MOTT MACDONALD

Millbrook Sludge Treatment Centre Environmental Permit Application

Environmental Risk Assessment

September 2024

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1 Introduction

1.1 Background and scope

This document has been prepared to support the application for the substantial variation of a Specified Generator Environmental Permit to a bespoke Waste Installation Environmental Permit reference EPR/CP3535XU (hereafter referred to as “the Permit”). The variation is for the inclusion of permitted activities at Millbrook Sludge Treatment Centre (STC) and Slowhill Copse Sludge Reception (SHCSR) (‘the Site’) on behalf of Southern Water Services Limited (‘Southern Water’ or ‘the Operator’). The Site currently operates under a T21 exemption and has two existing environmental permits for combustion activities at Millbrook (Permit reference EPR/CP3535XU), and for the import of tankered trade waste at Slowhill Copse (Permit reference EPR/GP3792HY).

As part of the application for an Environmental Permit, operators must assess the risk to the environment and potential harm to human health from the activities they propose to undertake. This document provides the environmental risk assessment (ERA) considered relevant to the Site in accordance with the Environment Agency’s Risk assessments for your environmental permit.[1]

1.2 Assumptions and limitations

The assessment of effects has been based on information sourced from relevant and applicable legislation, guidance, and websites. It is assumed that all guidance documents produced by the Environment Agency are up to date and correct at the time of writing.

[1] Environment Agency (2021) Risk assessment for your environmental permit. Available online at https://www.gov.uk/gufidance/risk-assessments-for-your-environmental-permit

2 Site setting

2.1 Location

Activity address: Western Docks, Millbrook, Hampshire, SO15 0HH

National grid reference: SU 38755 12378

A plan outlining the boundary of the scheme is provided in 790101_MSD_SiteLayoutPlan_MIL and SHC June 2024 June 2024.

2.2 Geology

Mapped artificial geology on-site comprises Made Ground deposits, indicating that the deposits are at least 2.5m thick in the area. These are widespread in the area along the banks of the River Test, indicating that the ground is likely reclaimed land.

Superficial geology on-site consists of Tidal Flat Deposits comprising clay and silt, Holocene in age. Tidal Flat Deposits are deposited on extensive nearly horizontal land in the intertidal zone that is alternately covered and uncovered by the rise and fall of the tide.

Underlying the Tidal Flat Deposits are River Terrace Deposits, comprising interbedded layers of sand and gravel, and clay and silt.

The Site lies upon the Earnley Sand Formation comprising sand, silt and clay, Lutetian in age. A band of the Wittering Formation lies approximately 300m to the north of the site and the Marsh Farm Formation lies adjacent to the south of the site both consisting of clay, silt and sand, Lutetian in age. These formations all belong to the Bracklesham Group.

2.3 Hydrogeology

The Tidal Flat Deposits underlying the site are classified by the Environment Agency as Unproductive strata, however the River Terrace Deposits below these are classified as a Secondary A aquifer.

A Secondary A aquifer exists in the Bracklesham Group bedrock, with medium vulnerability. No source protection zones (SPZ) or groundwater abstractions are known to exist within 1km of the site.

2.4 Hydrology

The River Test lies approximately 350m to the south-east of the site at its closest point (where the Southampton Docks are located). In the area it flows in approximately a north-west to south-east direction towards The Solent.

2.5 Protected areas

The European designated habitat sites located within 10km of the Site include:

- Solent and Dorset Coast Special Protection Areas (SPA) is located 4.6m from the Site
- Solent and Southampton Water SPA and Ramsar is located within 35m from the Site
- The New Forest, Special Area of Conservation (SAC), Ramsar and SPA is located 3.2km from the Site

- River Itchen (SAC) is located 5.6km from the Site
- Emer Bog (SAC) is located 8.4km from the Site

The national statutory designated sites located within 2km of the Site include:

- Eling and Bury Marshes Site of Special Scientific Interest (SSSI) is located within 35m from the Site
- Lower Test Valley SSSI is located 2km from the Site
- 49 Sites of Importance for Nature Conservation (SINC), closest is directly adjacent to the Site
- Ancient Woodland is located 0.8km from the Site
- Lower Test Hampshire & Isle of Wight Wildlife Trust Reserve is located 2km from the Site

The priority habitats located within 2km of the Site include:

- Deciduous woodland is located directly adjacent to the Site
- Coastal and floodplain grazing marsh is located 0.6km from the Site
- Lowland dry acid grassland is located 1.2km from the Site
- Lowland meadows is located 1.3km from the Site
- Mudflats is located 0.1km from the Site
- Undefined priority habitat is located within 0.1km from the Site
- Good quality semi-improved grassland is located 0.8km from the Site
- Coastal saltmarsh is located 0.1km from the Site
- Purple moor grass and rush pastures are located 1.4km from the Site
- Traditional orchard pastures are located 1.9km from the Site

Further discussion on impacts to natural habitats and ecology is provided in section 3.2.8 and Appendix B.

2.6 Other notable features

As shown in Figure A.4 in Appendix A, the Millbrook STC is located south of a densely populated area where three sensitive receptors found within 200m of a potential emission source, in some cases downwind of the prevailing wind direction. One area of sensitive receptors (includes residential, industrial, recreational) is found to the northeast of the Millbrook STC, two areas of industrial receptors are located southwest (Industrial 2) and northwest (Industrial 3) of the Millbrook STC. The nearest of these areas to a potential bioaerosol source is the area of industrial land use (Industrial 2) approximately 40m south west of the gravity belt thickeners and TSSTs. The closest residential receptors to the Millbrook STC are located on Brookside Road, 180m to the northeast of the site.

The Millbrook STC is located within a nitrate vulnerable zone (NVZ) with concern over eutrophic water conditions in the Hamble estuary. There is also a Special Protection Area (SPA) 120m to the east.

There are six areas of sensitive receptors found within 500m of potential emission sources at the SHCSR. Three areas of industrial land use are located to the southeast, west and northwest of the SHCSR, whilst two areas of residential properties are located to the southeast and west. One recreational land use is located to the southeast. The receptor closest to a potential emission source is an industrial facility, which is located approximately 30m southeast of the unscreened sludge tanks.

3 Environmental risks

3.1 Methodology

The ERA has been undertaken by identifying hazards and source-pathway receptors and assigning a probability of exposure and a severity of consequence. These are assigned as described in Table 3.1 and Table 3.2 and are based on the generic risk assessments used for standard rules “SR2012 No11 and No12”, “SR2009 No4” and “SR2008 No19”, applicable to anaerobic digestion operations including use of the resultant biogas.

The probability and severity scores are then combined within a matrix to give an overall magnitude of the risk. This matrix is shown in Table 3.3 and is intended to illustrate the general approach to scoring.

Risks are categorised as either low, medium or high; this ranges from being a nuisance in some instances to potential health risks in others.

Table 3.1: Severity Index

Severity of harm	Severity Index
Impact to people or designated receptor	High
Impact to non-designated receptor	Medium
All other impacts	Low

Table 3.2: Probability Index

Likelihood of harm occurring	Probability Index
Harm is near certain or very likely to occur	High
Harm is likely to occur	Medium
Harm is unlikely	Low

Table 3.3: Magnitude of risk

Magnitude of risk	Probability index		
Severity index	**Low**	**Medium**	**High**
Low	Low	Low	Medium
Medium	Low	Medium	High
High	Medium	High	High

3.2 Risk assessment

3.2.1 Introduction

This section of the report identifies any potentially sensitive receptors within the vicinity of the Site and assesses the environmental risks with the following categories:

- Point source and fugitive emissions to air;
- Point source and fugitive emissions to water and land;
- Noise and vibration;
- Odour;

- Litter, mud and debris;
- Vermin and insects (pests);
- Human health and environment safety (i.e. visual impacts, site security, flood risk); and
- Natural habitats and ecology.

The methodology used to assess and screen the environmental risk for each category is discussed in turn in the following subsections. The need for further detailed assessments and/or management plans, where applicable, is also elucidated upon.

An assessment of the overall and residual risk is provided in Appendix B. For each hazard there is the identification of the pathway and receptor and the mitigation proposed in order to reduce the residual risk.

3.2.2 Point source and fugitive emissions to air

3.2.2.1 Air quality

The CHP units and generators are currently permitted under the permit number EPR/CP3535XU, which allows for the operation of one Tranche B Specified Generator aggregated to <50MWth at a specified location.

The permit allows Southern Water to operate the following at Millbrook STC:

- Two biogas fuelled CHP engines. One engine has a rated thermal input of 3.23MWth and the remaining has a rated thermal input of 2.02MWth and was brought fully into operation after 1 December 2016 (Tranche B)
- Two diesel back-up generators with a rated thermal input of 5.03MWth each
- One diesel back-up generator which has a rated thermal input of 2.97MWth
- Two auxiliary boilers, fuelled on biogas, with rated thermal input of 1.6MWth each

Point sources to air were assessed in 2019 as part of the application for EPR/CP3535XU/V004 (document reference ED11464108 _R1 Issue Number 4), and in accordance with the Environment Agency's guidance on air quality modelling at the time the permit was granted. A worst-case approach was assessed to ensure that any air quality impacts are more likely to be over-estimated than under-estimated. The conclusions that the Site does not pose significant risk of exceedances of relevant Air Quality Objectives for the protection of human health and Critical Levels and Critical Loads for ecological habitats remain relevant as combustion activities are not being changed on-site as a result of permitting the AD plant and associated processes. The boilers were not included in the ADM, however the 2019 assessment assumed that the CHP would be operating at 100% load for a full year because this is a more conservative approach than modelling a split in operational hours between the CHP and boilers. This conservative approach is still valid with the replacement of one of the digester boilers and no update to the Air Quality Assessment and H1 screening assessment is necessary.

Table 3.4: Combustion plant details

	Boiler 1 (A01)	Boiler 2 (A01)	CHP 1 (A02)	CHP 2 (A03)	Back-up Generator 1 (A05)	Back-up Generator 2 (A05)	Back-up Generator 3 (A05)
Make/Model number	Strebel Eurograde RU2S-11	Strebel Eurograde RU2S-11	Jenbacher JMC 412	Caterpillar G3516	Newage LVSI 804S2	Stamford HC634H1	Stamford SC734B
Date that MCP became operational/was commissioned	Before 1st December 2016 and before 20 December 2018	Before 1st December 2016 and before 20 December 2018	After 1st December 2016 and before 20 December 2018	2008	Before 1st December 2016 and before 20 December 2018	Before 1st December 2016 and before 20 December 2018	Before 1st December 2016 and before 20 December 2018
Thermal input (MWth)	0.8	0.8	2.02	3.23	5.03	1.94	2.97
Stack height (m)	8	8	8.3	15	4	4	4
Fuel used (biogas, diesel etc)	Biogas (and natural gas for testing ~ 1 hour in a year)	Biogas (and natural gas for testing ~ 1 hour in a year)	Biogas	Biogas	Diesel	Diesel	Diesel
Estimated total hours of operation per year	>870 (emergency use only if CHP 1 is offline)	>870 (emergency use only if CHP 1 is offline)	Unlimited	6,570	68 hours per annum and no more than 3 hours per day	68 hours per annum and no more than 3 hours per day	>50 hours
MCPD and SG Regs status	Existing MCP	Existing MCP	Existing MCP Tranche B	Existing MCP Tranche A	Existing MCP	Existing MCP	Existing MCP Excluded generator

Note: Locations and emissions points are shown in 790101_MSD_SiteLayoutPlan_MIL and SLO June 2024 June 2024

The operation of the flare will be prioritised for during emergencies, such as during CHP maintenance or downtime. In any other scenarios the imports of the biogas to the CHP unit will be controlled to reduce the time of operation of the flare where possible. The flare is monitored through a site wide SCADA system and maintenance of the flares is undertaken every 6 months.

The existing approaches and relevant procedures presented in the Environmental Management System (EMS) and operational procedures are considered to adequately address the emissions that may present a risk, and, therefore, an Emissions Management Plan (EMP) is not considered to be required.

3.2.2.2 Bioaerosols

According to the Environment Agency guidance 'bioaerosol monitoring at regulated facilities (Jan 2018)', a bioaerosol risk assessment is required if a facility is within 250m of a sensitive receptor.

The sensitive receptors in relation to the Site are shown in Appendix A. The Site lies within 250m of sensitive human receptors and, therefore, a bioaerosols risk assessment has been undertaken and is provided with the supporting documents of the permit application (Doc reference 790101_ERA_BioRA_MIL September 2024).

For new permits there is a requirement to monitor in accordance with Technical Guidance Note (TGN) M9 'environmental monitoring of bioaerosols at regulated facilities' if the Site is within 250m of a sensitive receptor. The TGN lists sources of bioaerosols and refers to ambient and point sources of emissions.

The bioaerosols risk assessment concluded that the Site poses an acceptable level of risk of bioaerosol release and the STC activities do not endanger human health or the environment. This is primarily due to the control measures in place at the Site, which are considered to be effective at reducing and containing emissions of bioaerosols, inhibiting the pathway between source and receptor. Subsequently, since the Site is found to be low to medium risk, a Bio-aerosol Management Plan is not required.

Best practice methods will be followed during operation of the facility, to prevent the release of bioaerosols. These include methods and principles outlined in the Environment Agency's "Guidance on the evaluation of bioaerosol risk assessments for composting facilities" and are described in Appendix B.

3.2.2.3 Abatement of other fugitive emissions to air

Environment Agency best practice methods will be followed, during operation of the facility, to prevent the release of fugitive emissions. These are described in Appendix B.

3.2.3 Point source and fugitive emissions to water and land

An assessment of the risks from potential point source and fugitive emissions to water, sewers, land or groundwater is provided in Appendix B.

The Substantial Pollution Incident register in Landmark's Envirocheck report (100419175-001) has been used to provide details of pollution incidents within the past five years. According to the report, there have been no pollution incidents to controlled waters within 250m of the Site in the past 5 years.

3.2.3.1 Emissions to water (other than sewers)

Substantial Pollution Incident register in Landmark's Envirocheck report has been used to provide details of pollution incidents within the past five years. According to the Operators pollution incident register in the past five years there have been no incidents.

There are no groundwater source protection zones (SPZ) or groundwater abstractions within 250m of the Site.

At Millbrook STC, all drainage water including surface or foul water is captured by the drainage network and returned to the head of the works for treatment. There will be no direct discharge of wastewater to controlled waters from the STC.

There are no direct potentially contaminated discharges to groundwaters. Condensate from the flare, CHP and the biogas is captured in condensate pots and is returned to the drainage system and sent back to the head of works of the WTW. The condensate is clean, uncontaminated and discharges are small in volume.

Accidental releases of materials to the environment are controlled through adequate containment measures and working procedures.

For SHCSR, all drainage around waste reception points within the site boundary are captured by onsite systems and are returned to head of works.

The existing approaches and relevant procedures presented in the EMS and operational procedures are considered to adequately address the emissions that may present a risk, and therefore, an EMP is not considered to be required.

3.2.3.2 Emissions to sewers, effluent, treatment plants or other transfers off-site

There will be no point source emissions or direct discharges to controlled waters or public sewers, as part of the permit operation. Any liquid waste will either be reused or discharged to the drainage system of the adjacent WTW and will undergo treatment through the works prior to being discharged under an existing water discharge permit. On-site WTW effluent will meet the requirements of the existing environmental permit for discharges to water. The water used at the Site will be contained in a closed circuit; all wastewater streams will either be recycled within the process or captured and rerouted to the adjacent WTW.

Discharges will be minimal, typically arising from periodic maintenance/cleaning operations. As such, there are no direct potentially contaminated discharges to controlled surface waters and no significant impacts. All drainage (surface water or foul water) will be captured by the on-site drainage system and returned to the head of the WTW via a return pumping station. A drainage plan for Millbrook is presented in document reference 790101_MSD_DrainagePlan_MIL November 2021. A drainage plan for Slowhill Copse is presented in document reference 790101_MSD_DrainagePlan_SHC March 2008.

3.2.3.3 Emissions to land

There will be no point source emissions to land as part of the activities carried out on-site.

All raw materials are handled and stored within the confines of the buildings on-site, or in intermediate bulk containers (IBCs) in bunded areas, with the exception of biogas which is contained within the gas handling system. Releases of raw materials to land are, therefore, considered to be negligible due to adequate containment of the materials within the suitable storage vessels, the provision of bunding and the present of a contained drainage system.

3.2.3.4 Noise and vibration

One noise complaint was received for Millbrook WTW in the last five years (2019-2023), in 2019. Four noise complaints were received for Slowhill Copse site in the last five years (2019-2023).

However, none of the complaints were substantiated to the Millbrook STC and SHCSR.

Initial screening has been carried out for the Site. Since the Site is not undergoing changes to equipment and vehicle movements prior to application submission, a Noise Impact Assessment (NIA) is not considered to be required in respect of this application. Appropriate mitigation for noise and vibration impacts are provided in Appendix B. The sensitive receptors located within 1km of the Site are shown in Figure A.4 of Appendix A.

Since noise and vibration impacts are considered to be appropriately mitigated in the ERA, a Noise and Vibration Management Plan is not considered to be required.

3.2.4 Odour

A review of the nearest human receptors has been undertaken to establish the level of odour risk to the receptors before and after mitigation. Sensitive receptors to odour are users of the adjacent land, which may vary in their sensitivity to odour. A conservative approach is taken to sensitive receptor determination as the Site is located in a densely populated urban area. There are four sensitive human receptors within 500m of the buffer, as shown in Figure A.4 in Appendix A.

Current odour mitigation measures to prevent and reduce odours from receipt of waste, transfer across the Site, treatment and storage of waste have been assessed and are detailed in Appendix B.

The Millbrook STC lies within an industrial setting of Southampton Docks, approximately 3.8 km west of Southampton city centre. There are no residential receptors in the immediate vicinity of the site; the nearest residential receptors are located at Millbrook Road West (road), approximately 300 m north of the Site.

The Millbrook WTW has received 21 odour complaints in the last five years (2019-2023), including 18 in 2019. Seven complaints were received for Slowhill Copse site in the last five years (2019-2023).

However, none of the complaints were substantiated to the Millbrook STC and SHCSR.

There are no proposed works to be undertaken on the Site in respect of this permit application, therefore, the activities on-site are not anticipated to increase the off-site impact or result in adverse impact upon nearby sensitive receptors or the amenity of the area surrounding the Site.

The Site has an Odour Management Plan (OMP), produced in June 2024, which identifies potential odour emissions from the site operations and procedures to manage, control and minimise odour impacts. It sets out the procedures for engaging with neighbours and how the Operators will manage complaints, and the actions to be taken in the case of pollution events. The OMP also describes the monitoring and maintenance procedures to maintain the control measures.

The OMP was written in accordance with Environment Agency's H4 Odour Management guidance (2011). The level of odour risk from the Site is considered to be low, as shown in Appendix B, and the OMP provides sufficient mitigation.

3.2.5 Particulate matter, litter, mud and debris

Appendix B describes the aspects of the Site that generate litter, mud and debris within and outside the Site boundary and assesses their risk to the environment. Current waste management and site cleaning procedures (EMS308) have been assessed in the ERA table in Appendix B to justify whether additional measures could be required. Measures to prevent debris and dust leaving the Site have also been addressed, in addition to the sensitivity of nearby receptors and the effectiveness of existing measures to reduce the escape of dust.

The need for a dust management plan is triggered if the keeping and/or treating of biowaste in the open including the finished material is located:

- In, or within 2km of, an air quality management area for PM10;
- Within 500m of a sensitive receptor such as a home, school, hospital or nursing home, food preparation facility or similar; and
- Within 250m of a sensitive receptor when treating biowaste.
- Most of the Site operations are fully enclosed. All sludge treatment processes are covered or enclosed, with the exception of the PSTs and FSTs. The inlet works is partially uncovered.

The sludge cake is stored in a 240m^3 silo, and one 15t alternative cake bay when the silo is not in operation and is moved about the site by eight 20t tippers. Although the site has been screened as being within 250m of sensitive receptors (see Appendix A), a Dust Management Plan is not considered to be required since operations and waste types use on-site cause minimal dust emissions and appropriate mitigation is in place.

3.2.6 Pests

Discussions with the Site operator during a site visit to Millbrook STC addressed whether the Site activities are likely to attract pests, what measures are in place to deter pests and how effective these measures are. These are covered in Appendix B.

Pest control measures are implemented under EMS 227. Millbrook STC has routine visits by a contractor to install and inspect rat boxes.

Pests are not considered to be an issue at the Site, since the waste types handled on-site do not attract them. Contractors regularly check the Millbrook STC for pests and appropriate mitigation is in place. A pest control contractor also visits the Slowhill site on a regular basis.

Since the residual risk is considered to be low, a Pest Management Plan is not considered to be necessary.

3.2.7 Human health and environment safety

3.2.7.1 Visual impacts

The Site was built in 1963. The Site is within an industrial area (docks). Since no changes to the Site will occur prior to submission of this permit application, there will not be any changes in heights and configuration of the placement of equipment which could be noticed by nearby receptors.

Although the Site is surrounded business and industrial parks, the Site predates any other developments and as the Site is located away from residential properties, visual impacts from the Site are therefore considered to be moderate to low.

3.2.7.2 Site security

Activities are managed and operated in accordance with the management system. Access to the Millbrook STC and waste is restricted by automatically operated gates which are closed during operating hours. Access to Site is by using a telecom system prior to entry or key fob. The Millbrook STC perimeter is comprised of 8ft chain-link fencing. The Millbrook STC is manned during opening hours (7am – 7pm), and staff are on call. The Millbrook STC has CCTV at the inlet, gas holder and access gate. Regular inspections of the boundary fencing, and buildings are undertaken to ensure that these have not been compromised and continue to prevent easy access to the site.

Access to the SHCSR is restricted by secure, 6ft palisade perimeter fencing and an electric gate at the main entrance of the site. Visitors are required to sign in at the Site entrance. There is also a padlocked gate which is manually operated, and a locked gate policy is adhered to.

There are six CCTV cameras at SHCSR, spread between the inlet, diesel tanks and sludge reception points. SHCSR is manned only on weekdays, 07:30-16:00 Monday to Wednesday, and 07:30-15:00 Thursday to Friday.

Repairs at the Site are undertaken in accordance with the EMS requirements.

Other risks relating to human health and the environment are presented in the ERA in Appendix B.

3.2.7.3 Flood risk

Initial screening was undertaken to determine the flood risk for the Site. The data utilised for this study was published online by the Environment Agency and related to the flood risk from surface water, rivers and the sea.

The Millbrook STC is located in an Environment Agency zone 1 flood risk area. Areas within zone 1 have 1 in a 1,000 chance of river or sea related flooding. However, to the east of the site a section of Southampton docks is located within a zone 3 flooding risk area due to the proximity of the River Test. Areas within flood zone 3 have been shown to be at a 1% or greater probability of flooding from rivers or 0.5% or greater probability of flooding from rivers/ the sea.

The SHCSR is located in an Environment Agency very low risk zone, with less than 0.1% chance each year of flooding from river and sea.

Activities are managed and operated in accordance with a management system and management plans, and procedures implemented include (but not limited to) the removal and clean-up of spiled waste material, including sludge, cake etc. and other pollutants (which may also include removal used spill kits and mobile bunds) before these could enter any flood waters if an event was to occur.

There are no known issues with flooding on-site from the nearby waterbodies or rainfall at Millbrook STC. Millbrook STC did experience on-site flooding in 2021 from a high tidal event leading to back up of water from the drains flowing to the River Test. The drains were inspected and cleared to prevent an occurrence. No historical floods have been recorded.

There have also been no known flooding incidents recorded at SHCSR in recent operation of the site.

Since no changes to the Site are planned prior to application submission, and no impacts to flood pathways or sensitive receptors are anticipated, a full flood risk assessment (FRA) (defined here as a detailed assessment involving bespoke hydraulic modelling work) is unlikely to be required. When proposed changes do occur these are understood to be either of a relatively minor nature or are unlikely to significantly alter existing development footprints.

3.2.8 Natural habitats and ecology

Ecological features that are situated within set distances of the Site boundary have been identified and screened. For the following ecological features, the Study Area was defined as the following:

- Statutory designated European sites: Special Areas of Conservation (SAC), candidate Special Areas of conservation (cSAC), Special Protection Areas (SPA), potential Special Protection Areas (pSPA), Sites of Community Importance (SCI) and Ramsar sites within 10km of the Site boundary;
- Statutory designated national sites: Sites of Special Scientific Interest (SSSIs), Marine Conservation Zones (MCZs), National Nature Reserves (NNRs), Local Nature Reserve (LNRs), Areas of Outstanding Natural Beauty (AONB) within 2km of the Site boundary;
- Non-statutory designated sites: Local Wildlife Sites (LWS), Ancient Woodlands, Country Parks, Sites of Importance for Nature Conservation (SINC), Hampshire and Isle of Wight Wildlife Trust Reserves within 2km of the Site boundary;
- Priority habitats: within 2km of the Site boundary. Priority habitats are those listed under Section 41 of the Natural Environment and Rural Communities Act (2006) and include deciduous woodland, grassland, heathland, reedbed, vegetated shingle, wood-pasture and parkland, marshes, mudflats and fens; and
- Granted European Protected Species (EPS) within 2km of the Site boundary. Licences available on Multi-Agency Geographic Information for the Countryside (MAGIC), data from Hampshire and Isle of Wight Wildlife Trust. Accurate to within the nearest 100-200m depending on local council survey data accuracy.

No ecological field surveys have been completed to inform this screening. This screening identifies the likelihood of ecological features being present or further investigation being required.

Initial screening has been carried out for the Site, the high-level results of which are shown in Table 3.5. Where habitat sites are situated within the study area surrounding the Site, the relevant cells are highlighted in red and indicate the number of habitats sites located therein. Cells highlighted in green indicate that relevant habitat sites are not located within the specified study area. For cells highlighted in orange, there is potential for these protected species to be present within the study area.

Table 3.5: Results of initial screening of natural habitats and ecology for the Site

Natural habitats and ecology	Millbrook STC (including SHCSR)
Statutory designated European sites within 10km of the Site boundaries	
Special Areas of Conservations (SAC)	4
Special Protection Areas (SPA)	3
Sites of Community Importance (SCI)	
Ramsar sites	2
Statutory designated national sites within 2km of the Site boundaries	
Sites of Special Scientific Interest (SSSIs)	2
Marine Conservation Zones (MCZs)	
National Nature Reserves (NNRs)	
Local Nature Reserves (LNRs)	
Areas of Outstanding Natural Beauty (AONBs)	

Non-statutory designated sites within 2km of the Site boundaries	
Local Wildlife Sites (LWS)	
Ancient Woodlands	1
Country Parks	
Sites of Importance for Nature Conservation (SINC)	49
Hampshire and Isle of Wight Wildlife Trust Reserves	1
Priority habitats within 2km of the Site boundaries	
Priority habitats	10
Protected species	
Common nesting birds, common reptiles, terrestrial and aquatic invertebrates, common amphibians: within a 10m buffer of the Site boundaries	
Wintering birds: within a buffer of up to 500m of the Site	
Species of nesting birds: within 200m buffer of the Site boundaries	
Bats: within 50m buffer of the Site boundaries	
Badgers: within a 30m buffer of the Site boundaries	
Hazel dormice: within a 20m buffer of the Site boundaries	
Great crested newts – ponds within 500m buffer of the Site boundaries and terrestrial habitat within 10m	

Four SACs, three SPAs and two Ramsar sites are located within 10km of the site. The four SACs are located approximately 0.03km, 3.1km, 5.6km and 8.4km from the Site boundary. The SPAs are located approximately 0.03km, 0.01km and 3.2km from the Site. However, it is considered unlikely that a Habitats Regulations Assessment (HRA) would be required for the Site because Environment Agency best practice methods will be followed, during the operation of the facility to prevent significant effects to designated habitats. These are described in Appendix B.

Any potential impacts to statutory designated European and national habitat sites have been considered in the ERA following review of the following site-specific information:

Discharges to water, groundwater and emissions to air and land, and from dust, noise and vibration, from all activities on-site, particularly from the anaerobic digestion processes;

Pollution prevention and mitigation measures, including for emissions and spills; and

Site plans detailing storage arrangements and drainage plans.

Two SSSIs, 49 SINCs, one ancient woodland and a Hampshire & Isle of Wight Wildlife Trust Reserve are located within 2km of the site boundary; however it is considered unlikely that the Site activities will impact these habitat sites. This is covered in Appendix B along with appropriate mitigation.

It is considered very unlikely that Site activities would lead to the disturbance or removal of terrestrial habitats, and therefore, protected species surveys are not considered to be required for the Site.

The proposal for a varied permit does not involve the removal of vegetation, or structural modification to built structures, therefore, a Preliminary Ecological Appraisal is not considered to be required for the Site.

The application is to permit anaerobic digestion activities in order to meet the Industrial Emissions Directive (IED). The site has been operating in its current capacity for a number of years and mitigation measures already in place directly or indirectly prevent or limit harm to existing habitats and species, as shown in Appendix B. No changes to operations are proposed and therefore the current risks posed to these habitats and species are likely to improve upon granting of the permit.

A. Environmental Constraints Maps

Figure A.1: Statutory designated habitat sites within 10km of the Site

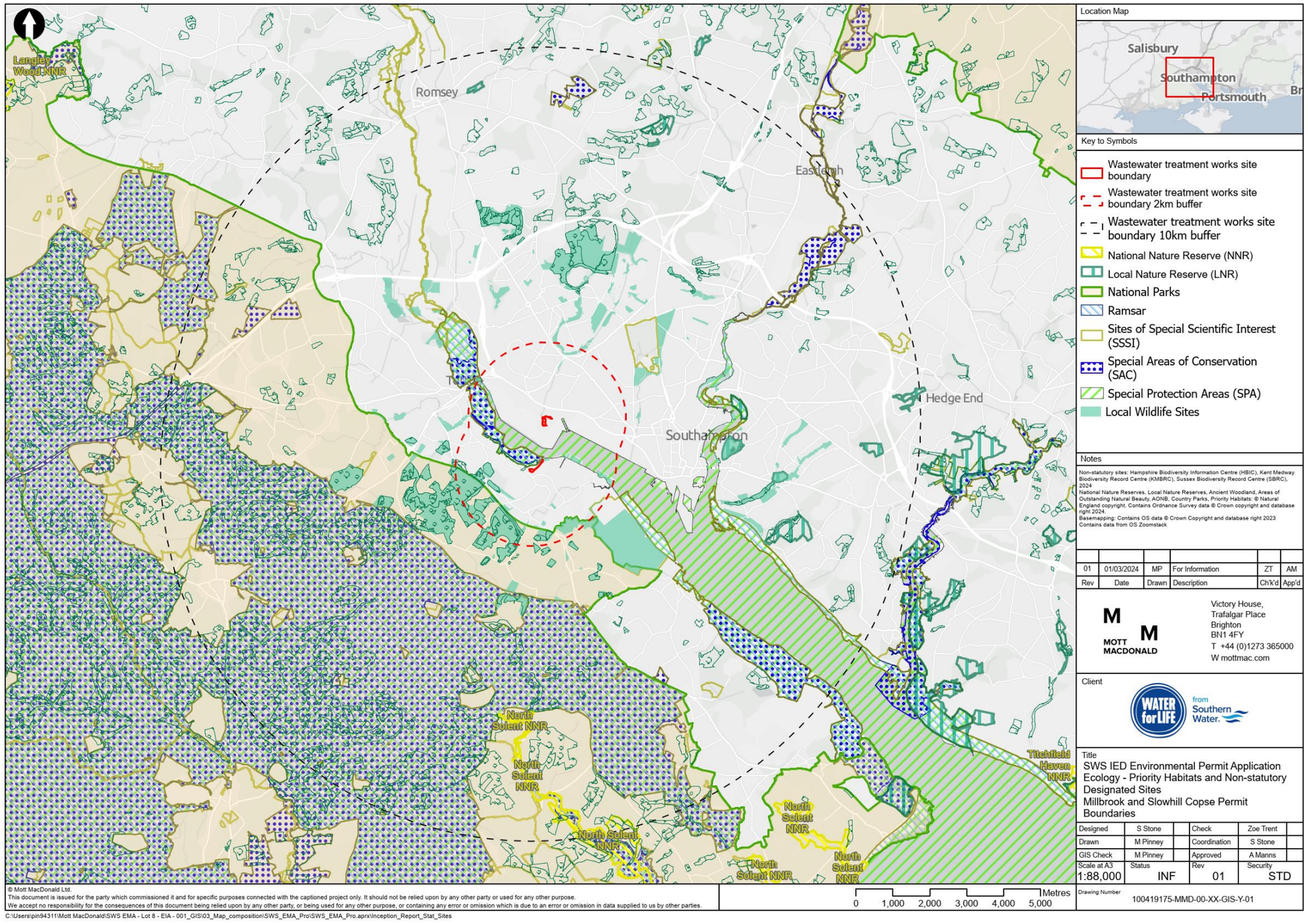


Figure A.2: Non-statutory designated habitat sites within 2km of the Site

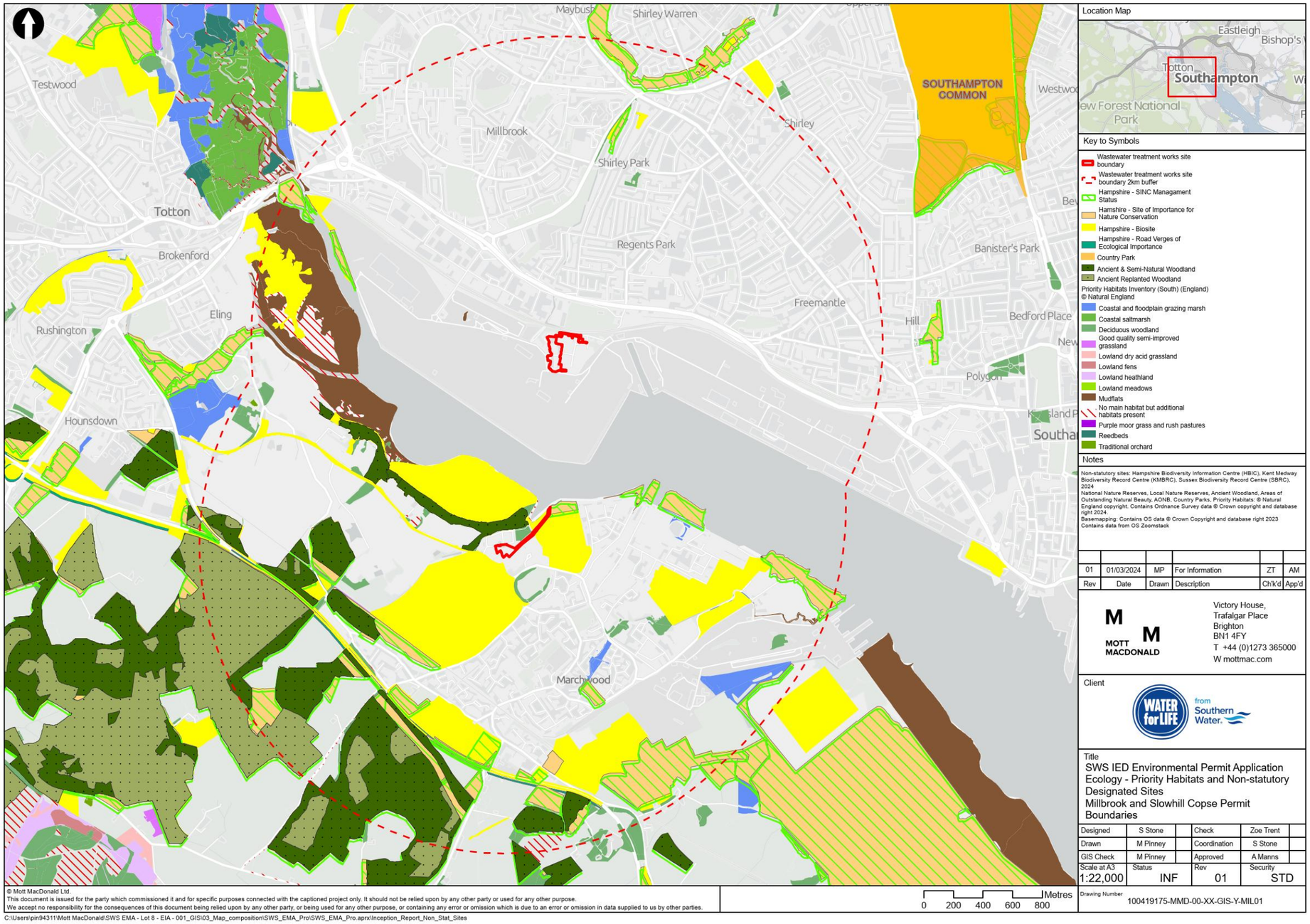
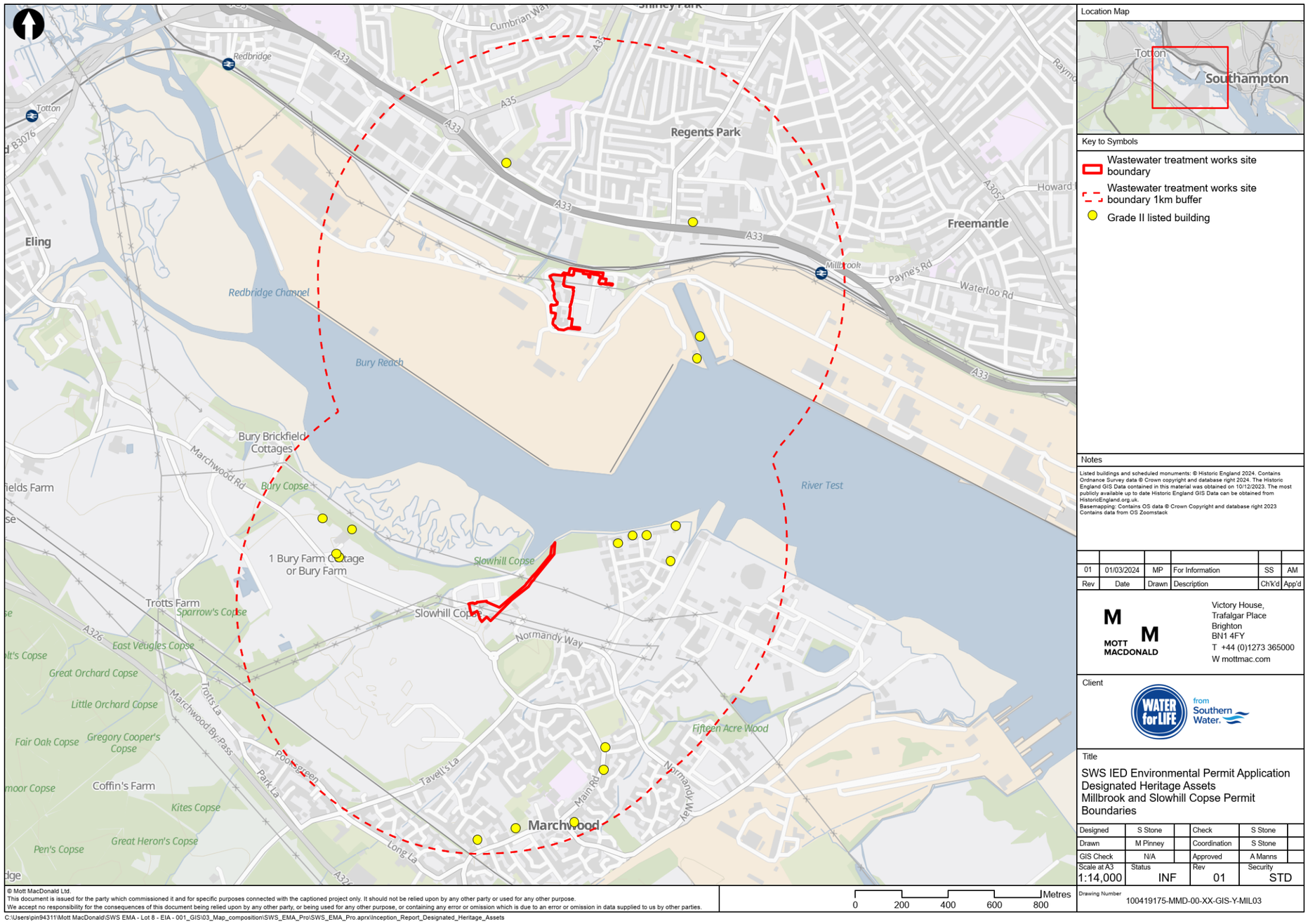
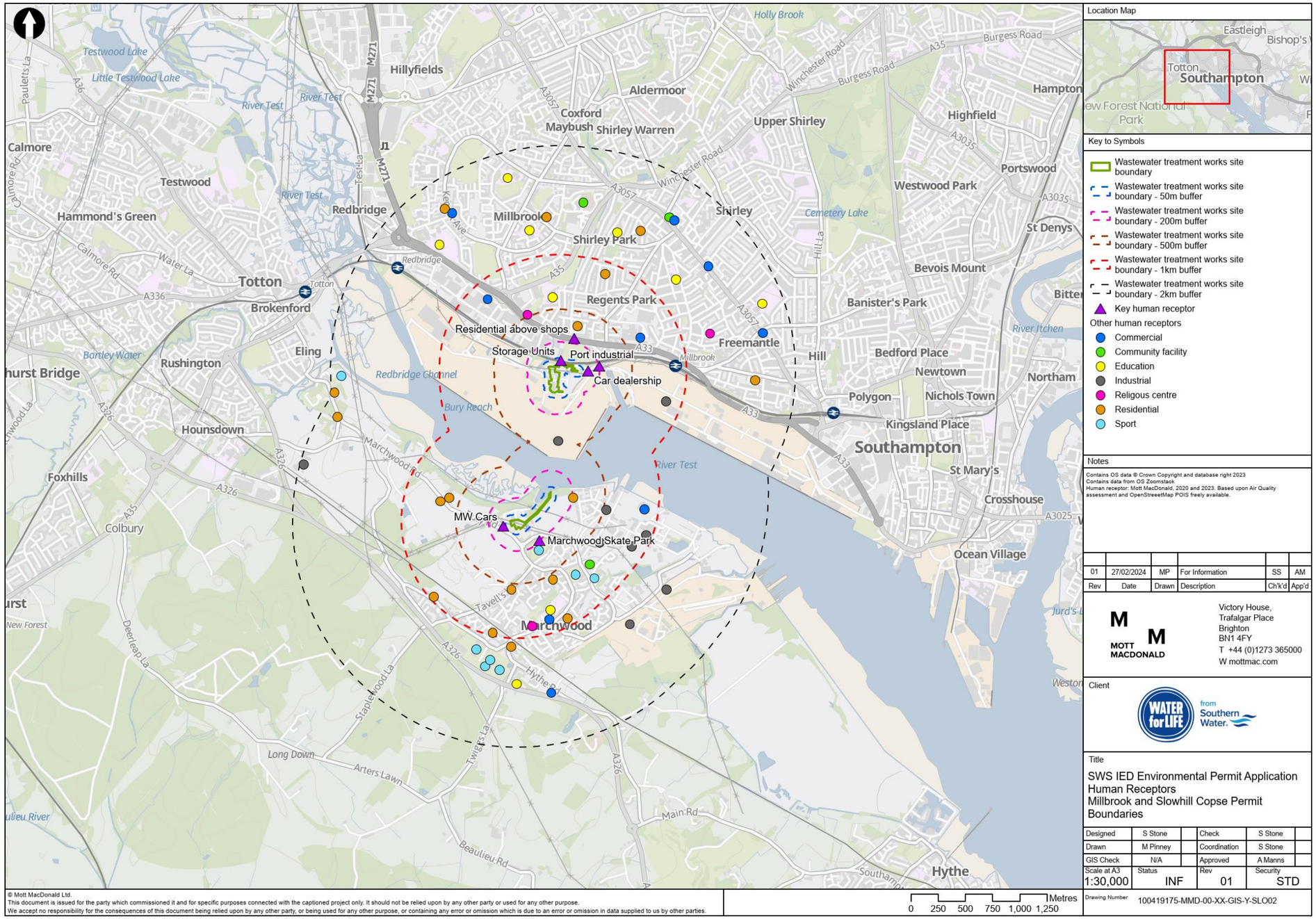


Figure A.3: Designated heritage sites within 1km of the Site



C:\Users\pin94311\Mott MacDonald\SWS EMA - Lot 8 - EIA - 001_GIS\03_Map_composition\SWS_EMA_Pro\SWS_EMA_Pro.aprx\Inception_Report_Designated_Heritage_Assets

Figure A.4: Sensitive receptors within 2km of the Site



B. Environmental Risk Assessment Tables

Table B.1: Environmental Risk Assessment Tables

Emissions to air									
Data and information				**Judgment**				**Action (by permitting)**	
Receptor	**Source**	**Hazard**	**Pathway**	**Probability of exposure**	**Consequence**	**Magnitude of risk**	**Justification for magnitude**	**Risk management**	**Residual risk**
Local human population	Releases of NO_2, SO_2, CO, NH_3 and other gases	Harm to human health – respiratory irritation and illness	Air transport then inhalation	Low	Medium	Low	There is potential for exposure to anyone living close to the Site or at locations where members of the public might be regularly exposed.	Activities will be managed and operated in accordance with the EMS. This will include regular inspection and maintenance of associated equipment. Point source emissions to air will be monitored in line with the permit requirements and any relevant TGNs including M2 and will meet Monitoring Certification Scheme (MCERTS) standards where suitable and available. NOx and GHG emissions are controlled by emission limits. Storage of high ammonia bearing material will be covered at all times. Any emissions of substances harmful to human health not controlled by emission limits (excluding odour and noise) shall not cause pollution.	Low
Local human population	Release of unburnt biogas	Harm to human health – respiratory irritation and illness. Release of potent climate change gases	Air transport	Medium	High	High	There is potential for exposure to anyone living close to the Site or at locations where members of the public might be regularly exposed. The operation of the flare will be prioritised for during emergencies, such as during CHP maintenance or downtime. In any other scenario the imports of the biogas to the CHP unit will be controlled to reduce the time of operation of the flare where possible.	Activities shall be managed and operated in accordance with the EMS and will include measures covering inspection and maintenance of equipment, including engine management systems. Point source emissions to air will be monitored to ensure emission limits for biogas are not exceeded, in accordance with permit requirements and any relevant TGN's including M2.	Medium
Domestic properties, local human population, local amenity, site staff, visitors and offices.	Releases of particulate matter (dust) from cake and storage bays and Transport off-site	Nuisance, loss of amenity.	Air transport then deposition	Medium	Low	Low	Local residents and the surrounding environment are often sensitive to dust. Dust may be produced from dirt deposits from vehicles or other users of the haul road and treatment and storage of cake. There is one small cake bay on-site for when the cake silo is not in use, in normal operations the cake is stored within a 240m3 silo. Waste types on site are unlikely to cause significant dust emissions, therefore, the magnitude of risk is considered to be low.	No wastes consisting solely of dusts are accepted. General operations at the Site do not create dust materials. Cake is stored in an enclosed silo on-site. Cake is moved around the site eight 20t tippers per day when cake is stored in the alternative cake bay (skip) when the silo is not in use. Vehicles, equipment and impermeable surfaces are swept and washed down when necessary. Internal roads are swept, as required, to reduce the likelihood of any dust becoming airborne. Vehicles removing cake from site are kept covered, whilst in transport to prevent the escape of waste. The majority of the Site operations are fully enclosed. All sludge treatment processes are covered or enclosed, with the exception of the primary settlement tanks (PSTs) and final settlement tank (FSTs). The inlet works is partially covered. Liquid lime solution is dosed into digested liquid sludge prior to the dewatering stage, it is therefore not dusty by nature.	Low

Local human population.	Release of microorganisms (bioaerosols)	Harm to human-health – respiratory irritation and illness.	Air transport then inhalation	Low	Medium	Low	The permitted waste is non-hazardous sludge in liquid and cake form. The nature of waste and the 'wet' processes undertaken on-site are not likely to cause a release of bio-aerosols. There are four sensitive receptors within 250m of the Site. Emergency situations such as failure of the flare of CHP/boilers could result in uncontrolled emissions of bioaerosols.	Multiple control measures are in place at the Site which reduce and contain emissions of bioaerosols from the processes on-site by inhibiting the pathway between source and receptor. The majority of the Site operations are fully enclosed. All sludge treatment processes are covered or enclosed, with the exception of the PSTs and FSTs. The inlet works is partially covered. Cake is removed from site and is dropped directly from the silo into the tipper trucks, or the alternative cake bay (skip) is emptied onto closed ro-ros every 3-4 hours. Imported sludge cake is delivered in sealed containers and is unloaded for processing immediately and the cake is transferred straight into the hopper. Any emergency event would be temporary and infrequent due to the extensive monitoring and maintenance programmes undertaken at the Site as well as the emergency procedures and warning systems in place. Combustion of biogas occurs at very high temperatures in the CHP, boilers and flare, which would destroy bioaerosols. Stringent loading and unloading procedures are in place for receipt of sludge and liquor. Appropriate wash facilities are also provided for drivers to clean the vehicles after loading or unloading in sludge storage bays and loading points, hose wash facilities are used at waste receptions, using final effluent. Lorry and tanker drivers are required to hose down any spillage after each loading or unloading and clean contaminated wheels before leaving site. A Bio-aerosol Risk Assessment has been undertaken to assess the risks of bio-aerosols from the site. This identifies that bio-aerosol risks are low to medium.	Low

Emissions to water and land									
Data and information				**Judgement**				**Action (by permitting)**	
Receptor	**Source**	**Hazard**	**Pathway**	**Probability of exposure**	**Consequence**	**Magnitude of risk**	**Justification for magnitude**	**Risk management**	**Residual risk**
All surface waters close to and downstream of the Site.	Tank failure, spillages of digestate and/or liquids including oil. Damage to drainage system. Spillage of raw materials of sludge/liquor during delivery/storage. Contaminated run off from cake storage e.g. containing suspended solids.	Aquatic or chronic effects to aquatic life, contamination, and water deterioration of water quality.	Direct run-off from the Site across ground surface, via surface water drains, ditches etc. Indirect run-off via the soil layer. Transport through soil/groundwater then extraction/ abstraction at borehole or intake.	Medium	High	High	Potential for leaks from digestions tanks, storage vessels/bays and drainage system which may cause contamination or deterioration of surface water quality. The hardstanding and pavement across the site is in reasonable condition. Parts of the site are bunded including storage areas for raw materials and waste stored on-site, and as hardstanding is in place, all water flows to the drainage network which diverts all water to the head of works. Quantities of liquids stored are generally low. The nearest watercourse is the River Test 350m south east of Site.	The Site drainage plan is documented and all staff are trained in the event of emergency or accident. Impermeable surface and secondary containment, in the form of constructed bunds or portable bunds, is in place around storage areas of all wastes and raw materials surrounding the Site. There is a waste area where all skips are and bins are stored on a hardstanding area. Additional containment around digesters and other storage vessels is subject to a risk assessment and will be undertaken as part of the BAT requirements and in accordance with the Construction Industry Research and Information Association (CIRIA) standard 736. All transfer of digestate and material takes place under supervision and with flow rate control.	Medium
Abstraction from watercourse downstream of facility (for agricultural or potable use).	Spillage of liquids, contaminated rainwater run-off from waste e.g. containing suspended solids.	Acute effects, closure of abstraction intakes.	Direct run-off from site across ground surface, via surface water drains etc. then abstraction.	Low	Medium	Low	Watercourse must have medium / high flow for abstraction to be permitted, which will dilute contaminated run-off. No groundwater abstractions are present on-site.	All tanks undergo a delegated inspection regime and the process parameters are monitored and understood by Site operatives. Digestion tanks are built to appropriate standard and require appropriate bunding.	Low
Groundwater, land and surface water	Spillages of liquids, contaminated rainwater	Chronic effects: contamination of	Transport through soil/groundwater then	Low	Medium	Low	Potential for leaks from digestion tanks and storage vessels.	Cake is stored in an enclosed silo on-site. Cake is moved around the site eight 20t tippers per day when	Low

	run-off from wate e.g. containing suspended solids. Sludge/liquid spillages as a result of loss of tank/pipe integrity carelessness during transfer or overfilling	groundwater, requiring treatment of water or closure of borehole or closure of abstraction intakes. Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality. Pollution of water or land.	extraction at borehole or intake.				Site infrastructure and hardstanding is generally in good condition. The hardstanding and pavement across the key areas of the site is in generally good condition, with minor cracks. Quantities of liquids stored are generally low.	cake is stored in the alternative cake bay (skip) when the silo is not in use. Activities are managed and operated in accordance with the EMS. Spill procedures are in place under EMS363 and 364 as well as a pollution prevention procedure EMS360 All spillages are recorded in the site diary including actions taken. Site Manager ensures the programme of Planned Preventative Maintenance (PPM) is implemented effectively to minimise the probability of equipment malfunction. Control of substances hazardous to health (COSHH) assessment undertaken for all raw materials. Both clean and contaminated surface water is directed to a pumping station which recirculates it back into the system. The surface drainage of potentially contaminated areas from within the Site boundary is routed into the head of the works with no discharge outside of the Site boundary. Regular inspections of the Site drainage systems and other equipment are undertaken, with any repairs and maintenance carried out if necessary. All complaints and other incidents are recorded in the site diary including actions taken. The condensate is clean, uncontaminated water and is small in quantity.	
Groundwater, land and surface water	Spillages of sludge/liquids during transfer of imported and indigenous/unknown sludge and liquids from tankers.	Acute or chronic effects: contamination of groundwater, requiring treatment of water or closure of borehole or closure of abstraction intakes. Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality. Pollution of water or land.	Transport through soil/groundwater then extraction/ abstraction at borehole or intake.	Low	Medium	Low	Potential for spillage during transfer of liquid/sludge from tankers. Five lorries a day of cake is imported to the Site from other Southern Water sites. Imported sludge is piped directly to the Site from SHCSR. Sludge cake is delivered in sealed containers. Cake is transported around the site via 20t tippers. Cake is dropped directly from the silo into the trucks.	Impermeable surface required for storage of all waste. Activities to be managed and operated in accordance with the EMS and management plans and procedures implemented to reduce spills when transferring liquids/sludges from tankers. Established procedures in place for the waste duty of care (EMS380), operational waste procedures (EMS381) and waste rejection (EMS488). Compliance with the waste duty of care requirements to ensure waste accepted meets the permit conditions and relevant legislation. All liquid run off will be captured in the drainage network and returned to head of works.	Low
Groundwater, land and surface water	Damage to drainage system	Acute or chronic effects: to aquatic life, contamination and deterioration of land and water quality. Pollution of water or land.	Transport through soil/groundwater then extraction/abstraction at borehole or intake.	Low	Medium	Low	There is no leak detection of underground pipework on the Site.	Site Manager ensures the programme of PPM is implemented effectively and inspections are carried out frequently to minimise the probability of damage to the drainage system.	Low
Groundwater, land and surface water	Flooding of site	If waste is washed off-site it may contaminate natural habitats downstream.	Flood waters	Low	Medium	Low	Permitted waste types are sludges/bio-solids, which may contain pathogens, so any waste washed off-site will add to the volume of the local post-flood clean up and may be hazardous to human health. There are no known issues with flooding on-site from the nearby waterbodies or rainfall at Millbrook STC. Millbrook STC did experience on-site flooding in 2021 from a high tidal event leading to back up of water from the drains flowing to the River Test. The drains were inspected and cleared to prevent an occurrence. No historical floods have been recorded.	The drainage network sends water to the head of the works for treatment. There are no direct potentially contaminated discharges to controlled surface waters. Activities to be managed and operated in accordance with a management system and management plans and procedures implemented, including the removal of spilled waste and other pollutants (such as use of spill kits and mobile bunds) before these could enter any flood waters if an event was to occur.	Low

							There have also been no known flooding incidents recorded at SHCSR in recent operation of the site.		
Noise and vibration									
Data and information				**Judgement**				**Action (by permitting)**	
Receptor	**Source**	**Hazard**	**Pathway**	**Probability of exposure**	**Consequence**	**Magnitude of risk**	**Justification for magnitude**	**Risk management**	**Residual risk**
Local human population	Noise and vibration from the following activities: Vehicles delivering/removing wastes and materials. Vehicles arriving/leaving the Site.	Nuisance, loss of amenity, loss of sleep	Noise through the air and vibration through the ground.	Low	Low	Low	Local residents and site staff are often sensitive to noise and vibration. There are three sensitive receptors within 250m of the Site	Site will only accept imports within existing operating hours established in current Environmental Permit (fully complying with site's planning conditions). Vehicles do not exceed the site speed limit of 10mph and will not generate a great amount of noise. The main truck movements are away from residential housing and other sensitive receptors. Noise and vibration shall be minimised and not cause nuisance. Noise kept to a minimum during operating hours. Exceptional noisy operations e.g. construction – inform residents. Noise complaints to be investigated and actioned and remedial measures will be undertaken. All complaints are recorded in the site diary including actions taken.	Low
Local human population	Noise and vibration from the following activities: Waste treatment processing. Plant boilers and engines.	Nuisance, loss of amenity, loss of sleep	Noise through the air and vibration through the ground.	Low	Low	Low	Local residents and site staff often sensitive to noise and vibration. Majority of site operations are fully enclosed. There are three sensitive receptors within 250m of the Site	Limitation of operating hours established in current Environmental Permit (fully complying with site's planning conditions). Fans and condensate traps will be checked for water and fans and extraction systems checked. The majority of the Site operations are fully enclosed. All sludge treatment processes are covered or enclosed, with the exception of the PSTs and FSTs. Flare usage is kept to a minimum to reduce noise impact. The design has been developed to minimise noise off-site. All equipment is maintained either in house or by a sub-contractor such that noise and vibration are maintained within the required limits and to manufacturers recommendations. Where equipment is to be replaced, preference will be given to procuring quiet plant and silencing equipment. Proper maintenance of plant and equipment. There is no equipment on-site that can cause vibration nuisance at the local receptors. Nonetheless, equipment is turned off when not in use, where appropriate. Any complaints received are investigated and actioned in line with the complaint's procedure. All complaints are recorded in the site diary including actions taken.	Low
Odour									
Data and information				**Judgement**				**Action (by permitting)**	
Receptor	**Source**	**Hazard**	**Pathway**	**Probability of exposure**	**Consequence**	**Magnitude of risk**	**Justification for magnitude**	**Risk management**	**Residual risk**
Local human population.	Odour from site activities	Nuisance, loss of amenity, (e.g. disruption during outdoor activities)	Air transport then inhalation	Low	Medium	Low	Local residents often sensitive to odour. Wide range of waste may cause odour issues at reception from wastes, release of biogas and from digestate hence control measures adopted. There are four sensitive receptors within 500m of the Site.	Odours are likely to be generated and released due to the nature of the wastes. There is one odour control unit (OCU) on Site. The OCU treats extracted odorous air from sludge reception tanks, PSSTs, gravity belt thickeners, digester feed tank and centrifuges.	Low

								The OCU consists of a single stage dual tower wet chemical scrubber system, using sodium hypochlorate and caustic to treat odorous air before the treated air is released via a stack to the atmosphere. Processes on-site are carried out indoors, with very little exposed to air, shutters are kept closed on buildings unless something is moving through them. The majority of the Site operations are fully enclosed. All sludge treatment processes are covered or enclosed, with the exception of the PSTs and FSTs. Odour is monitored to ensure emissions are free of odorous compounds. The Site's Odour Management Plan, which was produced in June 2024, identifies potential odour emissions from site operations and procedures to manage, control and minimise odour impacts. Using appropriate measures, non-point source emissions of biogas shall be minimised. All available measures and Best Available Techniques will be implemented. All abatement systems are designed, monitored and maintained to treat specified emissions and off gases. Any emissions of substances not controlled by emission limits (excluding odour and noise) shall not cause pollution. Cake is stored in a 240m^3 silo on-site, imported cake is processed immediately. Cake is transported around the site via 20t tippers. All waste is imported and exported in covered lorries or contained in tankers. Any complaints received are investigated and actioned in line with the complaint's procedure.	
Local human population, domestic properties, site offices.	Spillages of odorous materials including oils, fuels, chemicals. Failure to clean up spillages. Contaminated spill equipment not disposed of appropriately.	Nuisance, loss of amenity.	Air transport, then inhalation.	Low	Medium	Low	Local residents and staff often sensitive to odour. There are four sensitive receptors within 500m of the Site	Procedures for dealing with spillages are covered in the EMS under EMS363 and 364 for the Site. There is also a Field Event Co-ordinators (FEC) Manual which provides spillage procedures for EP sites (FEC322). The Site Manager shall ensure all relevant staff are appropriately trained to use the spill kits and that all spillages are cleaned up immediately. All areas of the Site are to be cleaned regularly; Site Manager to oversee regular cleaning schedule, all staff trained on importance of good housekeeping and site cleanliness. All spills are recorded in the site diary including actions taken.	Low
Local human population, domestic properties, site offices.	Fugitive release of H2S.	Nuisance, loss of amenity.	Air transport, then inhalation.	Low	Medium	Low	Local residents and staff often sensitive to odour. There are four sensitive receptors within 500m of the Site Fugitive release, not expected to occur under normal operating conditions.	Activities are managed and operated in accordance with the EMS (and include inspection and maintenance of equipment, including engine management systems). H2S point source emissions to air are controlled in accordance with emission limits. The OCU consists of a single stage dual tower wet chemical scrubber system, using sodium hypochlorate and caustic to treat odorous air before the treated air is released via a stack to the atmosphere.	Low
Litter, mud and debris									
Data and information				**Judgement**				**Action (by permitting)**	
Receptor	**Source**	**Hazard**	**Pathway**	**Probability of exposure**	**Consequence**	**Magnitude of risk**	**Justification for magnitude**	**Risk management**	**Residual risk**

Local human population, livestock and wildlife, domestic properties and local amenity.	Waste and litter on local and internal roads. Vehicles entering and leaving site.	Nuisance, loss of amenity and road traffic accidents.	Air transport then deposition.	Low	Low	Low	Local residents, surrounding environmental and animals sensitive to litter. There is some potential for litter to be generated from general site activities, but limited potential for it to leave the Site boundary. Cake that is delivered to the Site is transported in tankers.	All vehicles leaving the site which are transporting waste are to be covered to prevent waste/materials escaping from them. All waste produced from general site activities is kept in enclosed containers, or inside a building, prior to removing from site. All waste is removed by an external contractor when required. Regular inspections for litter and debris are undertaken. Nuisance management measures are included in the EMS and the site specific management plant. Details of the procedures Southern Water follows with regards to the controls of mud and debris and potentially polluting leaks and spillages can be found in EMS 360 and EMS 381.	Low
Local human population	Vehicles depositing mud and debris arriving/ leaving the Site.	Nuisance, loss of amenity and road traffic accidents.	Vehicles entering/ leaving the Site.	Low	Low	Low	Road safety issues – local residents often sensitive to mud on the road. Limited potential for mud and debris.	Activities shall be managed and operated in accordance with a site-specific management plan with overarching procedures set out in the EMS. Details of the procedures Southern Water follows with regards to the control of mud and debris and potentially polluting leaks and spillages can be found in EMS 360 and EMS 381. Any mud or sludge arising from activities on-site is cleared up promptly. All hardstanding is cleaned and swept on a regular basis. Hose wash facilities are available at waste receptions. Any emissions of substances not controlled by emission limits (excluding odour and noise) shall not cause pollution. Vehicle routes are to be inspected regularly and swept where necessary.	Low
Pests									
Data and information				**Judgement**				**Action (by permitting)**	
Receptor	**Source**	**Hazard**	**Pathway**	**Probability of exposure**	**Consequence**	**Magnitude of risk**	**Justification for magnitude**	**Risk management**	**Residual risk**
Local human population	Vermin, birds and insects	Harm to human health from wastes carried off-site and faeces. Nuisance and loss of amenity.	Air transport and over land	Low	Low	Low	Permitted wastes are unlikely to attract scavenging animals and birds but certain areas may become nesting / breeding sites. Pests are not considered to be an issue at the Site since the waste types handled on-site do not attract them. Contractors regularly check the Millbrook STC for pests and appropriate mitigation is in place. A pest control contractor also visits the Slowhill site on a regular basis. Therefore, the magnitude of risk is considered to be low	Activities to be managed and operated in accordance with the EMS and management plans and procedures implemented. Pest control measures are implemented under EMS227. The waste site adjacent to the Site uses birds of prey to deter birds, the presence of pigeons and gulls is reduced. The site has routine visits by a contractor to install and inspect rat boxes. If there is an increase in pest issues then a request is made for additional contractor visits. All reports of pests are sent to the contractor who will investigate and report findings and outcomes and detail any actions required. Ensure waste cannot be accessed by scavengers. All waste produced from general site activities are kept in enclosed containers, or inside a building, prior to removing from site. Doors of buildings are to remain closed at all times when not in use. Regular inspection and maintenance of boundary fencing and buildings is carried out to prevent access to the Site. Well established and proven operational controls and procedures are in place, including regular inspection and monitoring of the Site for pests by contractors.	Low

Human health and environmental safety									
Data and information				**Judgement**				**Action (by permitting)**	
Receptor	**Source**	**Hazard**	**Pathway**	**Probability of exposure**	**Consequence**	**Magnitude of risk**	**Justification for magnitude**	**Risk management**	**Residual risk**
Local human population and local environment.	Flooding of the site.	If waste is washed off-site it may contaminate buildings/gardens/natural habitats downstream.	Flood waters	Low	Medium	Low	Permitted waste types are sludges/bio-solids, which may contain pathogens, so any waste washed off-site will add to the volume of the local post-flood clean up and may be hazardous to human health. The Millbrook STC is located in an Environment Agency zone 1 flood risk area. Areas within zone 1 have 1 in a 1,000 chance of river or sea related flooding. However, to the east of the site a section of Southampton docks is located within a zone 3 flooding risk area due to the proximity of the River Test. Areas within flood zone 3 have been shown to be at a 1% or greater probability of flooding from rivers or 0.5% or greater probability of flooding from rivers/ the sea. The area is therefore potentially at risk of flooding, but there are no historical floods on record. Millbrook STC did experience on-site flooding in 2021 from a high tidal event leading to back up of water from the drains flowing to the River Test. The drains were inspected and cleared to prevent an occurrence. There have also been no known flooding incidents recorded at SHCSR in recent operation of the site.	The drainage network sends water to the head of the works for treatment. There are no direct potentially contaminated discharges to controlled surface waters. Activities to be managed and operated in accordance with a management system and management plans and procedures implemented, including the removal of spilled waste and other pollutants (such as use of spill kits and mobile bunds) before these could enter any flood waters if an event was to occur.	Low
Local human population and / or livestock after gaining unauthorised access to the installation.	All on-site hazards: machinery, wastes and vehicles.	Bodily injury, death.	Direct physical contact.	Low	Medium	Low	Potential injury to on-site personnel as a result of vehicle movements or equipment malfunction or misuse. Direct physical contact is minimised by activity being carried out within enclosed digesters so a low magnitude risk is estimated. Contact with waste is minimal with exception of leaks or spills from unloading of tanker and transfer of filter cake.	Overall management of the site is overseen by an experienced member of staff holding an appropriate Certificate of Technical Competence (CoTC) awarded by the Waste Management Industry Training and Advisory Board. This competent person delegates responsibilities to appropriately experienced and trained site operatives throughout the operating hours. All operational staff are fully trained in the site operating procedures and Southern Water safety and environmental management procedures and are kept up to date on changes. Training includes awareness raising of the potential on-site hazards and health and safety measures to adhere to. Preventative measures will be under continuous review as part of the EMS procedures. Activities are managed and operated in accordance with the EMS – this includes site security measures to prevent unauthorised access. No maintenance work or contractor is permitted on-site without a suitable permission to work and qualification. Access to the Site and waste is restricted by automatically operated gates which are closed during operating hours. The Site perimeter is comprised of 8ft chainlink fencing. The Millbrook STC is manned during opening hours	Low

Human health and environmental safety									
Data and information				**Judgement**				**Action (by permitting)**	
Receptor	**Source**	**Hazard**	**Pathway**	**Probability of exposure**	**Consequence**	**Magnitude of risk**	**Justification for magnitude**	**Risk management**	**Residual risk**
								(7am – 7pm), and staff are on call. The Site has CCTV at the inlet, gas holder and access gate. Access to SHCSR is restricted by a secure perimeter fencing and an electric gate at the main entrance of the site, plus a locked gate policy that is adhered to. The Slowhill site is manned only on weekdays, 07:30-16:00 Monday to Wednesday, and 07:30-15:00 Thursday to Friday. Authorised personnel can gain access to the Site using a fob system. For visitors and unauthorised personnel there is an automatic gate with an intercom system at the site entrance, and a visitor signing-in book is used. Regular inspections of the boundary fencing and buildings are undertaken to ensure that these have not been compromised and continue to prevent easy access to site. Repairs are undertaken in accordance with the EMS requirements. Key sludge treatment and wastewater treatment activities undertaken within enclosed systems. Five lorries a day of sludge are imported to the Site seven days a week. Vehicle movements around the Site vary depending on what activities are being undertaken. Cake is moved to cake bays once a trailer is full. Cake is removed from the site daily; the cake is dropped directly from the silo into tippers. Waste is removed as required. Therefore, frequent vehicle movements are typically undertaken only by site staff and maintenance contractors. Operator has produced a hazard review and risk assessment documents relating to this and other types of potential incidents, within the EMS, H&S and O&M manuals.	
Local human population and local environment.	Explosion of biogas causing release of polluting materials to air (smoke or fumes), water or land	Respiratory irritation, illness and nuisance to local population. Injury to staff, fire fighters or arsonists/vandals. Potential for uncontrolled release of fugitive emissions of gaseous, liquid or solid materials to air, water or land. Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality.	Air transport Direct run-off from site across ground surface, via surface water drains, ditches etc. Indirect run-off via the soil layer Transport through soil/ groundwater then abstraction.	Low	High	Medium	Emissions to air, land or water may cause harm to and deterioration of air, land or water. Smoke and fumes may cause irritation, illness or nuisance to local residents and site staff. An explosion could cause injury to local residents and site staff from flying debris. Although biogas is flammable, risk of direct physical contact is minimised by activity being carried out within the sludge treatment works and in containerised units or locked buildings. Permitted waste types limited to sludges and liquids.	The key sludge treatment and WTW processes are undertaken within enclosed systems such as the AD and biogas systems. All sludge storage tanks are covered and enclosed. Activities are managed and operated in accordance with the EMS, H&S and O&M manuals – this includes site security measures to prevent unauthorised access. No maintenance work or contractor is permitted on-site without a suitable permission to work and qualification. Fire detection equipment is installed in the CHP containers and the boiler building which activate an alarm on detection of a fire. Slam shut valves on biogas lines will automatically close on detection of a fire to prevent any fuel being supplied to the CHP engines or boilers. Training and regular toolbox talks are given to operatives on-site and all operators and staff understand their role in an emergency. The EMS includes procedures relating to maintenance and inspection of bunding of tanks. Site Manager shall ensure the programme PPM is implemented effectively to minimise the probability of fire through faulty plant and equipment.	Low
Local human population and local environment.	Explosion of pressurised tanks due to equipment and/ or process failure.	Respiratory irritation, illness and nuisance to local population. Fatality/injury to staff, fire fighters. Potential for uncontrolled release of fugitive emissions of gaseous, liquid or solid		Low	Medium	Low	Emissions to air, land or water may cause harm to and deterioration of air, land or water. Smoke, fumes and material released from tanks may cause irritation, illness or nuisance to local residents and site staff. Impact from the tank explosion may cause external damages to other equipment,		Low

Human health and environmental safety									
Data and information				**Judgement**				**Action (by permitting)**	
Receptor	**Source**	**Hazard**	**Pathway**	**Probability of exposure**	**Consequence**	**Magnitude of risk**	**Justification for magnitude**	**Risk management**	**Residual risk**
		materials to air, water or land. Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality.					buildings located close to the epicentre of the explosion.	All equipment is checked and calibrated as per the manufacturer's instructions. Emergency operating procedures are in place. Adequate firefighting measures are implemented on-site. The main site entrance is secured by an automictically operated gate. Furthermore, an 8ft chain link fence surrounds the entire site boundary to prevent unauthorised access of pedestrians. The Site also benefits from a CCTV system. There are CCTV cameras. All monitored and controlled from control room. The Millbrook STC is manned 12 hours a day, 7 days a week, with 24/7 call out. The Slowhill site is manned only on weekdays, 07:30-16:00 Monday to Wednesday, and 07:30-15:00 Thursday to Friday.	
Local human population and local environment	Accidental fire causing the release of polluting materials to air (smoke or fumes), water or land. Equipment failure.	Respiratory irritation, illness and nuisance to local population. Injury to staff or fire fighters. Potential for uncontrolled release of fugitive emissions of gaseous, liquid or solid materials to air, water or land. Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality.	Air transport Direct run-off from site across ground surface, via surface water drains, ditches etc. Indirect run-off via the soil layer Transport through soil/ groundwater then abstraction	Low	Medium	Low	Emissions to air, land or water may cause harm to and deterioration of air, land or water. Smoke and fumes may cause irritation, illness or nuisance to local residents and site staff. Although biogas is flammable, risk of direct physical contact is minimised by activity being carried out within the sludge treatment works and in containerised units or locked buildings. Risk of accidental combustion of waste is minimal. Permitted waste types limited to sludges and liquids.	The key sludge treatment and WTW processes are undertaken within enclosed systems Storage tanks are enclosed and covered. Activities are managed and operated in accordance with the EMS, H&S and O&M manuals including, fire and spill management. Fire detection equipment is installed in the CHP containers and the boiler building which activate an alarm on detection of a fire. Slam shut valves on biogas lines will automatically close on detection of a fire to prevent any fuel being supplied to the CHP engines or boilers. A Fire Prevention Plan is not required to be submitted for the permit application as the biowaste process on-site is wet anaerobic digestion. However, fire prevention and environmental fire risk assessment procedures are provided in the EMS, H&S manual and Safety Instruction Book (SIB) (EMS362, H&S204, H&S440, and SIB603). There is also Safety zoning of areas under DSEAR/PEXA on-site and Smoking is only permitted in designated areas. Firewater within a newly bunded area will be contained by the bund and allow for appropriate disposal. There will be no gravity hydraulic connection from the bund to the drainage system/return to head of works. Manual intervention by an operator will be required to start the pumps and remains subject to the pre-acceptance (sample/test) procedure to ensure the water is appropriate for discharge to head of works. In the event of an incident, depending on the nature of the contamination (firewater in this context) the product will be held within the bund and be subject to alternative disposal methods. Depending on the scale and nature of the incident this may include temporary holding in road tankers to facilitate safe recovery activities. The detail regarding this procedure remains subject to further evaluation as solutions are designed and implemented. Firewater use on other process/equipment areas (which either have existing, or will be provided with new, impermeable surfaces) will drain to site drainage	Low

Human health and environmental safety									
Data and information				**Judgement**				**Action (by permitting)**	
Receptor	**Source**	**Hazard**	**Pathway**	**Probability of exposure**	**Consequence**	**Magnitude of risk**	**Justification for magnitude**	**Risk management**	**Residual risk**
								systems. A robust means of isolating the site drainage from returning to the head of works is required. Where sites have pumped return to head of works stopping the pump and ensuring no hydraulic link (syphoning) is required. Where return to head of works is (or could be) gravity returned, a new isolation valve is required which is to be shut in the event of an incident. Implementation of these measures will ensure no firewater returns to the WtW without appropriate controls including sampling/testing. Further design development is underway to determine the most appropriate solution to address this requirement and ensure compliance.Training and regular toolbox talks are given to operatives on-site and all operators and staff understand their role in an emergency. The EMS and Safety Instruction Book (SIB) includes procedures relating to maintenance and inspection of bunding of tanks, spills and environmental incidents. Site Manager shall ensure the programme of PPM is implemented effectively to minimise the probability of fire through faulty plant and equipment. All equipment is checked and calibrated as per the manufacturer's instructions. Emergency operating procedures are in place. Adequate firefighting measures are implemented on-site.	
Local human population and local environment.	Arson and/or vandalism causing the release of pollution materials to air (smoke and fumes), water or land.	Respiratory irritation, illness and nuisance to local population. Injury to staff, fire fighters or vandals/arsonists. Potential for uncontrolled release of fugitive emissions of gaseous, liquid or solid materials to air, water or land. Acute or chronic effects to aquatic life, contamination of land and water quality.	Air transport. Spillages and contaminated firewater by direct run-off from site across ground surface, via surface water drains, ditches etc. Indirect run-off via the soil layer. Transport through soil/ groundwater then abstraction.	Low	Medium	Low	Emissions to air, land or water may cause harm to and deterioration of air, land or water. Smoke and fumes may cause irritation, illness or nuisance to local residents and site staff. Although biogas is flammable, risk of direct physical contact is minimised by activity being carried out within the sludge treatment works and in containerised units or locked buildings. Risk of accidental combustion of waste is minimal. Permitted waste types limited to sludges and liquids	The key sludge treatment and WTW processes are undertaken within enclosed systems such as AD and biogas systems. Storage tanks are covered and enclosed. Activities are managed and operated in accordance with the EMS, H&S and O&M manuals – this includes site security measures to prevent unauthorised access, fire explosions and spill management. No maintenance work or contractor is permitted on-site without a suitable permission to work and qualification. Fire detection equipment is installed in the CHP containers and the boiler building which activate an alarm on detection of a fire. Slam shut valves on biogas lines will automatically close on detection of a fire to prevent any fuel being supplied to the CHP engines or boilers. A Fire Prevention Plan is not required to be submitted for the permit application as the biowaste process on-site is wet anaerobic digestion. However, fire prevention and environmental fire risk assessment procedures are provided in the EMS and H&S manual (EMS362, H&S204 and H&S440). There is also Safety zoning of areas under DSEAR/PEXA on-site and Smoking is only permitted in designated areas. Training and regular toolbox talks are given to operatives on-site and all operators and staff understand their role in an emergency. The EMS includes procedures relating to maintenance and inspection of bunding of tanks, spills and environmental incidents.	Low

Human health and environmental safety									
Data and information				**Judgement**				**Action (by permitting)**	
Receptor	**Source**	**Hazard**	**Pathway**	**Probability of exposure**	**Consequence**	**Magnitude of risk**	**Justification for magnitude**	**Risk management**	**Residual risk**
								Site Manager shall ensure the programme of PPM is implemented effectively to minimise the probability of fire through faulty plant and equipment. All equipment is checked and calibrated as per the manufacturer's instructions. Emergency operating procedures are in place. Adequate firefighting measures are implemented on-site. Access to the Site and waste is restricted by automatically operated gates which are closed during operating hours. The Millbrook STC perimeter is comprised of 8ft chainlink fencing. The site is manned during opening hours (7am – 7pm), and staff are on call. The Site has CCTV at the inlet, gas holder and access gate. The Slowhill site is manned only on weekdays, 07:30-16:00 Monday to Wednesday, and 07:30-15:00 Thursday to Friday. Authorised personnel can gain access to the Site using a fob system. For visitors and unauthorised personnel there is an automatic gate with an intercom system at the site entrance, and a visitor signing-in book is used. Regular inspections of the boundary fencing and buildings are undertaken to ensure that these have not been compromised and continue to prevent easy access to the Site. Repairs are undertaken in accordance with the EMS requirements.	
Local human population and local environment.	Operator Error.	Pollution to air, land, surface water and groundwater and human health	Air transport Direct run-off from site across ground surface, via surface water drains, ditches etc. Indirect run-off via the soil layer. Transport through soil/ groundwater then abstraction.	Low	Medium	Low	Possible contamination to air, land, groundwater and surface water. Given the level of operator controls which are in place and management plans, it is considered the probability and magnitude will be low.	Activities to be managed and operated in accordance with the EMS and management plans and procedures implemented. All equipment is checked under preventative maintenance plans and is checked and calibrated as per the manufacturer's instructions. Overall management of the Site is overseen by an experienced member of staff holding an appropriate Certificate of Technical Competence (CoTC) awarded by the Waste Management Industry Training and Advisory Board. This competent person delegates responsibilities to appropriately experienced and trained site operatives throughout the operating hours. All operational staff are fully trained in the Site operating procedures and Southern Water safety and environmental management procedures and are kept up-to-date on changes. Training includes awareness raising of the potential implications of failure to control operations and the potential impact on the environment. Preventative measures will be under continuous review as part of the EMS procedures. Emergency operating procedures are in place and detailed in the Site's Operational Contingency Plan. Senior site-based management have direct responsibility for implementing risk management measures.	Low

Natural habitats and ecology									
Data and information				**Judgement**				**Action (by permitting)**	
Receptor	**Source**	**Hazard**	**Pathway**	**Probability of exposure**	**Consequence**	**Magnitude of risk**	**Justification for magnitude**	**Risk management**	**Residual risk**
Protected nature conservation sites – European and national designated sites.	Any, but principally NOx.	Harm to protected site through toxic contamination, nutrient enrichment, disturbance etc.	Air transport Direct run-off from site across ground surface water drains, ditches etc. Indirect run-off via the soil layer. Transport through soil/ groundwater then abstraction.	Low	Medium	Low	Physical disturbance and emission to air, water or land may cause harm to and deterioration of nature conservation sites. However, impacts to these sites are unlikely. Three SACs, two SPAs, and two Ramsar site are located within 10km of the Site. Two SSSIs and a Wildlife Trust reserve are located within 2km of the Site.	Activities to be managed and operated in accordance with the EMS and management plans and procedures implemented. Emissions of substances not controlled by emission limits (excluding odour and noise) shall not cause pollution. Storage of high ammonia bearing material will be covered at all times. Emission limits for stack gases are specified.	Low
Protected species, including nesting birds, wintering birds, common reptiles, terrestrial and aquatic invertebrates, common amphibians, bats, badgers, hazel dormice and great crested newts.	Any, but principally NOx.	Harm to protected species through disturbance or removal of habitats.		Low	Medium	Low	Physical disturbance and emissions to air may cause harm to protected species. The proposal for the Permit does not involve the removal of vegetation, or structural modification to built structures. It is considered very unlikely, therefore, that Site activities would lead to the disturbance or removal of terrestrial habitats.	BAT and appropriate additional mitigation measures set out in the EMS (EMS323, EMS223, EMS228 and EMS220), have been taken to prevent or where that is not practicable, to minimise, those emissions. As required by the Southern Water EMS various housekeeping and waste management practices are in place to monitor waste emissions. These include segregation of wastes according to their classification and nature, labelling waste and using designated storage containers.	Low

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