135
Volumetric Flow	$Am^3.s^{-1}$ (actual)	190	23	191
Volumetric Flow	$Nm^3.s^{-1}$ (1 atm, $0^{o}C$, dry, 11% O_2)	203.9	10.7	157.4

K1 – Kemsley Mill gas-fired CHP
K2 – Fluidised Bed Combuster (FBC)
K3 – Sustainable Energy Plant (SEP)
* Due to the proximity to each other, the two stacks have been modelled as one point source

Emission Rates

7.3.26 The SEP will be designed to achieve all applicable limits on releases to air, which include those required by Annex V of Directive 2000/76/EC [2]. By modelling at the permitted limits of these concentrations, the assessment therefore represents a worst-case scenario, as typical emissions from the Proposed Development are expected to be lower than these limits. Table 7.9 summarises the mass emission rates used in this assessment.

Table 7.9: Concentrations and Mass Emissions of Released Pollutants

Pollutants	Short-Term (Directive 2000/76/EC)		Long-Term (Directive 2000/76/EC) [(a)]	
	Concentration ($mg.Nm^{-3}$) [(b)]	Mass Emission ($g.s^{-1}$)	Concentration ($mg.Nm^{-3}$) [(b)]	Mass Emission ($g.s^{-1}$)
Total dust (particulates)	10	0.125	30	0.374
Carbon monoxide (CO)	50	0.624	-	-
Oxides of sulphur (SO_2)	200	2.495	50	0.624
Hydrogen chloride (HCl)	60	0.749	10	0.125
Hydrogen fluoride (HF)	4	0.050	1	0.012
Oxides of nitrogen (NO_x)	400	4.991	200	2.495
Group 1 (Cd + Tl) total	-	-	0.050	6.24×10^{-4}
Group 1 metal each	-	-	0.025	3.12×10^{-4}
Group 2 (Hg) total	-	-	0.050	6.24×10^{-4}
Group 3 (, As, Pb, Cr, Cu, Ni) total [(a)]	-	-	0.500	6.24×10^{-3}
Group 3 metal each (Sb, Co, Mn and V)	-	-	0.056	6.93×10^{-4}
Dioxins & furans	-	-	1.0×10^{-7}	1.25×10^{-9}
Ammonia	-	-	10	0.12
B[a]P	-	-	0.001	1.25×10^{-5}
PCB	-	-	0.005	6.24×10^{-5}

Note – [(a)] Calculated using the NAEI partitioning factors

Dioxins and Furans

7.3.27 Dioxins and furans exist as a number of different but closely related compounds, known as congeners. The congeners have different toxicities and physical properties.

7.3.28 The emission rates for each congener are presented in Table 7.10. The assumed emission rate profile for the dioxin and furan congeners is based on a standard concentration profile for a typical Energy from Waste (EfW) facility published by Her Majesty's Inspectorate of Pollution (HMIP) [17].

Table 7.10: Concentrations and Mass Emissions of Dioxins and Furans				
Congener	**Annual Mean Emission Concentration (ng.Nm-3)**	**I-TEF (toxic equivalent factors)**	**I-TEQ (toxic equivalent quotient)**	**Emission Rate ($g.s^{-1}$)**
2,3,7,8-TCDD	0.0031	1	3.1×10^{-3}	1.0×10^{-10}
1,2,3,7,8-PeCDD	0.025	0.5	1.3×10^{-2}	8.0×10^{-10}
1,2,3,4,7,8-HxCDD	0.029	0.1	2.9×10^{-3}	9.3×10^{-10}
1,2,3,7,8,9-HxCDD	0.021	0.1	2.1×10^{-3}	6.8×10^{-10}
1,2,3,6,7,8-HxCDD	0.026	0.1	2.6×10^{-3}	8.4×10^{-10}
1,2,3,4,6,7,8-HpCDD	0.17	0.01	1.7×10^{-3}	5.5×10^{-9}
OCDD	0.4	0.001	4.0×10^{-4}	1.3×10^{-8}
2,3,7,8-TCDF	0.027	0.1	2.7×10^{-3}	8.7×10^{10}
2,3,4,7,8-PeCDF	0.054	0.5	2.7×10^{-2}	1.7×10^{-9}
1,2,3,7,8-PeCDF	0.028	0.05	1.4×10^{-3}	9.0×10^{10}
1,2,3,4,7,8-HxCDF	0.22	0.1	2.2×10^{-2}	7.1×10^{-9}
1,2,3,7,8,9-HxCDF	0.0042	0.1	4.2×10^{-4}	1.4×10^{-10}
1,2,3,6,7,8-HxCDF	0.081	0.1	8.1×10^{-3}	2.6×10^{-9}
2,3,4,6,7,8-HxCDF	0.087	0.1	8.7×10^{-3}	2.8×10^{-9}
1,2,3,4,6,7,8-HpCDF	0.44	0.01	4.4×10^{-3}	1.4×10^{-8}
1,2,3,4,7,8,9-HpCDF	0.043	0.01	4.3×10^{-4}	1.4×10^{-9}
OCDF	0.36	0.001	3.6×10^{-4}	1.2×10^{-8}
Total	**-**	**-**	**-**	**1.2×10^{-9}**

NO_x to NO_2 Relationship

7.3.29 The NO_x emissions associated with combustion activities at the SEP will typically comprise approximately 90-95% nitric oxide (NO) and 5-10% nitrogen dioxide (NO_2) at source. Once released to atmosphere the NO oxidises in the presence of sunlight, ozone and volatile organic compounds (VOCs) to form NO_2, which is the principal concern in terms of environmental health effects.

7.3.30 There are various techniques available for estimating the proportion of NO_x converted to NO_2. The methods used in this assessment are discussed below.

7.3.31 For annual-mean calculations, the Environment Agency recommends that a 70% conversion of NO to NO_2 should be considered for a worst case scenario. If a breach of the annual-average NO_2 objective/limit value occurs, the Environment Agency requires a more detailed assessment in which the operator is asked to justify the use of percentages lower than 70%. For the purposes of this assessment, a 70% conversion of NO to NO_2 is assumed for annual-average NO_2 concentrations in line with the Environment Agency's recommendations.

7.3.32 For the calculation of the hourly-mean contribution of the Proposed Development to ground-level concentrations of NO_2, a lower conversion rate is used. Based on the Environment Agency's recommendations for the calculation of a worst case scenario for short-term NO_2 concentrations, 35% of the modelled NO_x was added to twice the annual-average background concentration of NO_2.

Significance Criteria – Effects of Stack Emissions

7.3.33 In order to ensure that the descriptions of effects used within this report are clear, consistent and in accordance with recent guidance, definitions have been adopted from the EA's H1 Guidance. Table 7.11 provides a summary of criteria that the Agency uses to:

- Screen out insignificant emissions; and
- Identify when detailed dispersion modelling is required.

Table 7.11: Summary for the Assessment of Stack Emissions to Air – H1 Methodology

Parameter	Long-term	Short-term
Criteria for screening out Insignificant Emissions	Emissions can be seen as insignificant where: PC long-term < 1% of long-term EAL / EQS	Emissions can be seen as insignificant where: PC short-term < 10% of short-term EAL / EQS
Criteria for detailed air modelling	Detailed air modelling is required if: PC Long-term >70% of long-term EAL / EQS or where there is an AQMA / AQAP for a substance	Detailed air modelling is required if: PC short-term >20% of (short-term EAL / EQS minus the long-term background concentration) or where there is: local human population
Acceptability against local Environmental Quality Requirements	If Long-term background > EU EQS or PEC long-term > long-term EU EQS then consideration of further control measures is required. If long-term background > long-term National EQS or PEC long-term > long-term National EQS then the operator needs to justify that further control measures are not required. Comparison with EALs can be treated as for National EQS	If PEC short-term (PC short-term plus twice the long-term background) > short-term National EQS then the operator needs to justify that further control measures are not required

Notes PC = process contribution; PEC = predicted environmental concentration (PC plus background concentration)
EAL = Environmental Assessment Level; EQS = Environmental Quality Standard
AQMA = Air Quality Management Area; AQAP = Air Quality Action Plan

7.3.34 The criteria summarised in Table 7.11 have been used in developing the magnitude descriptors that have been applied to the results of this assessment. These magnitude descriptors listed in Table 7.12 are specific to stack emissions from an industrial source and are distinct from those used to assess the significance of increases in road traffic emissions listed in paragraph 7.3.42.

7.3.35 The significance of air quality impacts is based on the magnitude of change in the context of existing conditions. The significance descriptors are listed in Table 7.13.

Table 7.12: Magnitude Descriptors for Process Contributions as a Percentage of EAL / EQS for the Assessment of Emissions to Air		
Magnitude Descriptor	**Averaging Period and Process Contribution as % of EAL / EQS**	
	Long-term	**Short-term**
Very Small	< 1%	< 10%
Small	1 – 5%	10 – 15%
Medium	5 – 10%	15 – 25%
Large	10 – 20%	25 – 50%
Very Large	> 20%	> 50%

Table 7.13: Descriptors for Impact Significance for Process Contributions					
Absolute Concentrations in Relation to Standard	**Magnitude Descriptor**				
	Very Small	**Small**	**Medium**	**Large**	**Very Large**
Above standard	Slight to Moderate adverse	Moderate to Substantial adverse	Substantial adverse	Very substantial adverse	Very substantial adverse
Below standard	Slight adverse	Slight adverse	Moderate adverse	Moderate adverse	Substantial adverse
Well below standard	Negligible	Slight adverse	Slight adverse	Slight adverse	Moderate adverse

Notes: The NSCA [18] example has been used as a framework for this assessment; however, professional judgment is still required to determine the significance of any change.
'Well below standard' =< 75% of the standard level,
Standard' = EQS objective or limit value

Methodology - Assessment of Plume Visibility

7.3.36 Visible plumes can arise when hot, wet exhaust gases are cooled to ambient temperature, resulting in the condensation of water vapour and a white plume. The extent of the plume is dependent on the volumetric flow rate of gases from the source, the amount of water vapour in the cooled gases, the relative humidity of the atmosphere, the temperature of the exhaust gas once in the air and the extent of plume dispersion in the atmosphere.

7.3.37 It is often desirable to recover heat from the exhaust gases for useful energy, rather than rejecting this to the atmosphere. However, issues arise with regard to corrosion once the dew point of the acid gas is reached (at any point in the cooling system) and in resolving a disposal route for the condensed water. There is, therefore, a trade-off between the amount of heat that can be usefully recovered from the exhaust gas stream and the heat required to avoid condensation under all atmospheric conditions.

7.3.38 The likely incidence and dimensions of visible plumes from the proposed stack have been predicted using the ADMS 4.1 Plume Visibility Module. Modelling has been undertaken using five years of hourly sequential meteorological data and based on an initial mixing ratio of the plume of 0.0998 $kg.kg^{-1}$ (mass of H_2O). The results have been used to determine:

- the amount of time that the length of the plume may exceed the average distance to the site boundary; and
- the number of plumes that exceed the average distance to the site boundary during daylight hours.

7.3.39 The visibility of the plume from the SEP has been scored on a scale ranging from 'zero' to 'high' based on criteria in the EA Guidance Note H1.

Methodology – Operational Traffic Effects

Approach

7.3.40 The air quality impacts associated with the changes in traffic flow characteristics on the local road network have been assessed using The Design Manual for Roads and Bridges (DMRB) model. The assessment utilises the DMRB version 1.03c (July 2007), which calculates pollutant concentrations from empirical relationships between traffic density, speed and distance of sensitive locations from road networks.

7.3.41 Annual-mean NO_2 concentrations have been derived from the modelled annual-mean NOx concentration using the LAQM.TG(09) calculator.

7.3.42 Modelling of NO_2 and PM_{10} concentrations has been undertaken for the following scenarios:

- 2011 Existing Situation – the base year;
- Without Development – without proposed development in the opening year (2014); and
- With Development– with proposed development in the opening year (2014).

Traffic Data

7.3.43 Traffic flow data included in this assessment were provided in the format suitable for input into the DMRB model and are summarised in Table 7.14. The road links modelled are illustrated in Figure 7.2.

7.3.44 Traffic data used for this assessment were provided by RPS traffic consultants. The average speed on each road has been reduced by 15 $km.hr^{-1}$ where necessary to take into account the possibility of slow moving traffic near junctions, roundabouts and traffic signals in accordance with LAQM.TG(09).

Table 7.14: Traffic Data Used Within Assessment

Road Link ID	Road Link Name	Speed ($km.hr^{-1}$)	2011		2014 Without		2014 With	
			LDV	HDV	LDV	HDV	LDV	HDV
1	A249	112	36622	3622	37435	3702	37435	3702
2	Swale Road	64	13363	2545	14875	2833	14916	3093
3	B2005	64	14967	1127	15549	1170	15575	1170
4	A249	112	33822	5054	35233	5265	35248	5525
5	A2	112	20038	1279	20251	1293	20258	1293
6	A2	112	26336	1681	26478	1690	26481	1690
7	A249	112	51049	6309	55132	7518	55138	7778
8	M2	112	53487	8894	62195	10281	62196	10437
9	M2	112	49560	6694	51268	8043	51269	8069
10	A249	112	0	0	44275	6038	44278	6116
11	Barge Way	64	2405	1182	2487	1223	2533	1483

Notes: $km.hr^{-1}$ = kilometres per hour
HDV = Heavy Duty Vehicle - vehicles greater than 3.5t gross vehicle weight including buses
LDV = Light Duty Vehicle
Without – Without the SEP
With – With the SEP

Model Verification

7.3.45 The results of the DMRB modelling have been verified against local monitoring data. The method used within this assessment is consistent with the verification process set out in LAQM.TG09. The process requires a comparison of the monitored NO_x with the modelled NO_x. Appendix 7 Section 7.3, details the comparison between monitored and modelled NO_x concentrations.

Significance Criteria for Operational Traffic Effects

7.3.46 The pollutant concentrations have been determined for each receptor. Presentation of numerical impacts allows comparison with relevant UK AQS objectives. Within this assessment, the following information is presented:

- Absolute pollutant concentrations without the proposed development (at existing receptors);
- Absolute pollutant concentrations with the proposed development (at existing receptors); and

- Percentage change in concentrations as a result of the proposed development relative to the relevant objective (at existing receptors).

7.3.47 It is generally considered that, where possible, an assessment should communicate impacts both numerically and descriptively. Guidance is available from a range of regulatory authorities and advisory bodies on how best to determine and present the significance of impacts within an air quality assessment. In order to ensure that the descriptions of impacts used within this report are clear, consistent and in accordance with recent guidance, definitions have been adopted from the National Society for Clean Air's (NSCA) Development Control: Planning for Air Quality document (NSCA, 2006) [18].

7.3.48 Table 7.15 shows the descriptors used to describe the magnitude of changes in NO_2 and PM_{10} concentrations as a result of the development.

Table 7.15: Magnitude Descriptors for Changes in Pollutant Concentrations as a Percentage of the Relevant EQS Objective/Limit Value

Descriptor	NO_2/PM_{10} Concentrations
Very large	Increase/decrease > 25%
Large	Increase/decrease 15 - 25%
Medium	Increase/decrease 10 - 15%
Small	Increase/decrease 5 – 10%
Very Small	Increase/decrease 1 – 5%
Extremely Small	Increase/decrease < 1%

7.3.49 The magnitude of the change identified must also be considered in the context of existing air quality conditions within the study area in order for the significance of the change to be determined. The most important aspects to consider are whether existing concentrations are above or below the relevant standard.

7.3.50 Table 7.16 show the descriptors for the significance of air quality impacts, based on the magnitude of change in the context of existing conditions.

Table 7.16: Descriptors for Impact Significance for when Concentrations Increase

Absolute Concentrations in Relation to Standard	Magnitude of Change in Concentrations due to the Proposed Development					
	Extremely Small	Very Small	Small	Medium	Large	Very Large
Above standard without scheme	Slight adverse	Slight adverse	Substantial adverse	Substantial adverse	Very substantial adverse	Very substantial adverse
Below standard without scheme, above with scheme	Slight adverse	Moderate adverse	Substantial adverse	Substantial adverse	Very substantial adverse	Very substantial adverse
Below standard with scheme, but not well below	Negligible	Slight adverse	Slight adverse	Moderate adverse	Moderate adverse	Substantial adverse
Well below standard with scheme	Negligible	Negligible	Slight adverse	Slight adverse	Slight adverse	Moderate adverse

Notes: The NSCA example has been used as a framework for this assessment; however, professional judgment is still required to determine the significance of any change.
'Well below standard' =< 75% of the standard level,
'Standard' = EQS objective or limit value
Adopted from NSCA guidance[18]

Cumulative Impacts

7.3.51 Where there are multiple industrial facilities located in close proximity to each other, there is the potential for cumulative effects to arise. Cumulative impacts from existing facilities in the area have been accounted for within the assessment through the adoption of appropriate background data.

7.3.52 The cumulative effects associated with the existing Kemsley Paper Mill operations have been included within this assessment and results presented separately.

Methodology – Assessment of Effects on Human Health

Input to Human Health Risk Assessment

7.3.53 The assessment of air quality effects at sensitive receptors identified for consideration in the human health risk assessment has used ADMS 4.1 dispersion model, retaining consistent input data as described above.

7.3.54 Pollutant emissions to the environment occur in vapour, particle or particle-bound phases. The proportion of pollutants in each phase is based on the following assumptions:

- highly volatile organic pollutants occur only in the vapour phase (i.e. the fraction of the

pollutant in vapour phase is 1.0);

- most metals and organic pollutants with very low volatility (i.e. the fraction of the pollutant in vapour phase is less than 0.05) occur only in the particle phase; and
- the remaining organic pollutants are condensed onto the surface of particulates (i.e. particulate bound).

7.3.55 Deposition of vapour-phase compounds is dependent on the dry and wet vapour-deposition factors and are not dependent on the mass fraction, surface area or particle size.

7.3.56 Deposition of particulate-phase pollutants is determined mainly by particle size, with the terminal velocity of a particle determining how soon it will deposit. Particle terminal velocity is dependent on particle size and density with larger/denser particles depositing closer to the source than smaller lighter particles. Wet deposition is a further factor, with larger particles scavenged more easily by falling liquid or frozen precipitation.

7.3.57 All pollutants are assumed to be emitted from the stack in the particle-bound phase. Dispersion modelling was undertaken to predict the airborne concentration of all relevant pollutants. The dry-deposition rates were then calculated from the concentration in air based on an assumed dry deposition velocity of 0.01 $m.s^{-1}$ for the particle-bound phase, and 0.029 $m.s^{-1}$ for Hg. Deposition rates were calculated using empirical methods recommended by the EA [19].

- Calculate dry deposition flux (0.01 $m.s^{-1}$ assumed as deposition velocity for particle-bound phase, 0.029 $m.s^{-1}$ for Hg):

Dry deposition flux = ground level concentration x deposition velocity
($\mu g.m^{-2}.s^{-1}$) ($\mu g.m^{-3}$) ($m.s^{-1}$)

7.3.58 The health risk assessment is concerned with the evaluation of possible effects on the health of the local population due to emissions from the project. Full details of the health risk assessment are reported in Chapter 8. The assessment not only evaluates potential impacts on human health in terms of inhalation, but also considers the overall long term exposure through additional viable routes such as the food chain. Consequently, the assessment is carried out on persistent substances that have the potential to accumulate in the environment.

7.3.59 The health risk assessment is based on the output from the atmospheric dispersion modelling summarised in this chapter. The Industrial Risk Assessment Programme-Human Health (IRAP-h View – version 3) which is based on the United States Environmental Protection Agency (USEPA) Human Health Risk Assessment Protocol (HHRAP 2005) has been used to

calculate the transport and fate of trace contaminants emitted from the project. This is considered to be the most appropriate method for an assessment of this type.

7.3.60 The site-specific risk assessment was conducted within a staged approach, consistent with the current UK risk assessment guidelines as presented below:

Stage 1: Development of Conceptual Model of the Site

7.3.61 The risk assessment procedure utilises the source-pathway-receptor concept in constructing a Site Conceptual Model (SCM) and assesses 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 - emissions from the proposed development;
- Contaminants of Potential Concern (COPCs) - the European Parliament Directive 2000/76/EC list of pollutants and other substances potentially associated with thermal treatment of waste, such as B[a]P and PCBs;
- Behaviour of contaminants within contaminated media - airborne, deposited on soils, taken up by home grown vegetables and other agricultural products;
- All relevant receptors;
- Location of potential exposure points; and
- 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.

Stage 2: Hazard Identification

7.3.62 This includes identification of:

- The type and spatial distribution of COPCs;
- 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.

Stage 3: Hazard/Risk Characterisation and Assessment

7.3.63 This includes:

- Identifying the toxicity of the identified contaminants of potential concern with relevance to chronic exposures;
- Identification of the nature of the potential effect (threshold or non-threshold effect); and

- Calculation of the magnitude of hazards and 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 potential concern with consideration to sensitive receptors.

Stage 4: Risk Control and Management

7.3.64 At this stage 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.

7.3.65 Potential health risks associated with the effect of emissions from the proposed SEP were considered. The European Directive 2000/76/EC prescribes air emission limits for the following pollutants:

- Oxides of nitrogen (NO_x);
- Sulphur dioxide (SO_2);
- Particles;
- Carbon monoxide;
- Total organic carbon;
- Hydrogen chloride;
- Hydrogen fluoride;
- Dioxins and furans;
- Group 1 metals;
- Group 2 metals; and
- Group 3 metals.

7.3.66 Only the metals and dioxins/furans in addition to BaP and PCBs 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.

7.3.67 All contaminants that were deemed by the UK Department for Environment, Food and Rural Affairs and the Environment Agency as priority contaminants (CLR8 2002) were considered in the assessment. These include cadmium, mercury in the form of mercuric chloride and vapour mercury, arsenic, chromium (hexavalent and trivalent), lead, antimony, PCBs, BaP, 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.

7.3.68 The annual rates of air concentrations and depositions of the metals, BaP, PCBs and dioxins/furans were estimated through air dispersion modelling using the air dispersion model ADMS. .

7.3.69 The Air dispersion modelling results were modelled in the human health risk assessment model for all relevant sources of emissions, to ensure that a worst-case scenario was considered.

7.3.70 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.

7.3.71 The model used for the human health risk assessment (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 annual 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.

7.3.72 The model identified 48 grid node receptors with the highest air parameters. These included 27 farms, 17 residential and 4 industrial receptors.

Table 7.17 List of Receptors

Receptor Area	Grid Node Receptors	OS Grid Reference (m) – X	OS Grid Reference (m) – Y	Bearing	Description	Modelled Land Use
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	West Kemsley	Residential
	RCPTR_10	590540	166020	SW	Milton Regis	Residential
RI_6	RCPTR_11	592220	164400	S	Milton Regis	Farm
	RCPTR_12	592580	164820	S	Meres Court Farm	Farm
RI_7	RCPTR_13	591200	163740	S	Meres Court Farm	Residential
	RCPTR_14	591920	164460	S	Snipeshill	Residential
RI_8	RCPTR_15	590420	164220	SW	Snipeshill	Industrial
	RCPTR_16	591920	165540	SW	Sittingbourne	Industrial
RI_9	RCPTR_17	592700	164160	SE	Sittingbourne	Farm
	RCPTR_18	592760	164580	SE	West Tonge Farm	Farm
RI_10	RCPTR_19	593420	164040	SE	West Tonge Farm	Residential
	RCPTR_20	593420	164100	SE	St Giles Houses	Residential
RI_11	RCPTR_21	594020	164820	SE	St Giles Houses	Residential
	RCPTR_22	594020	164880	SE	Chekes Court	Residential
RI_12	RCPTR_23	593720	164220	SE	Chekes Court	Farm
	RCPTR_24	593780	165120	SE	Wilford Court Farm	Farm
RI_13	RCPTR_25	593420	163680	SE	Wilford Court Farm	Farm
	RCPTR_26	593780	164700	SE	Bunces / Bax Farm	Farm
RI_14	RCPTR_27	593180	165420	E	Bunces / Bax Farm	Farm
	RCPTR_28	593480	166140	E	Tonge Corner Farm	Farm
RI_15	RCPTR_29	589400	167700	NW	Tonge Corner Farm	Residential
	RCPTR_30	590180	167220	NW	Iwade	Residential
	RCPTR_31	590240	167220	NW	Iwade	Residential
RI_16	RCPTR_32	589100	165540	W	Iwade	Residential
	RCPTR_33	589880	166200	W	Howt Green	Residential
RI_17	RCPTR_34	589100	165900	W	Howt Green	Farm
	RCPTR_35	589460	166020	W	Stickfast Farm	Farm
RI_18	RCPTR_36	589100	166140	W	Stickfast Farm	Farm
	RCPTR_37	589220	166200	W	Cambray Farm	Farm

RI_19	RCPTR_38	589100	166980	W	Cambray Farm	Farm
	RCPTR_39	590180	166860	W	Coleshall Farm	Farm
RI_20	RCPTR_40	589100	166620	W	Coleshall Farm	Farm
	RCPTR_41	590000	166320	W	Pheasant Farm	Farm
RI_21	RCPTR_42	590120	167820	NW	Pheasant Farm	Farm
	RCPTR_43	590300	167040	NW	Street Farm	Farm
RI_22	RCPTR_44	590780	166680	N	Street Farm	Industrial
	RCPTR_45	591620	169320	N	Coldharbour Marshes	Industrial
RI_23	RCPTR_46	592640	167100	NE	Kings Hill Farmland	Farm
	RCPTR_47	593720	167880	NE	Kings Hill Farmland	Farm
RI_24	RCPTR_48			NE	Kings Hill Farm	Farm

7.3.73 For residential, farms and fish eaters scenarios, in accordance with the UK guidelines as published in SR3 (Environment Agency 2009), the critical receptor is considered to be a female child aged 0-6. Breast milk feeding infant are also considered in both scenarios in addition to the industrial land use scenario within this assessment.

Pathways of Exposure

7.3.74 The two primary pathways of exposure considered in this assessment were inhalation and ingestion.

7.3.75 On the basis of the significance of exposure and consequently risks associated with exposure, the following pathways were identified as the relevant pathways of exposure:

- Inhalation;
- Ingestion of soil; and
- Ingestion of locally produced food.

7.3.76 Exposure through food consumption from the following products was considered. Details of the relevant pathways of exposure for each receptor are presented and discussed in Chapter 8.

- 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; and
- Breast milk – the worst case residential, farms and industrial properties.

7.3.77 It is noteworthy 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.

Hazard Identification

7.3.78 Hazard identification aims to identify contaminants of concern, their distribution in 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' [20] was used to estimate all exposures utilising the predicted concentrations in air and deposition rates provided as outputs of the atmospheric dispersion modelling. UK data for consumption of homegrown vegetables and, in the absence of UK data, US data for consumption of other foodstuffs were included in the exposure modelling.

Estimation of Exposure

7.3.79 Calculating COPC-specific exposure rates for each exposure pathway involves estimation of certain factors such as the media concentration and consumption rates.

7.3.80 Where UK parameters were available to calculate the exposure through a specific pathway of exposure such as the consumption of home-grown produce, they were used in the assessment. Where UK data in relation to media transfer factors and consumption rates were not available, these were estimated based on the recommendations and default values provided by the USEPA HHRAP.

7.3.81 Behaviour of COPCs in the environment and their transfer between different media is governed by their physical and chemical properties.

7.3.82 The IRAP-h View model used for the assessment is equipped with a database of physical and chemical parameters that are used to calculate the media concentrations for all relevant COPCs. These are chemical specific values based on current international knowledge of chemicals and therefore were used as presented in the database.

7.3.83 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
- Annual average wind velocity

7.3.84 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)

7.3.85 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.

7.3.86 Average wind velocity was calculated form the meteorological data used in the air dispersion modelling and was found to be 3.28m.s^{-1} based on the local met data used for the air dispersion modelling.

7.3.87 Details on the calculation of the concentrations of COPCs in the different media resulting from the air concentration and deposition rates and the assumptions associate with these calculations such as the relevant contamination mechanisms and biotransfer factors are presented and discussed in details in Technical Appendix 8.

Assessment of Significance

7.3.88 Impacts from the proposed development are only considered to be of potential significance, having regard to the sensitivity of receptors, if the predicted contribution leads to increases in the levels of risk from long-term exposure to levels greater than considered acceptable in the risk characterisation.

7.3.89 Risk characterisation involves combining the exposure quantities and the toxicity benchmarks available to calculate the excess lifetime cancer risks and non-cancer risk for each of the pathways and receptors

7.3.90 Assessment of cancer risk (non-threshold risk) from exposure to emissions is the assessment of 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 1 x 10^{-5} is interpreted to mean that an individual has up to a one in 100,000 chance of developing cancer during their life time from the evaluated exposure. The current UK approach to human health risk assessment utilises a range of acceptable risk levels ranging from 1 x 10^{-5} to 1 x 10^{-3} for the different contaminants and pathways of exposure.

7.3.91 The current UK approach, for assessment of carcinogenic risk to human health, is based on the utilisation of the Index Dose (ID) which is based on comparing the estimate of exposure to the index dose associated with a specified acceptable level of risk (i.e., 1 x 10^{-5}). This method was adopted for all carcinogenic compounds in this assessment

7.3.92 Current UK guidance also 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.

7.3.93 The assessment of non-cancer risk is the assessment of effects from exposure that 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 involves comparing exposures to Tolerable Daily Intakes and Reference Concentrations :

7.3.94 This assessment of non-cancer risk 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 of adverse health effects to potential receptors. A hazard quotient is used to describe this type of risk and is calculated as the ratio of the exposure to the relevant health criteria and as such, a value of 1 is used to indicate that the level of exposure is within levels that are not considered to pose unacceptable risks to health. A hazard index is calculated as the sum of all hazard quotients.

7.3.95 Impacts from the SEP are only considered to be potentially significant, having regard to the sensitivity of receptors, if:

- The predicted level of cancer risk from long-term exposure is greater than the relevant level of risk for the particular contaminant and pathway of exposure; or
- Any predicted hazard quotient is greater than 1.

7.3.96 Results of the health risk assessment are discussed in relation to these criteria in Section 7.7

Methodology – Assessment of Effects on Ecologically Designated Sites

7.3.97 The assessment of the effects of emissions to air from the proposed SEP on European designated sites is required under the Habitats Regulations. Following good practice, and discussions with Natural England, all European and nationally designated sites within 10 km have been considered within this assessment. Due to the large area of some of these designations, a series of discrete receptors were included within the modelling to account for the geographic variation of predicted concentrations.

7.3.98 The assessment of impacts on ecological receptors has been undertaken assuming emissions from the stack at the Waste Incineration Directive (WID) long-term emission limits. This is a precautionary approach to the assessment of the potential effect of emissions from the plant on sensitive ecological receptors, and represents the worst-case scenario for contributions from the proposed WTP.

7.3.99 Habitats within each site may be affected through changes in:

- Ambient atmospheric pollutant concentrations; and
- Deposition of certain compounds.

7.3.100 The potential effects on habitats within protected sites are quantified by comparing the maximum Process Contributions (PC) and Predicted Environmental Concentrations (PEC) (incorporating a maximum background concentration) to empirically derived thresholds above which damage to vegetation is known to occur (Environmental Quality Standards: EQS).

7.3.101 Two EQSs are used to assess the potential effect of emissions on sensitive ecological receptors. These are:

- Critical levels; and
- Critical loads.

7.3.102 Critical load and critical level are quantitative estimates of exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge. The critical load relates to the quantity of pollutant deposited from air to the ground, whereas the critical level is the gaseous concentration of a pollutant in the air

Assessment of Ambient Atmospheric Pollutant Concentrations

7.3.103 Critical levels for the protection of vegetation and ecosystems are specified within relevant European Air Quality Directives and corresponding UK air quality regulations as outlined in the National Air Quality Strategy (NAQS). Process Contributions (PC) and Predicted Environmental Concentrations (PEC) of NO_x, SO_2 and NH_3 at each site have been calculated

and compared with the relevant critical level: 30 $\mu g.m^{-3}$ in the case of NO_x, 20 $\mu g.m^{-3}$ in the case of SO_2 and 3 $\mu g\ m^{-3}$ in the case of NH_3. In addition, the Air Pollution Information System (www.apis.ac.uk) recommends an additional critical level for SO_2 of 10 $\mu g.m^{-3}$ for the protection of lichens, and of 1 $\mu g\ m^{-3}$ in the case of NH_3 for sites where lichens and bryophytes are an important component of the site.

7.3.104 Background NO_x, SO_2 and NH_3 concentrations at the designated site have been derived from the APIS website (www.apis.ac.uk). As they can vary across a site, particularly when sites are large; the highest background level was used in the assessment.

Assessment of pollution deposition

7.3.105 The most significant harmful effects of deposition on ecosystems are those known to result from:

- The deposition to land of nitrogen (N deposition), which contributes to the eutrophication of habitats; and
- The deposition of NO_X, SO_2, NH_3 and to a lesser extent HCl, which contribute to the acidification of habitats.

Acid deposition

7.3.106 The assessment of deposition accounts for NO_x, SO_2 and HCl emissions as a result of fuel burn, plus NH_3 from the selective catalytic reduction (SCR) system used to reduce NO_x emissions. NH_3 is not a WID pollutant. Therefore, for the purposes of this assessment an emission limit of 10 $mg.Nm^{-3}$ (derived from the EA's BREF (Best Available Technique Reference) Document on Waste Incineration has been used).

7.3.107 Background levels of acid deposition at each designated site have been derived from the APIS website (www.apis.ac.uk). They can vary across a site, particularly when sites are large; the highest background level for each ecological site has been used in the assessment.

Nitrogen deposition

7.3.108 Percentage contributions to nitrogen deposition have been derived from dispersion modelling using ADMS 4.1. Deposition rates were calculated using empirical methods recommended by the Environment Agency. Full details can be found in Chapter 7 of the EIA.

7.3.109 Background levels of N (nitrogen) deposition at each designated site have been derived from the APIS website (www.apis.ac.uk). They can vary across a site, particularly when sites are large; the highest background level for each ecological site has been used in the assessment.

Selection of Critical Loads for Ramsars, SSSIs and LWSs

7.3.110 The critical load for acid and N deposition depends on the habitat type potentially affected. APIS includes a number of broad habitat types for use in the searchable database of critical loads. The habitats within each site to be assessed therefore need to be assigned to one of these APIS habitat types. For the SSSI, this was done based on the information available in the site citation sheet.

7.3.111 The critical loads for acid deposition and N deposition can vary across a site. The lowest critical load for each ecological site has been used in the assessment.

7.3.112 Additionally, the citation for each designated site was investigated to determine what habitats occurred within the site. Subsequent to this, a corresponding APIS website habitat category was assigned.

7.3.113 Once the habitat was identified, APIS was further consulted to obtain the data for critical levels and background atmospheric concentrations of nitrogen NO_x and SO_2 and the critical load and deposition of nitrogen and acid for each corresponding habitat type at the OS grid reference of the designated site. The background levels all pollutants in the tables below are the maximum figures for that conservation site derived from APIS.

Site Relevant Critical Loads Assessment of SACs and SPAs

7.3.114 SACs and SPAs have been evaluated using the information in the Site Relevant Critical Loads tool in APIS (www.apis.ac.uk). An overview of each interest feature for each site is provided and critical loads (or critical load functions) are assigned to each feature if it is sensitive to either nutrient nitrogen or acidity. Furthermore, deposition data for nitrogen and sulphur at each site is provided.

7.3.115 To assess the significance of the predicted acid deposition against the relevant critical load function (CLF), the radial distance from the origin of the graph through the modelled deposition point to the critical function line is calculated. The distance from the origin to the modelled deposition point is divided by the radial distance to give a percentage.

7.3.116 The Site Relevant Critical Loads tool in APIS may also provide information on species sensitivity to acid and N deposition, and this information is referred to in the relevant evaluation sections where applicable

Ecological Evaluation Criteria

7.3.117 Maximum PC and PEC of NO_x, SO_2, NH_3, acid deposition and N deposition are compared against the relevant EQS for the relevant habitat type. Potentially significant impacts are

predicted if the maximum PC exceeds 1% of the relevant EQS and the PEC exceeds the relevant EQS.

7.3.118 Also, in cases where the EQS was already exceeded by background deposition rates, the Environment Agency's guidance (EU Habitats and Birds Direction Handbook) states that: "Where the concentration within the emission footprint in any part of the European site(s) is less than 1% of the relevant long-term benchmark (EAL, Critical Level or Critical Load), the emission is not likely to have a significant effect alone or in combination, irrespective of the background levels".

7.3.119 When comparing the maximum PC within a site against the EQS, it has been assumed that the maximum PC level affects the whole site. This is a conservative approach to the assessment and ensures that the predicted effects represent a worst-case scenario.

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 [21] and a report by the Expert Panel on Air Quality Standards (EPAQS) [22]. Additional data have also been taken from project-specific local monitoring. Detailed baseline data is provided in Appendix 7.1, Section 4.

7.4.3 Where possible, data have been obtained from monitoring sites that 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.

Swale Borough Council (SBC) Local Review and Assessment of Air Quality

7.4.4 SBC completed the first round of its Review and Assessment (R&A) process between 1998 and 200and 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.

Background Monitoring Data

7.4.7 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 as listed in Appendix 7 have been reviewed; those selected as being most suitable are provided in the Air Quality Technical Appendix 7, Section 4.

7.4.8 Table 7.18 summarises the background concentrations assumed for this assessment and provides the source of the data.

Table 7.18: 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	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	2.0×10^{-3}	1.0×10^{-3}	2.0×10^{-3}	1.0×10^{-3}	Project Specific Monitoring
Cd	0.4×10^{-3}	0.2×10^{-3}	0.4×10^{-3}	0.2×10^{-3}	
Cr	4.6×10^{-3}	2.3×10^{-3}	4.6×10^{-3}	2.3×10^{-3}	
Cu	10.0×10^{-3}	5.0×10^{-3}	10.0×10^{-3}	5.0×10^{-3}	
Pb	30×10^{-3}	15×10^{-3}	30×10^{-3}	15×10^{-3}	
Mn	13.4×10^{-3}	6.7×10^{-3}	13.4×10^{-3}	6.7×10^{-3}	
Hg	0.2×10^{-3}	0.1×10^{-3}	0.2×10^{-3}	0.1×10^{-3}	
Ni	6.4×10^{-3}	3.2×10^{-3}	6.4×10^{-3}	3.2×10^{-3}	
V	14.8×10^{-3}	7.4×10^{-3}	14.8×10^{-3}	7.4×10^{-3}	
Tl	0.02×10^{-3}	0.01×10^{-3}	0.02×10^{-3}	0.01×10^{-3}	
Sb	2.8×10^{-3}	1.4×10^{-3}	2.8×10^{-3}	1.4×10^{-3}	
Co	0.2×10^{-3}	0.1×10^{-3}	0.2×10^{-3}	0.1×10^{-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 Identification and Evaluation of Likely Significant Effects

Construction Effects

Dust from Construction Activity

7.5.1 The major influence on air quality throughout the construction phase of the proposed development is likely to be dust-generating activities. Activities that can cause fugitive-dust emissions during construction phase are as follows:

- earthworks and bund formation
- piling;
- wind-blow from stockpiles of particulate material;
- movement of vehicles, both on and off site;
- handling of loose construction materials; and
- concrete batching.

7.5.2 The level and distribution of construction dust emissions will vary according to factors such as the type of dust, duration and location of dust-generating activity, weather conditions and the effectiveness of suppression measures.

7.5.3 The main effect of any dust emissions, if not mitigated, would be nuisance due to soiling of surfaces, particularly windows, cars and laundry. Using suitable control measures, it is normally possible to ensure that dust deposition does not give rise to nuisance impacts. Routine

7.5.4 dust control measures would normally ensure that the risk of long-term impacts is insignificant, although occasional short-term events may occur (for example, due to technical failure or exceptional weather conditions).

7.5.5 In assessing the risk from construction dust, both the scale of the development and the potential for dust to have a significant impact on sensitive receptors should be taken into account. The proposed development site covers approximately 46,000 square metres and is anticipated to be completed by 2014.

7.5.6 There are no residential properties located on the site boundary or anywhere within 100m of where construction activities are likely to occur, though the site is located in close proximity to Milton Creek. On the basis of the size of the development and the proximity of sensitive receptors, the proposed development site is concluded to be at 'low risk' of causing potential air quality impacts during the construction phase if mitigation measures are not implemented.

7.5.7 Relevant mitigation measures set out in the BPG applicable to the 'low risk' category of sites are detailed in the Mitigation section of this assessment. Incorporating these as part of good housekeeping practice, particularly during the construction of the landscape bund, is expected to ensure no significant impacts from construction dust.

Construction Traffic Effects

7.5.8 Construction traffic flows are expected to be lower than operational traffic flows assessed in Section 7.5.35 (during operation there will be a two-way flow of 258 HGVs accessing the site on a typical weekday). Therefore, any changes in traffic flow characteristics during the construction phase and consequential changes in pollutant concentrations at properties near to roads will be less than those associated with the operational phase.

7.5.9 Emissions of combustion-related pollutants from construction traffic are expected to be negligible in terms of the effect on local air quality, due to the low vehicle numbers, and are therefore not considered quantitatively within this assessment. Nonetheless, good practice mitigation measures such as appropriate traffic control systems will be put in place.

Operational Effects

Overview

7.5.10 This section deals with the air quality effects associated with the operational phase of the SEP. This assessment focuses on the following key issues, which are assessed in the following subsections.

- Increase in pollutant concentrations due to releases from the SEP stack only;
- increase in pollutant concentrations (NO_2 and PM_{10}) due to changes in traffic flow as a result of the proposed SEP;
- increase in pollutant concentrations (NO_2 and PM_{10}) due to releases from the SEP stack together with the traffic; and
- increase in pollutant concentrations from the proposed SEP and existing operations at the Kemsley Paper Mill.

Stack Effects

7.5.11 The stack height selected for the optimum assessment was 90 m, based on the findings of the stack height determination presented in the Air Quality Technical Appendix 7.1, Section 5.

7.5.12 Modelling runs used a coarse grid with 200 m receptor spacing to a 10 km radius around the SEP. The effects of atmospheric emissions were also modelled at the identified sensitive (e.g. residential) receptors.

7.5.13 For each of the five years of meteorological data (2004 to 2008), the maximum predicted ground-level concentration in the modelled domain and at each of the discrete receptors has been derived. Results presented in the following sub-sections are derived from the maximum predictions made by ADMS. Full tabulated results are presented in the Air Quality Technical Appendix 7.1, Section 6.

7.5.14 The results of modelling atmospheric emissions from the SEP are summarised and interpreted below for each of the assessment scenarios. The model results are presented in tabular form for all emissions. Contour plots are also provided for PM_{10}, NO_x, nitrogen deposition and acid deposition only for annual-mean.

Scenario 1: Results

7.5.15 Table 7.19 summarises the maximum predicted contribution (PC) to ground-level concentrations. Table 7.20 presents the resulting predicted environmental concentrations (PEC) once the PC has been added to the background ambient concentration (AC), for all relevant pollutants with short-term emission limits set out in EU Directive 2007/76/EC. The maximum PC and PEC for all receptors (including residential receptors) are shown. The PEC for each pollutant is then compared with the relevant Environmental Quality Standard (EQS).

Table 7.19: Maximum Process Concentration (µg.m^{-3}) at Short-Term EU Directive Emission Limits

Pollutant	Averaging Period	EQS	Max PC	Max PC as % of EQS	Magnitude of PC
NO_2	1 hour 99.79th percentile	200	28.5	14.2	Small
SO_2	15 minute 99.9th percentile	266	43.6	16.3	Small
	1 hour 99.73rd percentile	350	42.7	12.2	Small
HCl	1 hour maximum	750	12.9	1.7	Very Small
HF	1 hour maximum	160	0.8	0.5	Very Small

Note: EQS - Environmental Quality Standard
PC – Process Contribution

Table 7.20: Maximum Environmental Contributions (µg.m^{-3}) at Short-Term EU Directive Emission Limits						
Pollutant	**Averaging Period**	**EQS**	**AC**	**Max PEC**	**Max PEC as % of EQS**	**Significance Descriptor**
NO_2	1 hour 99.79th percentile	200	42.6	71.1	35.5	Slight Adverse
SO_2	15 minute 99.9th percentile	266	4.0	20.3	7.6	Slight Adverse
	1 hour 99.73rd percentile	350	4.0	44.6	12.7	Slight Adverse
HCl	1 hour maximum	750	0.6	2.3	0.3	Negligible
HF	1 hour maximum	160	4.9	5.7	3.5	Negligible

Note: AC – Ambient concentration
PEC – Predicted environmental concentrations
EQS - Environmental Quality Standard

7.5.16 The results presented in Table 7.19 and Table 7.20 show that if the SEP operated at 100% of the short-term emission limits, the predicted concentrations would range from 'negligible' to "slight adverse" significance.

7.5.17 Because the maximum potential short-term effects have been based on the proposed SEP operating at the maximum short-term emission limits, with a 100% plant load factor, and coinciding with the worst-case meteorological conditions for dispersion, the results are considered to represent the 'worst case' for the short-term operation.

Scenario 2: Results

7.5.18 Table 7.21 summarises the results for all pollutants with the SEP operating at the long-term emission limits. All the short-term PCs are predicted to be less than 10% of the relevant EQS. All the long-term PCs are less than 1% of the relevant EQS (equivalent to a 'very small' magnitude), with the exception of NO_2, SO_2 Cd and PAHs (B[a]P equivalent) which are of 'small' to "medium" magnitude.

7.5.19 The results presented in Table 7.21 indicate that PECs from the SEP are considered to be 'negligible' significance (using the significance criteria discussed in section 7.3) for most of the pollutants; the exceptions are daily-mean $PM_{10,}$ 8 hour CO and annual-mean NO_2, SO_2, Cd and PAHs(B[a]P) which are all of 'slight-adverse' significance. The results presented in Table 7.21 and Table 7.22 are considered to represent the 'worst case' for the long-term operation of the SEP.

7.5.20 Contour plots of short-term and long-term NO_2 and PM_{10} contributions from the SEP operating at long-term emission limits set out in Directive 2000/76/EC are presented in Figure 7.3 to

Figure 7.5 These contour plots can be considered representative of the dispersion pattern for all pollutants. The contour plots show that the highest short-term contributions of NO_2 from the SEP and the highest annual-mean contributions are predicted to occur to the northeast of the site, within The Swale.

Table 7.21: Predicted Maximum Process Contributions (µg.m^{-3}) at Long-Term EU Directive Emission Limits ADMS Modelling

Pollutant	Averaging Period	EQS	Max PC	Max PC as % of EQS	Magnitude of PC
PM_{10}	24 hour (90.41st percentile)	50	0.62	1.2	Very Small
	Annual	40	0.15	0.4	Very Small
HCl	1 hour (maximum)	750	2.15	0.3	Very Small
	Annual	20	0.15	0.8	Very Small
HF	1 hour (maximum)	160	0.22	0.1	Very Small
SO_2	15 minute (99.90th percentile)	266	9.0	3.4	Very Small
	1 hour (99.73rd percentile)	350	10.1	2.9	Very Small
	24 hour (99.18th percentile)	125	7.2	5.8	Very Small
	Annual	50	0.7	1.4	Small
NO_2	1 hour (99.79th percentile)	200	14.3	7.2	Very Small
	Annual	40	2.10	5.3	Small
CO	8 hour (maximum daily running)	10,000	9.82	0.1	Very Small
	Annual	350	0.75	0.2	Very Small
Cd	1 hour (maximum)	1.5	5.39×10^{-3}	0.4	Very Small
	Annual	0.005	3.76×10^{-4}	7.5	Medium
Ti	1 hour (maximum)	30	5.39×10^{-3}	0.0	Very Small
	Annual	1	3.76×10^{-4}	0.0	Very Small
Hg	1 hour (maximum)	7.5	1.08×10^{-2}	0.1	Very Small
	Annual	0.25	7.51×10^{-4}	0.3	Very Small
Sb	1 hour (maximum)	150	1.20×10^{-2}	0.0	Very Small
	Annual	5	8.35×10^{-4}	0.0	Very Small
As	1 hour (maximum)	15	5.26×10^{-3}	0.0	Very Small
	Annual	0.2	3.66×10^{-4}	0.2	Very Small
Cr	1 hour (maximum)	3	2.64×10^{-2}	0.9	Very Small
	Annual	0.1	1.84×10^{-3}	1.8	Very Small
Co	1 hour (maximum)	6	1.20×10^{-2}	0.2	Very Small
	Annual	0.2	8.35×10^{-4}	0.4	Very Small
Cu	1 hour (maximum)	60	1.15×10^{-2}	0.0	Very Small
	Annual	2	8.04×10^{-4}	0.0	Very Small
Pb	Annual	0.5	2.63×10^{-3}	0.5	Very Small
Mn	1 hour (maximum)	1500	1.20×10^{-2}	0.0	Very Small
	Annual	1	8.35×10^{-4}	0.1	Very Small
Ni	1 hour (maximum)	30	2.68×10^{-2}	0.1	Very Small
	Annual	1	1.87×10^{-3}	0.2	Very Small
V	1 hour (maximum)	5	1.20×10^{-2}	0.2	Very Small
	Annual	1	8.35×10^{-4}	0.1	Very Small
Dioxins & Furans	Annual	-	1.50×10^{-9}	-	-
Ammonia	1 hour (maximum)	2500	1.08	0.0	Very Small
	Annual	180	0.08	0.0	Very Small
PAHs (B[a]P)	Annual	0.00025	1.53×10^{-5}	6.1	Medium
PCBs	Annual	0.2	7.54×10^{-5}	0.0	Very Small

Note: PC – Process Contribution; EQS – Environmental Quality Standard

Table 7.22: Predicted Environmental Quality Standard (µg.m^{-3}) at Long-Term EU Directive Emission Limits ADMS Modelling

Pollutant	Averaging Period	EQS	AC	Max PEC	Max PEC as % of EQS	Significance Descriptor
PM_{10}	24 hour (90.41st percentile)	50	28.3	28.9	57.8	Slight Adverse
	Annual	40	28.3	28.45	71.1	Negligible
HCl	1 hour (maximum)	750	0.6	2.75	0.4	Negligible
	Annual	20	0.3	0.45	2.3	Negligible
HF	1 hour (maximum)	160	4.92	5.14	3.2	Negligible
SO_2	15 minute (99.90th percentile)	266	4.0	13	4.9	Negligible
	1 hour (99.73rd percentile)	350	4.0	14.1	4.0	Negligible
	24 hour (99.18th percentile)	125	4.0	11.2	9.0	Negligible
	Annual	50	2.0	2.7	5.4	Slight Adverse
NO_2	1 hour (99.79th percentile)	200	42.6	56.9	28.5	Negligible
	Annual	40	21.3	23.4	58.5	Slight Adverse
CO	8 hour (maximum daily running)	10,000	5400	5410	54.1	Slight Adverse
	Annual	350	0.27	1.02	0.3	Negligible
Cd	1 hour (maximum)	1.5	0.4×10^{-3}	5.79×10^{-3}	0.4	Negligible
	Annual	0.005	0.2×10^{-3}	5.76×10^{-4}	11.5	Slight Adverse
Ti	1 hour (maximum)	30	0.02×10^{-3}	5.41×10^{-3}	0.0	Negligible
	Annual	1	0.01×10^{-3}	3.86×10^{-4}	0.0	Negligible
Hg	1 hour (maximum)	7.5	0.1×10^{-3}	1.09×10^{-2}	0.1	Negligible
	Annual	0.25	0.2×10^{-3}	9.51×10^{-4}	0.4	Negligible
Sb	1 hour (maximum)	150	2.8×10^{-3}	1.48×10^{-2}	0.0	Negligible
	Annual	5	1.4×10^{-3}	2.24×10^{-3}	0.0	Negligible
As	1 hour (maximum)	15	2.0×10^{-3}	7.26×10^{-3}	0.0	Negligible
	Annual	0.2	1.0×10^{-3}	1.37×10^{-3}	0.7	Negligible
Cr	1 hour (maximum)	3	2.3×10^{-3}	2.87×10^{-2}	1.0	Negligible
	Annual	0.1	4.6×10^{-3}	6.44×10^{-3}	6.4	Negligible
Co	1 hour (maximum)	6	0.2×10^{-3}	1.22×10^{-2}	0.2	Negligible
	Annual	0.2	0.1×10^{-3}	9.35×10^{-4}	0.5	Negligible
Cu	1 hour (maximum)	60	10.0×10^{-3}	2.15×10^{-2}	0.0	Negligible
	Annual	2	5.0×10^{-3}	5.80×10^{-3}	0.3	Negligible
Pb	Annual	0.5	15×10^{-3}	1.76×10^{-2}	3.5	Negligible
Mn	1 hour (maximum)	1500	6.7×10^{-3}	1.87×10^{-2}	0.0	Negligible
	Annual	1	13.4×10^{-3}	1.42×10^{-2}	1.4	Negligible
Ni	1 hour (maximum)	30	6.4×10^{-3}	3.32×10^{-2}	0.1	Negligible
	Annual	1	3.2×10^{-3}	5.07×10^{-3}	0.5	Negligible
V	1 hour (maximum)	5	14.8×10^{-3}	2.68×10^{-2}	0.5	Negligible
	Annual	1	7.4×10^{-3}	8.24×10^{-3}	0.8	Negligible
Dioxins & Furans	Annual	-	6.0×10^{-3}	6.15×10^{-8}	-	-
Ammonia	1 hour (maximum)	2500	2.2	3.3	0.1	Negligible
	Annual	180	1.1	1.2	0.7	Negligible
PAHs (B[a]P)	Annual	0.00025	9.0×10^{-5}	1.05×10^{-4}	42.1	Slight Adverse
PCBs	Annual	0.2	1.10×10^{-6}	7.65×10^{-5}	0.0	Negligible

Note: AC – Ambient concentration
PEC – Predicted environmental concentrations
EQS - Environmental Quality Standard

Assessment of $PM_{2.5}$ for Scenario 2

7.5.21 The provisional annual-mean urban background target currently proposed for $PM_{2.5}$ is 25µg.m^{-3}, to be met by 2020. In addition to the target level, there is an 'exposure reduction' target that requires a 15% reduction in urban background concentrations of $PM_{2.5}$ across the UK based on 2010 levels.

7.5.22 The Air Quality Expert Group Report on Particulate Matter in the UK states that there is only one long-running time series of $PM_{2.5}$ measurements. Annual-mean $PM_{2.5}$ concentrations monitored at Hodge Hill in Birmingham over the period from 1995 to 2002 have demonstrated a statistically significant downwards trend of 0.4 µg.m^{-3} per year.

7.5.23 If a worst case assumption is made that all the particulate emitted from the stack is $PM_{2.5}$, then the maximum process contribution across the model domain of 0.5µg.m^{-3} would represent 2% of the proposed objective (25µg.m^{-3}). In practice it is expected $PM_{2.5}$ emissions will represent significantly less than the limit.

7.5.24 The NAQIA provides an estimate of mapped background annual-mean $PM_{2.5}$ concentrations of 10.7µg.m^{-3} in 2014 for the grid square in which the SEP is located. When the maximum process contribution from the proposed SEP is added to this, the maximum PEC would be 11.2µg.m^{-3}. This is well below the 25 µg.m^{-3} target value for $PM_{2.5}$.

Stack Effects at Discrete Sensitive Receptors

7.5.25 Pollutant concentrations were also predicted at all sensitive receptors for Scenario 2. Table 7.23 and Table 7.24 presents the results for the pollutants specified in paragraph 7.33 as having a PC of more than 1 % of the EQS and pollutants specified in 7.33 with PECs of 'slight adverse' significance.

7.5.26 The predictions in Table 7.23 and Table 7.24 indicate that the highest PCs and PECs are predicted at receptors R1 and R2. This is largely because these receptors are located in proximity to the proposed SEP. R1 is located approximately 800 m to the south of the stack, and R2 is located south west of the stack at a distance of 1000 m. Full tabulated results for all relevant pollutants and averaging periods at each sensitive receptor are presented in Appendix 7.1.

Table 7.23: Maximum Process Contributions (µg.m^{-3}) at Discrete Receptors (Modelled at Long-Term 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
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
SO_2	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
Cd	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}
PAHs (B(a)P)	Annual	2.72×10^{-5}	1.77×10^{-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}

Table 7.24: Predicted Environmental Concentrations (µg.m^{-3}) at Discrete Receptors (Modelled at Long-Term 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)	28.5	28.5	28.4	28.4	28.4	28.4	28.4	28.3	28.3	28.3	28.3	28.3	28.3	28.3	28.3	28.5
	Annual	28.4	28.3	28.3	28.3	28.3	28.3	28.3	28.3	28.31	28.31	28.31	28.30	28.30	28.30	28.30	28.4
NO_2	1 hour (99.79th percentile)	49.8	46.0	43.5	44.3	43.9	41.9	41.5	40.4	40.9	40.2	39.6	39.7	39.2	39.5	39.5	49.8
	Annual	19.8	19.5	19.4	19.4	19.3	19.3	19.2	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.8
SO_2	Annual	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3
Cd	Annual	3.6×10^{-4}	3.0×10^{-4}	2.8×10^{-4}	2.8×10^{-4}	2.6×10^{-4}	2.7×10^{-4}	2.4×10^{-4}	2.3×10^{-4}	2.3×10^{-4}	2.3×10^{-4}	2.2×10^{-4}	2.1×10^{-4}	2.1×10^{-4}	2.1×10^{-4}	2.1×10^{-4}	3.6×10^{-4}
PAHs (B(a)P)	Annual	9.6×10^{-5}	9.4×10^{-5}	9.3×10^{-5}	9.3×10^{-5}	9.2×10^{-5}	9.2×10^{-5}	9.2×10^{-5}	9.1×10^{-5}	9.1×10^{-5}	9.1×10^{-5}	9.1×10^{-5}	9.0×10^{-5}	9.1×10^{-5}	9.0×10^{-5}	9.0×10^{-5}	9.6×10^{-5}

Metal Deposition

7.5.27 The maximum deposition rates for all receptors (sensitive receptors and the whole modelling domain) are compared against the relevant deposition EALs in Table 7.3. The results for the modelling of metal deposition at identified human health receptors are presented in Table 7.25. The results indicate that deposition rates are within all relevant EALs for deposition to land.

Table 7.25: Maximum Metal Deposition ($mg.m^{-2}.d^{-1}$) Process Contributions

Pollutant	Maximum Deposition Rate EAL	Maximum Deposition Rate 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

Dioxin and Furan Deposition

7.5.28 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 the Technical Appendix 7.1, Section 8. These results are used as the inputs to the HHRA, summarised in the following section and fully detailed in Technical Appendix 7.2.

Identificaiton and Evaluation of Key Human Health Impacts

Construction

7.5.29 Due to the nature of the health risk assessment being related to long-term exposure to persistent contaminants, the effect of the construction phase is not considered to be of relevance to this assessment. Acute (short term) effects from dust generation during the construction period and their potential effect on air quality are discussed within Section 7.7

Operation and Decommissioning

7.5.30 Standard risk assessment models assume that, for most chemicals with non-cancer effects, the effects exhibit a threshold response. The default approaches used by the model to assess the potential for health effects associated with a non-linear or threshold relationship involve:

- Comparing an estimate of ingested exposure to a Reference Dose (RfD) for oral exposure (the term Tolerable Daily Intake (TDI) is used in the UK toxicological reports to describe it
- Comparing an estimated chemical-specific air concentration to the Reference Concentration (RfC) for direct inhalation exposures

7.5.31 An RfD is a daily oral intake rate that is estimated to pose no unacceptable risk of adverse health effects, even to sensitive population 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.

7.5.32 Cancer risk estimates represent the incremental probability that an individual will develop cancer over a lifetime as a result of a specific exposure to a carcinogenic chemical.

Estimating Hazards and Risks

7.5.33 The risk assessment presented in this report has followed the following elements of work;

- Estimates of the combined cancer risks and non-cancer risks (Hazard Quotients) for all identified receptors
- estimates of risks associated with exposure to relevant COPCs
- estimates of risks 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
- 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.

7.5.34 The total cancer risks and total hazard quotients estimated by the model for the maximum emission from the proposed SEP from all the identified sources for all identified receptors are presented and discussed in the technical appendix.

7.5.35 The results have demonstrated 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, which forms the main source of their daily protein, 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. This is based on the assumption that the farmer receptor location is an active farm that produces beef, pork, poultry, eggs, milk and produce.

7.5.36 The results show that for all the assessed compounds, the non-threshold and threshold risks are significantly below their target levels.

7.5.37 Expressed as a probability, all cancer risks are well below the target level of 1×10^{-5} for all contaminants, 1×10^{-3} for the ingestion pathway for arsenic and 1×10^{-4} 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 (see details in Technical Appendix 8).

7.5.38 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 6.9×10^{-2}, with the ingestion contributing 5.0×10^{-2} and the inhalation contributing 1.91×10^{-2}, all significantly lower than the target level of 1. Expressed as a probability, the combined cancer risk is estimated to be 6.92×10^{-7}, significantly lower than that the target level of 1×10^{-5} for a combined risk of BaP.

7.5.39 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 1.90×10^{-2}, significantly lower than the target level of 1. Expressed as a probability, the cancer risk is estimated to be 1.90×10^{-6}, significantly lower than that the target level of 1×10^{-4} for inhalation of chromium.

7.5.40 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 1.35×10^{-3} through the ingestion pathway and 3.33×10^{-3} 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 1.38×10^{-6}, including a risk value of 1.35×10^{-6} from ingestion and 3.33×10^{-8} from inhalation, both significantly lower than the target level of 1×10^{-3} and 1×10^{-5} respectively.

7.5.41 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 4.73×10^{-1}, lower than the target level of 1.

7.5.42 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 3.63 x 10^{-1}, lower than the target level of 1. Thallium has also provided the worst risk for farmer receptor at a hazard quotient of 7.68 x 10^{-2}, 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.

7.5.43 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 4.95 x 10^{-2} 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 1.65 x 10^{-1}.

7.5.44 The quotients from PCBs at receptor 2 modelled as a fish eater were predicted to be 9.49 x 10^{-2} and 2.56 x 10^{-5} for the ingestion and inhalation respectively with the combined hazard index estimated to be 9.49 x 10^{-2}, lower than the target level of 1.

7.5.45 Despite the numerous highly conservative assumptions 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.

7.5.46 The total exposure for the worst receptor at farm receptor 47/48 using ADMS for BaP was 4.08 x 10^{-3}. Using a BMDL10 of 520µg/kg/day (lowest BMDL published by the Committee on Carcinogenicity of Chemicals in Food, Consumer Products and the Environment) an MoE ratio of 127,421 was calculated which corresponds to an MoE band of 'unlikely to pose a risk'.

7.5.47 Therefore potential cancer and non-cancer risk from exposure to emissions from the proposed SEP are well below the acceptable UK levels for all identified sensitive receptors.

7.5.48 IRAP-h View calculates the exposure through breast milk by calculating infant exposures, and risks associated with such infant exposures for dioxins and furans expressed as 2,3,7,8-TCDD TEQ.

7.5.49 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 to infants is to compare estimated TEQ exposures to national average background exposure levels.

7.5.50 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 Fisheries (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.

7.5.51 The infant ADD pg/kg-day for each receptor and the calculated average daily dose for an infant exposed to contaminated breast milk for specific dioxins and furans at the most affected receptor are presented and discussed in the Technical Appendix. All of the estimated values at all receptors significantly lower than the UK and USA infant background exposure.

7.5.52 Estimates of the potential health effects of exposure to lead are commonly assessed in relation to lead concentration in blood. In addition to the assessment of potential risk from exposure to lead through all the identified pathways of exposure, lead exposure was also compared with additional criteria. The EA formerly 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 0.25 mg/m^3. The model predicted average and maximum soil concentration and the air concentration of lead at different receptors are presented and discussed in relation to these additional criteria in the Technical Appendix. Both the soil and air concentrations of lead were found to be significantly lower than their target level at all receptors.

7.5.53 The predicted air concentrations at sensitive receptors were presented and compared with relevant environmental criteria and standards. All concentration found to be much lower than the acceptable concentrations

7.5.54 To allow for inspection of the very low predicted soil concentration of all identified contaminants as a result of the emission from the proposed SEP, they were presented in the Appendix 7.2 alongside the UK survey of soil data for urban and rural soils and the soil guideline values.

7.5.55 The predicted concentration for certain contaminants in meat, fish, poultry and produces produced in the area were presented and compared to the maximum allowable levels in foodstuffs as reported in Commission Regulations (EC) No 1881/2006 and enforced by The UK Contaminants in Food Regulations 2007 and found to be much lower than the UK standard.

Assessment of Effects on Ecologically Designated Sites

Ambient concentrations of NO_x, SO_2 and NH_3

7.5.56 The PC NO_x comprises <1% of the EQS and/or the PEC NO_x is not predicted to exceed the relevant EQS (critical level for NO_x) for all designated sites within the assessment area except Milton Creek LWS. Therefore, no significant impacts are predicted on these sites from increased concentrations of NO_x resulting from the operation of the SEP.

7.5.57 The EQS for NO_x is expected to be exceeded and the PC NO_x comprises >1% of that EQS at Milton Creek LWS. Further, the PC NO_x is expected to be >1% of the current background levels. Following European-wide industrial compliance with the requirements of the Large Combustion Plant Directive and Limitation of Sulphur in Liquid Fuels Directive, background levels of NO_x have fallen in recent years. Therefore, given the urban environment surrounding it (Sittingbourne, Kemsley and Merston), it is highly likely that the current background levels were very much higher in previous years with no adverse effects reported. Therefore, the small increase in NO_x as a result of the operation of the SEP is considered unlikely to have any significant impact.

7.5.58 The PC SO_2 comprises <1% of the EQS and is not predicted to exceed the relevant EQS at any designated site within the assessment area. Therefore, no significant impacts are predicted on these sites from increased concentrations of SO_2 resulting from the operation of SEP.

7.5.59 The PEC NH_3 comprises <1% of the EQS and is not predicted to exceed the relevant EQS at any designated site within the assessment area. Therefore, no significant impacts are predicted on these sites from increased concentrations of NH_3 resulting from the operation of SEP.

Acid deposition

Ramsar, SSSIs and LWSs

7.5.60 The PC acid deposition is predicted to comprise <1% of the EQS at the Thames Estuary & Marshes SSSI/Ramsar and Queensdown Warren SSSI. At all other sites assessed, the PC acid deposition was >1% of the EQS. However, at all these remaining sites, the habitats

present are not thought to be sensitive to acid deposition (www.apis.ac.uk), despite the apparent high deposition rates etc.

7.5.61 Further, following European-wide industrial compliance with the requirements of the Large Combustion Plant Directive and Limitation of Sulphur in Liquid Fuels Directive, background levels of acid deposition have declined in recent years - at the Swale and Medway Estuary and Marshes SPAs (which includes the respective SSSIs and Ramsar sites) they are predicted to decline from 1.74 and 1.96 keq.ha 1.year^{-1}, respectively, in 2003 to 1.5 and 1.71 keq.ha 1.year^{-1} in 2010 (www.apis.ac.uk), a decline of 14% and 13%, respectively. Consequently, even when the SEP is in operation, predicted levels of acid deposition at the above sites (PEC of 1.63 and 1.717 keq.ha 1.year^{-1}, respectively) will still be less than experienced at the sites in recent years.

7.5.62 Both sites are currently considered to be in favourable condition by Natural England (http://www.natureonthemap.org.uk/), with no evidence suggesting that the previously experienced levels of acid deposition had any adverse impacts. Therefore significant impacts on these sites as a result of increased levels of acid deposition resulting from the operation of the SEP are considered very unlikely.

SAC and SPAs

7.5.63 The PC acid deposition comprises <1% of the minimum critical load function (CLF) for all of those features of interest that are sensitive to acid deposition at all SAC/SPAs within the assessment area. Therefore, no significant impacts are predicted on interest features of SAC/SPAs as a result of acid deposition from the proposed SEP.

Nitrogen deposition

Ramsar, SSSIs and LWSs

7.5.64 The PC N deposition comprises <1% of the EQS at all SSSIs and LWSs within the assessment area. Therefore, no significant impacts are predicted on these sites from increased Nitrogen deposition resulting from the operation of the SEP.

SAC/SPAs

7.5.65 4.10 The majority of interest features are either insensitive to N deposition or sensitive indirectly via potential impacts on their habitats. However, the PC N deposition comprises <1% of the minimum EQS at all SAC/SPAs within the assessment area. Therefore, no significant impacts are predicted on these sites from increased Nitrogen deposition resulting from the operation of the SEP.

Assessment of Plume Visibility

7.5.66 Results derived from modelling plume visibility are presented in Table 7.26.

Table 7.26: Results of Plume Visibility Modelling

Parameter	2004	2005	2006	2007	2008	Range
Percentage of hours during the year that a visible plume is predicted	28.1	29.0	27.6	22.1	26.9	22.1 – 28.9
Number of visible plume hours	2472	2538	2419	1936	2361	1936 – 2538
Maximum plume length (m)	231	251	236	249	261	260 – 260
Average plume length (m)	61.5	66.8	65.2	54.6	60.3	54.6 – 66.7
Minimum plume length (m)	0.03	0.06	0.05	0.06	0.85	0.03 – 0.85
Number of hours per year when length of plume exceeds D	0	0	0	0	0	0
Environment Agency H1 classification						

Note D = average distance from the SEP stack to the site boundary

7.5.67 Based on the results of modelling using five years of hourly sequential meteorological data, Table 7.26 indicates that a visible plume could be expected for a maximum of 29% of hours in a year. The maximum number of visible plumes is likely to be in the region of 2538 hours, with an average plume length of 66.7m and a maximum plume length of around 260m.

7.5.68 The EA set a criterion for 'low' significance with regard to visibility of a plume where its length does not exceed the distance to the site boundary for more than 5% of daylight hours.

7.5.69 Results from the dispersion modelling predict that visible plumes that extend beyond the average stack-to-site boundary distance will occur less than 1 hour per year.

7.5.70 Visible plumes can occur at times when ambient temperatures are cooler than the temperature of the dispersing plume, and are therefore less frequent during the warmer daylight hours than they are at night time.

7.5.71 Based on the above results, the predicted significance of the effect of plume visibility is 'low' with reference to the EA criteria.

Traffic Effects

Nitrogen Dioxide (NO_2) Effects

7.5.72 Predicted annual-mean NO_2 concentrations for traffic emissions at the discrete receptors R1 to R15 are presented in Table 7.27 for the opening year of 2014, with and without the proposed SEP.

Table 7.27: Predicted Traffic Annual-Mean NO_2 Concentrations						
Receptor	**Concentration**		**2014 W – 2014 WO**	**2014 W – 2014 WO % of EQS Objective**	**Magnitude Descriptor**	**Significance Descriptor**
	2014 WO	**2014 W**				
R1	27.5	27.9	0.4	1.0	Extremely Small	Negligible
R2	28.0	28.3	0.3	0.7	Extremely Small	Negligible
R3	27.5	27.5	<0.05	<0.05	Extremely Small	Negligible
R4	27.7	27.7	<0.05	<0.05	Extremely Small	Negligible
R5	26.7	26.7	<0.05	<0.05	Extremely Small	Negligible
R6	30.3	30.7	0.4	1.0	Extremely Small	Negligible
R7	30.9	31.3	0.4	1.1	Extremely Small	Negligible
R8	21.9	21.9	<0.05	<0.05	Extremely Small	Negligible
R9	21.5	21.5	<0.05	<0.05	Extremely Small	Negligible
R10	29.5	29.5	<0.05	<0.05	Extremely Small	Negligible
R11	27.1	27.1	<0.05	<0.05	Extremely Small	Negligible
R12	26.2	26.2	<0.05	<0.05	Extremely Small	Negligible
R13	25.9	25.9	<0.05	<0.05	Extremely Small	Negligible
R14	29.5	29.5	<0.05	<0.05	Extremely Small	Negligible
R15	21.6	21.6	<0.05	<0.05	Extremely Small	Negligible

Notes: 2014 WO = 2014 without the proposed development
2014 W = 2014 with the proposed development
AQS Objective = 40 $\mu g.m^{-3}$

7.5.73 In the opening year (2014) with the proposed development, the annual mean NO_2 concentrations range between 21.5 to 31.3 $\mu g.m^{-3}$, which is below the AQS objective of 40$\mu g.m^{-3}$. Using the NSCA magnitude descriptors provided in Table 7.12, the change in NO_2 concentration at all existing receptors is deemed "extremely small" and the significance of annual-mean NO_2 impact is deemed "negligible".

Particulate Matter (PM_{10}) Effects

7.5.74 Predicted annual-mean PM_{10} concentrations at the discrete receptors R1 to R15 are presented in Table 7.28 for the opening year of 2014, with and without the proposed SEP.

Table 7.28: Predicted Traffic Annual-Mean PM_{10} Concentrations						
Receptor	**Concentration**		**2014 W – 2014 WO**	**2014 W – 2014 WO % of EQS Objective**	**Magnitude Descriptor**	**Significance Descriptor**
	2014 WO	**2014 W**				
R1	29.8	29.8	<0.05	<0.05	Extremely Small	Negligible
R2	30.0	30.1	<0.05	<0.05	Extremely Small	Negligible
R3	29.6	29.6	<0.05	<0.05	Extremely Small	Negligible
R4	29.7	29.7	<0.05	<0.05	Extremely Small	Negligible
R5	29.5	29.5	<0.05	<0.05	Extremely Small	Negligible
R6	30.7	30.7	<0.05	<0.05	Extremely Small	Negligible
R7	30.9	30.9	<0.05	<0.05	Extremely Small	Negligible
R8	28.6	28.6	<0.05	<0.05	Extremely Small	Negligible
R9	28.6	28.6	<0.05	<0.05	Extremely Small	Negligible
R10	31.1	31.1	<0.05	<0.05	Extremely Small	Negligible
R11	30.3	30.3	<0.05	<0.05	Extremely Small	Negligible
R12	29.6	29.6	<0.05	<0.05	Extremely Small	Negligible
R13	29.5	29.5	<0.05	<0.05	Extremely Small	Negligible
R14	30.6	30.6	<0.05	<0.05	Extremely Small	Negligible
R15	28.5	28.5	<0.05	<0.05	Extremely Small	Negligible

Notes: 2014 WO = 2014 without the proposed development
2014 W = 2014 with the proposed development
AQS Objective = 40 $\mu g.m^{-3}$

7.5.75 In the opening year (2014) with the proposed development, the annual mean PM_{10} concentrations range between 28.5 to 31.1 $\mu g.m^{-3}$, below the AQS objective of 40$\mu g.m^{-3}$. With the proposed development, the maximum change in annual-mean PM_{10} concentrations is below 0.05$\mu g.m^{-3}$. Using the NSCA magnitude descriptors provided in Table 7.15, the change in PM_{10} concentration at all existing receptors is deemed "extremely small" and the significance of annual-mean PM_{10} impact is deemed "negligible".

Particulate Matter ($PM_{2.5}$) Effects

7.5.76 $PM_{2.5}$ is a subset of PM_{10}. If all if the particulate emissions from the proposed increases in traffic are assumed to be $PM_{2.5}$, the results of the assessment indicate that contributions would be <0.05 $\mu g.m^{-3}$, representing <0.4% of the proposed objective.

7.5.77 The NAQIA estimate of background annual-average $PM_{2.5}$ concentration is 10.7$\mu g.m^{-3}$. When the above contribution from traffic is added to this background, the maximum annual-mean $PM_{2.5}$ concentration is estimated to be 10.6$\mu g.m^{-3}$, which is well below the 25 $\mu g.m^{-3}$ target for $PM_{2.5}$.

Combined Stack and Traffic Effects

7.5.78 The combined effects of the stack and traffic for NO_2 and PM_{10} in the opening year 2014 are presented in Table 7.29 and Table 7.30, respectively

Nitrogen Dioxide (NO_2) Effects

7.5.79 From Table 7.29, the combined annual-mean NO_2 concentrations at all existing receptors are below the AQS objective of 40µg.m^{-3}.

Table 7.29: Predicted Combined Annual-Mean NO_2 Concentrations

Receptor	Concentration (µg.m^{-3})				
	2014 WO	Proposed Development Contribution			PEC
		Traffic Contribution	Stack Contribution	Traffic and Stack SEP Contribution	
R1	27.5	0.4	0.8	1.2	28.7
R2	28.0	0.3	0.5	0.8	28.8
R3	27.5	<0.05	0.4	0.4	27.9
R4	27.7	<0.05	0.4	0.4	28.1
R5	26.7	<0.05	0.3	0.3	27.0
R6	30.3	0.4	0.3	0.7	31.0
R7	30.9	0.4	0.2	0.6	31.5
R8	21.9	<0.05	0.1	0.1	22.0
R9	21.5	<0.05	0.1	0.1	21.6
R10	29.5	<0.05	0.1	0.1	29.6
R11	27.1	<0.05	0.1	0.1	27.2
R12	26.2	<0.05	0.1	0.1	26.3
R13	25.9	<0.05	0.1	0.1	26.0
R14	29.5	<0.05	0.1	0.1	29.6
R15	21.6	<0.05	0.1	0.1	21.7

Particulate Matter (PM_{10}) Effects

7.5.80 From Table 7.30 the combined annual-mean PM_{10} concentrations at all the existing receptors are below the AQS objective of 40µg.m^{-3}.

Table 7.30: Predicted Combined Annual-Mean PM_{10} Concentrations					
Receptor	Concentration ($\mu g.m^{-3}$)				
	2014 WO	Proposed Development Contribution			PEC
		Traffic Contribution	Stack Contribution	Traffic and Stack SEP Contribution	
R1	29.8	<0.05	0.05	0.05	29.8
R2	30.0	<0.05	0.03	0.03	30.1
R3	29.6	<0.05	0.03	0.03	29.6
R4	29.7	<0.05	0.03	0.03	29.7
R5	29.5	<0.05	0.02	0.02	29.5
R6	30.7	<0.05	0.02	0.02	30.7
R7	30.9	<0.05	0.01	0.01	30.9
R8	28.6	<0.05	0.01	0.01	28.6
R9	28.6	<0.05	0.01	0.01	28.6
R10	31.1	<0.05	0.01	0.01	31.1
R11	30.3	<0.05	0.01	0.01	30.3
R12	29.6	<0.05	<0.05	<0.05	29.6
R13	29.5	<0.05	<0.05	<0.05	29.5
R14	30.6	<0.05	<0.05	<0.05	30.6
R15	28.5	<0.05	<0.05	<0.05	28.5

Particulate Matter ($PM_{2.5}$) Effects

7.5.81 If the whole of the particulate emissions from the stacks and traffic are assumed to be $PM_{2.5}$, the maximum contribution of 0.05$\mu g.m^{-3}$ would represent 0.2% of the proposed objective for urban background locations.

7.5.82 The NAQIA provides an estimate of background annual-average $PM_{2.5}$ concentrations of 10.7$\mu g.m^{-3}$. When the above contribution from traffic and stack is added, the maximum-annual mean $PM_{2.5}$ concentration is estimated to be 10.75$\mu g.m^{-3}$, which is well below the 25 $\mu g.m^{-3}$ target for $PM_{2.5}$.

Summary of Effects

Operational-Phase Stack Effects

7.5.83 The assessment has shown that with emissions from the stack assumed to be 100% of the long-term and short-term EU Directive limit, the resulting ground-level concentrations are predicted to be of 'negligible' for all pollutants, except for the annual-mean SO_2, NO_2, Cd and 8-hour CO which are of 'slight-adverse' significance but below their relevant environmental quality standards.

Operational-Phase Traffic Effects

7.5.84 The assessment has shown that traffic-related effects are 'negligible' for NO_2 and for PM_{10}.

Operational-Phase Stack and Traffic Effects Combined

7.5.85 With the stack emissions based on the worst-case, being at 100% of the EU Directive emission limit values, the assessment has shown that the combined contributions for ground-level annual mean NO_2 and PM_{10} concentrations are below the objective of 40 $\mu g.m^{-3}$.

Cumulative Stack Effects

7.5.86 The results of modelling atmospheric emissions from the SEP and emissions from the existing Kemsley Paper Mill are summarised and interpreted below for each of the assessment scenarios. The model results are presented in tabular form and as contour plots for NO_2 for 1-hour and annual-average for NO_2 and PM_{10}.

Scenario 1: Results

7.5.87 Table 7.30 summarises the maximum predicted contribution (PC) to ground-level concentrations.

Table 7.31: Maximum Cumulative Process Contributions ($\mu g.m^{-3}$) at Short-Term EU Directive Emission Limits

Pollutant	Averaging Period	EQS	Max PC	Max PC as % of EQS	Magnitude of PC
NO_2	1 hour 99.79th percentile	200	38.1	19.1	Medium
SO_2	15 minute 99.9th percentile	266	46.9	17.6	Medium
	1 hour 99.73rd percentile	350	42.7	12.2	Small
HCl	1 hour maximum	750	14.0	1.8	Very Small
HF	1 hour maximum	160	0.9	0.6	Very Small

Note: EQS - Environmental Quality Standard
PC – Process Contribution

Table 7.32: Maximum Cumulative Environmental Contributions (µg.m^{-3}) at Short-Term EU Directive Emission Limits

Pollutant	Averaging Period	EQS	AC	Max PEC	Max PEC as % of EQS	Significance Descriptor
NO_2	1 hour 99.79th percentile	200	42.6	80.7	40.3	Slight Adverse
SO_2	15 minute 99.9th percentile	266	4.0	50.9	19.1	Slight Adverse
	1 hour 99.73rd percentile	350	4.0	46.7	13.3	Slight Adverse
HCl	1 hour maximum	750	0.6	14.6	1.9	Negligible
HF	1 hour maximum	160	4.9	5.8	3.6	Negligible

Note: AC – Ambient concentration
PEC – Predicted environmental concentrations
EQS - Environmental Quality Standard

7.5.88 The results presented in Table 7.31 and Table 7.32 show that if the SEP operated at 100% of the short-term emission limits, the predicted concentrations would be of 'negligible' significance.

7.5.89 Because the maximum potential short-term effects have been based on the proposed SEP operating at the maximum short-term emission limits, with a 100% plant load factor, and coinciding with the worst-case meteorological conditions for dispersion, the results are considered to represent the 'worst case' for the short-term operation.

Scenario 2: Results

7.5.90 Table 7.33 summarises the results for all pollutants with the SEP and Kemsley Paper Mill operating at the long-term emission limits. All the short-term PCs are predicted to be less than 10% of the relevant EQS. All the long-term PCs are less than 1% of the relevant EQS (equivalent to a 'very small' magnitude), with the exception of NO_2, SO_2 and Cd, which are of 'small' to 'medium' magnitude.

7.5.91 The results presented in Table 7.34 indicate that PECs from the SEP are considered to be 'negligible' significance (using the significance criteria discussed in Table 7.12) for most of the pollutants; the exceptions are daily-mean PM_{10}, 8 hour CO and annual-mean NO_2, SO_2 and Cd which are all of 'slight-adverse' significance. The results presented in Table 7.33 and Table 7.34 are considered to represent the 'worst case' for the long-term operation of the SEP.

7.5.92 Contour plots of short-term and long-term NO_2 and PM_{10} contributions from the combined SEP and existing Kemsley Paper Mill operating at long-term emission limits set out in

Directive 2000/76/EC are presented in Figure 7.6 to Figure 7.8. These contour plots can be considered representative of the dispersion pattern for all pollutants. The contour plots show that the highest short-term contributions of NO_2 from the SEP and the highest annual-mean contributions are predicted to occur to the northeast of the site, within The Swale.

Table 7.33: Predicted Maximum Contribution Concentration (µg.m^{-3}) at Long-Term EU Directive Emission Limits

Pollutant	Averaging Period	EQS	Max PC	Max PC as % of EQS	Magnitude of PC
PM_{10}	24 hour (90.41st percentile)	50	0.69	1.4	Very Small
	Annual	40	0.17	0.4	Very Small
HCl	1 hour (maximum)	750	2.33	0.3	Very Small
	Annual	20	0.17	0.9	Very Small
HF	1 hour (maximum)	160	0.23	0.1	Very Small
SO_2	15 minute (99.90th percentile)	266	9.6	3.6	Very Small
	1 hour (99.73rd percentile)	350	10.7	3.1	Very Small
	24 hour (99.18th percentile)	125	7.8	6.2	Very Small
	Annual	50	0.9	1.8	Small
NO_2	1 hour (99.79th percentile)	200	23.34	11.7	Small
	Annual	40	3.79	9.5	Medium
CO	8 hour (maximum daily running)	10,000	34.69	0.3	Very Small
	Annual	350	3.08	0.9	Very Small
Cd	1 hour (maximum)	1.5	5.83×10^{-3}	0.4	Very Small
	Annual	0.005	4.28×10^{-4}	8.6	Medium
Ti	1 hour (maximum)	30	5.83×10^{-3}	0.0	Very Small
	Annual	1	4.28×10^{-4}	0.0	Very Small
Hg	1 hour (maximum)	7.5	1.17×10^{-2}	0.2	Very Small
	Annual	0.25	8.55×10^{-4}	0.3	Very Small
Sb	1 hour (maximum)	150	1.30×10^{-2}	0.0	Very Small
	Annual	5	9.50×10^{-4}	0.0	Very Small
As	1 hour (maximum)	15	5.68×10^{-3}	0.0	Very Small
	Annual	0.2	4.17×10^{-4}	0.2	Very Small
Cr	1 hour (maximum)	3	2.86×10^{-2}	1.0	Very Small
	Annual	0.1	2.10×10^{-3}	2.1	Very Small
Co	1 hour (maximum)	6	1.30×10^{-2}	0.2	Very Small
	Annual	0.2	9.50×10^{-4}	0.5	Very Small
Cu	1 hour (maximum)	60	1.25×10^{-2}	0.0	Very Small
	Annual	2	9.15×10^{-4}	0.0	Very Small
Pb	Annual	0.5	3.00×10^{-3}	0.0	Very Small
Mn	1 hour (maximum)	1500	1.30×10^{-2}	0.0	Very Small
	Annual	1	9.50×10^{-4}	0.1	Very Small
Ni	1 hour (maximum)	30	2.89×10^{-2}	0.1	Very Small
	Annual	1	2.12×10^{-3}	0.2	Very Small
V	1 hour (maximum)	5	1.30×10^{-2}	0.3	Very Small
	Annual	1	9.50×10^{-3}	0.1	Very Small
Dioxins & Furans	Annual	-	1.7×10^{-9}	-	-
Ammonia	1 hour (maximum)	2500	1.17	0.0	Very Small
	Annual	180	0.09	0.1	Very Small
PAHs (B[a]P)	Annual	0.00025	1.73×10^{-5}	6.9	Medium
PCBs	Annual	0.2	8.58×10^{-5}	0.0	Very Small

Note: PC – Process Contribution; EQS – Environmental Quality Standard

Table 7.34: Predicted Maximum Cumulative Environmental Quality Standards (µg.m^{-3}) at Long-Term EU Directive Emission Limits

Pollutant	Averaging Period	EQS	AC	Max PEC	Max PEC as % of EQS	Significance Descriptor
PM_{10}	24 hour (90.41st percentile)	50	28.3	29.0	58.0	Slight Adverse
	Annual	40	28.3	28.47	71.2	Negligible
HCl	1 hour (maximum)	750	0.6	2.93	0.4	Negligible
	Annual	20	0.3	0.47	2.4	Negligible
HF	1 hour (maximum)	160	4.92	5.15	3.2	Negligible
SO_2	15 minute (99.90th percentile)	266	4.0	13.60	5.1	Negligible
	1 hour (99.73rd percentile)	350	4.0	14.70	4.2	Negligible
	24 hour (99.18th percentile)	125	4.0	11.80	9.4	Negligible
	Annual	50	2.0	2.90	5.8	Slight Adverse
NO_2	1 hour (99.79th percentile)	200	42.6	65.94	33.0	Negligible
	Annual	40	21.3	25.09	62.7	Slight Adverse
CO	8 hour (maximum daily running)	10,000	5400	574.7	57.0	Slight Adverse
	Annual	350	0.27	3.35	1.0	Negligible
Cd	1 hour (maximum)	1.5	0.4×10^{-3}	6.23×10^{-3}	0.4	Negligible
	Annual	0.005	0.2×10^{-3}	6.28×10^{-4}	12.6	Slight Adverse
Ti	1 hour (maximum)	30	0.02×10^{-3}	5.85×10^{-3}	0.0	Negligible
	Annual	1	0.01×10^{-3}	4.38×10^{-4}	0.0	Negligible
Hg	1 hour (maximum)	7.5	0.1×10^{-3}	1.18×10^{-2}	0.2	Negligible
	Annual	0.25	0.2×10^{-3}	1.06×10^{-3}	0.4	Negligible
Sb	1 hour (maximum)	150	2.8×10^{-3}	1.58×10^{-2}	0.0	Negligible
	Annual	5	1.4×10^{-3}	2.35×10^{-3}	0.0	Negligible
As	1 hour (maximum)	15	2.0×10^{-3}	7.68×10^{-3}	0.1	Negligible
	Annual	0.2	1.0×10^{-3}	1.42×10^{-3}	0.7	Negligible
Cr	1 hour (maximum)	3	2.3×10^{-3}	3.09×10^{-2}	1.0	Negligible
	Annual	0.1	4.6×10^{-3}	6.70×10^{-3}	6.7	Negligible
Co	1 hour (maximum)	6	0.2×10^{-3}	1.32×10^{-2}	0.2	Negligible
	Annual	0.2	0.1×10^{-3}	1.05×10^{-3}	0.5	Negligible
Cu	1 hour (maximum)	60	10.0×10^{-3}	2.25×10^{-2}	0.0	Negligible
	Annual	2	5.0×10^{-3}	5.92×10^{-3}	0.3	Negligible
Pb	Annual	0.5	$15E \times 10^{-3}$	4.53×10^{-2}	3.9	Negligible
Mn	1 hour (maximum)	1500	6.7×10^{-3}	1.97×10^{-2}	0.0	Negligible
	Annual	1	13.4×10^{-3}	1.44×10^{-2}	1.4	Negligible
Ni	1 hour (maximum)	30	6.4×10^{-3}	3.53×10^{-2}	0.1	Negligible
	Annual	1	3.2×10^{-3}	5.32×10^{-3}	0.5	Negligible
V	1 hour (maximum)	5	14.8×10^{-3}	2.78×10^{-2}	0.6	Negligible
	Annual	1	7.4×10^{-3}	8.35×10^{-3}	0.8	Negligible
Dioxins & Furans	Annual	-	6.0×10^{-3}	6.17×10^{-8}	-	
Ammonia	1 hour (maximum)	2500	0.2×10^{-3}	1.17×10^{-2}	0.0	Negligible
	Annual	180	0.1×10^{-3}	9.01×10^{-2}	0.1	Negligible
PAHs (B[a]P)	Annual	0.00025	9.0×10^{-5}	1.07×10^{-4}	42.9	Slight Adverse
PCBs	Annual	0.2	1.10×10^{-6}	8.69×10^{-5}	0.0	Negligible

Note: AC – Ambient concentration
PEC – Predicted environmental concentrations
EQS - Environmental Quality Standard

Cumulative Assessment – Potential Impacts

Biomass Combined Heat and Power Plant at Ridham Dock, Kent

7.5.93 The potential cumulative air quality effects associated with the proposed Biomass CHP at Ridham Dock have been considered.

7.5.94 Ridham Dock is approximately 1.2 km to the north west of the proposed development. PCs have been predicted for a 20 km x 20 km grid square, centred on the location of the proposed stack. PECs for short-term and long-term emissions are presented in Table 7.21 and Table 7.22 respectively. The PECs are well below the Environmental Assessment Levels for all pollutants. Consequently, the contour plots show that the highest short-term contributions of NO_2 from the SEP and the highest annual-mean contributions are predicted to occur to the northeast of the site.

7.5.95 At Ridham Dock the maximum contributions are predicted to be 4µg.m^{-3} for 1-hour NO_2; 0.3µg.m^{-3} for annual-mean NO_2 and 0.03 µg.m^{-3} for annual-mean PM_{10}. Consequently, no significant cumulative effects are predicted.

G-Park, Kemsley Fields

7.5.96 The potential cumulative air quality effects associated with the proposed G-Pak at Kemsley Fields have also been considered.

7.5.97 The G-Park development is a 126 acre distribution centre, located 2 km to the south of the proposed development. The traffic assessment includes all known committed development in the area, including the proposed G-Park. The results have predicted that with the operation of the proposed SEP (including all committed developments), the effects to air quality are considered to be of "negligible" significance.

7.5.98 PCs have been predicted for a 20 km x 20 km grid square, centred on the location of the proposed stack. PECs for short-term and long-term emissions are presented in Table 7.21 and Table 7.22 respectively. The PECs are well below the Environmental Assessment Levels for all pollutants. Consequently, the contour plots show that the highest short-term contributions of NO_2 from the SEP and the highest annual-mean contributions are predicted to occur to the northeast of the site.

7.5.99 At the G-Park development site, the maximum contributions are predicted to be 8µg.m^{-3} for 1-hour NO_2; 0.2µg.m^{-3} for annual-mean NO_2 and 0.02µg.m^{-3} for annual-mean PM_{10}. Consequently, no significant cumulative effects are predicted.

7.6 Mitigation

Construction Phase

Construction Dust

7.6.1 The London BPG provides best practice mitigation and monitoring measures based on the level of risk identified at construction sites. The mitigation measures provided below are applicable to the proposed development site which has been identified as being of 'low risk' of causing air quality effects during the construction phase:

Site Planning

- Identify responsible person in charge;
- Plan site layout - machinery and dust causing activities should be located away from sensitive receptors; and
- All site personnel to be fully trained.

Demolition works

- Use water as dust suppressant;
- Cutting equipment to use water as suppressant or local exhaust ventilation systems; and
- Securely cover skips and minimise drop heights.

Construction Traffic

- All vehicles to switch off engines – no idling vehicles;
- All loads entering and leaving site to be covered;
- No site runoff of water or mud;
- All non road mobile machinery (NRMM) to use ultra low sulphur tax exempt diesel (ULSD) where available; and
- On road vehicles to comply with set emission standards.

Site Activities

- Minimise dust generating activities; and
- Use water as dust suppressant where applicable.

7.6.2 The BPG advises that implementation of the measures above will help to reduce the impact of construction activities.

Construction Traffic

7.6.3 Emissions of combustion-related pollutants from construction traffic are expected to be negligible in terms of the effect on local air quality, due to the low vehicle numbers, and are therefore not considered quantitatively within this assessment. Nonetheless, good practice mitigation measures such as appropriate traffic control systems will be put in place.

Operational Phase

7.6.4 Operational traffic effects are not expected to be significant. No additional mitigation measures are necessary.

7.7 Residual Impact

Construction Phase

7.7.1 Relevant mitigation measures to minimise the risk of dust nuisance during the construction phase are described in Section 7.3. Effects on air quality from the construction phase will be relatively short-term. Non-reversible residual effects due to construction are not expected and, therefore residual effects are likely to be negligible.

Operational Phase Stack Effects

7.7.2 The assessment has shown that even assuming worst-case emissions from the stack at 100% of the long-term and short-term EU Directive emissions limits, the resulting ground-level concentrations from will be of 'negligible' to 'slight adverse' significance. As such, residual effects from the operation of the proposed development are not likely to be significant.

Operational Phase Traffic Effects

7.7.3 According to the significance criteria adopted for this assessment, overall NO_2 and PM_{10} effects on local air quality are considered to be 'negligible'. Accordingly, no mitigation is proposed. Residual traffic-related effects from the operation of the proposed development are not likely to be significant.

Human Health Risk

7.7.4 Section 7.5 presented the results of the risk assessment for the SEP. No additional mitigation, other than that incorporated within the proposed plant design, is considered to be necessary for the control of emissions from the proposed SEP. Residual effects are therefore those predicted in Section 7.5, which are not considered significant.

7.8 Conclusions

7.7.5 A detailed air quality assessment predicting the potential effects of emissions generated during the construction and operation of the SEP has been undertaken as part of the Environmental Impact Assessment process.

7.7.6 Construction-phase dust effects have been assessed to be 'low' risk if un-mitigated, but are expected to be minimised if the recommended mitigation measures are adopted.

7.7.7 The effects of emissions for construction traffic are expected to be insignificant as traffic generated during the operational phase is less than that associated with the operational phase.

7.7.8 Emissions from the SEP have been assessed through detailed dispersion modelling using best practice approaches. The assessment has been undertaken based on a number of worst-case assumptions. This is likely to result in an over-estimate of the contributions that will arise in practice from the SEP.

7.7.9 The results of dispersion modelling reported in this assessment indicate that predicted contributions and resultant environmental concentrations of all pollutants considered is of 'negligible' to' slight adverse' significance.

7.7.10 With the stack emissions based on the worst-case, being at 100% of the EU Directive emission limit values, combined with the traffic-related contributions the assessment has shown that the resulting ground-level annual mean NO_2 concentrations are below the objective of 40µg.m^{-3}. The combined annual-mean PM_{10} concentrations at all the existing receptors are below the AQS objective of 40µg.m^{-3}. Receptors R10 and R7 are predicted to be marginally below the AQS objective, with the maximum contribution from the combined stack and road traffic contribution below 1µg.m^{-3}.

7.7.11 Overall the effects of the SEP are considered to be 'negligible' to 'slight-adverse'.

7.9 References

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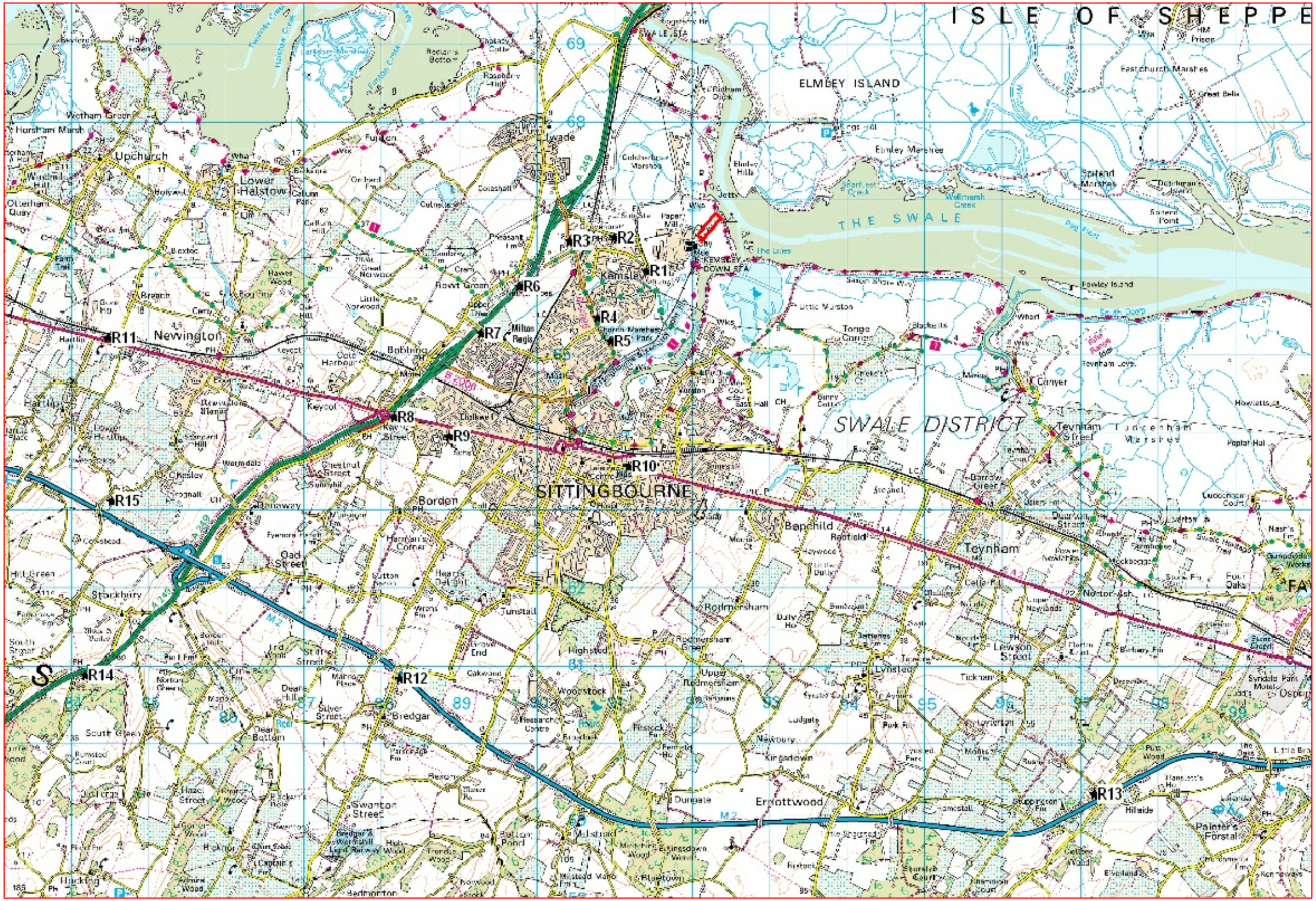
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PROJECT

Kemsley Sustainable Energy Plant

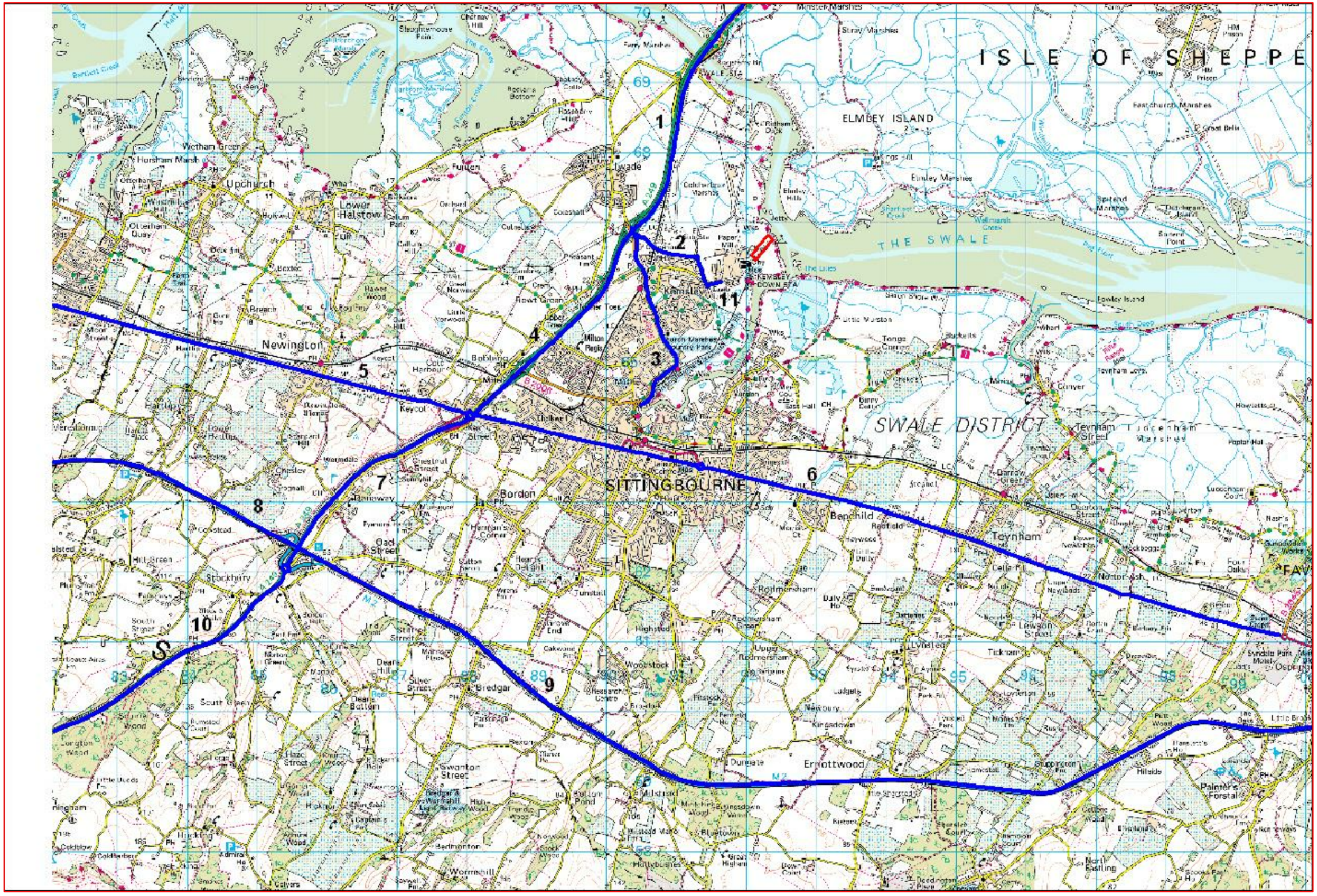
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PROJECT

Kemsley Sustainable Energy Plant

TITLE

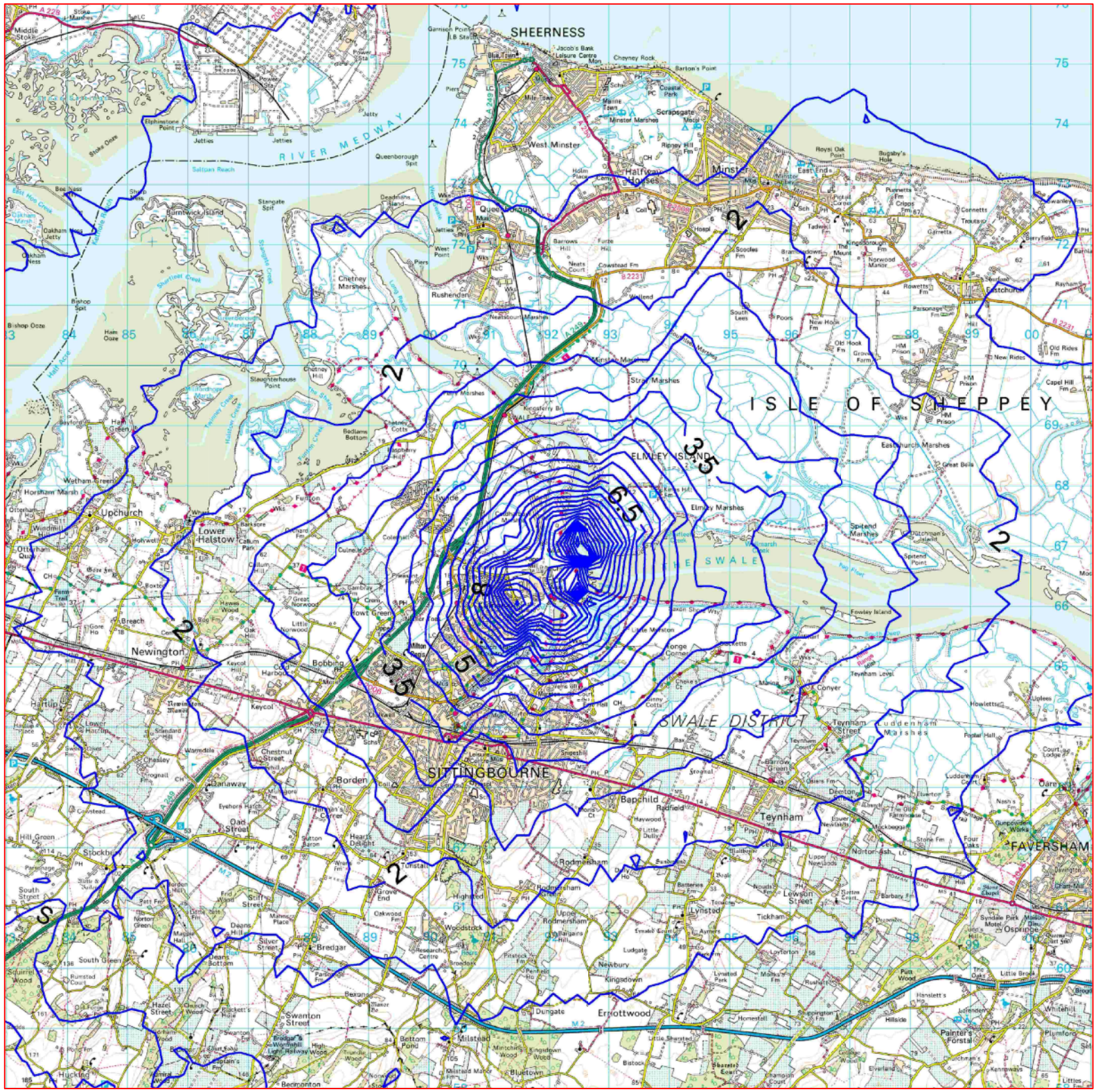
Location of Modelled Roads

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PROJECT

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TITLE

Proposed Facility - Predicted 99.79th Percentile of Hourly Maximum NO2 Contribution

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PROJECT

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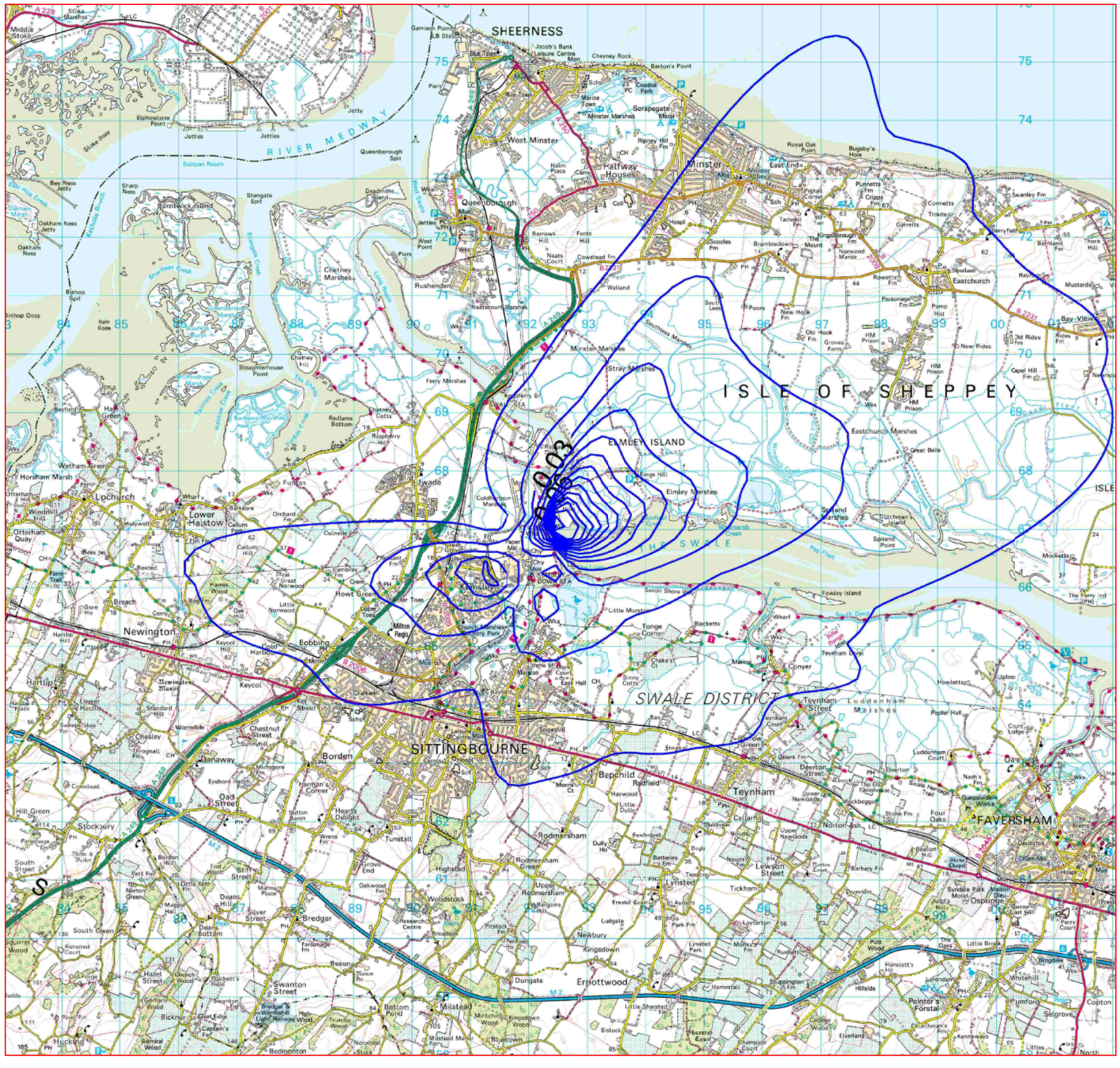
Proposed Facility - Annual Maximum NO2 Contribution

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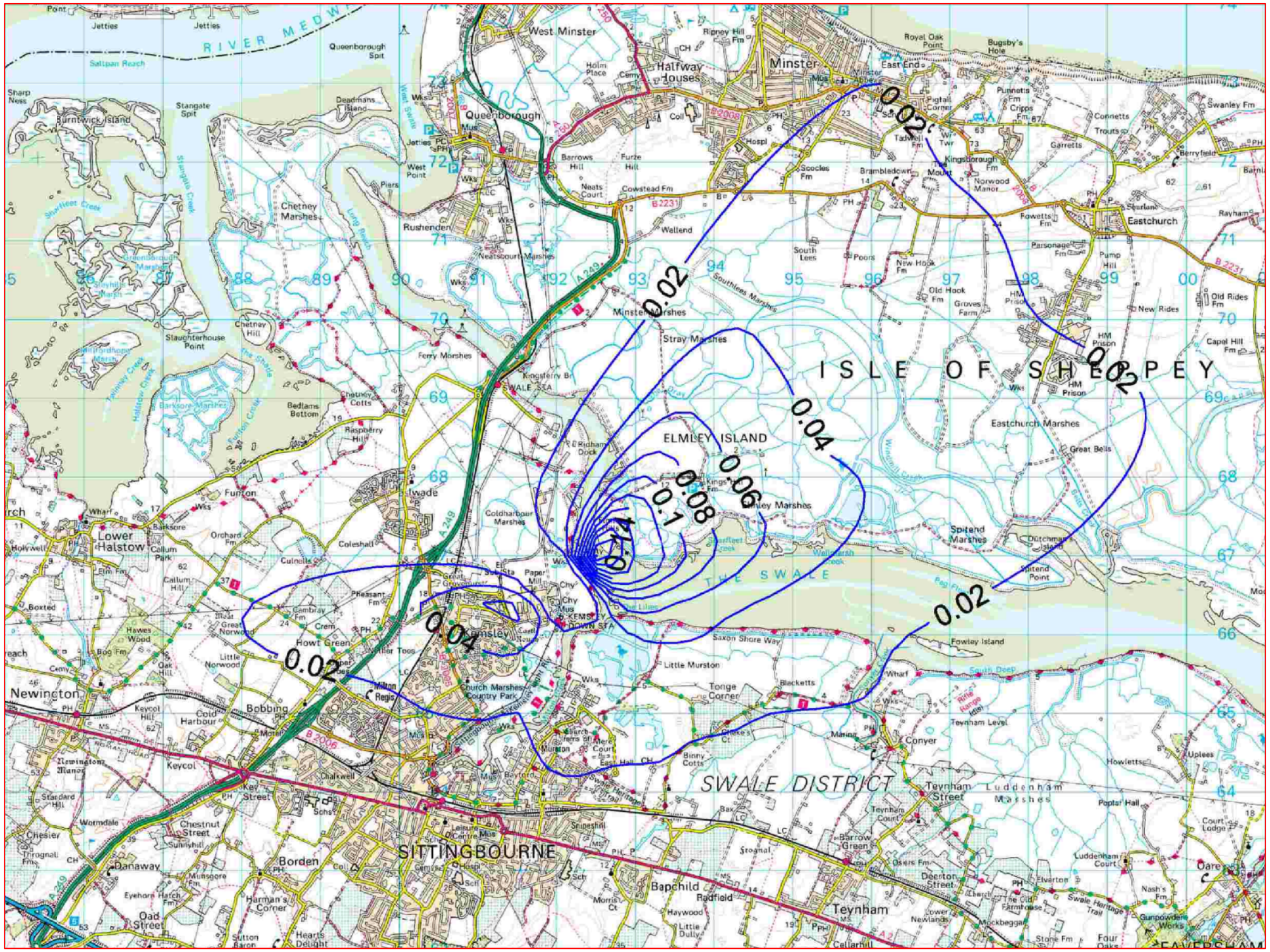
Proposed Facility - Annual Maximum PM10 Contribution

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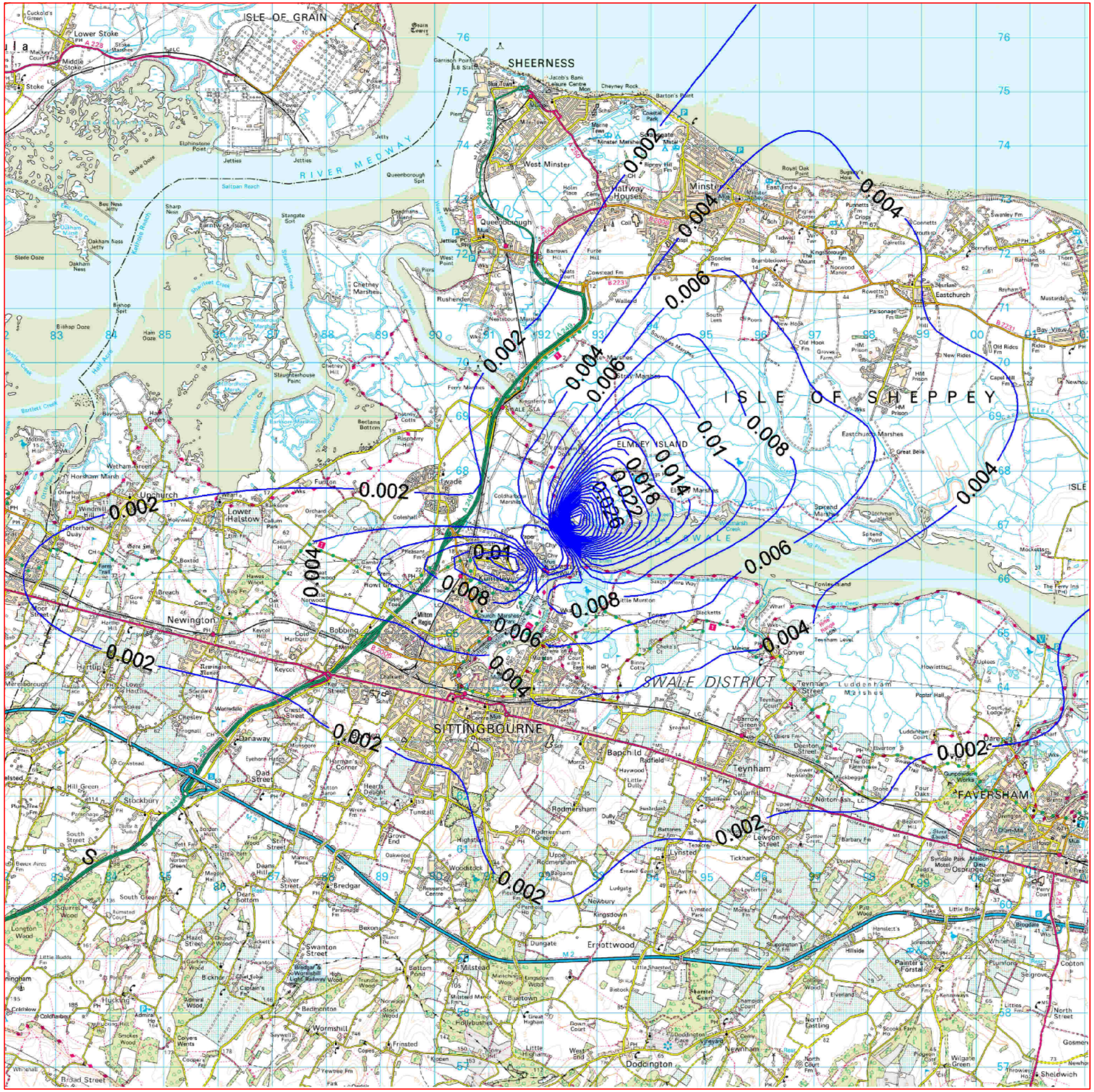
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Proposed Facility - Annual Maximum Acid Deposition

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PROJECT

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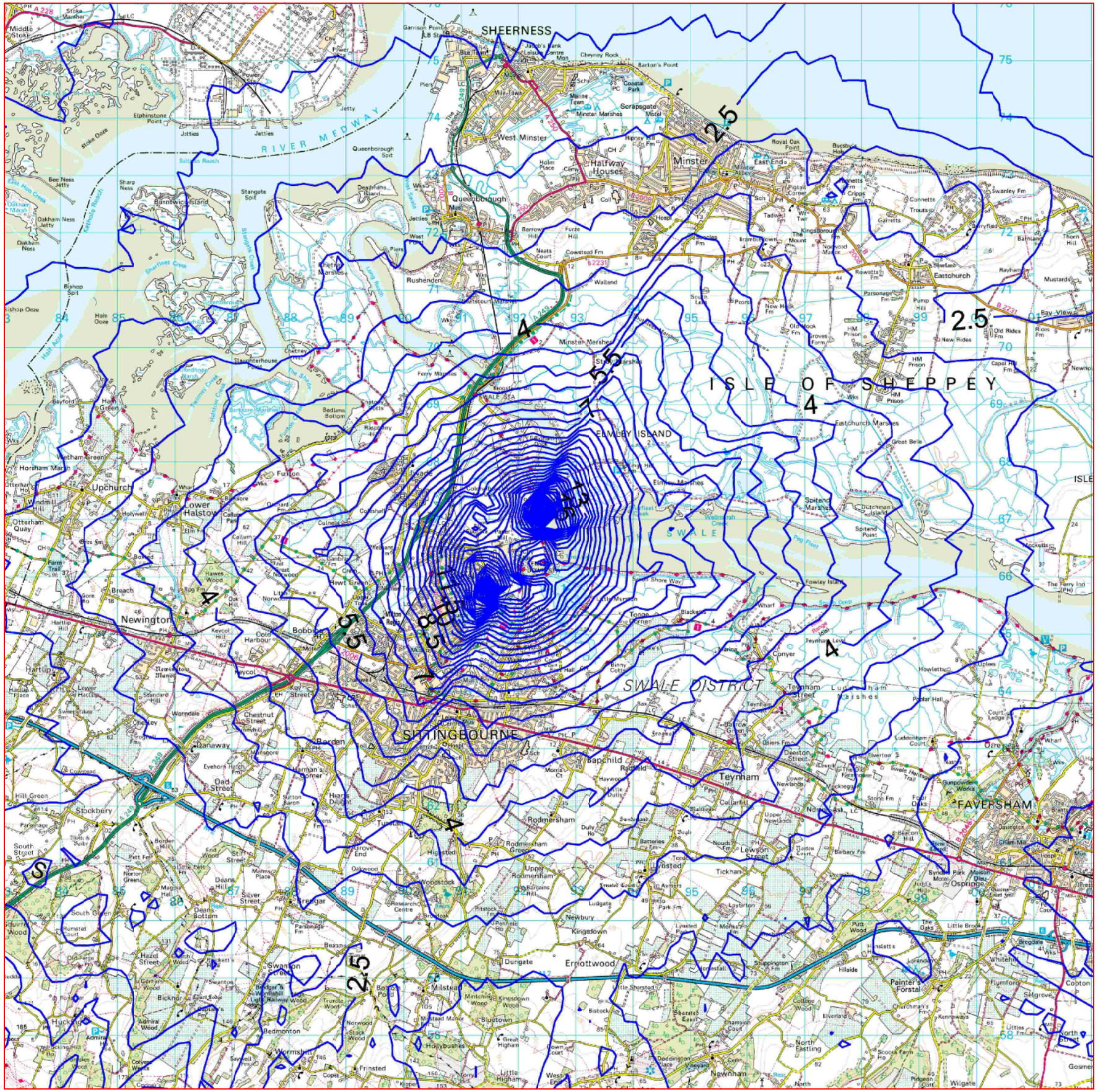
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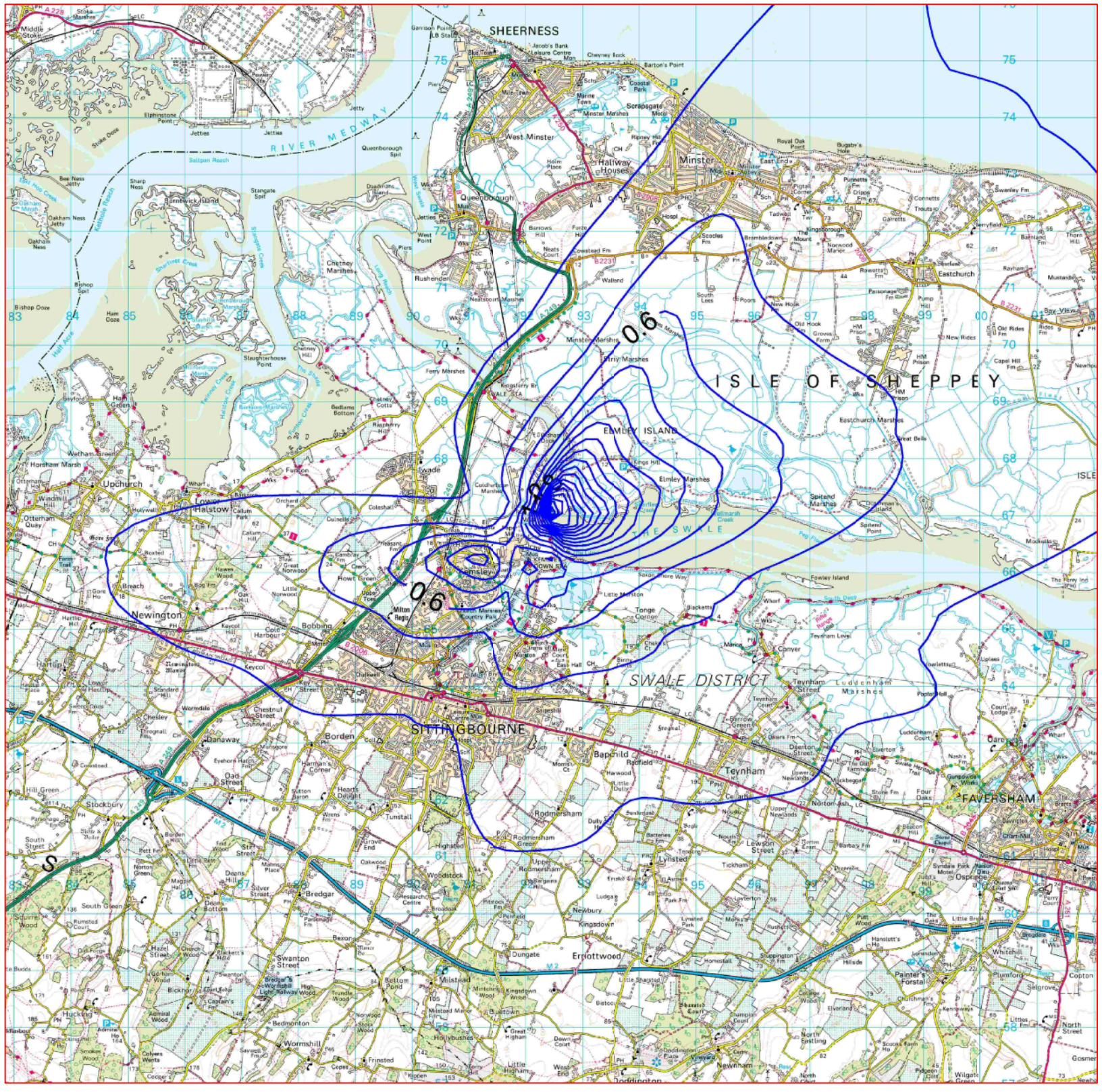
Proposed Facility - Annual Maximum Nitrogen Deposition

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SHEERNESS
RIVER MEDWAY
Queenborough
West Minster
Halfway Houses
Minster
Eastchurch
ISLE OF SHEPPEY
SWALE
SWALE DISTRICT
SITTINGBOURNE
Upchurch
Lower Halstow
Newington
Teynham
FAVERSHAM
Ospringe
Rushenden
Minster Marshes
Eastchurch Marshes
Spitend Marshes
Elmley Marshes
Harty Ferry
Ferry Marshes
Kingsdown
Ernottwood
Rodmersham
Tunstall
Bapchild
Newington
Bobbing
Bedmonton
Swanton Street
Milstead
Frinsted
Newnham
Tonge
Conyer
Leaveland
Lewson Street
Tickham
Painter's Forstal
Selgrove
Colton
Flumford
Hillside
Sheppey Light Railway
Sittingbourne & Kemsley Light Railway
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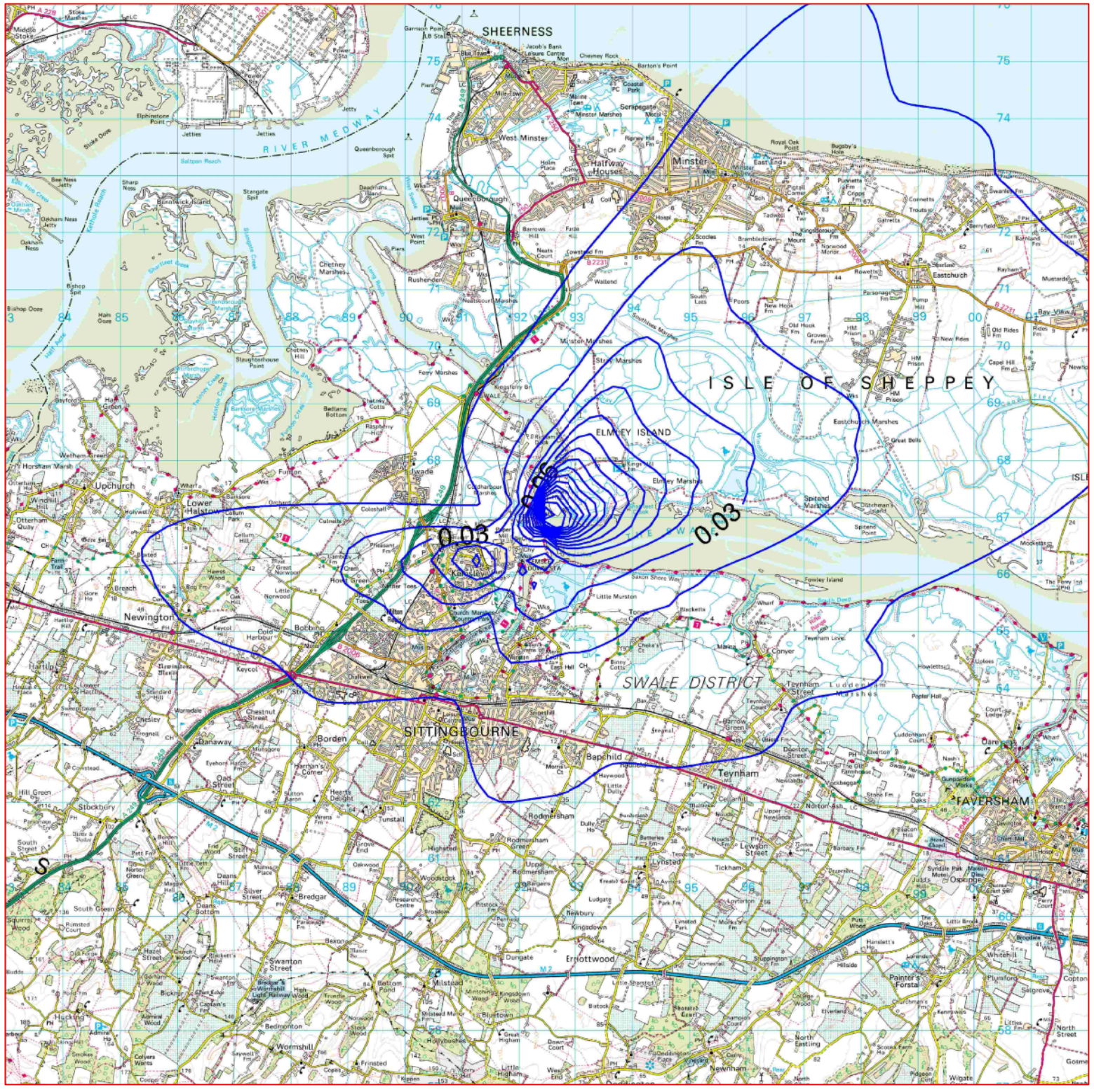
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PROJECT

Kemsley Sustainable Energy Plant

TITLE

Cumulative - Annual Maximum PM10 Contribution

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DEVELOPMENT OF A SUSTAINABLE ENERGY PLANT.

KEMSLEY PAPER MILL, SITTINGBOURNE, KENT

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

ENVIRONMENTAL STATEMENT

CHAPTER 8:

LANDSCAPE AND VISUAL IMPACT

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8 Landscape and Visual Impact

8.1 Introduction

8.1.1 This chapter describes and assesses the existing landscape, townscape and visual resources of the proposal site and in the vicinity of the site. This includes identification of the character and features of the landscape and townscape and consideration of the changes that would result as a consequence of the project. In addition, it considers the potential visual effects arising as a result of the proposals. The chapter reports on studies, including a combination of field surveys and desktop research, to describe, classify and evaluate the existing resource.

8.1.2 The principal objectives of the assessment are:

- to describe, classify and evaluate the existing landscape and townscape likely to be affected by the proposal during its construction and operational phases;
- to identify visual receptors with views of the proposal;
- to identify the likely significant effects on landscape, townscape and views, taking into account measures proposed to reduce or avoid any effects identified.

Relevant Guidance

8.1.3 As a matter of best practice, this assessment has been undertaken based on the relevant guidance on landscape and visual assessment. This includes:

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

Study Area

8.1.4 The study area for the project relates to the zone of theoretical visibility (ZTV) established for the proposed development. The landscape/townscape character and visual receptors have been identified and described within this area.

Consultation

8.1.5 Before the St Regis Paper Mill Sustainable Energy Plant (SEP) scheme application was submitted, consultation was carried out with the planning authority and other relevant parties in order to determine sensitive receptors and representative viewpoints. Following the issue of the scoping report a plan identifying a 15km radius study area, zones of theoretical visibility for both proposed buildings and stacks and 17 candidate viewpoint locations was issued to Kent

County Council for comment. Mike Clifton's response of 10th August 2009 indicated that subject to receipt of site photography, Kent County Council was happy with the viewpoints. Following a site visit on 27th August 2009, photography for 15 receptor viewpoints was issued to Kent County Council for further comment. At this stage 2 viewpoints were withdrawn as no views of the site could be gained and several other viewpoint locations were slightly amended to improve the baseline photography. Mike Clifton's response of 17th September 2009 confirmed that Kent County Council were happy that the viewpoint locations would form an appropriate basis for the landscape and visual impact assessment.

8.1.6 Further consultation was undertaken with Swale Borough Council regarding the detail of the landscape proposals. The proposed SEP lies within the Milton Creek Green Cluster study area. This is one of several areas identified within the Thames Gateway Delivery Plan as a strategic planning and development initiative as part of the Thames Gateway Parklands Programme. Details of the landscape proposals were forwarded to and discussed with members of the Milton Creek team at Swale Borough Council to ensure the overall aspirations of the Green Cluster study were reflected in the SEP scheme. Swale BC in their email of 1st December 2009 highlighted the need for two key elements within the proposals; native plant species local to the area and appropriate boundary treatments. The scheme illustrates that all tree, shrub and grassland species used would be native and locally common to the area, reflecting both the agricultural landscape around Sittingbourne and the estuarine landscape of The Swale. Boundary security fencing would comprise metal mesh fencing to allow views through to landscape planting within the site and views out to the surrounding landscape and townscape. This would allow visual links between the development and its setting to be established.

8.2 Legislation and Planning Context

8.2.1 The national and Development Plan policy framework recognises the importance of renewable energy, but also requires that due consideration is given to areas of recognised landscape value.

National

8.2.2 Planning Policy Statement 1: Delivery Sustainable Development, January 2005 sets out the Government's policies on sustainable development. Key aspects of this guidance, which are relevant to the SEP proposal within its location in Sittingbourne, refer to the need to protect and enhance the quality, character and amenity value of urban areas and to improve the built environment around urban areas. The use of suitably located vacant or underused land is considered desirable. Through the use of good design development can be integrated into the existing urban form and should respond to its local townscape context. It states that

proposed developments should be '*visually attractive as a result of good architecture and appropriate landscaping'*.

Regional and Local

8.2.3 As part of establishing the existing baseline environment, the assessment reviewed and considered a range of relevant policies from The South East Plan Regional Spatial Strategy for the South East of England, May 2009 which replaces the Kent and Medway Structure Plan The Swale Borough Local Plan was adopted in February 2008. Details of the relevant objectives of these plans are included in Chapter 3 of the Environmental Statement; however the key policies and objectives relevant to the landscape environment include:

The South East Plan Regional Spatial Strategy for the South East of England, May 2009 relating to:

- Policy CC6: Sustainable Communities and Character of the Environment.
- Policy CC8: Green Infrastructure.
- Policy NRM8: Coastal Management.
- Policy C3: Areas of Outstanding Natural Beauty.
- Policy C4: Landscape and Countryside Management
- Policy C5: Managing the Rural-Urban Fringe.
- Policy C6: Countryside Access and Rights of Way Management
- Policy C7: The River Thames Corridor.
- Policy BE1: Management of an Urban Renaissance

Kent Thames Gateway Sub-regional Strategy Area

- Policy KTG7: Green Initiatives.

Swale Borough Local Plan, February 2008

- Policy SP1: Sustainable Development.
- Policy SP2: Environment.
- Policy TG1: Thames Gateway Planning Area.
- Policy E1: General Development Criteria.
- Policy E6: The Countryside.
- Policy E9: Protecting the Quality and Character of the Borough's Landscape.
- Policy E13: The Coastal Zone and Undeveloped Coast.
- Policy E17: Historic Parks and Gardens.
- Policy E19: Achieving High Quality Design and Distinctiveness.
- Policy E21: Sustainable Design and Build.
- Policy AAP8: Land Around Milton Creek.

8.2.4 Details of these policies are provided at Appendix 8.1.

8.2.5 In addition to the previously listed policies, further strategies for the Thames Gateway at a regional and local level, which have been considered in the preparation of this chapter, are described below;

Creating sustainable communities: Greening the Gateway, DEFRA and ODPM, 2004.
This initiative aims to enhance the Thames Gateway region by improving economic, social and environmental value.

Thames Gateway Delivery Plan, December 2007.
The plan has the following objectives for regeneration;
'The Thames Gateway Parklands Programme, providing context for a network of accessible, high quality and sustainable landscapes and waterways, which capitalise on existing natural, built,, historical and cultural assets, to support their conservation, enhancement and ongoing use, and boost the Gateways rich biodiversity assets, strengthen character and identity, transforming perceptions and making it a great place to live, work and invest'.

Green Cluster Study 1 – Milton Creek, Department for Communities and Local Government, 2008.

This study intends to set initiatives to regenerate the green public realm of land around Milton Creek. The study identifies local distinctiveness as a basis for the design of a green framework within which a new waterfront district, bridges and pedestrian access will be located.

8.3 Assessment Methodology

Character Assessment

8.3.1 Landscape and townscape character area receptors have been described and evaluated for the proposal. Such receptors include physical elements, features and characteristics that may be affected by the proposal.

8.3.2 A desktop evaluation of the existing landscape has been undertaken, based on a review of existing published information for the study area. This includes information from the Countryside Agency and Swale Borough Council as well as maps and aerial photographs of the area. Site visits and assessments have also been undertaken to confirm and add to the information gathered during the desktop study and to extend the scope of the study to include townscape character. Evaluation of landscape and townscape receptors requires reference to a wide range of information including land use, geology, soils, landform, built environment, vegetation and drainage. The landscape and townscape has been classified into distinct character areas through the process of analysing character – the recognisable pattern of elements and/or features that occur consistently in a given area.

8.3.3 This has resulted in a baseline description of the study area and an analysis of the physical elements and characteristics of the landscape and townscape including their historical and cultural associations.

8.3.4 Landscape and townscape character evaluation requires professional judgement in relation to the resource's 'condition', 'value' and 'sensitivity'. Condition relates to the intactness of the landscape or townscape. Value is concerned with the relative importance that is attached to different landscapes and townscapes. Sensitivity is based on the ability of the resource to accommodate the proposed development without detrimental effects on its character.

Condition (or Quality)

8.3.5 The evaluation of condition is based on judgements about the physical state of the landscape or townscape. It reflects the state of repair of individual features and elements, as indicated by the categories within the scale below, or can be applied to the intactness of the resource as a whole outlined by the corresponding descriptions:

- very good: strong structure; very attractive with distinct features worthy of conservation; strong sense of place; no detracting features.
- good: recognisable structure; attractive with many features worthy of conservation; a sense of place; few detracting features.
- ordinary: distinguishable structure; common place with limited distinctiveness and limited features worthy of conservation; some detracting features.
- poor: weak structure; evidence of degradation; lacks distinctiveness and a sense of place; frequent detracting features.
- very poor: damaged structure; evidence of severe disturbance or dereliction; no distinctiveness; dominant detracting features.

Value (Level of Landscape Importance)

8.3.6 Value is concerned with the relative value or importance that is attached to different landscapes or townscapes. The assessment considers statutory designations and also takes into account other values to society, which may be expressed by the local community or consultees.

- International e.g. designated World Heritage Site.
- National e.g. designated National Park, Area of Outstanding Natural Beauty, Heritage Coast, Listed buildings.
- Regional/Local: Local Government designations e.g. Conservation Areas, or generally undesignated but certain elements or features may be worthy of conservation or enhancement.

8.3.7 The value of undesignated resources, or value expressed through consensus, demonstrable use or non-official publications have been assessed based on the following Countryside Agency criteria for landscape assessment:

- scenic quality: This measures the degree to which the landscape appeals to the visual senses.
- rarity: this is concerned with the presence of rare features and elements in the landscape or the presence of a rare character type.
- representativeness: this analyses the features or elements within the proposal site that are worthy of retention because they represent a particular character.
- conservation interests: features of particular wildlife, earth science or archaeological, historical and cultural interest.
- wildness: the presence of wild character in the landscape, which makes a particular contribution to sense of place.
- associations: associations with particular people, artists, writers, or other media, or other events in history.
- tranquillity: tranquillity is not a landscape-based criterion. It is a '*composite feature related to levels of built development, traffic, noise and artificial lighting'* (Countryside Agency 2002).

Sensitivity

8.3.8 Sensitivity relates to the ability of the landscape or townscape to accommodate the proposed change without detrimental effects on character/features/elements:

- high: proposed change would inevitably result in significant negative effects on character/features/elements.
- medium: proposed change would be accommodated with some negative effects on character/features/elements.
- low: proposed change would be accommodated with little or no negative effects, or would result in positive effects on character/features/elements.

Visual Assessment

Zone of Theoretical Visibility

8.3.9 Preliminary site evaluations and consideration of effects on viewpoints were undertaken at the baseline assessment stage. In order to determine available views and hence assess visual receptors and the visual amenity, a Zone of Theoretical Visibility has been mapped. The ZTV is the theoretical area from which part or all of the proposed development is potentially visible and broadly defines the study area for both the character and visual assessment.

8.3.10 Visual receptors include the public or community at large, residents and visitors to the area. The geographical extent of potential visibility has been established for stack and building

heights by production of Zones of Theoretical Visibility. The 15km radius from the proposal site is shown at Figure 8.1. The ZTV's have been achieved using Digital Terrain Model (DTM) and Digital Surface Model (DSM) data for this study area. Due to the likely extent of the ZTV it would be impossible to assess the visual impact on every individual visual receptor within the ZTV of the scheme. Consequently, key viewpoints looking towards the proposals have been agreed with Kent County Council as part of the baseline assessment. These viewpoints are representative of mainly 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.

8.3.11 Fully rendered computer models of the SEP buildings and stacks have been used to create photomontages of the proposals and set alongside baseline photographs of the study area to illustrate the location and potential appearance of the building and stacks from the agreed viewpoints. Landscape planting proposals shown at year 10 have been included in the photomontages. The assessment of effects on landscape/townscape and views has been based on the 'worst case' situation of the scheme at year 1 after completion.

Visual Evaluation Criteria

8.3.12 The assessment of visual effect is undertaken from identified receptors and takes into account the:

- sensitivity of the views and viewers (visual receptor) affected;
- nature, scale and duration of the change;
- extent of the proposal that would be visible;
- degree of visual intrusion or obstruction that would occur;
- distance of the views to the site;
- change in character or quality of the views compared to the existing views.

8.3.13 The assessment of visual effect is undertaken from identified receptors and takes into account the factors described in the following paragraphs.

Baseline Visual Evaluation

8.3.14 In order to evaluate the visual effect of the proposal and, if appropriate, what could be done to ameliorate the effect, it is necessary to describe the existing situation to provide a basis against which any change can be assessed. Each assessment of visual effect has been made taking into consideration the character and quality of the existing view.

Sensitivity of Visual Receptors

8.3.15 The sensitivity of visual receptors would be dependent upon the location and context of views, whether views are continuous, fragmented, or intermittent (i.e. the transient nature of a

view gained while travelling through an area), the importance of views and the activity or expectations of receptors. Influences such as the numbers of receptors affected, popularity of views and the significance of views in relation to valued landscapes, townscapes or features determine the importance of views. Descriptions relating to the categories within the scale below give an indication of how these criteria are applied:

- high: the most sensitive receptors may include users of public rights of way in rural areas whose attention or interest may be focused on the landscape – particularly landscapes of acknowledged importance or value; occupiers of residential properties with views affected by the development.
- medium: less sensitive receptors may include people engaged in outdoor recreation, such as ball sports; dynamic views gained by people travelling through or past the affected landscape in cars, on trains or using other transport routes;
- low: the least sensitive are likely to be people in urban areas, at their place of work, or engaged in similar activities, whose attention may be focussed on their work or activity and who may therefore be potentially less susceptible to changes in view.

8.3.16 The number of people with views affected by the proposals and the intervening distance will help to determine where in the range sensitivity lies. In extreme cases of very few or very many receptors or depending on the quality of the landscape or townscape context in which the views are gained, the sensitivity measure may be moderated (i.e. reduced or increased).

Assessment of Effects

8.3.17 The following paragraphs detail the criteria and definitions used to describe the likely nature and magnitude of changes to individual elements and characteristics and the consequential effects on the landscape character resulting from the proposals.

8.3.18 Both direct and indirect effects have been considered.

Magnitude (or scale) of Proposed Character Change

8.3.19 The magnitude of proposed change (beneficial or adverse) is assessed as follows:

- large: total loss of or major alteration to key elements/features/characteristics of the baseline townscape or landscape and/or introduction of elements considered to be totally uncharacteristic when set within the attributes of the receiving townscape or landscape.
- medium: partial loss of key elements/features/characteristics of the baseline townscape or landscape or immediately apparent alteration to, or introduction of, elements that may be prominent but may not necessarily be considered to be substantially uncharacteristic when set within the attributes of the receiving townscape or landscape.

- small: minor loss of or minor alteration to key elements/features/characteristics of the baseline townscape or landscape and/or introduction of elements that may not be uncharacteristic when set within the attributes of the receiving townscape or landscape.
- negligible: very minor loss of or minor alteration to key elements/features/ characteristics of the baseline townscape or landscape and/or introduction of elements that are not uncharacteristic in the surrounding townscape or landscape.

Magnitude (or scale) of Proposed Visual Change

8.3.20 The magnitude of proposed change (beneficial or adverse) is assessed as follows:

- large: the proposal forms a dominant or immediately apparent feature within views that would significantly affect and change the overall view.
- medium: the proposal may form a visible and recognisable new element that would affect and change the overall view.
- small: the proposal constitutes only a minor component of wider views, which might be missed by the casual observer or receptor. Awareness of the proposal would not have a marked effect on the overall view.
- negligible: only a very small part of the proposal would be discernible and/or it is at such a distance that it would be scarcely appreciated. Consequently it would have very little effect on the view.

Nature and Duration of Proposed Changes

8.3.21 The landscape or townscape and visual resource of an area can be affected both directly and indirectly. Visual effects are always direct because when an object is not in view by implication there can be no impact. Landscape and townscape effects on the other hand can be either direct or indirect. Change that affects onsite physical features (e.g. vegetation, buildings and landform), or the character area / type in which the site is located, is a direct landscape or townscape effect, whereas an effect on the character of the surrounding landscape or townscape character areas / type is indirect. It is generally assumed that indirect effects would be intrinsically less significant than direct ones. However, this is not necessarily the case and is dependant on the nature of the proposal and the landscape or townscape in which it is situated. The effect on the setting of a particular designated site or object is considered within Chapter 13, Cultural Heritage. The nature of the effect depends upon whether it is temporary (construction) or permanent (operational).

8.3.22 In general the scope of landscape or townscape and visual effect is:

- Direct effects on the townscape fabric and character of the site, and on views and visual amenity; and,
- Indirect effects on the surrounding landscape or townscape character.

Assessment of Significance

8.3.23 The purpose of an EIA is to determine the likely significant environmental effects of a proposal. It is accepted that, due to the nature and scale of development, a proposed energy plant would potentially give rise to some significant visual and landscape or townscape effects. However, it should be stressed that, not all landscape or townscape and visual effects arising would be significant in EIA terms. Furthermore, a significant effect would not necessarily mean that the effect is unacceptable in planning terms. What is important is that the likely effects are transparently assessed and understood in order that the determining authority can bring a balanced, well-informed judgement to bear when making the planning decision. This judgement should be based on weighing up the benefits of a proposed development project against the anticipated effects, both positive and negative.

8.3.24 Assessment of permanent operational effects has been primarily based on the design year when all the construction works are completed. In considering the significance of effect of construction activities on landscape or townscape and visual receptors, the duration of the effect and its temporary nature are taken into account.

8.3.25 Night-time effects have been assessed during construction and operational phases for the proposal.

Character Effects

8.3.26 The effect of relevant aspects of the proposal on the landscape and townscape has been described and the significance evaluated against the following criteria, defined as:

- Major adverse: where the proposed changes cannot be mitigated; would be completely uncharacteristic and would substantially damage the integrity of a valued and important landscape or townscape.
- Moderate adverse: where the proposed changes cannot be fully mitigated; would be uncharacteristic and would damage a valued aspect of the landscape or townscape.
- Minor adverse: where some elements of the proposed changes would be out of scale or uncharacteristic of an area.
- Negligible adverse: where the proposed changes would be at slight variance with the character of an area.
- Neutral: where the proposals would be in keeping with the character of the area and/or would maintain the existing quality or where on balance the proposals would maintain quality (e.g. where on balance the adverse effects of the proposals are off set by beneficial effects).
- Negligible beneficial: where the proposed changes would not only be in keeping with the character of the existing landscape, but would also slightly improve the character and quality of the existing resource.

- Minor beneficial: where the proposed changes would fit in well with the existing character and would improve the character and quality of the landscape or townscape.
- Moderate beneficial: where the proposed changes would not only fit in well with the existing character of the surrounding landscape or townscape, but would greatly improve the quality of the resource through the removal of detracting features.
- Major beneficial: where the proposed changes would substantially improve character and quality through the removal of large scale damage and dereliction and provision of far reaching enhancements.

Visual Effects

8.3.27 The effect of relevant aspects of the project on views has been described and the significance evaluated as follows:

- Major adverse: where the proposed changes would form the dominant feature, would be completely uncharacteristic and substantially change the scene in valued views.
- Moderate adverse: where the proposed changes would form a major part of the view, would be uncharacteristic, and would alter valued views.
- Minor adverse: where the proposed changes to views would be out of scale or uncharacteristic with the existing view.
- Negligible adverse: where the proposed changes to views would be at slight variance with the existing view.
- Neutral: where the project would be imperceptible or would be in keeping with and would maintain the existing views or where on balance the proposals would maintain the quality of the views (which may on balance include adverse effects of the proposals which are off set by beneficial effects for the same receptor).
- Negligible beneficial: where the proposed changes to the existing view would not only be in keeping with but would also slightly improve the quality of the existing view.
- Minor beneficial: where the proposed changes to the existing view would be in keeping with and would improve the quality of the existing view.
- Moderate beneficial: where the proposed changes to the existing view would not only be in keeping with, but would greatly improve the quality of the scene through the removal of visually detracting features.
- Major beneficial: where the proposed changes to existing views would substantially improve the character and quality through the removal of large scale damage and dereliction and provision of far reaching enhancements.

8.3.28 For the purposes of this assessment those effects indicated as being of ‘Moderate / Major’, ‘Major / Moderate’ and ‘Major’ significance, as indicated in Table 8.1, Significance Matrix below, are regarded as significant in EIA terms. Effects of ‘Moderate’ and lesser significance have been identified in the assessment, but are not considered significant in terms of the EIA

Regulations 1999[1].Temporary changes, i.e. those during construction may have higher ratings than the 'significance of effects' assessment would suggest. This is due to their temporary nature.

Table 8.1 Significance Matrix

Magnitude	**Sensitivity**		
	High	***Medium***	***Low***
Large	Major	Major/Moderate	Moderate/Major
Medium to Large	Major/Moderate	Moderate/Major	Moderate
Medium	Moderate/Major	Moderate	Moderate/Minor
Small to Medium	Moderate	Moderate/Minor	Minor/Moderate
Small	Moderate/Minor	Minor/Moderate	Minor
Negligible to Low	Minor/Moderate	Minor	Negligible/Minor
Negligible	Minor	Negligible/Minor	Negligible
Neutral to Negligible	Negligible/Minor	Negligible	Neutral/Negligible

The Guidelines for Landscape and Visual Impact Assessment (2002) (GLVIA) states *"the relationship between the two axes* [sensitivity and magnitude] *is not linear. The axes* [in the matrix] *are also likely to have different weightings, as the nature and scale of effects are largely derived from objective data, while the sensitivity and value of a landscape resource is largely derived from subjective judgements"* (GLVIA paragraph 7.47).

8.4 Baseline Conditions

8.4.1 The proposal site consists of approximately 7ha of largely disused or previously used land and small areas of storage land at Kemsley Marshes on the northern edge of Sittingbourne. This site lies on the shores of The Swale, the body of water which separates north Kent from the Isle of Sheppey (See Figure 8.1).

8.4.2 The context of the site is divided between the contrasting environments of the industrial townscape of Sittingbourne and the natural estuary landscape of The Swale (See Figure 8.5). Large scale industrial buildings and stacks at the St Regis Paper Mill, Kemsley form the south western site boundary, separating the location from the residential districts of Sittingbourne.

[1] HMSO, *The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations* 1999

To the south east lies the extensive landform of the restored landfill site at the confluence of The Swale and Milton Creek. To the north east the earth bund of the sea defences defines the edge of The Swale, separating the site from the marshes, mud flats and body of water which comprise this habitat. The Saxon Shore Way long distance footpath follows the top of these defences. To the north west of the site lies further disused open land supporting a similar range of vegetation to the site. A waste water treatment works and further ongoing industrial development are currently expanding in this area to the north.

Landscape Designations

8.4.3 There are no designated landscapes which lie within the site area (See Figure 8.5). The Swale Borough Local Plan recognises that the coastal landscapes and coastal margins enhance the value of the borough's landscape. This is supported, in part, by the designation of the North Kent Marshes Special Landscape Area which extends over the Swale and adjoining coastal landscape. This area includes the Chetney and Greenborough Marshes which adjoin the site and extend along Milton Creek. This area is valued for the open character of its landscape.

8.4.4 Other designated landscapes within the Borough include an Area of High Landscape Value approximately 1km to the south east of the site. This area of landscape lies inland of the marshes and coincides primarily with the Teynham Fruit Belt. The Kent Downs Area of Outstanding Natural Beauty lies on high land approximately 10km to the south east of the site. A second SLA on the North Downs coincides with a large area of the AONB designation.

Scheduled Ancient Monuments

8.4.5 There are no Scheduled Ancient Monuments which lie within the site area. The nearest site lies at Castle Rough, which comprises earthworks approximately 500m to the south west. Another site within the vicinity of the proposals is the remains of the Old Murston Church approximately 1.6km to the south. Both sites lie within the local level study area of 3km radius and are covered by the ZTV. See Figure 8.5.

Conservation Areas

8.4.6 There are no conservation areas which are covered by the ZTV within the 3km study area.

Land Use

8.4.7 The majority of the site is currently disused. The southern corner of the site contains a small area of storage for materials and vehicles with associated access tracks. Vegetation on site has occurred through natural colonisation following previous industrial use and is unmanaged.

Topography

8.4.8 The proposal site and the majority of its surroundings are relatively flat and lie at approximately 5m AOD within the coastal plain of The Swale estuary. The tidal mud flats and shingle beaches of the Swale lie beyond the sea defences to the north east. The restored landfill site immediately to the south rises to approximately 15m high. This man made landform forms an uncharacteristic and distinctive feature in the flat estuarine landscape. The land rises gradually over the Kent plains to the south before rising more steeply to form the North Downs, which rise to approximately 200m AOD 10km to the south.

Vegetation

8.4.9 The site supports a mixed range of ruderal weeds and woody vegetation which have colonised most of this disused location. Dog rose (Rosa canaina), elder (Sambucus nigra), hawthorn (Crataegus monogyna) and silver birch (Betula pendula) up to approximately 3m high are scattered sporadically throughout the site.

Settlement

8.4.10 The site lies on the industrial northern edge of Sittingbourne, which forms the largest settlement within the district of Swale. Development dates mainly from the 19th and 20th centuries, clustered around the A2 and railway which pass through the centre of the town. The rapidly expanding industrial and commercial district which extends from the edge of Sittingbourne north to Ridham Docks forms the immediate context to the site.

Public Rights of Way

8.4.11 There are no public rights of way which cross the site. The closest footpath is the Saxon Shore Way long distance path which follows the top of the sea defences which line The Swale and Milton Creek. The path extends along the Kent coastline throughout the Swale District.

Views

8.4.12 The existing zone of theoretical visibility (ZTV) of the proposal site in the immediate vicinity is contained to the east, south and west by either landform or large scale industry. To the north the ZTV extends over neighbouring disused land and the corridor of The Swale, through which the Saxon Shore Way passes. To the north east the ZTV is more extensive, crossing The Swale to the gently rising land of Elmley on the Isle of Sheppey. Areas of high land on the Isle of Sheppey and the bridge crossings provide elevated vantage points covered by isolated areas of the ZTV. (Figure 8.6).

8.4.13 The site is currently concealed in views from the majority of the settlement of Sittingbourne by industrial development on the edge of the town and the restored landfill mound. To the north of the site, where views are less constrained, the Saxon Shore Way long distance footpath forms the closest visual receptor as it follows the alignment of the sea defences. Views can

be gained from a section of path which extends approximately 2km north along the edge of the Swale from the site. Users of this path potentially form receptors of the highest sensitivity, however there is little evidence of the path being regularly used during the site visit. Industrial development, the light railway and over ground pipelines provide physical barriers between the settlement and the Swale, making access to the path difficult. The section of the Saxon Shore Way adjacent to the site is also relatively remote from the centre of Sittingbourne and the open areas at Kingsferry Bridge which allow direct public access to the right of way. The industrial edge of Sittingbourne forms a dominant urban influence within views from this section of the path and, as a result, may be less attractive to walkers.

8.4.14 Views of the site from the premises along the industrial edge of Sittingbourne would be fragmented by intervening development and gained by people at their place of work, who are of low sensitivity. The gently rising, open landscape of the Isle of Sheppey to the north east contains several small settlements, public rights of way and roads which provide vantage points for receptors to gain views back to the site. The industrial townscape of Sittingbourne is visible as an expanse of development along The Swale, of which the site forms a small fragment of disused land.

8.4.15 The Swale forms a transport corridor which defines the edge of Sittingbourne and divides the towns' industrial edge from the salt marsh, mudflats and open water of the estuary at Elmley Reach and Clay Reach. Views from occupants of vessels would be gained towards the site with a backdrop of dominant industry at St Regis' Kemsley Paper Mill. Receptors use the Swale for both leisure and commercial purposes and would range in sensitivity from medium to low.

8.4.16 Photographs have been taken from various viewpoints which are representative of views gained by visual receptors. Figure 8.6 shows the location of the photograph viewpoints, with the associated photographs provided at Figures 8.7 to 8.21.

Viewpoint 1: Saxon Shore Way North of the site.

8.4.17 Near open views looking south (600m to site) from the long distance footpath which follows the top of the sea defences. The view comprises a combination of industry and natural habitats in the estuarine landscape of The Swale. The large scale buildings and stacks of Kemsley Paper Mill form the focus of the view and together with the cranes and the jetty, form strong vertical elements in the relatively flat landscape. The grassy mound of the restored landfill creates an uncharacteristic landform in the estuary. Mud flats and salt marshes are typical features of The Swale in the foreground. Overhead power lines cross the landscape in the middle distance. The site is visible beyond security fencing, defined by clumps of scrub and ruderal vegetation, which are relatively insignificant in the view.

Viewpoint 2: Saxon Shore Way North East of the site

8.4.18 Near open view looking south west immediately adjacent to the site boundary from the long distance footpath. The large scale buildings and stacks of the Kemsley Paper Mill and adjoining industrial premises dominate the skyline in the centre of the view, visible beyond the low level vegetation of the site. The landform of the restored landfill screens distant views to the left. Overhead power lines and high mast lighting at Ridham Dock are visible to the right.

Viewpoint 3: Church Marshes Country Park

8.4.19 Near open view looking north east (800m to site) from the edge of the fishing lakes within the publicly accessible part of the Country Park. The view currently focuses on the Kemsley Paper Mill, partially visible beyond a belt of trees and scrub and a foreground of ruderal vegetation. The top of the restored landfill mound and high mast lighting columns are also visible beyond the trees. The earth works of the Castle Rough ancient monument are covered with scrub in the middle distance. The land within the site is not visible in this view. Overhead power lines cross the view in the foreground.

Viewpoint 4: Saxon Shore Way East of the site

8.4.20 Mid-distance open views looking west (1.2km to site) from the long distance footpath which follows the top of the sea defences. The view is predominantly of a natural landscape which focuses on the prominent buildings and stacks of Kemsley Paper Mill. The flat expanses of Little Murston Nature Reserve to the left and the mud flats of the Swale contrast with the mound of the restored landfill and the numerous vertical accents of stacks, pylons and cranes. The residential edge of Sittingbourne is visible through trees to the left of the view, with rising ground within the North Downs AONB beyond. Only the extreme north eastern corner of the site is visible in this view. The remainder is screened by the man made land form.

Viewpoint 5: Church Road at Tonge Corner (representative of views from residential properties)

8.4.21 Mid-distance open view looking north west (2.2km to site) from a low ridge of land adjacent to the hamlet. A foreground of arable farmland is subdivided by tree belts and woodland blocks. Overhead power lines crossing the landscape in the middle distance and the buildings and stacks of Kemsley Paper Mill form prominent elements in the view. Housing at Sittingbourne and the Church Marshes Country Park are visible to the left of the view. The landfill mound screens any views of the site. Trees and garden vegetation screen views to the right.

Viewpoint 6: Saxon Shore Way South of the site (representative of commercial properties on edge of Sittingbourne

8.4.22 Mid-distance channelled view looking north (1.6km to site) along the corridor of Milton Creek. The industrial edge location visually relates to the Kemsley Paper Mill development, separated by the predominantly natural landscape of the creek. Mud flats and salt marsh form a sinuous channel through the landscape. Views of The Swale and the site are blocked by the man made landform of the restored landfill site. Rail tracks, jetty's and brick walls are remnants of industrial heritage. Overhead power lines cross the creek in the middle distance.

Viewpoint 7: Church Marshes Country Park

8.4.23 Mid-distance open view looking north east (1.3km to site) from a man made landform within public open space. The view is clearly divided into 3 sections comprising a foreground of ruderal vegetation, housing at Kemsley beyond and the large scale industrial development of Kemsley Paper Mill forming a back drop. Pylons and stacks form prominent vertical elements. Belts of trees frame glimpses of the rural landscape on the Isle of Sheppey beyond, reflected visually in the Country Park to the right of the view. The site is concealed within the view behind the paper mill.

Viewpoint 8: Kemsley, residential edge

8.4.24 Mid-distance channelled view looking east (1.2km to site) from the new distributor road between residential and commercial districts. The buildings and stack at Kemsley Paper Mill and overhead power lines form a prominent cluster of vertical elements to terminate the view. There are no natural features within this urban view. The site is concealed behind industrial buildings.

Viewpoint 9: Iwade, residential edge

8.4.25 Mid-distance open views looking south west (2.2km to site) from public open space within a recent housing development at Iwade. The view contains the contrasting elements of a predominately rural foreground of farmland and a back drop of large scale industrial and commercial development. Numerous pylons and overhead lines form vertical accents throughout the view. The paper mill buildings and long low warehouse extend along the horizon. The A249 crosses the landscape in the middle distance, the moving traffic forming a prominent element. Woodland blocks and tree belts partially break up the view and soften the edges of development. Fragmented views of the site can be gained which lies in front of the restored landfill mound.

Viewpoint 10: Kings Ferry Bridge

8.4.26 Mid-distance open view looking south (2.7km to site) from the footway on the bridge over The Swale. The bridge parapet and mesh fencing partially obscure the natural landscape of The

Swale, mudflats and salt marshes, focusing attention on the continuous bands of industrial & commercial development which are characteristic of the urban edge of Sittingbourne. No single element is more prominent than the others, however the pair of pylons at the waters edge are significantly taller than any other feature. Clusters of cranes at Ridham Docks and stacks and pylons break the skyline throughout the view. The wooded horizon of rising land at the North Downs is partially visible beyond the industrial edge.

Viewpoint 11: Elmey Marshes Nature Reserve, public right of way

8.4.27 Mid-distance open view looking south west (1.9km to site) from the footpath at the public car park on the Isle of Sheppey. The view is a combination of the simple open expanses of grassland and sky. The Swale cuts through the middle of the view with the industry that lines it extending across the whole view. The stacks at Kemsley Paper Mill and numerous pylons form vertical elements in the landscape. The man made landform of the restored landfill forms an uncharacteristic mound in the flat landscape. The wooded ridge of the North Downs forms a distant horizon. The site is visible in front of Kemsley Paper Mill.

Viewpoint 12: Furze Hill, public right of way

8.4.28 Distant open view looking south (5.4km to site) from high ground on the Isle of Sheppey. The mixed agricultural land divided into large irregular fields extends down to The Swale. The limited extent of hedgerows and trees creates an expansive nature within the farmland, which is reflected in the wide open sky. The industrial edge of Sittingbourne forms a contrasting urban texture in the landscape. The two bridges, pylons and stacks form prominent features in the flat, open landscape. The level horizon of the North Downs remains unbroken. Traffic on the new A249 dominates the middle distance. The site is barely perceptible within the distance.

Viewpoint 13: B2231, Eastchurch

8.4.29 Distant framed view looking south west (7.8km to site) from the Eastchurch bypass on the Isle of Sheppey. The road junction dominates the foreground of the view. A break in the roadside planting allows distant views over The Swale to the landscape of north Kent. The buildings and stacks of the Kemsley Paper Mill are barely perceptible within the urban mass of Sittingbourne. The proposal site is not visible at this distance.

Viewpoint 14: Snipeshill, edge of residential development

8.4.30 Distant view looking north (3.4km to site) from a public right of way on the village edge. Urban fringe clutter dominates the foreground of the view. The tops of the stacks at the Kemsley Paper Mill are visible above a low ridge in the intervening agricultural landscape. The site and the settlement of Sittingbourne are not visible in this view.

Viewpoint 15: Teynham, edge of residential development

8.4.31 Distant open view looking north west (4.7km to site) from a public footpath on the edge of the village. A foreground of arable farmland is surrounded by residential development. Garden vegetation and hedgerows soften the edges of the development. The stacks at Kemsley Paper Mill and neighbouring industrial sites, and several pylons are visible on the horizon. The site on the edge of Sittingbourne is not visible in this view.

Existing Landscape and Townscape Character

8.4.32 The landscape and townscape character context is identified at different levels, with the Countryside Character Initiative (CCI) and English Nature's Natural Areas Map (1999) providing the broader framework to determine the character of the British countryside at a national level. Within the CCI character map, the 15km radius study area lies within Character Areas 81 Greater Thames Estuary, 113 North Kent Plain and 119 North Downs (see Figure 8.2).

The key characteristics of these areas are as follows;

Greater Thames Estuary

- *Low lying coastal landscape of salt marshes and reclaimed farmed marshland, dominated by wide open skies.*
- *Mixed arable and grazed pasture subdivided by a network of reed filled drainage ditches.*
- *Beaches and mudflats often separated from the farmland by sea walls.*
- *Hedgerows and trees limited to margins of the character area further inland.*
- *Small settlements and hamlets associated with historically important fishing and boat building locations.*

North Kent Plain

- *Gently undulating fertile land occupied by a mix of intensively farmed open fields, grazing marsh and reed beds.*
- *Large fields are exposed with few hedgerows or trees.*
- *Orchards and horticultural areas sub-divided by shelter belts provide contrast.*
- *Over head power lines and pylons are prominent in the open landscape.*

- *Settlements often dominate the landscape due to the lack of vegetation on urban edges.*

North Downs

- *Chalk downland with broad dip slope dropping towards the Thames estuary with incised river valleys.*

- *Dominated by arable fields interspersed with woodland on steep valley sides and hill tops.*
- *Small pockets of unimproved chalk grassland.*
- *A rural landscape with few scattered farm houses and estates.*
- *Motorways form prominent corridors along the base of the chalk ridge.*

Local Landscape Character Assessment

8.4.33 The character of the local landscape within the Borough of Swale has been assessed as part of the *Swale Landscape Character Assessment and Guidelines, March 2005.* This assessment has identified 42 landscape character areas within the district. A local level study area based on a 3km radius has been established to assess the character of the landscape at greater detail in close proximity to the site. See Figure 8.3. The following 8 character areas coincide with the ZTV within this study area;

- *01 Elmley Marshes*
- *02 Elmley Island*
- *06 South Sheppey Marshes and Mudflats*
- *11 Chetney and Greenborough Marshes*
- *12 Lower Halstow Clay Farmlands*
- *14 Iwade Arable Farmlands*
- *26 Teynham Fruit Belts*
- *27 Luddenham and Conyer Marshes*

The key characteristics of these areas are as follows;

Elmley Marshes

- *Flat alluvial marshland with sinuous reed filled ditches.*
- *Atmospheric and tranquil landscape with large open and often dramatic skies.*
- *Rough grassland largely used for cattle and sheep grazing.*
- *Important wetland habitats.*
- *Important transport routes A249, railway and link bridges onto island.*
- *Large-scale landscape with little sense of enclosure.*
- *Boats in the swale.*
- *Strong sense of place, remote and isolated.*

Elmley Island

- *Outcrops of high land formed of London clay contrasting with the surrounding flat open alluvial marshland.*
- *Long views across open marsh intermittently interrupted by trees and scrub growing on the ridge.*
- *3,100 acres Elmley Estate farming practices managed for promotion of biodiversity.*

- *Historic buildings in various states of repair.*
- *Numerous man made features found in the landscape, provide strong evidence of the history of the area.*

South Sheppey Marshes and Mudflats

- *Vast, atmospheric and tranquil landscape with large, open and often dramatic skies, with extensive uninterrupted panoramic views.*
- *Alluvial soils on land, tidal mudflats and marine beaches in estuary.*
- *Sea walls form the only man made element within the landscape.*
- *Unique flora and fauna specially adapted to harsh environmental conditions.*
- *Vegetation limited to coarse, hummocky ground cover in rusty browns, green and pink.*
- *Unsettled with limited pedestrian access.*

Chetney and Greenborough Marshes

- *An area of traditional coastal marsh.*
- *Flat grazing marsh, saltmarsh and mud flats. Natural and man made features include ditches, fleets and counter walls.*
- *Scattered isolated patches of scrub.*
- *Major transport routes and power lines cut across the marsh.*
- *Large areas designated for the protection of its ecologically important habitats.*
- *Atmospheric and tranquil landscape with large open and often dramatic skies.*

Lower Halstow Clay Farmlands

- *Mixed geology of London clay and outcrops of head brick earth and Woolwich beds, steeply rising to the south.*
- *Mixed agricultural land use with small-scale fields of pasture and localised orchards.*
- *Contrast between abutting marshland and farmland with hillside and ridge backdrop.*
- *Narrow lanes with impressive estuary views.*
- *Weak landscape structure with scattered mature standard trees and fragmented over-mature roadside hedges.*
- *Settlement limited to roadside cottages fixed mobile homes and isolated farms. Small scale industrial works.*

Iwade Arable Farmlands

- *Mixed geology, clay and fertile drift soils.*
- *Cereal production has replaced traditional orchards.*
- *Medium to large scale fields. Fragmentation of hedgerows.*

- *Hawes and Wardwell Woods are larger woodlands on a prominent hillside near the coast.*
- *Valley and hill setting to village of Newington with landmark church.*
- *Isolated farmsteads and cottages.*
- *Isolated historic properties. Elsewhere mixed 20th century development.*
- *Intrusive overhead powerlines.*
- *Major trunk road, rail link and enclosed, winding country lanes.*

Teynham Fruit Belts

- *Undulating intimate landscape composed of small hills and valleys.*
- *Complex geology of fertile drift deposits, head gravel and London clay.*
- *Small scale well managed network of orchards and occasional hop fields. Elsewhere enlarged arable and grazing fields.*
- *Birth place of commercial fruit growing at Osiers Farm.*
- *Narrow winding lanes enclosed by mature hedgerows and shelter belts.*
- *Tracks, lanes and historic buildings raised above adjacent areas, which is indicative of the areas susceptibility to flooding.*
- *Mixed traditional historic houses and farms. 20th century residential and commercial development.*
- *Main transport routes include the railway and A2.*
- *Important local landmark at Tonge Mill and pond.*

Luddenham and Conyer Marshes

- *Flat alluvial marshland with sinuous reed filled ditches.*
- *Large open and often dramatic skies.*
- *Rough grassland largely used for cattle and sheep grazing.*
- *Important wetland habitats.*
- *Access routes limited to Harty Ferry approach and Conyer.*
- *Boats in the Swale and Creek.*
- *Large-scale landscape with little sense of enclosure.*
- *Strong sense of place, remote and isolated.*

8.4.34 The proposal site forms part of the Sittingbourne urban area which lies outside any of the landscape character areas identified within the Swale Borough Councils assessment.

Therefore, for the purposes of this assessment, the settlement which lies within the study area has been divided into 2 separate townscape character areas which display distinct characteristics, Sittingbourne Industrial/Commercial and Sittingbourne Residential. See Figure 8.3. The following key characteristics of the townscape areas can be defined as follows;

Sittingbourne Industrial Commercial

- Large scale industrial development in flat topography adjoining The Swale.
- Complex skyline of built forms contrasting with strong vertical elements of stacks, pylons and cranes.
- Active, at times visually chaotic, townscape due to operations and construction activities.
- Noisy environment with HGV traffic and noxious odours.
- Smaller scale light industrial and commercial development adjoining Milton Creek.
- Rapidly changing and expanding character area with remnants of past industrial heritage.
- Extensive urban fringe having striking contrast with the adjoining natural landscape of The Swale.
- Linear tree belts and screens and blocks of scrub and woodland surrounding development.
- Extensively lit during night time.

Sittingbourne Residential

- Central area of mainly 19th century terrace houses surrounding the commercial core.
- Extensive 20th century residential estates extend out to the rural edge.
- The A2 and railway line cross the town centre as major transport corridors from east to west.
- Church Marshes Country Park provides a large informal green space on the northern edge of housing.
- Hedgerow remnants, street trees, designed green space and gardens comprise the majority of vegetation within the town.

Kent Historic Landscape Characterisation.

8.4.35 The description of the historic environment is detailed within Chapter 13 of the Environmental Statement. The Historic Landscape Study is the study of the 'time depth' aspect of the landscape. The Kent Historic Landscape Characterisation (May 2001) recognises that *"landscape is dynamic and constantly changing in a manner that reflects the immediate preoccupations, future aspirations and past activities of societies and individuals"*. Historic landscape characterisation identifies *"characteristic patterns of change and important relics of past change"*.

8.4.36 The site lies within Historic Landscape Character Area 17: Northern Horticultural Belt. Within this area the site lies within the Historic Landscape Type 12.4: Large Scale Industry. The character area is primarily defined by its horticultural activities, in particular fruit orchards. However, the industrial nature of the site is uncharacteristic of the overall character area. At

paragraph 4.36 the report states *"Although primarily rural in nature, Kent has a considerable quantity of industrial areas, abandoned or otherwise, which account for 1.78% of the county's land surface. For the most part industrial activity tends to be confined to the areas adjacent to major urban centres, i.e. east of Maidstone, although significant groupings can also be found in the coastal areas"*. The site is associated with the extensive strip of industrial land uses which form the northern edge of the settlement of Sittingbourne where it adjoins The Swale.

Landscape Value

8.4.37 From the desktop study and the field survey, the landscape value can be assessed. People give value to different landscapes which can be measured based on the following Countryside Agency criteria:

- scenic quality;
- rarity;
- representativeness;
- conservation interests;
- wilderness;
- cultural associations;
- tranquillity.

Scenic Quality

8.4.38 This measures the degree to which the landscape appeals to the visual senses. The visual baseline is analysed in more detail above.

8.4.39 The disused and derelict nature of the site is poor in terms of scenic quality. The neighbouring industrial edge of Sittingbourne and open expanse of The Swale create contrasting backdrops to the site and provide a local context. The landscape of the highest scenic value within the wider study area is the nationally important North Downs AONB. This ridge of high land provides a vantage point for limited views out from the wooded landscape, over the low lying coastal plain of the Thames Estuary.

Rarity

8.4.40 This is concerned with the presence of rare features and elements in the landscape or the presence of a rare character type.

8.4.41 The poor quality townscape of the site is relatively typical of the urban fringe on the northern industrial edge of Sittingbourne. However, when evaluated within the study area as a whole, the site is not typical. The neighbouring landscapes of The Swale are more unusual and have relative value in the context of the settlement. Within the wider landscape the extensive salt marshes and mudflats are relatively uncommon and important to the character of the area.

Representativeness

8.4.42 This analyses the features or elements within the site, which are worthy of retention. There are no features within the site that require retention and that would add positively to the townscape character.

Conservation Interests

8.4.43 There are no landscape or cultural heritage features of importance within the site. The estuarine habitat of The Swale is important for a wide range of flora and fauna and is designated in parts as a RAMSAR Site, National Nature Reserve, Special Protection Area, Site of Special Scientific Interest and Environmentally Sensitive Area.

Wildness

8.4.44 The nature of the site is disturbed and its character is heavily influenced by its location within the urban fringes of Sittingbourne. Consequently the site cannot be defined as wild. However, the adjoining open water, mud flats and salt marshes of The Swale have a wild character and provide a strong contrast to the site and its immediate context.

Associations

8.4.45 The most significant historic and cultural association within the local study area is The Swale as a transport corridor for Sittingbourne. The town, due to its location on this waterway, became an important port in the 19th century to transport goods to and from London. At the beginning of the 19th century the first sailing barges were designed and made in several locations along The Swale, the most significant being the Dolphin shipyard on Milton Creek. The brick and cement making industries and the fruit growers relied on the barges to transport produce to the markets of London. Following World War II there was a rapid decline in the barge building industry as road transport increased. Sailing barges are now an uncommon feature in the area, however commercial and leisure vessels continue to use The Swale.

8.4.46 During the 20th century the area became important as a producer of paper, particularly newsprint for Fleet Street. This industry continues to be important to Sittingbourne and the Kemsley site forms the location for the proposed Sustainable Energy Plant.

Tranquillity

8.4.47 The site's location on the edge of the industrial district of Sittingbourne precludes any sense of tranquillity.

Sensitivity

8.4.48 The site is typical of the previously developed or disused fragments of land within the urban fringes of the extensive industrial district of Sittingbourne. Disused open land rapidly becomes colonised by ruderal weeds and scrubby vegetation. These areas of land, together with built development are often of poor visual quality. The proposal site has a low sensitivity to change through redevelopment of this scale and nature, however an opportunity exists to make improvements to the townscape character of Sittingbourne's industrial district.

8.5 Incorporated Enhancement and Mitigation

8.5.1 Landscape proposals comprising tree, scrub and grassland establishment have been incorporated as an integral part of the project. See Figure 8.22. Landscape structure planting would be included along the north west and north east perimeters of the site and would incorporate a band of shrub planting with groups of trees. Native, locally typical species would form a robust mix to filter views of the development and add visual and ecological diversity to the townscape. These proposals have been taken into account in the assessment of effects of the proposal.

8.5.2 The landscape proposals have been designed as an integral part of the scheme to provide treatments for the perimeter and internal green spaces. The design has evolved with reference to key landscape features and qualities found within the surrounding Swale Borough landscape character types. The objective of the landscape proposals is to provide a scheme that is;

- An attractive working environment for employees that is practical and fit for purpose.
- Integrated with the landscape of The Swale, reflecting aspects of local landscape character and setting.
- Uncluttered to allow easy access and flow around the site.
- Integrated into the landscape and townscape in views from receptors both locally and at distance.

8.5.3 The perimeter landscape treatments to the north western and north eastern boundaries work in conjunction with the broad flood attenuation ponds which wrap around the development. Grassland would be established on the gently sloping sides of the ponds. The inner edge of the pond would be planted with scattered trees and shrubs along the top of the slope. Species would include silver birch (Betula pendula), hawthorn (Crataegus monogyna) and dog rose (Rosa canina) in an open mosaic habitat. A broader continuous band of scrub with clumps of trees would be established on the outer edge of the attenuation pond. Species would include goat willow (Salix caprea), aspen (Populus tremula), field maple (Acer campestre), hazel (Corylus avellana), hawthorn (Crataegus monogyna) and blackthorn (Prunus spinosa). The two linear planting treatments would combine to form a visual screen of vegetation when viewed from surrounding receptors. The base of development, including

site activities, would be concealed when the planting becomes established, whilst the upper portions of the development would remain visible. The planting would also add visual diversity to the attenuation ponds.

8.5.4 A wider area of land to the north east of the scheme would be planted with an open mosaic of scrub and rough grassland, with clumps of trees. Scrub would be established on the remaining two boundaries between the site and the landfill and the existing paper mill buildings.

8.5.5 Internal green spaces within the site would receive a simple treatment of grassland and flora with a network of mown paths. Seating areas would be defined by native fruiting trees arranged in geometric shapes to reference north Kent's heritage of orchards and fruit production.

8.5.6 The local landscape character areas of Elmley, South Sheppey, Chetney and Greenborough Marshes are primarily flat open marshlands with few trees or areas of scrub, however the Iwade Arable Farmlands and Teynham Fruit Belt contain hedgerows, tree belts, woodland and orchards. The proposal site lies within the Sittingbourne Industrial/Commercial townscape character area which typically includes linear tree belts and areas of scrub. The proposals seek to reflect the character of Sittingbourne and the surrounding landscape, establishing vegetation types using native species which will provide a transition in the landscape to connect the local areas' different urban and rural features and characteristics.

8.5.7 The landscape proposals would provide an attractive setting for the development, valuable habitats for wildlife and a means to soften the urban edge adjoining The Swale and merge development with the townscape of Sittingbourne in views from the surrounding landscape.

8.6 Identification and Evaluation of Likely Significant Effects

Construction Assessment

8.6.1 The construction site would be surrounded by security fencing. Located within the site area would be site offices, materials and spoil storage areas and cranes.

Normal working hours would be 07.00 to 19.00 with some flexibility. Lighting would be required for working outside daylight hours. Refer to Lighting Assessment Report, Appendix 8.2, for details. Security fencing would allow views through to ground level activities. Cranes, high level construction activities, large plant and vehicles would be clearly visible above these barriers.

8.6.2 The programmed period for construction site occupation is approximately 2 years.

Predicted Character Effects

8.6.3 The likely effects on the townscape and landscape fabric and character are described in Table 8.2.

8.6.4 Direct effects on townscape character relate to the Sittingbourne Industrial/Commercial Area, which has a poor to ordinary condition and local value. The character area's sensitivity to change through the effects of construction activities within the proposal site would be low. Low level ruderal vegetation and scrub would be cleared from the construction site. This vegetation is not visually significant within the wider townscape and landscape context and its loss would not open up views. The direct effect of the large scale construction works on the disused open site would create a medium magnitude of change to the character, which would be adverse in nature, but only short term in duration. The overall significance of effect on the Sittingbourne Industrial/Commercial character area would be Minor/Moderate.

8.6.5 Temporary lighting proposals would result in an extension of the existing urban conditions on adjacent land, into the site itself, during the construction phase. This would be within the well lit context of the existing building and tower mounted lights and lighting columns within industrial areas and high level mast mounted lights at Ridham Docks. The significance of night-time effects on the Sittingbourne Industrial/Commercial Area character area would be Negligible/Minor adverse.

8.6.6 The adjoining character area of Chetney and Greenborough Marshes and the South Sheppey Marshes and Mudflats form the immediate landscape context to the proposals site and are not directly affected by the construction activities. The nature and large scale of the construction works would result in indirect Negligible/Neutral effects on the natural and wild elements of these character areas during the daytime and at night.

8.6.7 The wider townscape and landscape of the Sittingbourne Residential character area which has an ordinary condition and the Elmley Marshes, Elmley Island, Lower Halston Clay Farmlands, Iwade Arable Farmland, Teynham Fruit Belt and Luddenham and Conyer Marshes which have a good to moderate condition provide context to the construction activities. The proposal site is set on the edge of an existing industrial area and would have no direct effect on the valued aspects of these character areas. The existing extensive industrial development at Sittingbourne forms a backdrop to the character areas and is a characteristic element of the study area in North Kent. The magnitude of change is negligible and adverse in the short term leading to a Neutral significance of effect.

8.6.8 At a national scale, direct effects on the landscape apply to the Greater Thames Estuary character area. The proposed development would affect the townscape of the industrial

fringes of Sittingbourne which are of poor condition. The medium sensitivity to the small magnitude of change would result in a Minor adverse effect in the short term. The neighbouring character areas of the North Kent Plain and the North Downs would experience a temporary indirect effect that would be of Neutral to Negligible significance.

8.6.9 The overall townscape/landscape effect during construction can be summarised as Minor Adverse.

Predicted Visual Effects

8.6.10 The zone of theoretical visibility (ZTV) for the existing site area would increase considerably during the construction phase due to the introduction of large scale tall structures, buildings and cranes into a flat, open site. The activities associated with the construction of the stacks and tall buildings would be visible above the adjoining industrial development and landform, which previously screened the existing site. The ZTV would extend over additional areas of Sittingbourne to the south and south west and also over the wider landscape to the south and south east of the site. Construction activities would appear as new elements in views gained by all visual receptors identified at the baseline stage. Many additional visual receptors would also be affected which had no view of the existing site.

8.6.11 Occupiers of residential properties at Kemsley on the edge of the Sittingbourne to the west and south west of the site and users of public open space at Church Marshes Country Park to the south have glimpsed views through intervening industrial development of high level construction activities. To the north and north east of the site users of the Saxon Shore Way would continue to form the closest visual receptors. The significance of effect on these receptors is dealt with in relation to specific viewpoint locations at paragraphs 8.6.17 to 8.6.46 below.

8.6.12 Views from occupants of vessels on The Swale to the north and north east of the site would be gained towards the construction site and activities. Near open views would potentially be gained of the works as a dominant element in the view with a backdrop of industry on the urban fringe of Sittingbourne. A relatively small number of receptors would use the Swale for either leisure or commercial purposes and would range in sensitivity from medium to low. The magnitude of change would be medium resulting in a Moderate/Minor adverse significance of effect.

8.6.13 Employees at industrial premises along the edge of Sittingbourne would be visual receptors of low sensitivity and form the largest group of receptors in close proximity to the proposals. Many views of the SEP construction activities would be gained through intervening development of a similar character. The works would be seen as an extension of existing

industry. The scale of the development would potentially create a medium to large magnitude of change in view, leading to a Moderate/Minor adverse significance of effect.

8.6.14 Throughout the assessment the sensitivity of receptors has been modified from a potential High for views from residential properties, public rights of way and open space to Medium or Medium to High. From many viewpoint locations the existing industrial edge of Sittingbourne is prominent or dominates views towards the proposal site within its urban fringe location. The introduction of further industrial development of a similar nature would not be uncharacteristic or at odds with the adjoining townscape. This therefore reduces the sensitivity of receptors to the proposed SEP.

8.6.15 In many instances footpaths are not in a predominantly rural or nationally designated landscape and the industrial edge of Sittingbourne is always visible, having a high level of influence over views, in particular from The Swale. The SEP would be of a similar scale to the adjoining development at the St Regis paper mill and would appear as an extension of the industrial edge. The levels of magnitude of change would also be reduced, even though the development is of a large scale, due to the existing urban context into which the buildings and structures would be placed.

8.6.16 The effects on views from the 15 identified visual receptors are set out in Table 8.3.

Viewpoint 1: Saxon Shore Way North of the site

8.6.17 Near open views gained by footpath users would focus on the construction site, activities and traffic. The works would appear within an urban fringe context comprising a combination of industry and natural habitats set beside the estuarine landscape of The Swale. The grassy mound of the restored landfill would be largely obscured in the view. The sensitivity of the receptor is medium in this urban fringe context and the magnitude of change in view would be medium and temporary in nature, leading to Moderate/Minor adverse effect on views.

8.6.18 The disused site is currently not lit during night time. Temporary lighting for night time working during the construction period would be seen in the context of existing light sources within the adjoining industrial district. Lighting would be seen as an extension to existing conditions resulting in a Negligible adverse significance of effect, in the short term.

Viewpoint 2: Saxon Shore Way North East of the site

8.6.19 This viewpoint lies immediately adjacent to the site boundary which may be defined, during the construction phase, by fencing to secure the site activities. Footpath users would gain near, partially filtered views of the construction site, activities and traffic. The works would dominate the view and obscure Kemsley Paper Mill beyond. The sensitivity of the receptor is

medium within this urban fringe context and the magnitude of change in view would be medium to large. The change in view would be short term resulting in a Moderate adverse effect on views.

8.6.20 There are no existing light sources on the site. Lighting for night time working during the construction period would be seen in the context of existing light sources within the adjoining industrial district. Lighting would temporarily be seen as an extension to existing conditions resulting in a Negligible adverse significance of effect.

Viewpoint 3: Church Marshes Country Park

8.6.21 Walkers and people engaged in leisure pursuits would gain near open views of the SEP during construction from this location on the edge of the fishing lakes within Church Marshes Country Park. Low level activities would be concealed by intervening vegetation and industrial development. High level construction activities would be visible next to the Kemsley Paper Mill. The sensitivity of the receptor is medium to high and the magnitude of change in view would be small to medium, temporarily leading to a Minor/Moderate adverse effect on views.

8.6.22 Only high level lighting for night time working during the construction period would be seen in the context of existing light sources within the adjoining industrial district. Lighting would temporarily be visible as an intensification of existing conditions. The significance of night time effects would be Neutral.

Viewpoint 4: Saxon Shore Way East of the site

8.6.23 Walkers on the Saxon Shore Way would gain mid-distance open views of the SEP under construction. The mound of the restored landfill site would screen much of the low level site activities and traffic, however, the high level construction of the buildings and stacks would form the most prominent element in the view. The urban fringe character of Sittingbourne would be intensified, extending its influence over the natural landscape of The Swale estuary. The receptors are of medium sensitivity at this distance and the magnitude of change they would experience is medium, leading to a Moderate/Minor adverse significance of effect, in the short term.

8.6.24 Very little of the currently unlit site would be seen in this view at night. During the construction period lighting would be required for night time working. New light sources would be seen in the context of existing lighting within the adjoining industrial townscape. Lighting would be seen as a temporary extension to existing conditions resulting in a Negligible adverse significance of effect.

Viewpoint 5: Church Road at Tonge Corner (representative of views from residential properties)

8.6.25 Residents within properties at the hamlet of Tongue are receptors of medium sensitivity and would have mid-distance views over arable farmland of high level construction activities visible above the restored landfill mound. Mature trees and garden vegetation would filter some views of the proposals. The construction activities would form a prominent although small element within the view. The magnitude of change in view would be negligible to small, resulting in a Negligible/Minor adverse temporary significance of effect.

8.6.26 High level lighting for night time working during the construction period would temporarily be seen in the context of existing light sources within the adjoining industrial district. Lighting would be visible as an intensification of surrounding conditions. The significance of night time effects would be Negligible/Neutral.

Viewpoint 6: Saxon Shore Way South of the site (also representative of commercial properties on edge of Sittingbourne

8.6.27 Walkers on this long distance footpath are receptors of medium sensitivity able to gain mid-distance channelled views along Milton Creek to the industrial edge of Sittingbourne. This view is also representative of views gained by low sensitivity occupiers of commercial premises, which form the urban fringe on the north eastern edge of the town. Construction activities at the SEP site would be partially visible, filtered through intervening mature trees. The proposals would form a prominent new element within the view. The small number of medium sensitivity walkers and the small to medium magnitude of the temporary change in view would result in a Minor/Moderate adverse significance of effect. The high number of occupiers of commercial properties is of low sensitivity. The small to medium magnitude of change in view would lead to a Minor/Moderate adverse significance of effect in the short term.

8.6.28 The disused proposal site has no existing lighting. Temporary lighting for night time working during the construction period would be seen in the context of existing light sources within adjoining industrial development. Proposed lighting would be seen as an extension to existing conditions resulting in a Negligible/Neutral significance of effect, in the short term.

Viewpoint 7: Church Marshes Country Park.

8.6.29 Walkers and people engaged in leisure activities are receptors of medium to high sensitivity within this open space which has a context of urban fringe and industrial townscapes and natural landscapes. These receptors would gain mid-distance open views over open space and housing of high level construction activities at the proposal site, rising up beyond existing development at Kemsley Paper Mill. The proposals would result in an intensification of

existing development on the skyline. The magnitude of change in view would be negligible to small resulting, temporarily, in a Minor adverse significance of effect.

8.6.30 High level lighting operated during the construction period would be seen in the context of existing light sources within the adjoining industrial district at night. New lighting would temporarily be visible as an intensification of existing conditions. The significance of night time effects would be Neutral.

Viewpoint 8: Kemsley, residential edge

8.6.31 Occupiers of new residential properties on the edge of Kemsley would gain mid-distance views of high level construction activities within a context of extensive, existing industrial development. The activities would form a prominent, although not uncharacteristic, element within the view. The medium sensitivity of the receptor in this urban fringe location and the negligible to small magnitude of change in view would result in a Negligible/Minor adverse significance of effect, in the short term.

8.6.32 High level lighting for night time working during the construction period would temporarily be seen in the context of existing light sources within the intervening industrial townscape and road corridor. Lighting would be visible as an intensification of surrounding conditions. The significance of night time effects would be Neutral.

Viewpoint 9: Iwade, residential edge

8.6.33 Occupiers of residential properties on the edge of Iwade would gain mid-distance open views over farmland to a band of industrial and commercial development at Sittingbourne. The construction site, activities and traffic associated with the SEP would be visible within this urban area. High level activities in particular would be prominent above surrounding development. These receptors would be of medium to high sensitivity and experience a small to medium magnitude of change. The significance of effect would be Moderate/Minor adverse in the short term.

8.6.34 Temporary lighting for night time working during the construction period would be seen in the context of existing light sources within surrounding industrial development and traffic on the A249. Proposed lighting would be seen as an extension to existing conditions resulting in a Negligible/Neutral significance of effect, in the short term.

Viewpoint 10: Kings Ferry Bridge

8.6.35 Pedestrians on the footway of the bridge over The Swale are moderately sensitive receptors who would gain mid-distance open views over the estuary landscape from this elevated location. The construction phase of the SEP would be visible within the existing extensive industrial district of Sittingbourne. The activities would be no more prominent than other

existing sites, such as Ridham Docks, however high level construction works would break the horizon of the North Downs beyond. The magnitude of change would be negligible to small and temporary in nature, resulting in a Negligible/Minor adverse significance of effect.

8.6.36 Proposed lighting for night time working during the construction period would be visible in the context of existing light sources within the surrounding industrial townscape. Lighting would temporarily result in an intensification of surrounding conditions. The significance of night time effects would be Negligible/Neutral.

Viewpoint 11: Elmey Marshes Nature Reserve, public right of way

8.6.37 Visitors to the Nature Reserve would gain mid-distance open views from the footpath on the Isle of Sheppey. The proposed construction site, activities and traffic would be seen as part of the industrial urban fringe of Sittingbourne beyond the foreground of open grassland. High level construction works would break the horizon of the North Downs beyond. The medium to high sensitivity of the receptor and the small to medium magnitude of change would lead to a Moderate/Minor adverse significance of effect in the short term.

8.6.38 Temporary lighting for night time working during the construction period would be seen in the context of existing light sources within surrounding industrial development. Proposed lighting would be seen as an extension to existing conditions resulting in a Negligible/Neutral significance of effect, in the short term.

Viewpoint 12: Furze Hill, public right of way

8.6.39 Distant open views gained by walkers from this rural footpath on high ground on the Isle of Sheppey would focus on the industrial fringes of Sittingbourne and the bridges over The Swale. The construction activities at the proposed SEP site would be visible as part of the extensive townscape setting. The receptors are of medium to high sensitivity and would experience a negligible magnitude of change in view which would be temporary in nature, resulting in a Negligible/Minor significance of effect.

8.6.40 Lighting for night time working during the construction period would be seen in the context of existing light sources within adjoining industrial development and at road junctions. Proposed lighting would be seen as a temporary extension to existing conditions resulting in a Negligible/Neutral significance of effect.

Viewpoint 13: B2231, Eastchurch

8.6.41 Occupiers of vehicles are low sensitivity receptors and would gain distant views from the road junction on the Isle of Sheppey towards the north Kent coast. The settlement of Sittingbourne would be briefly visible in these transient views, however the construction site would be

barley perceptible at this distance. The magnitude of change would be negligible, leading to a Neutral/Negligible significance of effect, in the short term.

8.6.42 Temporary construction phase lighting would be seen in the context of extensive existing lighting within Sittingbourne. The significance of night time effects would be Neutral.

Viewpoint 14: Snipeshill, edge of residential development

8.6.43 Public footpaths and residential properties on the edge of the village provide vantage points for views by medium to high sensitivity receptors. Distant views of high level stack construction activities would be visible above a low ridge in the intervening agricultural landscape, as a minor element in the view. Existing stacks at the Kemsley Paper Mill would be equally visible in the view. The magnitude of change would be negligible and temporary in nature, leading to a Negligible/Minor adverse significance of effect.

8.6.44 A limited extent of temporary construction phase lighting would be seen in an unlit context. Lighting within the settlement of Sittingbourne would be obscured in this view. The significance of night time effects would be Neutral.

Viewpoint 15: Teynham, edge of residential development

8.6.45 Users of footpaths and occupiers of residential properties on the edge of the village would gain distant open views across arable farmland of high level construction activities above mature vegetation. The works would be slightly more prominent in the view than the existing stacks at Kemsley Paper Mill. The magnitude of change would be negligible, leading to a Negligible/Minor adverse significance of effect.

8.6.46 Temporary construction phase lighting would be seen in a largely unlit context. Lighting within the settlement of Sittingbourne would be obscured in this view. The significance of night time effects would be Neutral.

Table 8.2 Construction Phase Character Effects

Townscape/Landscape Receptor			**Sensitivity**	**Effects**			**Significance of Effect**	
Description of Character Area	**Condition**	**Value (Level of Importance)**	**Townscape/ Landscape Sensitivity (Refer to Effects)**	**Description of Townscape/Landscape Effects**	**Magnitude of Proposed Change**	**Nature/ Duration of Proposed Change**	**Daytime**	**Night time**
Sittingbourne: Industrial/ Commercial	Poor/ Ordinary	Local	Low	Large scale Sustainable Energy Plant construction site, and prominent, high level activities in urban fringe location, not uncharacteristic of character area.	Medium-Direct effect on townscape	Adverse, short term	Minor/ Moderate adverse	Negligible /Minor
Sittingbourne: Residential	Ordinary	Local	Low, site not within character area	Large scale construction works in the context of adjacent residential areas.	Negligible-Indirect effect on townscape	Adverse, short term	Neutral	Neutral
Elmley Marshes	Good	International (Ramsar Site) Local (SLA and ESA)	Low, site not within character area	Large scale construction works in the context of nearby rural areas.	Negligible-Indirect effect on landscape	Adverse, short term	Neutral	Neutral
Elmley Island	Good	International (Ramsar Site) Local (SLA and ESA)	Low, site not within character area	Large scale construction works in the context of nearby rural areas.	Negligible-Indirect effect on landscape	Adverse, short term	Neutral	Neutral
South Sheppey Marshes and Mudflats	Good	International (Ramsar Site) Local (SLA and ESA)	Low, site not within character area	Large scale construction works in the context of nearby natural landscape areas.	Negligible-Indirect effect on landscape	Adverse, short term	Neutral/ Negligible adverse	Negligible /Neutral
Chetney and Greenborough Marshes	Good	International (Ramsar Site) National (SSSI) Local (SLA and ESA)	Low, site not within character area	Large scale construction works in the context of adjacent natural landscapes and rural areas.	Negligible-Indirect effect on landscape	Adverse, short term	Neutral/ Negligible adverse	Negligible /Neutral

Townscape/Landscape Receptor			Sensitivity	Effects			Significance of Effect	
Description of Character Area	**Condition**	**Value (Level of Importance)**	**Townscape/ Landscape Sensitivity (Refer to Effects)**	**Description of Townscape/Landscape Effects**	**Magnitude of Proposed Change**	**Nature/ Duration of Proposed Change**	**Daytime**	**Night time**
Lower Halstow Clay Farmlands	Moderate	Local	Low, site not within character area	High level construction works in the wider visual context of rural landscape.	Negligible-Indirect effect on landscape	Adverse, short term	Neutral	Neutral
Iwade Arable Farmlands	Moderate	Local	Low, site not within character area	Large scale construction works in the context of nearby rural areas.	Negligible-Indirect effect on landscape	Adverse, short term	Neutral	Neutral
Teynham Fruit Belt	Moderate	Local	Low, site not within character area	High level construction works in the context of nearby rural landscape.	Negligible-Indirect effect on landscape	Adverse, short term	Neutral	Neutral
Luddeham and Conyer Marshes	Good	National (SSSI and SPA) Local (SLA)	Low, site not within character area	Large scale construction works in the context of nearby natural landscapes and rural areas.	Negligible-Indirect effect on landscape	Adverse, short term	Neutral	Neutral
National Character Areas								
Greater Thames Estuary	Good to Poor	International (Ramsar Site) National (SSSI) Local (SLA and ESA)	Medium	Large scale Sustainable Energy Plant construction site, and prominent, high level activities in urban fringe location, typical of settlements on estuary coastline.	Small-Direct effect on urban element of landscape character area	Adverse, short term	Minor adverse	Negligible /Minor
North Kent Plain	Good to Ordinary		Low, site not within character area	Large scale construction works in the context of nearby, typically rural landscape.	Negligible-Indirect effect on landscape	Adverse, short term	Neutral/ Negligible adverse	Neutral

Townscape/Landscape Receptor			Sensitivity	Effects			Significance of Effect	
Description of Character Area	**Condition**	**Value (Level of Importance)**	**Townscape/ Landscape Sensitivity (Refer to Effects)**	**Description of Townscape/Landscape Effects**	**Magnitude of Proposed Change**	**Nature/ Duration of Proposed Change**	**Daytime**	**Night time**
North Downs	Good	National (AONB)	Low, site not within character area	Large scale construction works in the context of nearby, typically rural landscape.	Negligible- Indirect effect on landscape	Adverse, short term	Neutral/ Negligible adverse	Neural

Table 8.3 – Construction Phase Visual Effects

Receptor				**Description of Visual Effects**			**Significance of Effects**	
Ref	**Type**	**Location**	**Sensitivity**		**Magnitude of change**	**Nature & duration of proposed change**	**Daytime**	**Night time**
1	Saxon Shore Way	North of the site, Sittingbourne / The Swale	Medium: Users of public right of way	Near open views (600m) along The Swale, of construction site, activities and traffic forming dominant new elements in an urban fringe location.	Medium	Adverse, Short term	Moderate/ Minor adverse	Negligible /Neutral
2	Saxon Shore Way	North East of the site, Sittingbourne / The Swale	Medium: Users of public right of way	Near open views immediately adjacent to site, of construction site, activities and traffic forming dominant new elements and obscuring views beyond.	Medium to Large	Adverse, Short term	Moderate adverse	Negligible /Neutral
3	Church Marshes Country Park	South west of the site, Sittingbourne	Medium to High: Users of public open space	Near, partially obscured views (800m) over intervening vegetation of high level construction activities only, forming prominent new elements in view.	Small to Medium	Adverse, Short term	Minor/ Moderate adverse	Neutral
4	Saxon Shore Way	East of the site, The Swale	Medium: Users of public right of way	Mid-distance open views (1.2km) of construction site, activities and traffic, partially concealed by landform, forming dominant elements.	Medium	Adverse, Short term	Moderate/ Minor adverse	Negligible /Neutral
5	Tonge Corner	Church Road south east of the site	Medium: Residents	Mid-distance open views (2.2km) through trees and over landform of high level construction activities only. Prominent element in view.	Negligible to Small	Adverse, Short term	Minor adverse	Negligible /Neutral

Receptor				Description of Visual Effects			Significance of Effects	
Ref	**Type**	**Location**	**Sensitivity**		**Magnitude of change**	**Nature & duration of proposed change**	**Daytime**	**Night time**
6	Saxon Shore Way	South of the site, Sittingbourne/ Milton Creek	Medium: Users of public right of way (also representative of occupiers of commercial properties)	Mid-distance channelled views (1.6km) along Milton Creek of construction activities and traffic partially concealed by trees. Activities form prominent element in view.	Small to Medium	Adverse, Short term	Minor/ Moderate adverse	Negligible/ Neutral
7	Church Marshes Country Park	South of the site	Medium to High: Users of public open space	Mid-distance open views (1.3km) over houses and industry of high level construction activities, forming minor new element.	Negligible to Small	Adverse, Short term	Minor adverse	Neutral
8	Kemsley	Residential edge west of site	Medium: Residents	Mid-distance channelled views (1.2km) of high level construction activities visible above intervening industrial development. Change in view is perceptible.	Negligible to Small	Adverse, Short term	Negligible/ Minor adverse	Neutral
9	Iwade	Residential edge north west of the site	Medium to High: Residents	Mid-distance open views (2.2km) over farmland of construction site and activities within urban context, forming prominent new elements in view.	Small to Medium	Adverse, Short term	Moderate/ Minor adverse	Negligible/ Neutral
10	Kings Ferry Bridge	North west of site, over The Swale	Medium: Users of footway (also representative of views from vehicles)	Mid-distance open views from elevated location (2.7km) over The Swale of construction site and activities in industrial context. Prominent element in view.	Negligible to Small	Adverse, Short term	Negligible/ Minor adverse	Negligible/ Neutral

Receptor				Description of Visual Effects			Significance of Effects	
Ref	**Type**	**Location**	**Sensitivity**		**Magnitude of change**	**Nature & duration of proposed change**	**Daytime**	**Night time**
11	Elmey Marshes Nature Reserve, public right of way	North east of site, Isle of Sheppey	Medium to High: Users of public right of way	Mid-distance open views (1.9km) over grassland and The Swale of construction site, activities and traffic. Dominant element in industrial context.	Small to Medium	Adverse, Short term	Moderate/ Minor adverse	Negligible/ Neutral
12	Furze Hill, public right of way	North of site, Isle of Sheppey	Medium to High: Users of public right of way	Distant open views from high ground (5.4km) over agricultural land of construction site and activities in industrial context. Minor element in view.	Negligible	Adverse, Short term	Negligible/ Minor adverse	Negligible/ Neutral
13	B2231, Eastchurch	North east of site, Isle of Sheppey	Low: Occupiers of vehicles	Distant framed views (7.8km) over foreground vegetation of construction activities forming barely discernible element in view.	Negligible	Adverse, Short term	Neutral/ Negligible adverse	Neutral
14	Snipeshill,	Edge of residential development, south of site	Medium to High: Residents	Largely concealed mid-distance views (3.4km) over intervening landform of high level stack construction activities forming minor element in view.	Negligible	Adverse, Short term	Negligible/ Minor adverse	Neutral
15	Teynham	Edge of residential development, south east of site	Medium to High: Residents	Largely concealed mid-distance views (4.7km) over mature trees of high level construction activities forming minor element in view.	Negligible	Neutral, Short term	Negligible/ Minor adverse	Neutral

Operational Effects

8.6.47 The proposal would provide a facility for the production of sustainable energy for the St Regis paper mill at Kemsley. The scheme would comprise a layout of several buildings housing the main equipment for production of electricity and steam. The main turbine building/fuel handling building would be located in the central section of the site. The building comprises a series of connected simple rectilinear forms, clad in metal sheeting, with a maximum roof height of 50.5m. To the north of the site the slag transport structure comprises 4 connected rectilinear buildings up to 22m high, with pitched roofs facing The Swale. The metal cladding would be coloured either brown or grey. A pair of stacks for the discharge of flue gas would rise to 90m at the southern end of the site. Smaller buildings linking to the production of steam and electricity would be arranged around the main buildings. A weighbridge would be located near the sites road entrance which provides a new link from Ridham Avenue. Ancillary development would include internal roads, parking, water treatment tanks, fuel tanks, flood attenuation ponds, landscape planting, fencing, offices and lighting. Refer to Lighting Assessment Report, Appendix 8.2, for details.

8.6.48 Landscape proposals are described in detail at section 8.5.

Predicted Character Effects

8.6.49 The effects on the townscape and landscape fabric and character are set out in Table 8.4.

8.6.50 Direct effects on townscape character relate to the Sittingbourne Industrial/Commercial Area. Although the scale of the project is large, even within the context of this extensive industrial area of Sittingbourne, the Sustainable Energy Plant could be accommodated within this character area without significant effects on key features or characteristics. The disused site is covered by ruderal vegetation and scattered scrub, which would be lost following redevelopment. The project would offer the opportunity to enhance the transition between industrial fringe and natural landscapes of The Swale through the introduction of a high quality integrated development that incorporates landscape structure planting. The direct effect of the large scale development would create a small to medium magnitude of change in an area of poor to ordinary condition, no townscape designations and local value. The change in character would be adverse in nature in the long term resulting, on balance, in a Minor effect.

8.6.51 The redevelopment of the proposal site would result in new lighting for the site roadways and external areas. Although this would result in some high level lighting within the site and an increased level of lighting along the site boundaries, this would be in close proximity to the existing paper mill site. In addition, it would be in the context of the existing very well-lit character of the industrial urban fringe of Sittingbourne. Overall, therefore it is not considered

that the lighting at this site would affect the existing character of the area, particularly given the measures adopted to ensure lighting is directional and that spillage is therefore controlled as far as practicable. The significance of night-time effects on the Sittingbourne Industrial/Commercial Area would be Negligible adverse.

8.6.52 The remaining adjoining character areas of Chetney and Greenborough Marshes and the South Sheppey Marshes and Mudflats form the immediate landscape context to the proposals site and are not directly affected by the development. The large scale of the SEP buildings and tall stacks would result in indirect adverse effects on the natural and wild elements of these character areas during the daytime and at night. The significance of effect would be Negligible.

8.6.53 The wider townscape of the Sittingbourne Residential character area which has an ordinary condition and the landscape of Elmley Marshes, Elmley Island, Lower Halston Clay Farmlands, Iwade Arable Farmland, Teynham Fruit Belt and Luddenham and Conyer Marshes which have a good to moderate condition provide context to the SEP proposal. The development would be set on the edge of an existing industrial area and would have no direct effect on the valued aspects of these character areas. The existing extensive industrial development at Sittingbourne forms a backdrop to the character areas and is a characteristic element of the study area in North Kent. The magnitude of change is negligible and adverse in the short term leading to a Neutral/Negligible significance of effect.

8.6.54 Direct effects on national landscape character relate to the Greater Thames Estuary character area. The proposed development would affect the townscape of the industrial fringes of Sittingbourne which are of poor condition. The medium sensitivity to the small magnitude of change would result in a Minor/Moderate adverse long term daytime effect and Negligible adverse night time effects. The adjoining character areas of the North Kent Plain and the North Downs would experience indirect effects that would be of Neutral/Negligible significance. Night time effects would be Neutral.

Summary of Character Effects

8.6.55 The redevelopment of the project site would result in the removal of the majority of existing features. A small area of scrub would be retained in the south west corner of the site. The remaining ruderal vegetation, scattered scrub and post and wire fencing would be replaced by new buildings, infrastructure, roads, circulation space, parking and landscape structure planting within the redevelopment.

8.6.56 The proposal site is typical of the urban character of the industrial district of Sittingbourne. This area has a poor condition, local value and a low sensitivity to change. The introduction of

a group of relatively large-scale buildings and infrastructure elements and two high level stacks into this location would form a visually prominent new element in an industrial setting. An opportunity also exists to include areas of scrub and tree planting around the perimeter of the site. Native trees and shrubs in an open mosaic habitat would create attractive buffers between the industrial districts of Sittingbourne and rural elements of The Swale. Redevelopment of the project site would be on a large scale, however, opportunities also exist for enhancement of existing site conditions.

8.6.57 The overall townscape/landscape effect during operation can be summarised as Minor adverse.

Predicted Visual Effects

8.6.58 The operational phase ZTV for the Sustainable Energy Plant would extend over the same area as the construction phase ZTV (See Figure 8.6).

8.6.59 The effect on views from visual receptors is set out in Table 8.5 and illustrated in photomontages in Figures 8.7 to 8.21.

Viewpoint 1: Saxon Shore Way North of the site

8.6.60 Near open views gained by footpath users would focus on the large scale buildings and tall stacks of the new Sustainable Energy Plant. The proposals would form an extension of the industrial development within Sittingbourne's urban fringe. The mass of the new development, when seen together with the existing townscape would dominate the natural landscape of The Swale, reducing this to a secondary aspect of the view. The grassy mound of the restored landfill would be largely obscured in the view. The sensitivity of the receptor is medium and the magnitude of change in view would also be medium and long term in nature, leading to a Moderate adverse effect on views. Perimeter planting, as part of the landscape proposals would, in time, mature to soften and screen the base of development, traffic and site activities and enhance the transition between urban and rural areas, through which the Saxon Shore Way passes.

8.6.61 Proposed lighting columns and building mounted floodlights would be visible as new light sources in the context of extensive existing lighting within the adjoining industrial district. The building facades would also be visible as partially lit large scale structures within the urban townscape. Lighting would be seen as an intensification of existing conditions resulting in a Negligible adverse significance of effect, in the long term.

Viewpoint 2: Saxon Shore Way North East of the site

8.6.62 This viewpoint lies immediately adjacent to the site boundary which would be defined by a metal mesh security fence, partially filtering views of the base of the development. Due to the relatively close proximity of the slag storage building to the receptor, most views beyond of the other buildings within the SEP or existing industrial development would be obstructed. The proposals would form the dominant element in the view. The sensitivity of the receptor is medium and the magnitude of change in view would be medium to large. The change would be long term resulting in a Moderate/Major effect on views. Landscape proposals in the form of a wide expanse of scrub and grassland mosaic with scattered trees would mature to provide a screen of vegetation, initially concealing the base of the buildings and on site activities and, in time, all main aspects of the development. This would enhance the setting of the Saxon Shore Way and focus views towards The Swale, away from the industrial edge.

8.6.63 Lighting columns and building mounted floodlights for operational purposes would be seen in the context of existing light sources within the adjoining industrial district. Lighting sources and the lit facades of buildings would be seen as an extension to existing conditions resulting in a Negligible adverse significance of effect.

Viewpoint 3: Church Marshes Country Park

8.6.64 Walkers and people engaged in leisure pursuits would gain near open views of the SEP from this location within the Country Park. The base of the buildings would be concealed by existing vegetation at Castle Rough and industrial development at Kemsley Paper Mill. The new buildings and stacks would be of a similar scale and prominence to existing development, creating an intensification of the urban fringe character. The sensitivity of the receptor is medium to high and the magnitude of change in view would be small to medium, leading to a Moderate/Minor adverse effect on views. Proposed tree planting around the perimeter of the SEP would provide a small degree of additional screening at maturity.

8.6.65 No lighting columns or floodlights would be visible from this viewpoint. Night time views would include the partially lit outlines of stacks and buildings seen in the context of existing light sources and development within the adjoining industrial district. The proposals would be visible as a slight intensification of existing conditions. The significance of night time effects would be Neutral.

Viewpoint 4: Saxon Shore Way East of the site

8.6.66 Walkers on the Saxon Shore Way would gain mid-distance open views of the new SEP. The view would predominantly comprise the natural landscapes of The Swale mud flats and marshlands of the Little Murston Nature Reserve, however the urban edge of Sittingbourne extends across the whole width of the view, drawing attention away from the foreground landscape. The mound of the restored landfill site would screen much of the proposed low

level development, however, the tall buildings and stacks of the SEP would supersede Kemsley Paper Mill as the most prominent industrial development. The urban fringe character of Sittingbourne would be intensified, whilst the Energy Plant would form the dominant element in the view. The receptors are of medium sensitivity and the magnitude of change they would experience is medium, leading to a Moderate adverse significance of effect. Perimeter planting would, as it matures, provide screening of the slag storage building to the right, reducing the horizontal spread of the proposals in the view and softening the transition between industry and The Swale.

8.6.67 New lighting columns and building mounted floodlights would be visible as new light sources only at the extreme right hand side of the development where the intervening landform of the landfill site tapers down to The Swale. The building facades would also be visible as partially lit large scale structures within the well lit urban townscape. Lighting would be seen as an extension to existing conditions resulting in a Negligible adverse significance of effect.

Viewpoint 5: Church Road at Tonge Corner (representative of views from residential properties).

8.6.68 Residents within properties at the hamlet of Tonge are receptors of medium sensitivity and would have mid-distance views over arable farmland of the tops of tall buildings and stacks, visible above the restored landfill mound. Mature trees and garden vegetation would filter some views of the proposals. The SEP would be clearly visible within the view, however existing industrial development at Kemsley Paper Mill and numerous pylon towers would have equal prominence as strong vertical elements. The magnitude of change in view would be negligible to small, resulting in a Minor adverse significance of effect. Landscape proposals in the form of tree planting, even when mature, would probably not be visible above the landfill mound.

8.6.69 No lighting columns or floodlights would be visible from this viewpoint. Night time views would include the partially lit outlines of stacks and buildings seen in the context of existing light sources and development within the adjoining industrial district. The proposals would be visible as a slight intensification of existing conditions. The significance of night time effects would be Neutral.

Viewpoint 6: Saxon Shore Way South of the site (also representative of commercial properties on edge of Sittingbourne

8.6.70 Walkers on this long distance footpath are receptors of medium sensitivity able to gain mid-distance channelled views along Milton Creek to the industrial edge of Sittingbourne. This view is also representative of views gained by low sensitivity occupiers of commercial premises, which form the urban fringe on the north eastern edge of the town. The tall

buildings and stacks of the SEP would be partially visible, filtered through intervening mature trees which would break up the mass of the development. The proposals would form a prominent new element within the view however, stacks at Kemsley Paper Mill and pylon towers would have equal prominence. The small number of medium sensitivity walkers and the small to medium magnitude of the change in view would result in a Moderate/Minor significance of effect. The high number of occupiers of commercial properties are of low sensitivity. The small to medium magnitude of change in view would lead to a Minor/Moderate significance of effect. Proposed tree and scrub planting around the site would, in time, mature to provide additional screening of the SEP and reflect vegetation within the landscape of Milton Creek.

8.6.71 Lighting columns and building mounted floodlights for operational purposes would be seen in the context of existing light sources within adjoining industrial development. Night time views would also include the partially lit outlines of stacks and buildings at the SEP in addition to those currently visible at the Paper Mill. Proposed lighting would be seen as an extension to existing conditions resulting in a Negligible/Neutral significance of effect, in the long term.

Viewpoint 7: Church Marshes Country Park

8.6.72 Walkers and people engaged in leisure activities are receptors of medium to high sensitivity in this urban fringe context. These receptors would gain mid-distance open views from this elevated location, over open space and housing of the tops of tall buildings and stacks, rising up beyond existing development at Kemsley Paper Mill. The proposals would result in an intensification of existing development. Open space and housing constitute the main elements within the view, however the SEP together with Kemsley Paper Mill and surrounding pylon towers as vertical structures on the skyline form the most prominent elements in the view. The magnitude of change in view would be negligible to small resulting in a Minor/Moderate significance of effect. Proposed tree planting, even when mature, would not be visible above intervening industry.

8.6.73 No lighting columns or floodlights would be visible from this viewpoint. Night time views would include the partially lit outlines of stacks and buildings seen in the context of existing light sources and development within the intervening industrial district. The proposals would be visible as a slight intensification of existing conditions. The significance of night time effects would be Neutral.

Viewpoint 8: Kemsley, residential edge

8.6.74 Occupiers of new residential properties on the edge of Kemsley would gain mid-distance views over existing industrial development of the tops of new tall buildings and stacks. The SEP would be seen as an extension to and intensification of the wider urban fringe of

Sittingbourne. The proposals would form a prominent, although not uncharacteristic, addition to the view. The strong vertical features in the view, comprising lighting columns, stacks and pylon towers would be repeated in the SEP stacks. The medium sensitivity of the receptor and the negligible to small magnitude of change in view would result in a Minor significance of effect. Landscape planting proposals may, when mature, be visible above intervening development as a minor addition to the view.

8.6.75 No new light sources at the SEP would be visible from this viewpoint. Night time views would include the partially lit outlines of stacks and buildings seen in the context of existing light sources and development within the surrounding industrial district. The proposals would be visible as a slight intensification of existing conditions. The significance of night time effects would be Neutral.

Viewpoint 9: Iwade, residential edge

8.6.76 Occupiers of residential properties on the edge of Iwade would gain mid-distance open views over public open space and farmland to a wide band of industrial and commercial development at Sittingbourne. The SEP would be clearly visible within this urban area. The large scale buildings and tall stacks would rise up above surrounding development. However, the numerous pylon towers would be of equal prominence in the view. The proposals would intensify the existing industrial character of the area. These receptors would be of medium to high sensitivity and experience a small to medium magnitude of change. The significance of effect would be Moderate adverse. Tree and scrub planting would, in time, screen and soften the base of the development, traffic and operational activities, providing visual separation between blocks of industrial development and integrating with vegetation in the middle distance of the view.

8.6.77 Lighting columns and building mounted floodlights for night time operations would be seen in the context of existing light sources within surrounding industrial development and traffic on the A249. The building facades would also be visible as partially lit large scale structures within the urban townscape. Proposed lighting would be seen as an extension to existing conditions resulting in a Negligible/Neutral significance of effect, in the long term.

Viewpoint 10: Kings Ferry Bridge

8.6.78 Pedestrians on the footway of the bridge over The Swale are moderately sensitive receptors who would gain mid-distance open views over the estuary landscape from this elevated location. The wide band of industrial development at Sittingbourne extends across the full width of the view. The complex mix of long low buildings and tall vertical stacks, cranes and pylon towers dominates the view. The SEP would be partially visible as a large scale development of similar character within this urban context. However, the buildings would

break the horizon line of the North Downs beyond, focusing more attention on the proposals. The magnitude of change would be negligible to small, resulting in a Minor adverse significance of effect. Tree planting, as it matures, would screen and soften the base of the development. The belt of planting would provide visual separation between the site and adjacent industry and integrate with linear patterns of vegetation in the middle distance of the view.

8.6.79 Some of the lighting columns and building mounted floodlights would be seen beyond intervening buildings and in the context of existing light sources within surrounding industrial development. The buildings and stacks would also be visible as partially lit large scale structures within the urban townscape. The proposed scheme would be seen as an extension to existing conditions resulting in a Negligible/Neutral significance of effect, in the long term.

Viewpoint 11: Elmey Marshes Nature Reserve, public right of way

8.6.80 Visitors to the Nature Reserve would gain mid-distance open views from the footpath on the Isle of Sheppey. The large simple expanses of grass and sky dominate the view and define the character of the landscape in this area. The proposed SEP would be visible as part of the industrial urban fringe of Sittingbourne which extends as a narrow band throughout the entire width of the view. The proposals would build up development at Kemsley Paper Mill, breaking the horizon of the North Downs beyond. The medium to high sensitivity of the receptor in this rural landscape and the small to medium magnitude of change would lead to a Moderate adverse significance of effect. Tree and scrub planting would mature to provide a dense screen around the base of the development, softening its appearance in the view and providing a buffer between the industrial fringe of Sittingbourne and the natural landscapes of The Swale.

8.6.81 Proposed lighting columns and building mounted floodlights would be visible as new light sources against a backdrop of extensive existing lighting within the industrial district. The buildings and stacks would also be visible as partially lit large scale structures within the urban townscape. Lighting would be seen as an intensification of existing conditions resulting in a Negligible/Neutral adverse significance of effect, in the long term.

Viewpoint 12: Furze Hill, public right of way

8.6.82 Distant open views gained by walkers from this rural footpath on high ground on the Isle of Sheppey would focus on the industrial fringes of Sittingbourne and the bridges over The Swale. The SEP would be visible as an addition to the town's extensive industrial fringe. The large scale of the buildings and the height of the stack breaking the distant horizon of the North Downs would focus attention on the development, however the two Swale bridges would have equal prominence in the view. The receptors are of medium to high sensitivity

and would experience a negligible magnitude of change in view, resulting in a Minor adverse significance of effect. Landscape planting proposals would, in time, screen and soften the base of the buildings and visually relate to other belts of vegetation in the wider landscape.

8.6.83 New lighting columns and building mounted floodlights at the SEP would be visible as new light sources adjoining the extensive existing lighting within the industrial district. The buildings and stacks would also be visible during night time operations as partially lit large scale structures within the urban townscape. Lighting would be seen as a minor intensification of existing conditions resulting in a Negligible/Neutral adverse significance of effect.

Viewpoint 13: B2231, Eastchurch

8.6.84 Occupiers of vehicles are low sensitivity receptors and would gain distant views from the road junction on the Isle of Sheppey towards the north Kent coast. The settlement of Sittingbourne would be briefly visible in these transient views however, the SEP would be barley perceptible within the industrial fringe at this distance. The magnitude of change would be negligible, leading to a Negligible adverse significance of effect.

8.6.85 Lighting would form a very minor addition to the view and would be barely discernible from existing lighting when seen in the context of the industrial fringes of Sittingbourne. The significance of night time effects would be Neutral.

Viewpoint 14: Snipeshill, edge of residential development

8.6.86 Public footpaths and residential properties on the edge of the village provide vantage points for views by medium to high sensitivity receptors. Distant views of the tops of stacks at the SEP would be visible above a low ridge in the intervening agricultural landscape, as a minor element in the view. Existing stacks at the Kemsley Paper Mill would be visible and of equal prominence in the view. The magnitude of change would be negligible leading to a Minor adverse significance of effect.

8.6.87 No lighting columns or floodlights would be visible from this viewpoint. Night time views would include the partially lit outlines of stacks seen beside existing stacks at the Kemsley Paper Mill. The proposals would be visible as a slight intensification of existing conditions. The significance of night time effects would be Neutral.

Viewpoint 15: Teynham, edge of residential development

8.6.88 Users of footpaths and occupiers of residential properties on the edge of the village would gain distant open views across arable farmland of the tops of tall buildings and stacks above mature vegetation. The SEP would be slightly more prominent in the view than the stacks at

Kemsley Paper Mill. The magnitude of change would be negligible, leading to a Minor adverse significance of effect.

8.6.89 No lighting columns or floodlights would be visible from this viewpoint. Night time views would include the partially lit outlines of stacks and buildings seen beside existing stacks at the Kemsley Paper Mill. The proposals would be visible as a slight intensification of existing conditions. The significance of night time effects would be Neutral.

Summary of Visual Effects

8.6.90 In close and medium range views from the north, receptors would gain views of the proposed buildings and structures as prominent and sometimes dominant elements in front of an extensive backdrop of existing industry at the paper mill. The most significant changes in views occur for users of the Saxon Shore Way. At viewpoint 2 the visual effect would be Moderate/Major which is significant in terms of the EIA Regulations. In close range views from the south and east receptors would gain views of the tops of buildings and stacks, above intervening industrial development and the landfill mound, as prominent although minor new elements. In mid-distance views from the south the stacks would be visible alongside existing stacks at the paper mill above intervening housing or landform. Distant views of the proposals would be gained in the context of a broad swath of visually complex industrial development. There are no instances where new industrial buildings or structures at the SEP would be visible in a view that does not already contain existing views of industry.

8.6.91 Plumes emitted from the stacks would also form a visible element of the proposals. Chapter 7, Air and Climate, predicts that the plumes would be visible between 22.1% and 28.9% of the time. The form, size and extent of the plumes would constantly change throughout the day making a definitive assessment of their transient effect on views difficult. The proposed plumes would be visible in the context of existing plumes at the Paper Mill and adjoining industrial premises. Plumes are characteristic of the industrial of the northern fringes of Sittingbourne. The existing situation would be intensified through the introduction of the new SEP.

8.6.92 The overall visual effect during operation can be summarised as Moderate/Minor adverse.

Table 8.4 Operational Phase Character Effects

Townscape/Landscape Receptor			**Sensitivity**	**Effects**			**Significance of Effect**	
Description of Character Area	**Condition**	**Value (Level of Importance)**	**Townscape/ Landscape Sensitivity (Refer to Effects)**	**Description of Townscape/Landscape Effects**	**Magnitude of Proposed Change**	**Nature/ Duration of Proposed Change**	**Daytime**	**Night time**
Sittingbourne: Industrial/ Commercial	Poor/ Ordinary	Local	Low	Large scale SEP redevelopment of disused land. Loss of visually poor site features and vegetation. Intensification of industrial development in urban fringe location.	Small to Medium- Direct effect on townscape	Adverse, long term	Minor adverse	Negligible
Sittingbourne: Residential	Ordinary	Local	Low, site not within character area	Large scale industrial development in the context of adjacent residential areas.	Negligible- Indirect effect on townscape	Adverse, long term	Neutral/ Negligible adverse	Neutral/ Negligible
Elmley Marshes	Good	International (Ramsar Site) Local (SLA and ESA)	Low, site not within character area	Large scale industrial development in the context of nearby natural landscapes and rural areas.	Negligible- Indirect effect on landscape	Adverse, long term	Neutral/ Negligible adverse	Neutral/ Negligible
Elmley Island	Good	International (Ramsar Site) Local (SLA and ESA)	Low, site not within character area	Large scale industrial development in the context of nearby rural areas.	Negligible- Indirect effect on landscape	Adverse, long term	Neutral/ Negligible adverse	Neutral/ Negligible
South Sheppey Marshes and Mudflats	Good	International (Ramsar Site) Local (SLA and ESA)	Low, site not within character area	Large scale industrial development in the context of nearby natural landscape areas.	Negligible- Indirect effect on landscape	Adverse, long term	Negligible adverse	Negligible
Chetney and Greenborough Marshes	Good	International (Ramsar Site) National (SSSI) Local (SLA and ESA)	Low, site not within character area	Large scale industrial development in the context of adjacent natural landscapes and rural areas.	Negligible- Indirect effect on landscape	Adverse, long term	Negligible adverse	Negligible

Townscape/Landscape Receptor			Sensitivity	Effects			Significance of Effect	
Description of Character Area	**Condition**	**Value (Level of Importance)**	**Townscape/ Landscape Sensitivity (Refer to Effects)**	**Description of Townscape/Landscape Effects**	**Magnitude of Proposed Change**	**Nature/ Duration of Proposed Change**	**Daytime**	**Night time**
Lower Halstow Clay Farmlands	Moderate	Local	Low, site not within character area	High level industrial development in the wider visual context of rural landscape.	Negligible-Indirect effect on landscape	Adverse, long term	Neutral/ Negligible adverse	Neutral/ Negligible
Iwade Arable Farmlands	Moderate	Local	Low, site not within character area	Large scale industrial development in the context of nearby rural areas.	Negligible-Indirect effect on landscape	Adverse, long term	Neutral/ Negligible adverse	Neutral/ Negligible
Teynham Fruit Belt	Moderate	Local	Low, site not within character area	High level industrial development in the context of nearby rural landscape.	Negligible-Indirect effect on landscape	Adverse, long term	Neutral/ Negligible adverse	Neutral/ Negligible
Luddeham and Conyer Marshes	Good	National (SSSI and SPA) Local (SLA)	Low, site not within character area	Large scale industrial development in the context of nearby natural landscapes and rural areas.	Negligible-Indirect effect on landscape	Adverse, long term	Neutral/ Negligible adverse	Neutral/ Negligible
National Character Areas								
Greater Thames Estuary	Good to Poor	International (Ramsar Site) National (SSSI) Local (SLA and ESA)	Medium	Large scale EFW development in urban fringe location, typical of settlements on estuary coastline.	Small -Direct effect on urban element of landscape character area	Adverse, long term	Minor adverse	Negligible
North Kent Plain	Good to Ordinary		Low, site not within character area	Large scale industrial development in the context of nearby, typically rural landscape.	Negligible-Indirect effect on landscape	Adverse, long term	Neutral/ Negligible adverse	Neutral

Townscape/Landscape Receptor			Sensitivity	Effects			Significance of Effect	
Description of Character Area	**Condition**	**Value (Level of Importance)**	**Townscape/ Landscape Sensitivity (Refer to Effects)**	**Description of Townscape/Landscape Effects**	**Magnitude of Proposed Change**	**Nature/ Duration of Proposed Change**	**Daytime**	**Night time**
North Downs	Good to Ordinary	National (AONB)	Low, site not within character area	Large scale industrial development in the context of nearby, typically rural areas.	Negligible- Indirect effect on landscape	Adverse, long term	Neutral/ Negligible adverse	Neutral

Table 8.5 – Operational Phase Visual Effects

Receptor				Description of Visual Effects			Significance of Effects	
Ref	**Type**	**Location**	**Sensitivity**		**Magnitude of change**	**Nature & duration of proposed change**	**Daytime**	**Night time**
1	Saxon Shore Way	North of the site, Sittingbourne/ The Swale	Medium: Users of public right of way	Near open views (600m) along The Swale of large scale buildings and tall stacks forming dominant new elements in an urban fringe location. The SEP would be visible as an extension of existing industrial development, however, it would form the largest built element in the view. Landscape planting would, in time, screen and soften the base of development, reducing the apparent mass of the buildings.	Medium	Adverse, long term	Moderate adverse	Negligible
2	Saxon Shore Way	North East of the site, Sittingbourne/ The Swale	Medium to High: Users of public right of way	Near open views immediately adjacent to SEP of slag storage building forming dominant new element and obscuring views beyond. Tops of stacks would also be visible. Landscape planting would, in time, screen development in this view.	Medium to Large	Adverse, long term	Moderate/ Major adverse	Negligible
3	Church Marshes Country Park	South west of the site, Sittingbourne	Medium to High: Users of public open space	Near, partially obscured views (800m) over intervening vegetation of the tops of tall buildings and stacks forming prominent new elements in view. The SEP would be visible as an extension of existing industrial development. Landscape planting would, in time, provide a small amount of additional screening in this view.	Small to Medium	Adverse, long term	Moderate/ Minor adverse	Neutral

Receptor				Description of Visual Effects			Significance of Effects	
Ref	**Type**	**Location**	**Sensitivity**		**Magnitude of change**	**Nature & duration of proposed change**	**Daytime**	**Night time**
4	Saxon Shore Way	East of the site, The Swale	Medium: Users of public right of way	Mid-distance open views (1.2km) of large scale buildings and tall stacks partially concealed by landform, forming dominant elements. The SEP would be visible as an extension of existing industrial development however, it would form the largest built element in the view. Landscape planting would, in time, screen and soften the base of development to the right of the view.	Medium	Adverse, long term	Moderate adverse	Negligible
5	Tonge Corner	Church Road south east of the site	Medium: Residents	Mid-distance open views (2.2km) through trees of tops of proposed tall buildings and stacks partially visible rising up beyond landform. Prominent element in view. Landscape proposals would not be visible in this view, even when mature.	Negligible to Small	Adverse, long term	Minor adverse	Neutral
6	Saxon Shore Way	South of the site	Medium: Users of public right of way (also representative of occupiers of commercial properties)	Mid-distance channelled views (1.6km) along Milton Creek of SEP buildings and stacks, partially concealed by existing trees. Proposals would form prominent element in view. Landscape planting would, in time, screen and soften base of development and assimilate with mid-distance trees.	Small to Medium	Adverse, long term	Moderate/ Minor adverse	Negligible/ Neutral
7	Church Marshes Country Park	South of the site	Medium to High: Users of public open space	Mid-distance open views (1.3km) over houses and industry of tops of proposed tall buildings and stacks, forming minor new element. Landscape proposals would not be visible in this view, even when mature.	Negligible to Small	Adverse, long term	Minor/ Moderate adverse	Neutral

Receptor				Description of Visual Effects			Significance of Effects	
Ref	**Type**	**Location**	**Sensitivity**		**Magnitude of change**	**Nature & duration of proposed change**	**Daytime**	**Night time**
8	Kemsley	Residential edge west of site	Medium: Residents	Mid-distance channelled views (1.2km) of tops of proposed tall buildings and stacks visible above intervening industrial development. Change in view is perceptible. Landscape proposals would be barely visible when mature.	Negligible to Small	Adverse, long term	Minor adverse	Neutral
9	Iwade	Residential edge north west of the site	Medium to High: Residents	Mid-distance open views (2.2km) over farmland of large scale buildings and tall stacks of SEP within urban context, forming prominent new elements in view. Landscape planting would, in time, screen and soften the base of development, reducing the apparent mass of the buildings and merging with mid-distance trees.	Small to Medium	Adverse, long term	Moderate adverse	Negligible/ Neutral
10	Kings Ferry Bridge	North west of site, over The Swale	Medium: Users of footway (also representative of views from vehicles)	Mid-distance open views from elevated location (2.7km) over The Swale of proposed large buildings and tall stacks in extensive industrial context. Prominent element in view. Landscape planting would, in time, screen the base of buildings and provide visual separation between developments.	Negligible to Small	Adverse, long term	Minor adverse	Negligible/ Neutral
11	Elmey Marshes Nature Reserve, public right of way	North east of site, Isle of Sheppey	Medium to High: Users of public right of way	Mid-distance open views (1.9km) over grassland and The Swale of the large scale buildings and tall stacks of the SEP. Dominant element in industrial context. Landscape planting would, in time, screen and soften the base of development, reducing the apparent mass of the buildings.	Small to Medium	Adverse, long term	Moderate adverse	Negligible/ Neutral

Receptor				Description of Visual Effects			Significance of Effects	
Ref	**Type**	**Location**	**Sensitivity**		**Magnitude of change**	**Nature & duration of proposed change**	**Daytime**	**Night time**
12	Furze Hill, public right of way	North of site, Isle of Sheppey	Medium to High: Users of public right of way	Distant open views from high ground (5.4km) over agricultural land of proposed SEP in industrial context. Minor element in view. Landscape planting would, in time, screen and soften the base of development, reflecting vegetation in the wider landscape.	Negligible	Adverse, long term	Minor adverse	Negligible/ Neutral
13	B2231, Eastchurch	North east of site, Isle of Sheppey	Low: Occupiers of vehicles	Distant framed views (7.8km) over foreground vegetation of proposed SEP forming barely discernible element in view.	Negligible	Adverse, long term	Negligible adverse	Neutral
14	Snipeshill,	Edge of residential development, south of site	Medium to High: Residents	Largely concealed mid-distance views (3.4km) over intervening landform of tops of proposed stacks forming minor new elements in view.	Negligible	Adverse, long term	Minor adverse	Neutral
15	Teynham	Edge of residential development, south east of site	Medium to High: Residents	Largely concealed mid-distance views (4.7km) over mature trees of tops of stacks and tall buildings within SEP forming minor new elements in view.	Negligible	Adverse, long term	Minor adverse	Neutral

Cumulative Effects

8.6.93 Future major developments could include the following as described in Chapter 1:

- Biomass combined heat and power plant at Countryside Recycling, Ridham Dock
- Biomass combined heat and power plant at Brett's, Ridham Dock
- Kemsley Industrial Development
- Sittingbourne Northern Relief Road
- East Hall Farm residential expansion

8.6.94 The two proposed power plant developments at Ridham Dock, industrial expansion at Kemsley and the Northern Relief Road would lie within the same Sittingbourne Industrial/Commercial character area as the SEP proposal. It is possible that the construction phases of these projects could overlap, resulting in temporary, direct cumulative adverse effects on the townscape character. The relief road would also lie within the Chetney and Greenborough Marshes and Teynham Fruit Belt landscape character areas. The East Hall Farm residential expansion would also lie within the Tynham Fruit Belt. Direct effects on these two landscape character areas would occur as a result of these two developments. Indirect effects on the wider surrounding landscape character could also occur. Depending on the detail of the final schemes for the two power plants at Ridham Docks and the industrial developments at Kemsley, there could be a cumulative effect resulting from an intensification of the urban context, although the land use and character of this part of Sittingbourne would remain industrial.

8.6.95 For receptors at all of the previously assessed viewpoints, except viewpoints 6 and 14, the proposed industrial development at Kemsley would be visible as a minor addition to the extensive existing industrial fringes of Sittingbourne. The power plants at Ridham Docks would be visible from viewpoints 4, 5, 7, 9, 10, 11, 12 and 13, forming prominent new elements in views. These 3 developments would be in character with their townscape surroundings. The Northern Relief Road would be visible in viewpoints 3, 4, 5, 6, 7, 11, 12 and 14. The road would be particularly visible from viewpoint 3 where it crosses the foreground of the view and in viewpoints 4, 5 and 6 where the bridge over Milton Creek would form a prominent new element in the view. From viewpoints 11 and 12 the East Hall Farm proposal would be visible as an extension to the urban edge of Sittingbourne.

8.6.96 The Sittingbourne Industrial/Commercial character area contains an abundance of industry which the proposed power plants and Kemsley industrial developments would add to as an intensification of use. These developments are large in scale and would be visually prominent in the landscape/townscape in their own right. During construction and operation, visual receptors would gain views of the SEP in the context of a more developed location. The

proposed developments would not wholly block any of the views of the SEP from identified receptors.

8.7 Mitigation

8.7.1 The landscape mitigation measures described in section 8.5 Incorporated Enhancement and Mitigation, have been included as an integral part of the scheme so as to avoid, minimise and, where necessary, compensate for potential adverse effects. It is important to note that the SEP proposal would facilitate the restoration of a largely disused and derelict site on the urban edge of Sittingbourne. Replacing previously used land with a scheme combining appropriately designed buildings and landscape treatments will have some beneficial effects on the townscape of the site and adjoining industrial and commercial district. No further landscape mitigation would be proposed.

8.8 Residual Impacts

8.8.1 Landscape mitigation proposals have been included as an integral part of the proposed SEP scheme. The range of treatments including an open mosaic of scrub and rough grassland with clusters of trees, linear reed beds within the base of the flood attenuation ponds, grassland with flora and fruiting trees would be implemented as part of the proposals. The assessment of landscape/townscape and visual effects has been undertaken based on the scheme at year one after completion, when the planting proposals are newly established.

8.8.2 No further secondary mitigation measures are proposed to address the residual effects of the scheme on receptors. However, as the landscape proposals mature they will become a more significant aspect of the scheme, capable of enhancing views of the SEP and the quality of its townscape. There would be a slight reduction in adverse effects on views from the closest visual receptors at the Saxon Shore Way where boundary vegetation would, over time, screen and merge the development into the surrounding landscape and townscape setting. At mid to long distances the improvement in views from receptors would be less significant.

Table 8.6 Summary of Residual Effects

Effect	**Significance of Effects**	
	Construction	*Operation*
Townscape/Landscape Character – Daytime	Minor/Moderate adverse	Minor adverse
Townscape/Landscape Character – Night	Negligible	Negligible

time		
Views - Daytime	Minor/Moderate adverse	Moderate/Minor adverse
Views – Night time	Negligible/Neutral	Negligible/Neutral

8.9 Conclusions

8.9.1 The overall context of the site is that of an industrial townscape on the northern edge of Sittingbourne, beside The Swale estuary. The townscape is influenced by a variety of land uses including industrial, commercial, open land, disused land, transport corridors and docks. The proposed industrial redevelopment of the site would reflect the adjoining St Regis paper mill complex and reinforce local townscape character.

8.9.2 Due to the lack of significant site features in the form of built development or vegetation, the existing site is not prominent in views from the surrounding area. The site is easily missed and appears as a gap or opening on the edge of the urban fringe of Sittingbourne.

8.9.3 The new buildings, although of similar industrial character to existing neighbouring development, are of a large scale which draws attention to them. The redevelopment of the SEP site would extend the built development edge of industrial buildings at the paper mill much closer to the sensitive receptors within The Swale and on the Isle of Sheppey. In near views this can result in the development becoming the most prominent element or the new focus within the view, however in more distant views the SEP merely creates a minor intensification of the industrial fringes of Sittingbourne which are already a major feature within the view.

8.9.4 The changes that will occur in the Sittingbourne Industrial/Commercial character area as a result of the development of the SEP can be accommodated. The poor condition of the townscape of the site and the lack of significant features or designations, provide the opportunity for introducing the new elements of the proposals without unacceptably significant adverse effects. The proposals will not result in the loss of any key townscape elements.

8.9.5 The proposed landscape perimeter planting is an integral part of the proposal and would enhance the existing poor quality of the area's urban character and provide important buffers with neighbouring rural areas.

8.9.6 Location of the SEP on the north east side of the existing St Regis Paper Mill would result in a relatively small number of visual receptors in the settlement of Sittingbourne experiencing a

change in view. New stacks and the tops of buildings would be seen in the immediate context of existing stacks, buildings and pylons.

8.10 References

Landscape Institute and Institute of Environmental Management and Assessment (2002) Guidelines for Landscape and Visual Impact Assessment 2nd Edition

The Countryside Agency and Scottish Natural Heritage (2002) Landscape Character Assessment – Guidance for England and Scotland

The South East Plan Regional Spatial Strategy for the South East of England, May 2009

Kent Thames Gateway Sub-regional Strategy Area

Swale Borough Local Plan, February 2008

Creating sustainable communities: Greening the Gateway, DEFRA and ODPM, 2004

Thames Gateway Delivery Plan, December 2007

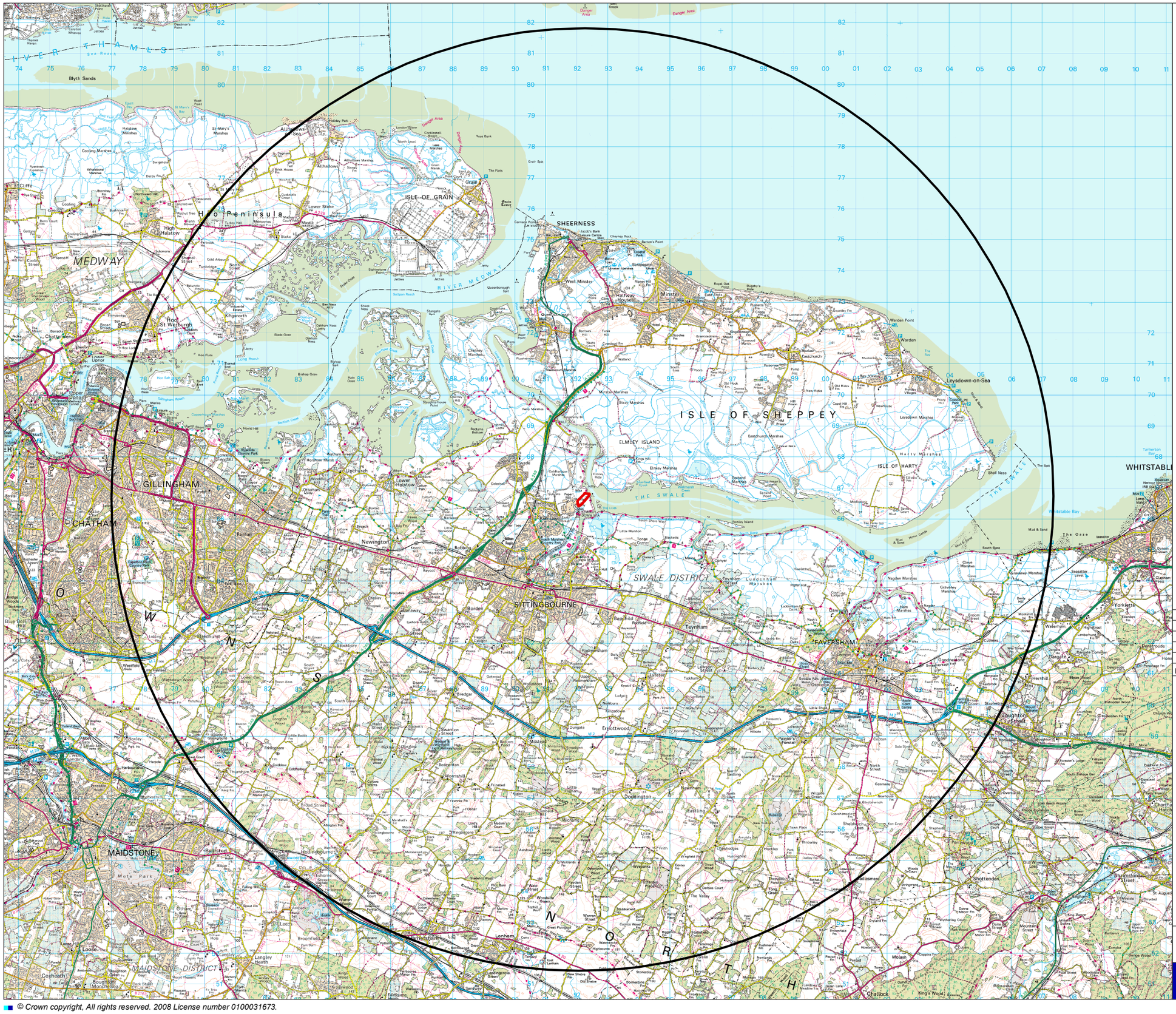
Green Cluster Study 1 – Milton Creek, Department for Communities and Local Government, 2008

HMSO, The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999

Swale Landscape Character Assessment and Guidelines, March 2005

D.L.Sattin, Barge Building and Barge Builders of The Swale, 1990

Alan Major, Hidden Kent, 1994



Legend

- Site Location
- Study Area (15km Buffer)

Rev:	Date:	Amendment:	Name:	Checked:

Data Source: RPS 2009

Status: FINAL

RPS
Mallams Court 18 Milton Park Abingdon Oxon Ox14 4RP
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Client: St Regis Paper Mill Co.

Project: Kemsley SEP.

Title: Site Location Plan and Study Area

Scale: A3 @ 1:120,000

0 1.25 2.5 Kilometers

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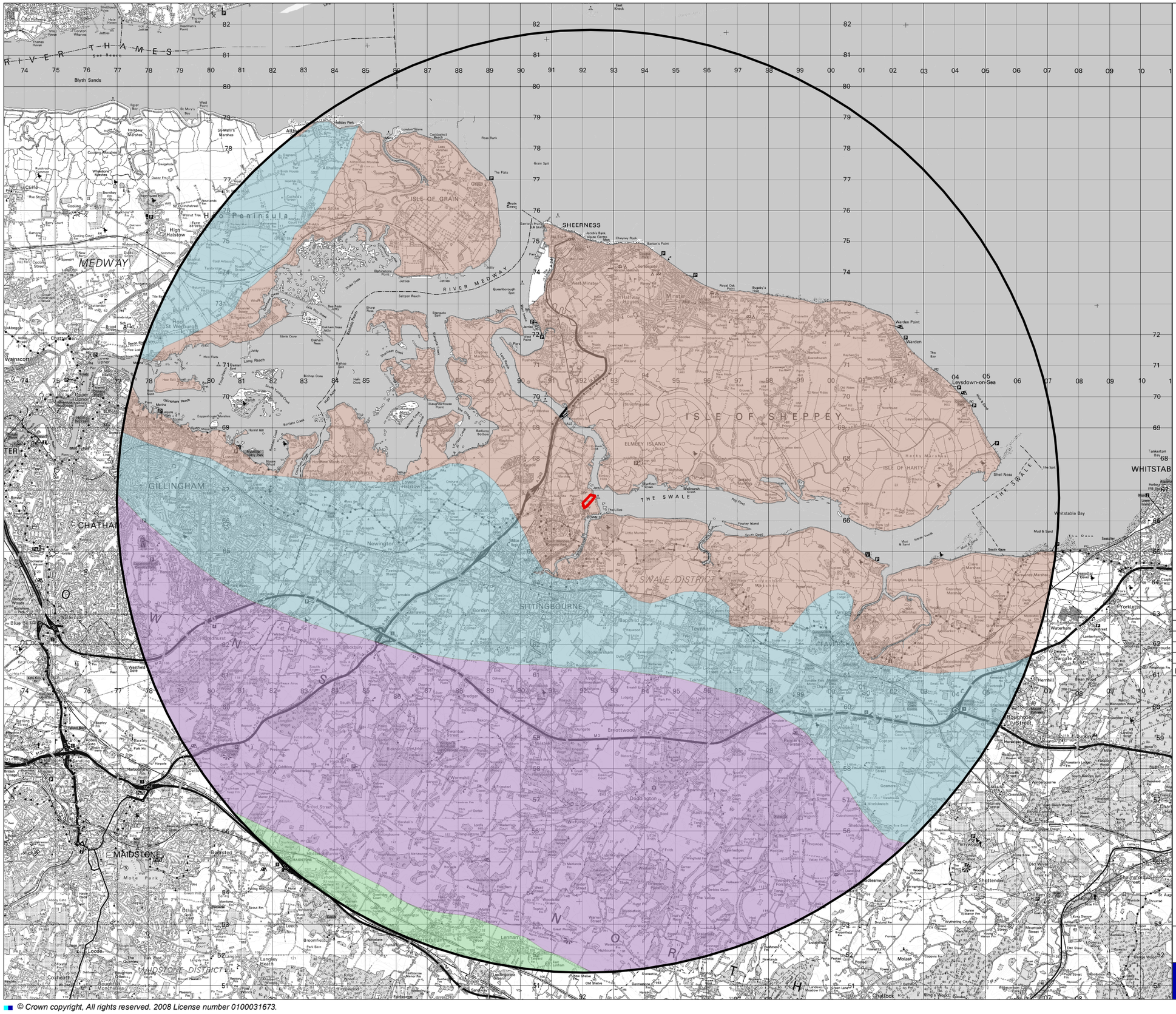
Date: 02/11/09 Datum: OSGB36 Projection: BNG

Drawn: CA Checked: JB Job Ref: JR5958

Figure No: 8.1 Revision: -

Project Ref:O:\5958b Kemsley Paper Mill\Tech\GIS\MXD\11_2009\5958D_091102CA_SiteLocation.mxd

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Legend

- Site Location
- Study Area (15km Buffer)

Countryside Character Initiative

National Landscape Character Areas

- 81 Greater Thames Estuary
- 113 North Kent Plain
- 119 North Downs
- 120 Wealden Greensand

Rev:	Date:	Amendment:	Name:	Checked:

Data Source: RPS 2009

Status: FINAL

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Client: St Regis Paper Mill Co.

Project: Kemsley SEP.

Title: Landscape Character Areas - 15km Radius

Scale: A3 @ 1:120,000

0 1.25 2.5 Kilometers

N

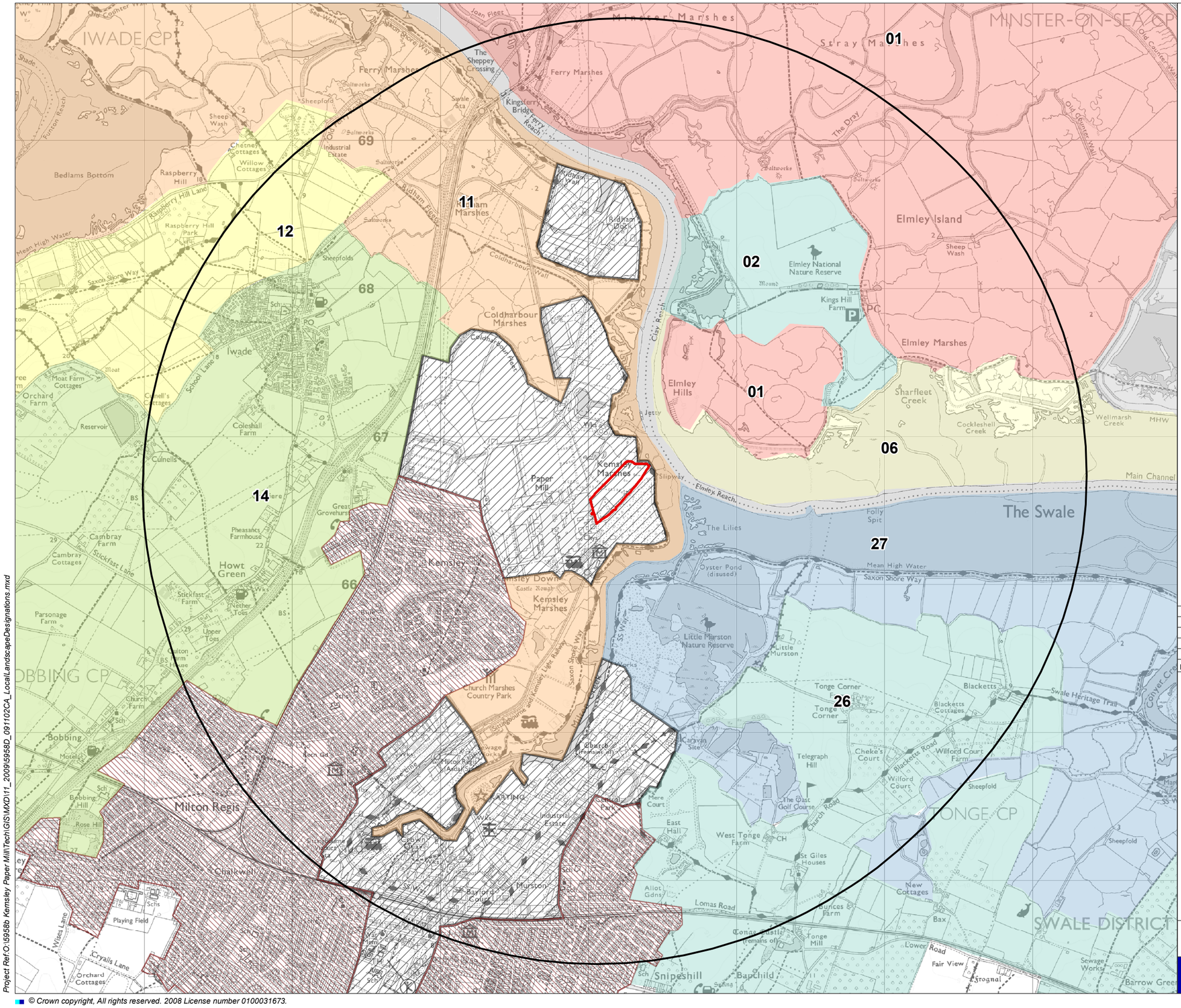
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Drawn: CA Checked: JB Job Ref: JR5958

Figure No: 8.2 Revision: -

Project Ref:O:\5958b Kemsley Paper Mill\Tech\GIS\MXD\1f1_20091102CA_NationalLandscapeDes.mxd

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Legend

- Site Location
- Study Area (3km Buffer)

Swale Borough Council

Local Landscape Character Areas

- 01, Elmley Marshes
- 02, Elmley Island
- 03, Spitend Marshes
- 06, South Sheppey Marshes And Mudflats
- 11, Chetney and Greenborough Marshes
- 12, Lower Halstow Clay Farmlands
- 14, Iwade Arable Farmlands
- 26, Teynham Fruit Belt
- 27, Luddenham And Conyer Marshes

Townscape Character Areas

- Sittingbourne: Residential
- Sittingbourne: Industrial/Commercial

Rev:	Date:	Amendment:	Name:	Checked:

Data Source: RPS 2009

Status: FINAL

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Client: St Regis Paper Mill Co.

Project: Kemsley SEP.

Title: Landscape Character Areas - 3km Radius

Scale: A3 @ 1:25,000

0 0.5 1 Kilometers

N

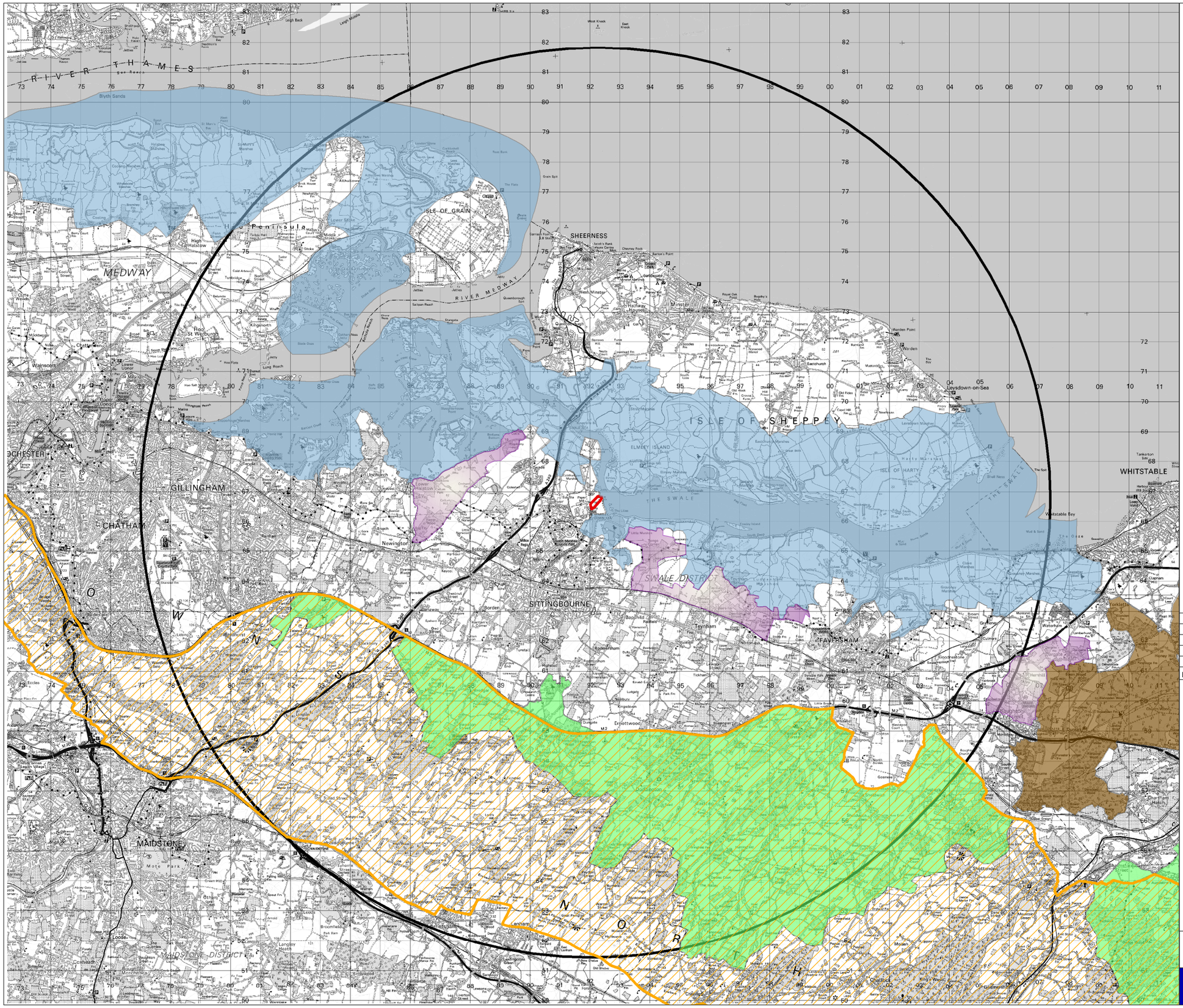
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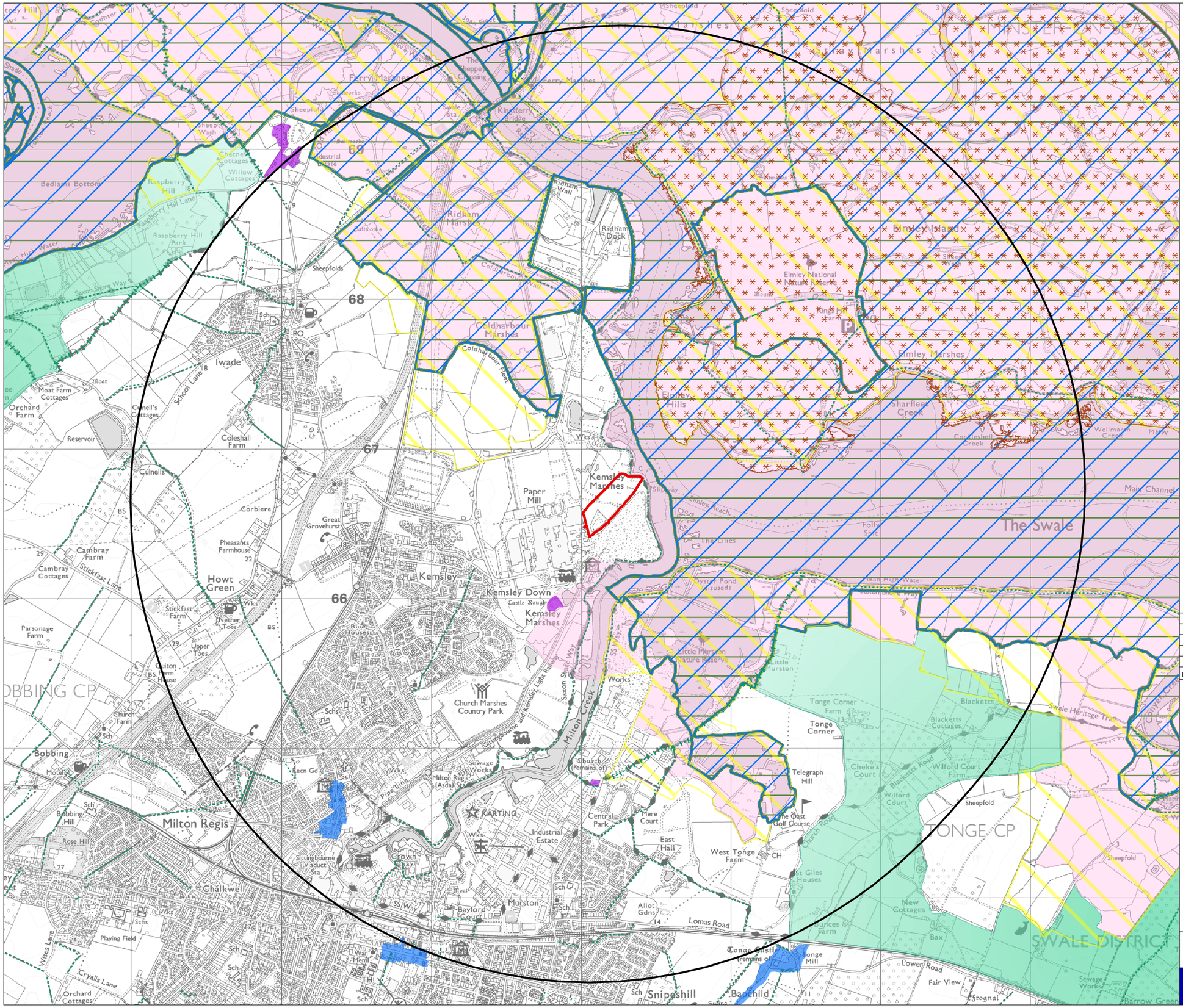
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Figure No: 8.3 Revision: -

Project Ref:O:\5958b Kemsley Paper Mill\Tech\GIS\MXD\1f1_20091102CA_LocalLandscapeDesignations.mxd

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RIVER THAMES
Hoo Peninsula
ISLE OF GRAIN
SHEERNESS
MEDWAY
RIVER MEDWAY
Minster
Halfway Houses
Queenborough
Leysdown-on-Sea
ISLE OF SHEPPEY
ELMLEY ISLAND
ISLE OF HARTY
THE SWALE
WHITSTABLE
Whitstable Bay
Tankerton Bay
Herne Bay
Reculver
Hoo St Werburgh
Wainscott
Upchurch
GILLINGHAM
CHATHAM
Newington
SITTINGBOURNE
Borden
Teynham
FAVERSHAM
Dunkirk
Ernettwood
Doddington
MAIDSTONE
Mote Park
Cobtree
Coxheath
Boughton Monchelsea
Langley Heath
Lenham
Charing
Shottenden
Chilham
Chartham
Chartham Hatch
Harbledown
Chestfield
Swalecliffe
Whitstable
Seasalter
Graveney Marshes
Oare Marshes
Faversham Creek
Nagden Marshes
Broad Oak
Blean
Tyler Hill
Canterbury
Kingsdown
Eastchurch
Warden
Warden Point
Leysdown
Minster
Queenborough
Halfway Houses
Sheerness
Isle of Grain
Hoo Peninsula
Allhallows
Cliffe
Cliffe Woods
High Halstow
Hoo St Werburgh
Wainscott
Upchurch
Newington
Sittingbourne
Teynham
Faversham
Dunkirk
Ernettwood
Doddington


IWADE CP
BOBBING CP
TONGE CP
SWALE DISTRICT
Iwade
Milton Regis
Kemsley
Kemsley Down
Howt Green
Chalkwell
Snipeshill
Barrow Green
Bobbing
Tonge
Murston
Ridham Marshes
Elmley Marshes
Elmley Island
Kemsley Marshes
Coldharbour Marshes
Church Marshes Country Park
Elmley National Nature Reserve
Little Murston Nature Reserve
The Swale
Milton Creek
Sharfleet Creek
Coldharbour Fleet
Saxon Shore Way
Swale Heritage Trail
Main Channel
Kingsferry Bridge
Ridham Dock
Paper Mill
Sewage Works
Industrial Estate
Central Park
Mere Court
East Hall
West Tonge Farm
Tonge Corner
Telegraph Hill
The East Golf Course
Church Road
Lomas Road
Lower Road
Fair View
Tonge Mill
Tonge Castle (remains of)
Milton Regis (site of)
Church (remains of)
Bayford Court
Crown Way
Sittingbourne Viaduct
Sittingbourne and Kemsley Light Railway
Pipeline
Sheepfolds
Sheepfold
Raspberry Hill
Raspberry Hill Lane
Raspberry Hill Park
Bedlams Bottom
Chetney Cottages
Willow Cottages
Sheep Wash
Ridham Wall
Coldharbour Farm
Moat Farm Cottages
Orchard Farm
Culnell's Cottages
Culnells
School Lane
Coleshall Farm
Reservoir
Corbiere
Great Grovehurst
Pheasants Farmhouse
Cambray Farm
Cambray Cottages
Stickfast Lane
Stickfast Farm
Nether Toes
Upper Toes
Parsonage Farm
Culton Farm House
Church Farm
Bobbing Hill
Rose Hill
Motel
Wises Lane
Cryalls Lane
Orchard Cottages
Playing Field
Allot Gdns
Bax
New Cottages
Sunces Farm
Blacketts
Blacketts Cottages
Blacketts Road
Cheke's Court
Wilford Court
Wilford Court Farm
St Giles Houses
Oyster Pond (disused)
Folly Spit
The Lilies
Elmley Beach
Shipyard
Little Murston
Tonge Corner Farm
Sheepfold
Mean High Water
Seawall
Saxon Shore Way
Milton Creek
Cockleshell Creek
Wellman Creek
Meadow
Works
Wks
Sch
PO
FB
TH
CH
Mem
Pond
Spring
Tks
Gdns
Allot
Sta
Jetty
Slipway
Beach
Dyke
Creek
Marsh
Flats
Island
Hill
Wood
Farm
Cottages
Houses
Reservoir
Viaduct
Bridge
Pipeline
Saxon Shore Way
Swale Heritage Trail
Main Channel
Milton Creek
Sharfleet Creek
Coldharbour Fleet
Cockleshell Creek
Wellman Creek
Folly Spit
Elmley Beach
Oyster Pond (disused)
Little Murston Nature Reserve
Elmley National Nature Reserve
Church Marshes Country Park



Legend

- Site location
- 15km buffer
- Stack visible
- Combined building and stack visible
- Viewpoint location
- Viewpoint deleted

1. Saxon Shore Way, north of site
2. Saxon Shore Way, north-east of site
3. Church Marshes Country Park, Sittingbourne
4. Saxon Shore Way, North Kent Marches SLA
5. Tonge Corner
6. Sittingbourne commercial edge, Saxon Shore Way
7. Church Marshes Country Park, Sittingbourne
8. Kemsley, residential edge
9. Iwade
10. Kings Ferry Bridge
11. Elmley Nature Reserve car park, Isle of Sheppey
12. Furze Hill public right of way, Minster, Isle of Sheppey
13. B2231, Eastchurch, Isle of Sheppey
14. Snipeshill
15. Teynham

No views available

16. Eastling, Kent Downs AONB
17. Doddington, Kent Downs AONB

Rev:	Date:	Amendment:	Name:	Checked:
-	-	-	-	-

Data source: RPS 2009

Status: FINAL

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Project: Kemsley SEP.

Title: Zone of Theoretical Visibility and Visual Receptor Viewpoints

Date: Nov 09 Scale: NTS Original Paper Size: A3

Drawn: AVG Checked: PE Job Ref: JR5958

Figure Number: 8.6 Rev:

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RPS stRegis e·on	Date of photograph: 27/08/09 Lens type: 50mm	Approximate distance to site: 600m OS reference: 592256, 167360	Direction to site: South Viewpoint height: 6.61m AOD	Horizontal field of view: 75^0 Viewing distance: 300mm @ A3	**VIEWPOINT 1: Saxon Shore Way, north of site** **KEMSLEY SEP** **Figure 8.7**

Ref: O:\5958b Kemsley Paper Mill\Tech\Graphics\Photomontage\ 5958D_100104RM_Photomontages03.indd





RPS stRegis e·on	Date of photograph: 27/08/09 Lens type: 50mm	Approximate distance to site: 5m OS reference: 592383, 166825	Direction to site: SW Viewpoint height: 4.45m AOD	Horizontal field of view: 75^0 Viewing distance: 300mm @ A3	**KEMSLEY SEP** **VIEWPOINT 2: Saxon Shore Way, north-east of site** **Figure 8.8**

Ref: O:\5958b Kemsley Paper Mill\Tech\Graphics\Photomontage\ 5958D_100104RM_Photomontages03.indd





RPS stRegis e·on	Date of photograph: 27/08/09 Lens type: 50mm	Approximate distance to site: 800m OS reference: 591668, 165685	Direction to site: NE Viewpoint height: 4.96m AOD	Horizontal field of view: 75^0 Viewing distance: 300mm @ A3	**KEMSLEY SEP** **VIEWPOINT 3: Church Marshes Country Park, Sittingbourne** **Figure 8.9**

Ref: O:\5958b Kemsley Paper Mill\Tech\Graphics\Photomontage\ 5958D_100104RM_Photomontages03.indd





RPS stREGIS e·on

Date of photograph: 27/08/09
Lens type: 50mm

Approximate distance to site: 1.2km
OS reference: 593473, 166182

Direction to site: NWW
Viewpoint height: 1.65m AOD

Horizontal field of view: 75°
Viewing distance: 300mm @ A3

VIEWPOINT 4: Saxon Shore Way, North Kent Marches SLA

KEMSLEY SEP

Figure 8.10

Ref: O:\5958b Kemsley Paper Mill\Tech\Graphics\Photomontage\ 5958D_100104RM_Photomontages03.indd





RPS stREGIS e·on	Date of photograph: 27/08/09 Lens type: 50mm	Approximate distance to site: 2.2km OS reference: 593748, 164983	Direction to site: NW Viewpoint height: 18.07m AOD	Horizontal field of view: 75^{0} Viewing distance: 300mm @ A3	**VIEWPOINT 5: Tonge Corner** **KEMSLEY SEP** **Figure 8.11**

Ref: O:\5958b Kemsley Paper Mill\Tech\Graphics\Photomontage\ 5958D_100104RM_Photomontages03.indd





Ref: O:\5958b Kemsley Paper Mill\Tech\Graphics\Photomontage\ 5958D_100104RM_Photomontages03.indd

RPS | stREGIS | e·on

Date of photograph: 27/08/09 Lens type: 50mm	Approximate distance to site: 1.6km OS reference: 591907, 164865	Direction to site: North Viewpoint height: 5.79m AOD	Horizontal field of view: 75^0 Viewing distance: 300mm @ A3	**VIEWPOINT 6: Sittingbourne commercial edge, Saxon Shore Way**

KEMSLEY SEP

Figure 8.12





RPS stRegis e·on

Date of photograph: 27/08/09
Lens type: 50mm

Approximate distance to site: 1.3km
OS reference: 591313, 165419

Direction to site: NNE
Viewpoint height: 6.40m AOD

Horizontal field of view: 75°
Viewing distance: 300mm @ A3

VIEWPOINT 7: Church Marshes Country Park, Sittingbourne

KEMSLEY SEP
Figure 8.13

Ref: O:\5958b Kemsley Paper Mill\Tech\Graphics\Photomontage\ 5958D_100104RM_Photomontages03.indd



EXISTING



PROPOSED

Ref: O:\5958b Kemsley Paper Mill\Tech\Graphics\Photomontage\ 5958D_100104RM_Photomontages03.indd

RPS | STREGIS | e·on

Date of photograph: 27/08/09 Lens type: 50mm	Approximate distance to site: 1.2km OS reference: 591108, 166521	Direction to site: East Viewpoint height: 13.02m AOD	Horizontal field of view: 75^0 Viewing distance: 300mm @ A3	**VIEWPOINT 8: Kemsley, residential edge**

KEMSLEY SEP
Figure 8.14

EXISTING



PROPOSED

RPS stRegis e·on	Date of photograph: 27/08/09 Lens type: 50mm	Approximate distance to site: 2.2km OS reference: 590347, 167274	Direction to site: SEE Viewpoint height: 11.81m AOD	Horizontal field of view: 75° Viewing distance: 300mm @ A3	**VIEWPOINT 9: Iwade** **KEMSLEY SEP** **Figure 8.15**

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RPS stRegis e·on	Date of photograph: 27/08/09 Lens type: 50mm	Approximate distance to site: 2.7km OS reference: 591393, 169300	Direction to site: SSE Viewpoint height: 5.89m AOD	Horizontal field of view: 75^0 Viewing distance: 300mm @ A3	**VIEWPOINT 10: Kings Ferry Bridge** **KEMSLEY SEP** **Figure 8.16**

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RPS | stREGIS | e·on

Date of photograph: 27/08/09 Lens type: 50mm	Approximate distance to site: 1.9km OS reference: 593801, 167940	Direction to site: SW Viewpoint height: 10.32m AOD	Horizontal field of view: 75^0 Viewing distance: 300mm @ A3	**VIEWPOINT 11: Elmley Nature Reserve car park, Isle of Sheppey**

KEMSLEY SEP

Figure 8.17





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RPS | stREGIS | e·on

Date of photograph: 27/08/09
Lens type: 50mm

Approximate distance to site: 5.4km
OS reference: 592679, 171902

Direction to site: South
Viewpoint height: 35.85m AOD

Horizontal field of view: 75^{0}
Viewing distance: 300mm @ A3

KEMSLEY SEP

VIEWPOINT 12: Furze Hill public right of way, Minster, Isle of Sheppey

Figure 8.18



EXISTING



PROPOSED

RPS stRegis e·on	Date of photograph: 27/08/09 Lens type: 50mm	Approximate distance to site: 7.8km OS reference: 598879, 171118	Direction to site: SW Viewpoint height: 42.88m AOD	Horizontal field of view: 75⁰ Viewing distance: 300mm @ A3	**VIEWPOINT 13: B2231, Eastchurch, Isle of Sheppey** **KEMSLEY SEP** **Figure 8.19**

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RPS stRegis e·on	Date of photograph: 27/08/09 Lens type: 50mm	Approximate distance to site: 3.4km OS reference: 592792, 163134	Direction to site: NNW Viewpoint height: 12.12m AOD	Horizontal field of view: 75^{0} Viewing distance: 300mm @ A3	**VIEWPOINT 14: Snipeshill** **KEMSLEY SEP** **Figure 8.20**

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RPS | stREGIS | e·on

Date of photograph: 27/08/09
Lens type: 50mm

Approximate distance to site: 4.7km
OS reference: 595343, 162961

Direction to site: NW
Viewpoint height: 12.99m AOD

Horizontal field of view: 75^0
Viewing distance: 300mm @ A3

VIEWPOINT 15: Teynham

KEMSLEY SEP
Figure 8.21