

## Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	05/07/21	E Jeffrey	S George	A Manns	For client comment
B	20/08/21	E Jeffrey	S Stone	A Manns	For client comment
C	22/09/21	Natalia Cunningham	S Stone	A Manns	Final
D	18/01/24	E Jeffrey	A Manns	A Manns	Amended for client review
E	31/01/24	S Stone	A Manns	A Manns	Resubmission
F	14/08/24	S Blackman	A Manns	A Manns	Duly making update

**Document reference:** 790101\_MSD\_SCR\_QUE August 2024

### Information class: Standard

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### Document purpose:

A Site Condition Report (SCR) provides information regarding the condition of the land and groundwater at permitted sites at particular points in time throughout its permit history. It is an on-going record of the potential and known contamination risks before a permit is granted, whilst activities are carried out under a permit and at the time of surrounding the permit.

The SCR will be submitted as required for Form B2/C2, Question 5b and will be completed following the Environment Agency's Environmental permitting: H5 Site condition report guidance (2013)<sup>1</sup>. The template structure is directly from the Environment Agency's H5 Site Condition Report word template<sup>2</sup>.

For all new permits **sections 1 to 3** will be completed.

For sites that are currently permitted **section 1 to 7** will be completed, updating sections from the previous Site Condition Report where available.

**Section 8 to 10** are not to be edited; these address surrender of the permit at a later date.

<sup>1</sup> <https://www.gov.uk/government/publications/environmental-permitting-h5-site-condition-report>

<sup>2</sup> <https://www.gov.uk/government/publications/environmental-permitting-h5-site-condition-report>

<b>1.0 SITE DETAILS</b>	
Name of the applicant	Southern Water
Activity address	Queenborough Wastewater Treatment Works Argent Road, Queenborough, Kent, ME11 5DZ
X Y coordinates	590914 170575

Document reference and dates for Site Condition Report at permit application and surrender	Site Condition Report: 790101_MSD_SCR_QUE Date of Permit Application: TBC Date of Surrender: TBC
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Document references for site plans (including location and boundaries)	Queenborough Wastewater Above Ground Capacity Assessment (April, 2014 revised 2020), AM 410 – Part 2. Site walkover notes – Queenborough (Appendix A) Landmark Envirocheck Report for Queenborough WwTW (Appendix B – available upon request) Site Plans document references: 790101_MSD_SiteLayoutPlan_QUE August 2024 ((Appendix C)
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<b>2.0 Condition of the land at permit issue</b>	
Environmental setting including: <ul style="list-style-type: none"> <li>• geology</li> <li>• hydrogeology</li> <li>• surface waters</li> </ul>	<p><b><u>Land use</u></b></p> <p>The site (Figure 1.1) comprises Queenborough Sludge Treatment Centre (STC) (hereby referred to as ‘the site’), which is located within Queenborough Wastewater Treatment Works (WwTW). The WwTW has been in the current location since the 1980s. The site is on the southern marshes, on the western side of the Isle of Sheppey, Kent, approximately 1.7km south-west of Queenborough.</p> <p>The site layout with STC permit boundary, as of 18 January 2024, can be found in Appendix C.</p>

**Figure 1.1: Queenborough Sludge Treatment Centre Site Plan**



Source : Queenborough STC layout plan

**Geology**

The entire site is underlain by superficial deposits comprising Alluvium (clay, silt, sand, and peat). There are no recorded artificial deposits beneath the site or within 1km of the site boundary, although artificial deposits may be present on-site as a result of site development.

The bedrock geology comprises the London Clay Formation, which is present beneath the entire site. Two of the nearest BGS borehole records to the site indicate the thickness of the London Clay Formation to be between 73m to 80m.

The London Clay Formation is described by BGS Lexicon as “*bioturbated or poorly laminated, blue-grey or grey-brown, slightly calcareous, silty to very silty clay, clayey silt and sometimes silt, with some layers of sandy clay. It commonly contains thin courses of carbonate concretions and disseminated pyrite. It also includes a few thin beds of shells and fine sand partings or pockets of sand, which commonly increase towards the base and towards the top of the formation.*”.

**Hydrogeology**

The superficial deposits (Alluvium) beneath the site is classed by the Environment Agency as a Secondary Undifferentiated aquifer. The bedrock geology (London Clay Formation) is classed by the Environment Agency as an Unproductive aquifer.

The STC permit boundary is not located within 250m of a Source Protection Zone (SPZ).

No discharges to groundwater are known to occur within 250m of the STC permit boundary.

**Hydrology**

The STC permit boundary is bounded to the south (approximately 380m) by The Swale, a tidal channel of the Thames Estuary. Adjacent to the STC permit boundary is a smaller channel named Joan Fleet (approximately 20m north of the STC permit boundary, at its closest), which is fed by a small drain that runs along the western boundary of the STC permit boundary. There are further drains, streams and small surface water features surrounding the wider site.

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	<p>One environmental permit is recorded within 250m of the STC permit boundary, operated by Southern Water Services Limited for the discharge of treated sewage effluent and settled storm sewage discharge to The Swale Estuary (saline estuary, approximately 140m south of the STC permit boundary) from Queenborough Wastewater Treatment Works.</p> <p><b><u>Sensitive land use</u></b></p> <p>The site is designated as an Environmentally Sensitive Area (North Kent Marshes – decommissioned), including the area within the STC permit boundary.</p> <p>There is one recorded Marine Nature Reserve (The Swale Estuary, approximately 200m south-west) within 250m of the STC permit boundary. Medway Estuary and Marshes is designated as a Ramsar Site (approximately 20m north-east), Site of Special Scientific Interest (SSSI; approximately 10m north-east) and Special Protection Area (SPA; approximately 20m north-east).</p> <p><b><u>Flooding</u></b></p> <p>The site is not located within an area with the potential for groundwater flooding to occur, including the area within the STC permit boundary.</p> <p>The STC permit boundary is located within Flood Zone 3 for flooding from rivers or sea and benefits from flood defences.</p>
<p>Pollution history including:</p> <ul style="list-style-type: none"><li>• pollution incidents that may have affected land</li><li>• historical land-uses and associated contaminants</li><li>• any visual/olfactory evidence of existing contamination</li><li>• evidence of damage to pollution prevention measures</li></ul>	<p><b><u>Pollution incidents to controlled waters</u></b></p> <p>There is one pollution incident to controlled waters recorded within 250m of the STC permit boundary. The incident relates to the release of Oils – Other Oil, approximately 170m north-west of the STC boundary in 1992. This was recorded as a Category 3 – minor incident.</p> <p><b><u>Substantiated pollution incident register</u></b></p> <p>There is one recorded pollution incident recorded within 250m of the STC permit boundary, details of which are summarised below:</p> <ol style="list-style-type: none"><li>1. April 2007, release of ‘other pollutant’, approximately 230m south-west of the boundary:<ol style="list-style-type: none"><li>a. Water: Category 2 (significant incident);</li><li>b. Air: Category 4 (no impact); and</li><li>c. Land: Category 4 (no impact).</li></ol></li></ol> <p><b><u>Industrial land uses</u></b></p> <p>Except for Southern Water Queenborough WwTW and STC which is on-site, there are no industrial land uses listed within 250m of the STC permit boundary.</p> <p><b><u>Contaminants of concern</u></b></p> <p>Contaminants of concern at the wider site (including the STC permit boundary) are likely to be related to the sewage works, and may include:</p> <ul style="list-style-type: none"><li>• heavy metals and inorganics;</li><li>• ammoniacal nitrogen;</li><li>• pathogens;</li></ul>

	<ul style="list-style-type: none"> <li>● total petroleum hydrocarbons (TPH);</li> <li>● polycyclic aromatic hydrocarbons (PAH);</li> <li>● polychlorinated biphenyls (PCB);</li> <li>● chlorinated solvents and phenols;</li> <li>● volatile and semi-volatile organic compounds (VOC/SVOC); and</li> <li>● asbestos.</li> </ul> <p>There may also be ground gases present, likely comprising CO<sub>2</sub> and CH<sub>4</sub>.</p> <p><b><u>Landfill and waste sites</u></b></p> <p>There are no current or historical landfill sites recorded within 250m of the STC permit boundary. A licenced waste management facility (landfill) exists approximately 50m south-east of the STC permit boundary. The site is categorised as a Physical Treatment Facility for Southern Water Services Ltd, licensed in 1996 (current status unknown however is likely to relate to Queenborough WwTW and STC).</p> <p>There is one registered waste treatment site recorded adjacent to the STC permit boundary (i.e. within the central area of Queenborough WwTW site but not located within the permit boundary), held by Southern Water Services Ltd. The site dates from 1996 and is currently closed. Authorised waste included food processing wastes and Kent Category D – non-special liquids.</p> <p>There are two records of potentially infilled land (water) within 250m of the STC permit boundary, both recorded within the boundary. The records relate to unknown filled ground (pond, marsh, river, stream, dock etc.). There were two small drains/streams on-site, one in the north-east corner of the site and one in the east of the site, continuing south off-site towards The Swale. These features were last mapped in 1961.</p> <p><b><u>Mining sites and mineral extraction</u></b></p> <p>The site (detailed within Figure 1.1), is located in a non-coal mining area and no other resources are present in the vicinity of the permit boundary.</p> <p><b><u>Review of historical mapping</u></b></p> <p><u>On-site history (STC permit boundary)</u></p> <p>Earliest available mapping from 1869 shows that the area within the STC permit boundary comprised undeveloped marshland (in an area named South Marshes) until construction of a sewage works was first recorded on maps published in 1984 – 1987, including buildings in the north-east corner of the permit boundary. Further development and expansion of the site can be observed from as early as 1999, with the site layout (permit boundary) recorded as similar to its present day configuration.</p> <p><u>Off-site history</u></p> <p>The area surrounding the permit boundary mainly comprises the rest of Queenborough WwTW (similar to the on-site history), and also comprises marshland adjacent to the nearby estuary and creeks. Earliest mapping shows very little development of the surrounding land, likely used for farming (sheep pens labelled). At its closest point, the railway line towards Queenborough is approximately 500m north-east of the STC permit boundary. By 1909, industrial</p>
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	<p>development had begun in the nearby village of Rushenden (approximately 850m north-east of the STC permit boundary) with the construction of a Copper Works. This became a Glass Works site by 1931, followed by the construction of residential housing and a Water Works (Queenborough Corporation) approximately 700m north of the STC permit boundary. The village's residential housing continued to expand south, up to approximately 350m north of the STC permit boundary, during the latter half of the 20<sup>th</sup> century. A pottery works also lies approximately 1km north of the site. The 1966 – 1968 map records a Medieval Salt Workings approximately 300m north of the STC permit boundary.</p> <p>After the establishment of Queenborough WwTW in the 1980s, the Glass Works was redeveloped into unknown industrial site/depot/works (Elmley Industrial Estate), with two car depots mapped 1km north and north-west of the STC permit boundary. The former Water Works is recorded as a covered reservoir, which is no longer present by 2020. The outfall for the sewage works is approximately 300m south/south-east of the STC permit boundary.</p>
<p>Evidence of historic contamination, for example, historical site investigation, assessment, remediation and verification reports (where available)</p>	<p><b><u>Site walkover</u></b></p> <p>A site walkover was undertaken by a Mott MacDonald contaminated land specialist on 15<sup>th</sup> October 2020. The following was noted in relation to the site and its operations (please refer to site walkover notes and photographs in Appendix A):</p> <ul style="list-style-type: none"> <li>● Minor cracks in pavement/roads, but hardstanding generally in good condition across the site. Cake storage bay walls and hardstanding in good condition;</li> <li>● Sludge reception tank has been patched near the top, multiple times;</li> <li>● No hazardous waste treatment on-site;</li> <li>● 2 generators on site fuelled by gas oil;</li> <li>● Wastes including: Waste Electrical and Electronic Equipment (WEEE), metal, general recyclates, black bag waste, waste oil, IBC/pallets all generated by the site. Grit and screenings collected in skips. WEEE store, metal skip and general recycling bins outside the site office. Grit and screenings in skips associated with relevant infrastructure. All removed by external contractor when required.</li> <li>● Gravel surround to the digesters with nearby watercourse to north. Secondary digesters are also steel (classed as temporary but with no known plans to update);</li> <li>● No notable staining of the ground, or vegetation dieback noted;</li> <li>● High H<sub>2</sub>S levels on site due to saline intrusion in the catchment – ferric dosing controls used. Odour control not used as no nearby receptors;</li> <li>● Can import &lt;300m<sup>3</sup> sludge per day but optimum tankering is 220m<sup>3</sup>/day.</li> </ul> <p>A number of hazardous materials are used on site, including</p> <ul style="list-style-type: none"> <li>● Polymer x3 varieties – sludge thickening – stored in IBC</li> <li>● Ferric chloride</li> <li>● Anti-foam – reduce foaming in digesters</li> <li>● Diesel – generators – stored in designated tanks.</li> <li>● Oils and greases for lubricating equipment</li> </ul>

	<ul style="list-style-type: none"> <li>• Kerosene – for office heating</li> </ul> <p>The above are stored as follows, and replaced as and when required:</p> <ul style="list-style-type: none"> <li>• Big tanks have concrete bunds</li> <li>• Double skinned fuel and kerosene tanks</li> <li>• Oil/grease drums on pallet bunds</li> </ul> <p><b>Site data</b></p> <p>No intrusive investigation data is known to be available for the site.</p> <p><b>Planning applications</b></p> <p>A search of the Kent County Council and Medway Council planning portal was conducted on the 14<sup>th</sup> August 2024. No relevant information to contamination was found.</p>
Baseline soil and groundwater reference data	No reference data is currently available.
<b>Supporting information</b>	<p>Sources used in the production of this SCR:</p> <ul style="list-style-type: none"> <li>• Landmark (2020), Envirocheck report – Queenborough WwTW, ref: 270504808_1_1;</li> <li>• British Geological Survey, GeoIndex <a href="http://www.bgs.ac.uk">www.bgs.ac.uk</a> consulted December 2020;</li> <li>• British Geological Survey, Borehole Scans <a href="http://www.bgs.ac.uk">www.bgs.ac.uk</a> consulted December 2020;</li> <li>• Magic Map <a href="http://magic.gov.uk/">http://magic.gov.uk/</a> consulted December 2020;</li> <li>• Site walkover notes – Queenborough (Appendix A)</li> </ul>

<h3>3.0 Permitted activities</h3>	
Overview of site processes	<p>The sludge treatment centre has liquid sludge reception facilities. Imported sludge makes up around 2/3 of the total dry solids treated. Indigenous primary sludge and imported sludge are screened and then thickened by 2 No. duty / standby gravity belt thickeners and stored in 1 No. thickened sludge holding tank. Thickened sludge is fed to 2 No. conventional mesophilic anaerobic digesters operating at round 35 degrees Celsius. Digested sludge is stored in 2 No digested sludge storage tank before being dewatered by 2 No. duty, standby centrifuges. Dewatered digested cake is stored on-site before being transported off-site for recycle to farm land. Biogas produced by the digesters is used by CHP to generate electricity. Centrate and decant liquor from the sludge thickeners gravitate to the site liquor pumping station and are returned to the end of the inlet channel.</p>

	The main sludge treatment processes are covered. Odorous air is extracted by 2 No. duty, standby fans and dispersed via the stack. The site is situated in a remote and windy location away for residential areas.
Permitted activities	<p>None for STC.</p> <p><u>Southern Water Queenborough WwTW Environmental Permits (adjacent to site):</u></p> <ul style="list-style-type: none"> <li>• Permit Reference A697/K/96 <ul style="list-style-type: none"> <li>– Water Discharge Activity environmental permit for the to discharge secondary treated sewage and settled storm sewage. The permitted discharges take place at the discharge points specified in the permit.</li> </ul> <p>The permit includes Urban Waste Water Treatment Regulations (UWWTR) conditions. Operator Self-Management (OSM) permit conditions also apply.</p> </li> <li>• Permit Reference P/05/51 (also listed as EPR/CP3798HU) <ul style="list-style-type: none"> <li>– Waste Management Licence issued in 1996 to Southern Water Services Ltd for the deposit, treating and keeping of waste. Activities under this permit have been suspended since 2017.</li> </ul> </li> </ul>
Non-permitted activities undertaken	Waste activities comprising imports, physio-chemical and anaerobic digestion treatment and waste storage are currently non-permitted activities on-site. Anaerobic digestion is to be permitted under the Industrial Emissions Directive under a Bespoke Installation Permit as Anaerobic Digestion is no longer excluded under the Urban Waste Water Treatment Directive and associated regulations. Permitted Directly Associated Activities include waste import, physio-chemical treatment of sludges and storage of indigenous and imported sludges.
Document references for:	<p>Mott MacDonald, Queenborough STC Permit Application – Main Supporting Document, Ref 790101_MSD_Main_QUE (2024).</p> <p>Mott MacDonald, Queenborough, Southern Water IED Permitting Environmental Risk Assessment, Ref 790101_ERA_QUE (2024)</p>
<ul style="list-style-type: none"> <li>• plan showing activity layout; and</li> <li>• environmental risk assessment.</li> </ul>	

**Note:**

In Part B of the application form you must tell us about the activities that you will undertake at the site. You must also give us an environmental risk assessment. This risk assessment must be based on our guidance (*Environmental Risk Assessment – EPR H1*) or use an equivalent approach.

It is essential that you identify in your environmental risk assessment all the substances used and produced that could pollute the soil or groundwater if there were an accident, or if measures to protect land fail.

These include substances that would be classified as ‘dangerous’ under the Control of Major Accident Hazards (COMAH) regulations and also raw materials, fuels, intermediates, products, wastes and effluents.



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If your submitted environmental risk assessment does not adequately address the risks to soil and groundwater we may need to request further information from you or even refuse your permit application.

4.0 Changes to the activity	
Have there been any changes to the activity boundary?	No
Have there been any changes to the permitted activities?	<p>Due to impending changes in the way the Waste Management industry is regulated by the Environment Agency and Natural Resources Wales, STCs are obliged to apply for Fixed Installation Permits under the Industrial Emissions Directive (IED) and comply with new permit conditions by August 2022. Fixed Installation Permits will amalgamate and supersede all current permits and exemptions under which waste is treated on the STC sites (including Environmental Permitting Regime (EPR), Medium Combustion Plant Directive (MCPD), old style Waste Management Licenses, and T21 exemptions).</p> <p>Activities at Queenborough WTW and STC will continue, as prior to the introduction of the updated and amalgamated permit, although under any new requirements imposed by the permit.</p>
Have any 'dangerous substances' not identified in the Application Site Condition Report been used or produced as a result of the permitted activities?	<p>No prior site condition report (SCR) is known to exist for the site, due to the length of time that the site has been in operation. This SCR presents the condition of the site at the point of the amalgamation of the existing permits on site and the introduction of additional requirements relating to sludge processing, as required under the IED.</p> <p>'Dangerous substances' that are used or produced at the site include:</p> <ul style="list-style-type: none"> <li>● Lime (sludge treatment before centrifuge) solid granules</li> <li>● Ferric sulphate (in ferric dosing units (primary treatment and tertiary treatment (near sand filters – for phosphorous control))</li> <li>● Polymer (cationic polyacrylamides)</li> <li>● Antifoam – Kemira Kemfoam X2500</li> <li>● Lubricant (Tufgrease plus / Wymark Grease OG)</li> <li>● Compro68 compressor fluid</li> <li>● Coolant</li> <li>● Sodium bisulphate</li> <li>● Carbon filters</li> </ul>
Checklist of supporting information	<p>Plan showing any changes to the boundary (where relevant)</p> <p>Description of the changes to the permitted activities (where relevant)</p> <p>List of 'dangerous substances' used/produced by the permitted activities that were not identified in the Application Site Condition Report (where relevant)</p>

### 5.0 Measures taken to protect land

Use records that you collected during the life of the permit to summarise whether pollution prevention measures worked. If you can't, you need to collect land and/or groundwater data to assess whether the land has deteriorated.

Checklist of supporting information

- Inspection records and summary of findings of inspections for all pollution prevention measures
- Records of maintenance, repair and replacement of pollution prevention measures

### 6.0 Pollution incidents that may have had an impact on land, and their remediation

Summarise any pollution incidents that may have damaged the land. Describe how you investigated and remedied each one. If you can't, you need to collect land and /or groundwater reference data to assess whether the land has deteriorated while you've been there.

Checklist of supporting information

- Records of pollution incidents that may have impacted on land
- Records of their investigation and remediation

### 7.0 Soil gas and water quality monitoring (where undertaken)

Provide details of any soil gas and/or water monitoring you did. Include a summary of the findings. Say whether it shows that the land deteriorated as a result of the permitted activities. If it did, outline how you investigated and remedied this.

Checklist of supporting information

- Description of soil gas and/or water monitoring undertaken
- Monitoring results (including graphs)

### 8.0 Decommissioning and removal of pollution risk

Describe how the site was decommissioned. Demonstrate that all sources of pollution risk have been removed. Describe whether the decommissioning had any impact on the land. Outline how you investigated and remedied this.

Checklist of supporting information

- Site closure plan
- List of potential sources of pollution risk
- Investigation and remediation reports (where relevant)

### 9.0 Reference data and remediation (where relevant)

Say whether you had to collect land and/or groundwater data. Or say that you didn't need to because the information from sections 3, 4, 5 and 6 of the Surrender Site Condition Report shows that the land has not deteriorated.

If you did collect land and/or groundwater reference data, summarise what this entailed, and what your data found. Say whether the data shows that the condition of the land has deteriorated, or whether the land at the site is in a "satisfactory state". If it isn't, summarise what you did to remedy this. Confirm that the land is now in a "satisfactory state" at surrender.

#### Checklist of supporting information

- Land and/or groundwater data collected at application (if collected)
- Land and/or groundwater data collected at surrender (where needed)
- Assessment of satisfactory state
- Remediation and verification reports (where undertaken)

### 10.0 Statement of site condition


Using the information from sections 3 to 7, give a statement about the condition of the land at the site. This should confirm that:

- the permitted activities have stopped
- decommissioning is complete, and the pollution risk has been removed
- the land is in a satisfactory condition.

# Site Visit Record

## A. Site Walkover

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<b>Project</b>	<b>100419175 Southern Water IED permits</b>
<b>Site</b>	Queenborough WwTW / STC, Argent Road, Queenborough, Kent, ME11 5DZ
<b>Visit Date</b>	15/10/2020
<b>Attendees</b>	
<b>Notes</b>	Weather: bright with some wind

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## 1 Purpose

Due to impending changes in the way the Waste Management industry is regulated by the Environment Agency, Sludge Treatment Centres (STCs) are obliged to apply for Fixed Installation Permits under the Industrial Emissions Directive (IED) and comply with new permit conditions by August 2022. Fixed Installation Permits will amalgamate and supersede all current permits and exemptions under which waste is treated on the STC sites (including Environmental Permitting Regime (EPR), Medium Combustion Plant Directive (MCPD), old style Waste Management Licences, and T21 exemptions).

Mott MacDonald have been awarded the contract to assist Southern Water with technical surveys and compiling information. A site visit was therefore undertaken to Queenborough Water Treatment Works (WwTW) and STC with the aim of collecting information relevant to the permit, and understanding the operation and condition of the site.

## 2 Key findings

This section summarises the key findings of the visit, which were collated from visual inspection of the site and infrastructure during the walkover, and from discussion with the site operatives.


**Record general site observations (as noted above) here:**

Process is gravity fed following pumping up to high level screens.

Site suffers from high H<sub>2</sub>S levels due to saline intrusion in the catchment.

Incoming effluent has high commercial trade component as significant industry nearby, although no particular commercial imports to site.

Sludge reception tank has patchwork of fixings at the top although tank is quite new.

<p>Secondary digesters are steel (classed as temporary although not being changed). Some corrosion on fasteners and possible seepage at base.</p>	
<p><b>Site operations</b></p>	
<p>Operational contact details for the application forms</p>	
<p>No of site staff (day and shift operators etc)</p>	<p>Technically 4 but only ever max 3 on-site 7am-6pm Mon-Fri 7am-3pm Sat and Sun</p>
<p>What hazardous waste treatment capacity (tonnes per day) is available on site?</p>	<p>None</p>
<p>What non- hazardous waste treatment capacity (tonnes per day) is available on site? This should also include Commercial Waste where appropriate.</p>	<p>Total primary treatment volume = 2552.54m<sup>3</sup> with 2.36h retention at max flow (1276.27m<sup>3</sup>/hr)</p>
<p>What is the total waste storage capacity (tonnes) at the site? Note: Cake, digesters, other tanks relating to STC)</p>	
<p>What is the annual waste throughput (tonnes each year) at the site? (TDS volume for the STC)</p>	
<p>For the waste types authorised to be accepted at the site (EWC codes) – List the types of waste required to be listed on each permit.</p>	
<p>How many years is each permit expected to be required for? List details of each permit separately</p>	<p>Permanently</p>
<p><b>Sludge import</b></p>	
<p>Does the site accept trade waste (commercial tankers)?</p>	<p>No</p>
<p>How many tankers arrive at the site per day? Where are the tankers unloaded? Is an odour control hose used during unloading?</p>	<p>Imports up to 300m<sup>3</sup>/d – optimum is 220m<sup>3</sup>/day Tanker = 27.3m<sup>3</sup> (~8 tankers/day) Sludge reception tank in north of site. OCU extraction system constantly running across site but not focussed at unloading area</p>
<p>Where is sludge imported from? Sludge imported from other satellite sites? How many?</p>	<p>Sittingbourne, Eastchurch mainly but others locally as required</p>

Volumes from Swatse	<p>Assumed sludge production rate (domestic) = 74 gDS/hd/d</p> <p>Consented trade effluent flow = 1810.7m<sup>3</sup>/d</p> <p>Mass of sludge dry solids produced = 3363kg/d</p> <p>Volume of sludge produced = 112m<sup>3</sup>/d</p> <p>Total holding tank volume = 3694.5m<sup>3</sup></p> <p>Holding tank retention time = 32.96d</p>
<b>Air Emissions</b>	
<b>Please provide the following information for all point source emissions (CHP, boilers, flare, pressure valves/vents, odour abatement, emission points) to air from each site:</b>	
<b>Source 1</b>	<b>Indicate individual sources on site layout plan</b>
National Grid Reference	51.4021909, 0.7436351
Source type	CHP stack
Parameter (e.g. oxides of nitrogen)	
Quantity (with its unit)	
Stack height	
<b>Source 2</b>	<b>Indicate individual sources on site layout plan</b>
National Grid Reference	51.4015507, 0.7447137
Source type	Flare stack
Parameter (e.g. oxides of nitrogen)	
Quantity (with its unit)	
Stack height	
<b>Source 3</b>	<b>Indicate individual sources on site layout plan</b>
National Grid Reference	51.4021920, 0.7435399
Source Type	Boilers
Parameter (e.g. oxides of nitrogen)	
Quantity (with its unit)	
<b>Source 4</b>	<b>Indicate individual sources on site layout plan</b>
National Grid Reference	<p>51.4022664, 0.7437514 - Digester 1</p> <p>51.4023660, 0.7434741 – Digester 2</p> <p>51.4021386, 0.7432106 – Gas bag</p>
Source Type	Whesso valves
Parameter (e.g. oxides of nitrogen)	
Quantity (with its unit)	
<b>Source 5</b>	<b>Indicate individual sources on site layout plan</b>
National Grid Reference	51.400961, 0.743110

Source Type	OCU			
Parameter (e.g. oxides of nitrogen)				
Quantity (with its unit)				
<b>Source 6</b>				
National Grid Reference	51.4009554, 0.7426215			
Source Type	Generator			
Parameter (e.g. oxides of nitrogen)				
Quantity (with its unit)				
<b>Source 7</b>				
National Grid Reference	51.4024132, 0.7432069			
Source Type	Condensate discharge (inlet)			
Parameter (e.g. oxides of nitrogen)				
Quantity (with its unit)				
<b>What was the date that each combustion plant became operational?</b>				
<b>Plant 1/Date</b>	<b>Plant 2/Date</b>	<b>Plant 3/Date</b>	<b>Plant 4/Date</b>	<b>Plant 5/Date</b>
<b>Exemptions</b>				
What exemptions are used on site? Typically SW have T21, D5 and S1. Do they know what these are for?		T21		
<b>Cake storage</b>				
Is any cake imported? If so, how is it unloaded from trucks and where is it unloaded?		Rare occasions – no treatment, just storage in cake bays. Esp in winter months		
Where is cake stored? How is cake stored? E.g. Cake bays, silos, directly into skips etc		Cake bays in east of site after conveyor from press house		
How many cake bays/silos/other are there on site?		6 bays in east and 1 backup bay in south – all open Capacity = 6200T		
How is cake moved to the cake bays (enclosed truck etc)? How frequently is cake moved around the site?		Low loader from conveyor along road into bay Notable amount of cake on road and in drains in this area Daily movement as produced		
Is the cake treated further after the centrifuge e.g. liming of cake within cake bays?		No		
When cake is within the bay, is the cake turned/disturbed at all? How often? Why?		No		



<p>How is cake removed from the site? How often? Over what timeframe? e.g. 2weeks constantly</p>	<p>AGS collect when bay is compliant. ~2/3 months maturation ~4-6 weeks to fill 1 bay</p>
<p>What is the condition of the cake bays? Eg condition of base, height of walls? Does this sufficiently contain the cake? Are there any known issues?</p>	<p>Seen to be in good condition with walls 6-7ft high which was suitable for volume of sludge stored  No issues</p>
<p><b>Water usage</b></p>	
<p>What sources of water does the site use? E.g. potable, secondary washwater, other process water etc  What proportion/% of the site's water usage is from this source?? E.g. 2% potable water for polymer make-up and drinking, 98% primary or secondary wash water for other i.e. cleaning etc?  What is it used for e.g. poly make-up, washing down etc?  Is specifically potable water required for any of the site processes? (e.g. poly make-up)</p>	<p>Potable – offices, thickeners, centrifuge, polymer Final wash water for cleaning</p>
<p>Does the site get water from other sources? Abstraction from river etc?  How much is permitted to be abstracted/day/hr etc?  What is it used for e.g. poly make-up, washing down etc?</p>	<p>No</p>
<p><b>Generators</b></p>	
<p>Are there any generators on site?  How many and what size (MW)? What are they used for e.g. primary/secondary. Site running, exporting power to grid?  Do they export to grid or import from grid to run the site?  What are their fuel sources? E.g. diesel, biogas, other source  How many hours per year do they operate?  Any monitoring undertaken?  If so, what for and what are the standards used?</p>	<p>Yes – 1 (primary) standby - fuelled by diesel  Exports – triads  No emissions monitoring</p>
<p><b>CHP engines/boilers</b></p>	

<p>How many CHPs/boilers on site?</p> <p>What size (MW)? What are they used for e.g. primary/secondary. Site running, exporting power to grid?</p> <p>Are there any flares? If so how often is the flare used? E.g. during emergency or maintenance of the engines or all the time?</p> <p>Are the CHP's/boilers/ generators adequate for the amount of gas produced by the site?</p> <p>Any monitoring undertaken?</p> <p>If so, what for and what are the standards used?</p> <p>Is operation of the CHPs temperature sensitive? If yes, what is their optimum temperature range? Is there a temperature above/below which they will not operate?</p>	<p>1 CHP - not running at the time of visit as high H<sub>2</sub>S levels and no H<sub>2</sub>S scrubbing. Running 04/21</p> <p>Yes Simon – when running</p> <p>1 flare – running almost all of the time – behind cake bays in east of site</p> <p>CHP – looking to upgrade size/efficiency and move outside</p> <p>No temp sensitivity</p>
<p><b>Noise</b></p>	
<p>Please describe any noise mitigation measures on site.</p>	<p>None</p>
<p>Other abatement?</p>	<p>No</p>
<p>Have any noise assessments been undertaken on the site?</p>	<p>No</p>
<p>Have there been any noise complaints?</p>	<p>No</p>
<p>Any monitoring undertaken?</p> <p>If so, what standards are used?</p>	<p>No</p>
<p><b>Odour</b></p>	
<p>Please describe any odour mitigation measures on site e.g. processing of imported sludge immediately, odour control hoses for tankers, water suppression sprays, enclosed processes, doors to buildings kept closed, buildings under negative pressure?</p>	<p>Odour unit present and extraction running although chemical dosing now redundant as not used.</p> <p>Ferric dosing for H<sub>2</sub>S control in relation to infiltration of salt water</p> <p>Redundant - 50,000L tank – 15% sodium hypochlorite</p> <p>Redundant - 17,000L tank – 27% caustic</p>
<p>What is the odour control system used – specific to locations on site? Bio-scrubbers/carbon filter etc?</p> <p>What is the media used?</p> <p>Which processes are odour controlled?</p> <p>How and when is the odour control maintained/inspected to ensure they remain effective?</p>	<p>Carbon filters (extraction system). Can get temp mist spray if needed</p>

Is odour monitored? If so how?	No
Is there a site specific odour management plan?	Generic SW OMP
Any odour complaints?	No – in a very isolated area so no receptors nearby
Other abatement?	
<b>Pests</b>	
Does the site experience pests and if so what are they (birds, vermin etc)? If so how often What measures are in place to prevent pests? What measures are in place to remove pest issues?	Rabbits around digesters, gulls Contract with SafeGuard – pest control
<b>Raw materials and resource efficiency</b>	
What raw materials are used on site? List all including diesel, poly, lime etc What is their purpose? What are they used for? Try to get the proper chemical name as well as what it is referred to.	Poly (belt – Kemira C6598[liquid], centrifuge - C498[powder]) – sludge thickening – stored in IBC 2 IBC(1050kg)/month, 2 bags (750kg)/month – store 4 of each (months supply) Ferric sulphate solution 12.5% - order 15T, hold 20T, order every month (depends on infiltration rate) Anti-foam (Kemira kemfoam X2500 – 25kg drums – 4 drums stored -use 1000L/year– reduce foaming in digesters Diesel – generators – stored in designated tanks – 3xtanks Generator, site heating Oils and greases (250ml/month) for lubricating equipment Combo68 compressor fluid for gas mixing- 205L drum (~4/year)
How and where are they stored? Bunded, stored undercover etc? Are they in IBC's, bags, tanks etc?	Bunded areas, or portable bund tray when in wider site
What is the storage capacity of tanks, IBC's etc, how many on site?	Diesel tank – 5000L H2S media
How much is stored on site at any one time?	
How often are they replaced?	As required – poly = approx. 45 IBC and 45 T bags per year
Describe the basic measures for improving energy efficiency of the activities carried out on site	Triad – energy back to grid Baffle in PST – increases sludge production early in process so less energy needed later

Any water saving measures?	Recirculation of final effluent back into system.
Describe waste avoidance and waste recovery measures (for the whole site operations, including staff generated waste). Describe how waste is disposed, by whom.	Waste stored in designated areas and collected by contractors
<b>Digesters</b>	
How many digesters on the site?	2 primary, 2 secondary
Digester capacity	Primary #1 = 1845m <sup>3</sup> sludge, 163m <sup>3</sup> biogas Primary #2 = 1845m <sup>3</sup> sludge, 163m <sup>3</sup> biogas
Any Wesso valves? How many? Any temperature sensitivity observed in the Wesso valves? (previously we have heard of Wesso valves freezing below -5°C)	2 per primary digester = 4
Any monitoring of tanks/gas? Is there an alarm system attached to the Wesso valves (inform SCADA when operational)?	SCADA system. No particular alarm. Temperature alarm
What is the ground like surrounding the tanks? E.g. permeable gravel, concrete etc	Gravel surrounding digesters - permeable
Underground pipework? Known condition?	No condition known
<b>Drainage</b>	
Where do the drains go? E.g. Head of the works	Back to head of works
Is site adjacent to a river or stream?	Yes, site surrounded by drainage channel that has unknown connectivity to adjacent river - The Swale
Is the whole site bunded	No
Are there any cracks in the pavement	Minor/general good condition
Please describe the drainage surrounding the cake storage bays and whether run off from there is also captured by the drainage system.	Drains outside front of bays – leads back to head of works
Has there been any flooding on site? When, how frequent, how severe has flooding been. Has the flooding lead to untreated wastewater being discharged to the watercourses due to high volume of water exceeding the storm storage capacity?	None known
Are there any isolation valves, penstock etc operational that can isolate flows? If so where and in what circumstances are these used?	Isolation valves for maintenance, isolate flow at PS before coming to site

<b>Abnormal conditions – extreme high temperature, flooding</b>	
How large is the site's stormwater storage capacity?  OR how much retention time do the storm storage tanks allow?  Have there been any issues in the past with direct discharge to the watercourse when stormwater storage capacity has been exceeded, occurring repeatedly?	2356m <sup>3</sup> storm storage capacity  N/A
Is the access route to the site (main road access) at risk of flooding?  Has it flooded previously?  Are there alternative access routes?"	Risk but low. Only access route to works
Does the site operate any temperature-sensitive processes? E.g. do any of the biological treatment processes have optimal operating temperature ranges? Does the AD plant or anything else have optimum temperature range for operation"	Digesters – 36°C target  Outfall – 8°C
Has the site experienced any issues related to high temperatures in the past – e.g. any odour control issues?  Or Potable water availability issues during drought?	No
<b>Waste generation</b>	
What wastes are generated by the site?	WEEE, metal, general recyclates, black bag waste, waste oil, IBC/pallets.  Grit and screenings collected in skips.
How is it stored?	WEEE store, metal skip and general recycling bins outside the site office. IBCs towards south of site. Grit and screenings in skips associated with relevant infrastructure.  All removed by external contractor when required.
<b>Other</b>	
Has any ground investigation/monitoring been undertaken on the site eg for planning permissions? Are there any available monitoring boreholes?	No
Planned AMP7 schemes for the site that may impact the permit application?	None known – recently had new washwater system for screens
What is the general site infrastructure like?  Any areas of concern?	Aging assets although still in reasonable condition, however sludge reception tank has been patched multiple times at top

	<p>Need new screens</p> <p>Secondary digesters are (temporary) steel structures rather than concrete – no plans to change though</p>
Any positive interventions witnessed on site?	No
Age of site? Are any infrastructure enclosed?	<p>~1976 last update in about 1996/8.</p> <p>CHP, centrifuge, blowers/aeration lanes. Sludge reception enclosed.</p> <p>PSTs, FSTs, storm tanks, final effluent not enclosed</p>
<b>Additional notes and questions</b>	
<p><b>Site security</b> – CCTV (normal and thermal) 3 viewing diesel tanks, 2 main gate, 1 inlet. 1 ANPR at main gate. Main gate is electronic palisade (9-10ft). No flood lighting. Chain link perimeter fence (8ft high), surrounded by watercourse (40m wide).</p> <p>No wheel wash but hoses near cake bay (wash water)</p>	

### 3 Photographs

Key points:

	<p>Cake bays in reasonable condition with cake kept below wall limits.</p>
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Road near cake bays in good condition although some tracking of cake



Odour unit - decommissioned



Bunding of chemicals



Fixing of tank - patches

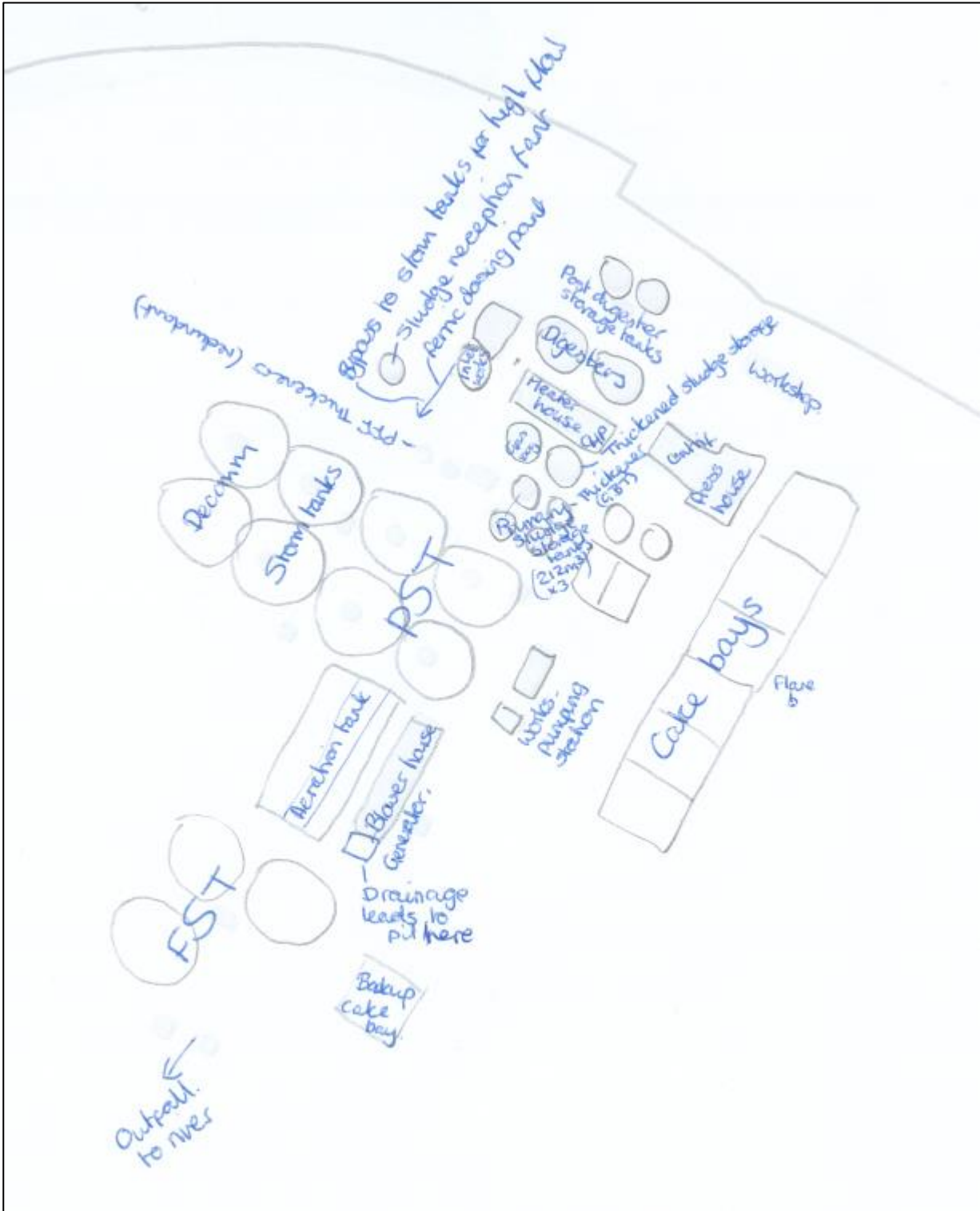


Skips stored on hardstanding

Further photographs available at: <https://mottmac.sharepoint.com/:u:r/teams/pj-e4908/datacollection/Queenborough/Site%20visit%202015.10.20/Queenborough%20photos.zip?csf=1&web=1&e=eGYBnY>



### 4 Layout of site



## **B. Landmark Envirocheck Report**

Please refer to document reference 790101\_MSD\_SCR\_QUE\_AppB\_Envirocheck

## **C. Permit Boundary**

Please refer to document reference 790101\_MSD\_SiteLayoutPlan\_QUE August 2024