

Afan Strategic Storage

Land Contamination Desk Study and Preliminary Risk Assessment

Alun Griffiths

61323

March 2025



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S0 – Work in progress

S1 – For coordination

S2 – For information

S3 – For review and comment

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List of Abbreviations

Abbreviation	Full Description
WwTW	Wastewater Treatment Works
AOD	Above ordnance datum
BGS	British Geological Survey
CSM	Conceptual Site Model
PRA	Preliminary Risk Assessment
RAMS	Risk Assessment and Method Statement
PPE	Personal Protective Equipment

INTRODUCTION

It is proposed to construct temporary storage for sludge cake to increase the storage capacity at the Dwr Cymru Welsh Water (DCWW) Afan Wastewater Treatment Works (WwTW), Port Talbot, South Wales. The proposed storage facility is to be constructed within the existing Afan WwTW site. The development is subject to a planning permission.

TACP (UK) Ltd have been commissioned by Alun Griffiths (Contractors) Ltd, the principal contractor, to provide land contamination risk management for the proposed development. This report presents a desk study and a land contamination Preliminary Risk Assessment (PRA), as well as outlines the ground investigation proposals.

DEVELOPMENT PROPOSALS

The proposed development is a single 12m x 30m shelter to be located to the north of existing settlement tanks at Afan WwTW. The shelter will be constructed using legato blocks and lightweight roof material and are supplied / installed by a specialist provider.

It is proposed that the drainage from the shelter roof be discharged through infiltration to the surrounding soils if proven viable. The surface run off will be collected and discharge into the sewer system within the WwTW.

There are no significant opportunities for reuse of materials within the proposed development and therefore it is likely that excavated material will require off-site disposal.

THE SITE

Location and topography

The Afan Welsh Water strategic storage facility is associated with the Afan WwTW, located in Port Talbot, near Swansea, South Wales. Port Talbot is on the South Wales coast, and the site is positioned near the River Afan and feeding into the Bristol Channel, which is efficient for wastewater processing and resource management. The site is between Port Talbot beach and Morfa Beach. The location is strategically placed for serving the surrounding urban and industrial communities.

The site is approximately 2.96ha in size and only just off the shore, on coastal lowland topography. This type of terrain is generally flat or gently sloping, making it suitable for industrial infrastructure like wastewater treatment facilities. The topography around the site in Port Talbot, is characterised by a coastal lowland area bordered by gently rolling hills. It lies near the River Afan, which flows through the region and into Swansea Bay to the south. The landscape combines industrial zones and natural features, with flat, low-lying terrain around the site facilitating infrastructure development and accessibility. The nearby hills, part of the South Wales Valleys, rise to the north and east, providing a contrasting backdrop to the more urban and coastal setting of Port Talbot. The ground level is approximately at 10m (above ordnance datum) AOD.

Site history

The site is located on the fringes of the Port Talbot steel works area. The site remained largely undeveloped until the 1960s, when the expansion of Port Talbot steel works resulted in a construction of access tracks and placement of slag across the site. However, no significant development of the site occurred until the early 2000s when the existing Afan WwTW were constructed. No significant changes to the site layout since its construction have been identified. A detailed site history is presented in Table 1.

Table 1 Historical site development

Date	Site	Off-site
1876-1885	Site is undeveloped comprising predominately sand. The site is within a High Water Mark of Ordinary Tides.	Marsh extends to the north of the high tide line. The Old River channel is present 50m to the east of the site.
1899-1900	No change to site but the high tide line moves south with the northern site area outside the tide influence.	The Old River channel now located adjacent to the site. Railway tracks associated with the Port Talbot docks (located approximately 1.5km to the north-east of the site) terminate approximately 110m to the north of the site.
1914-1921	Site remains undeveloped.	The Old River's channel location is now located approximately 100m to the east of the site. New railway sidings terminate at the Old River channel, approximately 200m to the north.
1938-1940	Site remains undeveloped.	No significant changes to the site surroundings except for minor ground works within 100m to the north of the site.
1949	Site remains undeveloped. The high tide line further withdraws to the south, with now half a site outside the tide zone.	No significant changes to the site surroundings.
1964-1965	Site remains undeveloped. Marsh and dunes cover the site. The site is completely outside the high tide line. A slag heap encroaches on the site. A track crosses the site leading to a tank located approximately 50m west of the site.	The ground works to the north of the site now extend nearly to the site northern boundary. A slag heap extends to the north. The Old River is no longer shown, with the area now shown to be covered in slag deposits associated with the expanding Port Talbot steel works.
1977-1982	Another track and a drain and tracks. Slag is now shown covering the central and southern parts of the site.	A conveyor runs to the north and east of the site. A pipeline and sludge pond are located to the north-east of the site, 50m and 20m respectively. Entire area to the east is now covered in slag.
1993	No significant changes to the site.	A pumping station with two outfalls into the sea is now shown 20m to the west of the site.

Date	Site	Off-site
2001 - 2003	Sewage works in their current layout are shown within the site area.	No significant changes to the site surroundings. Workings to the east are now shown discussed.
Current	No significant changes to the site.	No significant changes to the site surroundings.

Geology

Geology is crucial for a desk study as it provides information about the ground conditions, helping to assess potential risks and constraints for this project. Understanding the geological characteristics of a site, such as soil composition, rock formations, groundwater levels, and potential hazards like landslides or subsidence, allows for informed decision-making and reduces unforeseen complications during development.

Geological maps

Geology maps at 1:10,000 scale were consulted to identify the underlying geology. These are included in the Groundsure Report (enclosed in Appendix A).

The geology maps show the site and surrounding area to be underlain by 'landscaped ground' defined as artificially modified ground. This is supported by historical plans, which show the site to be gradually covered in slag.

Blown Sand is shown to be underlying the site, with Tidal Flat Deposits comprising clay, silt and sand shown to the east of the site, and Storm Beach Deposits comprising gravels and Marine Beach Deposits comprising sand and gravels to the west.

The bedrock formations beneath the site comprise South Wales Middle Coal Measures Formation of mudstone, siltstone and sandstone. An inferred coal seam running in north-west-south-east direction is shown approximately 100m to the north of the site.

An inferred fault line running north to south of unknown displacement runs approximately 400m to the east of the site.

Hydrogeology

The northern part of the site is underlain by superficial deposits classified by Natural Resources Wales as a Secondary A aquifer, and the southern part underlain by a Secondary Undifferentiated aquifer. The bedrock is classified as a Secondary A aquifer with primary flows through well connected fractures. The aquifers are of high vulnerability.

The bedrock aquifer is a designated Water Framework Directive (WFD) groundwater body: Swansea Carboniferous Coal Measures (ID GB41002G201000). It was rated as 'Poor' in 2017.

Secondary A aquifers are defined as '*Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers*'.

Secondary Undifferentiated are defined as '*Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non- aquifer in different locations due to the variable characteristics of the rock type*'.

There are no Source Protection Zones or groundwater abstractions within 2km of the site boundaries.

Hydrology

The site is located within the coastal setting with current Mean High Water on the Bristol Channel mark located approximately 50m south of the site. There are no surface water features within the site boundaries.

A water course is shown approximately 40m to the north-east identified in the Groundsure report as 'inland river not influenced by normal tidal action' and containing water all year round. This watercourse runs along the boundary of the former sludge pond, which is shown as marshes on the current OS map. Historical maps showed the Old River channel in that area until approximately 1960s, when the area was infilled with slag. The existing watercourse is unlikely to represent the Old River channel and is more likely to form a drainage system associated with the sludge pond. The Old River may provide a preferential flow path for groundwater towards the Bristol Channel. Although the historical plans show the Old River channel outside the site area, it cannot be excluded that the channel did transect the site area in the more distant past.

Flooding

The site is not in a flood zone and there are no records of flooding within the site area. However, the risk of river and coastal flooding on site is considered high based on the Risk of Flooding from Rivers and Sea (RoFRaS)/Flood Risk Assessment Wales (FRAW) models. High risk is defined as greater than or equal to 1 in 30 chance.

The risk of surface water flooding on site or within 50m of the site is negligible. There is a low risk of groundwater flooding on site and a moderate risk within 50m of the site, within the area of tidal influence.

Historical ground investigations

1997 Afan Partnership Investigation

British Geological Survey (BGS) records show extensive ground investigation was undertaken in 1997 within the site area as part of the sewage treatment works development [1]. As the proposed development is located within the northern part of the site, only the relevant exploratory holes have been reviewed as part of this desk study. Table 2 provides a summary of the encountered ground and groundwater conditions in the northern site area. The locations are shown on Figure 1.

The reviewed investigations comprised 3No trial holes to between 1.5 and 4m below ground level (bgl), 3No cable percussive boreholes to between 26.2 and 28.4m bgl, and 3No rotary boreholes with open hole drilling to bedrock to between 36.0 and 39.6m bgl. Selected boreholes were equipped with groundwater monitoring installations, however the results are not available. The exploratory hole logs are enclosed in Appendix B.

Encountered ground and groundwater conditions

In summary the completed historical investigations show the northern part of the site, the area of the proposed development (prior to current development) to be underlain by 0.4-4.0m of made ground (typically 0.4-1.2m) comprising slag or sand with slag or black ash, over superficial deposits of sands, silt, clay and gravel to at least 28.4m bgl, with bedrock of mudstones encountered at between 31-33.9m bgl.

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Table 2 Historical BGS boreholes and encountered ground and groundwater conditions

Borehole ID	Depth, m	Topsoil/MG	Superficial Deposits	Bedrock	Groundwater observations
SS78NE315	27.7	0.0- 0.6m topsoil over slag	0.6- 12.4m sand 12.4-27.7m silt 27.7->27.9m gravel	-	GW levels recorded at start of shift 6.3m, 12.1m, 6.1m bgl
SS78NE327	39.6	No recovery	No recovery	33.9 – > 39.6m Mudstones	Not recorded
SS78NE334	3.2	0.0 – 0.4m topsoil over slag	0.4 - >3.2 sand	-	Dry
SS78NE336	4.0	0.0- 0.6m topsoil over slag	0.6->4m sand	-	Dry
SS78NE319	26.2	0.0-1.2 sand with slag	1.2-8.3m sand 8.3-26.0 clay 26.0->26.4 sand	-	Strike 6.3m GW levels recorded at start of shift 14.7m, 13.9m, 22.3m, 6.7 bgl
SS78NE332	36.5	No recovery	No recovery	31.0- >36.0 Mudstones	Not recorded
SS78NE339	3.0	0.0 – 1.1m topsoil over slag	1.1->3.0 sand	-	Dry
SS78NE322	28.4	0.0-4.0 black ash over MG 'gravel'	4.0-9.6m sand with bands of peat at 8.7- 9.6m 9.6-24m silt 24-26.7 clay 26.7->28.4m gravel	-	GW levels recorded at start of shift 14.0m, 19.0m,
SS78NE329	36.4	No recovery	No recovery	31.0- >36.4 Mudstones	Not recorded
SS78NE340	1.5	0.0 – 0.4m topsoil over slag	0.4->1.5 sand	-	Dry

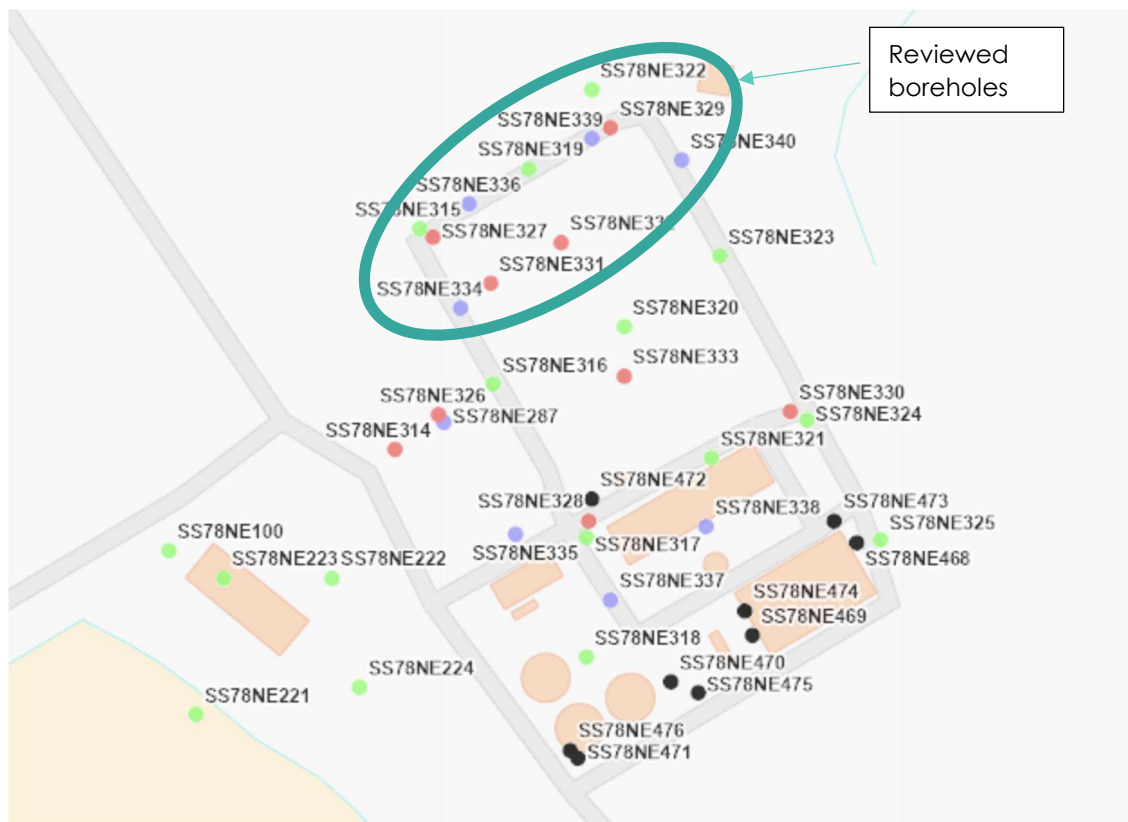


Figure 1 BGS boreholes location plan

Anticipated ground and groundwater conditions

Based on available geological maps and historical ground investigations (prior to the sewage treatment works development), it is anticipated that the site is underlain by 0.6-1.5m of made ground, although it may be encountered to 4m bgl in the northeastern site area. The superficial deposits within the construction area are likely to be encountered as sands. The historical trial hole logs record unstable conditions during the trial hole excavations.

It is anticipated that groundwater level beneath the site is influenced by tidal fluctuations. Historically the site was within the high tide water mark, which gradually over time retrieved to its current location, some 50m south of the site. The site has been uplifted as part of the expansion of the steel works, although the historical investigations indicate typically up to 1.5m of made ground. Groundwater was encountered at 6.3m bgl or at greater depth and therefore the risk of encountering groundwater during excavation works is low. This requires confirmation through development specific investigation.

Ground stability

Natural ground subsidence

Groundsure provides the following classification of risk with respect to ground hazards:

- Natural ground subsidence – shrink swell clays – Negligible.

- Natural ground subsidence – running sands – Negligible.
- Natural ground subsidence – compressible deposits – Negligible
- Natural ground subsidence – collapsible deposits – Negligible
- Natural ground subsidence – landslides – Very low
- Natural ground subsidence – ground dissolution of soluble rocks – Negligible

There are no reported natural or mining cavities, or sinkholes within the 250m of the site area.

However, it needs to be noted that historical trial hole logs recorded unstable ground (collapse of side walls) during the trial holes excavation. This will need to be considered as part of the temporary works design.

Mine workings

There are no recorded coal mine workings within the site area or surrounding 1km of the site.

There are records of non-coal mining with the nearest located 280m south of the site – iron ore (bedded). These are classed as Class B defined as 'Underground mine workings may have occurred in the past or current mines may be working at significant depth to modern engineering standards. Potential for difficult ground conditions are unlikely and are at a level where they need not be considered.'

Radon gas

The site contains one record of radon gas data within BGS and Public Health England inventory. The site has been classified as having a maximum radon potential of less than 1%, therefore requiring no radon protection measures.

Environmental Information

In accordance with the Guidance for the Safe Development of Housing on Land Affected by Land Contamination [2], potential sources of contamination within a 250m radius of the site have been reviewed, as these are most likely to possibly have a significantly detrimental impact on the site.

Waste disposal sites

There are no active or historical landfill sites within the site or surrounding 250m.

Waste activities and waste transfers

Welsh Water Afan WwTW hold a waste management licence for a combined heat and power facility. The Environmental Permitting Regulations (Waste) Licence Number ZP3032KQ/V002 is for a Landfill Gas Engine (3mW) and was first issued in 2010 and revised in 2013. The licence was reissued in 2018 and is effective.

There are no other waste activities or radioactive waste records within 250m of the site area.

Waste exemptions

There are no records of waste exemption in 250m of the site.

Industrial site uses

The site is currently used as a sewage treatment works. There are records of two electricity sub-stations within the site area. These are located in the southern part of the site, away from the proposed development area.

A pumping station and associated tanks and outflows (for licenced discharges) is located approximately 70m south-west of the site.

Groundsure does not identify any underground high pressure gas pipelines or high voltage underground electricity transmission cables within 250m of the site.

Control of Major Accident Hazards (COMAH)

The site is within the Tata Steel UK Limited COMAH zone. Historically, the site was also within British Steel Strip Products Notification of Installations Handling Hazardous Substances (NIHHS) site.

Licenced Sites

Afan Waste Water Treatment Works is a Part A(1) installation and is regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

There are no other licenced installations within 250m of the site.

Historical tank database

There are no current or recent petrol stations within the site or its vicinity. Two tanks are identified within 250m of the site, approximately 20m west of the site and 70m south-west of the site. They are likely to be associated with the pumping station.

Pollution incidents

There is a record of one pollution incident within 250m of the site boundary. It was a minor release of pollutant to air, located approximately 80m south-east of the site area. No impact on water or land was recorded.

Licensed discharges to controlled waters

Afan WwTW holds a licence to discharge final/treated sewage effluent to the Swansea Bay.

There are two other discharge licences within 250m of the site, sewer storm overflow and from the pumping station, both located 25m southwest of the site.

CONCEPTUAL SITE MODEL

A conceptual site model (CSM) is a representation of the characteristics of the site. It shows the possible relationships between contaminants, pathways and receptors. The CSM will focus on the area of the proposed development, which will be undertaken in the northern area of the Afan WwTW site.

Sources

The review of the desk study information identified a number of potential sources of contamination within the site area and its immediate surroundings, which have a potential to adversely impact the site and result in land contamination. These are summarised in Table 3.

Table 3 Potential sources of contamination

Potential source(s) of contamination	Remarks
On site	
Made ground associated with construction of Afan WwTW	Materials brought to site as part of the construction activities. May contain metals, asbestos, PAHs. Made ground is a potential source of ground gas (methane, carbon dioxide).
Activities at Afan WwTW	May have resulted in release of contaminants such as asbestos, petroleum hydrocarbons, volatile and semi-volatile organic compounds.
Electricity sub-stations within Afan WwTW	PCBs, oils. Electricity sub-stations are located away from the proposed construction works and therefore unlikely to be impacted.
Made ground (slag) associated with steel works expansion and activities; Encountered by historical ground investigations	Slag may contain contaminants such as metals, PAHs, sulphates. Made ground is a potential source of ground gas (methane, carbon dioxide).
Port Talbot steel works activities	May have resulted in release of contaminants such as asbestos, metals, cyanides, sulphates, fuel, tar, oils.
Made ground (black ash) encountered by historical ground investigations	May contain contaminants such as metals, PAHs, sulphates. Made ground is a potential source of ground gas (methane, carbon dioxide).
Deposits of peat	Peat is a potential source of methane.
Groundwater	Groundwater beneath the site may be a source of contaminants originating from site and off-site sources.
Off site	
Port Talbot steel works activities (adjacent)	May have resulted in release of contaminants such as asbestos, metals, cyanides, sulphates, fuel, tar, oils. These may have migrated into the site through air deposition (asbestos) or through groundwater movement (others)
Made ground associated with Port Talbot steel works activities – incl. slag,	Slag may contain contaminants such as metals, PAHs, sulphates. These may have migrated into the site through groundwater movement. Made

Potential source(s) of contamination	Remarks
slag heap, infilled Old River channel (adjacent)	ground is a potential source of ground gas (methane, carbon dioxide)
Sludge pond (40m NE)	Sludge resulting from treatment of steel works process waters may contain metals, sulphates and be of low or high pH. Accumulated sludge is a potential source of ground gas (methane, carbon dioxide)
Afan WwTW licenced discharges (25m SW)	Licenced discharges are to the Swansea Bay and therefore unlikely to impact the site.
Pumping station and associated licenced discharges (25m SW)	

Pathways

Construction works may result in creating new pathways of exposure to subsurface contamination.

Potential pathways to human receptors:

- Direct ingestion of soils and dust;
- Inhalation of dusts, fibres and particulates;
- Direct dermal contact with soils;
- Inhalation of vapours; and
- Gas migration.

Potential pathways to controlled water(s):

- Leaching and vertical/lateral migration of contaminants;
- Direct discharge;
- Surface water runoff;
- Contamination migration through preferential flow paths through historical infilled Old River channel; and
- Contamination migration through preferential flow paths through Potentially induced by the inbuilt drainage.

Receptors

Human receptors

- Construction workers;
- Welsh Water Afan WwTW employees and visitors; and
- Maintenance workers (external contractors).

The site is located within an area where access is controlled and therefore not accessible to general public. The surrounding areas are occupied by steel works and covered in stockpiles of materials. There are no permanent buildings or structures occupied by steel works staff.

Therefore, neither general public nor site neighbours are considered to be potential receptors.

Controlled water(s) receptors

- Blown sands (Secondary aquifer); and
- Mudstone of the Middle Coal Measures (Secondary aquifer).

Swansea Bay is not considered to be a primary receptor to the contamination on site due to the potential substantial dilution within that water body. The impact is likely to be localised and therefore with the greatest consequence on the underlying groundwater, which is considered the primary receptor.

Preliminary Risk Assessment

A PRA has been undertaken to qualitatively classify the nature of risk(s) posed by potential pollution linkages. This is based on the identified sources, pathways and receptors of contamination in the Conceptual Site Model developed for the site. The PRA has been undertaken in accordance with the current industry standard CIRIA C552 [3] and is illustrated in Table 4 below.

Table 4 Preliminary Risk Assessment

Potential source	Potential receptor	Possible pathway	Likelihood	Severity	Risk	Comment
Construction works						
Made ground on site impacted by WwTW activities and historical steel works activities	Construction workers	Ingestion, inhalation, dermal exposure to soils and dust	Likely	Medium	Moderate	The construction workers are likely to be exposed to made ground during excavation works as part of construction of the foundations and drainage. There is potential for asbestos presence in the ground. Significant unexpected contamination may be encountered during the works. This will need to be managed through an appropriate action plan. The construction works will be subject to Risk Assessment Method Statement (RAMS), which will consider identified and residual land contamination risks. Ground investigation is required to obtain information on the made ground quality to inform RAMS.
	Afan WwTW workers	Ingestion, inhalation, dermal exposure to soil dust	Likely	Medium	Moderate	Afan WwTW staff present on site during construction works may be exposed to dust generated during the construction works. The Afan WwTW workers are likely to be present albeit for short duration of time. There is a potential for asbestos to be present in the ground. The construction works will be subject to RAMS, which will consider identified land contamination risks. Ground investigation is required to obtain information on the made ground quality to inform RAMS.
	Secondary aquifers	Leaching and migration	Likely	Medium	Moderate	During construction works made ground currently covered by hardstanding is likely to be exposed to rainfall and therefore resulting in increased contaminants leaching potential and migration into the underlying aquifer. Ground investigation is required to obtain information on the made ground quality to inform further risk assessments.
		Direct discharge	Unlikely	Medium	Low	Historical investigations indicated the groundwater levels to be at around 6m bgl. Excavations works are proposed to max. 2m bgl and therefore groundwater is unlikely to be encountered and require control.

Potential source	Potential receptor	Possible pathway	Likelihood	Severity	Risk	Comment
						Ground investigation is required to confirm the groundwater regime to confirm the risk.
		Surface runoff	Likely	Medium	Moderate	During excavation works, removed made ground may be stored on site awaiting reuse (if proven suitable) or disposal. Surface run off from stockpiled soils as well as exposed made ground may result in migration into the underlying aquifer. Ground investigation is required to obtain information on the made ground quality to inform further risk assessments.
Ground gas and hydrocarbon vapours (made ground/ groundwater)	Construction workers	Inhalation Aspiration	Unlikely	Severe	Low	The proposed works require relatively shallow excavations, where accumulation of ground gas or hydrocarbon vapours is unlikely to occur. The risk of exposure to ground gas during construction works is also considered low due to diffusion of ground gas in the open air.
Made ground (incl. sludge accumulated in the sludge pond) off site	Construction workers	Ingestion, inhalation, dermal exposure to soil dust	Low likelihood	Minor	Very low	Dust generated from made ground areas outside the site may migrate into the site area. However, considering that the works would be undertaken in the open air there is a low likelihood that the exposure would be significant.
Groundwater impacted by offsite sources including steel works, made ground, sludge pond	Construction workers	Ingestion, inhalation, dermal exposure.	Unlikely	Minor	Very low	Historical investigations indicated the groundwater levels to be at around 6m bgl. Excavations works are proposed to max. 2m bgl and therefore groundwater is unlikely to be encountered. Ground investigation is required to confirm the groundwater regime to confirm the risk.
Operational phase						
Made ground on site impacted by WwTW activities and historical	Afan WwTW workers	Ingestion, inhalation, dermal exposure to soil and dust.	Unlikely	Medium	Low	Afan WwTW staff present on site during storage scheme operation is unlikely to be exposed to soils or dust generated in the area of the scheme. The storage unit will be placed on a concrete base with the surrounding area reinstated to current surfacing of hardstanding. Inhalation of hydrocarbon vapours is unlikely to pose a significant risk. Encountered unacceptable levels of

Potential source	Potential receptor	Possible pathway	Likelihood	Severity	Risk	Comment
steel works activities		Inhalation of hydrocarbon vapours				contamination will be dealt with during construction and therefore unlikely to remain post construction.
	Maintenance workers	Ingestion, inhalation, dermal exposure to soil and dust. Inhalation of hydrocarbon vapours	Likely	Medium	Moderate	Maintenance works may involve ground breaking activities, which would potentially expose the underlying made ground, potentially containing asbestos. The construction works will be subject to RAMS, which will consider identified and residual land contamination risks. The information on encountered contamination including asbestos will need to be incorporated into the Health and Safety file for the site. Ground investigation is required to obtain information on the made ground quality to inform RAMS and health and safety file for the site. Reuse of soils, where possible, will be subject to assessment of their suitability for reuse.
	Secondary aquifers	Leaching and migration	Likely	Medium	Moderate	The storage unit will be placed on a concrete base with the surrounding area reinstated to current surfacing of hardstanding. Therefore, rainwater infiltration into the ground in the area of the scheme will be limited. This is with an expectation of the proposed soakaway. Should the soakaway depth be within the made ground or area of contamination this is likely to mobilise the contamination and impact the underlying aquifer. The design of the soakaway should consider the depth, quality and leaching potential of the made ground. Ground investigation is required to confirm the soils quality and leaching potential of contaminants.

PRELIMINARY GEO-ENVIRONMENTAL CONSIDERATIONS

From the desk study information, a Conceptual Site Model (CSM) was developed for the site, as discussed in sections above. The source-pathway-receptor linkages identified in the CSM were then considered in the PRA.

Minimal land use development has occurred since the first available historical Ordnance Survey plans, comprising dunes and marshland until the late 1950s. The encroachment of the steel works activities including deposition of slag occurred since the 1960s. Afan WwTW was constructed in the early 2000s, since when the site remains in unchanged state. It is now proposed to construct a temporary sludge storage facility in the northern part of the Afan WwTW site. These works are likely to comprise shallow excavations. On completion the area of the scheme will be covered in concrete and reinstated to hardstanding as per current condition.

Risk to human health

The findings of the PRA indicate that, with respect to human health, there is a potential for moderate risk of exposure to made ground containing asbestos both during the construction works (construction workers and site workers) and post completion (maintenance workers). Application of appropriate health and safety management during the works (including PPE) should be sufficient in limiting the risks from the identified exposure scenarios. However, ground investigation is required to provide information of risk drivers to inform the RAMS and the health and safety file.

Risk to controlled waters

With respect to controlled waters, during construction there is a potential moderate risk of increased leaching potential should there be open excavations. This would increase the potential for leachable contaminants, which may impact the underlying groundwater aquifers.

During the operational phase, the site will predominantly be covered with hardstanding however infiltration is currently proposed through a soakaway, which is likely to result in potential generation of leachable contaminants with a moderate level of risk.

A ground investigation is required to inform further assessments.

Materials management

The proposed development may result in generation of a substantial volume of materials. There are limited opportunities for soil arisings reuse within the development, and therefore it is anticipated that excavated surplus soils will require removal from site. Therefore, off-site reuse or disposal of these materials will have to be considered. There are a number of options that can be considered for the surplus materials:

- Reuse on other sites;
- Waste transfer stations;
- Soil recycling; and/or
- Landfill disposal.

The re-use of arisings on another development is likely to be the most cost effective solution for dealing with excess material from the site. The re-use of arisings on another development is subject to site specific risk assessments and the management of these materials would require implementation of Cl:aire Waste Code of Practice and approvals from the Regulators.

The disposal cost to a landfill, waste transfer station or soil recycling facility is primarily dependent on the materials classification, but also type of facility (e.g. identified landfill class) and distance to that facility.

Landfill disposal cost comprises a gate fee (varies depending on a facility) and Landfill Tax. Rates of the Landfill Tax from 1 April 2024 are £103.70/tonne standards rate (hazardous and non-hazardous waste) and £3.30/tonne – inert waste (1m³ weighs approximately 1.8tonne, hence the rates should be multiplied by 1.8 for a rate/m³). The Landfill Tax rates will be increased to £126.15/tonne and £4.05/tonne respectively.

Considering its cost and sustainability issues, landfilling of the soil arisings should be considered as the last option. In accordance with the waste management regulations treatment of waste is required for all materials designated for disposal.

This may include for example physical sorting, which aims at the reduction of waste volume, which also could be considered as an opportunity to reduce disposal costs.

Further action

An investigation is required to characterise the site to allow for appropriate management of risks and also input into materials management. This should include soil sampling and testing, as well as groundwater monitoring to allow for comprehensive risk assessments to be undertaken. The results of the investigation should be assessed in accordance with development proposals and proposed site end uses. Following this, mitigation and/or remediation measures may be recommended in order to ensure the site is suitable for its intended end use, with no unacceptable risks posed to human health or controlled water receptors.

SITE INVESTIGATION PROPOSALS

Intrusive ground investigations are recommended to assess the potential for contamination of soil and groundwater and suitability for re-use of site won materials within earthworks, where possible.

In order to investigate the above considerations, the ground investigation is anticipated to comprise of the following:

Windowless hole:

- Nature of made ground and underlying superficial deposits;
- Groundwater monitoring installation;

Trial Pits:

- Stratigraphy, nature of superficial deposits/made ground;

Laboratory sampling and testing:

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- Collection of soil samples for geo-environmental testing;
- Groundwater sampling –one round.

Additional monitoring:

- Groundwater level monitoring;

REFERENCES

- [1] British Geological Survey, Geoindex Onshore, Accessed February 2025
[<http://mapapps2.bgs.ac.uk/geoindex/home.html>]
- [2] NHBC, Environment Agency, CIEH (2008), Guidance for the Safe Development of Housing on Land Affected by Contamination.
- [3] CIRIA C552 (2001), Contaminated land risk assessment, A guide to good practice.

APPENDICES

Appendix A

GroundSure Report