



Chaintoft Lane, Quadring

Flood Risk Assessment

Anglian Water Services Ltd

Flood Risk Assessment to support the application for the installation of a new water booster pumping station and associated infrastructure including a new layby off Chaintoft Lane, Quadring, Lincs PE11 4PS.

Reference: WAT-07144

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1. Introduction and Background

Anglian Water Services Limited (Anglian Water) has produced this Flood Risk Assessment (FRA) in accordance with the requirements of the National Planning Policy Framework and the supporting Planning Practice Guidance (PPG) for Flood Risk and Coastal Change.

The assessment is site-specific and has been written to a level considered appropriate to the scale and nature of the proposed development.

It relates to Anglian Water's proposal to install a new water booster pumping station and associated infrastructure including a new layby off Chaintoft Lane, Quadring, PE11 4PS.

2. Policy Requirements

The National Planning Policy Framework (NPPF) sets out the Government's planning policies. A revised version of the NPPF was published in July 2018 and it was subject to further update in February 2019.

Paragraph 155 states that inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.

Paragraph 163 outlines that where appropriate, applications should be supported by a site-specific flood risk assessment. Development should only be allowed in areas of flooding where, in the light of assessment (and the sequential and exception tests, as applicable), it can be demonstrated that:

- a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;
- b) the development is appropriately flood resistant and resilient;
- c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;
- d) any residual risk can be safely managed; and
- e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan.

South Holland District Council's approach to flood risk is set out in the adopted South East Lincolnshire Local Plan (2011-2036). This is a joint local plan covering the Borough of Boston, South Holland District Council and Lincolnshire County Council.

Policy 4 Approach to Flood Risk reflects the approach in the NPPF and the South East Lincolnshire Strategic Flood Risk Assessment (SFRA) Report dated March 2017, detailing a number of criteria against which planning applications will be considered.

The SFRA recognises that large parts of South Holland District lie within flood zone 3. As such it is necessary to use the refined flood risk assessment information (hazard and depths maps) to assist with the application of the sequential test and the preparation of a site-specific FRA.

Policy 4 Approach to Flood Risk states: -

Policy 4: Approach to Flood Risk

Development proposed within an area at risk of flooding (Flood Zones 2 and 3 of the Environment Agency's flood map or at risk during a breach or overtopping scenario as shown on the flood hazard and depths maps in the Strategic Flood Risk Assessment) will be permitted, where:

- 1. It can be demonstrated that there are no other sites available at a lower risk of flooding (i.e. that the sequential test is passed). The sequential test will be based on a Borough or District wide search area of alternative sites within the defined settlement boundaries, unless local circumstances relating to the catchment area for the development justify a reduced search area, i.e. there is a specific need for the development in that location. The sequential test is not required for sites allocated in the Local Plan, minor development or change of use (except for a change of use to a caravan, camping or chalet site, or to a mobile home or park home site).*
- 2. It can be demonstrated that essential infrastructure in FZ3a & FZ3b, highly vulnerable development in FZ2 and more vulnerable development in FZ3 provide wider sustainability benefits to the community that outweigh flood risk.*
- 3. The application is supported with a site-specific flood risk assessment, covering risk from all sources of flooding including the impacts of climate change and which:*
 - a. demonstrate that the vulnerability of the proposed use is compatible with the flood zone;*
 - b. identify the relevant predicted flood risk (breach/overtopping) level, and mitigation measures that demonstrate how the development will be made safe and that occupants will be protected from flooding from any source;*
 - c. propose appropriate flood resistance and resilience measures (following the guidance outlined in the Strategic Flood Risk Assessment), maximising the use of passive resistance measures (measures that do not require human intervention to be deployed), to ensure the development maintains an appropriate level of safety for its lifetime;*
 - d. include appropriate flood warning and evacuation procedures where necessary (referring to the County's evacuation routes plan), which have been undertaken in consultation with the authority's emergency planning staff;*
 - e. incorporates the use of Sustainable Drainage Systems (SuDS) (unless it is demonstrated that this is not technically feasible) and confirms how these will be maintained/managed for the lifetime of development (surface water connections to the public sewerage network will only be permitted in exceptional circumstances where it is demonstrated that there are no feasible alternatives);*
 - f. demonstrates that the proposal will not increase risk elsewhere and that opportunities through layout, form of development and green infrastructure have been considered as a way of providing flood betterment and reducing flood risk overall;*
 - g. demonstrates that adequate foul water treatment and disposal already exists or can be provided in time to serve the development;*
 - h. ensures suitable access is safeguarded for the maintenance of water resources, drainage and flood risk management infrastructure.*

3. Site Location and Description of Development

The development site is a small parcel of land located to the south of number 1 Chaintoft Lane. The National Grid reference of the central point of the site is TF22973271.

The position and extent of the site are shown in figure 1 below.

General ground level is +3.0m above Ordnance Datum Newlyn.

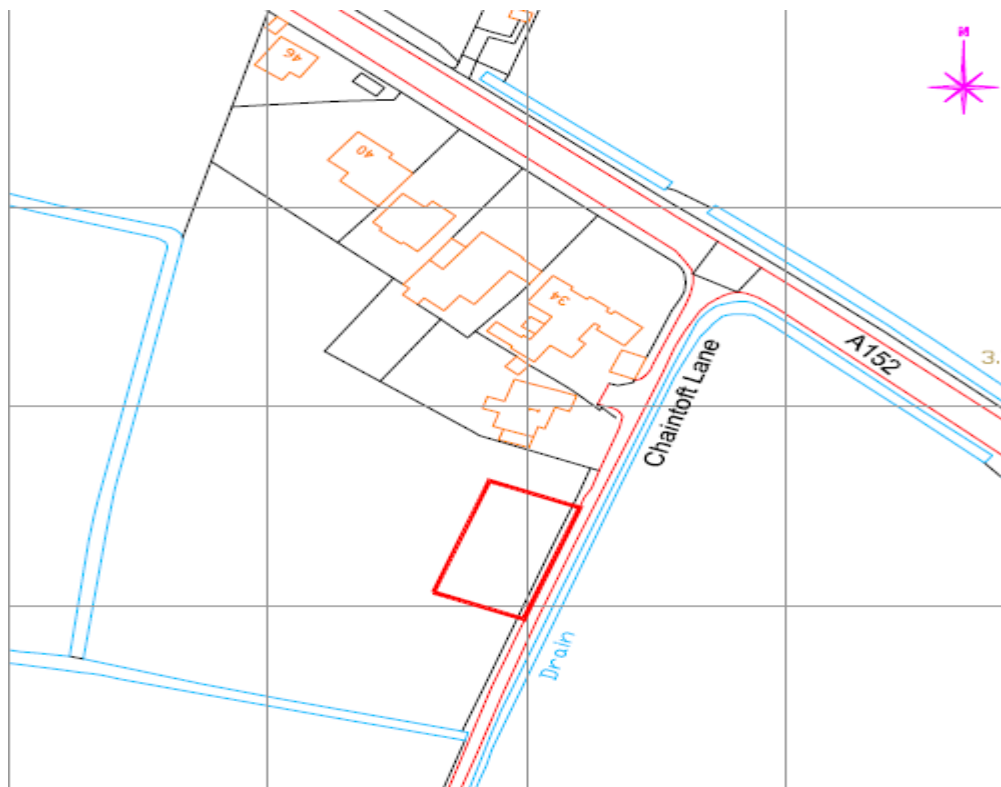


Figure 1: Site Location

The site and the surrounding area are located within the Welland and Deepings Internal Drainage Board (IDB) District. The area is within the Risegate Eau catchment and drains in an easterly direction to Risegate Eau Pumping Station that discharges to the River Welland.

4. Description and Need for the Development

The scheme comprises the following elements: -

- A new above ground pumping station measuring 4.5 metres long by 2.55 metres wide with below ground connections into the water network;
- The creation of a new gravelled compound area enclosed by post and rail fencing;
- A new layby off Chaintoft Lane.

The scheme is required to ensure that customers within the Donington area do not experience low water pressure/ a loss of water as a result of housing growth to the west of the town.

Anglian Water has an extensive and complex water network from which it supplies its customers. Water in this area comes initially from Anglian Water's reservoir at Covenham near Louth from where it is supplied to Sutterton Reservoir. There are a number of different connections from Sutterton and pipe sizes gradually decrease from this point. As pipe sizes decrease so to does the overall water pressure.

Anglian Water is required by OFWAT, the industry regulator, to ensure that water pressures remain above a certain level. If they drop below or are predicted to drop below this level for any period of time, then Anglian Water is obligated to put in measures to prevent this from

occurring. Anglian Water therefore proactively monitors water pressures across its network and puts in measures where they are required to prevent this from happening thereby ensuring that it can continued to supply water to all of its customers.

The modelling work which has been undertaken shows that in order to ensure that water pressures are protected a new pumping station is required within the immediate vicinity of the application site.

The pumping station has a very small footprint of only some 11.50 square metres and is designed to have an asset life of some 20-30 years. The area of the layby is some 120 square metres.

5. Flood Risk Vulnerability

The Environment Agency Flood Maps indicate that the site is located with Flood Zone 2/3, with a medium to high probability of flooding.

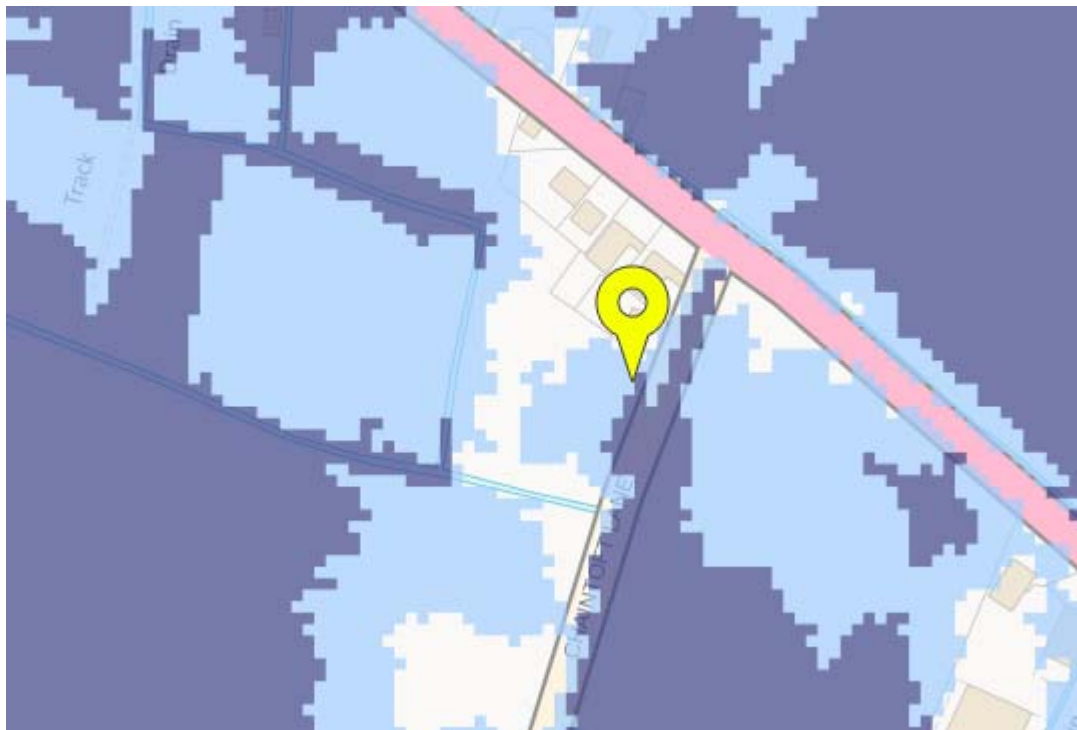


Figure 2: Environment Agency Flood Maps Extract

The Environment Agency's Long-Term Flood Risk maps show that:

- the site has a medium risk of flooding (annual probability between 1% and 3.3%);
- the site has a low risk of surface water flooding (annual probability between 0.1% and 1%); and
- the site is not within an area at risk of reservoir flooding.

Within the South East Lincolnshire SFRA: -

- the Residual Flood Hazard Map for the present day 1% fluvial event and 0.5% tidal event shows that the site is outside of the 'low hazard' area;
- the Residual Flood Hazard Map for the 2115 1% fluvial event and 0.5% tidal event shows that the site is outside of the 'low hazard' area;
- the Residual Peak Depth Map for the present day 1% fluvial event and 0.5% tidal event shows that the site is not within an area of flooding; and

- the Residual Peak Depth Map for the 2115 1% fluvial event and 0.5% tidal event shows that the site is not within an area of flooding.

The Sequential and Exceptions Test

The NPPF requires the application of a Sequential Test to ensure that new development is located in areas with the lowest probability of flooding.

The Exceptions Test allows consideration to be given to the benefits of a scheme where areas at lower flood risk are not available and for development to proceed where a scheme has benefits which outweigh that risk. It only needs to be undertaken for certain types of development, based upon its vulnerability.

Vulnerability Classification

Whilst the development is necessary to ensure that water pressure does not drop for any prolonged period of time it would not need to function in times of flood. There is sufficient resilience within Anglian Water's network to supply water to homes in the area in the event of a flooding event within the site. The new pumping station can therefore be classed as 'less vulnerable' development using the Environment Agency's Flood Risk Vulnerability Classification. In view of this there is no requirement to undertake an Exceptions Test.

Application of the Sequential Test

As has been set out above, there is a specific need for the development in this location. The new pumping station cannot therefore be located within an area shown to be at lower risk of flooding on the Environment Agency's maps.

The development will result in considerable public benefit, ensuring continued water supply to thousands of customers. This community benefit outweighs the flood risk indicated on the Environment Agency maps.

Whilst the scheme cannot be classed as minor development under the Environment Agency's guidance as it is not an extension to an existing commercial development, the footprint of the impermeable area of the new pumping station and layby would only be some 108.5 square metres (as the remainder of the compound area will be permeable). This is well below the threshold the 250 square metre threshold set by the Environment Agency for minor developments. The pumping station also has a limited asset life of some 20-30 years.

It is also material that Anglian Water as a statutory undertaker has extensive permitted development rights under Part 13 Class A of the Town and Country Planning (General Permitted Development) Order 2015 (as amended), including for above ground infrastructure. There is no requirement for Anglian Water to consider flood risk where it uses its permitted development rights. This scheme is only considered to need planning permission as it will create a new operational site.

The South East Lincolnshire SFRA states that it is necessary to use the refined flood risk information (hazard and depth maps) to assist with the application of the sequential test. The refined flood risk information contained within the SFRA demonstrates the site is not at risk during the 1% fluvial event and 0.5% tidal event. The site therefore has a low probability of flooding and is considered to pass the sequential test. Figures 3 and 4 refer.

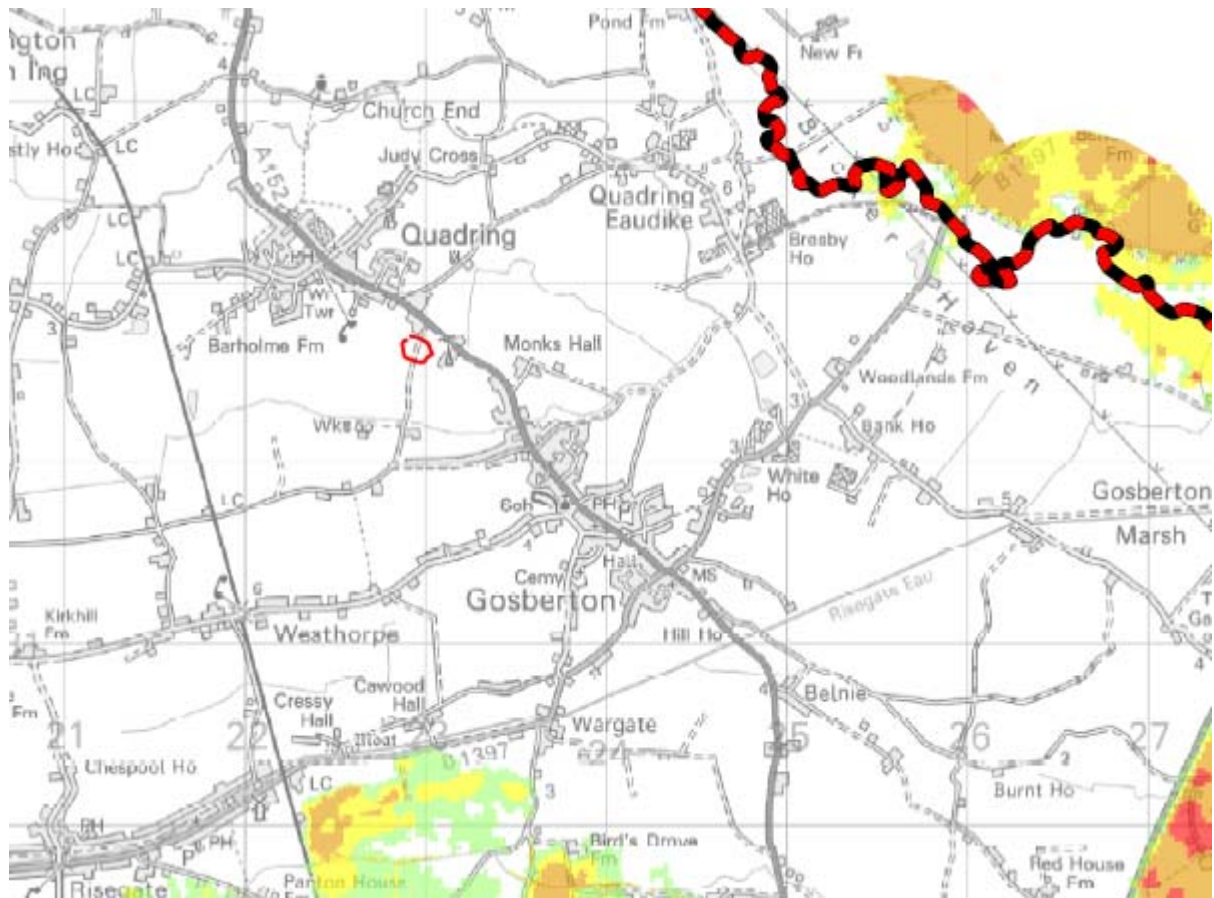


Figure 3: SRFA map extract- Residual Flood Hazard Map 2115 (1% fluvial and 0.5% tidal)

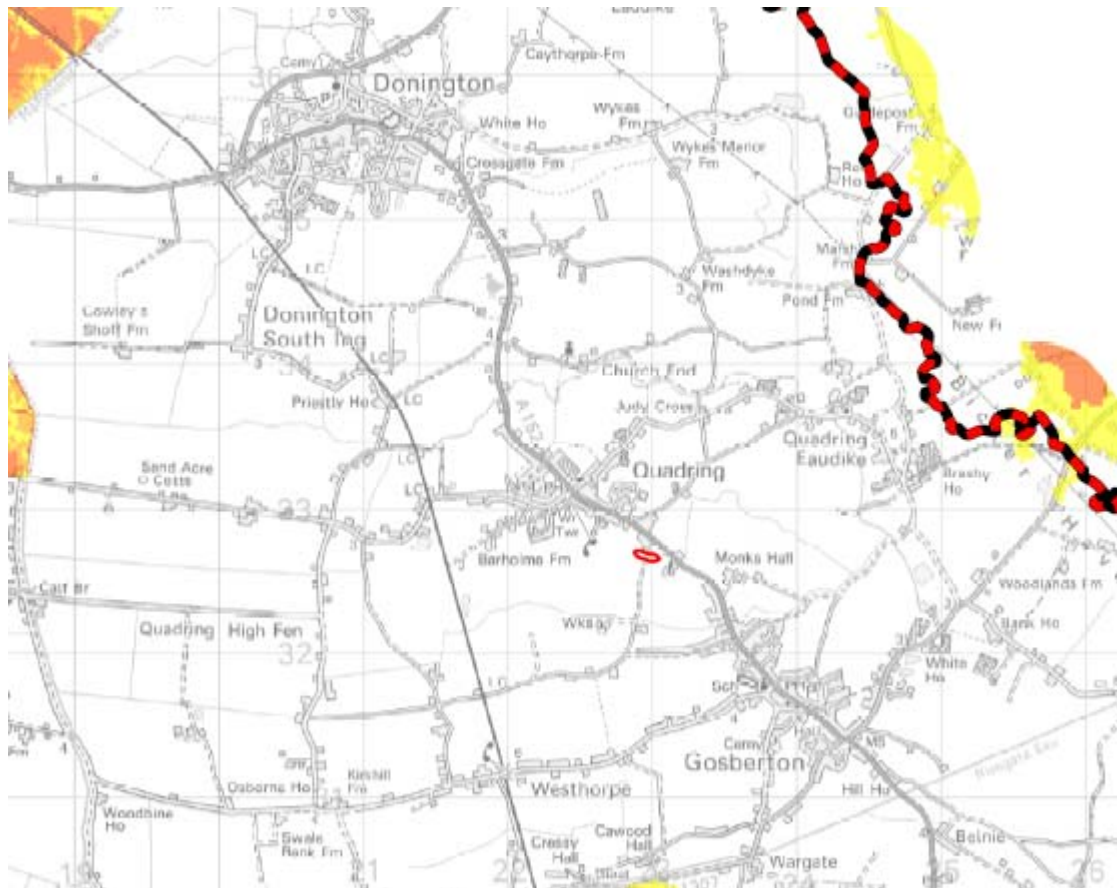


Figure 4: SFRA map extra- Residual Flood Depth Map 2115 (1% fluvial and 0.5% tidal)

6. Site Specific Flood Risk

Local Flood Sources

The site is approximately 6km north east of the tidal River Welland downstream of Spalding. The River Glen, a tributary of the River Welland, is a similar distance to the south east of the site. The defences on the River Welland and the River Glen are the responsibility of the Environment Agency.

There is a long-term strategy for the maintenance of the Environment Agency defences which is reviewed and updated every 5 years.

There is an extensive local drainage network managed by Welland and Deepings IDB. There is an IDB maintained watercourse, the Watergate Dyke, some 50 metres to the east of the site. The site and the surrounding land drains to the Risegate Eau which is approximately 3km south of the site. The catchment drains in an easterly direction to Risegate Eau Pumping Station which discharges to the tidal River Welland.

During the operation and maintenance of its pumping stations, associated structures and channel systems, the IDB seeks to maintain a general standard capable of providing flood protection to its district. A routine maintenance programme is in place to ensure that the Boards assets are commensurate with the standard of protection that is sought.

Current maintenance standards of the Welland and Deepings IDB, Black Sluice IDB and the Environment Agency are generally good.

Sources of Potential Flood Risk and Probability

The key potential sources of flooding have been identified as: -

- a) local blockages to the Welland and Deepings IDB main drainage system
- b) an event in the local drainage network which exceeds that standard of protection
- c) failure of the Risegate Eau Pumping Station
- d) over topping and/or breach of the River Glen defences and
- e) overtopping and/or breaching of the River Welland tidal defences

The probability of flooding from a) is considered to be low due to the Welland & Deepings IDB main drain design standard incorporating storage in the Board's system.

The standard of drainage provided by Welland and Deepings IDB and Black Sluice IDB is assessed at 2% annual probability (1 in 50 chance each year), compatible with the Department of the Environment, Food and Rural Affairs (DEFRA) target level of service for rural drainage and flood defence works. The risk associated with flooding due to events greater than 2% annual probability (1 in 50 chance each year) is lowered due to the Welland and Deepings IDB and Black Sluice IDB main drains incorporating a freeboard. This provides storage during events greater than 2% annual probability (1 in 50 chance each year).

Failure of the Risegate Eau Pumping Station could occur due to a mechanical breakdown or disruption to power supply. However, if this were to occur the IDB would put emergency measures in place such as temporary pumping equipment. The likelihood of such an event occurring is also considered to be low.

The River Welland tidal defences provide protection during the 0.5% annual probability (1 in 200 chance each year) tidal event. The River Glen has defences that provide protection during the 1% annual probability (1 in 100 chance each year) fluvial event.

Historic Flooding

During the preparation of this assessment no evidence was discovered of the site or the adjoining area flooding.

Climate Change

Climate change is likely to impact the site through increased rainfall intensity and duration affecting the local drainage network and increased tide levels. The River Welland tidal defences provide protection during the 0.5% annual probability (1 in 200 chance each year) event inclusive of the effects of climate change. The estimated tide level during this event is +7.13m OD and typical defence levels are in excess of +7.5m OD. In summary the existing systems and defences are appropriate for the design life of the development (i.e. 20-30 years).

Residual Risks

The South East Lincolnshire SFRA includes maps demonstrating the impact of climate change in 2115. The Residual Peak Depth maps within the SFRA show that when the climate change allowances are applied to the 1% annual probability fluvial (1 in 100 chance each year) and the 0.5% annual probability tidal (1 in 200 chance each year) event the site is not at risk. It should also be noted that the pumping station has an asset life of some 20-30 years and so it is not at risk of flooding during its operational life span.

The residual risk to the site is during an event that exceeds the standard of protection provided by the defences. In these events the risk to the site is lowered due to the distance of the site from the River Welland and River Glen.

7. Flood Risk Mitigation and Residual Impacts

The new pumping station will be located on a concrete base 150mm above general ground level. Electric equipment in the pumping station will be raised above 300mm from ground level as a precautionary measure.

The development is 'commercial' i.e. not lived in, with an assumed life expectancy of some 20-30 years.

The pumping station will not be a manned building. Network operatives will visit occasionally (typically twice a month) to check that all the equipment is working and to carry out planned maintenance.

Anglian Water has a responsibility to ensure that all site operatives are aware of health and safety risks including flooding. As a business it strives to ensure that site personnel are not put at risk from flooding. It also educates and informs staff of the appropriate flood risk management procedures to follow on a given site. The risk to these staff is considered small.

The impermeable area created by the development i.e. the pumping station and layby is only some 108.5 square metres. As such it will not increase the potential for flood risk elsewhere.

A risk assessment will be prepared for all temporary works associated with this proposed development, addressing items such as evacuation procedures, oil and other chemical storage, and appropriate staff information including signage.

The probability of flooding from the localised drainage system is considered to be low as is the potential for failure of the Risegate Eau Pumping Station.

The probability of the site flooding from any Environment Agency system is less than 1% annual probability (1 in 100 chance each year) because of the standards of the existing flood defences. During the design life of the development the site is not at risk. Over time there will be a gradual increase in risk to the site due to climate change but this remains low.

There is a residual risk to the site during an exceedance event. The risk from the River Welland and River Glen is reduced due to the distance of the site from these watercourses. If during an extreme event the site was affected, the situation would not be sudden.

8. Conclusion

This FRA has considered and assessed the potential flood risk associated with this the scheme.

The proposed development is necessary to ensure that customers do not experience a drop-in water pressure a result of new development around the Donington area. Due to the nature of Anglian Water's operational network the development cannot be located elsewhere.

The development is at a very low risk of flooding as per the South East Lincolnshire SFRA and is not predicted to flood in 2115. The asset life of the development is for less than this period. The surrounding IDB network is well maintained and risk of flooding from it also considered to be low.

The development has a very small footprint and will not, given its small footprint, increase flood risk elsewhere.

The scheme is therefore considered to comply with the provisions of the NPPF and policy 4 of the adopted Local Plan.