

Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	30/07/2021	M Sweeney	S George	A Manns	First issue for client comment
B	29/10/2021	M Sweeney	S George	A Manns	Second issue for client comment
C	08/12/2021	N Cunningham	S. Stone	A. Manns	Third issue for application submission
D	25/01/2024	SM Bukar	A Manns	A Manns	Update for client review
E	26/02/2024	A Luk	S Stone	A Manns	Resubmission

Document reference: | 790101_MSD_SCR_GRA February 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)¹. The template structure is directly from the Environment Agency's H5 Site Condition Report word template.

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.

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

1.0 SITE DETAILS	
Name of the applicant	Southern Water
Activity address	Gravesend Wastewater Treatment Works and Sludge Treatment Centre Dering Way Gravesend Kent DA12 2QF
National grid reference	TQ 66711 73969

Document reference and dates for Site Condition Report at permit application and surrender	Site Condition Report: 790101_MSD_SCR_GRA February 2024 Date of Permit Application: TBC Date of Surrender: TBC
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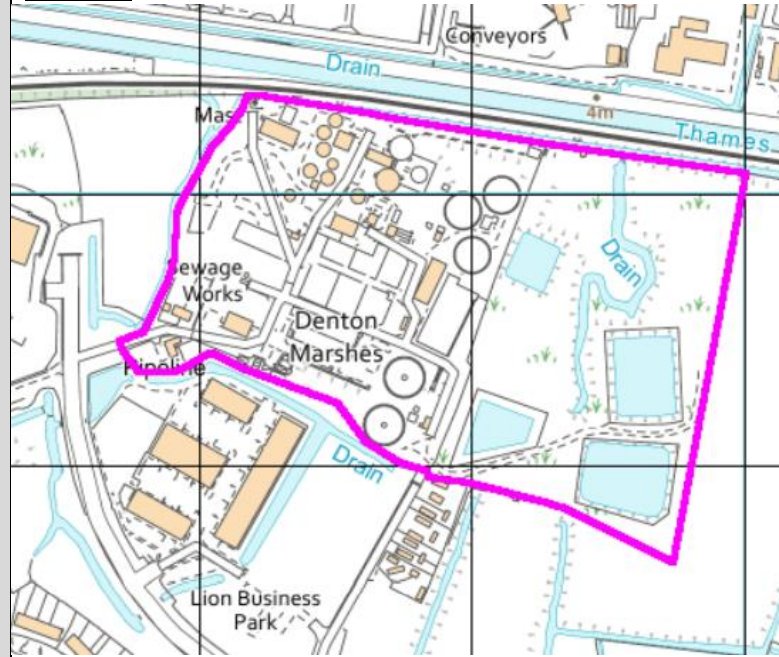
Document references for site plans (including location and boundaries)	Document reference: 790101_MSD_SiteLayoutPlan_GRA February 2024
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2.0 Condition of the land at permit issue	
Environmental setting including: <ul style="list-style-type: none"> geology hydrogeology surface waters 	<p>Land use</p> <p>The site (Figure 1.1 taken from the Landmark Envirocheck Report) is located to the east of the town of Gravesend. The site currently hosts the Gravesend Wastewater Treatment Works (WTW), within which the Gravesend Sludge Treatment Centre (STC), hereby referred to as ‘the Site’ is located. The sewage treatment works was constructed approximately in the mid-1920s and reconfigured in 1982 in a new configuration. The majority of the process areas of the treatment works are in the northern half of the site area, and there are areas of worked ground on the Site which extend further to the east (as determined by satellite imagery, herein called the ‘eastern marshes’).</p> <p>Two residential properties exist at the site entrance in the south-west of the site. To the north, the Thames and Medway canal bounds the site, with a freight yard and sand and gravel distributors beyond. To the east of the site, agricultural fields are identified. To the south and the west of the site, industrial land uses are present, including a mechanical service (50m southwest of the site), garage (20m south) and a car dealer (110m south). A lubricant manufacturer is noted 80m southwest of the site area.</p>

Figure 1.1: Gravesand WTW and the Sludge Treatment Centre (STC) Site Plan

Source: Landmark Envirocheck Report, 28th June 2021, 281083627_1_1

Geology



Superficial Geology

The site is immediately underlain by superficial deposits of Alluvium.

Alluvium (also known as alluvial deposits) is a general term for clay, silt, sand and gravel. It is the unconsolidated detrital material deposited by a river, stream or other body of running water as a sorted or semi-sorted sediment in the bed of the stream or on its floodplain or delta, or as a cone or fan at the base of a mountain slope. Normally soft to firm consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel. A stronger, desiccated surface zone may be present.

To the south of the site, superficial deposits are noted to be absent. These areas are recorded adjacent to the southern site boundary.

Bedrock Geology

The site is underlain by the Lewes Nodular Chalk Formation, Seaford Chalk Formation and Newhaven Chalk Formation (undifferentiated).

Composed of hard to very hard nodular chalks and hardgrounds (which resist scratching by finger-nail) with interbedded soft to medium hard chalks (some grainy) and marls; some grotte chalks. The softer chalks become more abundant towards the top. Nodular chalks are typically lumpy and iron-stained (usually marking sponges). Brash is rough and flaggy or rubbly, and tends to be dirty. First regular seams of nodular flint, some large, commence near the base and continue throughout (British Geological Survey, 2021).

There are three boreholes recorded within 100m of the site area, which are summarised below:

Geology	Description	Thickness Encountered (m)	Depth to Base (m)
Made ground	Made ground Encountered in TQ67SE39 only	2.00	2.00
Alluvium	Brown sand and gravel	18.50 – 27.00	18.50 – 29.00
Lewes Nodular Chalk Formation, Seaford Chalk Formation and Newhaven Chalk Formation (undifferentiated)	Bubble chalk and flints overlying chalk and flints	47.00 (unproven)	76.00 (unproven)

Source: (British Geological Survey, 2021)

Hydrogeology

The superficial deposits of the Alluvium encountered underlying the site have been designated as a Secondary (undifferentiated) aquifer, defined by the Environment Agency as layers in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.

The bedrock geology of Lewes Nodular Chalk Formation, Seaford Chalk Formation and Newhaven Chalk Formation (undifferentiated) underlying the site is designated as a Principal aquifer, identified by the Environment Agency as layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.

Hydrology and flooding

The Envirocheck Report (Envirocheck , 2021) and online mapping indicates the presence of surface waters around the site.

A drain is noted passing north to south from approximately 60m east of the site. Historic maps indicate that this drain passes between five surface water ponds, likely associated with the Gravesend WTW in the western areas of the site, however recent mapping indicates that these are overgrown, and may only periodically host surface waters.

Further drains are noted within 100m of the site area, including bounding the site to the north, west and south of the site. Extensive networks of drains occur to the east of the site in the agricultural fields which are found in these areas. The Thames and Medway canal runs east to west, occurring approximately 30m north of the site area. The River Thames is located 280m north of the site area, and in this area is impacted by tidal action.

The entire site area is located within Flood Zone 3 (less than 1 in 100 annual probability). The area is also registered as an area which is benefitting from flood

	<p>defences, and flood defences are noted occurring on the banks of the River Thames, 280m north of the site area.</p> <p>There are five groundwater water abstractions reported on public record to have been issued within 1km of the site area;</p> <ul style="list-style-type: none"> • Southern Water Services Ltd; Commercial; general washing/process washing is recorded on site. The abstraction was registered in 2006, and there is no revocation date. • J Clubb Ltd; Mineral products; mineral washing is recorded 98m to 125m northeast of the site. The four abstractions associated with this site were registered between 2008-2016, and there are no revocation dates for them. <p>No surface water abstraction points are recorded within 500m of the site, the nearest are two licenses issued to Gravesham Borough Council at approximately 616m east of the site.</p> <p><u>Sensitive land use</u></p> <p>The South Thames Estuary site of special scientific interest (SSSI) is noted 225m east of the site area.</p> <p>The site is within a Nitrate Vulnerable Zone and was in the North Kent Marshes Environmentally Sensitive Area although this is now labelled as being decommissioned.</p>																																												
<p>Pollution history including:</p> <ul style="list-style-type: none"> • pollution incidents that may have affected land • historical land-uses and associated contaminants • any visual/olfactory evidence of existing contamination • evidence of damage to pollution prevention measures 	<p><u>Nearby industrial land uses</u></p> <p>There are 30 potentially contaminative contemporary trade directory entries within 250m of the site area. The potentially contaminative contemporary trade directories within 100m are listed below in Table 1.</p> <table border="1" data-bbox="470 1232 1364 1747"> <thead> <tr> <th>Contemporary Trade Directory Entries</th> <th>Direction</th> <th>Distance (m)</th> <th>Active / Inactive</th> </tr> </thead> <tbody> <tr> <td>Garage Services</td> <td>West</td> <td>20</td> <td>Inactive</td> </tr> <tr> <td>Car Body Repairs</td> <td>Southwest</td> <td>23</td> <td>Inactive</td> </tr> <tr> <td>Car Body Repairs</td> <td>Southwest</td> <td>43</td> <td>Active</td> </tr> <tr> <td>Garage Services</td> <td>Southwest</td> <td>44</td> <td>Inactive</td> </tr> <tr> <td>MOT Testing Centres</td> <td>Southwest</td> <td>44</td> <td>Inactive</td> </tr> <tr> <td>Car Dealers</td> <td>Southwest</td> <td>53</td> <td>Inactive</td> </tr> <tr> <td>Office Furniture and Equipment</td> <td>Southwest</td> <td>55</td> <td>Active</td> </tr> <tr> <td>Commercial Cleaning Services</td> <td>Southwest</td> <td>58</td> <td>Active</td> </tr> <tr> <td>Scaffolding and Work Platforms</td> <td>Southwest</td> <td>63</td> <td>Inactive</td> </tr> <tr> <td>Pallets, Crates & Packing Cases</td> <td>Southwest</td> <td>90</td> <td>Inactive</td> </tr> </tbody> </table> <p>A tank is also noted on site, as registered as a point of interest with regards to manufacturing and production. A further 11 no. records of tanks are identified within 250m of the site area associated with nearby industrial land uses.</p> <p>Seven records of points of interest - public infrastructure are noted on site, which include four records of sewage works and three records of sludge beds. Within 250m of the site area, two sluices are recorded 51m and 53m northeast of the</p>	Contemporary Trade Directory Entries	Direction	Distance (m)	Active / Inactive	Garage Services	West	20	Inactive	Car Body Repairs	Southwest	23	Inactive	Car Body Repairs	Southwest	43	Active	Garage Services	Southwest	44	Inactive	MOT Testing Centres	Southwest	44	Inactive	Car Dealers	Southwest	53	Inactive	Office Furniture and Equipment	Southwest	55	Active	Commercial Cleaning Services	Southwest	58	Active	Scaffolding and Work Platforms	Southwest	63	Inactive	Pallets, Crates & Packing Cases	Southwest	90	Inactive
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site area. An outfall is noted 248m north of the site, which is understood to relate to the discharge of treated effluent from the Gravesend WTW.

Recorded Landfill and Historic Landfill

There are no records of Registered Landfill Sites within 250m of the site area.

Three records of Historic Landfill Sites are recorded within 250m of the site area:

- Shamrock Road landfill is recorded at an approximately 45m distance from the south-east corner of the eastern marshes; receiving deposited waste including inert and household waste (ref: EAHLD19301)
- J Clubb Limited is recorded 4m west of the site; receiving deposited waste including inert waste (ref: EAHLD19298)
- An unnamed landfill is recorded 230m northwest of the site; received deposited waste including inert and commercial waste (ref: EAHLD19292)

There are three records of Potentially Infilled Land (Water) within 250m of the site area. All these were recorded in 1961 for unknown filled ground (pond, marsh or river), recorded 55m and 130m northeast of the site, and one record 237m northwest.

Water Discharge Activity Environmental Permits

Four environmental permits are recorded within 250m of the site area:

- Services Support (Gravesend) Limited: A consent for trade effluent into freshwater stream/rivers is recorded 116m northeast of the site. The consent was issued in 2001 and there is no revocation date.
- Central Electricity Gen. Board: A consent for other matter – surface water is recorded 126m west of the site. The consent was issued in 1967 and revoked in 1991.
- Clubbs Washed Gravel Company: A consent for trade discharge – mineral workings is recorded 160m north of the site. The consent was issued in 1995 and revoked in 1996.
- National Grid: A consent is registered for other matter – surface water is recorded 192m northeast of the site. The consent was issued in 1967 and revoked in 2010.

Integrated Pollution Prevention and Control

One recorded Integrated Pollution Prevention and Control is recorded just outside the southwestern site boundary for Southern Water Services Limited for a new medium combustion plant. This control is in place since May 2019 and is still effective.

Local Authority Pollution Prevention and Control

One recorded Local Authority Pollution Prevention and Control is recorded 239m northwest of the site – registered for J Clubb for blending, packing, loading and use of bulk cement. This control is in place since June 2010 and is still permitted.

Pollution Incidents to Controlled Waters

There are four recorded pollution incidents to controlled waters within 250m of the site area:

- Category 3 – minor incident – Recorded on site in 1998 as ‘sewage sludge lost from digester to drainage ditch’.
- Category 3 – minor incident – Recorded 20m west of the site in 1997 for oils, noted for Gravesend Sewage Treatment Works’.
- Category 3 – minor incident – Recorded 153m north of the site in 1999 as ‘general’.
- Category 3 – minor incident – Recorded 179m west of the site in 1994 as ‘four pump fire; industrial; other’ with fire water/foam as the contaminant.

Substantiated Pollution Incidents Register

There are two recorded Substantiated Pollution Incidents on the register:

- A water category 2 – significant incident is recorded 63m west of the site area, recorded as crude sewage.
- A land category 2 – significant incident is recorded 199m west of the site area, recorded as other specific waste materials.

Explosive Sites

There is one recorded explosive site, Denton Wharf Ltd, registered 245m northwest of the site area.

Historical Land use

Pertinent land contamination information indicated in historic maps is reported below.

Date	Land Use
1864 – 1874 (1:2,500)	<p>On site: The earliest available historic maps from 1864 indicate that the site is agricultural land. A series of drains pass over the site, bisecting the site from east to west, and two further drains cross the site in a north to south orientation.</p> <p>Off site: To the north of the site, on the boundary of the site, is a rail track running east to west. Immediately beyond that, the Thames and Medway canal are present in a similar orientation. Beyond the canal to the north, and to the east, west and south, further agricultural fields (labelled marshes) are present.</p>
1897 (1:2,500)	<p>On site: No changes</p> <p>Off site: A sanitary hospital is present 110m north of the site area. No further changes are present in the surrounding area.</p>
1909 (1:10,560)	<p>On site: No changes</p> <p>Off site: A windpump is present 125m northwest of the site area. No further changes are present in the surrounding area.</p>
1936 – 1938 (1:2,500)	<p>On site: The site has been developed into a sewage works, covering the presently developed areas of the site. Tanks, sludge beds, pump house, tramway, and sediment tanks are present. Earthworks are seen in the east of the site</p> <p>Off site: A hospital is present 250m west of the site area, and a residential development is present 220m south of the site.</p>
1954 (1:1,250)	<p>On site: Further settlement ponds (unlabelled) are present in the eastern half of the site area. The eastern extent of the site is still marsh land.</p>

1960 – 1973 (1:1,250)	<p>On site: No changes.</p> <p>Off site: A storm water tank is present immediately south of the site area. To the north, a works is present 125m north, with warehouses 110m northwest. A National Sea Training school is present 220m northeast of the site. A works is present 180m west of the site.</p>
1980 – 1988 (1:2,500) 1982 (1:10,000)	<p>On site: The site has been reconfigured and remains as a sewage works.</p> <p>Off site: A timber yard and a gravel works are now present 50m north of the site area. A caravan site is marked to the south of the site</p>
1993 (1:1,250)	<p>On site: The eastern half the site is worked into six separate ponds, assumed associated with the workings of the sewage works.</p> <p>Off site: No changes.</p>
1999 (Aerial)	<p>On site: The worked ponds in the eastern half of the site are infilled, and vegetation is present on top of each pond. The layout is similar to that seen presently.</p> <p>Off site: No changes are indicated.</p>
2006 (1:10,000)	<p>On site: No changes are indicated.</p> <p>Off site: The works 180m west of the site is developed into a larger development. A large development, unlabelled, is present 50m northeast of the site area. The large storm tank to the south is no longer marked.</p>
2021 (1:10,0060)	<p>On site: No changes.</p> <p>Off site: The Lion Business Park is present immediately south of the site area in the location of the old storm tank. The brownfield industrial park is present 125m southwest of the site area. The large development to the northeast is labelled as police services.</p>

Contaminants of concern

The site is within a lower probability radon area (less than 1% of homes are estimated to be at or above the action level).

Soil Chemistry

The following soil concentrations are found on site, as detailed in the Envirocheck Report:

- Arsenic: 15-25mg/kg;
- Cadmium: <1.8mg/kg;
- Chromium: 90-120mg/kg;
- Lead: 200-300mg/kg; and
- Nickel: 30-45mg/kg.

Contaminants associated with current and historic land use

The following contaminants are of concern regarding the industrial activities stated above, in addition to the current use of the site:

- total petroleum hydrocarbons (TPH);
- polycyclic aromatic hydrocarbons (PAH):
- heavy metals and inorganics;
- pathogens;
- asbestos;
- polychlorinated biphenyls (PCBs);

	<ul style="list-style-type: none"> • chlorinated solvents and phenols; and • volatile and semi-volatile organic compounds (VOC/SVOC). <p>There may also be ground gases present at the site, especially due to the presence of the landfill, and would likely comprise CO₂ and CH₄.</p>
<p>Evidence of historic contamination, for example, historical site investigation, assessment, remediation and verification reports (where available)</p>	<p><u>Site walkover</u></p> <p>A walkover was undertaken on 6th July 2021 by a contaminated land specialist from Mott MacDonald. During the visit, key points identified included:</p> <ul style="list-style-type: none"> • Previous redevelopment around the site has resulted in groundworks and infilling of old tanks, filter lanes, sludge beds etc, therefore there is likely made ground across the site, even in areas that are currently undeveloped. • The eastern marshes are not used or accessed by SW staff currently. The residents of a Travellers community to the south of the site sometimes access this land to graze their horses. • Roads and hardstanding were in reasonable condition, with some cracking noted. • Permeable gravel or grassed areas surround the majority of tanks. • The site was overgrown in unused areas, including access to the flare stack, which has resulted due to a changed grounds maintenance contract not yet being finalised. There was no sign of vegetation distress. • The digester was out of service and reported by site staff to have been so since October 2020 due to a faulty valve and when drained, the lining was found to be in poor condition. It is expected to be fixed by end-2021. • Cake was well-contained within the cake bays area due to hosepipes and wheel wash for cleaning the roadway and vehicle tyres respectively. Drainage in the area was satisfactory. • The CHP was replaced in 2016. The old equipment remains on the site but is now redundant. • No ground investigation reports are known to be available for the site. <p><u>Planning applications</u></p> <p>A review of the Gravesend Borough Council planning portal was conducted in July 2021 and returned one Planning Application (Ref: 20180768) within 100m of the site area with ground investigation data.</p> <p>A ground investigation has been undertaken on a site adjacent to the Gravesend WTW and STC site, located at Dering Road (NGR 566573, 174026) by Your Environmental, dated 22nd December 2015. The ground investigation consisted of:</p> <ul style="list-style-type: none"> • 5no. window sampler boreholes, including 4no installations with standpipes for gas and groundwater monitoring; • Representative environmental sampling • Return gas and groundwater monitoring undertaken on the 29th December 2015, 5th January and 12th January 2016. <p>Soils results determined there were no exceedances of representative generic assessment criteria for human health risks identified at the site (tested determinands included metals, organics, BTEX (benzene, toluene, ethylbenzene and xylenes), MTBE (Methyl Tert Butyl Ether), and volatile/semi-</p>

	<p>volatile organic compounds. No visual or olfactory evidence of contamination was noted.</p> <p>Groundwater results indicated exceedances of PAH concentrations and one exceedance of TPH concentrations. Boron exceedances are also noted but are determined by the assessment as naturally occurring.</p> <p>A Characteristic Situation 2 (CIRIA C665) is noted for the Dering Road site area.</p>
<p>Supporting information</p>	<p>Sources used in the production of this SCR:</p> <ul style="list-style-type: none"> ● Landmark (2021), Envirocheck Report – Gravesend WTW and STC, ref: 281083627_1_1; ● British Geological Survey, GeoIndex www.bgs.ac.uk consulted July 2021; ● British Geological Survey, Borehole Scans www.bgs.ac.uk consulted July 2021; ● Magic Map http://magic.gov.uk/ consulted July 2021; ● Southern Water (2020) Operating Plan for Gravesend WTW/STC ● Emerson Project Management (2020) Gravesend WTW Process Schematic for Certified Flow Monitoring. Drawing No. 101794-PS-002. ● Southern Water Environmental Permits. Folio No. EPR/QP3337QC. Gravesend WTW. ● Southern Water (2014) Wastewater Above Ground Capacity Assessment AM410 Part 2. ● Gravesend Borough Planning Portal (2021). Planning application search. Available at: https://plan.gravesham.gov.uk/online-applications/ (Accessed July 2021) ● YourEnvironment (2016) Site Investigation Report – Land Between Comma Oil and Southern Water Treatment, Dering Way, Gravesend, DA12 2QH (For Cowland Ltd). Report Ref. TE2272.

<p>3.0 Permitted activities</p>	
<p>Overview of site processes</p>	<p>Gravesend catchment serves the town of Gravesend. It is on the south bank of River Thames neighbouring Northfleet Catchment to the west. The south boundary of the catchment is along A2 with a small section on the south side of the motorway. Sewage is collected by gravity sewers with wastewater pumping stations followed by short rising mains. All sewage is transferred to the treatment works by 2 No. gravity interceptor sewers along the River Thames. A 1000 mm diameter sewer serves the west part of the catchment and the other 560 mm diameter sewer serves the east part of the catchment.</p> <p>All sewage received from Gravesend WTW from 2 No. gravity sewers enters the inlet pumping station. Sewage is pumped by 4 No. inlet pumps, rated between 249 l/s and 292 l/s each, to 2 No. 6 mm, 2D, duty, assist escalator inlet screen</p>

	<p>rated at 537 l/s each with a 10 mm, 1D bypass screen rated at 894 l/s. Screened sewage passes through 1 No. detritor for grit removal.</p> <p>Following screening and grit removal ferric chloride is dosed into the sewage to reduce H₂S in the biogas for the CHP.</p> <p>Flows more than 442 l/s, controlled by the storm separation penstock, overflow from the storm weir to 2 No. storm tanks. Settled storm sewage is either returned to treatment ahead of the primary tanks by storm return pumps or discharged to the outfall via the tidal lift pumping station.</p> <p>Flows up to 442 l/s gravitates to the primary tanks distribution chamber and is split equally to 2 No. primary settlement tanks. Settled sewage enters the intermediate pumping station. Flows more than 281 l/s are discharged to the outfall via tidal lift pumping station.</p> <p>Flows up to 281 l/s is mixed with RAS and pumped by the intermediate pumping station to 4 No. aeration lanes of the activated sludge plant. The aeration lanes have fine bubble aeration served by 6 No. blowers (3 No. duty, standby pairs, which could potentially run as 3 duty, 2 assist and 1 standby). Mixed liquor is settled in 3 No. circular final settlement tanks.</p> <p>Treated effluent is discharged to the Tidal River Thames either directly from the outfall chamber or is pumped to the outfall via the tidal lift pumping station to under high tide conditions.</p> <p>The site also serves as a regional sludge treatment centre. Primary tanks are auto-desludged by actuated valves and de-sludge pumps. Imported liquid sludge other than those from Northfleet is received in 1 No. sludge reception tank. Both Indigenous and imported sludge (other than those from Northfleet) are pumped through 2 No. duty, standby strain presses. Screened imported sludge is stored in 2 No. sludge holding tanks before being thickened by 2 No drum thickeners. SAS is stored in 1 No. SAS balance tank and then thickened by 2 No. drum thickeners.</p> <p>Thickened raw sludge from drum thickener and thickened SAS plus imported liquid sludge from Northfleet are mixed in 1 No. thickened sludge storage tank. Combined thickened sludge is fed to 1 No. anaerobic digester followed by 1 No. post digestion storage tanks. Digested sludge is dewatered by 1 No. centrifuges. Dewatered digested sludge cake is stored in 7 No. cake storage bays before being recycled to farmland. Biogas is collected in 1 No. gas holder and used to generate electricity via 1 No. CHP engine as well as supplying the boilers for digester heating.</p> <p>Sludge liquors from the drum thickeners, PFT and centrifuge are first pumped to 2 No. liquor balancing tanks (280 m³) before joining with PST effluent and RAS at the head of the aeration lanes.</p>
<p>Permitted activities</p>	<p>The operation of the CHP and diesel backup generator are permitted under Environmental Permit Ref EPR/QP3337QC.</p> <p>The discharge of secondary treated settled sewage effluent, primary treated storm sewage and settled storm sewage Gravesend WTW to the Tidal River Thames is permitted under water discharge activity environmental permit ref WR2969.</p>

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	The site also has a licence for the abstraction of groundwater from an on-site borehole (ref 9/40/1/508G, max 55000m ³ /yr, or 340m ³ /day or 20m ³ /hr). This is used for polymer make-up.
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 the anaerobic digestion of sludge as wastewater treatment works 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: <ul style="list-style-type: none">• plan showing activity layout; and• environmental risk assessment.	<ul style="list-style-type: none">• Southern Water – Gravesend STC Site Location Plan (Document reference: 790101_MSD_SiteLayoutPlan_GRA).• Southern Water - Site Process Activity Manual Gravesend WTW• EnviroDat (2019) Report for the Periodic Monitoring of Emissions to Air from the Biogas Engine Located at Gravesend WTW.• Southern Water Environmental Permits. Folio No. EPR/QP3337QC. Gravesend WTW.• Southern Water (2014) Wastewater Above Ground Capacity Assessment AM410 Part 2.

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.

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 March 2025. 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 Gravesend 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. 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"> ● Biogas ● Gas oil ● Diesel. ● Ferric chloride ● Polymer – Highmark C498 and C498HMW (centrifuge), Perfloc C496, and SAS SNF Flopam640 HIB ● Antifoams – Flowfoam 681F (digester) and Burst5400 ● Methane (produced from the digestors and stored in the on-site double membrane gas holder); ● Effluent screenings (rag and grit from screening process at inlet works). ● Carbon filters ● Hydrated lime, calcium dihydroxide
Checklist of supporting information	<ul style="list-style-type: none"> ● Southern Water – Gravesend STC Site Location Plan (Document reference: 790101_MSD_SiteLayoutPlan_GRA). ● Southern Water - Site Process Activity Manual Gravesend WTW ● EnviroDat (2019) Report for the Periodic Monitoring of Emissions to Air from the Biogas Engine Located at Gravesend WTW. ● Southern Water Environmental Permit Refs. EPR/QP3337QC. Gravesend WTW.

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**

	<ul style="list-style-type: none"> Investigation and remediation reports (where relevant)
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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	<ul style="list-style-type: none"> 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)
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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.

A. Site Walkover Record

Site Name	Gravesend STW
Date	06/07/2021
Attendees	Suzanne George (Motts)  
Permit and exemption references	MCP/SG Environmental Permit – EPR/QP3337QC Water Discharge Activity Environmental Permit – WR2969 Abstraction licence – 9/40/1/508G (on-site borehole)
Covid secure measures for accessing site	Risk assessment

Follow the process through the site – Start with sludge import area and walk the site going through the process. Make notes on condition of site infrastructure and assets such as bunds, tanks, impermeable surface, storage areas etc.

Please remember to take photos as documentary evidence of useful information, e.g. CHP generator name plates. Note on the survey form when a photo has been taken and reference in numerical order (photo 1, 2, 3 etc...)

Make notes of the general site housekeeping, is it kept clean and tidy.

Notes relating to surrounding area.

Record general site observations (as noted above) here:

The site was generally clean and tidy although significantly overgrown with weeds, which NS confirmed was because the contracts for grounds maintenance had changed and the work under the new contractor has yet to be started.

Hardstanding was in reasonable condition with a few cracks present. Cane on the ground surface was limited to around the conveyor and cane bays, with hosepipe and wheel wash facilities minimising spread outside of the area.

RFI Ref	Site operations	
	Operational contact details for the application forms	Neil Semple, Field Performance Manager [REDACTED] [REDACTED]
	No of site staff (day and shift operators etc)	4 based permanently at the site, although only ever 3 on site at once (rota)
I15	During what hours is the site staffed Monday – Friday and at weekends?	7am-6pm Monday to Friday 7am-3pm Saturday and Sunday
	What hours can waste enter the site (planning)	7am-4pm Monday to Friday 7am-1pm Saturday No imports on Sunday Imports = sludge only
I16	What hazardous waste treatment capacity (tonnes per day) is available on site?	None

117	<p>What non- hazardous waste treatment capacity (tonnes per day) is available on site?</p> <p>This should also include Commercial Waste where appropriate.</p>	<p>183m³ capacity in digesters for 14 day treatment time</p> <p>Digester offline (Oct 2020 to Nov 2021) but when operational, usually have 90m³/day thickened sludge import (mainly Northfleet) and 110m³/day unthickened import (mainly Northfleet)</p>
118	<p>What is the total waste storage capacity (tonnes) at the site?</p> <p>Note: Cake, digestors, other tanks relating to STC)</p>	<p>Sludge reception tank – 100m³</p> <p>Imported sludge storage – 290m³</p> <p>SAS balance tank – 290m³</p> <p>TSST – 100m³</p> <p>Digester – 2,563m³</p> <p>Emergency storage tank – 2,563m³</p> <p>Post digester storage tank – 320m³</p> <p>Liquor storage tanks – 2 x 275m³</p> <p>7 cake bays – total 5,500m³ (enough for 6 months storage)</p> <p>Gas bag – 925m³</p>
119	<p>What is the annual waste throughput (tonnes each year) at the site?</p> <p>(TDS volume for the STC)</p>	
120	<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>	
121	<p>How many years is each permit expected to be required for?</p> <p>List details of each permit separately</p>	Indefinitely
GEN07	<p>Please describe the aspects of the site that generate litter, mud and debris within and outside the site boundary.</p>	<p>Cake bays – export trucks and telehandler pass through wheel wash system before exiting area, and use hosepipe to wash road between bays when moving cake. Note wheel wash is offline at moment due to tank leak and due to be fixed soon.</p> <p>Office – waste kept in designated bins</p>


GEN08	<p>Describe the site cleaning procedures on site.</p> <p>Including any infrastructure cleaning, wheel wash etc</p>	<p>Daily housekeeping around site by site ops (litter pick, sweeping hardstanding if dirty etc)</p> <p>Offices cleaned twice weekly by site ops</p> <p>Road sweeper used once per year</p> <p>Wheel wash (when operational) for vehicles exiting cake bays</p>
GEN09	<p>Please describe the site security measures in place at site.</p> <p>Can you elaborate on the type of fencing e.g. palisade, chain link, barbed wire, and mix of? How high, do they go all around the perimeter? Do they have barbed wire on top? Type of gate, what are the gates made of, height etc? Gate control, CCTV, how many cameras etc</p>	<p>Gate at front – stays closed but held in place with removable pin so residents can access.</p> <p>AMPR, thermal and daytime camera looking at inner front gate (steel palisade, approx. 2.5m high) – entry to STW</p> <p>Palisade fencing (~2.5m) borders all of operational site except adjacent to railway in north.</p> <p>Chainlink fence with barbed wire (approx. 2m high) adjacent to railway.</p> <p>Back gate (palisade) allows entry to eastern undeveloped plot of land</p> <p>Cameras (thermal and daytime) pointed at: inlet, bulk storage tanks and back gate.</p> <p>Lighting around site</p> <p>Total 9 cameras including AMPR.</p>
Site Plans		
GEN13	<p>Please provide a copy of the Site Plan showing the proposed permitting boundary in green.</p> <p>This can be overlaid the Site Layout Plan.</p> <p>The Site Plan will be placed in the permit and needs to show a north arrow, identifiable location indicators (such as roads).</p>	<p>Note: eastern plot of land is owned by SW but not used for site operations. There is a permanent travellers site to the south of this, and they often use the land for their horses.</p>
Visual impacts		
GEN10	<p>Please describe the visual impacts of each site.</p>	<p>Site is located in predominantly industrial/commercial area, with railway and canal to north (more commercial and River Thames beyond). Travellers community to south of site, and 2x residential properties by site entry (accessed through first entry gate).</p>

		Mature trees around majority of northern, western and eastern boundaries. Area is relatively flat. No tall infrastructure other than digester and emergency storage tank.
Site condition report		
SCR02	Please provide a list of permitted activities per site.	Combustion (CHP) Discharge of treated sewage effluent, primary treated storm sewage and settled storm sewage. Abstraction licence
SCR03	Please provide a list of non-permitted activities per site. Including exemptions	
SCR05	Please provide any environmental risk assessments for site.	None known
SCR06	Site overview	Already provided
Emergency procedures		
GEN17	Provide a description of the emergency procedures for each site	Site emergency pack in offices. Provides key contact details, DSEAR information, fire risk assessment, COSHH, CHP isolation procedure.
Sludge import		
SV01	Does the site accept trade waste (commercial tankers)?	No trade waste
SV01/02	How many tankers arrive at the site per day? Where are the tankers unloaded? Is an odour control hose used during unloading?	7-8 tankers per day (mostly from Northfleet, thickened and unthickened sludge) Tanks covered and hose used to unload. No particular OCU control in this location
SV03	Where is sludge imported from? Sludge imported from other satellite sites? How many?	Northfleet mainly. Also Oxted, Tonbridge, Whitewall Creek, Stoke and Grain
I22	Air Emissions	

	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:	
	Source 1	<i>CHP</i>
	National Grid Reference	TQ 66736 73992
	Source type	
	Parameter (e.g. oxides of nitrogen)	
	Quantity (with its unit)	
	Stack height	10m high (see drawing 160913)
	Source 2	<i>Boilers</i>
	National Grid Reference	2 x chimneys at TQ 66731 74033
	Source type	
	Parameter (e.g. oxides of nitrogen)	
	Quantity (with its unit)	
	Stack height	Boiler flues approx 8.5m high
	Source 3	<i>Flare</i>
	National Grid Reference	TQ 66851 74031
	Source Type	
	Parameter (e.g. oxides of nitrogen)	
	Quantity (with its unit)	Flare stack 5m high
	Source 4	<i>Whesso valves (pair at each location)</i>
	National Grid Reference	Gas bag –TQ 66767 740121 Digester – TQ 66740 74010 Post-digestion storage tank – TQ 66719 74001
	Source Type	
	Parameter (e.g. oxides of nitrogen)	
	Quantity (with its unit)	
	Source 5	<i>Odour control units</i>
	National Grid Reference	Unit 1 – TQ 66670 73915 Unit 2 – TQ 66662 74064
	Source Type	
	Parameter (e.g. oxides of nitrogen)	
	Quantity (with its unit)	
	Source 5	<i>Diesel generator</i>
	National Grid Reference	TQ 66761 73928 (vent)

	Source 6	<i>Condensate pots</i>	
	National Grid Reference	Gas bag – TQ 66758 74010 Flare – TQ66847 74029 Digester – TQ 66766 74038	
	Please provide the emission/maintenance report(s) for the flare(s). Are there any maintenance reports?		
	Please clarify whether safety zoning of areas is undertaken under DSEAR/PEXA at site.	Yes	
	Air Emissions from plant		
		CHP	Generator (back-up power)
I27	What date did the combustion plant become operational?	2016	2016
I28	What type of SG/MCP is at each plant? E.g. diesel engine, gas turbine, other engine or MCP Take photos of all relevant tanks/equipment and processes	Schedule 2B SG	Schedule 2B SG
I29	What is the MWth input of each plant? Take photos of any plates	1.23MWth	2.86MWth
I30	What are the guaranteed emission limits for the plant?	Oxides of N (only required to monitor once during first four months of permit issue)	None
I31	What are the total operating hours for the year?	No limit	No limit for operation. <50hrs/year for testing
I32	What is the stack height for each stack?	10m	
I33	What fuel is used? Natural gas, biogas, diesel)	Biogas	Diesel, stored in 40,000L tank. Usually use about 10,000L/yr

	<p>Dual or co- fired?</p> <p>What total volume of fuel is used?</p> <p>What total volume is stored at any one time?</p>		
	<p>Provide manufacturer's specifications for all combustion plant where possible.</p>	<p>Technical data sheet (V-0550LH-070-DG-50) in walkover folder</p>	
<p>Additional space for information on plant (if required)</p>			
<p>Emissions</p>			
GEN13	<p>Please explain how and where discharges solely of sanitary determinands are undertaken, including details of any treatment prior to discharging. Include reference to any permissions held for the discharge (permits/exemptions etc).</p>		
<p>Emissions to land</p>			
GEN20	<p>Please describe where all condensate pipes discharges (typically CHP exhaust , gas bag and digester), including the exact location of the emission and the quantity/rate of discharge.</p>	<p>Condensate discharges: Gas bag – TQ 66758 74010 Flare – TQ66847 74029 Digester – TQ 66766 74038</p>	

	<p>Include NGR is discharges to ground.</p> <p>Include location of inlet works if condensate goes to site drainage.</p> <p>If container used to collect condensate, where and how often, does it get emptied?</p>	All go to head of the works (TQ 66633 73879)
Exemptions		
	<p>What exemptions are used on site? Typically SW have T21, D5 and S1.</p>	
Cake storage		
SV04	<p>Is any cake imported? If so, how is it unloaded from trucks and where is it unloaded?</p>	<p>Cake from Ham Hill only (storage only as their drying bays are in poor condition)</p> <p>1-2 bins imported daily (covered roto – see below) straight into own cake bay (kept separate from Gravesend cake)</p> 
SV05	<p>Where is cake stored?</p> <p>How is cake stored? E.g. Cake bays, silos, directly into skips etc</p>	<p>Cake bays (see plan).</p>
	<p>How many cake bays/silos/other are there on site?</p> <p>How long does it take to fill a bay e.g. 4-6weeks?</p>	<p>7 bays with 5500m3 capacity</p> <p>Bay takes approx. 4 weeks to fill</p> <p>Currently more sludge production as digester out of service (Oct 20 until approx. Nov 21) – raw cake taken to Ashford to mature</p>
	<p>What is the total surface area of the cake bays?</p>	<p>5500m3 in bays</p>

	<p>Or total volume that can be stored if known? E.g. L x H x W.</p> <p>What is the total capacity (if in a silo)?</p>	
SV06	<p>How is cake moved to the cake bays (enclosed truck etc)?</p> <p>How frequently is cake moved around the site?</p>	<p>Out of centrifuge via conveyor and drops into distribution area. Moved into active cake bay by telehandler each day</p>
SV07	<p>Is the cake treated further after the centrifuge e.g. liming of cake within cake bays?</p>	<p>Liming in adverse weather (rare) in bay to south of conveyor</p>
SV08	<p>When cake is within the bay, is the cake turned/disturbed at all?</p> <p>How often?</p> <p>Why?</p>	<p>No, usually left as placed for approximately 2 months</p>
SV09	<p>How is cake removed from the site?</p> <p>How often?</p> <p>Over what timeframe? e.g. 2weeks constantly</p>	<p>Cake lorries (external contractor)</p> <p>About every 2 months when bay matured and empty bay in approx. 2 days</p>
SV10	<p>What is the condition of the cake bays? Eg condition of base, height of walls?</p> <p>Does this sufficiently contain the cake?</p> <p>Are there any known issues?</p>	<p>Good condition including drainage. Walls approximately 2.5m high</p> <p>Yes</p> <p>No</p>
	Water usage	
SV11	<p>What sources of water does the site use? E.g. potable, secondary washwater, other process water etc</p> <p>What proportion/% of the site's water usage is from this source? E.g. 2%</p>	<p>On-site borehole – usually abstract ~70m³/day for poly make-up</p> <p>Potable water for offices only. Does not get bills so does not know quantity</p>

	<p>potable water for polymer make-up and drinking, 98% primary or secondary wash water for other i.e. cleaning etc?</p> <p>What is it used for e.g. poly make-up, washing down etc?</p> <p>Is specifically potable water required for any of the site processes? (e.g. poly make-up)</p>	<p>Secondary washwater used around site (~100m³/day) for all other uses eg screens, hosepipes, drum thickeners</p>
SV12	<p>Does the site get water from other sources? Abstraction from river etc?</p> <p>How much is permitted to be abstracted/day/hr etc?</p> <p>What is it used for e.g. poly make-up, washing down etc?</p>	<p>Yes, borehole (groundwater)</p> <p>Permitted to abstract: Max 55,000m³/year Max 340m³/day Max 20m³/hr</p> <p>Poly make up only</p>
Generators		
SV13 - 19	<p>Are there any generators on site?</p> <p>How many and what size (MW)? What are they used for e.g. primary/secondary. Site running, exporting power to grid?</p> <p>Do they export to grid or import from grid to run the site?</p> <p>What are their fuel sources? E.g. diesel, biogas, other source</p> <p>How many hours per year do they operate?</p> <p>Any monitoring undertaken? If so, what for and what are the standards used?</p>	<p>Yes, for site running when CHP not in use/sufficient</p> <p>1 x 2.86MWth</p> <p>Diesel powered, no triad</p> <p>6 monthly maintenance by scheduled task</p>

CHP engines/boilers		
	How many CHPs/boilers on site?	<i>Take photos of any plates</i>
	What size (MW)? What are they used for e.g. primary/secondary. Site running, exporting power to grid?	1 x 1.23MWth
	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?	Primary supply to site, only used for site power
	Are the CHP's/boilers/ generators adequate for the amount of gas produced by the site?	Yes, 1 flare which operates occasionally
	Any monitoring undertaken? If so, what for and what are the standards used?	New, larger CHP fitted in 2016 so generally adequate
SV18	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?	H2S readings, gas quality = daily
SV17	What is the annual load of CHP (given as %)?	Veolia monitor CHP from their service desk
GRA01		
Noise		
I64	Please describe any noise mitigation measures on site.	None
	Other abatement?	No
	Have any noise assessments been undertaken on the site?	No

	ensure odour and bioaerosol control measures are maintained	
OMP02	Please identify the most common sources of odour complaints (i.e. during movement of cake, etc)	N/A – no complaints
OMP01	Dry solids range (%), sludge type, sludge pH, and storage time at average throughput for different tanks / processes.	PST/imported thickened sludge – range 7-9.5%, target 8% Unthickened sludge – range 2-4%, target 3% SAS – range 5.5-7.5%, target 6.5% Digester feed – range 6-7%, target 6.5% Digested sludge – range 3.4-4.4%, target 3.9% Cake – range 22-25.5%, target 23%
OMP04	For each asset on-site, please provide: <ul style="list-style-type: none"> • Potential odour source • Odour controls in place (see SV21) • Potential for odour emissions • Action to be taken in case of failure • Person responsible 	
Bioaerosols		
GEN15	Describe the processes and bioaerosol control measures (e.g. odour abatement systems, enclosed tanks, filters) associated with:	
	<ul style="list-style-type: none"> • Sludge reception/transfer of sludge between the vehicles and the facility (including: frequency of deliveries and collections, and types of vehicles used to transport waste; proportion of water within the sludge cake delivered to site etc) 	Hose into enclosed tank. Process enclosed until cake bays then removed by covered truck (approx. 2 days work every 2 months)
	<ul style="list-style-type: none"> • Handling and storage of sludge/digestate throughout AD process 	All enclosed
	<ul style="list-style-type: none"> • Disposal of biogas (combustion) 	CHP, flare or via boilers
	<ul style="list-style-type: none"> • Any other relevant procedures onsite which could generate bioaerosols 	Aeration lanes open, screw lifts for SAS open
	If using odour suppression sprays are they used to just mask the smell or to catch and drop the odour?	Not used
Is sludge arriving on site processed immediately? If not how long is it until it is fed into the system?	Yes	

	Pests	
SV25 & GEN12	<p>Does the site experience pests and if so what are they (birds, vermin etc)?</p> <p>What measures are in place to prevent/control pests?</p> <p>What measures are in place to remove pest issues?</p> <p>What's the frequency of visits by a pest control contractor?</p>	<p>Rats, pigeons</p> <p>Pest control contractor used. Frequency of visits depend on severity of issue (ranges between monthly to 6 monthly)</p> <p>Also put new flues on boilers to control pigeon entry to boiler house</p>
	Raw materials – Write here or refer to table at the bottom	
135	<p>Will operations require raw materials?</p> <p>What raw materials are used on site? List all including diesel, poly, lime etc</p> <p>Try to get the proper chemical name as well as what it is referred to.</p>	See list at end
I36	How much is stored on site of each at any one time (maximum tonnage)?	
	What is each material used for?	
SV26	<p>How and where are they stored? Bunded, stored undercover etc?</p> <p>Are they in IBC's, bags, tanks etc?</p>	Stored in covered buildings
SV27	What is the storage capacity of tanks, IBC's etc, how many on site?	
	How often are they replaced?	
I38	Describe the basic measures for improving energy efficiency of the activities carried out on site	<p>Optimisation team</p> <p>Spread timings of high energy usage equipment, lights off when not needed,</p>
	Resource efficiency	

I41	Explain and justify the raw and other materials, other substances and water that SW use at site	Natural gas for office heating All materials used needed for operation of processes on site
SV28	Describe waste avoidance and waste recovery measures (for the whole site operations, including staff generated waste). Describe how waste is disposed, by whom. This relates to all wastes generated by SWS operations on site – e.g. wash water, screenings etc	BIFA bins for general waste and dry recyclates WEEE– removed by contractor Scrap metal bins – removed by contractor Rag / grit skips (uncovered) – removed by contractor CHP – heat recovered for heating digesters Water reused where possible
	Any water saving measures?	On-site borehole to reduce potable supply needs
Combustion		
I43	Does the site have an aggregated net thermal input of combustion plant/s more than 20MW?	No
Site Plans and Processes		
I50	Please obtain a site layout plan for the site to show the location of all equipment, key aspects of the site infrastructure and operations and emission points	Emission points in plan at end
I52	Please explain the waste treatment processes carried out on site, the associated environmental risks and how these are managed/mitigated for each site	Inlet removes rag and grit – saves damage to systems and pollution. PSTs remove sludge – reduces energy needs later in process Tidal lift screws to discharge to Thames even at high tide Aeration lanes – remove ammonia FSTs remove RAS – RAS sent back to aeration lanes Treated effluent discharged to river Indigenous sludge pumped from PSTs to screens then drum thickeners then TSST – removes water and unwanted solids to decrease pollution in sludge

		<p>Imported sludge into reception tank via hose (to reduce spills), then through screens (to remove any unwanted solids) to imported sludge storage tank. Then to drum thickeners (to remove water for lower storage requirements) then to TSST.</p> <p>SAS from aeration lane to SAS balance tank then drum thickeners then TSST.</p> <p>From TSST, goes to digester (although currently not working so producing raw sludge instead) where sludge is made easier to dewater and destroys pathogens. After digestion goes to centrifuge (to further dry) then into cake bays to mature.</p>
	Risk Assessment	
I55	Please provide any existing environmental risk assessments relating to the operations of the site	None known
I57	Please confirm whether the site sources all water or a proportion of water through surface water or ground water abstraction.	Groundwater abstraction via borehole
I61	<p>Please provide details of the tanks on each site, their contents, how they are maintained, capacity and specification (e.g bunding features)</p> <p>What are the age/condition of tanks?</p>	<p>Tanks in good condition based on visual checks. Digester in poor condition – currently out of service.</p> <p>No bunding</p> <p>Age not known</p>
I62	<p>Please provide details of all environmental incidents that have occurred within, or near the site, including any fires and spills.</p> <p>Please explain how these were handled and any environmental impacts identified following the incident.</p>	<p>Small occasional fires on traveller camp, none serious</p> <p>No significant other issues</p>
I63	Please describe any noise mitigation measures on site	None

GEN03	<p>Please provide historical flood records for all sites</p> <p>Are these events recorded anywhere e.g. site diary/log</p> <p>How often are flooding occurrences – e.g. monthly, during heavy rainfall?</p>	None occurred
GEN04	<p>Please provide copies of any additional assessments undertaken at the site e.g. air dispersion modelling, habitats regulations, protected species surveys, preliminary ecological, MCZ screening, noise impact, flood risk, heritage, bioaerosols risk assessments etc</p>	Some for MCP permit –
Health and Safety		
GEN05	<p>Please provide a description of the health and safety procedures that are in place to deal with accidents/incidents on site.</p> <p>Please confirm any accreditation achieved for H&S.</p>	<p>Rule of 2 for reporting</p> <p>Clean up any leaks/spills immediately</p> <p>Site emergency pack details actions to take</p>
	<p>Is SCADA used on site?</p> <p>What processes are covered by SCADA?</p>	Yes, everything
Digesters		
	How many digesters on the site?	1 although not currently operational. Expected to be fixed by end-2021
	Digester capacity	2563m3
SV29	<p>Any Wesso valves? How many?</p> <p>Any temperature sensitivity observed in the Whesso valves? (previously we have heard of Whesso valves freezing below -5°C)</p>	<p>6 (2 on gas bag, 2 on digester, 2 on post-digestion storage tank)</p> <p>No</p>

SV30	Any monitoring of tanks/gas? Is there an alarm system attached to the Wesso valves (inform SCADA when operational)?	No
	What is the ground like surrounding the tanks? E.g. permeable gravel, concrete etc	Mostly permeable gravel
SV31	Underground pipework? Known condition?	Yes, most underground. Drainage survey planned as part of IED application but otherwise unknown. No leak detection system for underground pipework other than SCADA balances
	Is biogas generation managed by reducing the digester feed in the event that the flare stack and/or CHP engine failed and caused the Whessoe valves to release biogas?.	Yes
	Drainage	
	Where do the drains go? E.g. Head of the works	Head of the works
	Is site adjacent to a river or stream?	Near to Thames
	Is the whole site bunded	No – areas of pavement have kerbs to force water to drains but lots of unbunded permeable areas
	Are there any cracks in the pavement	Some limited cracking, generally reasonable condition
GEN21	Please describe whether all drainage (surface or foul water) will be captured by the onsite drainage systems.	Yes
GEN21	Please describe the drainage surrounding the cake storage bays and whether run off from there is also captured by the drainage system.	Good condition, drains run along entrances to cake bays and at end of road through centre of bays. Water seen to be draining freely during visit. All returns to head of works
SV34	Has any flooding on site lead to untreated wastewater being discharged to the watercourses due to high volume of water exceeding the storm storage capacity?	No
SV32	Are there any isolation valves, penstock etc operational that can isolate flows? If so where and in what circumstances are these used?	All processes have isolation valves for maintenance

Abnormal conditions – extreme high temperature, flooding (Climate Change RA)		
SV36 CC04	<p>How large is the site's stormwater storage capacity?</p> <p>OR how much retention time do the storm storage tanks allow?</p> <p>Have there been any issues in the past with direct discharge to the watercourse when stormwater storage capacity has been exceeded, occurring repeatedly?</p>	<p>2100m3 storm tanks</p> <p>Yes</p>
CC01	<p>Has the site previously experienced any flooding incidents?</p> <p>If yes, is there information on these? When, how frequent, how severe has flooding been.</p> <p>Has the flooding led to untreated wastewater being discharged to the watercourses due to high volume of water exceeding the storm storage capacity?</p>	No
CC07	<p>Is the access route to the site (main road access) at risk of flooding?</p> <p>Has it flooded previously?</p> <p>Are there alternative access routes?"</p>	<p>No</p> <p>Pedestrian access at rear gate – no vehicles</p>
CC03	<p>What wastewater flow is the site rated at? What is the pass-forward' flow?</p>	<p>Dry weather flow 10886m3/day and 126l/s. Anything over 442l/s to river</p>
CC06	<p>Does the site require potable water for any of its processes?</p>	<p>Offices only</p>
CC05	<p>Does the site operate any temperature-sensitive processes?</p> <p>E.g. do any of the biological treatment processes have optimal operating temperature ranges? What are they?</p> <p>Does the AD plant or anything else have optimum temperature range for operation"</p>	<p>Digester – around 35oC but not currently operational</p>

SV38 & CC02	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
CC08	Does the site already have a generator installed / provision for a plug-in generator at the site?	Yes
	Waste generation	
	What wastes are generated by the site? How is it stored?	BIFA bins for general waste and dry recyclates WEEE in cage– removed by contractor Scrap metal bins – removed by contractor Rag / grit in uncovered skips– removed by contractor
	Other	
SV39	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?	Potential Cess reception in future (not confirmed)
	What is the general site infrastructure like? Any areas of concern?	No other than digester
	Any positive interventions witnessed on site?	Moving empty IBC and drums to hardstanding
	Age of site? What infrastructure is enclosed?	Everything except the cake bays, PST, FST, tidal screw lift, aeration lanes

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	Additional notes and questions
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If there are any questions that are unable to be answered on-site, find out when they can be and who to ask. Make the internal team aware of any outstanding information.

Notes to FPM/APCS: Please provide annual throughput and maximum amount stored on-site for each raw material (in either tonnes or m3)

RFI ref	Raw materials mainly associated with chemicals	What raw materials are used on site? Proper chemical name as well as what it is referred to.	How much is stored on site of each at any one time (maximum tonnage)?	What is each material used for?
I39	ferric	Ferric chloride 40%	10T delivered every 5-6 weeks	
	poly	Highmark C498 and C498HMW (750kg bags)	3-4 bags on site, restock 2 bags every 4 weeks	Centrifuge
		Perfloc C496 (750kg bags)	2 on site, each bag lasts 5 weeks	
		SAS SNF Flopam640 HIB (1000L IBC)	2 on site, each IBC lasts 4 weeks	
	anti foam	Burst 5400 or Flowfoam 681F (both 1000L IBC)	1 on site, 1 IBC lasts 1 year	
	other? Sodium Hypochlorate, sodium hydroxide etc	No		

Diesel/ gas oil		40,000L generator tank 10,000L boiler tank Use approx. 15,000L a year	Generator/boilers
Lime	(same as Ham Hill)		Sludge drying
Odour control	Carbon filter - Neil to provide		

<u>Bioaerosols</u>	Site name
Control measures for bioaerosols include things such as:	
Limiting frequency of deliveries of sludge to site	All imported via hose so not a concern Not enough trucks per day to mean they queue
Covering/enclosing processes which could release bioaerosols e.g. sludge treatment works, digesters	All trucks covered when entering/leaving site STC processes all covered except cake bays Thickeners in building where doors kept closed
Keeping these buildings under negative pressure and keeping doors/covers closed	Doors kept closed in buildings No negative pressure
Processing sludge arriving to site immediately	Yes
Sealing tanks to prevent escape of biogas and monitoring for potential leaks	Tanks all sealed No particular monitoring
Odour control units e.g. biofilters/scrubbers	OCU1 - Biofilter and carbon filter OCU2 – biofilter
Operating at high temperatures/unfavourable pH e.g. thermal drying of sludge, lime treatment etc.	Liming in adverse weather (wet) only
Avoiding handling of cake on windy days	No

Avoiding frequent turning of waste in cake bays	No turning
If using odour suppression sprays are they used to just mask the smell or to catch and drop the odour?	No sprays used

It would therefore be good to know whether Southern Water has any of these measures in place at their sites.



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



B. Landmark Envirocheck Report

Available on request.



C. Permit Boundary

[Please refer to document reference 790101 MSD SiteLayoutPlan GRA January 2024](#)