

AMP7 REPLACEMENT EEL SCREENS PROGRAMME
Sesswick RWI –

TAN15 Flood Consequences Assessment

December 2022

Version	Date	Description	Author	Check	Reviewer
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Executive Summary

This document presents the findings of a Flood Consequences Assessment (FCA) undertaken to accompany a planning application to install eel screens at the Sesswick Raw Water Intake (RWI) to comply with The Eels (England and Wales) Regulations 2009 that came into force on 15 January 2010 to support the UK in implementing EC Council Regulation (1100/2007) (the EC Eel Regulation).

The Sesswick Raw Water Intake is located to the southeast of Wrexham, Wales, and is owned and operated by Hafren Dyfrdwy (HD). Sesswick Water Treatment Works (WTW) is situated within the administrative boundary of Wrexham County Borough in Wales. The river intake is situated on the left hand inside bank of the main channel of the River Dee just north of Bangor-on-Dee. The WTW includes an existing perimeter flood defence wall to protect internal assets from flooding from the River Dee, which has been in place on site for a number of years.

Parts of the Sesswick Intake site are shown to be located within the floodplain of the River Dee, with a Medium / High Flood Risk from Rivers as designated by Natural Resources Wales (NRW). Within the NRW Development Advice Map (DAM), the site is within Flood Zone C; with a risk of flooding from the river equal to or greater than 0.1%. As such, current planning regulations require that the planning application for the proposed development is accompanied by an appropriate FCA.

This FCA has been prepared in accordance with Welsh Government Technical Advice Note 15 – Development and Flood Risk (TAN15) and covers all aspects of the proposed development. The Proposed Development represents essential infrastructure required to deliver sustainable development in order to comply with the above Eel Regulations to reduce the environmental impact of HD's operations on eel populations.

According to the Natural Resources Wales (NRW) Flood Risk from Rivers map, parts of the Sesswick Intake lie within areas with a Medium / High Flood Risks from Rivers (River Dee). As part of this FCA, flood levels for the River Dee have been obtained from NRW, indicating the flood levels at the abstraction location for a range of flood events, ensuring that the new infrastructure will remain safe and operational over its intended lifetime, whilst taking climate change into account.

An existing flood wall is present at the Sesswick Intake site, with a defence level provided by HD, shown to be 16.83mAOD. This is above the 1 in 1000 year flood level provided by NRW, although it is not shown on NRW mapping as a defence, given its private ownership. As the proposed development is located within the boundary of the existing flood wall, it will remain safe and operational for its design lifetime.

This FCA confirms that the proposed development will meet the requirements of TAN15. Specifically, this FCA has demonstrated that:

- The proposed land use is appropriate for location within an area with a medium / high risk of flooding from rivers, and the development proposals will not involve an increase in the number of staff working within a flood risk area;

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- An existing flood wall is located at the perimeter of the site, set to a level which is higher than the 1 in 1000 year fluvial level, indicating that the proposed development would remain safe and operational over its design lifetime;
- The proposed development will not result in a loss of floodplain storage capacity or reduce floodplain conveyance; and
- The new infrastructure will not result in an increase in the volume and rate of surface runoff leaving the site.

In summary, this FCA has demonstrated that the proposed development is appropriate for its location, will remain operational in times of flooding, and will not result in an increase in off-site flood risk.

1.0 INTRODUCTION

1.1 PURPOSE

This document presents the findings of a Flood Consequences Assessment (FCA) undertaken for the proposed construction of eel screens at the existing Sesswick Raw Water Intake. Hafren Dyfrdwy (HD) is required to deliver the project in order to comply with Eel Regulations. The location of this site poses a risk to elver, yellow and silver eels.

On 15th January 2010 the Eels (England and Wales) Regulations 2009 came into force, implementing the Council Regulation EC (1100/2007). HD is to ensure their asset complies with the regulation by 31st December 2025. The regulations state that all surface water abstractions of more than 0.02 MLD shall be fitted with suitable eel screens.

The Proposed Development comprises modifications to the existing intake channel on the bank of the River Dee, which is not anticipated to affect floodplain capacity and installation of a new 15.8m² kiosk for air burst equipment, located within the existing flood wall boundary.

Parts of the Sesswick Intake site are located within the floodplain of the River Dee, with a Medium / High Flood Risk from Rivers as designated by Natural Resources Wales (NRW). This relates to TAN15 Flood Zone C – areas with a flood risk equal to or greater than 0.1% (river, tidal or coastal). An existing flood wall at the site, with as-built levels shown to be above the 1 in 1000 year flood level, protects the site from flooding. Due to the presence of the flood wall, the site can be considered to be within Flood Zone C1 - Areas of the floodplain which are developed and served by significant infrastructure, including flood defences. Under the TAN15 guidance, development in flood zone C1 can take place subject to passing the justification test, including an assessment of the acceptability of consequences.

This FCA seeks to demonstrate that flood risk from all sources has been considered as part of the proposed development and that the requirements of TAN15 are met. As set out in TAN15, the objectives of an FCA are to ensure that:

- Flood risk is taken into account at all stages of the planning process to ensure that new development is appropriate for its location;
- The proposed development will remain safe and operational throughout the duration of its intended design lifetime; and
- The proposed development will not increase flood risk elsewhere.

The purpose of this document is to:

- Present the broad scale and nature of the proposals for the new eel screens development;
- Summarise the potential sources of flood risk to the new plant; and
- Identify the primary source of flood risk and present detailed flood level data to inform the ongoing designs.

1.2 REPORT OBJECTIVES AND STRUCTURE

This FCA concentrates on the flood risk issues over the operational lifetime of the proposed development. This report has been prepared in accordance with the requirements of the Welsh Government Technical Advice Note 15 – Development and Flood Risk (TAN15). The objectives of this report are to a) quantify the flood risk to the site; b) demonstrate that the proposed development will remain safe and operational over its intended design lifetime taking climate change into consideration; and c) demonstrate that the proposed development will not increase flood risk elsewhere.

1.3 AVAILABLE INFORMATION

This FCA is based on the following available information:

- Natural Resources Wales Flood Map for Planning / Development Advice Map
- Natural Resources Wales' 2012 River Dee at Bangor on Dee Flood Risk Mapping Study hydraulic modelling outputs; and
- A site layout plan, topographical survey and outline design drawings of the proposed development, all provided by Hafren Dyfrdwy (HD).

2.0 DESCRIPTION OF THE EXISTING SITE AND PROPOSED DEVELOPMENT

2.1 EXISTING SITE DESCRIPTION

The Sesswick Intake (Raw Water Intake) is located to the southeast of Wrexham, Wales, and is owned and operated by Hafren Dyfrdwy (HD). Sesswick WTW is situated within the administrative boundary of Wrexham County Borough in Wales. The River Dee passes through the southeast of the site, with the eastern bank forming the south-eastern boundary.

The Sesswick Intake site occupies an area of approximately 0.47 Ha. Site levels are relatively flat, with an elevation ranging between 16m-17m AOD. The site is part of an active water intake works, comprising a building and associated hardstanding areas, and poor semi-improved grassland verges as well as an area of broadleaved woodland and scattered trees. The land surrounding the pumping station is within the natural flood plain of the River Dee. The site includes an existing perimeter flood defence wall to protect internal assets from flooding from the River Dee, which has been in place on site for a number of years.

The existing intake structure is set several metres back from the main river channel on an inside bend of the River Dee. Any fish entrained into the intake are either screened out by the band screen and returned to the river through the return chute or pass through the band screen mesh and travel within the abstracted water to Marchwiell Reservoir and are potentially lost from the River Dee population. This 6 mm mesh is sufficient to prevent the entrainment of yellow/silver eel (>30 cm) and silver eel (>50 cm) but would not protect all elvers or small yellow eel (>14 cm). The Sesswick Intake is situated 16.4km upstream of the maximum tidal limit (approximately 21.4km upstream of Chester Weir), and as such all-life stages of eel except glass eels are potentially at risk of entrainment into the intake.

The national grid reference for the site is:

(Easting) 338660, (Northing) 346359

The postal address for the site is:

Bangor Road (near), Sesswick, Cross Lanes, Wrexham, Wales, LL13 0TN, United Kingdom

The existing site location is shown in Appendix A.

2.2 DETAILS OF THE PROPOSED DEVELOPMENT

HD is required to deliver the project 'Sesswick Eels Screens' in order to comply with Eel Regulations. The location of this site poses a risk to elver, yellow and silver eels. In full, the Proposed Development comprises the following works:

- New cover to existing intake channel
- New PWWC screens
- New PWWC supporting structure
- New kiosk to contain air compressor equipment (15.8m²)
- New air burst pipework to screens from kiosk

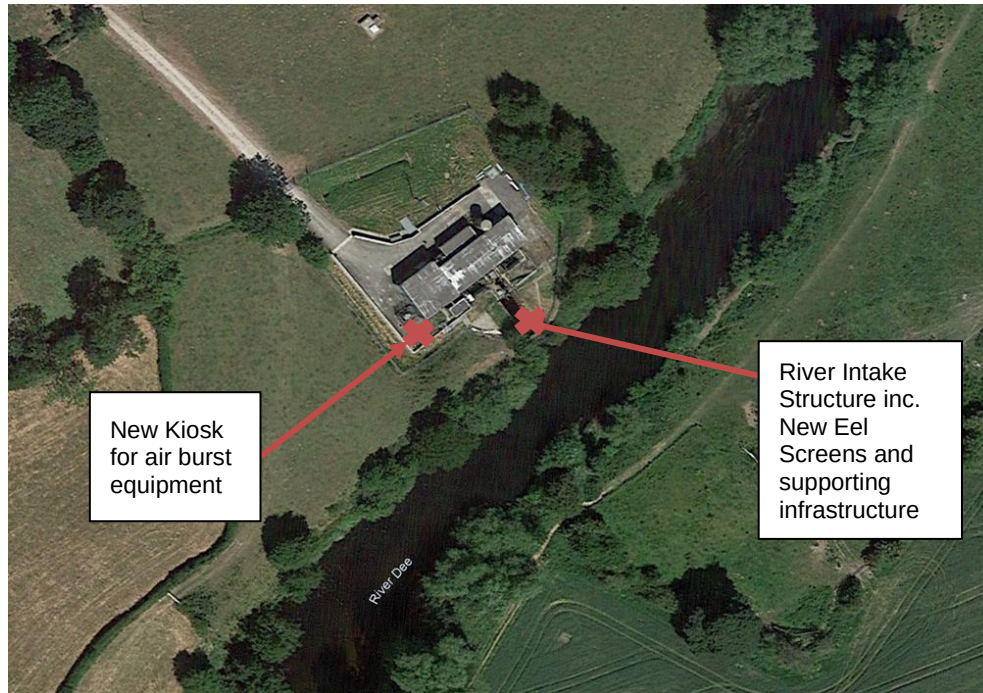


Figure 1 - Site Layout and Proposed Development depicted by red crosses

The Proposed Development involves the construction of eel screens on the bank of the River Dee. The purpose of eel screening is to exclude eels from the river inlet, through the installation of a mesh screen. The installation of a screen will require mobilisation and construction of supporting infrastructure over the existing river intake channel, and a new cover installed upon it. The proposed river intake structure is located within the existing river intake channel, will broadly involve construction below the water level, and will not result in a net change to floodplain storage. Therefore, the proposed river intake structure is not considered to impact flood risk. The proposal also includes a new kiosk to contain the air burst equipment for the Eel screens, situated within the existing flood wall boundary.

The proposed development drawings are detailed in Appendix B.

3.0 FLOOD RISKS TO THE PROPOSED DEVELOPMENT

3.1 POTENTIAL SOURCES OF FLOODING

Flooding can occur from a number of sources as presented in Table 1. Maps showing the potential sources of flooding that could impact the proposed development are shown in Appendices C, D and E.

Table 1 - Possible sources of flooding (outlined in the English Planning Practice Guidance (PPG))

Source	Description
Flooding from rivers (or fluvial flooding)	River flows which exceed the flow capacity of the river channel (or culverts) can cause flooding from rivers. It can happen for example, when heavy rain falls on an already waterlogged catchment. A blockage caused by natural material or manmade objects/litter can also cause rivers to overtop their banks.
Flooding from the sea (or coastal/tidal flooding)	High tides and/or storm surges which lead to overtopping of existing defences (if any) can cause flooding from the sea.
Flooding from surface water (or pluvial flooding)	Intense rainfall that cannot soak into the ground or enter drainage systems can quickly run off the land and result in local flooding. This type of flooding is typically localised and happens very quickly after the rain has fallen.
Flooding from groundwater	Groundwater flooding occurs when water levels in the ground rise above surface elevations. It is most likely to occur in areas underlain by permeable rocks or granular layers called aquifers.
Flooding from sewers	Sewer flooding can occur when piped systems are overwhelmed by heavy rainfall, when sewers become blocked or when sewers are of inadequate capacity.
Flooding from reservoirs, canals and other artificial sources	Non-natural or artificial sources of flooding can include reservoirs, canals and lakes where water is retained above natural ground level.

3.2 FLOOD RISK FROM RIVERS

TAN15 defines three Flood Zones as shown in Table 2. The following section presents the flood risk classification for the proposed development based on the Natural Resources Wales (NRW) Flood Risk from Rivers map.

Table 2 - TAN15 Flood Zones

Flood Zone	Description
A	Considered to be at little or no risk of fluvial or tidal/coastal flooding.
B	Areas known to have been flooded in the past evidenced by sedimentary deposits.
C	Based on Environment Agency extreme flood outline, equal to or greater than 0.1% (river, tidal or coastal)
C1	Areas of the floodplain which are developed and served by significant infrastructure, including flood defences.
C2	Areas of the floodplain without significant flood defence infrastructure.

According to the Flood Risk from Rivers map provided by the Natural Resources Wales (NRW) parts of the existing intake site are located within Medium and High-risk areas as shown in Figure 2 below. Analysis of a bathymetric and topographic survey at the site, provided by HD, shows that the minimum ground level at the location of the proposed kiosk is 15.54mAOD. Analysis of the hydraulic modelling outputs¹ provided by NRW show this to be between the 1 in 100 year + Climate Change and 1 in 1000 year flood levels (Table 4). The site topographic survey shows that the existing flood defence level is 16.83mAOD, which is above the 1 in 1000 year flood level. The source of this flooding is the River Dee.

Table 3 - Summary of ground levels at site

Aspect	Level (mAOD)	First flood (see Table 4)
Proposed Kiosk Ground level (approximate)	15.54 – minimum level taken from site topographic survey	1 in 1000 year (15.92 mAOD)
Defence level	16.83	Does not overtop in 1 in 1000 year flood

¹ Taken from the 2012 River Dee at Bangor on Dee Flood Risk Mapping Study hydraulic modelling outputs

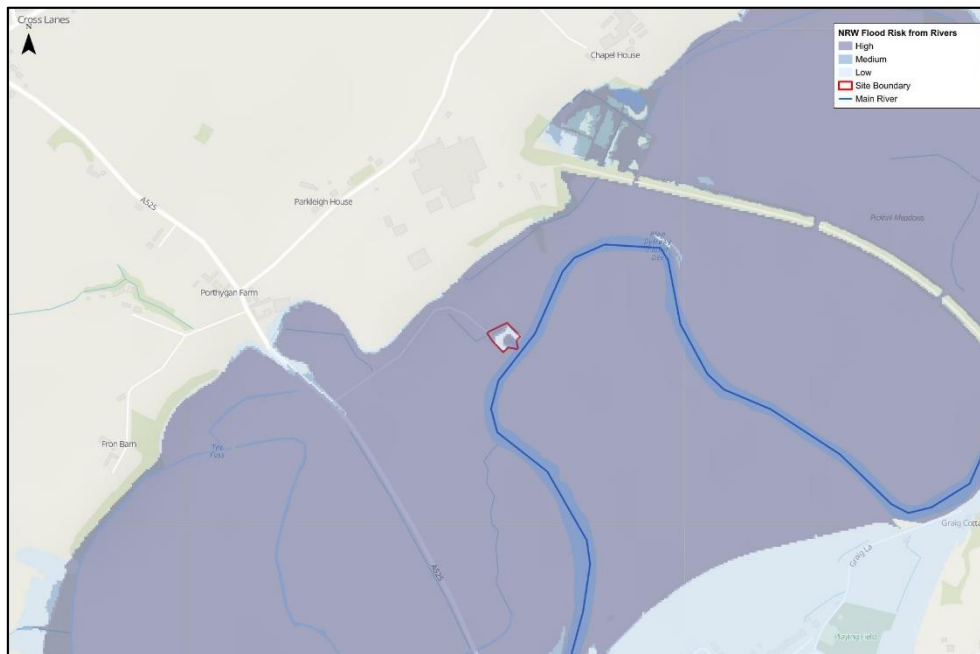


Figure 2 - The NRW's Flood Risk from Rivers. The location of the Site boundary is shown in red.

3.3 PRIMARY SOURCE OF FLOODING

To quantify the flood risk to the site in detail, the Natural Resources Wales 2012 River Dee at Bangor on Dee Flood Risk Mapping Study hydraulic modelling outputs have been obtained. The model outputs demonstrate that the ground level of the proposed kiosk is between the 1 in 100 year + 20% Climate Change level and the 1 in 1000-year level. However, the existing flood defences at the site offer a higher standard of protection than currently represented at the site in the hydraulic modelling, and the proposed kiosk, located within the boundary of the flood wall, is therefore protected by the flood defence.

Table 4 - Predicted Water Levels from the Defended 1D Model (2012 River Dee at Bangor on Dee Flood Risk Mapping Study)

Node	Node 5% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP	1%CC
DEE03_21079	15.08 mAOD	15.21 mAOD	15.25 mAOD	15.38 mAOD	15.92 mAOD	15.42 mAOD

3.4 FLOODING FROM GROUNDWATER

The Sesswick Intake site is located near to the River Dee. Any groundwater present beneath the site is likely to be in hydraulic continuity with water levels in the river due to this close proximity. The flood levels presented in Table 4 can, therefore, also be considered representative of any potential groundwater flood risk to the site.

3.5 FLOODING FROM SEWERS

The proposed development will not be served by – or exposed to flood risk from – a significant sewer catchment area (either surface or foul). The risk of flooding from sewers is, therefore, not considered further.

4.0 TAN 15 LAND USE ACCEPTABILITY

4.1 TAN 15 DEVELOPMENT CATEGORY FOR THE PROPOSED PROJECT

Under TAN15 guidance, utilities infrastructure is classed as “Less Vulnerable” development. However, as the Sesswick WTW provides drinking water, and would need to be operational and accessible at all times, this FCA has considered the development to be an Emergency Service.

Emergency Services are to be treated as ‘Highly Vulnerable Development’ in the TAN15 guidance. Highly Vulnerable Development is appropriate for DAM Zone C1, subject to the application of the TAN15 Justification Test and an assessment of the acceptability of flood consequences. The TAN15 Justification Test is considered in Section 5 and the consequences assessment is presented in Section 7.

As the site is to be considered to be Highly Vulnerable, a higher Climate Change

5.0 TAN 15 JUSTIFICATION TEST

5.1 JUSTIFICATION TEST FOR THE PROPOSED PROJECT

TAN 15 states that new development should be directed away from Zone C and towards suitable land in Zone A, otherwise to Zone B, where river or coastal flooding is less of an issue. New development should only be permitted within Zones C1 and C2 if determined by the planning authority to be justified in that location. Development will only be justified if it can be demonstrated that:

- (i) its location in Zone C is necessary to assist, or be part of, a local authority regeneration initiative or a local authority strategy required to sustain an existing settlement; or,
 - (ii) its location in Zone C is necessary to contribute to key employment objectives supported by the local authority, and other key partners, to sustain an existing settlement or region;
- and,
- (iii) it concurs with the aims of Planning Policy Wales (PPW) and meets the definition of previously developed land; and,
 - (iv) the potential consequences of a flooding event for the particular type of development have been considered and found to be acceptable.

The proposed development at the existing Sesswick Water Treatment Works is necessary in order to comply with The Eels (England and Wales) Regulations 2009 that came into force on 15 January 2010 to support the UK in implementing EC Council Regulation (1100/2007) (the EC Eel Regulation). The Proposed Development's proximity to the existing infrastructure at Sesswick site is necessary, and due to the nature of the infrastructure, this is located within Zone C, satisfying item (ii).

The Proposed Development is sited on previously developed land, within the site boundary of Sesswick Water Treatment Works.

The potential consequences of flooding for the Proposed Project are considered in Section 10 of this FCA and are found to be acceptable. As such, the Proposed Project is deemed to meet the requirements of the TAN 15 Justification Test.

6.0 FLOOD RISK CONSIDERATIONS

6.1 BE SAFE AND REMAIN OPERATIONAL FOR ITS LIFETIME

6.1.1 Remain Safe and Operational

The site flood defence level has been shown to be higher than that of the maximum flood level produced from the model of the River Dee. As such, the proposed development would be expected to remain safe and operational for its lifetime without further mitigation measures.

6.1.2 Climate Change

A 1 in 100 year level with a climate change allowance of 20% has been provided by NRW. The TAN15 guidance recommends that 'Highly Vulnerable' development uses apply the 'Upper End' allowance for climate change impacts on peak river flows in Flood Zone C1. Under August 2022 guidance produced by the Welsh Government², the Upper End total potential change anticipated for the Dee River Basin District is 45%. The appropriate design horizon for the proposed development is the 2080 period.

While a 45% Climate Change allowance has not been provided for the site, a 1 in 1000 year flood level has been provided (maximum 1 in 1000 year level at the site is shown to be 15.794 mAOD). As-built survey of the existing flood wall at the site is shown to be 16.83 mAOD. It has been assumed that the 1 in 1000 year flood level exceeds that of the 1 in 100 year + 45% Climate Change level.

6.2 NOT INCREASE FLOOD RISK ELSEWHERE

6.2.1 No net loss of floodplain storage

The proposed kiosk is partially located in an area of the site within the 1 in 1000 year flood extent. However, the existing flood defence wall would prevent flooding of the site under this event. As such, the proposed development of the kiosk within the boundary of the flood wall would not result in any net loss of existing floodplain storage.

6.2.2 No impediment to flood water flows

The proposed kiosk is located within an existing flood defence structure. As such, it would not result in an impediment to flood water flows.

6.2.3 Surface water runoff

The proposed kiosk will be installed on currently undeveloped land, and has a small footprint of 15.8m². As such, it is anticipated to result in a negligible increase in surface water runoff, which will be accommodated by the existing site surface water drainage.

² Adapting to Climate Change: Guidance for Flood and Coastal Erosion Risk Management Authorities in Wales, August 2022

7.0 CONSEQUENCES ASSESSMENT

7.1 OBJECTIVES OF THE CONSEQUENCES ASSESSMENT

Appendix A1.2 of TAN 15 states that the prime objective of a consequences assessment is to develop a full appreciation of:

- The consequences of flooding on the development; and
- The consequences (i.e., the overall impacts) of the development on flood risk elsewhere within the catchment for a range of potential flooding scenarios up to that flood having a probability of 0.1%.

Section 7.3 of TAN 15 also states that where development is justified (as demonstrated in Section 7 of this FCA) the consequences assessment can be used to establish whether suitable mitigation measures can be incorporated within the design to ensure that development is as safe as possible and there is:

- minimal risk to life;
- minimal disruption to people living and working in the area;
- minimal potential damage to property;
- minimal impact of the Proposed Project on flood risk generally; and
- minimal disruption to natural heritage.

Finally, section A1.12 of TAN 15 presents the acceptability criteria for flooding consequences. Any new development on the flood plain will generally result in additional risks. The main criteria for deciding whether such a development is acceptable will depend on whether those factors can be effectively managed. NRW will advise the planning authority on the consequences of flooding for the type and nature of any proposal and this should enable the planning authority to arrive at a judgement on the acceptability of the flooding consequences. To satisfy these criteria a site should only be considered for development if the following conditions can be satisfied:

- Flood defences must be shown by the developer to be structurally adequate particularly under extreme overtopping conditions (i.e. that flood with a probability of occurrence of 0.1%);
- The cost of future maintenance for all new/approved flood mitigation measures, including defences must be accepted by the developer and agreed with NRW;
- The developer must ensure that future occupiers of development are aware of the flooding risks and consequences;
- Effective flood warnings are provided at the site;
- Escape/evacuation routes are shown by the developer to be operational under all conditions;
- Flood emergency plans and procedures produced by the developer must be in place;
- The development is designed by the developer to allow the occupier the facility for rapid movement of goods/possessions to areas away from the floodwaters;

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- Development is designed to minimise structural damage during a flooding event and is flood proofed to enable it to be returned to its prime use quickly in the aftermath of the flood; and
- No flooding elsewhere.

As such, this section on the TAN 15 Consequences Assessment addresses each of these points in turn.

The consequences of flooding on the development

Due to the Proposed Development being located within the existing flood defences at Sesswick Treatment Works, which is shown to be above the 0.1% AEP fluvial peak water level, the Proposed Development is not considered at risk of flooding, and there will be no change to the consequences of flooding.

The consequences (i.e. the overall impacts) of the development on flood risk elsewhere

This FCA has demonstrated that an existing flood defence wall prevents flooding from the 0.1% AEP fluvial event. As the Proposed Development is located within the existing flood wall, the FCA demonstrates how the Proposed Development will avoid causing an increase in fluvial flood risk elsewhere. The proposed development is considered to have a negligible impact on surface water flood risk.

Minimal risk to life

The Proposed Development will not increase flood risk to third party land or property and would be routinely unmanned throughout the operational phase, with the exception of visits by HD's operational staff for the purposes of asset management and maintenance. HD will sign up to NRW's automated flood warning service and monitor national and regional weather forecasts in order to avoid maintenance staff visiting the sites during flood conditions.

Minimal disruption to people

During its operational phase, the Proposed Development will only incur minimal disruption to the surrounding communities and only as a result of visits by HD's operational staff for the purposes of asset management and maintenance.

Minimal damage to property

The Proposed Project will not increase flood risk to third party land or property, as it is solely located within existing flood defences on the existing Sesswick treatment works site.

Minimal impact of the Proposed Project on flood risk

This FCA has demonstrated that the Proposed Project would not have a significant impact on flood risk elsewhere.

Minimal disruption to natural heritage

The Environmental Assessment Report demonstrates that the Proposed Development will incur minimal disruption to natural heritage, as the construction will be within the existing Sesswick RWI works.

Flood defences

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This FCA has demonstrated that the existing tidal flood defences provide a high standard of protection and would not result in flooding of the Proposed Development under a 0.1% AEP event. The Proposed Development has been designed so that it does not rely on the maintenance of existing or the creation of new flood defences in order to remain operational over its intended design lifetime, with climate change taken into consideration.

Cost of future maintenance for all new/approved flood mitigation measures

The main flood mitigation measure associated with the Proposed Development will be from an existing flood wall at the site, and additional flood mitigation measures are not required.

Occupier awareness of flooding risks and consequences

The Proposed Development would be routinely unmanned throughout the operational phase, with the exception of visits by HD's operational staff for the purposes of asset management and maintenance. HD will sign up to NRW's automated flood warning service and monitor national and regional weather forecasts in order to avoid maintenance staff visiting the site during flood conditions.

Effective flood warnings

As above, effective flood warnings will be provided as part of NRW's flood warning service.

Escape/evacuation routes

The Proposed Project would be routinely unmanned throughout the operational phase, with the exception of visits by HD's operational staff for the purposes of asset management and maintenance. As mentioned above, the use of NRW's automated flood warning service and monitoring of national and regional weather forecasts will avoid maintenance staff visiting the sites during flood conditions.

Flood emergency plans and procedures

N/A – see *Escape/evacuation routes* above.

Facility for rapid movement of goods/possessions

N/A – due to the existing defences, the Proposed Development will not be subject to flooding under the 0.1% AEP event over the duration of its intended lifetime.

Designed to minimise structural damage

N/A – due to the existing defences, the Proposed Development will not be subject to flooding under the 0.1% AEP event over the duration of its intended lifetime.

No flooding elsewhere

This FCA has demonstrated that the Proposed Project would not have a significant impact on flood risk elsewhere.

7.2 CONCLUSION OF THE CONSEQUENCES ASSESSMENT

Based on the above, the conclusion of this assessment is that the flood consequences of the Proposed Project are considered to be acceptable.

8.0 CONCLUSIONS AND RECOMMENDATIONS

This document presents the findings of a Flood Consequences Assessment (FCA) undertaken to accompany a planning application to install eel screens at the Sesswick Raw Water Intake (RWI) to comply with The Eels (England and Wales) Regulations 2009 that came into force on 15 January 2010 to support the UK in implementing EC Council Regulation (1100/2007) (the EC Eel Regulation).

The Sesswick Raw Water Intake is located to the southeast of Wrexham, Wales, and is owned and operated by Hafren Dyfrdwy (HD). Sesswick Water Treatment Works (WTW) is situated within the administrative boundary of Wrexham County Borough in Wales. The river intake is situated on the left hand inside bank of the main channel of the River Dee just north of Bangor-on-Dee. The WTW includes an existing perimeter flood defence wall to protect internal assets from flooding from the River Dee, which has been in place on site for a number of years.

Parts of the Sesswick Intake site are shown to be located within the floodplain of the River Dee, with a Medium / High Flood Risk from Rivers as designated by Natural Resources Wales (NRW), relating to being within Development Advice Map (DAM) Zone C. As such, current planning regulations require that the planning application for the proposed development is accompanied by an appropriate FCA.

This FCA has been prepared in accordance with Welsh Government Technical Advice Note 15 – Development and Flood Risk (TAN15) and covers all aspects of the proposed development. The Proposed Development represents essential infrastructure required to deliver sustainable development in order to comply with the above Eel Regulations to reduce the environmental impact of HD's operations on eel populations.

According to the Natural Resources Wales (NRW) Flood Risk from Rivers map, parts of the Sesswick Intake lie within areas with a Medium / High Flood Risks from Rivers (River Dee). As part of this FCA, flood levels for the River Dee have been obtained from NRW, indicating the flood levels at the abstraction location for a range of flood events, ensuring that the new infrastructure will remain safe and operational over its intended lifetime, whilst taking climate change into account.

An existing flood wall is present at the Sesswick Intake site, with a defence level provided by HD, shown to be 16.83mAOD. This is above the 1 in 1000 year flood level provided by NRW, although it is not shown on NRW mapping as a defence, given its private ownership. As the proposed development is located within the boundary of the existing flood wall, it will remain safe and operational for its design lifetime.

This FCA confirms that the proposed development will meet the requirements of TAN15. Specifically, this FCA has demonstrated that:

- The proposed land use is appropriate for location within an area with a medium / high risk of flooding from rivers, and the development proposals will not involve an increase in the number of staff working within a flood risk area;

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- An existing flood wall is located at the perimeter of the site, set to a level which is higher than the 1 in 1000 year fluvial level, indicating that the proposed development would remain safe and operational over its design lifetime;
- The proposed development will not result in a loss of floodplain storage capacity or reduce floodplain conveyance; and
- The new infrastructure will not result in an increase in the volume and rate of surface runoff leaving the site.

In summary, this FCA has demonstrated that the proposed development is appropriate for its location, will remain operational in times of flooding, and will not result in an increase in off-site flood risk.