MOTT MACDONALD

Queensferry Sludge Treatment Centre

Environmental Risk Assessment

February 2025

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Issue and Revision Record

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Document reference: B16383-123532-XX-XX-AS-ZA-EI0108 – QUY Environmental Risk Assessment February 2025

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1 Introduction

1.1 Background and scope

This document has been prepared to support the application for a new bespoke Industrial Emissions Directive (IED) Installation environmental permit for the Queensferry Sludge Treatment Centre (STC) ('the Site') on behalf of Dwr Cymru Welsh Water (DCWW or 'the Operator'). The Site does not currently hold an Environmental Permit for its STC activities.

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 facility in accordance with the Natural Resources Wales (NRW), and where applicable the Environment Agency's, 'Risk assessments for your environmental permit' guidance[1].

Operations on-site include the recovery of sludge (non-hazardous waste) using biological treatment and the utilisation and flaring of resultant biogas, currently operating under a T21 exemption at the site.

1.2 Assumptions and limitations

The risk assessment sets the requirements for the management of the permitted operations at the site including emission control measures. All control measures within the rules must be adhered to in order to obtain the permit. 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 NRW and the Environment Agency are up to date and correct at the time of writing.

[1] Environment Agency (2023) Risk assessments for your environmental permit .Available online at: https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit

2 Site Setting

Information presented within this Section is taken from the Envirocheck for the Site (B16383-123532-XX-XX-NN-NA-DH0111 QUY SCR App Envirocheck). Any reference made to the WwTW is for context only.

2.1 Location

Activity address: Queensferry WwTW, Queensferry, Deeside, CH5 2QJ.

National grid reference: SJ 32380, 68530

A plan showing the boundary of the site is presented in document reference B16383-123532-XX-XX-DR-ZA-DH0113 – QUY Site Layout Plan October 2024.

2.2 Geology

The entire WwTW, including the STC, is underlain by made ground (undivided), which extends north-east towards the River Dee and infers that >2.5m thickness of made ground is present.

Below the made ground, the entire site is underlain by superficial deposits comprising Tidal Flat Deposits (clay, silt and sand). Borehole data available from the BGS indicate that the superficial deposits extend to a depth of around 20m below ground level (bgl), although boreholes in the area record bedrock at depths between approximately 8m (300m to the west) and 45mbgl (1km to the south-east).

The bedrock geology mainly comprises the Pennine Lower Coal Measures (PLCM) in the west of the WwTW, and Pennine Middle Coal Measures (PMCM) in the east of the site (both comprising mudstone, siltstone and sandstone). The Etruria Formation (mudstone, sandstone, and conglomerate) is present on the eastern boundary of the site.

The majority of the proposed permitted installation site is underlain by the Etruria Formation, with PMCM in the west / south-west side of the site.

A fault intersects the site along the north-eastern corner of the WwTW (orientated north-south) between the PMCM and the Etruria Formation. The fault runs through part of the proposed permitted installation site.

Table 2-1 summarises the published geological mapping[2] of the site:

Table 2-1: Expected Underlying Geology

Strata	Description
Made Ground	Artificial deposits of variable composition.
Tidal Flat Deposits	*Normally a consolidated soft silty clay, with layers of sand, gravel and peat.*
Glacial Till	*Heterogenous mixture of clay, sand, gravel, and boulders varying widely in size and shape.*
Pennine Middle Coal Measures Formation	*Interbedded grey mudstone, siltstone, pale grey sandstone and commonly coal seams.*

[2] British Geological Survey GeoIndex Onshore via: https://mapapps2.bgs.ac.uk/geoindex/home.html accessed November 2023.

2.3 Hydrogeology

The Environment Agency classes the underlying Tidal Flat Deposits and Glacial Till as secondary undifferentiated aquifers and the Pennine Middle Coal Measures Formation as a secondary A aquifer.

Secondary undifferentiated are aquifers where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type. These have only a minor value.

Secondary A aquifers comprise permeable layers that can support local water supplies and may form an important source of base flow to rivers.

The majority of the wider WwTW (except the eastern site boundary), including the Site boundary has the potential for groundwater flooding at surface level.

The Site is located within Flood Zone 3 for flooding from rivers or sea without defences, due to its proximity to the River Dee.

The site is not located within a Source Protection Zone (SPZ).

2.4 Hydrology

The River Dee flows approximately from east to west, 210m north of the site boundary. Sandycroft Drain (a drainage ditch) flows along the western boundary of the site into the River Dee.

A search of NRW's Public Register has been conducted. The records include a single water discharge activity permit relating to the site issued in 1996 (permit number: CG0367201), which is expected to relate to the final effluent produced on-site. Gas condensate collected from the on-site digesters is discharged to an internal site drain which returns flows to the head of the works.

2.5 Protected Areas

European sites within 10km of the Site boundary include:

- The Dee Estuary Special Area of Conservation (SAC) and Ramsar site, to the northwest of the Site.
- River Dee and Bala Lake SAC running from the northwest to the southeast of the Site
- Deeside and Buckley Newt sites SAC to the west of the Site.

Statutory designated national sites within 2km of the Site boundary include:

- Flint Mountain Special Scientific Interest (SSSI) to the west of the Site.
- The Dee Estuary SSSI to the north of the Site.
- Inner Marsh Farm SSSI to the north of the Site.
- Shotton Lagoons and Reedbeds SSSI to the northwest of the Site.
- Halwood Farm Marl Pit SSSI to the northeast of the Site.
- Gathering Grounds Woods and Llwyni Pond Local Nature Reserve (LNR) to the west of the Site.
- Burton Mill Wood LNR to the north of the Site.
- Stanney Wood LNR to the northeast of the Site.

Protected areas around the Site are shown in the environmental constraints maps included in Appendix A.

2.6 Other Notable Features

The Site is situated in a generally industrial area. It is bounded to the east by industrial units of Factory Road; to the south by the Chester and Holyhead railway line; to the west by the A494 (dual carriageway) and by a derelict site to the north.

The nearest residential properties to the Site are located approximately 90m south-west of the Site boundary. A caravan community has occupied an area approximately 110m north of the Site. These are identified in Figure A-4 in Appendix A.

3 Environmental Risk Assessment

3.1 Methodology

This 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 "SR2021 No 6 SR2012 No12", "SR2009 No 4" and "SR2008 No 19", 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. The magnitude of risk uses professional judgement and site-specific knowledge and, as such, the general pattern in Table 3-3 is not necessarily applicable to all risks.

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 ERA identifies potentially sensitive receptors within the vicinity of the Site and assesses the environmental risks within 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);
- Emissions to water and land;
- 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 risks 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.

A site-specific 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. Further risk assessment and mitigation applied across DCWW STC sites is also addressed in document reference EN (2) 01 Environmental Aspect & Impact Register, and should be read in conjunction with Appendix **Error! Reference source not found.**.

3.2.2 Point source and fugitive emissions risk

3.2.2.1 Air quality

An air quality risk assessment (AQRA) and H1 assessment to assess the impact of the combustion activities on the Site has been carried out (see document references B16383-123532-XX-XX-AS-ZA-DH0119 -QUY Air Quality Risk Assessment November 2024; B16383-123532-XX-XX-AS-ZA-DH0127 - QUY H1 Screening Assessment April 2024 and B16383-123532-XX-XX-CA-ZA-DH0128 - QUY H1TOOL_2.78 WW). This has used readily available information provided by DCWW. NRW's, and where applicable the Environment Agency's, 'Risk assessments for your environmental permit'[1] methodology was used, and has informed the environmental risk assessment presented in Appendix B. The initial review has been considered taking into account some of the following information:

- Emission points and pollutants released from the Site;
- Effective stack heights;
- Quantification of pollutants and emission rates;
- Background pollutant levels;
- Pollutant concentrations and comparison against relevant Environmental Quality Standards (EQS)/Environmental Assessment Levels (EALs); and
- Emission Limit Values.

For potential human health effects, the pollutant of key concern is NO_2, although emissions of SO_2 have also been considered. Effects of atmospheric concentrations of NOx and SO_2 have also been assessed with respect to sensitive ecological sites. The method of the assessment has taken a conservative approach by assuming worst case conditions for a number of aspects including emissions characteristics, operating scenarios and metrological conditions.

The assessment has been undertaken to determine the effect on air quality associated with emissions from the Site using advanced dispersion modelling (document reference: B16383-123532-XX-XX-AS-ZA-DH0119- QUY Air Quality Risk Assessment November 2024). For gridded and human health receptors, the emissions of NOx and SO_2 have been considered in accordance with NRW and Environment Agency guidance. Effects of atmospheric concentrations of NO_x and SO_2 and resultant effects on acidification and eutrophication have also been assessed with respect to nearby ecological sites. The method of the assessment has taken a conservative approach by assuming worst-case conditions for factors such as emission characteristics, the operating envelope and meteorological conditions.

No exceedances of the EQS are predicted as a result of the operation of the Site at locations of relevant public exposure. The air quality effects are highly localised and the impact at sensitive human health receptors is insignificant in accordance with Environment Agency guidance. At ecological receptors, the impact of NOx and SO_2 on critical levels and critical loads at nearby ecology sites is also considered to be insignificant. The Site is not considered to conflict with the relevant air quality regulations.

The CHP engine at Queensferry was replaced in August 2024, by a CHP from DCWW's Kinmel site, and refurbished. The AQRA used the specification data for this CHP model provided by DCWW for their assessment.

The CHP is powered by biogas and has a thermal rated input of 0.545MWth. Therefore, the Site falls outside the scope of the Medium Combustion Plant Directive (MCPD) since the thermal rated input is less than 1MWth thermal rated input. It is also, not subject to the specified generator rules as it is not used for standby operation. The CHP total annual operating hours is 8,500, allowing for routine maintenance. – This is due to be brought fully online by December 2024.

The Site's flare will only operate during emergencies, or when the Combined Heat and Power (CHP) is on downtime for maintenance, but less that 10% of operational time. Maintenance of the flare is undertaken annually. Overall impacts of all air pollutants are considered to be low.

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.

3.2.2.2 Bioaerosols

According to the Environment Agency guidance 'bioaerosol monitoring at regulated facilities (July 2023)', 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 multiple sensitive receptors and, therefore, a bioaerosols risk assessment has been undertaken and is provided with the supporting documents of the permit application (document reference: B16383-123532-XX-XX-AS-ZA-DH0117– QUY Bioaerosol Risk Assessment November 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 risk, a Bioaerosol Management Plan is not required.

Best practice methods will be followed, during operation of the Site, 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" [3] and are described in Appendix B.

3.2.2.3 Abatement of other fugitive emissions to air

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 (Reference no: B16383-123532-XX-XX-NN-NA-DH0111) has been used to provide details of pollution incidents within the past five years. According to the report, there have been two recorded pollution incidents within 250m of the site (although not within the proposed permitted installation boundary). In 2002, a release of inorganic chemicals was recorded 73m north-west of the Site. This incident had no impact on waste, a significant impact on air (category 2) and a minor impact on land (category 3). In May 2018, there was a release of atmospheric pollutants and effects (smoke) 35m north-west of the site. There was no impact to land or water (category 4), but a significant impact to air (category 2).

3.2.3.1 Emissions to water (other than sewers)

The water used at the Site will be contained in a closed circuit and all wastewater streams will be recycled within the process. The only emissions not returned to the process is uncontaminated surface water runoff. A drainage plan has been submitted with the application (document reference: B16383-123532-ZZ-XX-DR-CC-CI0014 - QUY Drainage Plan June 2022).

The Substantial Pollution Incident register in Landmark's Envirocheck report has been used to provide details of pollution incidents within the past five years. There have been no pollution incidents to water within 250m of the Site.

The site, including the proposed permitted installation, is not located within 250m of a Source Protection Zone (SPZ).

There are no known discharges to groundwater (historical/current) within 250m of the site, including the proposed permitted installation.

All drainage (surface water or foul water), including gas condensate collected within digesters, will be captured by the onsite drainage system and returned to the WwTW via a return pumping station at the northwest of the Site.

There will be no point sources emissions from the Site. There are no direct potentially contaminated discharges to controlled surface waters.

The majority of the wider WwTW site (except the eastern site boundary), including the proposed permitted installation boundary has the potential for groundwater flooding at surface level. Although there is the potential for contamination of soils and groundwater as a result of the operation of the Site, significant mitigation measures are already in place, including; bunding, maintenance of infrastructure, environmental management systems etc which reduce the risks of contamination occurring to very low.

[3] Drew, G.H., Deacon, L.J., Pankhurst, L., Pollard, S.J.T. and Tyrrel, S.F. (2009). Guidance on the evaluation of bioaerosol risk assessments for composting facilities. Environment Agency.

The site is located within Flood Zone 3 for flooding from rivers or sea without defences, due to its proximity to the River Dee.

Accidental releases of materials (i.e. spillages) to the environment are controlled through adequate containment measures and working procedures to minimise the risk of a significant impact from accidental spillages.

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. Drainage from the Site sends water to the head of the works for treatment.

Any liquid waste will either be reused or discharged to the drainage system of the adjacent Queensferry WwTW and will undergo treatment through the works before being discharged under an existing water discharge permit. On-site WwTW effluent will meet the requirements of the existing discharge permit. 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 WwTW.

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 WwTW via a return pumping station. A drainage plan of the Site is presented in document reference B16383-123532-ZZ-XX-DR-CC-CI0014 – QUY Drainage Plan June 2022.

The liquors from the STC will enter the inlet works before storm overflow. During storm flow conditions, effluent will back up the inlet channel upstream of the IPS, as the three pumps maintain a maximum flow to treatment of 277l/s. Flows in excess of this figure will pass over the storm weir and gravitate to the inlet weir of the two rectangular storm tanks. These provide six hours' worth of storage capacity during storm conditions. If storm conditions persist, then the surplus settled storm effluent overflows from the tanks to the Tidal Outfall Pumping Station. There will be potential for a percentage of return liquors to enter the water course during storm conditions, however, this will be at high level of dilution, when flows into the Site are in excess of 277l/s. The Site does not have the ability to inhibit the discharge.

Any areas of the Site, where there is a risk of contamination of surface water, groundwater or discharge of process waters are located on impermeable concrete surface. All surface water from these areas drain to the Site's surface water pumping station via internal drainage system and are returned to the head of the works for treatment prior to discharge as final effluent. Surface water does not mix with STC liquors.

3.2.3.3 Emissions to land

There are no point source emissions or direct discharges to land. The CHP exhaust condensate, gas bag and digester are collected and returned to the head of the works. Discharges will be minimal, typically arising from periodic maintenance/cleaning operations, and are captured in spill trays.

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 the 2 No. diesel tanks, which is kept within appropriately bunded tanks, and the biogas, which is contained within

the gas handling system. Releases of raw materials to land are considered to be negligible, due to adequate containment of the materials within suitable storage vessels, the provision of bunding and the presence of a contained drainage system.

3.2.4 Noise and Vibration

The Site has not received any substantiated noise complaints in the last five years. Initial screening has been carried out for the Site. Potentially sensitive human receptors have been identified in residential housing as close as 90m from the site boundary. However, the site is situated in a largely industrial area adjacent to a dual-carriageway and railway.

In addition, baseline surveys conducted, by Mott MacDonald in 2018 in line with BS4142:2014, for a neighbouring highways project (the A494 River Dee Bridge Improvement) included two positions that represent the closest sensitive receptors to the STC (1. Dundas Street and Queens Street and 2. The Traveller Site, Queensferry). This baseline survey has shown that a major source of noise affecting the noise climate in the area of these two sensitive receptors was identified as road traffic on the A494 road. Other contributors were identified, but these did not include sources attributable to the operation of the STC. The noise impact of the STC is, therefore, considered likely to be sufficiently minor and will have no material impact on the community. It is therefore considered that a noise impact assessment for the site will provide the same conclusions and is not considered necessary.

Further discussions with the Acoustic Engineer also concludes that given the location of other noise emitting activities adjacent to the site (railway and dual carriageway), and that the site is not undergoing any changes to its existing operations, equipment or vehicle movements, a separate noise impact assessment is not required nor provide any additional benefit, and the data provided by the baseline survey carried out for the A494 scheme is sufficient to justify the STC does not impact on the closest sensitive receptors.

To support these discussions and survey data a high-level noise impact assessment has been undertaken and the findings is present in document reference B16383-123532-XX-XX-AS-ZA-DH0109 QUY Noise Impact Assessment January 2024.

Appropriate mitigation for any noise and vibration impacts that can be attributed to the site during abnormal operations are provided in Appendix B, and within the Noise and Vibration Management Plan (B16383-123532-XX-XX-NN-ZA-DH0118 - QUY Noise and Vibration Management Plan July 2024). The sensitive receptors located within 1km of the Site are shown in Figure A.4.of Appendix A.

3.2.5 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. Sensitive receptors to odour within 500m of the site are residents to the south-west and residents of the caravan park to the north. DCWW are aware of over 40 complaints from the public regarding perceived odour from the STC (or wider WwTW, therefore, not associated with the STC) within the last 2 years. Although, there are other sources within area that these odours have been identified as the cause of which NRW, the Local Authorities Environmental Health Officer and DCWW are aware of.

Odour dispersion modelling conducted by Olfasense of behalf of DCWW indicates that, under current operational conditions, odours from Queensferry WwTW (rather than the STC) might impact residential areas to the north and east of the site up to a distance of 900m, and commercial premises up to 600m. Based on this modelling, and the H_2S level dispersion rates over this distance, it is considered that the WwTW is unlikely to be the cause of the odour complaints received.

Olfasense has visited the site to conduct a quantitative odour impact assessment and have produced an Odour Impact Assessment (OIA) report (presented in document reference DCWW221_05_final) for the STC.

The Site currently does not have any operational odour control units (OCUs). However, works are underway as part of the Queensferry IED Odour Control Scheme to install new OCU's, to replace the current non-functioning OCUs, to comply with the IED and BAT requirements.

The provision of new odour control treatment system - AWT Dry (Peacemaker chlorinated shale) system (similar to the existing odour unit on site as part of the wastewater treatment) at the works to treat combined extracted odorous airflow from the following locations:

- Sludge import tank
- Liquor return storage tank
- Imported sludge screen and screening skip
- Thickener building including direct extraction from existing drum thickener
- Indigenous sludge storage tanks no's.1 and 2
- Digestor feed sludge storage tank

The extracted odours combine from the above locations to a new odour abatement plant to give reduced odour emission from a 315mm x 5m high stack, 2470m^3/h – 15m/s at a maximum of 1,000 ou/m^3.

In addition, as part of this scheme, DCWW will make odour cover improvements on the following assets:

- Sludge import tank
- Liquor return storage tank
- Indigenous sludge storage tanks no's.1 and 2
- Digestor feed sludge storage tank
- New enclosure on imported sludge screening skip

Sludge treatment processes mostly happen in covered environments, with exception of the digested sludge holding tanks in Zones 1, 3, 4 & 5), minimising the likelihood for uncontrolled odour or bio-aerosol release. While cake storage bays are uncovered, the sludge at this stage does not require further treatment and has minimal bio-aerosol content.

Additional works are underway for odour cover improvements to replace existing covers that are in poor condition. There is no plans to cover the digested sludge tanks in Zones 1, 3, 4 & 5. The decision behind this is that the Site is due to be decommissioned before the end of AMP 8, although a date is yet to be confirmed,

The Site has an Odour Management Plan (OMP), reviewed and updated in September 2024 (document reference B16383-123532-XX-XX-PR-ZA-DH0129 - QUY Odour Management Plan February 2025), which identifies potential odour emissions from site operations and procedures to manage, control and minimise odour impacts. It sets out the procedures for engaging with neighbours and how the Operator 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 the Environment Agency's H4 Odour Management guidance (2011) and NRW's Additional guidance for H4 Odour Management. The level of odour risk from the Site is considered to be high, as shown in Appendix B and the OMP provides sufficient mitigation to reduce the risk to medium.

In addition, DCWW have requested Olfasense to support site operation teams to undertake regular checks on the OCU's for the first 6 months, so they understand what checks and NRW reporting is required in the future.

3.2.6 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 have been assessed in Appendix B to justify whether additional measures would be required. Measures to prevent dust leaving the Site have also been addressed in Appendix **Error! Reference source not found.**, 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; or
- Within 250m of a sensitive receptor when treating biowaste.

Most of the Site operations are fully enclosed or covered, except for the digested sludge storage tanks (Zones 1, 3, 4 & 5), centrifuge feed tank and cake storage bays which are uncovered.

Odours from the cake bays, are minimised by:

- Sludge cake is not disturbed until being loaded into trucks
- All sludge cake being exported is transported in covered trucks.

To minimise odour nuisance, it is important to ensure that the Queensferry STC is operating as designed. Covers and hatches are being replaced to maintain the integrity of enclosures provided to collect odorous air. Although the Site has been screened as being within 500m of sensitive receptors (see Appendix A), a Dust Management Plan is not considered to be required since operations and waste types used on-site cause minimal dust emissions and appropriate procedures are in place.

3.2.7 Pests (including birds, vermin and insects)

Discussions with the Site operator have considered whether the Site activities are likely to attract pests, what measures are in place to deter pests and how effective these are. These are covered in Appendix B.

Pests are not considered to be an issue since the waste types handled on-site do not attract them. Contractors undertake quarterly visits to check the Site and install rat boxes. Since the residual risk is considered to be very low, a Pest Management Plan is not considered to be necessary.

3.2.8 Human and Environment Safety

3.2.8.1 Visual impacts

A treatment works has been on the site since the 1910s and it is situated in a generally industrial area. 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.

The Site is surrounded by hedgerow and trees along the boundaries of the Site. Visual impacts from the Site are, therefore, considered to be low.

3.2.8.2 Site security

Activities are managed and operated in accordance with an EMS. Access to the Site is restricted by a combination of fence lines including a 3m palisade fence and 3.9m and 2.4m weldmesh fence. The Site also benefits from a CCTV system, which consists of multi-directional cameras and motion sensors (notably at the main entrance and site outlet), and intruder detection alarms. Intruder detection alarms are operational in all major buildings covering the control room, boiler house, admin office and mess room, these are activated/deactivated by keypad entry. Security rated doors are present protecting key buildings. 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.

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

3.2.8.3 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 NRW and relates to the flood risk from surface water, rivers and the sea.

The majority of the wider WwTW site (except the eastern site boundary), including the proposed permitted installation boundary, has the potential for groundwater flooding at surface level.

The site is located within Flood Zone 3 (high flood risk) for flooding from rivers or sea without defences, due to its proximity to the River Dee, which has a chance of flooding the site higher than 1:30. The banks of the river (extending north-west / south-east) are recorded to be underlain by made ground (undivided), indicating that flood defences are present.

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

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 to the Site do occur these are understood to be either of a relatively minor nature or are unlikely to significantly alter existing development footprints.

3.2.9 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 screening 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), 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) licences available on Multi-Agency Geographic Information for the Countryside (MAGIC), within 2km of the site boundary. MAGIC, data from Wildlife Trust Reserves. 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. The following ecological conservation areas are located within 2km of the site boundary which are shown in the constraints mapping included in Appendix A:

- The River Dee Site of Special Scientific Interest (SSSI and SAC) - approximately 200m north of the site boundary; and,
- The Dee Estuary (Ramsar and SPA) - approximately 1100m north-west of the site boundary.

Initial screening has been carried out for the Site, the high-level results of which are shown in Table 3-4. 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 3-4: Results of initial screening of natural habitats and ecology for Queensferry STC

Natural habitats and ecology	Queensferry STC
Statutory designated European sites within 10km of the site boundaries	
Special Areas of Conservation (SAC)	4
Special Protection Areas (SPA)	
Sites of Community Importance (SCI)	
Ramsar sites	1
Statutory designated national sites within 2km of the Site boundary	
Sites of Special Scientific Interest (SSSIs)	5
Marine Conservation Zones (MCZs)	
National Nature Reserves (NNRs)	
Local Nature Reserve (LNRs)	3
Areas of Outstanding Natural Beauty (AONBs)	
Non-statutory designated sites within 2km of the Site boundary	
Local Wildlife Sites (LWS)	
Ancient Woodlands	
Country Parks	
Sites of Importance for Nature Conservation (SINC)	

Natural habitats and ecology	Queensferry STC
Sussex Wildlife Trust Reserves	
Priority habitats within 2km of the Site boundary	
Priority habitats	
Protected species	
Granted European Protected Species (EPS) licences: within 2km of the site boundaries	
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 boundaries	
Species of nesting birds within a 200m buffer of the site boundaries	
Bats: within a 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 a 500m buffer of the site boundaries and terrestrial habitat within 10m	

There are four SACs and one Ramsar sites located within 10km of the Site. However, a Habitats Regulations Assessment (HRA) is not 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 and groundwater, 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.

Appendix B addresses mitigation for the consideration of the above identified designated habitats along with appropriate mitigation.

SSSIs, LNR and Ancient woodlands are located within 2km of the site boundary, however 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 application for the permit does not involve the removal of vegetation, or significant structural modifications 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 Mapping

Figure A.1: Designated Heritage Assets within 1km of the Site

Figure A.2: Designated Sites within 2km

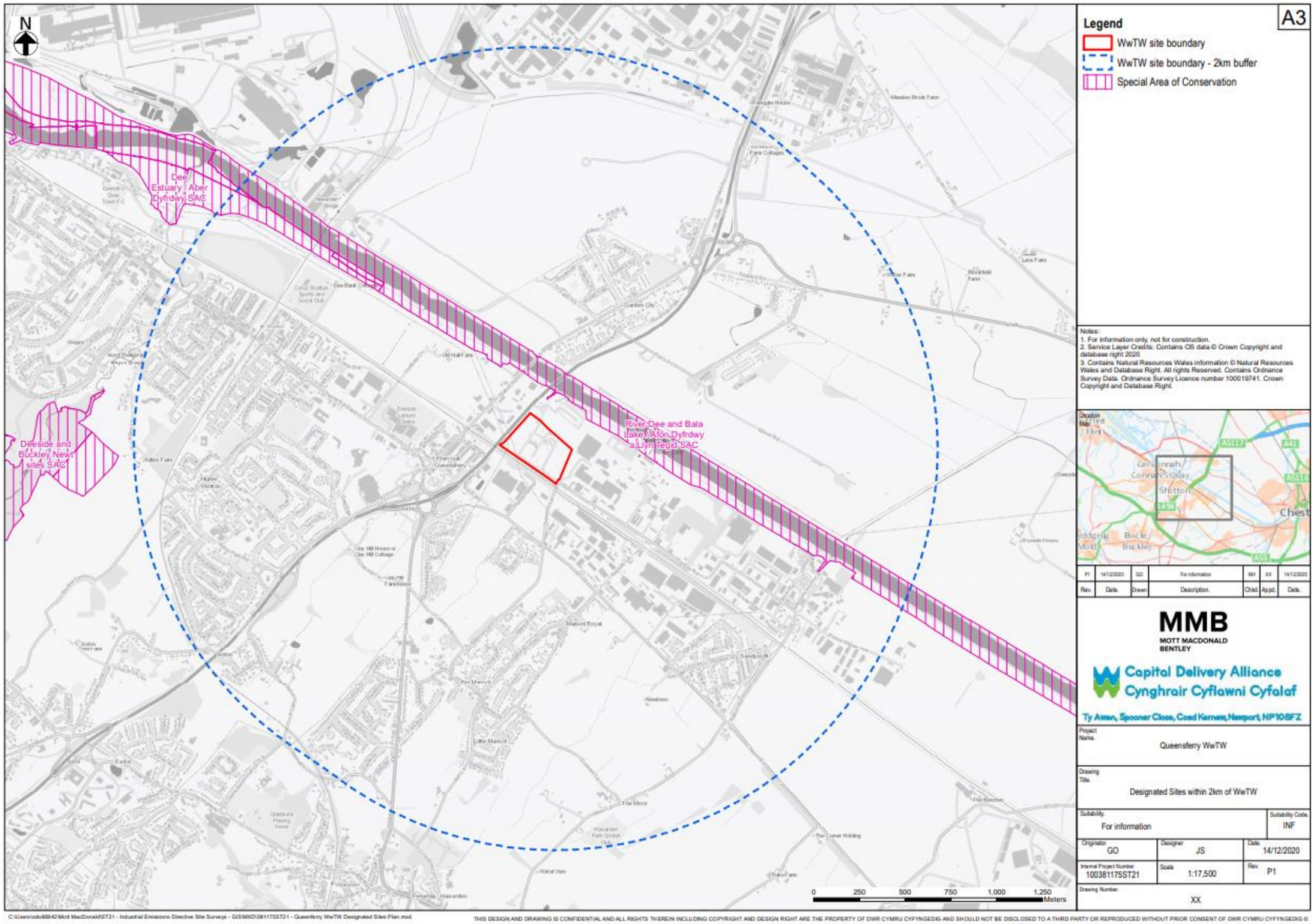


Figure A.3: Designated Sites within 10km

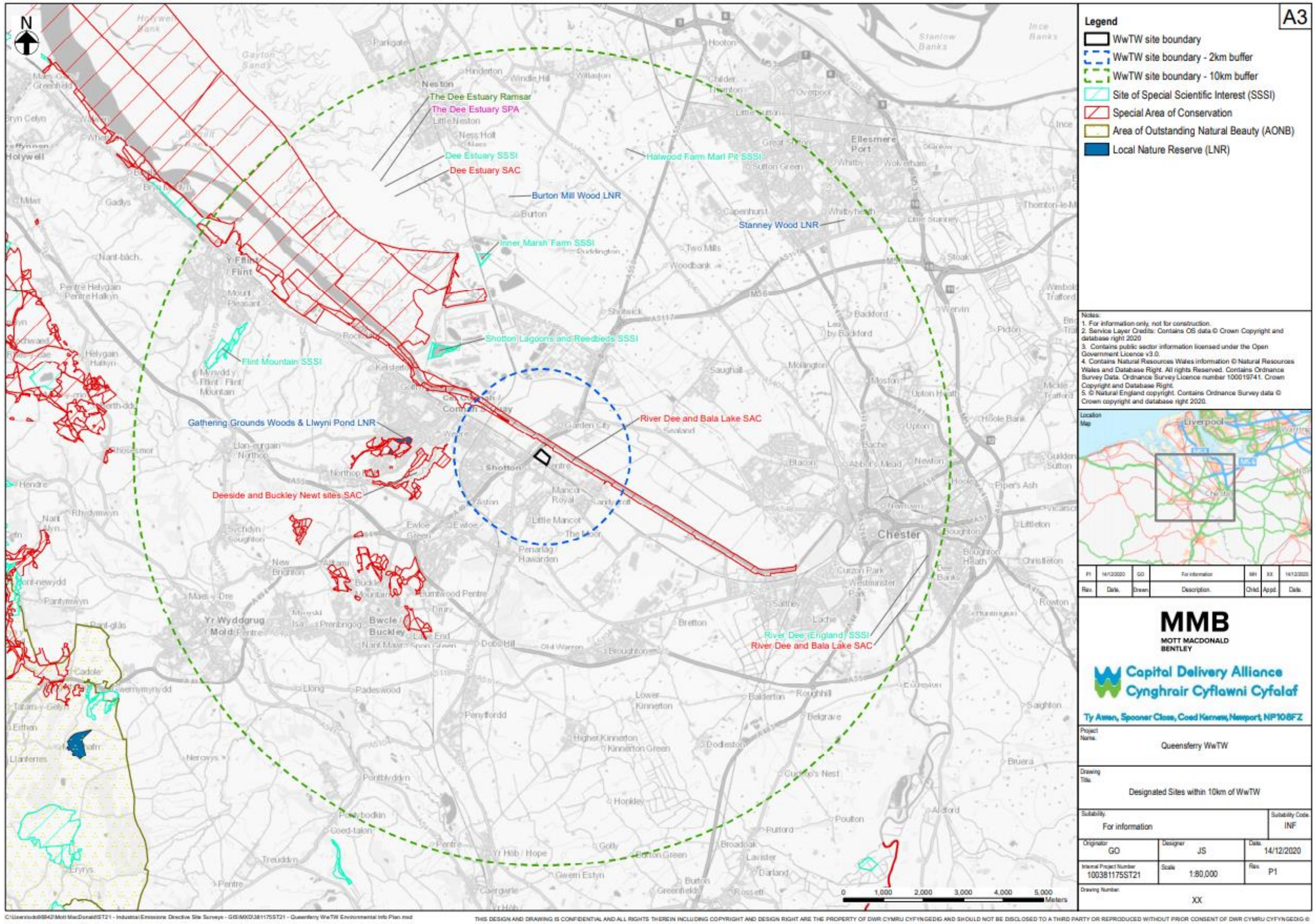


Figure A.4: Human Receptors within 1km

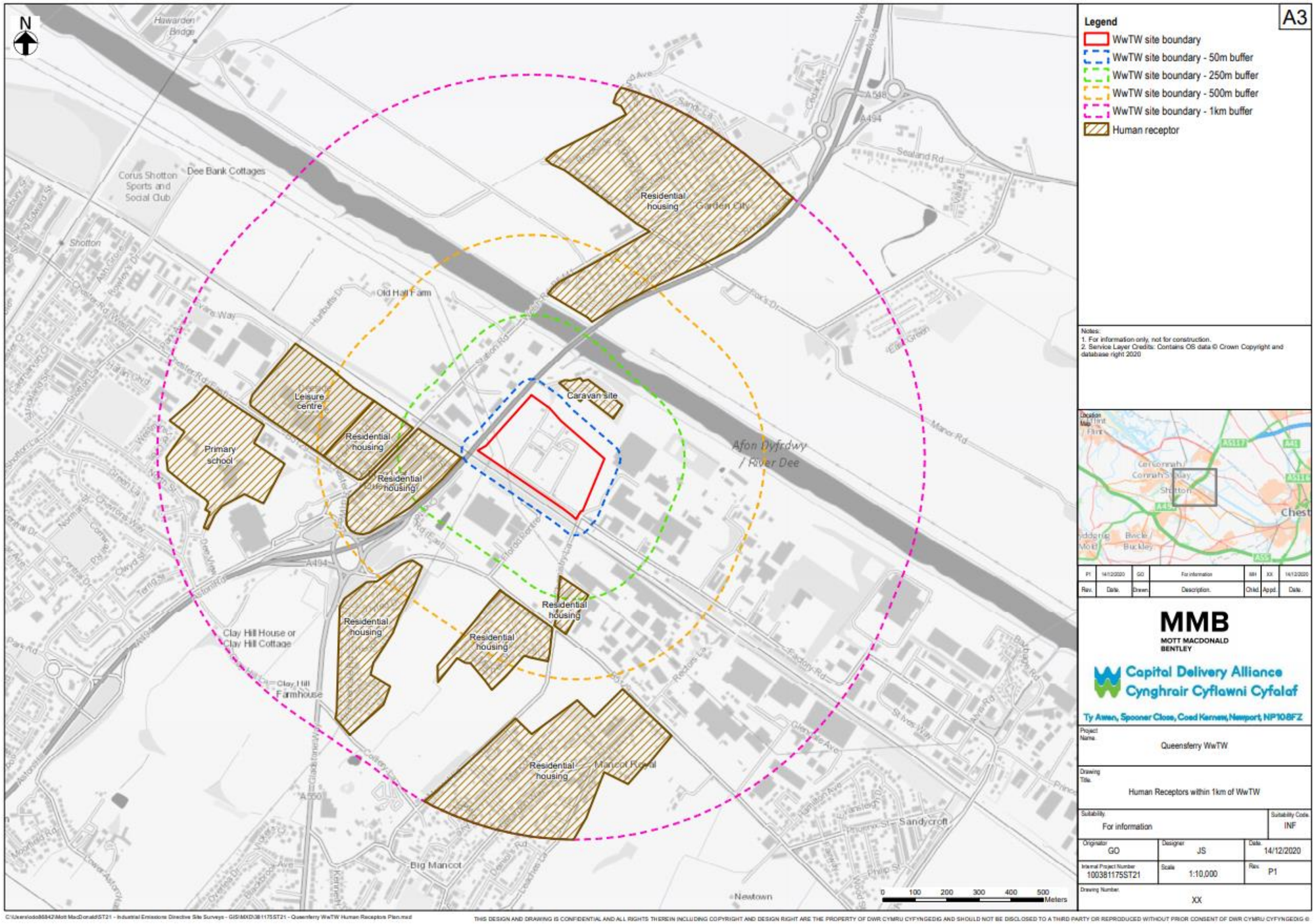
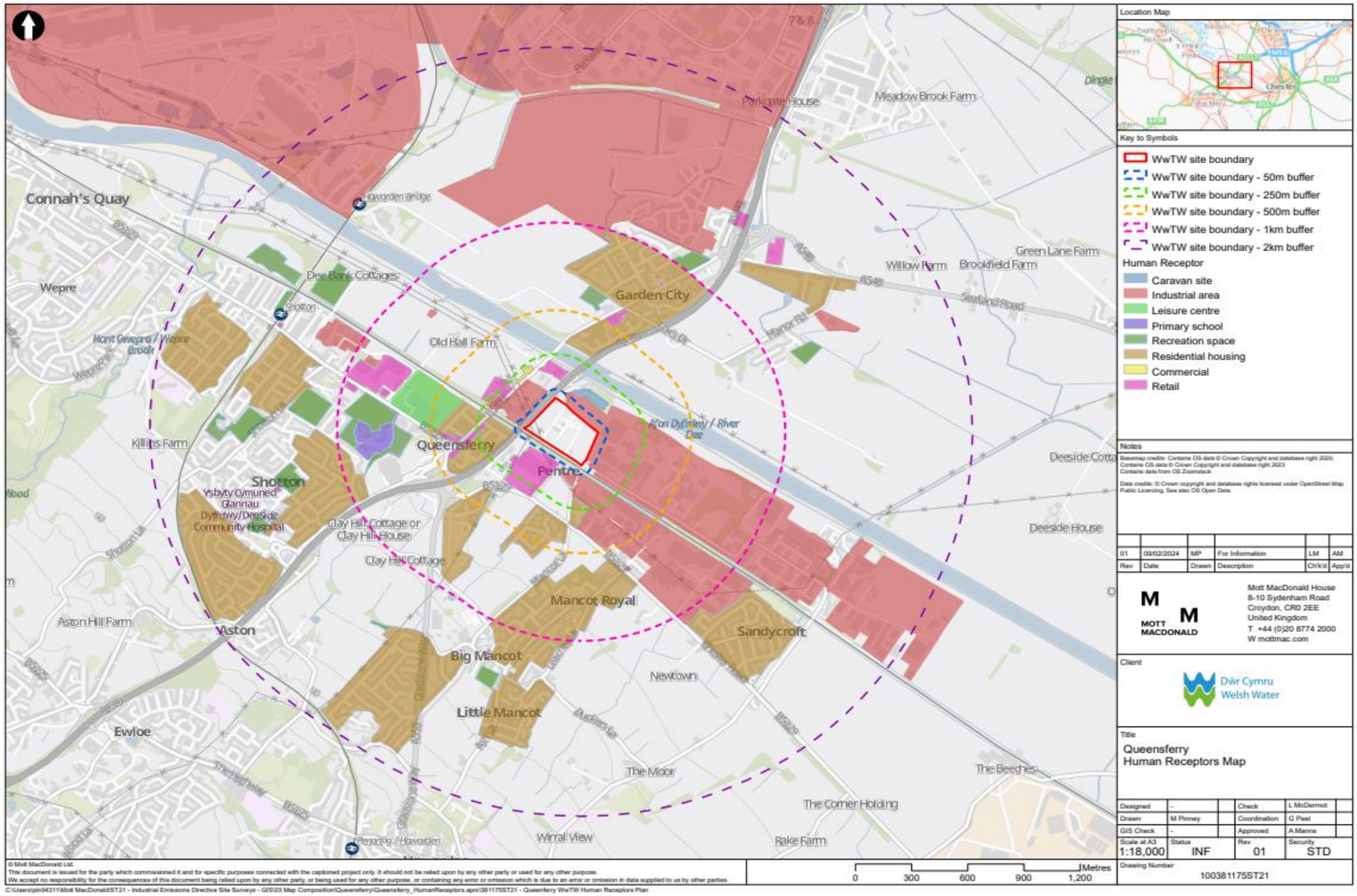


Figure A.5: Human Receptors within 2km



B. Environmental Risk Assessment

Emissions to air									
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.	Releases of NO_2, SO_2, CO, H_2S, 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. AN air quality risk assessment and H1 assessment have been undertaken.	Activities will be managed and operated in accordance with the EMS. This will include regular inspection and maintenance of associated equipment (flare, mobile equipment and vehicles). 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. NOx and GHG emissions are controlled by emission limits. Storage of high ammonia bearing material will be covered at all times, where appropriate. 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	Low	High	Medium	There is potential for exposure to anyone living close to the Site or at locations where members of the public might be regularly exposed. There is one flare present on site, which is used to burn excess biogas, during emergency use or when the CHP engine is down for maintenance.	Activities shall be managed and operated in accordance with the EMS and will include measures covering operation, 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 TGNs including M2.	Low
Domestic properties, local human population, local amenity, site staff, visitors and offices. Haul roads, public highways.	Releases of particulate matter (dust) from cake storage bays. Transport of cake off-site	Nuisance, loss of amenity.	Air transport then deposition	Low	Low	Low	Local residents and surrounding environment are often sensitive to dust. Dust may be produced from dirt deposits from vehicles or other users of the haul road and storage of cake. Cake bays are in reasonable condition with cake kept below wall limits. Road near cake bays is also in a good condition although there is some tracking of cake. The waste types used on-site are unlikely to cause dust emissions.	No wastes consisting solely of dusts are accepted. General operations at the site do not create dusty materials. Cake is stored in the open prior to removal, but this material is not dusty by nature even when it is dry. Vehicles, equipment and impermeable surfaces are swept and washed down when necessary. Internal roads are swept, as required, to reduce the likelihood of dust becoming airborne. There are no additional dust suppression techniques (e.g. mist spray, etc) employed on site as this is not considered necessary. Vehicles removing cake from site are kept covered, whilst in transport to prevent the escape of waste. There are three open cake storage bays on-site, All of the cake bays are in good condition and their walls are	Low

								approximately 2.5m high. The capacity of the cake storage bays is sufficient to contain the quantity of cake stored on-site and limit dust emissions therefrom. Cake storage time on site is minimal and cake is removed every 3-4 days to go further further treatment at Five Fords AAD.	
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. Sludge treatment processes mostly happen in covered environments, with exception of the digested sludge holding tanks in Zones 1, 3 4 &5), minimising the likelihood for uncontrolled bioaerosol release. While cake storage bays are uncovered, the sludge at this stage does not require further treatment and has minimal bio-aerosol content. Additional works are underway for odour cover improvements to replace existing covers that are in poor condition. There is no plans to cover the digested sludge tanks in Zones 1, 3, 4 & 5. The decision behind this is that the Site is due to be decommissioned before the end of AMP 8, although a date is yet to be confirmed. Biogas combustion happens at very high temperatures, making uncontrolled release of bioaerosol unlikely. However, emergency situations such as a failure of the flare or CHP/boilers could result in uncontrolled bio-aerosol emissions. There are sensitive receptors found within 250m of potential bioaerosol emission sources at the Site.	Multiple control measures are in place at the Site which restrict the Source-Pathway-Receptor link by reducing and containing emissions of bioaerosols from these processes and enhancing dispersion. Should sludge spillages happen, operators are required to clean as soon as possible. Lorry and tanker drivers are required to hose down any spillage after each loading or unloading and clean contaminated wheels before leaving site. Key operations take place within a closed system, including covered tanks, pipework and machinery. The anaerobic digestion vessels are sealed and biogas is extracted from the vessels. This minimises the risk of bioaerosols affecting operational staff. Biofilters are regularly checked for efficiency. The nature of waste and the 'wet' processes undertaken on-site are not likely to cause a release of bio-aerosols. Odour control unit is airtight and treats air released to remove bioaerosols. The process is monitored and regularly maintained. Gas holder is air-tight to prevent uncontrolled release of bioaerosols. SCADA system in place to detect leaks. Combustion of biogas occurs at very high temperatures in the CHP, boilers and/or flare, which would destroy bio-aerosols. In case of a flare stack and CHP failure, biogas generation will be minimised until the issue is rectified, to reduce bioaerosol emissions. 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. Stringent loading and unloading procedures are in place for receipt of sludge and liquor. A Bio-aerosol Risk Assessment has been undertaken to assess the risks of bioaerosols from the Site. This identifies that bioaerosol risks are low.	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 including the River Dee SSSI & SAC (200m) and the Dee Estuary Ramsar and SPA (1100m).	Tank failure, spillages of digestate and/or liquids including oil Damage to drainage system. Spillage of raw materials or sludge/liquor during delivery/storage Contaminated run off from cake storage e.g. containing suspended solids.	Acute or chronic effects to aquatic life, contamination and 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.	Low	High	Medium	The River Dee is located approximately 200m from the northern boundary of the site and is a designated SSSI and SAC. Further downstream, approximately 1,100m from the site, the Dee Estuary is a designated Ramsar site and Special Protection Area (SPA). Although the river is considered an especially sensitive receptor, the potential for spillage from digestions tanks and storage vessels is considered low and processes on-site are generally contained. Potential for leaks from digestion tanks, storage vessels/bays and drainage system which may cause contamination or deterioration of surface water quality. Raw materials and liquids/chemicals are stored in suitable locations on-site and are appropriately bunded or within enclosed buildings. Site infrastructure and hardstanding are generally in a good condition. Quantities of liquids and raw materials stored on site are generally low.	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 and surrounding the STC. Bunding is also be implemented for raw material storage, although the majority of the raw materials are stored within buildings, with the exception for he two diesel tanks, which are bunded to 110% containment. Additional containment around digestors and other storage vessels is subject to a risk assessment and will be undertaken as part of the Best Available Technique (BAT) requirements and in accordance with the Construction Industry Research and Information Association (CIRIA) standard 736. Hardstanding has been provided as part of the containment construction preparations, in line with the recommendations of the CIRIA risk assessment. All tanks undergo a delegated inspection regime and the process parameters are monitored and understood by site operatives. Additional monitoring and sampling will be undertaken as part of the BAT requirements. All sludge tanks are built to appropriate standard and require appropriate bunding. Activities are managed and operated in accordance with the EMS. Spill procedures are in place. All spillages are recorded in the site diary including actions taken. Site Manager ensures the programme of Planned Preventative Maintenance is implemented effectively to minimise the probability of equipment malfunction. Control of substances hazardous to health (COSHH) assessment undertaken for all raw materials. All condensate from the CHP, flare stacks and biogas system discharges into a sealed drainage system and are returned to the head of the works. The condensate is clean, uncontaminated water and is small in quantity. Both clean and contaminated surface water is directed to a pumping station which recirculates it back into the system. The surface water drainage of potentially contaminated areas from within the Site boundary is routed into the head of the works with no direct 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	Low

								other incidents are recorded in the site diary including actions taken.	
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, ditches etc. then abstraction.	Low	Low	Low	Watercourse must have medium / high flow for abstraction to be permitted, which will dilute contaminated run-off. No identified groundwater abstraction is undertaken from nearby watercourses.	The stream that runs through a culvert was recently bunded to reduce runoff. All liquid from site drains are pumped back to the inlet and the Site has no soakaways. Activities are managed and operated in accordance with the EMS. Spill procedures are in place. All spillages are recorded in the site diary including actions taken. No point source emissions to controlled water from the STC. All biogas condensate from the CHP, flare stacks and biogas system discharges into a sealed drainage system to a liquor storage tank (aka supernatant) and then to the liquor pumping station and returned to the head of the works. The condensate has not been tested, but is assumed to be uncontaminated water and is small in comparative volume. Impermeable surface provided for storage of waste and raw materials. Final effluent discharges into the River Dee.	Low
Groundwater, land and surface water	Spillage of liquids, contaminated rainwater run-off from waste e.g. containing suspended solids. Sludge/liquid spillages as a result of loss of tank/pipe integrity/ carelessness during transfer or overfilling	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 leaks from digestion tanks and storage vessels. Site infrastructure and hardstanding is generally in a good condition. Quantities of liquids stored are generally low. Underlying superficial Tidal Flat Deposits are designated a Secondary Undifferentiated Aquifer. The underlying Pennine Middle Coal Measure Formation is designated a Secondary A Aquifer. Contaminants sourced from on-site spillages are unlikely to significantly affect groundwater within the underlying aquifers. Quantities of liquids stored are generally low.	The inlet works, raw sludge storage tanks, blended sludge tanks, digestor feed, buffer tanks activated sludge process and all sludge treatment processes are covered or enclosed. Spill kits are available near some of the chemical storage. Improvements to waste and material storage are being made on site. All transfer of material takes place under supervision. All primary tanks undergo a delegated inspection regime and the process parameters are monitored and understood by site operatives. Site Manager shall ensure the programme of Planned Preventative Maintenance (PPM) is implemented effectively to minimise the probability of loss of tank/pipe integrity. Activities to be managed and operated in accordance with the EMS. Spill procedures are in place. All spillages are recorded in the site diary including actions taken. No point sources to controlled waters from the STC. All condensate is discharged into a sealed drainage system and returned to the head of the works via the liquor storage tank.	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.	Transport through soil/groundwater then extraction/ abstraction at	Low	Medium	Low	Potential for leaks from digestion tanks and storage vessels. 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

		Pollution of water or land.	borehole or intake.					Activities to be managed and operated in accordance with the EMS.	
Groundwater, land and surface water	Flooding of site	If waste is washed off site it may contaminate natural habitats downstream.	Flood waters	Low	High	Medium	The area is classified as Flood Zone 3 (high risk) due to its proximity to the River Dee. 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 drainage network sends water to the head of the works for treatment. There are no direct potentially contaminated discharges to controlled surface waters. Activities are managed and operated in accordance with a management system and management plans and procedures implemented, including (but not limited to) the removal and clean-up of spilled waste material, including sludge, cake etc. and other pollutants (this may also include removal of used spill kits and mobile bunds) before these could enter any flood waters if an event was to occur.	Medium
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.	Medium	Low	Low	Local residents and site staff are often sensitive to noise and vibration. Nearest sensitive receptors located within 300m of the Site.	A noise impact assessment was undertaken and a noise and vibration management plan produced. The site will be operational 24/7, but will only be manned between 8am and 4pm, thus limiting the timeframe for noise and vibration. The Site will only accept imports within existing operating hours (fully complying with the Site's planning conditions). Vehicles do not exceed the site speed limit of 15mph 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 shall be kept to a minimum during operating hours. Any noise attributable to abnormal operations will be investigated and appropriate action taken by the Site Ops team, where necessary. Noise from operations, considered to be excessive or likely to leave the site boundary, that are part of planned activities (i.e. construction/upgrades) would be communicated to the local residents, by the DCWW Communications Team. Controlled measures would be explored to minimise any impact. 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	Medium	Low	Low	Local residents and site staff often sensitive to noise and vibration. Nearest sensitive receptors located within 300m of the Site. No noise complaints have been received.	Operating hours are limited to between 8am and 4pm, although the site is in operation 24/7. Fans and condensate traps will be checked for water and fans and extraction systems checked. Flare usage shall be kept to a minimum to reduce noise impact. The design has been developed to minimise noise off-site. The operator will maintain all equipment either in house or by a sub-contract such that noise and vibration are maintained within the limits of the inputs to the sound model. All other STC site operations are either covered or enclosed. Where equipment is to be replaced, silencing equipment will be chosen. 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 noise attributable to abnormal operations will be investigated and appropriate action taken by the Site Ops team, where necessary. Noise from operations, considered to be excessive or likely to leave the site boundary, that are part of planned activities (i.e. construction/upgrades) would be communicated to the local residents, by the DCWW Communications Team. Control measures would be explored to minimise any impact. 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.	High	Medium	High	Local residents and staff sensitive to odour. The nature of the waste may cause odour issues during reception of wastes, from release of biogas and from digestate, hence control measures have been adopted. Following an odour survey and dispersion modelling, it would be reasonable to state that 5 odour complaints that have been associated	The Site has two odour control units (although both currently not in operation) DCWW has provision for a new odour control treatment system consisting of two new OCUs - AWT Dry (Peacemaker chlorinated shale) system (similar to the existing odour unit on site as part of the wastewater treatment) at the works to treat combined extracted odorous airflow from the following locations: • Sludge Import Tank • Liquor Return Storage Tank • Imported Sludge Screen and screening skip	Medium

							with Queensferry over the past 3 years. Odour dispersion modelling conducted by Olfasense on behalf of DCWW indicates that, under current operational conditions, odour emissions from the permitted site are currently predicted to pose a risk of impact up to 0.8 km from the site boundary, which includes residential properties to the north, south and east of the site, the traveller park to the north of the site, and a number of commercial premises to the west of the site across the A494. Based on this modelling, and the H_2S level dispersion rates over this distance, it is considered that the WwTW is unlikely to be the cause of the odour complaints received.	• Thickener building including direct extraction from existing Drum thickener • Indigenous Sludge Storage Tanks No.1 and 2 • Digestor Feed sludge storage tank A site-specific Odour Management Plan, is followed and details the odour management measures. The Odour Management Plan should continue to be implemented. An Odour risk assessment should be undertaken. An odour assessment and modelling was undertaken by Olfasense in September 2022, which gave a number of recommendations to DCWW. Emissions shall be free from odorous compounds. Non-point source emissions of biogas shall be minimised using appropriate measures. Odours are likely to be generated and released due to nature of the wastes. Odours are controlled by an odour control unit at the inlet works. All abatement systems are designed, monitored and maintained to treat specified emissions and off gases. Other odour mitigation measures implemented on-site include placing covers on containers and limiting the height of rising sludge. Using appropriate measures, non-point source emissions of biogas shall be minimised. All available measures and BATs 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. All storage tanks are covered or enclosed. All sludge is processed as soon as it is discharged to the STC. Quantity of sludge cake retained on site is limited to 164m^3 and is removed regularly. All waste is imported and exported in covered lorries or contained in tankers. Any complaints received are investigated and actioned in line with the complaints procedure.	
Local human population, domestic properties, site offices.	Spillage 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. Waste processes on-site are generally conducted within sealed units. Accidental major spillages are unlikely to occur and cause an odour nuisance.	Procedures for dealing with spillages are covered in the EMS . 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. The site is monitored for spillages as part of routine	Low

								inspections. If a spillage occurs, it is washed into site drainage or removed to an appropriate disposal location as soon as possible. If spillages are a recurring incident, investigations into the cause of such occurrences are undertaken, and action taken to minimise these occurrences.	
Local human population, domestic properties, site offices	Fugitive release of H_2S	Nuisance, loss of amenity	Air transport then inhalation.	Low	Medium	Low	Local residents and staff often sensitive to odour. 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). H_2S point source emissions to air are controlled in accordance with emission limits. A specialist unit equipped with carbon filters is used for air treatment and abatement to reduce odours and the generation of other gaseous compounds.	Low
Particulate Matter, 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 environment 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. Sludge that is delivered to the Site is transported in tankers.	All vehicles leaving the Site which are transporting waste are covered to prevent waste/materials being blown from them. All waste produced from general site activities is kept in enclosed containers, or inside a building, prior to removing from site. Bins for general waste and recyclable waste are located outside the office, grit and screenings are stored in skips associated with relevant infrastructure. 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 plan.	Low
Local human population.	Vehicles depositing mud and debris arriving/ leaving the Site.	Nuisance, loss of amenity, 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. Waste is either pumped onto site or transported in sealed tanks or containers.	Activities shall be managed and operated in accordance with a site-specific management plan with overarching procedures set out in the EMS. Any mud or sludge arising from activities on-site is cleared up promptly. There are no wheel washing facilities on the site, but vehicles can be washed down and equipment and impermeable surfaces are swept and washed down, when necessary. Any emissions of substances not controlled by emission limits (excluding odour and noise) shall not cause pollution. Vehicle routes are inspected regularly and swept when necessary.	Low

								All vehicles leaving the Site, transporting waste/ cake are covered to prevent waste/materials being blown from them.	
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 may become nesting / breeding sites. The waste types handled on-site do not attract pests and contractors regularly check the Site for pests.	Activities to be managed and operated in accordance with the EMS and management plans and procedures implemented. Pest control measures are implemented. The site has 12 visits per year, by a contractor. Rat boxes are used around the Site, where appropriate. 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 is 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 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 / or livestock after gaining unauthorised access to the installation.	All on-site hazards: machinery, tanks, wastes and vehicles.	Bodily injury Risk of drowning	Direct physical contact.	Low	Medium	Low	Vehicle movements or equipment malfunction or misuse might result in potential injury to on-site personnel. Direct physical contact is minimised by activity being carried out within enclosed digesters so a low magnitude risk is estimated. Access to storage tanks is probable with a risk of drowning. Contact with waste is minimal with exception of leaks or spills from	Overall management of the site is overseen by an experienced member of staff having undergone appropriate training under DCWW's soon-to-be accredited Competency Management System (CMS). 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 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. Activities are managed and operated in accordance with the EMS – this includes site security measures to prevent	Low

							unloading of tanker and transfer of filter cake.	unauthorised access. Preventative measures will be under continuous review as part of the EMS procedures.No maintenance work or contractor is permitted on-site without a suitable permission to work and qualification. The site is secured by a combination of fence line of 3m palisade, 3.9m and 2.4m weldmesh, a gated entrance off Factory Road in the south-east and another disused entrance from the A494 in the north, a monitored CCTV system, intruder detection alarms and security rated doors protecting key buildings. Lighting is provided at all reception facilities to give good visibility at all times of the day and night. The site is monitored 24/7, but only manned between 8am and 4pm with out of hours call out where required. 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. Vehicle movements around the site vary depending on what activities are being undertaken. Cake movement is limited as cake is stored in silos. Cake is removed from site frequently during specific land spreading windows, or taken to Five Fords for further processing. Waste is removed as required. Therefore, frequent vehicle movements are typically undertaken only by site staff and maintenance contractors.	
Local human population and local environment.	Explosion of biogas and AD causing the 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 processes are undertaken within enclosed systems such as the AD and biogas systems. The digested sludge storage tanks are not covered but are not considered a fire or expolsion risk. 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 activates 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.	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 materials to air, water or land. Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality.	Low	High	Medium	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, buildings located close to the epicentre of the explosion.	The EMS includes procedures relating to maintenance and inspection of bunding of tanks. 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. The site is secured by a combination of fence line of 3m palisade, 3.9m and 2.4m weldmesh, a gated entrance off Factory Road in the south-east and another disused entrance from the A494 in the north, a monitored CCTV system, intruder detection alarms and security rated doors protecting key buildings. Lighting is provided at all reception facilities to give good visibility at all times of the day and night. The site is monitored 24/7, but only manned between 8am and 4pm with out of hours call out where required. 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. 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. 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 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	Low

								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. There is also Safety zoning of areas under the Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR)/ Potentially Explosive Atmospheres (PEXA) on-site and smoking is only permitted in designated areas. An accident management plan is part of the EMS and includes measures for security, fire and spill management. 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 tanks. Emergency operating procedures are in place. Smoking only permitted in designated areas.	
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 site is located within an area of groundwater flooding capability with potential flooding to property situated below ground level and at the surface. There is limited potential for groundwater flooding to occur, however there is the potential for groundwater flooding of property situated below ground level at the south west part of the Site. The site is located within Flood Zone 3 (high flood risk) for flooding from rivers or sea without defences, due to its proximity to the River Dee, which has a chance of flooding the site higher than 1:30. The banks of the river (extending north-west / south-east) are recorded to be underlain by made ground (undivided), indicating that flood defences are present.	Most of the site can be isolated by penstocks or isolation valves. The drainage for the Site goes 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 local environment	Accidental fire causing the release of polluting materials to air (smoke	Respiratory irritation, illness and nuisance to local population.	Air transport Direct run-off from site across ground surface,	Low	High	Medium	Emissions to air, land or water may cause harm to and deterioration of air, land or water.	The key sludge treatment and WwTW processes are undertaken within enclosed systems such as the AD and biogas systems.	Low

	or fumes), water or land. Equipment failure	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.	via surface water drains, ditches etc. Indirect run-off via the soil layer Transport through soil/ groundwater then abstraction.				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.	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 and H&S manual 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 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 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. Smoking only permitted in designated areas. Emergency operating procedures are in place.	
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 and deterioration 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	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. 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 WwTW processes are undertaken within enclosed systems such as the AD and biogas systems. 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 . 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. Site Manager shall ensure the programme of Planned Preventative Maintenance (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. Smoking only permitted in designated areas. Emergency operating procedures are in place. Adequate firefighting measures are implemented on-site. Access to site and waste restricted by security fencing. The site is secured by a combination of fence line of 3m palisade, 3.9m and 2.4m weldmesh, a gated entrance off Factory Road in the south-east and another disused entrance from the A494 in the north, a monitored CCTV system, intruder detection alarms and security rated doors protecting key buildings. Lighting is provided at all reception facilities to give good visibility at all times of the day and night. Regular inspections of the boundary fencing and buildings are undertaken to ensure that these have not been	Low

							compromised and continue to prevent easy access to the Site. Repairs are undertaken in accordance with the EMS requirements. 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 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.	
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	Lo	Possible contamination to air, land, groundwater and surface water	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 having undergone appropriate training recognised as part of the soon-to-be accredited CMS. 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 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.	Low

								Preventative measures will be under continuous review as part of the EMS procedures. Emergency operating procedures are in place.	
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	Harm to protected site through toxic contamination, nutrient enrichment, disturbance etc.	Air transport Direct run-off from site across ground surface, via surface water drains, ditches etc. Indirect run-off via the soil layer	Low	Low	Low	Physical disturbance and emissions to air, water or land may cause harm to and deterioration of nature conservation sites. There are a number of European designated sites, located within 10km of the Site, (identified in Appendix A3) so potential impacts on receptors are likely.	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. BAT and appropriate additional mitigation measures set out in the EMS have been taken to prevent or where that is not practicable, to minimise, those emissions. As required by the DCWW 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. The potential hazards from the permitted activities pose a low risk to the broad sensitivity of species and habitats groups.	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	Harm to protected species through the disturbance or removal of habitats	Transport through soil/ groundwater then abstraction.	Low	Low	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.		Low
Protected sites including the Dee River SSSI and SAC (200m) and the Dee Estuary Ramsar and SPA (1100m).	Any	Harm to protected site through toxic contamination, nutrient enrichment, smothering, disturbance, predation etc.	Any	Unlikely	Medium	Low	Emissions to air, land or water may cause harm to and deterioration of nature conservation sites. Operations may cause harm to and deterioration of nature conservation sites.