**Document 3.3 – 2010 Environmental Statement (2017 Addendum)**

**ES Chapter 10**

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

**September 2019 -Submission Version**

**PINS ref: EN010083**

RPS

# ENVIRONMENTAL STATEMENT CHAPTER 10: HYDROLOGY & FLOOD RISK – SUPPLEMENTARY REPORT

# ENVIRONMENTAL STATEMENT
# CHAPTER 10: HYDROLOGY & FLOOD RISK – SUPPLEMENTARY REPORT

Date: May 2017

**Our Ref: JER6846**

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# QUALITY MANAGEMENT

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|---|---|
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| Date: | May 2017 |
| Project Number/Document Reference: | JER6846 |

# CONTENTS

# 1 INTRODUCTION

1.1 This Report has been prepared to supplement the original Environmental Statement (ES) Hydrology and Flood Risk chapter (Chapter 10) submitted as part of the Sustainable Energy Plant (SEP) ES (2009) in support of a Section 73 (s. 73) application to vary Condition 16 (outlined below) which seeks to substitute the approved drainage scheme and allow for any subsequent changes to the drainage scheme to be approved without having to seek to them under s. 73.

1.2 The purpose of this Report is to determine whether further information needs to be added to the original ES to satisfy the requirements of the Town and Country Planning (Environmental Impact Assessment) Regulations 2011, as set out in Planning Practice Guidance (Paragraph: 016 Reference ID: 17a-016-20140306, Revision date: 06 03 2014).

1.3 This Report takes into account the changes to the Kemsley SEP site layout, as well as new legislation, guidance and the baseline including the Environment Agency (EA) flood risk data obtained subsequent to the 2009 submission.

1.4 In summary, condition 16 currently requires the development to be carried out strictly in accordance with the FRA and Surface Water Management and Foul Drainage Philosophy Statement submitted in support of the original application and as such, the site layout and buildings approved. However, the site layout and buildings have subsequently been amended under s96A such that the approved FRA and Surface Water Management and Foul Drainage Philosophy Statement are no longer applicable. Further non-material amendments were approved by the planning authority in March 2017, and a FRA and Surface Water Management and Foul Drainage Philosophy Statement have been prepared in relation to those amended plans.

1.5 It is therefore proposed to amend the wording of condition 16 as follows:

*The Development hereby permitted shall be carried out strictly in accordance with ~~the Flood Risk Assessment (FRA) submitted in support of the application and which includes the following detailed mitigation measures~~ EITHER:*

*A] The Flood Risk Assessment (FRA) submitted in May 2017 which includes the following detailed mitigation measures:-*
*~~The surface water management scheme outlined within Appendix 4 of the FRA (Surface Water Management and Foul Drainage Philosophy Statement) and the storage areas shown on drawings 16315 AO 0600 and 16315 AO 0301 within Appendix B shall be constructed and operational prior to the acceptance of waste by the Development.~~*

1. *The Surface Water Management and Foul Drainage Philosophy (including the drainage layout and surface water storage pond as shown on drawing referenced 16315 / A0 / 0301 Rev H and site section referenced 16315 / A0 / 0250 Rev G at Appendix B which shall be constructed and operational prior to the acceptance of waste by the development*

2. *A safe route into and out of the Application Site to an appropriate safe haven shall be identified and provided.*

3. *Finished floor levels are to be set in accordance with the FRA.*

*OR.*

*B] A Flood Risk Assessment and Surface Water Drainage Philosophy submitted to and approved by the Waste Planning Authority in writing.*

*Reason; In order to reduce the risk of flooding and to ensure the safe access and egress from and to the Application Site pursuant to the requirements of ~~PPS25 (Development and Flood Risk).~~* National Planning Policy Framework.

1.6 Changes in the location and level of the pipe outfall, alteration to development layout and dimensions of the built development can alter surface water run-off characteristics, potentially impacting on flood risk to and from the development site. Therefore, the amendments to the development design and layout at the Kemsley site have been re-calculated to determine whether the impacts on hydrology and flood risk receptors remain acceptable.

1.7 In addition, subsequent to the original assessment, the EA has undertaken further hydrological and tidal flood modelling for the Swale Estuary. The new (2013) model data has been reviewed and assessed against the development design changes and NMAs.

# 2 LEGISLATION AND GUIDANCE

2.1 Subsequent to the original ES submission (2009) both Planning Policy Statement 23 (PPS23) - Planning and Pollution Control, and Planning Policy Statement 25 (PPS25) – Development and Flood Risk have been superseded by the National Planning Policy Framework (NPPF) (2012) and the online flood risk specific Planning Practice Guidance ID7 Flood Risk and Coastal Change. A summary of the documents is presented below.

*National Planning Policy Framework, March 2012*

2.2 The National Planning Policy Framework (NPPF) sets out Government planning policies for England and how these are expected to be applied. The framework acts as guidance for local planning authorities and decision-takers, both in drawing up plans and making decisions about planning applications.

2.3 Paragraphs 99-104 set out the need for an appropriate assessment of flood risk. Guidance on the minimum requirements for such an assessment is contained in PPG ID7.

2.4 The NPPF requires the application of a sequential risk-based approach to determining the suitability of land for development in flood risk areas, and that flood risk assessment should be carried out to the appropriate degree, at all levels of the planning process.

*Planning Practice Guidance, online.*

2.5 PPG ID7 Flood Risk and Coastal Change provides guidance to ensure the effective implementation of the NPPF planning policy for development in areas at risk of flooding.

2.6 PPG ID7 states that a site-specific FRA is required for all proposals for new development in Flood Zones 2 and 3 and for any proposal of 1 hectare or greater in Flood Zone 1. An FRA should consider vulnerability to flooding from other sources as well as from river and sea flooding, and also the potential for any increased risk of flooding elsewhere resulting from a development.

2.7 In summary, these new policies do not constitute a material change to the policies of PPS23 and PPS25 upon which the original application was assessed in 2009.

# 3 AMENDMENTS TO THE APPROVED SCHEME

3.1 As discussed above, subsequent to the approval of the proposed SEP in March 2012, non-material amendments were approved to the original approved plans and drawings relating to the site layout and the buildings in 2013, 2015 and 2017.

3.2 In 2013 the non-material amendments approved *inter alia* included:

- Redesign of surface water attenuation storage to comprise a single pond located to the east of the built development (Drawing 16315/A0/P/0105)
- Raising the proposed profile ground level from 5.8 mAOD to 6.3 mAOD (Drawing 16315/A0/0250)
- Redesign of internal built structures (Drawing AAK-04-20020002_UMG0910-C-ZONE 0 - SITE PLAN).

3.3 A revised Surface Water Management and Foul Drainage Philosophy Statement relating to the non-material amendments to the site layout was submitted in support of that application.

3.4 In 2015 further non-material amendments were submitted which more closely related to the 2013 site layout.

3.5 In addition, following the appointment of the Engineering, Procurement and Construction (EPC) contractor in August 2016, a number of refinements were made to the approved site layout and buildings which were submitted as an application seeking approval as non-material amendments in February 2017. That application was approved by the planning authority (Kent County Council) in March 2017.

3.6 The latest non-material amendments approved by the planning authority are shown in their entirety on the submitted Figures. The main non-material amendments that are relevant to this application to vary condition 16 comprise of changes to the site layout as shown on Figures 4.1C, 4.2C and 4.3C; changes to the site's re-profiled ground level as shown on Figures 4.24C, 4.26C; and its drainage layout as shown on Figure 4.25C. These are also described within revised Surface Water and Foul Drainage Philosophy. In summary, these are as follows:

Site layout

The main change to the site layout compared with that of the original site layout is the removal of the IBA storage and maturation facility. This enables a surface water attenuation pond to be located in that part of the site instead of the surface water attenuation swales previously proposed along the northern boundary and to the east of the concrete apron. This has in turn allowed for a significant reduction in the low permeable footprint overall, and an increase in landscape areas. The site layout and building footprints within the remaining part of the site are broadly similar to that of the original layout.

Site level (and FFLs)

The proposed site levels of the development platform are now proposed to be between 5.7mAOD and 6.7mAOD compared with to those of between 5.3 and 7mAOD in the original application. The finished floor levels of the proposed buildings are now 6.3mAOD compared with the 5.8mAOD in the original development.

Site drainage

Site drainage is achieved broadly through the same on site drainage layout albeit surface water is attenuated with a surface water attenuation pond rather than the surface water attenuation swale of the original application, prior to its discharge to the Swale Estuary.

3.7 A number of variations to the original Surface Water Management and Foul Drainage Philosophy Statement are propsoed, as follows:

- Variation 1 - a single pipe system is used with all water discharging through an oil interceptor.
- Variation 2 - separators installed to treat runoff from the car park and yard areas are bypass interceptors in line with BS 852-2:2003.
- Variation 3 – proposal that the invert level for the outfall is set at 2.9 mAOD.
- Variation 4 - a single primary siphonic system is proposed. Designed to take rainfall intensities of up to 231mm/hr and discharge directly to the underground drainage system.
- Variation 5 - pond is designed on new layout such that a 600mm freeboard is maintained in the 1 in 100 year rainfall event combined with the 1 in 100 year storm surge
- Variation 7 - new enhanced ditch will replicate the intention of the Ditch Buffer Zone Management whilst shifting the alignment of the ditch approximately 4.0m to the west.
- Variation 8 - proposed system instead uses a dedicated process drainage network in which effluent is collected, treated and recirculated inside the plant.
- Variation 9 - automated vehicle wash as shown in to be removed.
- Variation 10 - surface water drainage network will incorporate underground water harvesting tanks and pump arrangements to collect water from the building roofs. This is to be removed.

3.8 A Flood Risk Assessment, and a Surface Water Management and Foul Drainage Philosophy Statement have been prepared in support of the application to vary

condition 16 under s73 to allow changes in these documents in relation to the approved non-material amendments.

3.9 **Flood Risk**

3.10 As discussed above, subsequent to the approval of the proposed SEP in March 2012, the Environment Agency undertook further hydrological and tidal flood modelling for the Swale Estuary in 2013.

*EA data*

3.11 A hydrological record and data request was submitted to the EA in 2016. The EA's response (Appendix 1) included updated flood zone extent mapping, and new model data extracted from the North Kent Coast Modelling and Mapping Study (2013) covering the proposed development site.

*Fluvial and Tidal Flooding*

3.12 The 2009 FRA noted that the majority of the site was located within Flood Zone 1, with a proportion of the northeast region being within Flood Zone 2 and 3a. Amendments to the EA flood zone map following the incorporation of historical flood data now indicates that the majority of the site lies primarily within Flood Zone 2 and 3a (FZ2 and FZ3a), with FZ2 having a 'medium' probability of flooding. A section within the western extent of the site is defined as being within Flood Zone 1 (Figure 1).

3.13 Model nodes from the North Kent Coast Modelling and Mapping Study (2013) for the defended and undefended scenarios specific to the application area (presented in Table 1) have been assessed against the proposed development and profiled ground level (minimum 5.80 mAOD).

3.14 For the purposes of this Report a conservative approach has been adopted for the flood risk assessment, where by the 'worst-case' undefended flood level for the 0.5% Annual Event Probability (AEP) 2070 (5.28 mAOD) has been compared against the proposed development profiled ground level (minimum 5.80 mAOD). The assessment indicates that the development would remain flood free for events with a, up to an including a 0.5% AEP (1 in 200 year event) including climate change to 2070, with c.0.27 m freeboard.

3.15 The EA reiterates that The Swale is the only source of flooding, therefore fluvial influences were still not considered in the report.

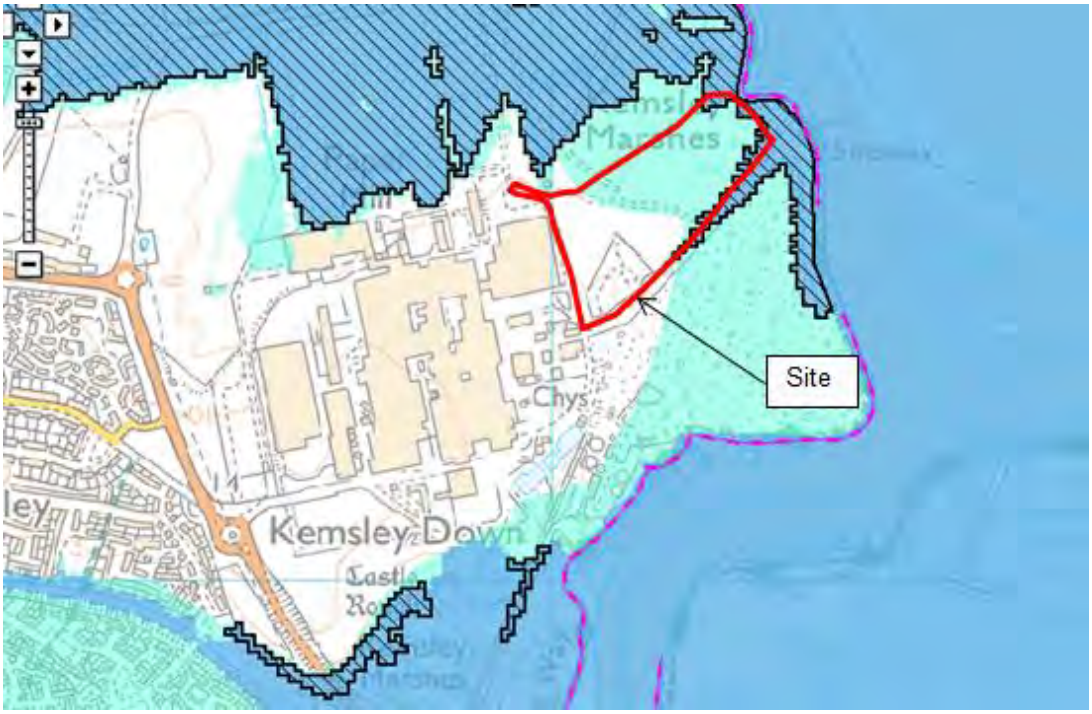


**Figure 1: EA Flood Map for Planners**

*Flood Defences*

3.16 EA confirmed that no upgrade of flood defences have occurred since the original RPS 2009 FRA report.

*Flooding from surface water*

3.17 Following the implementation of the Flood and Water Management Act 2010, whilst KCC as Lead Local Flood Authorities is responsible for assessing surface water flood risk, the EA under its Strategic Overview role in England has produced the third iteration of the national surface water map. The 'new' map represents a significant improvement on the previous surface water flood map, due to considerably improved modelling techniques and data used, including the incorporation of locally produced mapping, where available, to represent local scale flooding.

3.18 The EA surface water flood map (Figure 2) indicates that the majority of the site is at 'very low' risk with a chance of flooding each year of less than 1 in 1000 (0.1%) chance of occurring. Localised areas within the development area are defined as being at low risk of surface water flooding.


**Figure 2: Surface Water Flood Map**

*Other sources of flooding*

3.19 There has been no change in the potential sources of flooding from artificial drainage systems, sewers, ponds or reservoirs.

*On site drainage*

3.20 As a consequence of the proposed non-material amendments approved in March 2017 there will be a c.0.7 ha reduction in proposed low permeable surfacing. The updated design incorporated c.39,000 $m^2$ in low permeable surfacing.

3.21 Drawing 16315 / A1 / P / 0100 within the SEP Drainage Design Philosophy Statement (2016) (Appendix 2) indicates that attenuation storage will be situated to the east of the SEP, and designed to store surface water run-off from the 1 in 100 year + 20% climate change storm event to be discharged into the Swale via appropriate water treatment during a 3.5 hour low tide period. The pond's location as per the subsequent non-material amendments differs from the original SEP Drainage Design Philosophy (2009) which comprised two ponds, one following the northern and eastern extent of the site and the second along part of the southern extent.

3.22 The 2016 Drainage Philosophy (Appendix 2) outlines that there will be a 300 $m^3$ increase in attenuation storage as a consequence of the non-material amendment and design variations currently under consideration from 3,200 $m^3$ (Drainage Strategy, 2009) to 3,500 $m^3$. The increase in storage requirement has been incorporated in the Surface Water Management and Foul Drainage Design

Philosophy Statement (RPS, December 2016) with an attenuation sized to meet this criteria.

3.23 A sustainable approach to the management of surface water drainage would be adopted, similar to the 2009 Drainage Strategy :

- The perimeter storage pond will be vegetated and will hold, slow down and contribute to treatment of the run-off water. The pond will prevent uncontrolled discharge water entering areas of land adjacent the site.
- The water reclamation systems indicated, represent additional source control in addition to providing a useable resource.

3.24 The management of surface water would follow the standard practice guidelines within CIRIA SuDS Manual C753 (2015).

3.25 Based on the above, it has been determined that there would be no change to the findings of the original environmental impact assessment submitted as part of the ES submitted in 2009.

**Table 1: Modelled Defended and undefended Tidal Flood Levels**

| Node Location ID | Return Period and Model Scenario | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 5% AEP 2012 | | 0.5% AEP 2012 | | 0.5% AEP 2070 | | 0.5% AEP 2115 | | 0.1% AEP 2012 | |
| | Defended | Undefended | Defended | Undefended | Defended | Undefended | Defended | Undefended | Defended | Undefended |
| 3 | Null | 4.07 | Null | 4.71 | Null | 5.28 | 5.42 | 6.01 | Null | 5.17 |
| 6 | Null | Null | Null | Null | Null | Null | 5.52 | 6.02 | Null | Null |
| 8 | Null | Null | Null | Null | Null | Null | Null | Null | Null | Null |

Key: 'Null' model results do not record any water inundation.

# 4 FLOOD / SURFACE WATER MANAGEMENT MEASURES

4.1 The following recommendations regarding the construction and operation phase pollution control measures have been included within the surface water management and foul drainage design philosophy statement (2016) (Appendix 2) in line with the previous iteration. The management measures are outlined below:

*Site reprofiling*

4.2 Topographic data from the 2010 ES (REF JKK5098, June 209) indicates that the site slopes from the west at an elevation of approximately 7.0 mAOD to approximately 4.0 mAOD in the east. It is proposed to profile the site to a minimum of 5.80 mAOD in line with the previous 5.80 mAOD due to variations to the site layout and drainage outfalls, which will bring the level above the 0.5% AEP 2070 tidal flood level of 5.28 mAOD.

4.3 The proposed re-profiling to a minimum of 5.80 mAOD (Appendix 3 REF Figure 4.26C) would elevate the site into Flood Zone 1 (low risk of tidal flooding).

*Construction Phase Pollution Control*

4.4 The following safeguards shall be implemented during the construction phase to minimise the risk of pollution and detrimental effects to the water interests around the site. The following general mitigation measures shall be implemented in line with the original Drainage Strategy (2009).

- Works on site shall generally follow the best practice guidelines outlined in Section 5 and 6 of CIRIA C532 – Control of Water Pollution from Construction Sites.
- Temporary foul drainage to serve the contractors welfare facilities will be provided at the start of works on site.
- Refuelling and maintenance of machines shall be strictly controlled and oil storage tanks confined to locations remote from the perimeter of the site. All leaking or empty oil drums shall be immediately removed from site.
- Well-constructed and designated storage areas shall be provided located more than 20m away from the site perimeter. Chemical or fuel storage shall comprise of impermeable boxes and appropriate bunding.
- On site concrete batching plants (if utilised) are to be located more than 20m away from the site perimeter. The washing out of any concrete mixing plant or cleaning of ready mix concrete tankers shall be strictly controlled. The effluent from such cleaning shall be tankered off site or suitably treated using sedimentation tanks before the run-off is discharged.
- A strict waste management system will be incorporated to prevent the disposal of construction or domestic rubbish entering the adjacent marshland areas. Waste materials will be properly stored on site.

- Fill material imported to upfill to site will be sourced with due regard to leachate characteristics to the approval of the EA and Natural England. It is anticipated that the storage pond required for the permanent works will be constructed in advance of the earthworks operations such that construction phase storage and settling pond capabilities are available from the start of the works, and to provide tidal inundation protection to the construction site.
- Regular cleaning of roads of any construction waste and dirt will be carried out.
- It is proposed that a single pipe drainage system will be used with all water discharging through an oil interceptor into the attenuation pond.
- A construction method statement will be submitted for approval by the relevant statutory authorities prior to the commencement of construction.

*Water Quality Operation*

4.5 Surface water runoff can contain a wide range of contaminants such as oil, organic matter and toxic metals. Although often at low levels, cumulatively these can result in poor water quality in rivers and streams which affects biodiversity and amenity. After rainfall, the first flush can often be highly polluting. The treatment process of surface water runoff will be detailed in the secondary drainage issue.

4.6 Based on the above, there would be no change to the findings of the original environmental impact assessment submitted as part of the ES submitted in 2009.

# 5 FLOOD RISK VULNERABILITY CLASSIFICATION

5.1 As discussed above, subsequent to the approval of the proposed SEP in March 2012, PPS25 has been superseded by the NPPF. Within the FRA (RPS 2009) the SEP site was classified as essential infrastructure under PPS25, compatible with land defined as Flood Zone 1 and 2.

5.2 The flood risk vulnerability classification within Table 2 of the NPPF has been reviewed against the classification in the PPS25 and shows that there has been no material consequences on the proposed development's site vulnerability classification, therefore the proposed SEP development is classified as 'Essential Infrastructure' in line with Table 3 of Planning Practice Guidance ID 7 and appropriate for developments within the reprofiled Flood Zone 1.

# 6 CONCLUSIONS

6.1 RPS has produced a supplementary report to the original ES Hydrology and Flood Risk chapter in support of a Section 73 application. The Report identifies the non-material amendments recently approved including site layout changes, new planning policies, as well as updated EA hydrological mapping and model data.

6.2 The Report has determined that:

- There are no material changes as a consequence of new planning polices which would change the findings of the original ES.
- There are no material changes as a consequence of the non-material amendments and updated Drainage Philosophy which would change the findings of the original ES.
- There are no material changes as a consequence of new EA flood mapping and model data which would change the findings of the original 2009 ES.

6.3 It is therefore concluded that the approved NMA's including changes in site layout and new EA data will not alter the conclusion of the original Hydrology and Flood Risk ES chapter and the proposed SEP is acceptable from a hydrology and flood risk perspective**. It is not therefore necessary to update the original ES further.**

# APPENDIX 1

Correspondence

## Jonathan Morley

**Subject:** FW: Kemsley SEP - Drainage meeting

**From:** SUDS@kent.gov.uk [mailto:SUDS@kent.gov.uk]
**Sent:** 01 December 2016 10:31
**To:** Andrew Stevenson
**Cc:** Bronwyn.Buntine@kent.gov.uk
**Subject:** RE: Kemsley SEP - Drainage meeting

Good morning Andrew.

I have had a read of the documentation you have sent through and would suggest that a meeting is unlikely to be necessary.

The drainage principles are presently acceptable; we would be unlikely to raise any concerns if a discharge of conditions application were submitted. The only amendment we would like to see would be a reinstatement of the separate roof and hardstanding surface water pipe networks. This would reduce the strain on the oil/water separator and would require the removal of 'variation 1' in Section 3 of the 'drainage design philosophy variations' document.

Beyond this, we are happy with the proposed unrestricted discharge to the tidal water body under normal conditions, with the attenuation being provided to accommodate tide-locked periods. Appropriate scour prevention should be provided at the outfall, but we would anticipate that the Environment Agency will be insisting on this by way of Flood Risk Activity Permit.

Are there any specific points that you collectively wanted to discuss with us in detail? I may be able to provide the guidance you need by way of e-mail to save everybody's time.

Let me know if you need anything else from us.

Kind regards,

Joe Williamson

**Joseph Williamson | Flood Risk Project Officer | Kent County Council**
**Environment Planning and Enforcement, Invicta House, County Hall, Maidstone, Kent, ME14 1XX**
**t: 03000 413481| e: joseph.williamson@kent.gov.uk | www.kent.gov.uk**



**From:** Andrew Stevenson [mailto:andrew.stevenson@rpsgroup.com]
**Sent:** 30 November 2016 13:17
**To:** SUDS - GT
**Subject:** RE: Kemsley SEP - Drainage meeting

Bronwyn

Please can we confirm the meeting which we assume will take place at your offices.

Attending will be myself, Chris Ratcliffe and Mark Walsh from WTI and three others from the Contractor and Arup. Please find attached a document explaining the variations to the scheme which we wish to discuss.

We have already met with Mike Clifton in KCC planning and briefed him on the proposed variations. We have also met with the EA.

Kind regards

Andy

**Andrew Stevenson BA (Hons), Dip TP, MRTPI**
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**From:** SUDS@kent.gov.uk [mailto:SUDS@kent.gov.uk]
**Sent:** 29 November 2016 18:30
**To:** Andrew Stevenson
**Subject:** RE: Kemsley SEP - Drainage meeting

Andrew –

We would be able to meet on Thursday 8 December at 11:30 am to 12:30 pm (or 1 pm if needed). If this time is agreeable we will coordinate within our team as to who meets with you.

It would be appreciated if information on the development could be forwarded to us prior to the meeting.

Regards

Bronwyn

**Bronwyn Buntine | Sustainable Drainage Team Leader | Kent County Council**
**Environment, Planning and Enforcement, Invicta House, County Hall, Maidstone, Kent, ME14 1XX**
**t: 03000 413341 | m: 07824 306231 | e: bronwyn.buntine@kent.gov.uk | www.kent.gov.uk**



---

**From:** Andrew Stevenson [mailto:andrew.stevenson@rpsgroup.com]
**Sent:** 29 November 2016 10:39
**To:** SUDS - GT
**Subject:** Kemsley SEP - Drainage meeting

Dear Sirs

Please could we arrange a meeting to discuss a new drainage scheme for the Sustainable Energy Plant adjacent the Paper Mill in Sittingbourne. Could we suggest 8 December for the meeting.

Kind regards

Andy

**Andrew Stevenson BA (Hons), Dip TP, MRTPI**
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Environment Agency

Mr Jonathan Morley
RPS Planning and Development
Josephs Well (Suite 10d)
Hanover Walk
Leeds
LS3 1AB

**Our ref:** KT/2016/122025/01-L03
**Your ref:** Wheelabrator Kemsley

**Date:** 17 February 2017

Dear Mr Morley

**KEMSLEY CHP DCO: PRE-APPLICATION ADVICE**

**LAND TO THE EAST OF KEMSLEY PAPER MILL, KEMSLEY, SITTINGBOURNE, KENT, ME10 2TD**

Thank you for consulting us on your plans. We would like to offer the following advice on your proposed variations from the approved scheme.

**Variations 1, 2, 8**
We have no objection

**Variation 3**
We have no objections to the change of outfall level.

**Variations 4, 5, 10**
This is for the lead local flood authority to comment on (Kent County Council)

**Variation 6**
We have no objection to unrestricted discharge rate to the Swale Estuary.

**Variation 7**
We have no objection to this proposed variation.

**Variation 9**
We have no objection to the removal of the automated vehicle wash. However, any vehicle washing that does occur must be done in a designated area, and must drain to foul sewer. Run off from vehicle washing contains detergents which negate the effectiveness of oil interceptors. Therefore vehicle wash areas must not drain into the surface water drainage

system.

**North Kent coast modelling**
As discussed at our meeting dated 24 November 2016, the North Kent Coast modelling is currently being updated. If this is complete by the time of the DCO application a note referring to this should be submitted. The updates are not likely to change any flood levels affecting the proposed site.

**Pollution prevention**
We have provided advice on pollution prevention in an appendix of this letter. This guidance must be followed in the design of your drainage system, and in the operation of the site.

**Pre-application meeting**
We can confirm that we agree the minutes you circulated following the pre-application meeting at our offices on the 24 November 2016.

Please do not hesitate to contact me if you require any further information.

Yours sincerely

**Mr Niall Connolly**
**Planning Specialist**

Direct dial 0208 474 6765
Direct e-mail kslplanning@environment-agency.gov.uk

**Pollution Prevention**

1. Introduction

Effluent and run-off from vehicle washing and cleaning activities can damage the environment and pollute rivers, streams, burns and groundwater. Dirt, brake dust, traffic film residue and oil that is washed off are all pollutants. The cleaning agents you use (including those labelled biodegradable or traffic film removers) are very poisonous to river life. If you cause pollution, you are breaking the law and spoiling your environment. Dirty water or run-off from vehicle washing and cleaning carried out as a business or industrial activity is called trade effluent. Whether you're cleaning just one vehicle or responsible for a large lorry fleet, you must arrange for collection and disposal of effluent to prevent pollution. It's illegal to discharge trade effluent to the environment or into drains without permission.

1.1 Find out about drainage systems and get a drainage plan

Understanding your drainage system is the key to preventing pollution. Most areas have what is known as a separate drainage system where there are two types of drain:

• **Surface water** or **clean water drains** should only carry uncontaminated rainwater; they lead directly to ditches, streams, burns, rivers and soakaways. Roof water, car park, road and some yard drainage is usually connected to the surface water drainage system
• **Foul water drains** carry contaminated water (sewage and/or trade effluent) safely to a sewage treatment facility, which is either owned privately or by the local sewage treatment provider. Any system designed to carry foul water is called a foul water drainage system

Drains (surface water and foul) are also known as sewers. Your local sewer provider is the organisation with the legal responsibility to provide public sewerage and sewage treatment facilities in your area. Drains owned by the local sewer provider are known as mains drainage, main sewers or public sewerage systems. Older, urban areas might have a **combined** drainage system that has one drain, carrying both foul and surface water to a sewage treatment facility.
Techniques called "sustainable drainage systems" (SUDS) are now used as a better way of dealing with surface water run-off, rather than using piped outfalls to rivers, streams or burns. In Scotland, the use of SUDS is a legal requirement for surface water disposal. These systems must be protected from contamination in the same way as piped surface water drainage systems. See reference 1 for more information on SUDS.

To prevent pollution, don't allow washing or cleaning effluent, runoff or cleaning chemicals to enter oil separators, drains or gullies connected to the surface water drainage system. You need to have a good, up-to-date drainage plan of your whole site, including areas where vehicle washing and cleaning will take place. If you don't have a plan, you can't be sure that drainage is connected to the right system. If there is no in-house expertise to do this, use a reputable drainage consultant or consulting engineering company.

2. What kind of vehicle washing and cleaning are you doing?

Think about what you're doing and the best way to manage your cleaning activity and any effluent. Are you:

**Washing and cleaning your own business vehicles and plant on your own premises?**
What do you need to wash or clean, and where? If you use a vehicle cleaning business or contractor to work on your site, it's your responsibility to provide appropriate facilities such as

those detailed in section 3. Using washing equipment that re-uses water might be more cost effective, as would using a nearby commercial wash facility.

**Allowing washing and cleaning to be carried out for commercial gain by someone else on land or premises that you own?**
Are you giving clear instructions about where and how the washing and cleaning is to be carried out and how solid and liquid waste should be dealt with? Have you provided appropriate facilities? As a landowner or landlord, you are responsible for:

• trade effluent and surface water discharges
• pollution caused by site contractors, service providers and tenants. You must provide good environmental practices and guidelines and make sure that site operators follow them; see section 3, 4 and 5. If you allow washing and cleaning to take place in an unsuitable area, you might be prosecuted for permitting pollution

**Washing and cleaning vehicles as your business?**
Where and how will you carry out your business? If you offer an on-site vehicle washing and cleaning service (including franchises), you must use a designated washing area that has proper drainage arrangements if run-off is produced from your activities; see section 3. If there isn't a designated area, your activities might cause pollution and you will be responsible even though you don't own the site. If your business involves washing cars by hand see section 4. What solid wastes will you produce and what arrangements have you made for its correct disposal?

## 3. Requirements for all vehicle washing and cleaning activities

Activities that produce run-off from the vehicle onto the ground and use cleaning and valeting products should be carried out in areas that are clearly marked and isolated from surface water drainage systems, unmade ground and porous surfaces. These areas are called **designated washing bays**. A designated washing bay should be designed so that run-off is:

• isolated using channels, gullies, gradient (fall on the surface) and kerbs
• directed to a silt trap or settlement tank to remove larger particles of silt and sediment
• either collected in a sealed system for reuse, discharged to the public foul sewer with prior permission of the local sewer provider or collected in a sealed system for authorised disposal

You should also:
• have procedures for everyone, including contractors, that cover where and how vehicle washing and cleaning should be carried out and what to do in a spillage emergency
• provide notices for designated washing bays saying what they're for and that washing and cleaning should only be carried out in the bay
• consider whether a fence or barrier is required to prevent spray or wind drift out of the designated area
• have procedures and equipment which minimises water use and solid waste production

### 3.1 Reduce, reuse and recycle – resource efficiency and waste minimisation

You should consider ways to reduce the volume of water you use for washing and cleaning, and the amount of liquid and solid waste you produce. Recycling effluent and reusing the water is the best environmental option for dealing with vehicle washing and cleaning effluent. Use washing equipment that has a collection and re-use or recirculation process. These systems usually require regular, off-site removal of some water, silt or sludge so waste management licensing legislation will apply.

A waste minimisation review will help you save money on raw materials and waste disposal costs. Free, independent and practical advice on how to minimise waste is available from Envirowise; this includes free publications, events, site visits and waste reviews.

## 3.2 Connecting and discharging to a public foul sewer

If recycling and reuse isn't possible, discharging all the vehicle washing and cleaning effluent to a public foul sewer is generally the next best environmental option as the effluent is carried to a purpose-built and closely monitored sewage treatment plant. You need permission from your local sewer provider to discharge vehicle washing and cleaning effluent to a public foul sewer. Permission (a consent or agreement) isn't given automatically so you must talk to your sewer provider before you make any connection or discharge. If you don't have their consent, you're breaking the law. See reference 6 to find your local sewer provider. You're likely to pay for this discharge; the amount depends on volume and chemical composition. You should give your local sewer provider an accurate site drainage plan to support your proposals. You might have to cover your designated washing bay to prevent clean rainwater adding to the volume of effluent. You might also be required to provide an oil separator for the discharge.

## 3.3 What happens if a public foul sewer isn't available?

If you can't recycle water or connect to a suitable public foul sewer, you'll have to consider these options:

• carry out washing and cleaning activities on another site that does have proper facilities
• collect all the effluent in a sealed system for off-site removal as a liquid waste. Waste management licensing legislation will apply; see section 5
• install your own trade effluent treatment system. The system must be designed, manufactured and installed to treat washing effluent to a good enough quality to discharge to the environment (to land or watercourse) or to a private surface water sewer. You need our permission (a consent or authorisation) for this and an annual charge is payable. We don't give permission automatically so you must talk to us before you buy any equipment or make any connection or discharge. A discharge of treated effluent to a public surface water sewer needs the prior permission of the local sewer provider, which may not be given in some areas. A suitably designed and installed sustainable drainage solution, such as a reedbed, might be an acceptable, cost effective alternative.

## 3.4 Using and storing cleaning chemicals

• Only use biodegradable washing and cleaning products. This will help treatment processes when effluent is discharged to the foul sewer
• Follow the manufacturer's environmental and health & safety information, such as for the COSHH (Control of Substances Hazardous to Health) Regulations
• Use non-corrosive products. Corrosive products, such as traffic film remover, can damage paintwork, metal surfaces, ground coverings and drains
• Store all detergents, emulsifiers and other cleaning agents in suitable bunded or containment facilities, within a locked storage area or building away from any surface water drains
• Only use the minimum amount needed for a job diluted to the appropriate working strength Never use undiluted concentrates
• Prepare working strength solutions in the storage area, never in areas that drain to the surface water system

## 3.5 Dealing with spillages of cleaning chemicals

• Produce a spillage response plan; test and use it (see reference 8)
• Deal with all spillages immediately; follow the manufacturer's health and safety advice
• Keep suitable spill kits where cleaning chemicals are stored and used, and make sure everyone knows how to use them. Make sure kits are replenished after use
• Stop spillages from entering drains, channels, gullies, watercourses and unmade ground. Use proprietary sorbent materials, sand or drain mats
• Make sure your spillage response plan includes information about how to recover, handle and correctly dispose of all waste produced from a spillage. Make sure you deal with all waste safely and legally (see section 5)
• Tell us immediately if you have a pollution emergency using the free emergency hotline number 0800 807060

# 4. Good practice for different washing and cleaning methods

## 4.1 High pressure washers (jet washers) and steam cleaning

High pressure washers (including jet washers) and steam cleaners are effective at removing dirt, grease and coatings from vehicles, machinery and surfaces. But they use large volumes of water (500 – 7,200 litres an hour), often at high temperatures and containing cleaning chemicals. If you are cleaning vehicles and plant with a high pressure washer (jet wash) or steam cleaner, you must use a designated washing bay.

If you use a pressure washer to clean roads, yard surfaces, other equipment or in areas where the drainage isn't collected or connected to the foul sewer, you must stop run-off from entering surface water drains. See section 3 for good practice advice for dealing with this runoff. Never allow run-off containing cleaning chemicals, detergents or emulsifiers to enter surface water drains as this will cause pollution and prevent oil separators from working properly. See reference 9 for more information.

## 4.2 Washing and valeting by hand

If you wash, clean or valet vehicles by hand, or are responsible for a site where this service is offered, you must have good site management procedures and practices in place to avoid pollution. You should use designated wash bays as detailed in section 3, or make sure that you have other satisfactory arrangements in place. However, it may be acceptable to clean or valet private cars by hand in areas such as car parks, without designated wash bays (roving activities), if:

• only clean water is used and no detergents or cleaning chemicals
• or your working method doesn't produce any runoff from the vehicle
• or the runoff from the vehicle is contained, collected or treated in some way and dealt with or disposed of legally
• and you can show us that the proposed activity will not adversely affect separators and SUDS, or
damage the environment at any time

## 4.3 Automatic vehicle washing systems

These systems use a variety of techniques but generally involve the use of water jets and rotating brushes, and they often have a drying facility. It's possible to get systems which filter, re-circulate and re-use most of the water but they still require a connection to the foul sewer

for overflow and filter backwash water. As with all discharges to the public foul sewer, this would be regarded as a trade effluent and its disposal requires permission from the local sewer provider. If no foul sewer is available, you'll have to consider the options in section 3.3. Waste management legislation applies to the disposal of solid trade waste, silt and sump sludge from these systems.

## 4.4 Cleaning platforms

In this system, a vehicle is driven onto a mobile or static cleaning platform, which has an integral containment sump for holding wash water. Cleaning chemicals are sprayed or applied by hand onto the vehicle, which is then sponged and wiped dry. The wash water is either discharged to a foul drain or settled and passed through a series of filters and tanks where it's cleaned and then circulated for re-use. When using this system, you must contain wash water and cleaning chemicals to prevent them entering surface water drains. Waste management legislation applies to the disposal of solid trade waste, silt and sump sludge.

## 4.5 Cleaning methods that don't use water

Technologies for hand washing that don't use water on site have been developed. Vehicles are sprayed with a product which cleans the surface and applies a polish in one application. Towels and micro-fibre materials are used to remove dirt and polish the vehicle. Used towelling is machine washed off site.

Providing no liquid effluent or application spray drift is produced, this method is unlikely to cause water pollution on site. The cleaning agent must be used as intended and stored safely. You must follow the requirements for general hand washing in section 4.2 where appropriate and consider how you will prevent spray drift from landing on hard surfaces draining to surface water drains. Waste management legislation applies to the storage and disposal of solid trade waste, such as used polishing cloths and empty containers.

You must follow the manufacturer's recommendations for handling and using these products including the need to use appropriate personal protective equipment.

## 5. Waste management and your legal duty of care

Waste produced from vehicle washing and cleaning businesses can include, for example, water contaminated with oil, detergents or silt; silt, sludge, empty containers, product packaging, washing and polishing materials such as cloths.

There are strict legal requirements for the storage, movement and disposal of business waste. You have a duty of care to make sure that any waste you produce:

- does not escape from your control
- is transferred only to a registered waste carrier for recycling or disposal at a suitably licensed facility
- is accompanied by a transfer note with a full description of what it is
- is disposed of lawfully

Disposing of hazardous waste (such as oily wastes, acids, solvents and solvent-based products) has stricter requirements. You must find out if any of the waste you produce is classified as hazardous and if it is, you must register with us. The NetRegs website explains how to comply with waste legislation. Alternatively, contact us for advice or visit our Web sites.

## Angus Kerry

**From:** Jonathan Morley
**Sent:** 08 June 2016 11:04
**To:** Angus Kerry
**Subject:** FW: KSL 1494 TM Environmental Information Request
**Attachments:** KSL1494 TM Info request.pdf; Standard_Notice 2012.pdf; KSL 1494 TM Environmental Information Request

**Jonathan Morley BSc (Hons)**
**Senior Geoenvironmental Engineer - RPS Planning & Development**
Suite D10, Josephs Well, Hanover Walk,
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United Kingdom
**Tel:** +44 (0) 113 220 6190
**Direct:** +44 (0) 113 2204427
**Mobile:** +44 (0) 7920 566017
**Email:** jonathan.morley@rpsgroup.com
**www:** www.rpsgroup.com

**From:** KSL Enquiries [mailto:KSLE@environment-agency.gov.uk]
**Sent:** 15 February 2016 16:35
**To:** Jonathan Morley
**Subject:** KSL 1494 TM Environmental Information Request

Dear Jonathan,

Our reference: **KSL 1494 TM Environmental Information Request**

***We respond to requests for recorded information that we hold under the Freedom of Information Act 2000 (FOIA) and the associated Environmental Information Regulations 2004 (EIR). Please get in touch if you have any further queries or contact us within two months if you'd like us to review the information we have sent.***

Thank you for your request for modelled flood levels.

Please find attached the requested Product 4. I will send you what information we have on the rest of your enquiry as soon as I can.

Please be aware that the Environment Agency supply data, but we do not interpret it for use in a Flood Risk Assessment. Flood Risk Assessments should be completed by a suitably competent and qualified person.

You may be interested in the following guidance / information publically available:

- **'Planning Practice Guidance'** - provides information about planning considerations in areas at risk of flooding. http://planningguidance.planningportal.gov.uk/
- **'Planning applications: assessing flood risk'** - information about completing Flood Risk Assessments. https://www.gov.uk/planning-applications-assessing-flood-risk
- **'Site specific flood risk assessment: Checklist'** – a checklist to help ensure you have considered all the relevant factors in your flood risk assessment. http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/site-specific-flood-risk-assessment-checklist/

We recommend that you discuss your proposals with the Local Planning Council at the earliest opportunity. They will be able to advise you on a wide range of planning matters in addition to flood risk.

This information is subject to the attached standard notice.

I trust this information is of use. If you have any further questions, please contact us and we will be happy to help.

If you have any further queries or if you'd like us to review the information we have provided under the Freedom of Information Act 2000 and Environmental Information Regulations 2004 please contact us within two months and we will happily do this for you.

We would be really grateful if you could spare five minutes to help us improve our service. Please click on the link below and fill in our survey – we use every piece of feedback we receive:http://www.smartsurvey.co.uk/s/EnvironmentAgencyCustomerSurvey/?a=KSL

Kind regards,

Toby

Toby Mortby | Customers and Engagement Officer | Kent and South London
Environment Agency | Orchard House | Endeavour Park | London Road | West Malling | Kent | ME19 5SH
Internal: 723-3115 External: 01732 223115
Email: KSLenquiries@environment-agency.gov.uk

We would be really grateful if you could spare five minutes to help us improve our service. Please click on the link below and fill in our survey – we use every piece of feedback we receive:
**http://www.smartsurvey.co.uk/s/EnvironmentAgencyCustomerSurvey/?a=KSL**

www.gov.uk/floodsdestroy


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**From:** Jonathan Morley [mailto:jonathan.morley@rpsgroup.com]
**Sent:** 12 February 2016 12:10
**To:** KSL Enquiries
**Subject:** RE: KSL 1494 TM Environmental Information Request

Good afternoon Toby,

I understand that fees were paid on the 02/02/16. Would you be able to supply the Product 4 data at your earliest convenience as we a have very tight project timeframe?

Thank you in advance.

Best regards

Jonathan

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**Jonathan Morley BSc (Hons)**
**Senior Geoenvironmental Engineer - RPS Planning & Development**
Suite D10, Josephs Well, Hanover Walk,
Leeds, West Yorkshire, LS3 1AB.

United Kingdom
**Tel:** +44 (0) 113 220 6190
**Direct:** +44 (0) 113 2204427
**Mobile:** +44 (0) 7920 566017
**Email:** jonathan.morley@rpsgroup.com
**www:** www.rpsgroup.com

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**From:** KSL Enquiries [mailto:KSLE@environment-agency.gov.uk]
**Sent:** 26 January 2016 11:56
**To:** Jonathan Morley
**Subject:** RE: KSL 1494 TM Environmental Information Request

Dear Jonathan,

Once payment has been made I can then send your request to the relevant teams. Depending on when the payment is made we would aim to supply a response within 20 working days of your original enquiry, this would be the 11 February 2016. Of course if there is a delay in payment then this could be later.

We do however try to answer all enquiries as quick as we can so will of course aim to supply your data before then.

If you have any other questions please contact us and we'll be happy to help.

Kind regards,

Toby

Toby Mortby | Customers and Engagement Officer | Kent and South London
Environment Agency | Orchard House | Endeavour Park | London Road | West Malling | Kent | ME19 5SH
Internal: 723-3115 External: 01732 223115
Email: KSLenquiries@environment-agency.gov.uk

We would be really grateful if you could spare five minutes to help us improve our service. Please click on the link below and fill in our survey ï we use every piece of feedback we receive:
**http://www.smartsurvey.co.uk/s/EnvironmentAgencyCustomerSurvey/?a=KSL**

www.gov.uk/floodsdestroy


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**From:** Jonathan Morley [mailto:jonathan.morley@rpsgroup.com]
**Sent:** 26 January 2016 09:27
**To:** KSL Enquiries
**Subject:** RE: KSL 1494 TM Environmental Information Request

Good morning Toby,

Thank you for the email.

Please can you confirm when the data will be available?

Kind regards

Jonathan

**Jonathan Morley BSc (Hons)**
**RPS Planning & Development**
Suite D10, Josephs Well, Hanover Walk,
Leeds, West Yorkshire, LS3 1AB.
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**Tel:** +44 (0) 113 220 6190
**Direct:** +44 (0) 113 2204427
**Mobile:** +44 (0) 7920 566017
**Email:** jonathan.morley@rpsgroup.com
**www:** www.rpsgroup.com

**From:** KSL Enquiries [mailto:KSLE@environment-agency.gov.uk]
**Sent:** 25 January 2016 16:00
**To:** Jonathan Morley
**Subject:** KSL 1494 TM Environmental Information Request

Dear Jonathan,

**RE: KSL 1494 TM Environmental Information Request**

Thank you for your request for information that was received on 14 January 2016.

Before proceeding with this request, we will require a payment of £50 + VAT (£60). This is not a charge for supplying the data, but a charge for the copyright licence which is set out in our Standard Notice. The Standard Notice explains how you may use the information you have asked for and will be sent to you at the same time that we send you your information.

**Charging Summary**
Copyright Licence Charge = £50 + VAT @ 20%
Total Charge = £60

If you wish to pay by credit or debit card please contact me on 01732 223 115 and I will be pleased to take these details over the phone. **Please note that we can only accept card payments from the cardholder.**

If you wish to make payment by cheque, please make your cheque payable to 'The Environment Agency' and send it to the address below.

Once we have received your payment, we will aim to respond to your enquiry within 10 working days in accordance with our Customer Charter.

If I have not received your payment within 60 days of the date of this letter/email, I will assume that you no longer require the information.

If you have any further queries please contact us and we will be happy to help.

Kind Regards,

Toby

Toby Mortby | Customers and Engagement Officer | Kent and South London
Environment Agency | Orchard House | Endeavour Park | London Road | West Malling | Kent | ME19 5SH
Internal: 723-3115 External: 01732 223115
Email: KSLenquiries@environment-agency.gov.uk

www.gov.uk/floodsdestroy

DO YOU KNOW WHAT TO DO?


**From:** Jonathan Morley [mailto:jonathan.morley@rpsgroup.com]
**Sent:** 14 January 2016 12:49
**To:** Enquiries, Unit
**Cc:** Andrew Stevenson
**Subject:** Environmental Information Request

Dear Sirs,

**Environmental Information Request: Kemsley, Kent.**

We are currently conducting a flood risk assessment for a development at Kemsley Marshes, Kent (site outlined in red on the attached plan).

To undertake the assessment RPS wish to obtain the following information

- Confirmation of Flood Zone (electronic MapInfo Version if possible);
- Confirmation of the most recent Strategic Flood Risk Assessment (SFRA);
- SFRA Flood zone extents for the area (electronic MapInfo Version if possible);
- EA and SFRA Flood Hazard, surface water and reservoir flood risk mapping including water depths for the area;
- A online link to or copy of the most recent SFRA, including associated drawings, maps and appendices;
- Mapping and records for any surface water assets owned or maintained;
- Any existing river and/or tidal levels, for the 100 year, 100 year with climate change, 200 year, 200 year with climate change, 1000 year, and 1000 year with climate change flood events;
- Any gauged flow records for river networks in close proximity to the site, with associated estimated return periods;
- Details of any historical flood events;
- Details of existing or planned flood alleviation and defences in this area;
- Details of future defence upgrades and/or shoreline management plans/policies;
- Details of any flooding due to drainage problems associated with the site, including flood levels, flood extents and any available anecdotal information;
- Records of any surface and groundwater discharges, abstractions including private licences and pollution incidents;
- Details of any recorded groundwater levels in the area, and groundwater vulnerability of the area;
- Details of any groundwater flooding issues in the area, including flood levels, flood extents and any available anecdotal information;
- Details of aquifer designation, soil classification, and Source Protection Zones in this area; and
- Any other flooding related data and/or reports held in relation to the site and immediate area.

Please would you inform me of any data costs that may be incurred as soon as possible.

Should you have any queries please do not hesitate to contact me.

Yours sincerely
for RPS

**Jonathan Morley BSc (Hons)**
**Senior Engineer - RPS Planning & Development**
Suite D10, Josephs Well, Hanover Walk,
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RPS Planning and Development Limited, company number: 02947164 (England). Registered office: 20 Western Avenue Milton Park Abingdon Oxfordshire OX14 4SH.

RPS Group Plc web link: http://www.rpsgroup.com

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# Product 4 (Detailed Flood Risk) for: Kemsley, Kent
Requested by:  Jonathan Morley - RPS
Reference: KSL1494 TM
Date:  11 February 2016

## Contents



The information provided is based on the best data available as of the date of this letter.

You may feel it is appropriate to contact our office at regular intervals, to check whether any amendments/ improvements have been made to the data for this location. Should you re-contact us after a period of time, please quote the above reference in order to help us deal with your query.

This information is provided subject to the enclosed notice which you should read.


Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.
Email: kslenquiries@environment-agency.gov.uk

# Flood Map Confirmation

The Flood Map:

Our Flood Map shows the natural floodplain for areas at risk from river and tidal flooding. The floodplain is specifically mapped ignoring the presence and effect of defences. Although flood defences reduce the risk of flooding they cannot completely remove that risk as they may be over topped or breached during a flood event.

The Flood Map indicates areas with a 1% (0.5% in tidal areas), Annual Exceedance Probability (AEP) - the probability of a flood of a particular magnitude, or greater, occurring in any given year, and a 0.1% AEP of flooding from rivers and/or the sea in any given year. The map also shows the location of some flood defences and the areas that benefit from them.

The Flood Map is intended to act as a guide to indicate the potential risk of flooding. When producing it we use the best data available to us at the time, taking into account historic flooding and local knowledge. The Flood Map is updated on a quarterly basis to account for any amendments required. These amendments are then displayed on the internet at www.gov.uk/prepare-for-a-flood.

At this Site:

The Flood Map shows that this site lies within the outline of the 0.5% chance of flooding in any given year from the sea.

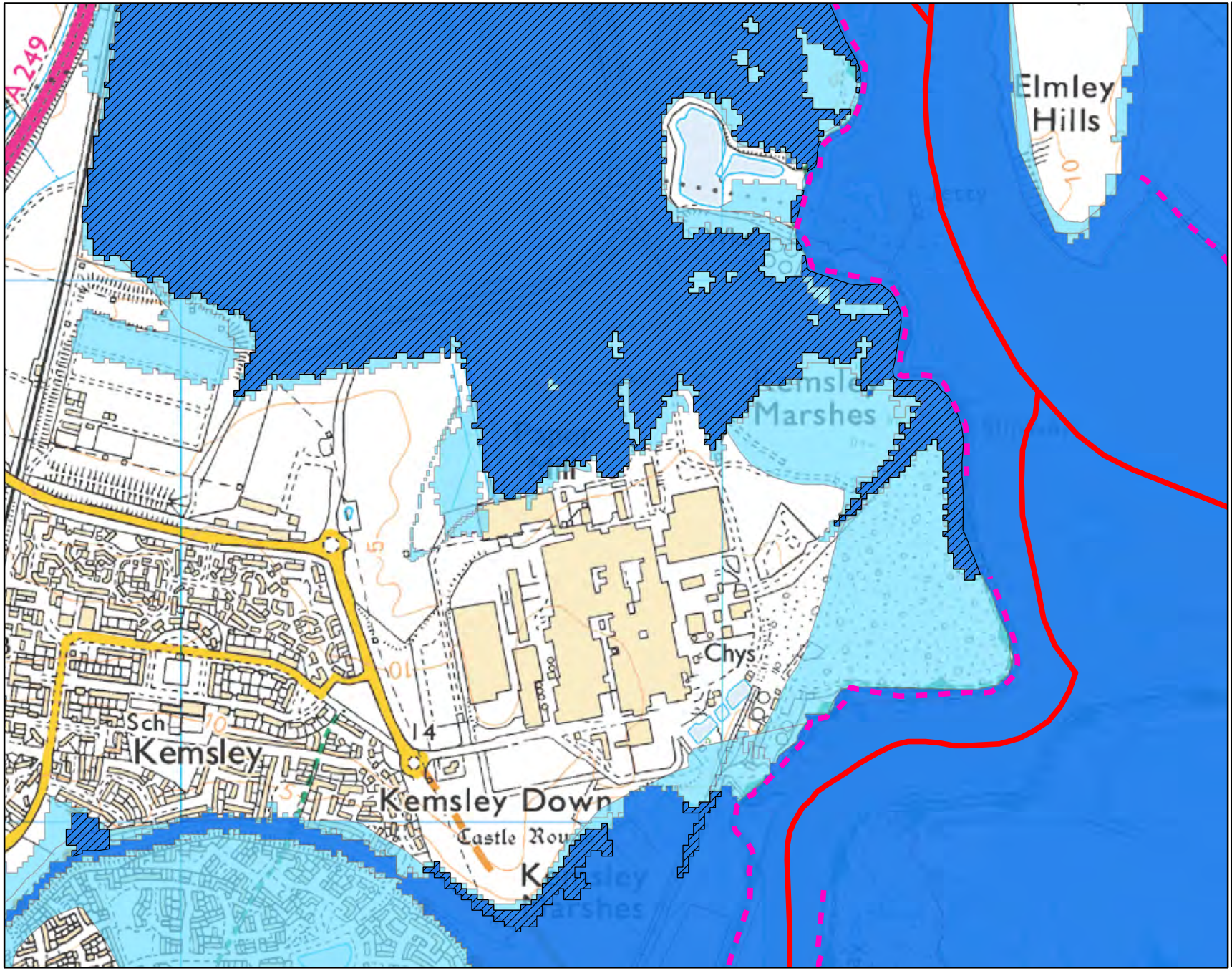
Enclosed is an extract of our Flood Map which shows this information for your area.

Method of production

The Flood Map at this location has been derived using detailed tidal modelling of the North Kent Coast, completed in August 2013.

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.
Email: kslenquiries@environment-agency.gov.uk

# Flood Map Centred on Kemsley, Kent
# Created 11 February 2016 (Ref KSL1494 TM)




Environment Agency

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## Legend

- Main Rivers
- Flood Defences
- Areas Benefiting From Flood Defence
- Flood Zone 3
- Flood Zone 2

Scale 1:10,000

0 250 500

Meters


Contact us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506. Email:enquiries@environment-agency.gov.uk

# Model Output Data

You have requested flood levels for various return periods at this location.

The modelled flood levels for the closest most appropriate model grid cells, any additional information you may need to know about the modelling from which they are derived and/or any specific use or health warning for their use are set out below.

Using a 2D TuFLOW model the floodplain has been represented as a grid. The flood water levels have been calculated for each grid cell.

A map showing the location of the points from which the data is taken is enclosed. Please note you should read the notice enclosed for your specific use rights.

Table 1: Defended Modelled Tidal Flood levels for Annual Exceedance Probability shown in mAOD

| Node Location ID | Modelled Tidal Flood levels for Annual Exceedance Probability shown in mAOD | | | | | | |
|---|---|---|---|---|---|---|---|
| | National Grid Ref | | Defended | | | | |
| | Easting | Northing | 5% AEP 2012 | 0.5% AEP 2012 | 0.5% AEP 2070 | 0.5% AEP 2115 | 0.1% AEP (2012) |
| 1 | 591602 | 166964 | 0.00 | 0.00 | 0.00 | 5.43 | 0.00 |
| 2 | 591831 | 166982 | 0.00 | 0.00 | 0.00 | 5.42 | 0.00 |
| 3 | 592174 | 166953 | 0.00 | 0.00 | 0.00 | 5.42 | 0.00 |
| 4 | 591709 | 166753 | 0.00 | 0.00 | 0.00 | 5.43 | 0.00 |
| 5 | 591874 | 166756 | 0.00 | 0.00 | 0.00 | 5.43 | 0.00 |
| 6 | 592170 | 166731 | 0.00 | 0.00 | 0.00 | 5.52 | 0.00 |
| 7 | 591927 | 166470 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 592145 | 166588 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.
Email: kslenquiries@environment-agency.gov.uk

Table 2: Undefended Modelled Tidal Flood levels for Annual Exceedance Probability shown in mAOD

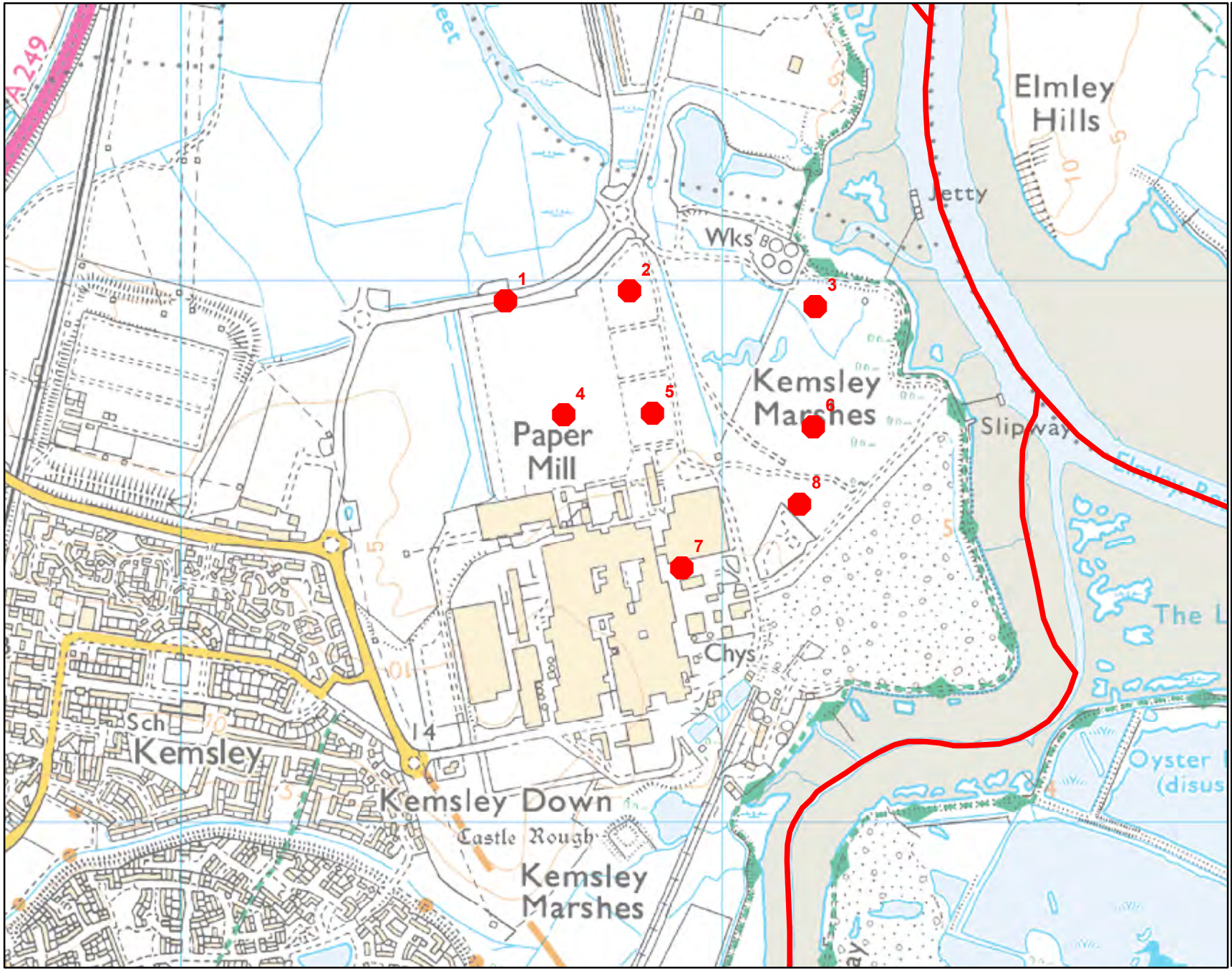
| Node Location ID | Modelled Tidal Flood levels for Annual Exceedance Probability shown in mAOD | | | | | | |
|---|---|---|---|---|---|---|---|
| | National Grid Ref | | Undefended | | | | |
| | Easting | Northing | 5% AEP 2012 | 0.5% AEP 2012 | 0.5% AEP 2070 | 0.5% AEP 2115 | 0.1% AEP 2012 |
| 1 | 591602 | 166964 | 4.06 | 4.70 | 5.27 | 6.01 | 5.16 |
| 2 | 591831 | 166982 | 4.06 | 4.70 | 5.27 | 6.01 | 5.16 |
| 3 | 592174 | 166953 | 4.07 | 4.71 | 5.28 | 6.01 | 5.17 |
| 4 | 591709 | 166753 | 4.06 | 4.70 | 5.27 | 6.01 | 5.16 |
| 5 | 591874 | 166756 | 0.00 | 4.71 | 5.28 | 6.01 | 5.16 |
| 6 | 592170 | 166731 | 0.00 | 0.00 | 0.00 | 6.02 | 0.00 |
| 7 | 591927 | 166470 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 592145 | 166588 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Data taken from North Kent Coast Modelling and Mapping Study, completed by JBA Consulting, in August 2013.

There are no health warnings or additional information for these levels or the model from which they were produced.

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.
Email: kslenquiries@environment-agency.gov.uk

# Modelled Node Locations Centred on Kemsley, Kent
# Created 11 February 2016 (Ref KSL1494 TM)




Environment Agency

N

## Legend

- NodeLocations
- Main Rivers

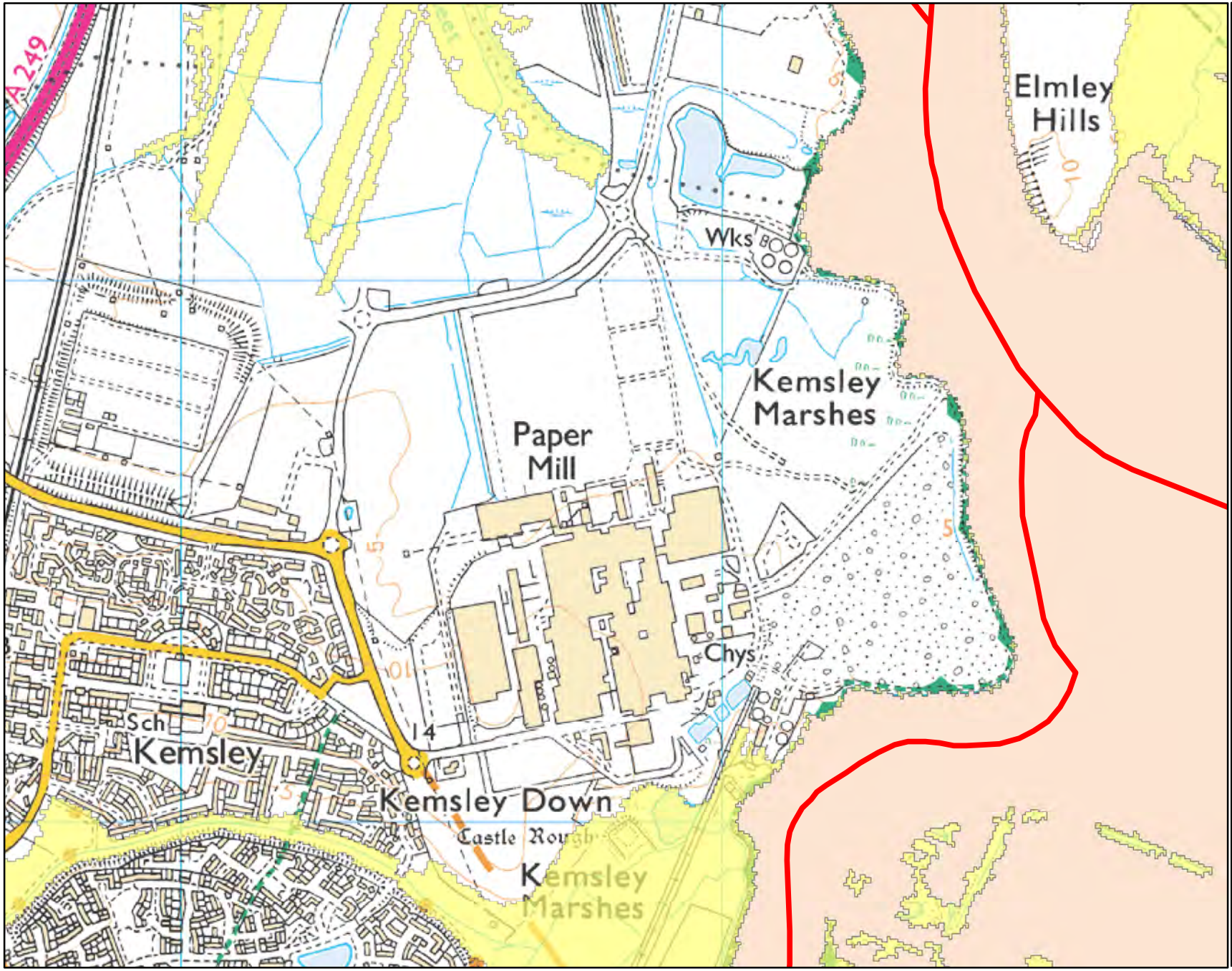
Scale 1:10,000

0 250 500

Meters


Contact us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506. Email:enquiries@environment-agency.gov.uk

# Defended Modelled Tidal Flood Outlines Centred on Kemsley, Kent
# Created 11 February 2016 (Ref KSL1494 TM)




Environment Agency

N

## Legend

- Main Rivers
- 5% AEP (2012)
- 0.1% AEP (2012)

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occuring in any given year.

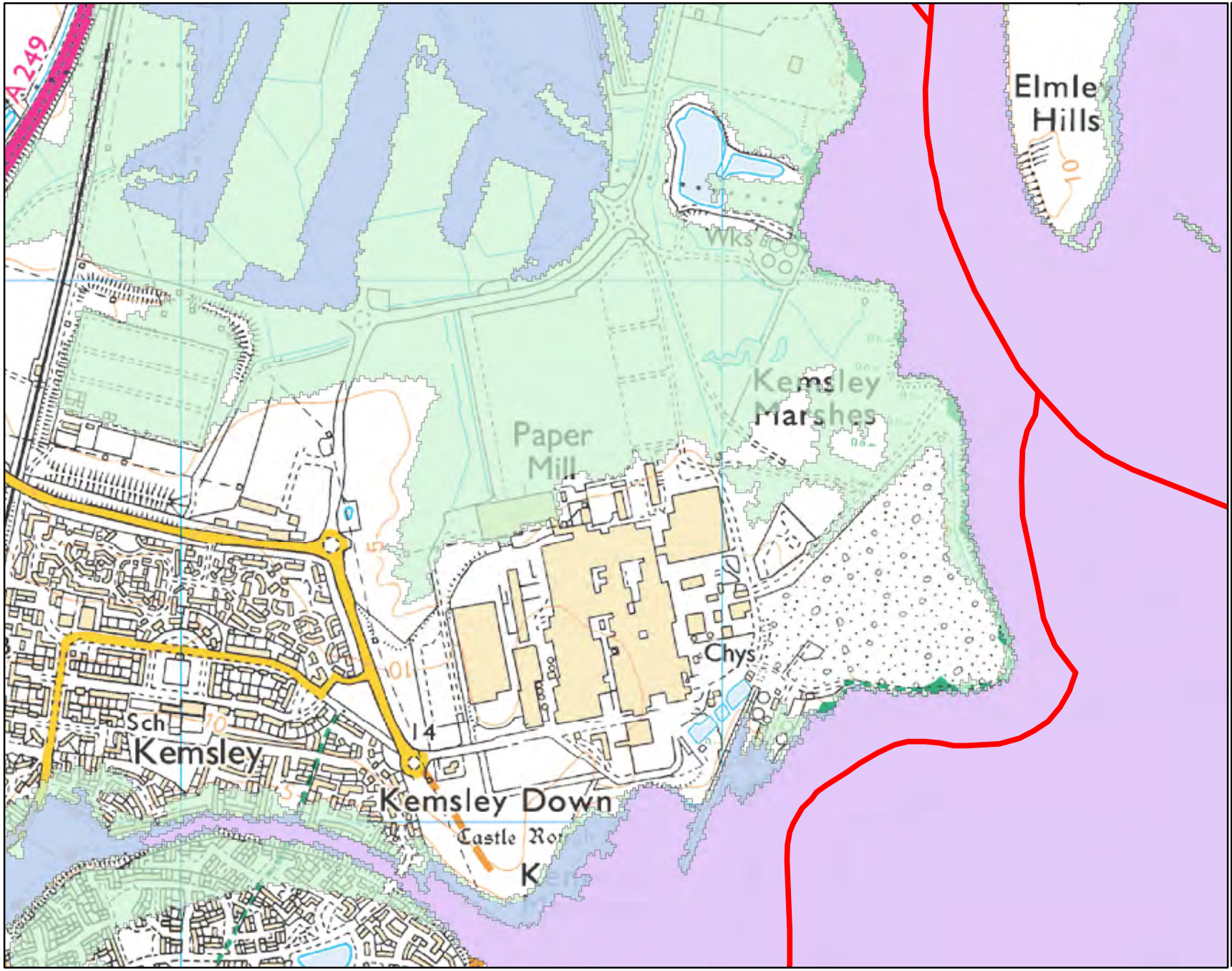
Scale 1:10,000

0 250 500

Meters


Contact us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506. Email:enquiries@environment-agency.gov.uk

# Defended Modelled Tidal Flood Outlines Centred on Kemsley, Kent
# Created 11 February 2016 (Ref KSL1494 TM)




Environment Agency

N

## Legend

- Main Rivers
- 0.5% AEP (2012)
- 0.5% AEP (2070)
- 0.5% AEP (2115)

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occuring in any given year.

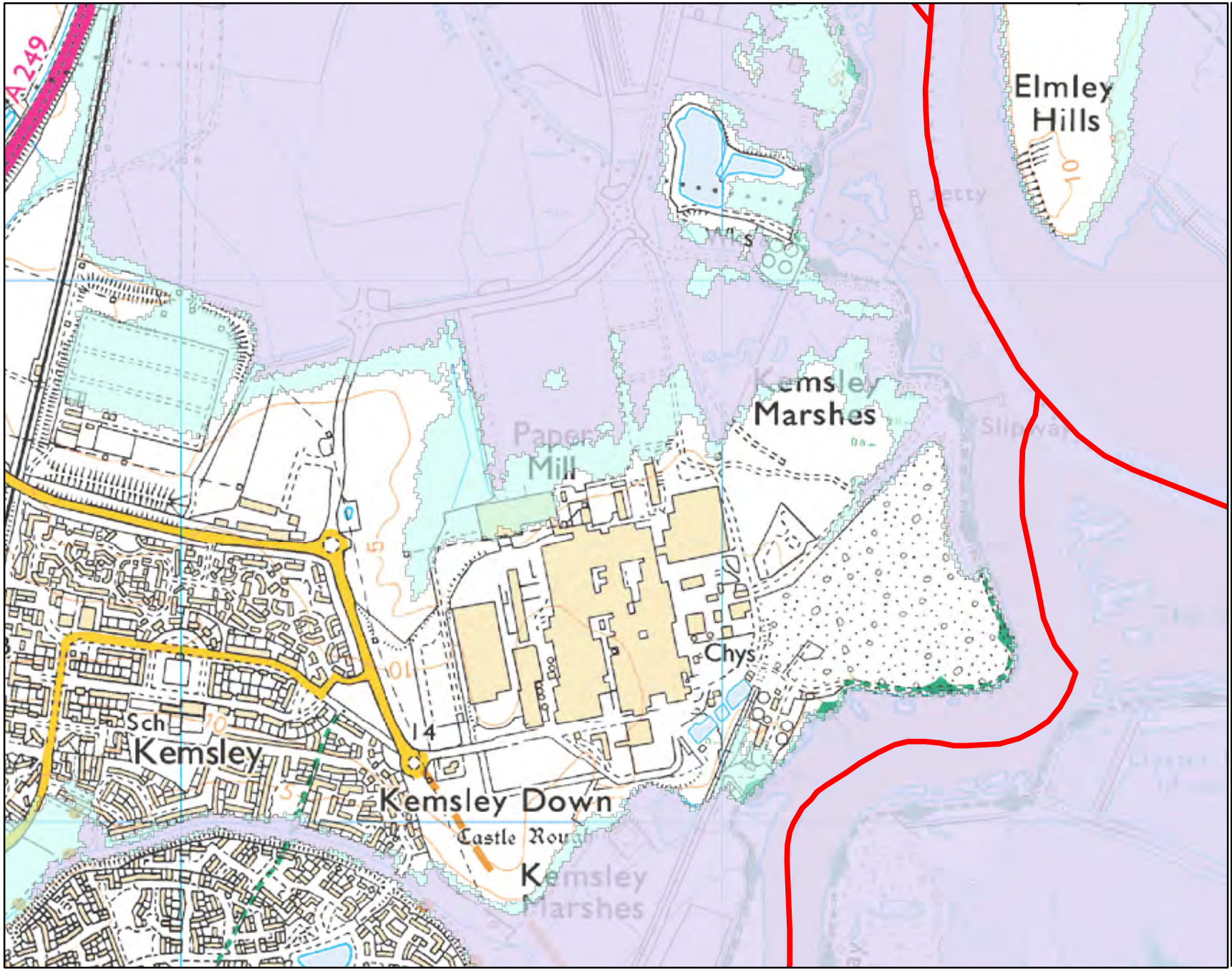
Scale 1:10,000

0 250 500

Meters


Contact us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506. Email:enquiries@environment-agency.gov.uk

# Undefended Modelled Tidal Flood Outlines Centred on Kemsley, Kent
# Created 11 February 2016 (Ref KSL1494 TM)




Environment Agency

N

## Legend

- Main Rivers
- 5% AEP (2012)
- 0.1% AEP (2012)

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occuring in any given year.

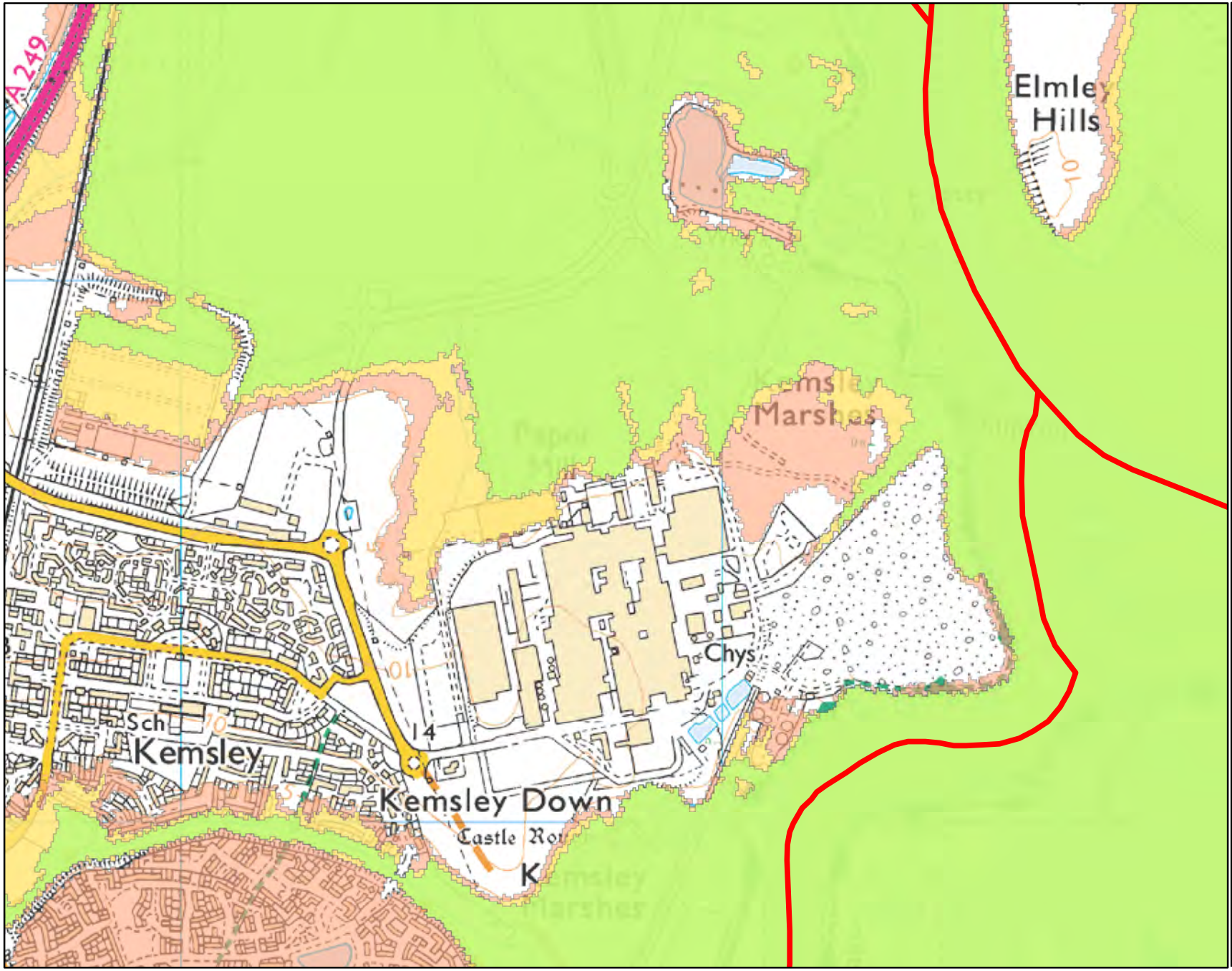
Scale 1:10,000

0 250 500

Meters


Contact us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506. Email:enquiries@environment-agency.gov.uk

# Undefended Modelled Tidal Flood Outlines Centred on Kemsley, Kent
# Created 11 February 2016 (Ref KSL1494 TM)




Environment Agency

N

## Legend

- Main Rivers
- 0.5% AEP (2012)
- 0.5% AEP (2070)
- 0.5% AEP (2115)

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occuring in any given year.

Scale 1:10,000

0 250 500

Meters


Contact us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506. Email:enquiries@environment-agency.gov.uk

# Defence Details

Existing flood defences in this area are made up of raised walls and embankments. These provide a 1 in 1000 year standard of protections.

The Environment Agency currently has no planned improvement works to these defences.

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.
Email: kslenquiries@environment-agency.gov.uk

# Historic Flood Data

We hold records of historic flood events from rivers and the sea. Information on the floods that may have affected the area local to your site are provided on the enclosed map (if relevant).

Flood Event Data

Please note that our records are not comprehensive. We would therefore advise that you make further enquiries locally with specific reference to flooding at this location. You should consider contacting the relevant Local Planning Authority and/or water/sewerage undertaker for the area.

We map flooding to land, not individual properties. Our historic flood event record outlines are an indication of the geographical extent of an observed flood event. Our historic flood event outlines do not give any indication of flood levels for individual properties. They also do not imply that any property within the outline has flooded internally.

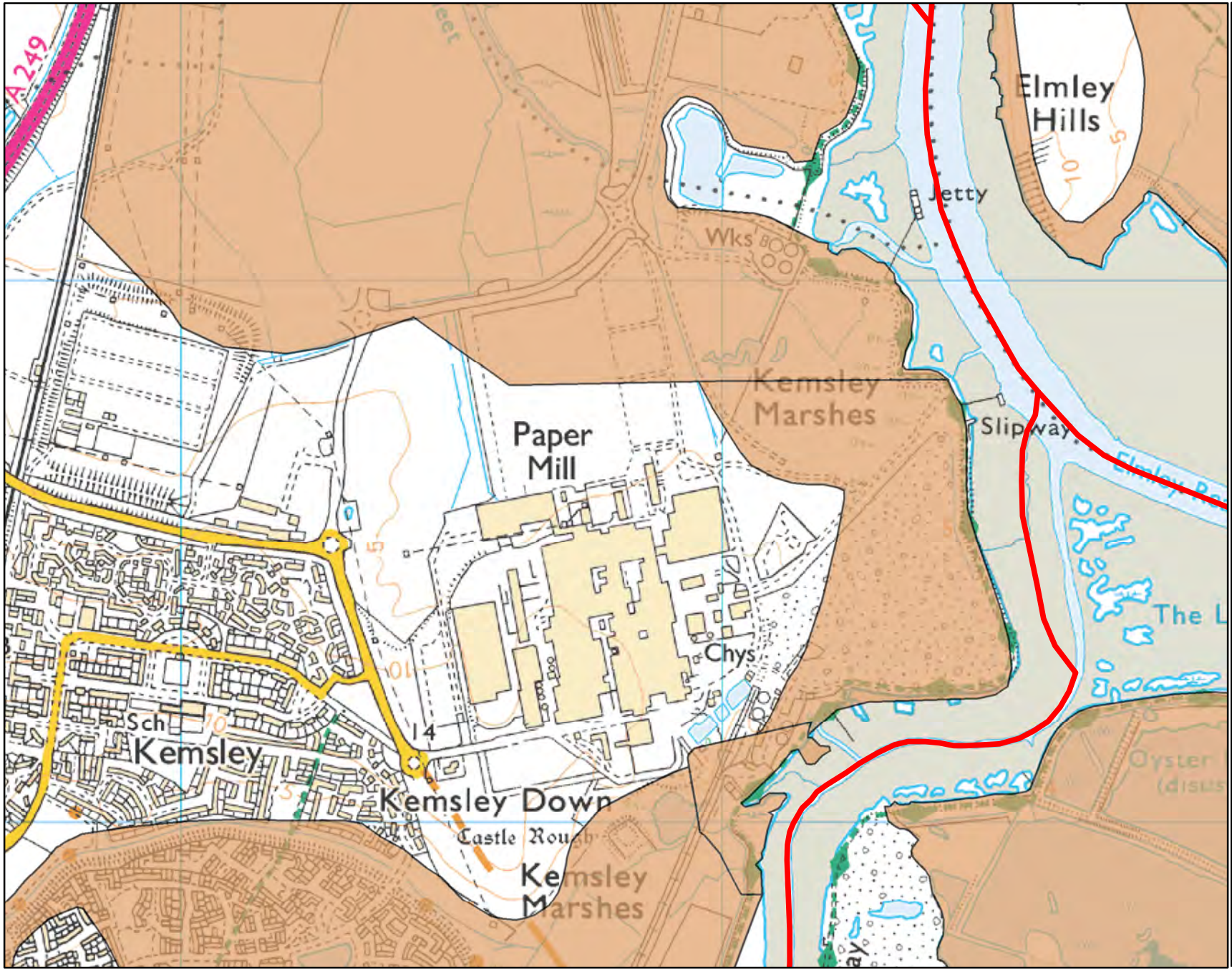
Please be aware that flooding can come from different sources. Examples of these are:

- from rivers or the sea;
- surface water (i.e. rainwater flowing over or accumulating on the ground before it is able to enter rivers or the drainage system);
- overflowing or backing up of sewer or drainage systems which have been overwhelmed,
- groundwater rising up from underground aquifers

Currently the Environment Agency can only supply flood risk data relating to the chance of flooding from rivers or the sea. However you should be aware that in recent years, there has been an increase in flood damage caused by surface water flooding or drainage systems that have been overwhelmed.

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.
Email: kslenquiries@environment-agency.gov.uk

# Historic Flood Outlines Centred on Kemsley, Kent
# Created 11 February 2016 (Ref KSL1494 TM)




Environment Agency

N

## Legend

- Main Rivers
- Feb 1953

Scale 1:10,000

0 250 500

Meters


Contact us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506. Email:enquiries@environment-agency.gov.uk

# Additional Information

**Use of Environment Agency Information for Flood Risk / Flood Consequence Assessments**

Depending on the enquiry, we may also provide advice on other issues related to our responsibilities including flooding, waste, land contamination, water quality, biodiversity, navigation, pollution, water resources, foul drainage or Environmental Impact Assessment.

In **England**, you should refer to the Environment Agency's Flood Risk Standing Advice, the technical guidance to the National Planning Policy Framework and the existing PPS25 Practice Guide for information about what flood risk assessment is needed for new development in the different Flood Zones. These documents can be accessed via:

https://www.gov.uk/government/publications/flood-risk-standing-advice-for-local-planning-authorities-frsa
http://planningguidance.planningportal.gov.uk/

You should also consult the Strategic Flood Risk Assessment produced by your local planning authority.

You should note that:

1. Information supplied by the Environment Agency may be used to assist in producing a Flood Risk / Consequence Assessment (FRA / FCA) where one is required, but does not constitute such an assessment on its own.

2. This information covers flood risk from main rivers and the sea, and you will need to consider other potential sources of flooding, such as groundwater or overland runoff. The information produced by the local planning authority referred to above may assist here.

3. Where a planning application requires a FRA / FCA and this is not submitted or deficient, the Environment Agency may well raise an objection.

4. For more significant proposals in higher flood risk areas, we would be pleased to discuss details with you ahead of making any planning application, and you should also discuss the matter with your local planning authority.

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.
Email: kslenquiries@environment-agency.gov.uk

Surface Water

We have provided two national Surface Water maps, under our Strategic Overview for flooding, to your Lead Local Flood Authority –Kent County Council, who are responsible for local flood risk (i.e. surface runoff, ground water and ordinary watercourse), which alongside their existing local information will help them in determining what best represents surface water flood risk in your area.

Kent County Council have reviewed these and determined what it believes best represents surface water flood risk. You should therefore contact this authority so they can provide you with the most up to date information about surface water flood risk in your area.

You may also wish to consider contacting the appropriate relevant Local Planning Authority and/or water/sewerage undertaker for the area. They may be able to provide some knowledge on the risk of flooding from other sources. We are working with these organisations to improve knowledge and understanding of surface water flooding.

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Email: kslenquiries@environment-agency.gov.uk

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Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.
Email: kslenquiries@environment-agency.gov.uk

## Angus Kerry

**From:** KSL Enquiries <KSLE@environment-agency.gov.uk>
**Sent:** 16 February 2016 14:39
**To:** Jonathan Morley
**Subject:** KSL 1494 TM Environmental Information Request
**Attachments:** spotflowgaugings.csv; KSL 1494 TM Env Info Request Kemsley Marshes.xlsx; KSL 1494.pdf; Standard_Notice 2012.pdf

Dear Jonathan,

Thank you for your enquiry which was received on 14 January 2016.

We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004.

In addition to the Product 4 supplied yesterday please find our following response.

- *Any gauged flow records for river networks in close proximity to the site, with associated estimated return periods*

A single spot flow gauging is available near this location, please find the data attached.

- *Records of any surface and groundwater discharges, abstractions including private licences and pollution incidents"*

Within the site boundary, there are **no records.** You will however see on the map attached that there are three pollution incidents (blue dots) one abstraction (red cross) and one surface water discharge (orange square) in close proximity of the site boundary in question.

- *Details of any recorded groundwater levels in the area, and groundwater vulnerability of the area*
  *Details of any groundwater flooding issues in the area, including flood levels, flood extents and any available anecdotal information*

Please find attached an Excel workbook response. There are two spreadsheets within this workbook ï the first shows abstractions within approximately 2 km of the site.
In the second spreadsheet, there is a table of observation boreholes for which we have level data ï these are within approximately 4.5 km of the site.
There are no records of any groundwater flooding reports within 3 km of the subject area.

- *Details of aquifer designation, soil classification, and Source Protection Zones in this area*

Aquifer Designation & Soil Classification ï This site is underlain by Alluvium which at this location is described as ñclay, silty, peaty and sandyòand is classified as a secondary (undifferentiated) aquifer. The alluvium is likely to be underlain by other superficial deposits; Beach and Tidal Flat Deposits (clay, silt and sand), and/ or Head deposits (clay and silt), which are classified as a secondary (undifferentiated) aquifer, and unproductive strata respectively. The bedrock underlying the site comprises the London Clay Formation, which is classified as unproductive strata.
Source Protection Zone ï The nearest Source Protection Zone 3 is located 1.4km to the southwest of the southernmost point of the subject site

For future enquiries, please refer to our online ñWhatôs In Your Back Yardòservice, where this information is already publicly available.

This information is subject to the attached standard notice.

I trust this information is of use. If you have any further questions, please contact us and we will be happy to help.

If you have any further queries or if youâ d like us to review the information we have provided under the Freedom of Information Act 2000 and Environmental Information Regulations 2004 please contact us within two months and we will happily do this for you.

We would be really grateful if you could spare five minutes to help us improve our service. Please click on the link below and fill in our survey ï we use every piece of feedback we receive:
http://www.smartsurvey.co.uk/s/EnvironmentAgencyCustomerSurvey/?a=KSL

Kind Regards,

Toby

Toby Mortby | Customers and Engagement Officer | Kent and South London
Environment Agency | Orchard House | Endeavour Park | London Road | West Malling | Kent | ME19 5SH
Internal: 723-3115 External: 01732 223115
Email: KSLenquiries@environment-agency.gov.uk

We would be really grateful if you could spare five minutes to help us improve our service. Please click on the link below and fill in our survey ï we use every piece of feedback we receive:
**http://www.smartsurvey.co.uk/s/EnvironmentAgencyCustomerSurvey/?a=KSL**



---

**From:** Jonathan Morley [mailto:jonathan.morley@rpsgroup.com]
**Sent:** 14 January 2016 12:49
**To:** Enquiries, Unit
**Cc:** Andrew Stevenson
**Subject:** Environmental Information Request

Dear Sirs,

**Environmental Information Request: Kemsley, Kent.**

We are currently conducting a flood risk assessment for a development at Kemsley Marshes, Kent (site outlined in red on the attached plan).

To undertake the assessment RPS wish to obtain the following information

- Confirmation of Flood Zone (electronic MapInfo Version if possible);
- Confirmation of the most recent Strategic Flood Risk Assessment (SFRA);
- SFRA Flood zone extents for the area (electronic MapInfo Version if possible);
- EA and SFRA Flood Hazard, surface water and reservoir flood risk mapping including water depths for the area;
- A online link to or copy of the most recent SFRA, including associated drawings, maps and appendices;
- Mapping and records for any surface water assets owned or maintained;
- Any existing river and/or tidal levels, for the 100 year, 100 year with climate change, 200 year, 200 year with climate change, 1000 year, and 1000 year with climate change flood events;

- Any gauged flow records for river networks in close proximity to the site, with associated estimated return periods;
- Details of any historical flood events;
- Details of existing or planned flood alleviation and defences in this area;
- Details of future defence upgrades and/or shoreline management plans/policies;
- Details of any flooding due to drainage problems associated with the site, including flood levels, flood extents and any available anecdotal information;
- Records of any surface and groundwater discharges, abstractions including private licences and pollution incidents;
- Details of any recorded groundwater levels in the area, and groundwater vulnerability of the area;
- Details of any groundwater flooding issues in the area, including flood levels, flood extents and any available anecdotal information;
- Details of aquifer designation, soil classification, and Source Protection Zones in this area; and
- Any other flooding related data and/or reports held in relation to the site and immediate area.

Please would you inform me of any data costs that may be incurred as soon as possible.

Should you have any queries please do not hesitate to contact me.

Yours sincerely
for RPS

Jonathan Morley

---

**Jonathan Morley BSc (Hons)**
**Senior Engineer - RPS Planning & Development**
Suite D10, Josephs Well, Hanover Walk,
Leeds, West Yorkshire, LS3 1AB.
United Kingdom

**Tel:** +44 (0) 113 220 6190
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**Mobile:** +44 (0) 7920 566017
**Email:** jonathan.morley@rpsgroup.com
**www:** www.rpsgroup.com

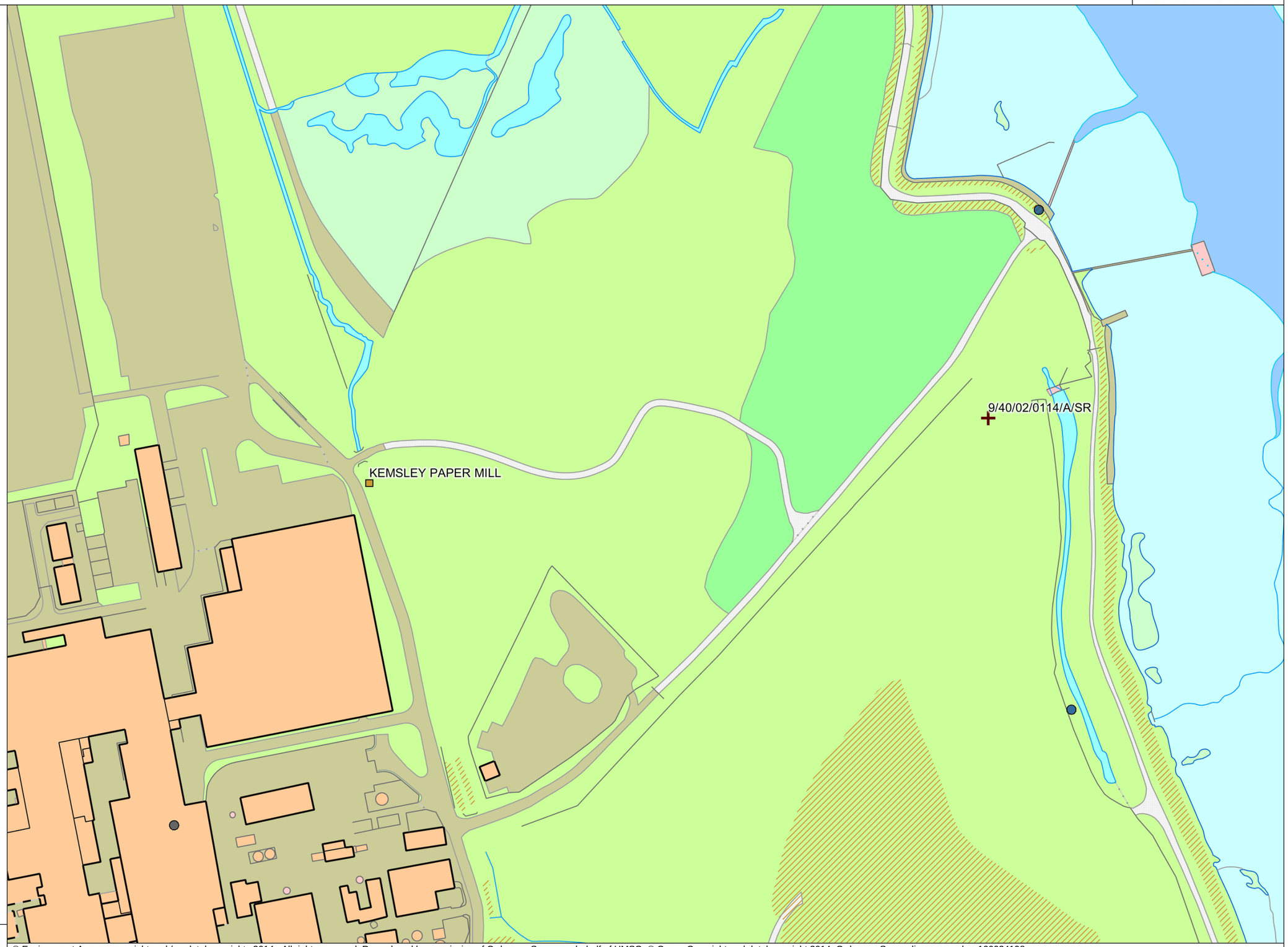
---

# KSL 1494

Environment Agency

**Legend**

- NIRS2 Pollution Incidents
- WIMS Active Discharge Consents Outlets
  - Agriculture
  - Miscellaneous
  - Sewage Outlet - not from Water Companies
  - Sewage Outlet - from Water Companies
  - Sewage and Trade combined
  - Trade
  - Waste Site
- Water Discharge Activity Exemptions
- NALD Abstraction Points
- NALD Abstraction Reaches
- NALD Abstraction Areas




0 22 44 66 m.

N W E S

# APPENDIX 2

Surface Water Management and Foul Drainage Design Philosophy Statement (2016)

**Title:** **Surface Water Management and Foul Drainage Design Philosophy Statement**

**Project:** **NK016315**
**Prepared for:** **Kemsley Sustainable Energy Plant**

**Date:** 13th December 2016

**Our Ref:** NK016315

**RPS Planning & Development**
Sherwood House
Sherwood Avenue
Newark
Nottinghamshire
NG24 1QQ

**Tel:** 01636 605700
**Email:** rpsnewark@rpsgroup.com

# QUALITY MANAGEMENT

| | |
|---|---|
| Prepared by: | Dean Watson |
| Authorised by: | Gordon Barnard |
| Date: | 13th Dec 2016 |
| Project Number/ Document Reference: | NK016315 |

Revision History

| Rev. | Description |
|---|---|
| Rev A | Amended in accordance with landowners comments in clause 7.2.10 |
| Rev B | Project description fuel stock capacity corrected. |
| Rev C | Design Addendum added.<br>Appendix D, Appendix C contents replaced accordingly.<br>7.3.11; 7.3.2; 7.3.3 updated in accordance with Design Addendum. |
| Rev D | Section 7 – clauses 7.1, 7.2.1, 7.2.3, 7.2.4, 7.3.1.1, 7.3.1.2, 7.3.2, 7.3.3 and 7.3.4 amended.<br>Section 8 – clause 8.1 amended.<br>Section 9 – clause 9.1 amended.<br>Appendix B – figures updated.<br>Appendix C – WINDES microdrainage calculations updated.<br>Appendix D – omitted. |
| | |

# CONTENTS

# 1 INTRODUCTION

**1.1** The following report outlines the scheme design philosophy with respect to surface water, foul and process drainage for a proposed Sustainable Energy project to be constructed on the Swale Estuary at Sittingbourne in Kent.

# 2 PROJECT DESCRIPTION

**2.1** The proposed project will comprise:

- A sustainable energy plant with a fuel stock capacity of 550,000 tpa.

The facility will use combustible non hazardous waste as the fuel source.

In addition to the main fuel store, treatment, boiler and turbine buildings, ancillary development will comprise access roads, parking, weighbridge, maintenance and office areas.

The current site layout is indicated on drawing figure 4.3C.

# 3 GROUND CONDITIONS/ADJACENT LAND

**3.1** A phase II site investigation undertaken by RPS in July 2009 indicates that the geological strata beneath the site comprise:

(i) Cohesive made ground to maximum thickness of 4.5m.

(ii) Cohesive alluvium to maximum thickness of 3.5m

(iii) London clays to maximum thickness of 5m.

These deposits overlay the solid geology associated with the Woolwich and Thanet sands and Cretaceous bedrock Chalk.

Historical site investigation information made available by the landowner indicates the following:

(i) The area of land to the north of the site was previously used to store coal. This area is indicated as hatched on the drawings. The made ground in this area retains a residual coal element.

(ii) The area to the south of the site forms the Kemsley Waste Disposal Site (KWDS). This landfill area has recently been capped with clay. An access track forms the northern boundary of the KWDS. It is understood that methane monitoring stations are located along the path. Furthermore it is believed that leachate from the KWDS is discharged to an existing ditch located on the development site.

It is proposed that the path is retained on its present line such that access is maintained post development.

# 4 GROUND WATER

**4.1** The site investigation groundwater monitoring indicates wide spread seepage within the made ground and alluvium layers. It is likely that this represents a perched system. A deeper groundwater system (most likely in continuity with the Swale estuary) was encountered at a depth of 14m below existing ground level.

The London clay is classified as a non-aquifer. The Woolwich and Thanet sands are minor aquifers and the chalk bedrock is classified as a major aquifer.

# 5 EXISTING TOPOGRAPHY AND PROPOSED FINISHED LEVELS

**5.1** The existing site slopes gently from west to east towards the Swale estuary.

The elevation at the western end is approximately 7.0m AOD and at the eastern boundary approximately 4.0m AOD. Finished floor levels for the proposed scheme are anticipated to be set to a level of 6.30m. Thus part of the site will be in cut and part will require upfilling.

# 6 ECOLOGICAL CONTEXT

**6.1** A phase I Habitat and Scoping Survey and assessment was carried out by RPS in June 2009.

Much of the surrounding area to the north-east, east and south of the site is designated as SSSI, SPA and Ramsar notable for coastal grazing and salt marshes and intertidal habitat.

# 7 SURFACE WATER MANAGEMENT

## 7.1 Overall Philosophy

The current site generally comprises undeveloped marsh land (together with a stock pile area used by the adjacent paper mill). The construction and operation of the new development will therefore significantly increase the impermeable area of the site and hence the volume of the surface water run-off from the site and potentially the nature of the run-off in terms of its capacity to pollute receiving watercourses/bodies.

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.

This overall approach is in accordance with the requirements of Appendix F of PPS 25 (Development and Flood Risk). PPS 25 has now been superseded by Planning Policy Framework (NPPF) with particular reference to paragraph 9 of the Technical Guidance to the NPPF published in March 2012. It is anticipated that the pollution risks identified and mitigations proposed in this document will satisfy the requirements of the relevant planning consultees such as the Environment Agency and Natural England.

A preliminary proposed Surface Water Drainage design is shown on drawing figure 4.25C. As shown on the drawing, it is proposed that all clean surface water from the site is discharged to receiving storage pond constructed on the site as shown on drawing figure 4.24C. The storage ponds discharge this water under gravity to the tidal Swale estuary to the north east. The provision of the constructed pond will provide an effective and economic way of conveying water to the receiving swale during normal conditions with the added benefit of protecting the adjacent marsh land habitat from surface water run-off. The pond will also provide protection against flooding of the site during design rainfall and tidal events. This design proposal is assessed in detail below against the following criteria:

- Pollution/Aquifer contamination
- Flooding
- SUD's
- Climate change
- Water reclamation

## 7.2 Pollution/Aquifer Contamination

The operation of the facility exposes the surface water management system to pollution risk. The operations and activities which contribute to this risk together with the proposed mitigation measures to be implemented are outlined below.

### 7.2.1 Potential Polluting Activities/Sources

The following activities/operations require consideration.

(i) Waste water associated with the process.

(ii) Movement of lorries, loading shovels and cars.

(iii) Storage of fuel and operation of on site re-fuelling facility.

(iv) Fire suppression.

(v) Landscape top soil run-off

(vi) Discharge of leachate from adjacent KWDS land.

(vii) Exposure of contaminated land/creation of pathways in areas adjacent to the site.

### 7.2.2 Waste Water associated with the process

Refer to Section 8 for further details.

### 7.2.3 Movement of lorries, loading shovels and cars

**Normal activity**

Minor day to day fuel/oil spillages from car/lorry/loading shovel engines will be flushed into the yard and car park surface water drainage systems and treated through by-pass interceptors.

The by-pass interceptors will be alarmed for fuel and silt build up and to indicate when routine maintenance is required.

**Lorry yard accident / exceptional fuel spillage/unloading spillages**

Lorry or loading shovel impact or damage to fuel pumps could result in volumes of fuel/oil released sufficient to exceed the capacity of the interceptors. In these scenarios untreated contaminated water would be discharged directly to the storage pond. In order to deal with this an electrically operated closure valve will be provided so that contaminated water is retained in the storage pond such that it can be pumped to tanker for removal off site.

### 7.2.4 Production of Domestic Foul Waste Water

The energy plant will comprise areas of office space with associated welfare facilities. The domestic waste water produced shall be discharged to the foul system.

### 7.2.5 Fire Suppression

In the event of fire, the water required to suppress it will be stored in pits and sumps constructed within each building. Perimeter upstands and ramped access doors will prevent this water escaping to the external areas. Contaminated water contained within the fire water pits and sumps will be tested and disposed of off site.

### 7.2.6 Landscape Topsoil run-off

Surface water run-off from the landscape slopes will be collected by a series of land drains located at the base of the slopes and these will discharge the water into the storage pond.

### 7.2.7 Aquifer Contamination

As indicated in section 3.1, the ground conditions effectively preclude the use of infiltration drainage techniques. Thus the project presents no risk of contamination to the underlying aquifers.

### 7.2.8 Existing Ditch

(i) The location of an existing ditch on the western boundary of the site is shown on the drawings. The land owner has indicated that this ditch does not receive any leachate discharge from the adjacent KWDS. In order to accommodate the proposed scheme the ditch will be infilled and a new mitigation ditch constructed – see section 10.

### 7.2.9 Adjacent Area Pollution Pathways

The construction of the storage ponds will require works (including excavations) in the potentially contaminated areas on the boundaries of the site.

Excavations for the pond are likely to encounter the made ground. It is intended however that the storage pond will be lined with clean site won clay placed to a depth of at least 300mm. Thus potential for the pond to act as a pathway for coal residue pollution is removed.

## 7.3 Flooding

The site will be exposed to the risk of flooding due to the following:

(i) Exceedance of the capacity of the below ground pipework, channel drains storage elements, etc., constructed as part of the works during design rainfall events.
(ii) Failure of the above ground superstructure drainage elements such as siphonic pipework and gutters as a consequence of (i) above.
(iii) Exceedance of available storage capacity as a result of design rainfall events coinciding with tidal events. This situation will result in the site becoming tide locked. Thus discharge to the adjacent Swale estuary or Milton Creek would not be possible during these periods.
(iv) Inundation of the site of seawater during extreme tidal events.

For the purposes of this report, flooding as a result of (i), (ii) and (iii) described above is defined as:

- Rainwater falling on the development site, entering the drainage system and subsequently crossing the site boundary at any location.
- Rainwater falling on the development site, entering the drainage system and subsequently entering buildings on the development site.

### 7.3.1 Capacity Exceedance

#### 7.3.1.1 Basic Criteria for Design

The surface water drainage system shown on drawing figure 4.25C will be designed in accordance with the following basic criteria:

(i) All network pipework will be designed for no surcharging above pipe soffit for 1 in 2 year design storms.

(ii) The system shall be designed not to flood (as defined above) for 1 in 100 year +20% climate change design storms.

(iii) The site drainage serving the roofs and external areas will discharge freely to the storage pond for all rainfall events.

(iv) The drainage networks will be designed and flooding simulated using WINDES micro-drainage software. All drainage will generally be designed in accordance with BS EN 752-2008: Drain and Sewer Systems outside buildings and the recommendations outlined in the 7$^{th}$ Edition of Sewers for Adoption.

(v) The roof drainage for the various buildings comprising the facility shall be siphonic drainage systems designed to provide category 3 protection (as described in BS EN 12056:3) and a 25-year design life. The siphonic drainage systems and gutters will therefore be designed for 1 in 100 year return period storms.

For the main buildings, a single primary siphonic system is proposed. This will be designed to take rainfall intensities of up to 231mm/hr and discharge directly to the underground drainage system. Overflows will also be implemented such that in the event of an exceptional rainfall event or blockage the water can still be discharged from the gutter.

#### 7.3.1.2 Additional Comments with respect to Capacity Exceedance

In addition to the basic criteria defined above, it should be noted:

- As indicated on the drawing slot, channel and kerb drains constructed close to the surface will be utilized to a considerable extent. This will ensure that the drainage is generally kept shallow thus avoiding expensive and potentially dangerous deep excavations and the perched water table at high level.

- Storage of run-off water in external areas through design of external levels/provision of raised kerbs, etc., has not been utilized given the nature of the facility (extensive buildings, limited yard areas, potential ash contamination).

The two points above will require that, in effect, the below ground pipework and high level slot and kerb drains are designed to convey 1:100 year rainfall volumes (including secondary siphonic roof water) directly to the storage pond.

It is proposed that the pond is designed such that a 600mm freeboard is maintained in the 1:100 year +20% climate change rainfall event combined with the 1 in 100 year storm surge.

### 7.3.2 Coinidence of Design Rainfall and Tidal Events

The RPS Flood Risk Assessment states that the EA has confirmed that there are no runoff requirements entering the Tidal Swale Estuary. Due to the tidal nature of the outfall, the outfall from the proposed site will not have any impact on flood risk in the Tidal Swale Estuary.

### 7.3.3 Tidal Range

The normal tidal range at the outfall is provided in the UK Hydrographic Office Admiralty Tide Table Volume 1 2016. The nearest tabulated port is Grovehurst Jetty (within 200m of the proposed outfall). The normal tidal range (in m AOD) for this is give in Table 1.

| LAT (m) | MLWS (m) | MLWN (m) | MHWN (m) | MHWS (m) | HAT (m) |
|---|---|---|---|---|---|
| -2.9 | -2.3 | -1.4 | +1.8 | +2.9 | +3.4 |

Table 1: Tidal Range at Grovehurst Jetty (2000)

Where:

- MLWS: Mean Low Water Springs
- MLWN: Mean Low Water Neaps
- MHWN: Mean High Water Neaps
- MHWS: Mean High Water Springs
- LAT: Lowest Astronomical Tide
- HAT: Highest Astronomical Tide

**Figure 1** shows the Tidal Cycle for Sheerness adjusted for Grovehurst Jetty (from UK Hydrographical Office Admiralty Tide Table) for the 1 in 200 year + 20% climate change event.

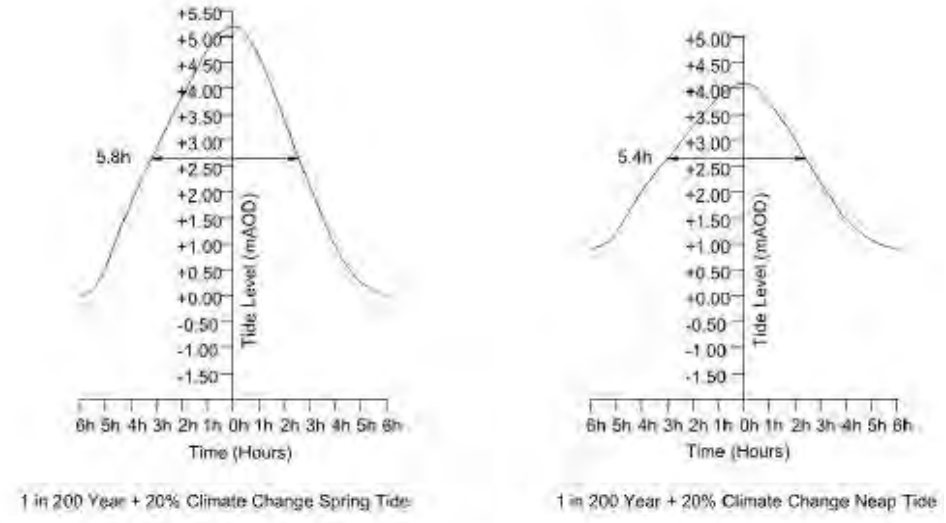



Figure 1: Tidal Cycles at Grovehurst Jetty

These show that if the outfall is set at a level of 2.65m AOD then the pond is tide locked for a maximum period of 5.8 hours (350 minutes). For Kemsley the total rainfall for a 360 minute 1 in 100 year rainfall event is 73.7mm (based on data from the Flood Estimation Handbook Version 3). Including 20% climate change this becomes 88.5mm.

The total equivalent impermeable area (taking 1.0 as a runoff coefficient for hardstanding and 0.3 as a runoff coefficient for softscape) of this is 3.4 hectares. The total area of the pond is assumed to be 5000m² taking the total equivalent impermeable area to 3.9 hectares.

This gives a total runoff volume during the 360 minute 1 in 100 year + 20% climate change rainfall event of 3500m³. The attenuation basin is therefore to be sized to meet this criteria.

### 7.3.4 Discharge

The design principles assume that the pond must fully empty before the outfall becomes tide locked again. Making the conservative assumption that no discharge occurs until the tide level falls below the invert of the outfall this means that the pond must discharge fully within a period of 6.2 hours. Over 6.2 hours this flow rate would be sufficient to drain 7700 litres indicating that this criteria will be met.

## 7.4 SUD's

With reference to NPPF and CIRIA SuDS Manual C753 a sustainable approach to the management of surface water drainage is to be adopted:

(i) The perimeter storage pond will be vegetated and will hold, slow down and contribute to treatment of the run-off water. The pond will prevent uncontrolled discharge water entering areas of land adjacent the site.

(ii) The water reclamation systems indicated, represent additional source control in addition to providing a useable resource.

The ground conditions comprising essentially cohesive impermeable strata to considerable depth and the presence of perched water table preclude the use of infiltration devices.

## 7.5 Climate Change

As indicated in preliminary discussions with the EA and as recommended in NPPF design peak rainfall intensities will be increased by 20% as a precaution against the effects of climate change.

# 8 PROCESS DRAINAGE

**8.1** The following measures will be implemented to deal with waste process water generally.In the tipping hall and bunker it is not intended that any dedicated internal drainage is provided with all water draining into the bunker and soaking into the waste. The bottom ash hall will drain to the dedicated process drainage network in which effluent is collected, treated and recirculated inside the plant.

(i) Buildings or equipment areas where waste water is generated or the risk of spillage of fuel, oil, condensate etc. is present will be provided with internal building drainage as necessary.

(ii) It is envisaged that waste water associated with the boiler process will be recycled for slag cooling purposes.

(iii) Level entry doors will be provided with threshold channel drains discharging to the foul system. Perimeter upstands and ramped access to ensure all spillages, leaks, etc. remain with the building footprint.

# 9 FOUL DRAINGE

**9.1** The foul drainage elements described in 7.2.1 (production of domestic foul waste, process driven waste water and refuelling.) will discharge (to rates agreed with the receiving sewer owners and/or the Water Authority) to the existing foul sewer located within Ridham Avenue. The remoteness of some of the areas requiring connection to the foul system (e.g. slag laydown area) will require that a pumping station and rising main are provided to discharge foul water to the receiving sewer at self cleansing velocities.

**9.1.1** The new site foul drainage will be designed in accordance with BS EN 752, 7$^{th}$ Edition of Sewers for Adoption and the requirements of the Building Regulations.

# 10 ECOLOGICAL ENHANCEMENT

**10.1** In order to compensate for infilling of the existing ditch located on the western boundary (see 7.2.10) it is intended to provide a new ditch slightly to the west of the existing ditch. The ditch is indicated on drawing figure 4.41C .

# 11 CONSTRUCTION PHASE POLLUTION CONTROL

**11.1** Safeguards shall be implemented during the construction phase to minimise the risk of pollution and detrimental effects to the water interests around the site. The following general mitigation measures shall be implemented.

(i) Works on site shall generally follow the best practice guidelines outlined in Section 5 and 6 of CIRIA C532 – Control of Water Pollution from Construction Sites.

(ii) Temporary foul drainage to serve the contractors welfare facilities will be provided at the start of works on site.

(iii) Refuelling and maintenance of machines shall be strictly controlled and oil storage tanks confined to locations remote from the perimeter of the site. All leaking or empty oil drums shall be immediately removed from site.

(iv) Well constructed and designated storage areas shall be provided located more than 20m away from the site perimeter. Chemical or fuel storage shall comprise of impermeable boxes and appropriate bunding.

(v) On site concrete batching plants (if utilised) are to be located more than 20m away from the site perimeter. The washing out of any concrete mixing plant or cleaning of ready mix concrete tankers shall be strictly controlled. The effluent from such cleaning shall be tankered off site or suitably treated using sedimentation tanks before the run-off is discharged.

(vi) A strict waste management system will be incorporated to prevent the disposal of construction or domestic rubbish entering the adjacent marshland areas. Waste materials will be properly stored on site.

(vii) Fill material imported to upfill to site will be sourced with due regard to leachate characteristics to the approval of the EA and Natural England. It is anticipated that the storage pond required for the permanent works will be constructed in advance of the earthworks operations such that construction phase storage and settling pond capabilities are available from the start of the works, and to provide tidal innundation protection to the construction site.

# APPENDIX A

Ground Investigation Report Extracts/Ground Water Level Extract

# BOREHOLE LOG

RPS

Borehole No. **BH1**
Sheet 1 of 2

| | | | | | |
|---|---|---|---|---|---|
| Project Name: Kemsley Mill | Coordinates | Drilling Plant: | Casing Details | | Hole Type |
| Project No. JER4418 | Northings: - | Start Date: 09/07/2009 | Hole Diameter (mm) | Casing Depth (m) | BH |
| Location: Sittingbourne, Kent | Eastings: - | End Date: 10/07/2009 | | | Scale |
| Client: E.ON | Ground Level: - m OD | Logged By: | | | 1:50 |

| Well | Water Strikes | Samples & In Situ Testing Depth (m) | Type | Results | Level (m AOD) | Depth (m) | Legend | Description Of Strata | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Grey brown slightly gravelly silty SAND with occasional fill including metal, stone and bricks. Occasional bands of light brown clay with concrete. (MADE GROUND) | 0.50 |
| | | 1.00 | SPT | 68/225mm (3,3,9,9,50) | | | | | 1.00 |
| | | | | | | | | | 1.50 |
| | | 2.00 | U001 | | | 2.00 | | | 2.00 |
| | | | | | | | | Firm to stiff grey slightly gravelly slightly sandy CLAY. Gravels are subangular to angular stone. (MADE GROUND) | 2.50 |
| | | 3.00 | SPT | N=10 (1,1,2,2,3,3) | | | | | 3.00 |
| | | | | | | | | | 3.50 |
| | | 4.00 | U002 | | | 3.85 | | Firm to stiff grey brown occasionally orange mottled CLAY. | 4.00 |
| | | | | | | | | | 4.50 |
| | ▼ | 5.00 | SPT | N=12 (1,2,3,3,3,3) | | | | | 5.00 |
| | | | | | | | | | 5.50 |
| | | | | | | | | | 6.00 |
| | | 6.50 | U003 | | | | | | 6.50 |
| | | | | | | | | | 7.00 |
| | | | | | | 7.40 | | Stiff light grey CLAY. Occasional bands of sand present with depth. | 7.50 |
| | | 8.00 | SPT | N=14 (1,2,2,4,4,4) | | | | | 8.00 |
| | | | | | | | | | 8.50 |
| | | | | | | | | | 9.00 |
| | | 9.50 | U004 | | | | | | 9.50 |
| | | | Type | Results | | | | Continued next sheet | |

Remarks:

| Chiselling Details | | | | Groundwater Notes | | |
|---|---|---|---|---|---|---|
| Time Taken | Depth From (m) | Depth To (m) | Tool Used | Strike (m) | Casing Depth (m) | Level After 20 Mins (m) |
| | | | | 13.00 | 12.50 | 5.25 |

AGS

# RPS

# BOREHOLE LOG

Borehole No. **BH2**
Sheet 1 of 2

| | | | | | |
|---|---|---|---|---|---|
| Project Name: Kemsley Mill | Coordinates | Drilling Plant: | Casing Details | | Hole Type |
| Project No. JER4418 | Northings: - | | Hole Diameter (mm) | Casing Depth (m) | BH |
| Location: Sittingbourne, Kent | Eastings: - | Start Date: 06/07/2009 | | | |
| | Ground Level: - m OD | End Date: 06/07/2009 | | | Scale 1:50 |
| Client: E.ON | | Logged By: | | | |

| Well | Water Strikes | Samples & In Situ Testing Depth (m) | Type | Results | Level (m AOD) | Depth (m) | Legend | Description Of Strata |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Grey slightly gravelly silty sand. Gravel is subangular flient, stone and stone ash. Occasional metal, bricks and bands of firm light brown clay. (MADE GROUND) |
| | | 1.00 | SPT | N=4 (1,1,1,1,1,1) | | | | |
| | | 2.00 | SPT | N=10 (2,2,2,2,3,3) | | 2.00 | | Stiff light brown light brown slightly sandy CLAY. Occasional fragments of brick and concrete. (MADE GROUND) |
| | | 3.00 | U001 | | | | | |
| | | 4.00 | SPT | N=9 (2,3,2,2,3,2) | | | | |
| | | | | | | 4.60 | | Firm light grey orange mottled CLAY. |
| | ▼ | | | | | 5.00 | | Stiff light grey orange mottled slightly sandy CLAY. |
| | | 6.50 | SPT | N=25 (3,5,6,6,6,7) | | | | |
| | | | | | | 7.80 | | Stiff grey CLAY. |
| | | 8.00 | U002 | | | | | |
| | | 9.50 | SPT | N=24 (2,4,4,6,7,7) | | 9.50 | | Stiff grey CLAY with occasional sand. Sand bands present below 12.1m. |
| | | | Type | Results | | | | |

Continued next sheet

Remarks:

| Chiselling Details | | | | Groundwater Notes | | |
|---|---|---|---|---|---|---|
| Time Taken | Depth From (m) | Depth To (m) | Tool Used | Strike (m) | Casing Depth (m) | Level After 20 Mins (m) |
| | | | | 14.50 | 14.50 | 5.10 |

AGS

RPS

# BOREHOLE LOG

Borehole No. **BH3** Sheet 1 of 2

| | | | | | |
|---|---|---|---|---|---|
| Project Name: Kemsley Mill | Coordinates | Drilling Plant: | Casing Details | | Hole Type |
| Project No. JER4418 | Northings: - | Start Date: 13/07/2009 | Hole Diameter (mm) | Casing Depth (m) | BH |
| Location: Sittingbourne, Kent | Eastings: - | End Date: 14/07/2009 | | | Scale |
| Client: E.ON | Ground Level: - m OD | Logged By: | | | 1:50 |

| Well | Water Strikes | Samples & In Situ Testing Depth (m) | Type | Results | Level (m AOD) | Depth (m) | Legend | Description Of Strata |
|---|---|---|---|---|---|---|---|---|
| | | 1.00 | SPT | N=6 (1,1,1,1,2,2) | | | | Stiff brown slightly gravelly slightly sandy CLAY. Gravels are subangular to angular limestone and stone fill. Includes fill material such as glass and pottery. (MADE GROUND) |
| | | 2.00 | SPT | 65/225mm (2,2,5,10,50) | | 2.00 | | Dense dark grey slightly sandy SILT. Becomes clayey with depth. (MADE GROUND) |
| | ▼ | 3.00 | SPT | N=11 (2,2,2,3,3,3) | | 3.00 | | Stiff light brown orange grey mottled slightly sandy CLAY. Becomes grey with depth. |
| | | 4.00 | U001 | | | | | |
| | | 5.00 | SPT | 50/150mm (9,21,30,20) | | | | |
| | | 6.50 | U002 | | | | | |
| | | | | | | 7.00 | | Dense grey slightly silty SAND. |
| | | 8.00 | SPT | 52/150mm (11,23,22,30) | | | | |
| | | 9.50 | U003 | | | | | |
| | | | Type | Results | | | | |

Continued next sheet

Remarks:

| Chiselling Details | | | | Groundwater Notes | | |
|---|---|---|---|---|---|---|
| Time Taken | Depth From (m) | Depth To (m) | Tool Used | Strike (m) | Casing Depth (m) | Level After 20 Mins (m) |
| | | | | 3.00 | 3.00 | 2.87 |
| | | | | 14.00 | - | - |

AGS

The Solid Geology is recorded as typically consisting of a veneer of the London Clay formation underlain by the Woolwich Beds.

The London Clay was proven as a grey clay with localised sand bands to 12.3m depth at BH1 and 14m depth at BH2. The London Clay was not encountered at BH3 with the Superficial Deposits underlain directly by the Woolwich Beds below 7m depth. This is supported by the high SPT 'N' values recorded within BH3, consistent with expectation for the Woolwich Beds. However, the associated high SPT 'N' values correlate very much with the latter one. The soils at BH3 between 7m and 14m may simply be a transition zone between the two formations.

A single plasticity test indicates a high plasticity index of 49 with a natural moisture content of 30%. A high shrinkage material is indicated.

4 no. standard penetration tests recorded uncorrected N values of between 14 and 29. The results are provided in *Appendix F* and indicate a trend of increasing value with depth from a firm consistency within the upper formation, gradually hardening to stiff with depth. These results correlate with the single triaxial test result of 97kPa (stiff).

### 6.1.4 Solid Geology – Woolwich Beds

The Woolwich Beds was proven as a grey silty sand to at least 20m depth.

3 no. particle size distribution tests indicate a variable material ranging from gap graded (consisting of silty fine sand) to poorly graded (consisting of slightly sandy very silty clay).

9 no. standard penetration tests all recorded uncorrected N values in excess of 50 indicating a very dense relative density. The results are provided in *Appendix F*.

The 2 no. shear box test within cohesive material gave an angle of shearing resistance of 14.5° and 15.5 ° associated with an apparent cohesion of 20kPa and 22kPa.

## 6.2 Groundwater

Groundwater seepages within the Made Ground or the upper Alluvium were recorded in most trial pits and boreholes. These are believed to be perched and characteristic of the variability of the material and the associated infiltrations. A deeper ground water body was encountered at 13 to 14.5 mBGL confined below the London Clay within the Woolwich Beds. All deeper strikes rose to about 5 m depth after 20mins (recorded as fast inflow).

Standing levels of the confined groundwater body were recorded between 3 and 4.7 mBGL. Standing levels of the perched groundwater body were recorded between 1.7 and 4.4 mBGL within the Made Ground or Alluvium.

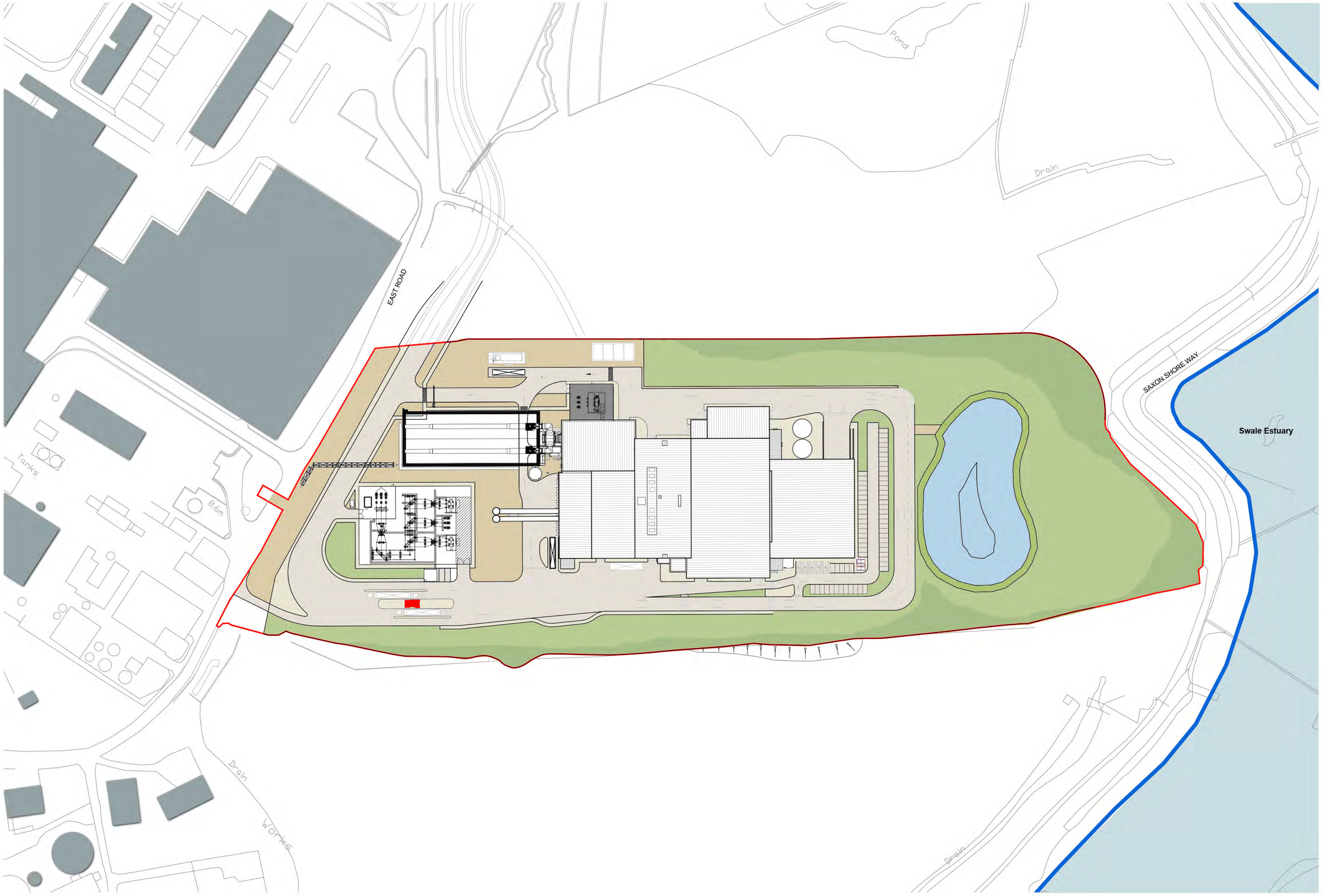
# APPENDIX B

Drawings

notes :

1. If this drawing has been received electronically it is the recipients responsibility to print the document to the correct scale.
2. All dimensions are in millimetres unless stated otherwise. It is recommended that information is not scaled off this drawing.
3. This drawing should be read in conjunction with all other relevant drawings and specifications.
4. Information based on drawing reference: OH8013-0202/62G105.

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

Content of drawing based on UMC drawing number AAK-04-2002002_UMG0910. Reproduced with permission

| rev | amendments | by | ckd | date |
|---|---|---|---|---|
| N | Site Plan updated. | JH | CMGD | 09.01.17 |
| M | Updated to suit current site layout received from EPC contractor | AE | JAT | 16.11.15 |
| L | Updated as per client comments 26.10.15. | MK | JAT | 27.10.15 |
| K | Updated to suit current building layout received from EPC contractor. | MK | JAT | 19.10.15 |
| J | Vehicle wash down area removed. | JAT | TP | 24.02.15 |
| H | Updated as per current comments. | CB | JAT | 18.02.15 |
| G | Logos confirmed.Site layout/access clarified | AJL | RS | 28.06.13 |
| F | Title block and roof layout updated | JAT | SG | 24.10.12 |
| 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: D S Smith Paper | Wheelabrator Technologies

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 N

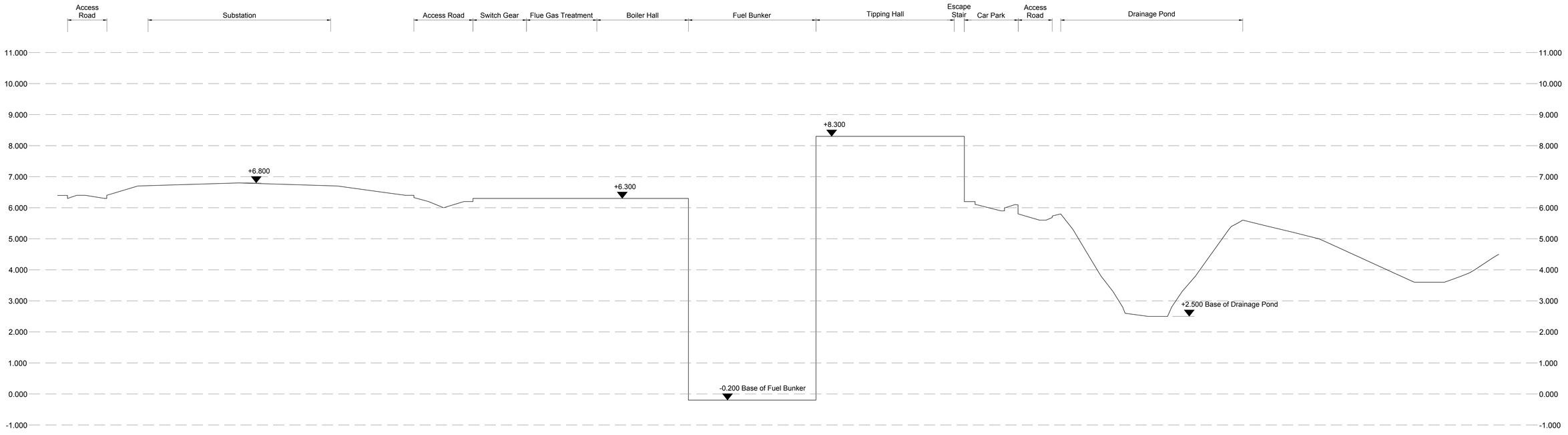
Rev: N

FIGURE 4.3C

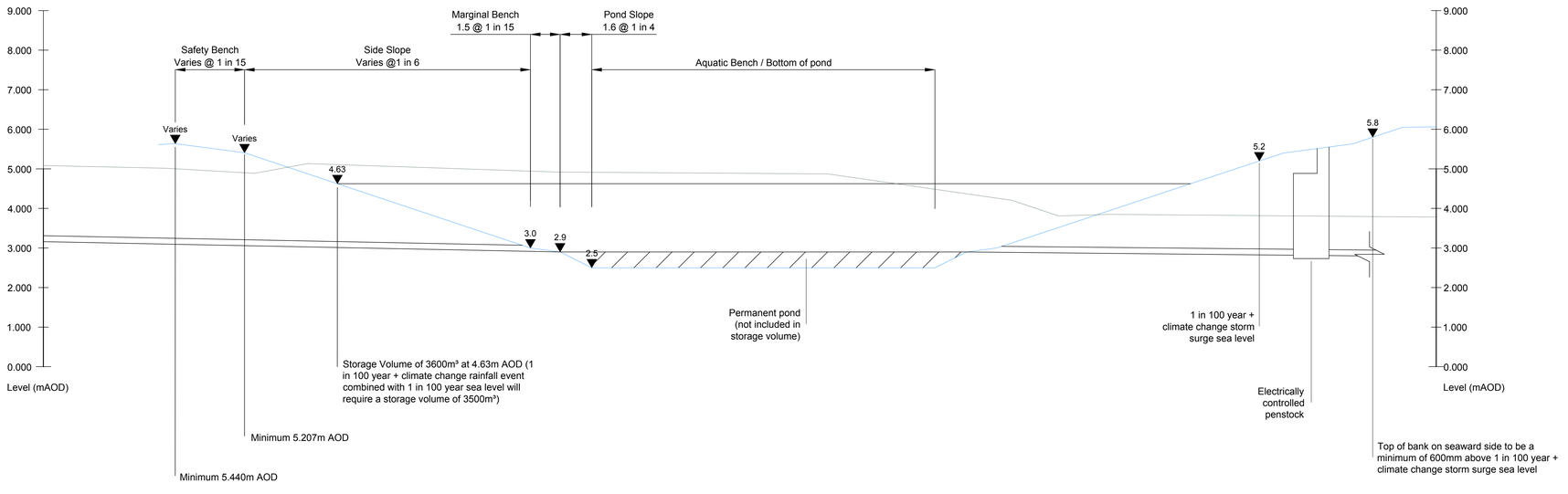
10m SCALE 1:1000

notes :

1. If this drawing has been received electronically it is the recipients responsibility to print the document to the correct scale.
2. All dimensions are in millimetres unless stated otherwise. It is recommended that information is not scaled off this drawing.
3. This drawing should be read in conjunction with all other relevant drawings and specifications.




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




## Section B-B
Scale 1:50

Refer to RPS drawing 0600 for section line locations

Key:

Existing Levels

Proposed Levels

Drawing for PLANNING purposes only

Content of drawing based on UMC drawing number AAK-04-2002002_UMG0910 and ARUP drawing number SK-005. Reproduced with permission

| rev | amendments | by | ckd | date |
|---|---|---|---|---|
| G | Client logos updated. Section A-A title changed to Section B-B. New Section A-A added. Drawing title updated to Site Sections. | JT | CMG | 15.02.17 |
| F | Updated to suit NMA 2016 | JH | CMG | 11.01.17 |
| E | Sections updated to suit latest UI design. | AJL | ST | 26.07.13 |
| 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: Wheelabrator Technologies

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 / 0250

Rev: G

Figure 4.24C

1m SCALE 1:50

10m SCALE 1:500

notes :

1. If this drawing has been received electronically it is the recipients responsibility to print the document to the correct scale.
2. All dimensions are in millimetres unless stated otherwise. It is recommended that information is not scaled off this drawing.
3. This drawing should be read in conjunction with all other relevant drawings and specifications.

Legend:

- Channel Drain
- Surface water sewer
- Surface water filter drain (perforated pipe)
- Kerb inlet drain
- Manhole
- RG01 Road Gully
- KG02 Kerb Gully
- CG03 Channel Gully
- BPIN Bypass Petrol interceptor
- RPIN Full Retention Petrol interceptor
- Headwall
- DP 1 Downpipe

Future IBA Facility

Connection to IWW pit overflow. Refer to Industrial Wastewater Drawings for information.

Connection to oil detecting pump located within sump of bund for Externally Bunded Diesel Storage Tank. To be detailed in Secondary Drainage Issue.

Connection to oil detecting pump located within sump of oil retention pit of CNIM Transformers. To be detailed in Secondary Drainage Issue.

Connection to drainage within UKPN Transformer Room to be confirmed with UKPN

Connection to oil detecting pump located within sump of oil retention pit of UKPN Transformers. To be detailed in Secondary Drainage Issue.

Refer to Note 11

Attenuation basin

Refer to Note 8

Refer to Note 10

Refer to Note 9

Outfall A1 (Type A)

Outfall B1 (Type B)

Outfall B3 (Type B)

Outfall B2 (Type B)

Attenuation Basin Bottom

Attenuation Basin Marginal Bench

Attenuation Basin Top of Bank

## Drainage Layout

Scale 1:500

1. This drawing to be read in conjunction with Surface Water Drainage Schedule (5025 20 02 00 22/AP G 0011), Surface Water Setting Out drawing (5025 20 02 00 22/AP G 0015), Drainage Construction Details (5025 20 02 00 22/AP G0091, 0092, 0093, 0096 and 0097), CNIM, MEP and structural drawings.
2. External pipes with cover less than 1.2m to have Class A3 pipe bedding, external pipes with cover greater than 1.2m to have Class S pipe bedding.
3. Upstream gully / channel connection pipe invert level to suit gully / channel connection detail.
4. All gully and channel connections to main drainage runs to be 100mm Ø unless stated otherwise.
5. Connection Points to building drainage pending confirmation from UMC.
6. Pipes, fittings and gully materials to be as per surface water drainage schedule (5025 20 02 00 22/AP G 0011). Those upstream of the 3 way valve or leading to the CNIM spill tank in the HCl/NaOH delivery area to be PVC-U with EPDM seals.
7. Discharge location and outfall design for outfall A1 to be confirmed with EA.
8. Manhole SW 1.17 to contain electrically controlled penstock or gate valve, rated to close when water levels in manhole SW 1.18 reach -3.3mASD (Hydoc UK ElectroSlide or similar approved). To be supplied with power as required by actuator and telemetry from level sensor in manhole SW 1.18. Comms to be routed back to Admin Block.
9. Manhole SW 1.18 to contain level sensor to monitor water level in manhole. To be supplied with power as required by sensor. Comms to be routed back to manhole SW 1.17.
10. Manhole SW 17.00 to contain three way valve to divert flows to containment tank during delivery process.To be supplied with power as required by actuator and comms from control panel mounted on external building wall (refer to MEP designer's drawings).
11. Landscape drainage to be determined upon completion of levels design.

Drawing for PLANNING purposes only

Content of drawing based on ARUP drawing number 20-02-00-22 APG 0001. Reproduced with permission

| rev | amendments | by | ckd | date |
|---|---|---|---|---|
| H | Client logos updated. Steam export rack updated as per CNIM drawing. Drainage philosophy updated. Outfall detail note removed. Electrical layouts removed. Site plan updated. | JT | CMG | 15.02.17 |
| G | Drawing updated to suit new drainage layout. | JH | CMG | 18.01.17 |
| F | Foul outfall drainage updated | LMA | ST | 02.08.13 |
| E | **Drawing updated to suit UI layout.** | **AJL** | **ST** | **11.07.13** |
| 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: Wheelabrator Technologies

Project: Kemsley Sustainable Energy Plant

Title: Proposed Drainage Layout

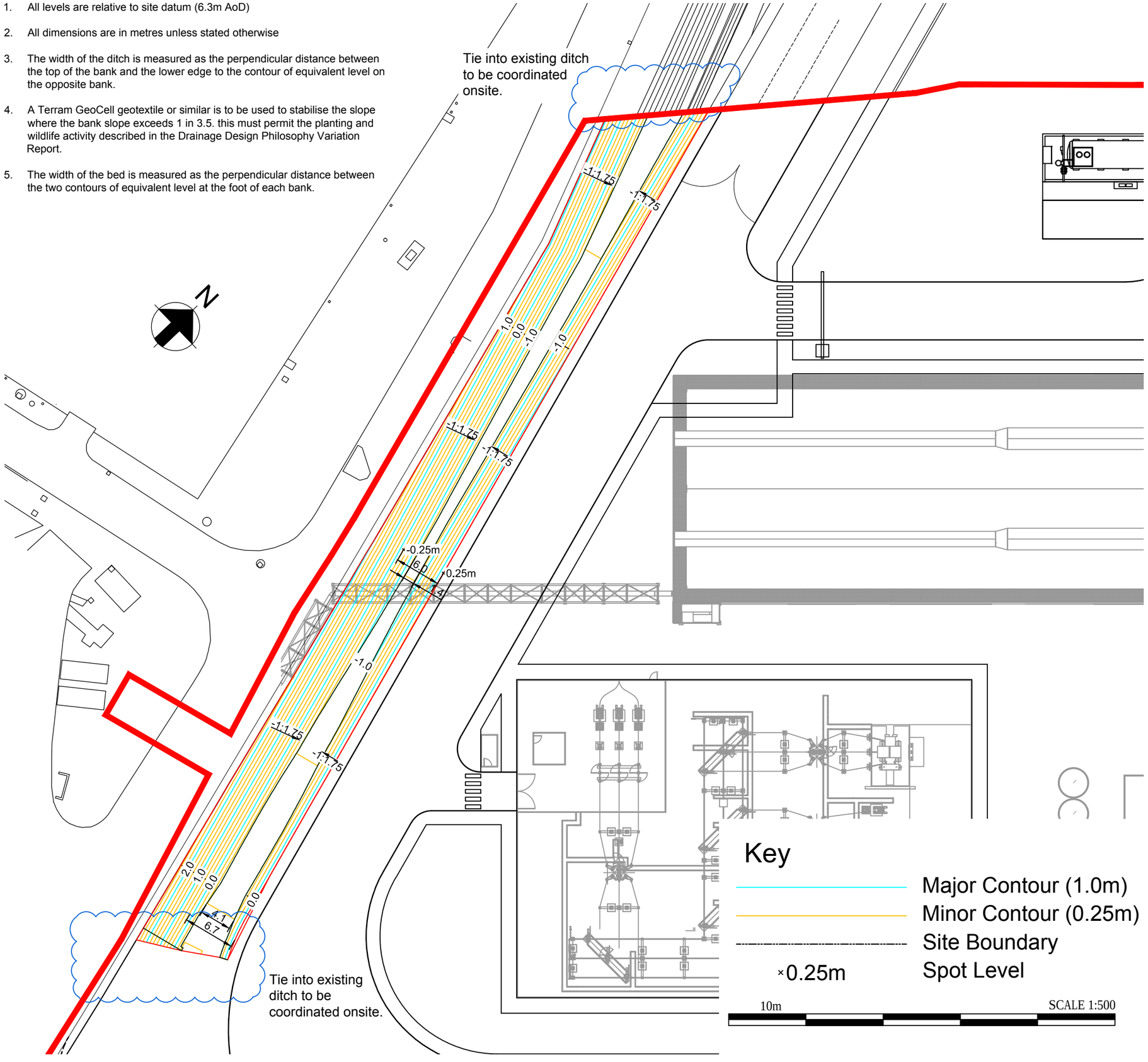
| Drawing Status | Date Created | Drawing Scale |
|---|---|---|
| Preliminary | September 2009 | 1:500 |
| Project Leader | Drawn By | Initial Review |
| AWY | AKC | ST |

Drawing Number: 16315 / A0 / 0301 Rev: H

Figure 4.25C

10m SCALE 1:500

1. All levels are relative to site datum (6.3m AoD)
2. All dimensions are in metres unless stated otherwise
3. The width of the ditch is measured as the perpendicular distance between the top of the bank and the lower edge to the contour of equivalent level on the opposite bank.
4. A Terram GeoCell geotextile or similar is to be used to stabilise the slope where the bank slope exceeds 1 in 3.5. this must permit the planting and wildlife activity described in the Drainage Design Philosophy Variation Report.
5. The width of the bed is measured as the perpendicular distance between the two contours of equivalent level at the foot of each bank.






## notes :

1. If this drawing has been received electronically it is the recipients responsibility to print the document to the correct scale.
2. All dimensions are in metres unless stated otherwise. It is recommended that information is not scaled off this drawing.
3. This drawing should be read in conjunction with all other relevant drawings and specifications.

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Client: DS SmithPaper; Wheelabrator TECHNOLOGIES

Project: Kemsley Sustainable Energy Plant

Title: Proposed West Ecological Ditch

| Drawing Status | Date Created | Drawing Scale |
|---|---|---|
| Preliminary | January 2017 | 1:500 |
| Project Leader | Drawn By | Initial Review |
| TP | JH | CMGD |

Drawing Number: 16315 / A3 / 0260

Rev: -

Figure 4.41C

# APPENDIX C

WINDES microdrainage results.

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# Microdrainage Model Output – 30 year Critical Return Period Event

| Pipe Number | Duration (mins) | Return Period | US/CL (m) | Water Level (m) | Surcharged Depth (m) | Flooded Volume ($m^3$) | Status |
|---|---|---|---|---|---|---|---|
| 1.000 | 30 | 30 | 0.066 | -0.271 | 0.863 | 0 | SURCHARGED |
| 1.001 | 30 | 30 | 0.020 | -0.381 | 1.068 | 0 | SURCHARGED |
| 2.000 | 30 | 30 | -0.357 | -0.667 | 0.890 | 0 | SURCHARGED |
| 1.002 | 30 | 30 | -0.154 | -0.679 | 0.988 | 0 | SURCHARGED |
| 3.000 | 30 | 30 | -0.550 | -1.110 | 0.640 | 0 | SURCHARGED |
| 1.003 | 30 | 30 | -0.475 | -1.162 | 0.778 | 0 | SURCHARGED |
| 4.000 | 30 | 30 | -0.374 | -1.219 | 0.355 | 0 | SURCHARGED |
| 1.004 | 30 | 30 | -0.460 | -1.245 | 0.728 | 0 | SURCHARGED |
| 1.005 | 30 | 30 | -0.216 | -1.381 | 0.676 | 0 | SURCHARGED |
| 1.006 | 30 | 30 | -0.369 | -1.504 | 0.631 | 0 | SURCHARGED |
| 5.000 | 30 | 30 | -0.047 | -1.168 | 0.089 | 0 | SURCHARGED |
| 6.000 | 30 | 30 | -0.049 | -0.784 | 0.465 | 0 | SURCHARGED |
| 1.007 | 30 | 30 | -0.116 | -1.538 | 0.622 | 0 | SURCHARGED |
| 7.000 | 30 | 30 | -0.044 | -1.306 | -0.062 | 0 | OK |
| 1.008 | 30 | 30 | -0.325 | -1.697 | 0.538 | 0 | SURCHARGED |
| 8.000 | 30 | 30 | -0.107 | -1.254 | 0.053 | 0 | SURCHARGED |
| 9.000 | 30 | 30 | -0.013 | -0.585 | 0.628 | 0 | SURCHARGED |
| 8.001 | 30 | 30 | -0.408 | -1.443 | 0.165 | 0 | SURCHARGED |
| 1.009 | 30 | 30 | -0.348 | -1.935 | 0.424 | 0 | SURCHARGED |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 10.000 | 30 | 30 | 0.192 | -1.057 | -0.049 | 0 | OK |
| 1.010 | 30 | 30 | -0.284 | -2.127 | 0.292 | 0 | SURCHARGED |
| 1.011 | 30 | 30 | -0.480 | -2.230 | 0.245 | 0 | SURCHARGED |
| 11.000 | 30 | 30 | -0.457 | -1.799 | -0.142 | 0 | OK |
| 1.012 | 30 | 30 | -0.700 | -2.384 | 0.165 | 0 | SURCHARGED |
| 1.013 | 30 | 30 | -1.000 | -2.548 | 0.216 | 0 | SURCHARGED |
| 1.014 | 30 | 30 | -1.000 | -2.601 | 0.199 | 0 | SURCHARGED |
| 12.000 | 30 | 30 | -0.069 | -0.350 | 0.919 | 0 | FLOOD RISK |
| 12.001 | 30 | 30 | -0.051 | -0.356 | 1.052 | 0 | SURCHARGED |
| 12.002 | 30 | 30 | 0.180 | -0.480 | 1.220 | 0 | SURCHARGED |
| 13.000 | 30 | 30 | -0.071 | -0.574 | 0.697 | 0 | SURCHARGED |
| 13.001 | 30 | 30 | 0.385 | -0.594 | 0.964 | 0 | SURCHARGED |
| 12.003 | 30 | 30 | 0.181 | -0.610 | 1.205 | 0 | SURCHARGED |
| 14.000 | 30 | 30 | 0.246 | 0.095 | 1.199 | 0 | FLOOD RISK |
| 12.004 | 30 | 30 | 0.143 | -0.697 | 1.155 | 0 | SURCHARGED |
| 15.000 | 30 | 30 | -0.070 | -0.627 | 0.643 | 0 | SURCHARGED |
| 15.001 | 30 | 30 | -0.073 | -0.648 | 0.856 | 0 | SURCHARGED |
| 16.000 | 30 | 30 | -0.443 | -0.604 | 1.039 | 0 | FLOOD RISK |
| 15.002 | 30 | 30 | -0.391 | -0.625 | 1.151 | 0 | FLOOD RISK |
| 12.005 | 30 | 30 | -0.563 | -0.815 | 1.211 | 0 | FLOOD RISK |
| 17.000 | 30 | 30 | -0.225 | -0.329 | 1.096 | 0 | FLOOD RISK |
| 17.001 | 30 | 30 | -0.210 | -0.330 | 1.193 | 0 | FLOOD RISK |
| 17.002 | 30 | 30 | -0.188 | -0.772 | 1.051 | 0 | SURCHARGED |
| 12.006 | 30 | 30 | -0.549 | -1.054 | 1.052 | 0 | SURCHARGED |
| 18.000 | 30 | 30 | -0.205 | -1.411 | -0.006 | 0 | OK |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 19.000 | 30 | 30 | -0.284 | -1.430 | 0.054 | 0 | SURCHARGED |
| 18.001 | 30 | 30 | -0.210 | -1.440 | 0.711 | 0 | SURCHARGED |
| 12.007 | 30 | 30 | -0.594 | -1.564 | 0.737 | 0 | SURCHARGED |
| 12.008 | 30 | 30 | -0.781 | -1.921 | 0.502 | 0 | SURCHARGED |
| 20.000 | 30 | 30 | -0.213 | -1.418 | -0.080 | 0 | OK |
| 12.009 | 30 | 30 | -0.845 | -2.125 | 0.326 | 0 | SURCHARGED |
| 12.010 | 30 | 30 | -1.000 | -2.339 | 0.333 | 0 | SURCHARGED |
| 12.011 | 30 | 30 | -1.000 | -2.550 | 0.175 | 0 | SURCHARGED |

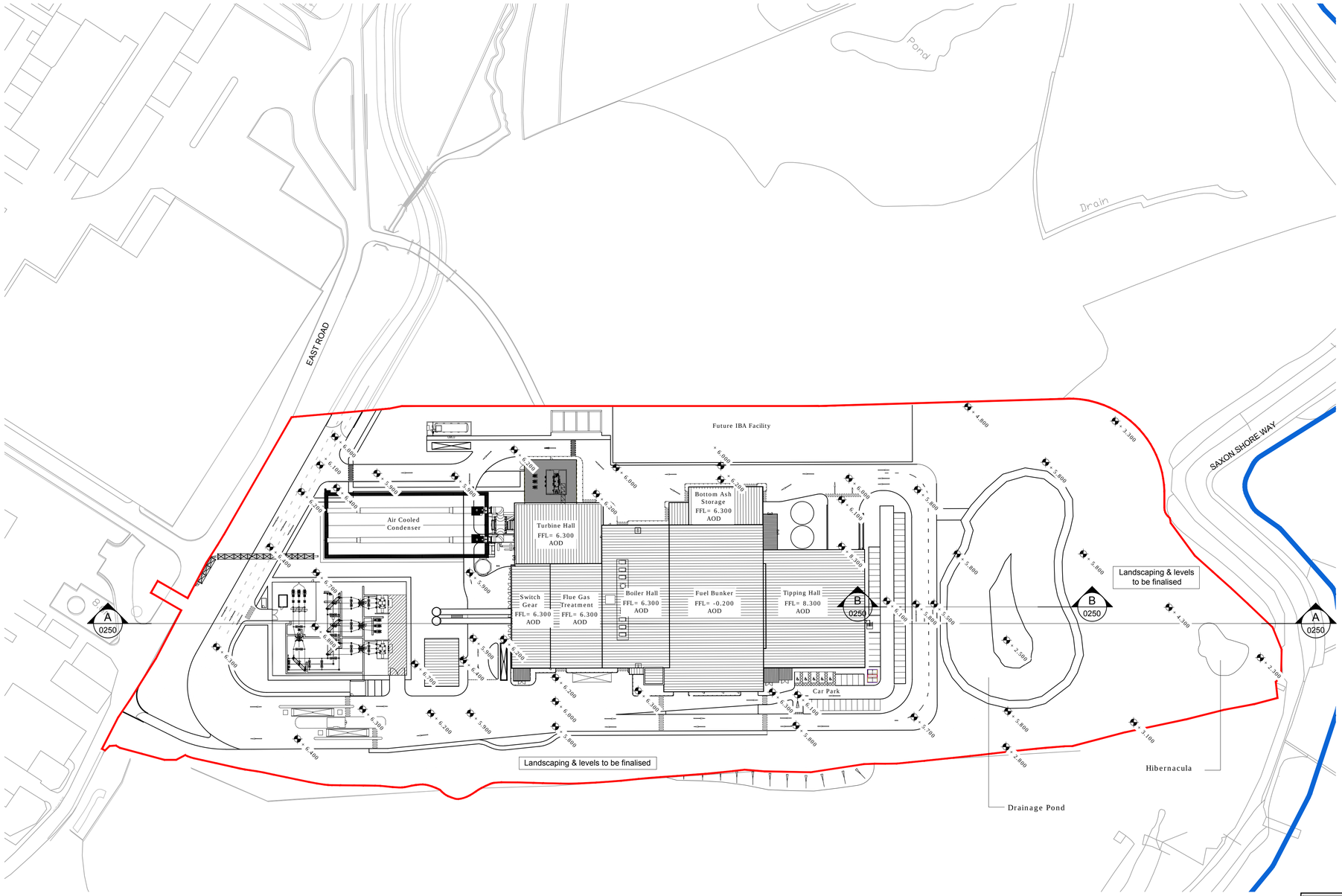
# APPENDIX 3

Proposed Levels/Site Plan

notes :

1. If this drawing has been received electronically it is the recipients responsibility to print the document to the correct scale.
2. All dimensions are in millimetres unless stated otherwise. It is recommended that information is not scaled off this drawing.
3. This drawing should be read in conjunction with all other relevant drawings and specifications.

10m SCALE 1:1000




Proposed Levels
Scale 1:1000

Refer to Figure 4.24 for site sections A-A and B-B

Key
× 4.300 Proposed Level (m A.O.D.)

All levels obtained from ARUP CAD information issued 23/01/17

All levels relative to ordinance datum

Received - 3 March 2017
Planning Applications Group

Drawing for PLANNING purposes only

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| rev | amendments | by | ckd | date |
|---|---|---|---|---|
| E | Admin HVAC area roof added. Escape stairs amended to be un-enclosed stair. Landscaping and levels note added. | JT | CMGD | 28.02.17 |
| D | **Updated to reflect current scheme.** | JT | CMGD | 14.02.17 |
| C | **Drawing updated to suit UI layout.** | AJL | ST | 25.07.12 |
| 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 |

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Client: Wheelabrator Technologies

Project: Kemsley Sustainable Energy Plant

Title: Proposed Levels/ Site Plan

| Drawing Status | Date Created | Drawing Scale |
|---|---|---|
| Preliminary | September 2009 | 1:1000 |
| **Project Leader** | **Drawn By** | **Initial Review** |
| AWY | AKC | ST |

Drawing Number: 16315 / A1 / 0600
Rev: E

FIGURE 4.26C