Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	11/03/2021	E Jeffrey	S George	A Manns	For client comment
B	25/03/2021	E Jeffrey	S George	A Manns	Draft for submission to DCWW
C	31/03/2022	E Jeffrey	S Blackman	A Manns	Comments addressed

Information class: Standard

Document purpose:

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

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

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

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

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

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

1.0 SITE DETAILS	
Name of the applicant	Dwr Cymru Welsh Water
Activity address	Queensferry Wastewater Treatment Works, Factory Road, Pentre, Flintshire, CH5 2QJ
National grid reference	332304, 368140

Document reference and dates for Site Condition Report at permit application and surrender	Site Condition Report: TBC Date of Permit Application: TBC Date of Surrender: TBC

Document references for site plans (including location and boundaries)	Site Plans document references: Mott MacDonald, Queensferry Permit Application Main Supporting Document – B14411-123532-ZZ-XX-NN-ZA-DI1035 - IED Queensferry - Main Supporting Document (2021)

2.0 Condition of the land at permit issue	
Environmental setting including: • geology • hydrogeology • surface waters	**Land use** The site comprises Queensferry Water Treatment Works (WTW) and Sludge Treatment Centre (STC) (red line boundary), which has been in the current location since approximately 1911 but has been subject to periods of development, especially around the 1960s and 1980s. The site is located approximately 220m south-west of the River Dee, in the town of Queensferry, Flintshire. The A494 (Aston Road) runs adjacent to the north-western boundary of the site. The proposed permitted installation (green line boundary) is located in the central northern / north-eastern section of the site and is irregular in shape (see Figure 2.2 of the Environmental Risk Assessment (ERA)). The approximate centre can be found at National Grid Reference 332319 , 368268. **Geology**

Sourced from British Geological Survey (BGS) mapping.

Superficial Geology

The entire site, including the proposed permitted installation, 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. The banks of the river (extending north-west / south-east) are also recorded to be underlain by made ground (undivided), indicating that flood defences are present, as well as isolated areas within 250m of the site (to the east, south-west and west) associated with the railway and highways.

The entire site, including the proposed permitted installation, is underlain by superficial deposits comprising Tidal Flat Deposits (clay, silt and sand). Devensian Till is recorded to the south-west of the site and underlies the Tidal Flat Deposits. 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).

Bedrock Geology

The bedrock geology mainly comprises the Pennine Lower Coal Measures (PLCM) in the west of the site, 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.

Structural Geology

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

Hydrogeology

The superficial deposits (Tidal Flat Deposits) beneath the site are classed by the Environment Agency as a Secondary Undifferentiated aquifer. The bedrock geology, (PLCM, PMCM and Etruria Formation) are all classed as Secondary A aquifers and likely in continuity with each other.

The groundwater is assumed to be relatively shallow and tidally may be fluctuating due to the proximity of the mouth of the River Dee into Liverpool Bay (the Irish Sea) approximately 5km to the north-west.

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.

Hydrology

The site is approximately 220m south-west of the River Dee, and approximately 5km from the Dee Estuary. There are several land drains/streams in the area

surrounding the site, most notably a drain that enters the Dee which runs adjacent to the north-western boundary of the site.

There are 19 discharge consents within 250m of the site (many of which relate to the site as a whole, although none are within the proposed permitted installation boundary), the details of which are summarised in Table 1:

Table 1: Discharge consents within 250m of the site

Location	Distance & Direction	Date	Receiving Water	Discharge	Status
Queensferry STW Outlet	1m NW	December 1970 – February 1986	Queensferry Drain	Unspecified	Expired
Queensferry STW	20m NW	November 1989 – December 1992	Queensferry Drain	Final/treated effluent	Expired
Queensferry STW	20m NW	January 1982 – November 1989	Queensferry Drain	Final/treated effluent	Expired
Queensferry STW	27m NW	March 1996 -	Queensferry Drain	Storm overflow	Effective
Queensferry STW	27m N	August 1993 – March 1996	River Dee Estuary	Final/treated effluent	Revoked
Queensferry STW	27m N	August 1990 – August 1993	River Dee Estuary	Final/treated effluent	Revoked
Queensferry STW	27m NW	December 1989 – August 1990	River Dee Estuary	Unspecified	Revoked
Queensferry STW	27m NW	October 1976 – December 1989	River Dee Estuary	Unspecified	Revoked
Pilkington Insulation Ltd	128m SW	August 1985 – December 1992	Queensferry Drain	Trade effluent	Expired
Queensferry STW	174m NE	October 1976 – March 1996	Un-named	Unspecified	Revoked
Queensferry WWTW	178m N	March 2010 -	River Dee Estuary	Final/treated effluent	Effective
Queensferry WWTW	178m N	January 2010 – March 2010	River Dee Estuary	Final/treated effluent	Modified
Queensferry WWTW	178m N	December 2005 – December 2009	River Dee Estuary	Final/treated effluent	Modified
Queensferry WWTW	178m N	March 2005 – December 2005	River Dee Estuary	Final/treated effluent	Varied
Queensferry WWTW	185m N	December 2015 -	Un-named	Storm overflow	Effective
Queensferry STW	185m N	November 2000 – March 2005	River Dee Estuary	Final/treated effluent	Modified
Queensferry STW	185m N	March 1996 - unknown	Un-named	Storm overflow	Modified
Queensferry STW	185m N	March 1996 – November 2000	River Dee Estuary	Final/treated effluent	Modified
Veolia Environmental Services Plc	243m SE	August 2009 -	River Dee	Final/treated effluent (not water company)	Effective

(Landmark, 2021)

Sensitive land use

The site does not have any designated sensitive land uses. There is one Site of Special Scientific Interest (River Dee) and one Special Area of Conservation (River Dee and Bala Lake) within 250m of the site (both recorded 120m north of the wider site).

Flooding

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 for flooding from rivers or sea without defences, due to its proximity to the River Dee.

Pollution history including:

- pollution incidents that may have affected land
- historical land-uses and associated contaminants
- any visual/olfactory evidence of existing contamination
- evidence of damage to pollution prevention measures

Pollution incidents to controlled waters

There are 35 recorded pollution incidents to controlled waters (i.e. River Dee and drains/tributaries of the River Dee) within 250m of the site, one of which is recorded on-site (although not within the proposed permitted installation boundary). The details of these records are summarised in Table 2:

Table 2: Pollution incidents to controlled waters within 250m of the site

Location	Distance & Direction	Incident date	Incident severity	Pollutant
Deeside Industrial Park	On-site	13th November 1996	Category 3 – Minor	Light Oil
Queensferry STW	3m N	15th August 1991	Category 2 – Significant	Treated sewage
Queensferry STW	7m N	15th August 1991	Category 2 – Significant	Mud/clay/soil
Queensferry STW	9m N	28th July 1995	Category 3 – Minor	Treated sewage
Queensferry STW	11m N	5th August 1991	Category 2 – Significant	Algae
Queensferry STW	16m N	15th August 1991	Category 2 – Significant	Treated sewage
Queensferry STW	19m N	30th January 1992	Category 2 – Significant	Crude sewage
Queensferry STW	22m N	30th October 1991	Category 3 – Minor	Light oil
Queensferry STW	14m N	9th February 1995	Category 3 – Minor	Foam/soap suds
Blue Bridge, Queensferry	29m N	20th July 1996	Category 3 – Minor	Farm land run-off
Queensferry STW	33m N	14th November 1996	Category 2 – Significant	Oils – diesel
Neston Tank	33m N	3rd March 1992	Category 2 – Significant	Chemicals (pesticides)
Queensferry STW	78m N	13th April 1992	Category 2 – Significant	Foam/soap suds
Old Queensferry Bridge	34m NE	19th January 1997	Category 3 – Minor	Foam/soap suds
Junction of Chemistry Lane and Manncot Lane	45m SE	23rd June 1997	Category 3 – Minor	Crude sewage

Junction of Chemistry Lane and Manncot Lane	49m SE	23rd June 1997	Category 3 – Minor	Crude sewage
A494 Top of Aston Hill	103m W	14th June 1996	Category 3 – Minor	Unspecified
Queensferry STW	110m NE	25th June 1996	Category 3 – Minor	Oils – diesel
A494 Bypass	142m NE	17th July 1996	Category 2 – Significant	Treated effluent
Queensferry STW	120m N	11th October 1995	Category 3 – Minor	Crude sewage
Queensferry STW	125m N	9th February 1995	Category 3 – Minor	Rubble/litter or solids
Queensferry STW	139m NE	17th July 1996	Category 2 – Significant	Septic tank effluent
Upstream of Welsh Side of Quay	142m NE	15th July 1996	Category 3 – Minor	Foam/soap suds
Perimeter of Owens Corning	142m S	17th August 1995	Category 3 – Minor	Farm effluent/slurry
Queensferry STW	171m NE	25th October 1995	Category 3 – Minor	Chemicals – detergents/surfactant
Owens Corning Factory	174m NE	30th December 1996	Category 3 – Minor	Mining water
Confluence with Dee	182m W	28th November 1991	Category 2 – Significant	Farm effluent/slurry
Queensferry STW	215m N	26th May 1995	Category 3 – Minor	Septic tank effluent
Queensferry	220m N	15th May 1992	Category 3 – Minor	Unspecified
Queensferry STW	226m N	7th June 1991	Category 3 – Minor	Algae
Queensferry Old Bridge	234m SW	24th June 1991	Category 3 – Minor	Unspecified
Rear of Owens Corning	235m SW	6th March 1996	Category 3 – Minor	Unspecified
Between fire station and B&Q Queensferry	235m NW	22nd August 1996	Category 3 – Minor	Rubber/litter or solids
Old Bridge	240m NW	15th October 1991	Category 2 – Significant	Unspecified
Owen Corning Factory	244m S	28th February 1996	Category 3 – Minor	Unspecified

(Landmark, 2021)

Substantiated pollution incident register

There are two recorded pollution incidents recorded within 250m of the site (although not within the proposed permitted installation boundary), the details of which are summarised below:

1. September 2002, release of inorganic chemicals (acids) 73m north-west of the site:
   a. Water – Category 4 (no impact)
   b. Air – Category 2 (significant incident)
   c. Land – Category 3 (minor incident)

2. May 2018, release of atmospheric pollutants and effects (smoke) 35m north-west of the site:
   a. Water – Category 4 (no impact)
   b. Air – Category 2 (significant incident)
   c. Land – Category 4 (no impact)

Industrial land uses

There are 37 recorded contemporary trade directory entries, including one fuel station entry, within 250m of the site, the details of which are summarised in Table 3. There are no records within the WwTW site boundary or proposed permitted installation boundary.

Table 3: Contemporary trade directory entries within 250m of the site

Name	Classification	Status	Distance & direction
Queensferry MOT Testing Station	Garage Services	Inactive	69m NW
Gladiator Marine	Boatbuilders & Repairers	Inactive	69m NW
M Power Transformer Services Ltd	Transformer Manufacturers	Inactive	69m NW
Mealor Mowers	Lawnmowers and Garden Machinery	Inactive	69m NW
Queensferry MOT Testing Station	Garage Services	Active	70m NW
Nexon Fires	Gas Appliances Sales and Services	Inactive	94m NW
Huws Grey	Builders Merchants	Inactive	73m NW
Queensferry Car Spares	Car Breakers and Dismantlers	Inactive	79m N
Discount Pet Food	Pet Food and Animal Feeds	Inactive	92m SW
Deeside Jag Centre	Garage Services	Inactive	113m south-east
County Auto Services	Garage Services	Inactive	117m south-east
A G Clubbe Solid Fuel Distributors	Coal and Smokeless Fuel Merchants and Distributors	Inactive	140m south-east
P & J Auto Engineers	Garage Services	Inactive	147m south-east
J & M Garner Haulage Ltd	Road Haulage Services	Active	135m north
J & M Garner Haulage Ltd	Road Haulage Services	Inactive	135m north
Riverside Joinery	Joinery Manufacturers	Inactive	171m north-east
Hi Q Tyres	Garage Services	Inactive	160m north-west
Harding Motor Co Ltd	Used Car Dealers	Inactive	160m north-west
Flintshire Caravan Dealers	Caravan Dealers and Manufacturers	Inactive	194m west
Bell Automotive	Garage Services	Active	160m west
Norvex	Cleaning Materials and Equipment	Inactive	162m north-west
NWP Electrical Ltd	Engineers	Inactive	187m north-west
Lindop Bros Queensferry Ltd	Car Dealers	Inactive	165m north
Lindop Toyota	Car Dealers	Active	165m north
Huws Gray	Builders Merchants	Active	177m north-west
Sammys Car Ltd	Used Car Dealers	Active	222m north-west
Shell UK Ltd	Petrol Filling Station	Inactive	223m north-west

Blue Bridge	Car Dealers	Inactive	223m north-west
300 Recycling Ltd	Recycling Site	Inactive	182m south-east
Knauf Insulation Ltd	Insulation Materials	Inactive	211m south
Screwfix	Builders Merchants	Active	219m south-west
Kaybee Doors and Fires Ltd	Fires and Mantlepieces	Inactive	241m south-west
Enviro Truck Ltd	Garage Services	Active	228m south-east
Orion Motors	Garage Services	Active	235m south-east
Blue Bridge Cars	Car Dealers	Inactive	237m north-west
Quicks of Queensferry	Car Dealers	Inactive	237m north-west
Evans Halshaw	Car Dealers	Inactive	237m north-west

(Landmark, 2021)

Landfill and waste sites

There is one registered landfill site recorded within 250m of the site. A McFadden & Co Ltd, 105m north-west of the site, operated from 1st March 1984 to an unknown date (licence lapsed/cancelled). Authorised waste such as construction and demolition waste, excavated natural materials and hardcore and rubble.

A licensed waste management facility is recorded on-site. There are nine additional licensed waste management facilities recorded within 250m of the site, as detailed below:

1. United Utilities, Chemistry Lane, Physical Treatment Facility, issued 2nd November 1994 (on-site, although not within the boundary of the proposed permitted installation), issued;
2. Queensferry STW, Biological Treatment, issued 2nd November 1994 (52m north), surrendered;
3. A494 Queensferry Bypass, Physico-chemical Treatment Facility, issued 11th April 1994 (63m north), surrendered;
4. Queensferry Car Breakers Ltd, Metal Recycling/Vehicle Dismantlers, issued 12th August 2016 (70m north), effective;
5. Queensferry Car Breakers Ltd, Metal Recycling/Vehicle Dismantlers, issued 13th February 2001 (70m north), transferred;
6. Edmund Nuttall Ltd, Physico-chemical Treatment Facility, issued 11th April 1994 (72m north), surrendered;
7. S P Manweb Plc, Physical Treatment Facility, issued 14th October 1994 (213m south-east), effective;
8. S P Manweb Plc, Physical Treatment Facility, issued 14th October 1994 (213m south-east), issued;
9. A&A Car Dismantlers, Metal Recycling/Vehicle Dismantlers, issued 7th July 1994 (226m south-east), revoked;
10. Dundas Sidings, Metal Recycling/Vehicle Dismantlers, issued 7th July 1994 (226m south-east), revoked.

There are four records of potentially infilled land (water), two of which are on-site, within 250m of the site, as detailed below:

1. Unknown filled ground (pond, marsh, stream, river, dock etc.) on-site (although not within the boundary of the proposed permitted installation), mapped in 1963;
2. Unknown filled ground (pond, marsh, stream, river, dock etc.) on-site (although not within the boundary of the proposed permitted installation), mapped in 1882;
3. Unknown filled ground (pond, marsh, stream, river, dock etc.) 6m west, mapped in 1882;
4. Unknown filled ground (pond, marsh, stream, river, dock etc.) 125m south-east, mapped in 1900;

There is one registered waste transfer site within 250m of the site. Edmund Nuttall Ltd, 72m north-east of the site, operated from 11th April 1994 to unknown date (licence surrendered). Authorised waste included drummed industrial wastes.

There are six registered waste treatment or disposal sites within 250m of the site, one of which is on-site, as detailed below:

1. Queensferry STW, on-site, operational from 1st November 1994. This record is adjacent to the south-eastern boundary of the proposed permitted installation. Authorised waste includes animal processing wastes, cellulose wastes, dyestuffs waste, food processing wastes, glue wastes, industrial effluent treatment sludge, latex, liquid industrial wastes, mixed inorganic compounds, mixed organic compounds, oxygen containing organic compounds, paint waste, pharmaceutical/cosmetic products, phenols, polymeric material, soaps and detergents, synthetic adhesive waste, contaminate water.
2. Fourway Management, 24m north, operated from 1st June 1982 to unknown date (licence lapsed/cancelled). Authorised waste included oily waste.
3. Clwyd Waste Disposal Ltd, 69m north, operated from 1st June 1982 to unknown date (licence lapsed/cancelled). Authorised waste included fats, waxes and greases, fuel oil, kerosene, mineral oils, other oils.
4. D L Lockett, 72m north-east, operational from 13th February 2001 to unknown date. Authorised waste included vehicles (and special waste that is part of the vehicle).
5. Edmund Nuttall Ltd, 72m north-east, operational from 11th April 1994 to unknown date (surrendered). Authorised waste included contaminated water.
6. Manweb Plc, 154m east, operational from 14th October 1994 to unknown date (site dormant). Authorised waste associated with scrap refrigeration plant.

Mining sites and mineral extraction

The entire site is located in a coal mining reporting area but is not located in a development high risk area. The site is located within a surface coal resource area. The nearest recorded area of past/current surface mining is approximately 800m south-west of the wider WwTW site.

The nearest recorded coal outcrop, mine entry (past shallow coal mine workings) and associated mine entry potential zone of influence is approximately 500m south-west of the site. The nearest mine entry had a shaft depth of 164.9m (recorded working date in 1913).

Recorded working dates (1913) are also present immediately to the north-east and east of the site (seam level approximately 126m depth).

Review of historical mapping

On-site history

Earliest available mapping from 1870 shows that the wider WTW site was mainly undeveloped grass land and was bounded to the south by the Chester & Holyhead Branch of the L&NWR (London and North-Western Railway). The southern border and south-western corner of the WTW is occupied by railway sidings/shed and a small pond.

The WTW site was established by 1911 (presence of filter beds in the south of the wider site). An engine shed is also present on-site associated with the railway link to the Chemical Works to the north of the site. The WTW site had expanded by 1963-64 and was fully developed into its present layout by 1984-92, with the presence of multiple tanks and beds etc.

Two pylons have been present in the south-east of the site since 1963-64, following the removal of the railway line and small pond in this location.

Tanks and filter beds have been present within the boundary of the proposed permitted installation since 1963-1964, before which it was undeveloped land on the wider WTW.

Off-site history

A large chemical works site is recorded approximately 100m north of the site from mapping in 1870, which is connected by a small railway line that runs along the eastern site boundary. The chemical works site became a caravan park by 2000 with a larger area of disused hardstanding adjacent to the northern site boundary.

Landing stages are also present along the banks of the River Dee to the north of the site. Shipbuilding and engineering works were established in this location (approximately 200m north of the site) by 1900.

The Queensferry railway station is approximately 250m west of the site, and the Chester & Holyhead Branch of the L&NWR railway line runs along the southern boundary of the site.

The town of Queensferry is largely undeveloped (smithy, hotel, limited housing within 250m of the site from 1870) until 1913. Queensferry Engineering Works was a large site established to the east of the site, including tanks, pumps, engine sheds and a reservoir, with a tarmacadam works to the east. There is also a fire station adjacent to the north of the site (1913 – 1960s).

A saw mill is present to the south-east (approximately 200m) of the site from 1954, which later developed into a larger mill complex and unspecified works. A depot/unspecified works is also recorded in 1969 – 2006 to the south-west of the site.

Contaminants of concern

The following contaminants are considered to be 'relevant hazardous substances', as defined in Article 3(18) of the IED and Article 3 of Regulation (EC) 1272/2008.

	The contaminants of concern are associated with the historical and current industrial activities within 250m of the WTW (including the proposed permitted installation), in addition to the current use of the site. Off-site land uses (particularly the chemical works to the north) are unlikely to be a source due to the indicative direction of groundwater flow (off-site to the north, towards the river). Heavy metals and inorganics; acids and alkalis; cyanides; detergents; polymerised glycols and ethers; ammoniacal nitrogen; pathogens; total petroleum hydrocarbons (TPH); polycyclic aromatic hydrocarbons (PAH); polychlorinated biphenyls (PCB); organic solvents/thinners; coal/ash; coal tar constituents/products; crude oil; organosulphur/organonitrogen compounds; halogenated hydrocarbons and solvents; paraffin; chlorinated solvents and phenols; volatile and semi-volatile organic compounds (VOC/SVOC); and asbestos. There may also be ground gases present, likely comprising CO_2 and CH_4. 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. The Environmental Risk Assessment report includes the potential risk to receptors from the use, production and release of relevant harmful substances from operational activities at the WTW. No further risk assessment for the release of contaminants to the environment are therefore considered to be needed beyond the Environmental Risk Assessment for the application.
Evidence of historic contamination, for example, historical site investigation, assessment, remediation and verification reports (where available)	**Anecdotal evidence** Between October 2015 and June 2019, a supervisor at the site reported that there have been: • No known spillages of diesel or other fuel oils; • No known failures of the containers that hold the liquid polymer, ferric sulphate, antifoam and powdered polymer; • Two recorded spills on-site to land, which was cleaned up predominantly with tankers. These were caused by failure of pipework on the primary desludge pump out-of-hours with no way of altering the site team. These were believed to have occurred in December 2018 and May 2019. • Another incident is reported to have occurred, caused by a third party, where a blue dye was tipped into the sewer and contaminated the works. The final effluent turned blue with no detriment to the processes (Natural Resources Wales were informed). • A minor fire occurred on the centrifuge in December 2018 when friction caused grease to catch fire. An investigation by a specialist centrifuge contractor was undertaken and found no further issues. It is unknown if there is any documented evidence of these events. The specific locations of these incidents have not been confirmed, therefore it is unknown if these occurred within the boundary of the proposed permitted installation. **Site data**

	No intrusive investigation data is known to be available for the site, however the BGS indicates that there are numerous boreholes on site associated with 'Queensferry WTW Phase 2', although these are confidential on the website. **Planning applications** A search of the Flintshire County Council planning portal was conducted on the 15th January 2021. No relevant information to contamination was found.
Baseline soil and groundwater reference data	No reference data is currently available. It is not considered necessary to undertake additional geo-environmental samples to establish baseline conditions, as the site is underlain by made ground (BGS maps) and the site was previously undeveloped before becoming a WTW, therefore any ground impacts are likely a result of the presence and operation of the wider WTW. Whilst the Environmental Risk Assessment has identified potential hazards to the environment from the identified contaminants, any existing contamination at the proposed permitted installation site is considered to be as a result of historical WTW development and operational activities only. Additionally, the baseline information collected for the WTW (see above sections) does not indicate that significant degradation of the land quality has occurred within the boundary of the proposed permitted installation.
Supporting information	Sources used in the production of this SCR: • Landmark (2021) Envirocheck report – Queensferry WTW, ref: 271638395_1_1; • British Geological Survey, GeoIndex www.bgs.ac.uk consulted January 2021; • British Geological Survey, borehole scans www.bgs.ac.uk consulted January 2021; • British Geological Survey, The Coal Authority Interactive Map consulted January 2021; • Consultation with Welsh Water; • Mott MacDonald Bentley, Preliminary Site/Ground Condition Assessment, ref: B14411-123532-XX-XX-RP-GB-GC5002 (May 2020); • Mott MacDonald, Queensferry IED Permitting Environmental Risk Assessment - B14411-123532-ZZ-XX-AS-NA-RI1037 - IED Queensferry - Environmental Risk Assessment (2021)

3.0 Permitted activities

Overview of site processes	Effluent treatment (wider WTW activities)

	Queensferry WTW receives flows of crude effluent through a number of sewers e.g. Deeside Industrial Estate, Pentre, Sandycroft, Mancott & Hawarden, Sealand Road, Queensferry and Site Returned Liquors. All flows into the works are directly pumped from the various pumping stations. Industrial flows constitute approximately 80% of total flow to the works. All inlet channels upstream of the Inlet Screens are covered to contain Hydrogen Sulphide Nuisance smells. To further reduce nuisance smells, ferric sulphate is dosed to the incoming crude sewage in proportion to the flow rate. The inlet works equipment consists of two Longwood Engineering Parkwood 6mm elevator screens, macerator, dewaterer/compactor. The two grit traps, and two grit lifts and grit classifier/organics impellers are not in use (reported in 2018). The screened effluent gravitates to the Inlet Pumping Station (IPS), passing the Storm Return Inlet and the Storm Overflow Weir. In the IPS wet well, three submerged pumps (duty/assist/standby) maintain a maximum flow of 277.6 l/sec (full flow to treatment) to the Inlet Flume Channel (IFC). 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. 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. From the Primary Settlement Tanks Distribution Chamber, the flow is divided equally to the two Primary Settlement Tanks (PST). Primary sludge is pumped into the wet well of the Primary Sludge Pumping Station. Primary settled effluent is divided into two separate streams – one third to the conventional biological filter beds and two thirds to the high rate biofilters. The three high rate biofilters contain a plastic media. Of the five conventional filter beds, four contain a stone media – the other has a plastic media. Biologically treated effluent flows to two separate sets of humus tanks (from the three high rate biofilters to two rotary flow tanks, and from the five filter beds to six pyramidal upward flow tanks). Settled final effluent from both sets of tanks gravitates to the operational UV plant; from there is flows to the inlet well of the Tidal Outfall Pumping Station prior to being discharged through the works outfall to the River Dee. Humus sludge from the pyramidal tanks gravitates to the Returned Liquors Tank (within proposed permitted installation boundary). Humus sludge from the rotary tanks is umped back to a chamber downstream of the inlet flume. <u>Sludge treatment (within proposed permitted installation boundary)</u> Primary sludge is pumped from the primary sludge pumping station to consolidation tank No.1. Screened sludge leaving the Rotamat Unit flows under gravity to the Screened Sludge Reception Tank, from where it is pumped to the consolidation tanks. Here there is a manual bypass into the drum thickener of if

	deemed sufficiently thick enough already it can be sent directly to the thickened sludge holding tank. Blended sludge is pumped to the Drum Thickener Plant, the function of which is to receive blended sludges at 1%ds and thicken to 6%ds with the aid of a polymer system. The thickened sludge is pumped to the Thickened Sludge Holding Tank (TSHT) from where it is continuously pumped into Digester 1 or 2. Within each digester, heat exchangers maintain the sludge temperature at 35°C ± 0.5°, and the process of digestion takes place. Partially digested sludge is continuously discharged under gravity and is stored within digested sludge storage tanks. The Alfa Laval Decanter Centrifuge is designed to raise the percentage of dry solids in the sludge to approximately 25%. The centrifuge receives digested sludge from the Centrifuge Feed Tank, and polyelectrolyte is injected into the Centrifuge inlet to aid dewatering. The Centrifuge, by means of a rapidly rotating centrifuge bowl, removes additional water from the sludge before continuously discharging the processed sludge into a solids discharge chute. A single transfer pump draws the sludge from the chute and deposits it via high pressure pipework into the selected bay of three Sludge Cake Bays, ready for off-site disposal. The Environmental Risk Assessment report includes the potential risk to receptors from the use, production and release of relevant harmful substances from operational activities at the WTW.
Permitted activities	The site is permitted to discharge secondary treated sewage effluent (with ultraviolet disinfection) and settled storm sewage, into the River Dee. **Welsh Water Queensferry Environmental Permits** • Permit Licence CM0082201 – Water discharge activity for secondary treated sewage. Subject to the UWWTR 1994. Last varied in 2005. • Permit Licence CM0082301 - Water discharge activity for settled storm sewage. Consolidated permit under the Environmental Permitting (England and Wales) Regulations 2010. Last varied in 2015.
Non-permitted activities undertaken	Waste activities comprising imports, physio-chemical and anaerobic digestion treatment and waste storage are currently non-permitted activities on site. Anaerobic digestion is to be permitted under the Industrial Emissions Directive under a Bespoke Installation Permit as Anaerobic Digestion is no longer operational under T21 exemptions. Permitted Directly Associated Activities include waste import, physio-chemical treatment of sludges and storage of indigenous and imported sludges.
Document references for: • plan showing activity layout; and	Queensferry WwTW Drainage Plan, Asset No. 00932, April 2015. Queensferry WwTW Works Operating Manual, WOL 00932-01 Issue 05, November 2018. Mott MacDonald, Queensferry Permit Application Main Supporting Document – B14411-123532-ZZ-XX-NN-ZA-DI1035 - IED Queensferry - Main Supporting Document (2021)

• environmental risk assessment.	Mott MacDonald, Queensferry IED Permitting Environmental Risk Assessment - B14411-123532-ZZ-XX-AS-NA-RI1037 - IED Queensferry - Environmental Risk Assessment (2021)

Note:

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

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

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

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

4.0 Changes to the activity	
Have there been any changes to the activity boundary?	If yes, provide a plan showing the changes to the activity boundary.
Have there been any changes to the permitted activities?	If yes, provide a description of the changes to the permitted activities
Have any 'dangerous substances' not identified in the Application Site Condition Report been used or produced as a result of the permitted activities?	If yes, list of them
Checklist of supporting information	• Plan showing any changes to the boundary (where relevant) • Description of the changes to the permitted activities (where relevant) • List of 'dangerous substances' used/produced by the permitted activities that were not identified in the Application Site Condition Report (where relevant)

5.0 Measures taken to protect land

Use records that you collected during the life of the permit to summarise whether pollution prevention measures worked. If you can't, you need to collect land and/or groundwater data to assess whether the land has deteriorated.	
Checklist of supporting information	• Inspection records and summary of findings of inspections for all pollution prevention measures • Records of maintenance, repair and replacement of pollution prevention measures

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

Summarise any pollution incidents that may have damaged the land. Describe how you investigated and remedied each one. If you can't, you need to collect land and /or groundwater reference data to assess whether the land has deteriorated while you've been there.	
Checklist of supporting information	• Records of pollution incidents that may have impacted on land • Records of their investigation and remediation

7.0 Soil gas and water quality monitoring (where undertaken)

Provide details of any soil gas and/or water monitoring you did. Include a summary of the findings. Say whether it shows that the land deteriorated as a result of the permitted activities. If it did, outline how you investigated and remedied this.	
Checklist of supporting information	• **Description of soil gas and/or water monitoring undertaken** • **Monitoring results (including graphs)**

8.0 Decommissioning and removal of pollution risk

Describe how the site was decommissioned. Demonstrate that all sources of pollution risk have been removed. Describe whether the decommissioning had any impact on the land. Outline how you investigated and remedied this.	
Checklist of supporting information	• **Site closure plan** • **List of potential sources of pollution risk** • **Investigation and remediation reports (where relevant)**

9.0 Reference data and remediation (where relevant)

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

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

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

10.0 Statement of site condition

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

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

A. Plans and figures

Refer to:

- B14411-123532-XX-XX-DR-AC-PN8201 - IED Queensferry - Site Location Plan
- B14411-123532-XX-XX-DR-AC-PN8202 - IED Queensferry - Site Layout Plan (Emissions)
- B14411-123532-XX-XX-DR-CC-CI8606 - IED Queensferry - Drainage Plan
- B14411-123532-XX-XX-DR-AD-PR8401 - IED Queensferry - Block Flow Diagram

B. Landmark Envirocheck Report

Available on request.