

National Grid Cable Tunnel Replacement Project

Flood Warning and Evacuation Plan

December 2023



Quality information

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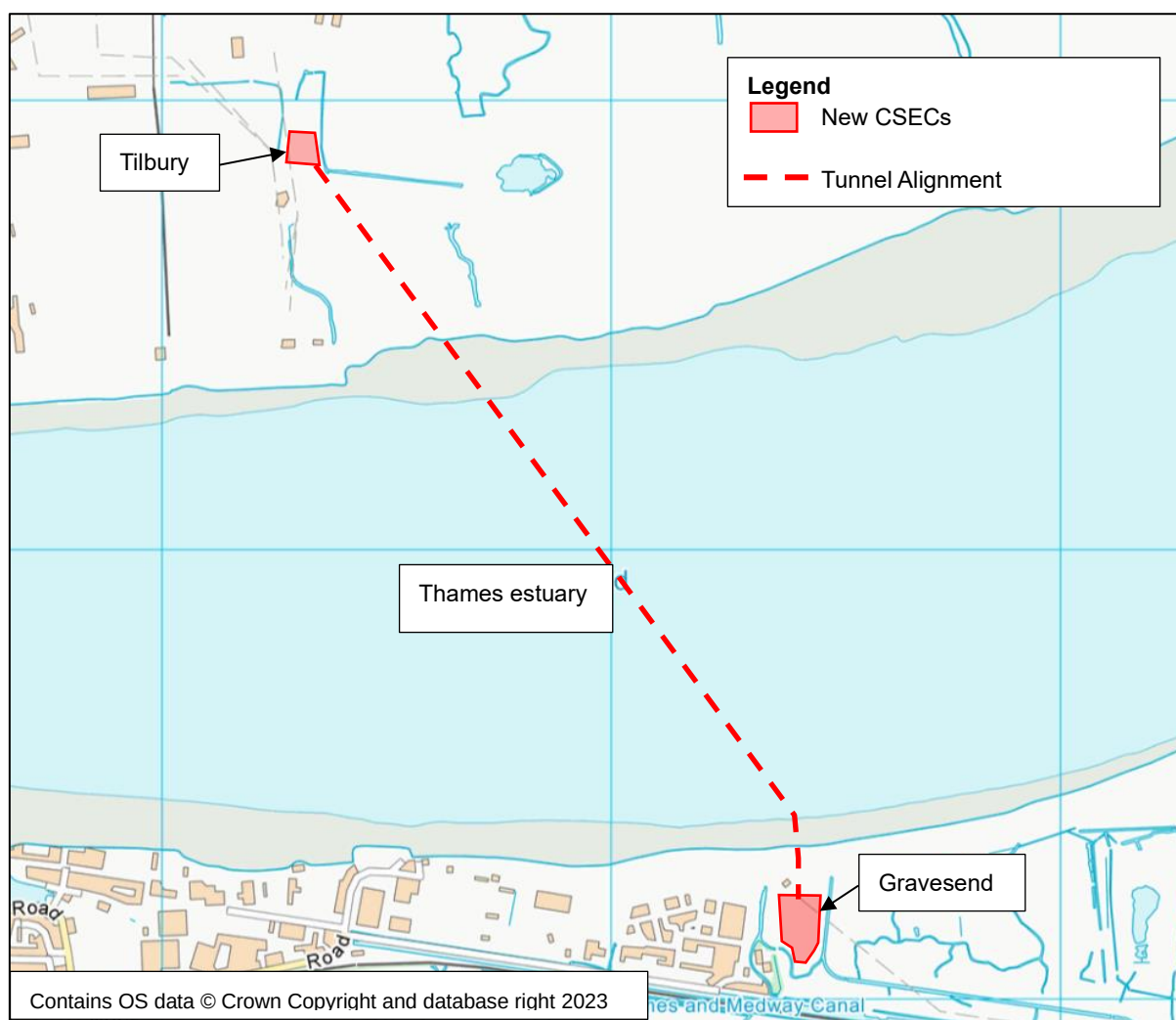
1 Introduction

1.1 Overview

- 1.1.1 AECOM Limited (AECOM) has been commissioned by National Grid Electricity Transmission (National Grid) to prepare a Flood Warning and Evacuation Plan (FWEP) for the Tilbury to Grain and Tilbury to Kingsnorth (TKRE) Cable Tunnel Replacement Project. The site-specific Flood Risk Assessment (FRA)¹ identified a residual flood risk for the development in Tilbury and Gravesend, if the Thames Estuary defences were to fail and therefore a FWEP has been prepared to advise site users what to do to mitigate this risk.
- 1.1.2 The TKRE Cable Tunnel Replacement Project (hereafter, the Proposed Development) comprises the **boring of a new tunnel** and the following above-ground components at both ends of the new tunnel:
- **A new cable sealing end compound:** consisting of:
 - **a new tunnel headhouse** which will cover the shaft into the tunnel;
 - **a new overhead line gantry structure** which will connect the overhead line download conductors and transfer them to six sealing end structures; and
 - **Modifications to the existing overhead line (OHL):** The new OHL conductors will be connected to the existing TKRE 400kV OHL conductors via new terminal pylons. The old OHL conductors and existing pylons will be either replaced, refurbished or removed.
- 1.1.3 The new SECs will be located at Tilbury and Gravesend as seen on Figure 1-1. The Proposed Development is expected to become operational in 2028 and has a development lifetime of 120 years. It is understood that personnel will only be required to visit both sites infrequently for maintenance purposes, and not need to access the sites during a flood event.
- 1.1.4 The centre of the Tilbury site is located at NGR TQ663758 and the nearest postcode is RM18 8TH. The Tilbury site is currently a hardstanding area with a historic ash landfill site to the east and the former Tilbury B Power Station site to the west. To the north and south of the site is wasteland. Further to the south of the site is the existing CSEC and the Tilbury substation is located further to the north of the site. The Tilbury site is accessible from an existing private road belonging to Port of Tilbury, which connects to Fort Road. The Tilbury site is located approximately 500m to the north of the Thames Estuary. There is an unnamed ordinary watercourse located approximately 5m to the east of the site and an unnamed ordinary watercourse located approximately 150m to the south of the site.
- 1.1.5 The centre of the Gravesend site is located at NGR TQ674741 and the nearest postcode is DA12 2HR. The Gravesend site is currently greenfield land with East Court Marshes to the east and various training centres to the west. To the north is the existing cable tunnel CSEC and approximately 100m to the south is the Thames and Medway Canal. The Gravesend site is accessible from an existing private access road belonging to National Grid, which connects to the Thames and Medway Canal. The Gravesend site is located approximately 200m to the south of the Thames Estuary. The Gravesend site is boarded by a series of drainage ditches to the south and east of the site which are recognised by the Environment Agency as Main River.

¹ BakerHicks (June 2023) Flood Risk Assessment TKRE, Grain-Tilbury and Kingsnorth-Tilbury 400kV Upgrading FEED.

Figure 1-1: Tilbury and Gravesend Headhouses and CSECs



- 1.1.6 According to the Environment Agency Flood Map for Planning² (Figure 2-1 and Figure 2-5), the Tilbury and Gravesend sites are located within Flood Zone 3. Flood Zone 3 is defined as land which in any year has a 1% or more chance of flooding from rivers, or a 0.5% or more chance of flooding from the sea. The Environment Agency's Reduction in Risk of Flooding from Rivers and the Sea due to Defences³ shows that the majority of the Tilbury and Gravesend sites are in an area where there is a reduction in risk of flooding from rivers and the sea due to defences present along the banks of the Thames Estuary. According to the Environment Agency's Spatial Flood Defences dataset⁴, the design standard of protection of the defences for both sites is up to the 0.1% Annual Exceedance Probability (AEP) event.

1.2 Hazards Associated with Flooding

- 1.2.1 Floodwaters have the potential to be hazardous, and exposure to them should be avoided wherever possible. Some of the hazards associated with floodwaters include:
- Fast flowing water with possible undercurrents, capable of knocking people off their feet or drawing them under the water surface;

² Environment Agency Flood Map for Planning. Available at: <https://flood-map-for-planning.service.gov.uk/> (accessed July 2023)

³ Environment Agency Reduction in Risk of Flooding from Rivers and the Sea due to Defences. Available at: <https://www.data.gov.uk/dataset/dcdcf96b-3293-4987-8ca8-9b8827f5ccf8/reduction-in-risk-of-flooding-from-rivers-and-sea-due-to-defences> (accessed July 2023)

⁴ Environment Agency Spatial Flood Defences. Available at: <https://www.data.gov.uk/dataset/cc76738e-fc17-49f9-a216-977c61858dda/aims-spatial-flood-defences-inc-standardised-attributes> (accessed July 2023)

- Debris suspended in the fast moving water, which may be moving with flow. This material may be of significant size and may be capable of knocking people off their feet and/or cause impact injuries and damage to buildings leading to instability. For example, cars can become suspended in floodwaters and cause damage to people and buildings;
- Floodwaters may become contaminated by pollutants. These pollutants may be hazardous to the short term and long term health of individuals, and may not be easily visible; and,
- The concealing of obstacles and hazards within floodwater which is often dark and not easy to see through. Obstacles and hazards may include blown manhole covers, tripping obstacles and relocated debris.

1.2.2 These hazards have the potential to cause adverse health effects, severe injury or death. For these reasons floodwater should only be entered in unavoidable circumstances and with extreme caution.

1.3 Aims and Objectives

1.3.1 The overall aim of this FWEP is to set out recommended procedures and actions, which, if followed, should keep site users safe during times of flood. The objectives of this FWEP are set out below and have been developed in line with the recommendations made in the Thurrock Council Strategic Flood Risk Assessment (SFRA)⁵ and Kent Thameside SFRA⁶ regarding emergency planning in areas of flood risk:

- a) **Provide information on local Flood Warning Services** - details of Environment Agency Flood Warning Area and/or proposed Warning System for owners/users, including likely timing/duration of warning;
- b) **Provide guidance on education and training** - increase awareness regarding the risk of flooding;
- c) **Provide an emergency evacuation procedure** - including a general evacuation route for both vehicles and site users on foot;
- d) **Provide guidance on Safe Refuge designation** - what a Safe Refuge area is and where it should be located;
- e) **Define roles and responsibilities during a flood event** – the FWEP lists the roles and responsibilities of who will need to act on flood warnings and other tasks required to prepare for flood events; and
- f) **Provide practical flood advice** – lists of provisions and the best way to respond before and during a flood event.

⁵ Thurrock Level 1 Strategic Flood Risk Assessment (2018): <https://www.thurrock.gov.uk/new-local-plan-for-thurrock/evidence- to-support-local-plan> (Accessed July 2023)

⁶ Kent Thameside Delivery Board Strategic Flood Risk Assessment (2005): <http://windmz.dartford.gov.uk/media/Eb53%20SFRAReport.pdf> (Accessed July 2023)

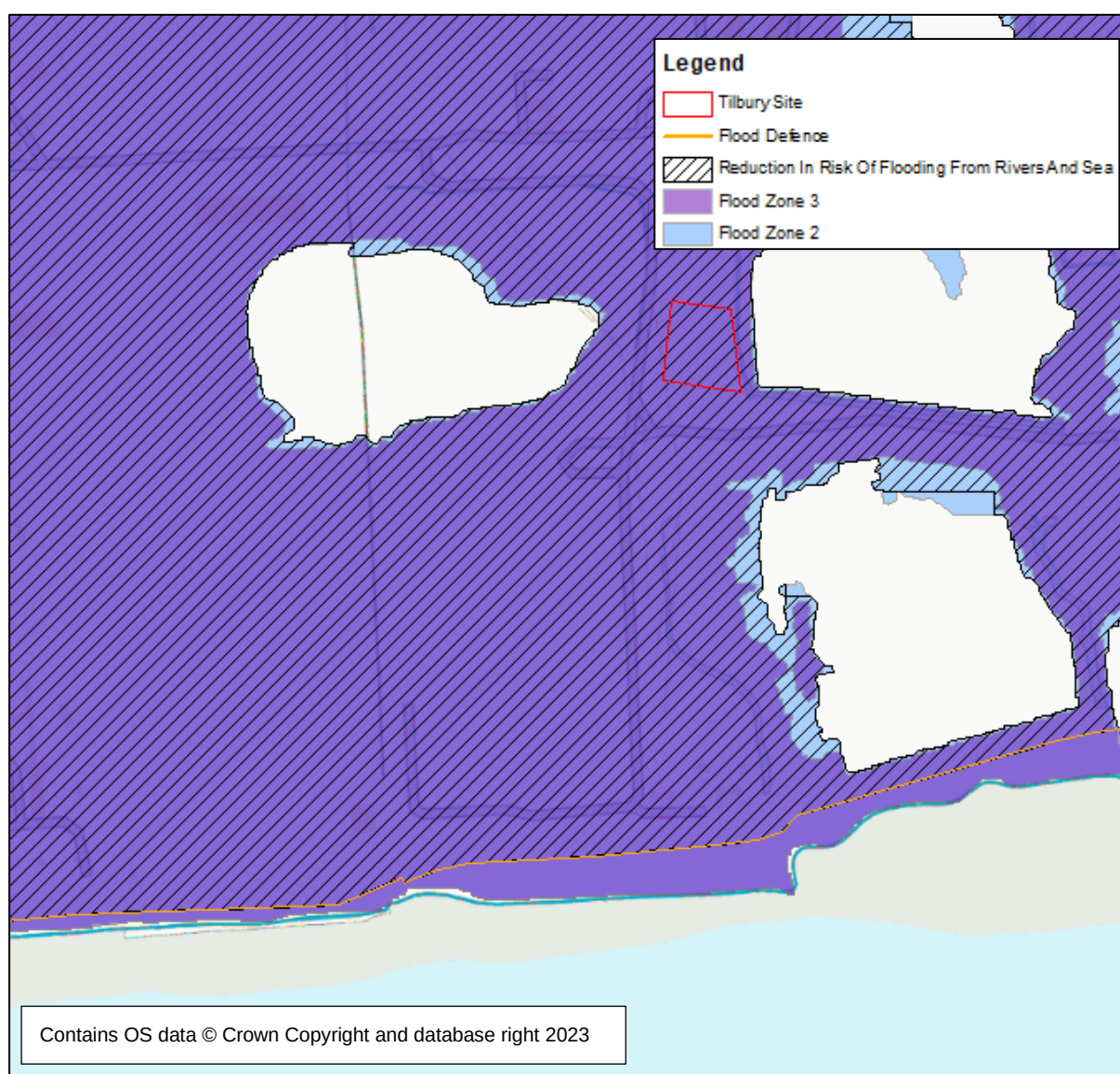
2 Flood Risk

2.1 Tilbury

Tidal River Thames

- 2.1.1 The Thames Estuary (tidal) presents the greatest flood risk to the Tilbury site, located approximately 500m to the south of the site. The site benefits from the protection of defences along the Thames Estuary (Figure 2-1).

Figure 2-1: Tilbury Flood Zone Map



- 2.1.2 The closest flood defence is a wall located on the frontage of the Thames Estuary and according to data provided by the Environment Agency as part of a data request received on 19 April 2023, this defence has an effective crest level of 6.49m AOD and has a 0.1% Annual Exceedance Probability (AEP) standard of protection.

- 2.1.3 The Thames Estuary 2100 (TE2100)⁷ flood risk management policy in this area is P4 which means that the Environment Agency will take further action to keep up with climate change and land use change so that flood risk does not increase. Therefore, the defence should provide protection to the site throughout its lifetime.
- 2.1.4 Table 2-1 displays the in-channel flood levels for 2005 – 2160, based on the 0.5% AEP and 0.1% AEP events from the TE2100 study. These have been extracted from a model node from the Thames Estuary (node 3.27) approximately 1.6km to the south-east of the site and have been provided by the Environment Agency. All instances where the in-channel flood levels are lower than the effective crest level of the defence (6.49m AOD) are protected events. It can be seen that in-channel flood levels during a 0.1% AEP event exceed the current crest level of the defence in 2120 and 2170, however in line with the TE2100 flood risk management policy in this area, the defences should be improved to provide the required protection.

Table 2-1: In-channel flood levels (TE2100)

Year	2005	2040	2070	2100	2120	2170
In-channel Flood Levels (m AOD) (0.5% AEP)	5.38	5.59	5.75	6.05	6.28	7.03
In-channel Flood Levels (m AOD) (0.1% AEP)	5.71	5.92	6.08	6.38	6.61	7.19

- 2.1.5 Assuming the defences will be upgraded in line with P4 of the TE2100, the Tilbury site will be protected by tidal flood defences of the Thames estuary throughout its lifetime (up to 2148), the greatest flood risk to the site is therefore if the defences fail (also referred to 'residual' flood risk).

Residual Risk (Defence Failure)

- 2.1.6 Hydraulic modelling is commonly used to simulate a failure of defences. The results from hydraulic breach modelling are used to indicate flood depths, velocities and rates of inundation. To inform this FWEP, breach modelling results from Thurrock Council's 2018 SFRA⁵ have been used. The nearest breach modelled as part of the 2018 SFRA (TIL005) is located approximately 800m to the south-west of the site. The results from the breach modelling are as follows:
- During a 0.5% AEP (2116) event and using the TIL005 breach location, the model indicates that the Tilbury site will first become inundated after 3 hours. The maximum flood depth is approximately 1.30m, located in the north-west of the site, which is reached approximately 16 hours after the breach event. The maximum velocity of floodwater on the site is approximately 1.20m/s. This breach subsequently proposes an 'extreme hazard' to the site.
 - The extent of floodwater is shown in Figure 2-2 to Figure 2-4 at 1 hour, 2 hours and 3 hours after a breach at the TIL005 location. Floodwater is shown to initially flow north and eastwards from the breach location and inundates the site. The designated evacuation route via Fort Road (section 4.1.1) floods prior to the site flooding and is considered safe to use up to 2 hours after the breach when the route is dry. After 2 hours the road becomes flooded and reaches a maximum depth of 3m 5 hours after the breach and is not a safe evacuation route.
- 2.1.7 As mentioned above, results have been extracted from the breach location which is closest to the Tilbury site and causes the quickest onset of flooding. It should be noted that there could be locations which have not been modelled as part of the Thurrock 2018 SFRA where a breach in the defences could cause flooding of the Site to occur more quickly. It is therefore important

⁷ Thames Estuary 2100 Study (2023). Available at: <https://www.gov.uk/government/collections/thames-estuary-2100-te2100> (Accessed July 2023)

that recommendations relating to flood warnings (Section 3) and evacuation plans (Section 4) are implemented.

Figure 2-2: Breach Flood Depth Map: 1 hour after breach (0.5% AEP, 2116)

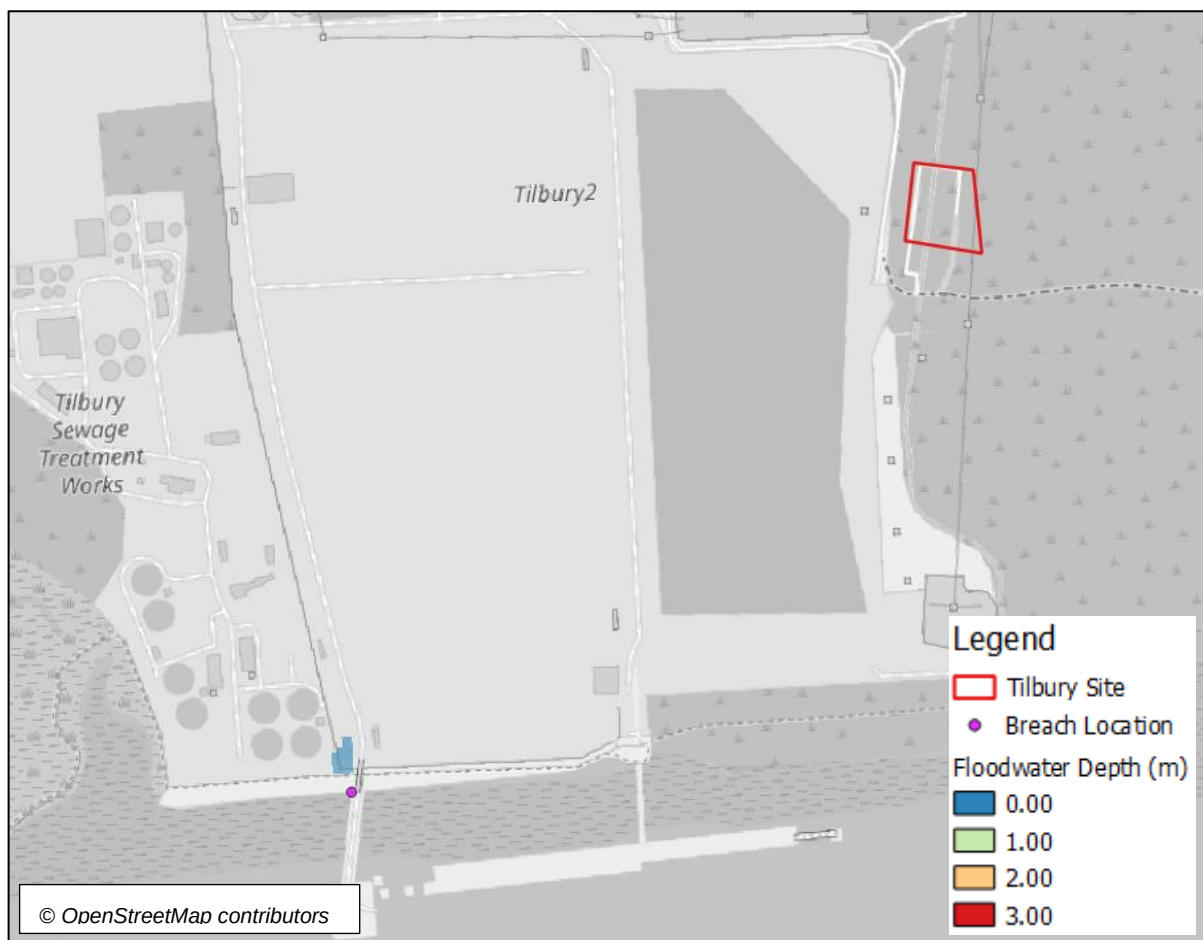


Figure 2-3: Breach Flood Depth Map: 2 hours after breach (0.5% AEP, 2116)

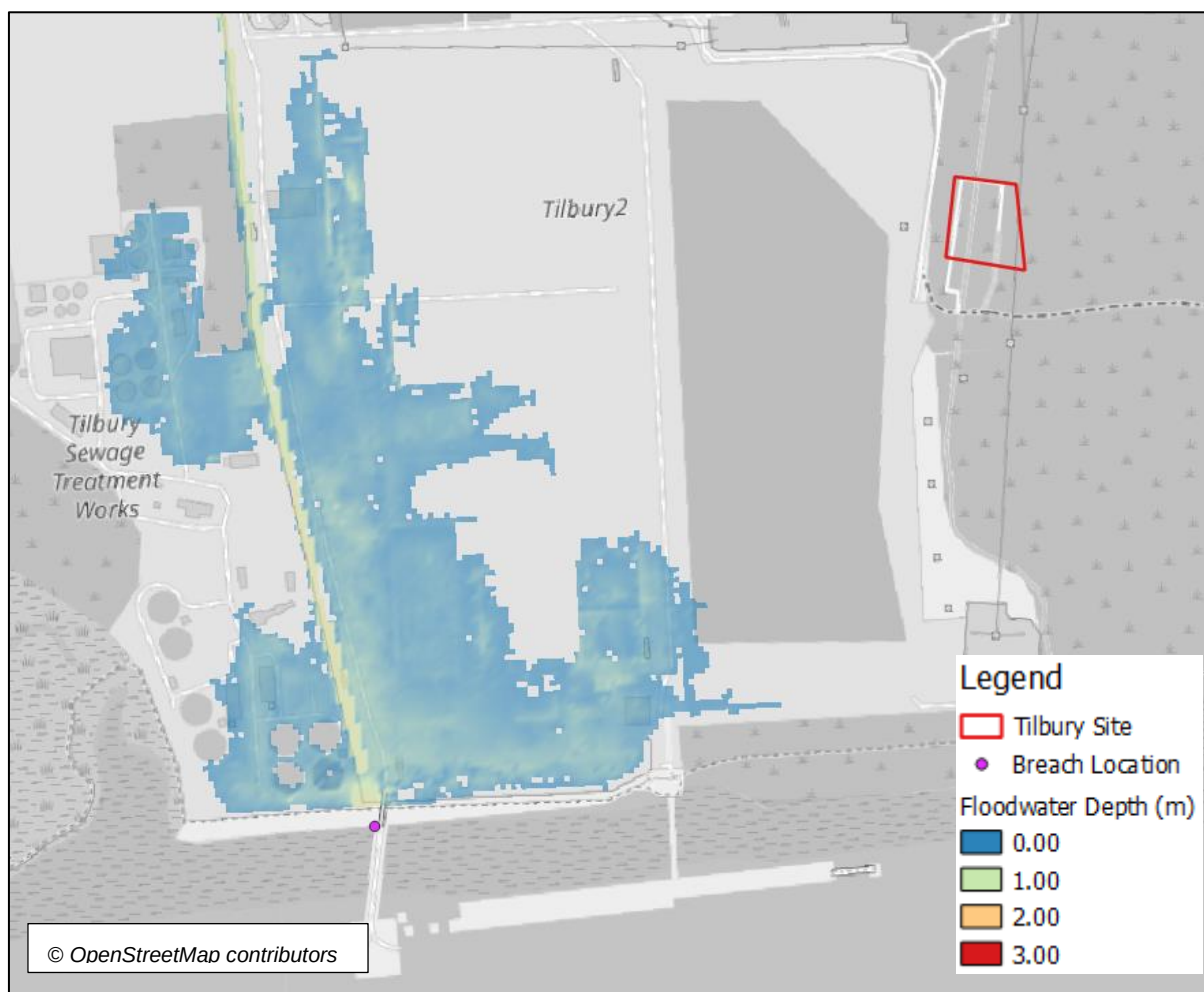
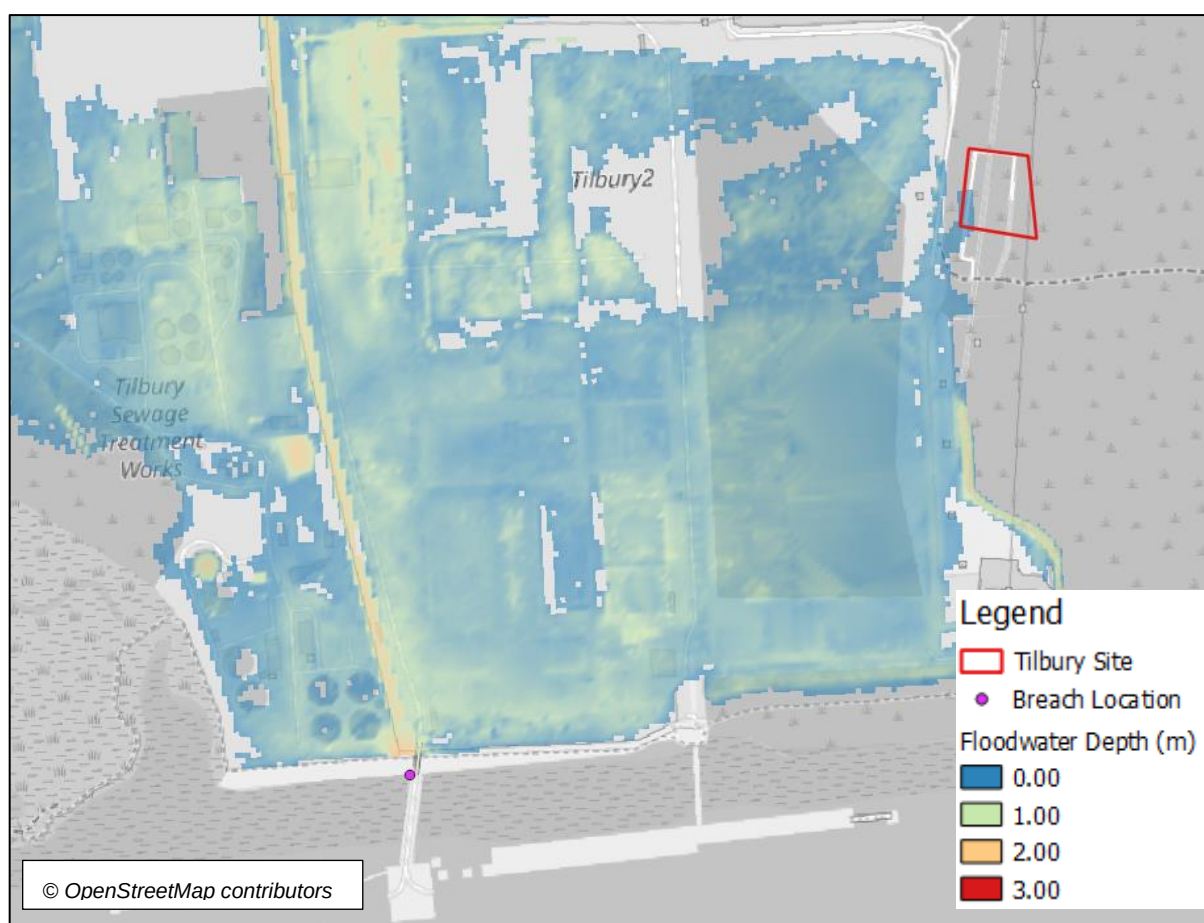


Figure 2-4: Breach Flood Depth Map: 3 hours after breach (0.5% AEP, 2116)



Other Sources

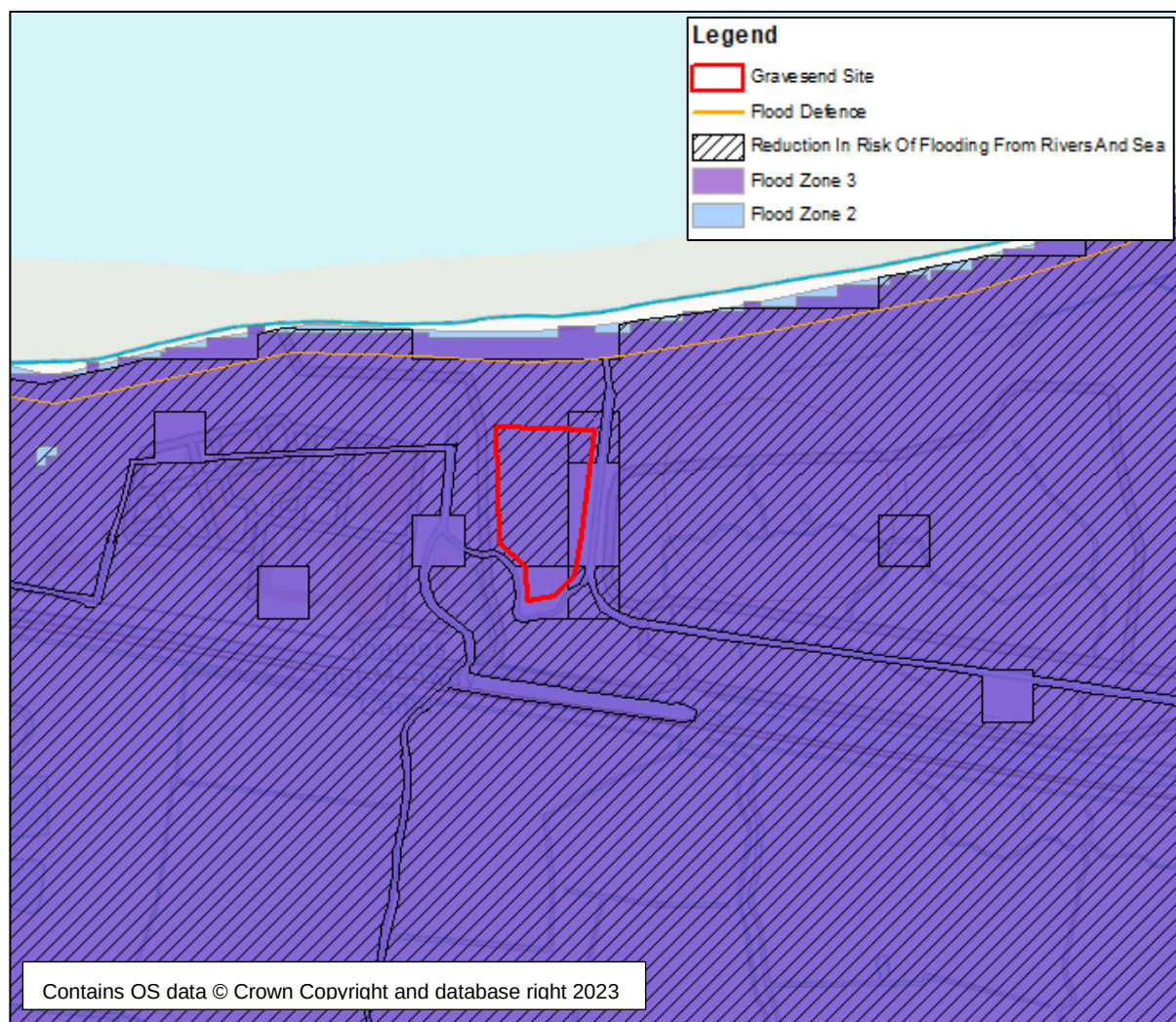
- 2.1.8 The FRA prepared for the site¹ suggests that the risk posed to the site from other sources such as fluvial, surface water, sewer, groundwater and artificial flood sources is low and are therefore not considered further as part of this FWEP.

2.2 Gravesend

Tidal River Thames

- 2.2.1 The Thames Estuary (tidal) presents the greatest flood risk to the Gravesend site, located approximately 200m to the north of the site. The majority of the site benefits from defences along the Thames Estuary (Figure 2-5).

Figure 2-5: Gravesend Flood Zone Map



2.2.2 The closest flood defence is an embankment located on the frontage of the Thames Estuary and according to Environment Agency Spatial Flood Defence dataset⁴, this defence has an effective crest level of 6.30m AOD and has a 0.1% AEP standard of protection. The TE2100 policy in this area is P3 which means that the Environment Agency will maintain flood defences at their current level, accepting that flood risk will increase.

2.2.3 Table 2-2 displays the in-channel flood levels for 2005 – 2160, based on the 0.5% AEP and 0.1% AEP events from the TE2100 study. These have been extracted from a model node from the Thames Estuary (node 3.27) approximately 0.8km to the north-west of the site and have been provided by the Environment Agency. All instances where the in-channel flood levels are lower than the effective crest level of the defence (6.30m AOD) are protected events. It can be seen that in-channel flood levels during a 0.5% AEP event exceed the current crest level of the defence in 2100, 2120 and 2170.

Table 2-2: In-channel flood levels (TE2100)

Year	2005	2040	2070	2100	2120	2170
In-channel Flood Levels (m AOD) (0.5% AEP)	5.38	5.59	5.75	6.05	6.28	7.03
In-channel Flood Levels (m AOD) (0.1% AEP)	5.71	5.92	6.08	6.38	6.61	7.19

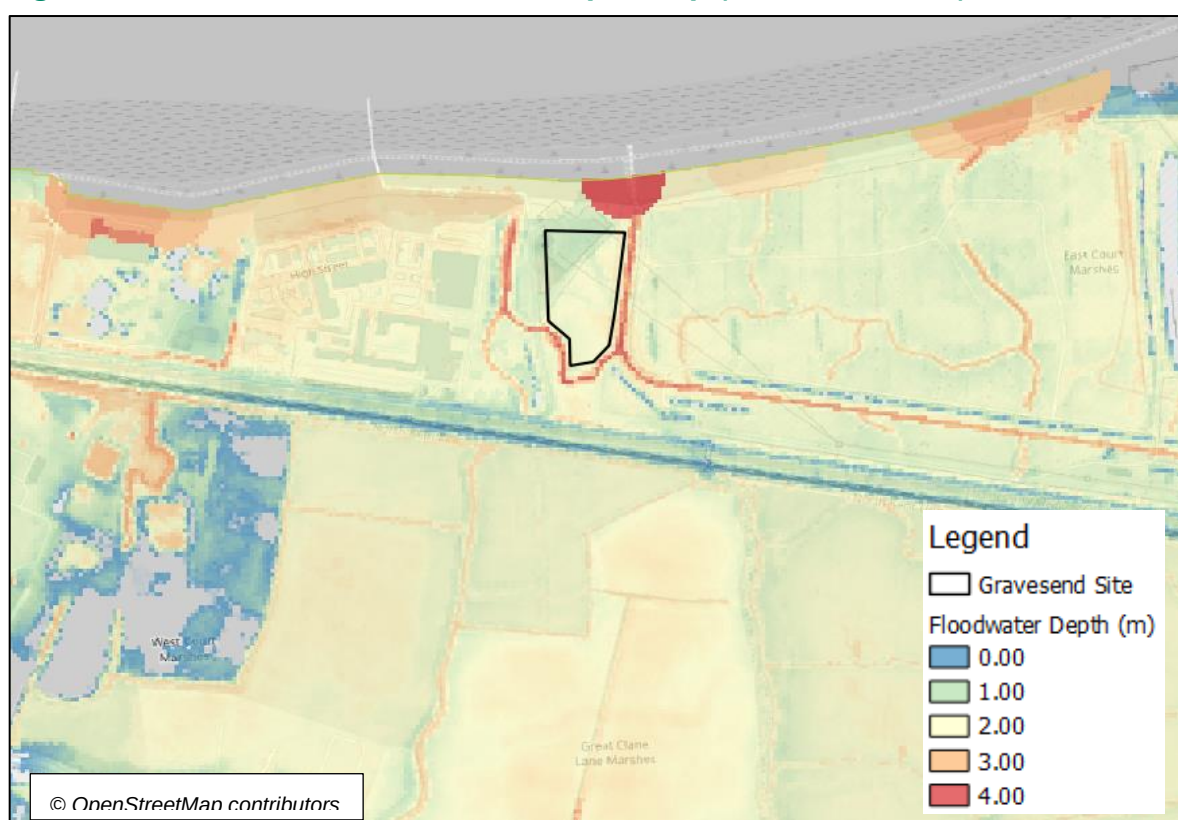
2.2.4 A water depth model was made in GIS as part of the FRA prepared for the Gravesend site using the Higher Central 0.5% AEP sea level rise scenario which showed that the existing flood defences would be overtopped by 0.8m in 2148¹. Therefore, mitigation measures have been

proposed in the FRA including raising Finished Floor Levels of the development above the TE2100 0.5% AEP in-channel flood level in 2148 and allowing a 1m freeboard for resilience. With this mitigation in place, the greatest flood risk to the site is therefore in the form of a residual breach. Should an overtopping event occur, the recommendations relating to flood warnings (Section 3) and evacuation plans (Section 4) should be followed.

Residual Risk (Defence Failure)

- 2.2.5 Examining the impact of structural failures of tidal defences allows the residual risk of tidal flooding to be accounted for. Hydraulic modelling is commonly used to simulate a failure of defences. The results from hydraulic breach modelling are used to indicate flood depths, velocities and rates of inundation. To inform this FWEP, the Environment Agency provided breach modelling results from the Thames Tidal Downriver Breach Inundation Modelling undertaken in 2018. This modelling simulates continuous tidal breaches of the defences (i.e. where all the defences are removed) along the entire extent of the Thames and provides the worst-case scenario.
- 2.2.6 Figure 2-6 displays the maximum breach flood depth results for the 0.5% AEP event (2115). This shows the entire Gravesend site to be inundated with floodwater up to a maximum depth of approximately 2.4m in the south-east of the site. The results provided did not allow interrogation to understand the flooding mechanisms or the time at which the floodwater begins to inundate the site following the breach. However, as the site is in close proximity to the Thames Estuary, it is likely that the site will begin to be inundated very quickly following a breach and no safe dry egress will be possible once a failure in the defences close to the site occurs. It is therefore important that recommendations relating to flood warnings (Section 3) and evacuation plans (Section 4) are implemented to ensure there are no personnel on the site during a flood event.

Figure 2-6: Maximum Breach Flood Depth Map (0.5% AEP, 2115)



Other Sources

- 2.2.7 The FRA prepared for the site¹ suggests that the risk posed to the site from other sources such as fluvial, surface water, sewer, groundwater and artificial flood sources is low and are therefore not considered further as part of this FWEP.

3 Environment Agency Flood Warning System

- 3.1.1 A breach in the flood defences may be caused by a third-party collision of shipping traffic, hydrostatic pressure during high tides or vehicle collision. Breaches are more likely to occur during high water level events including extreme tides and storm surge conditions. Therefore, the Environment Agency Flood Warnings play an important role in preparing for the possibility of such an event.
- 3.1.2 The Environment Agency monitors rainfall, fluvial levels and tidal conditions and uses this information to forecast the possibility of flooding. If flooding is forecast, they issue warnings using a set of three different warning types. These warning types are detailed below in Table 3-1 and are issued by the Environment Agency through a variety of different media.

Table 3-1: Environment Agency's Flood Warning Codes⁸

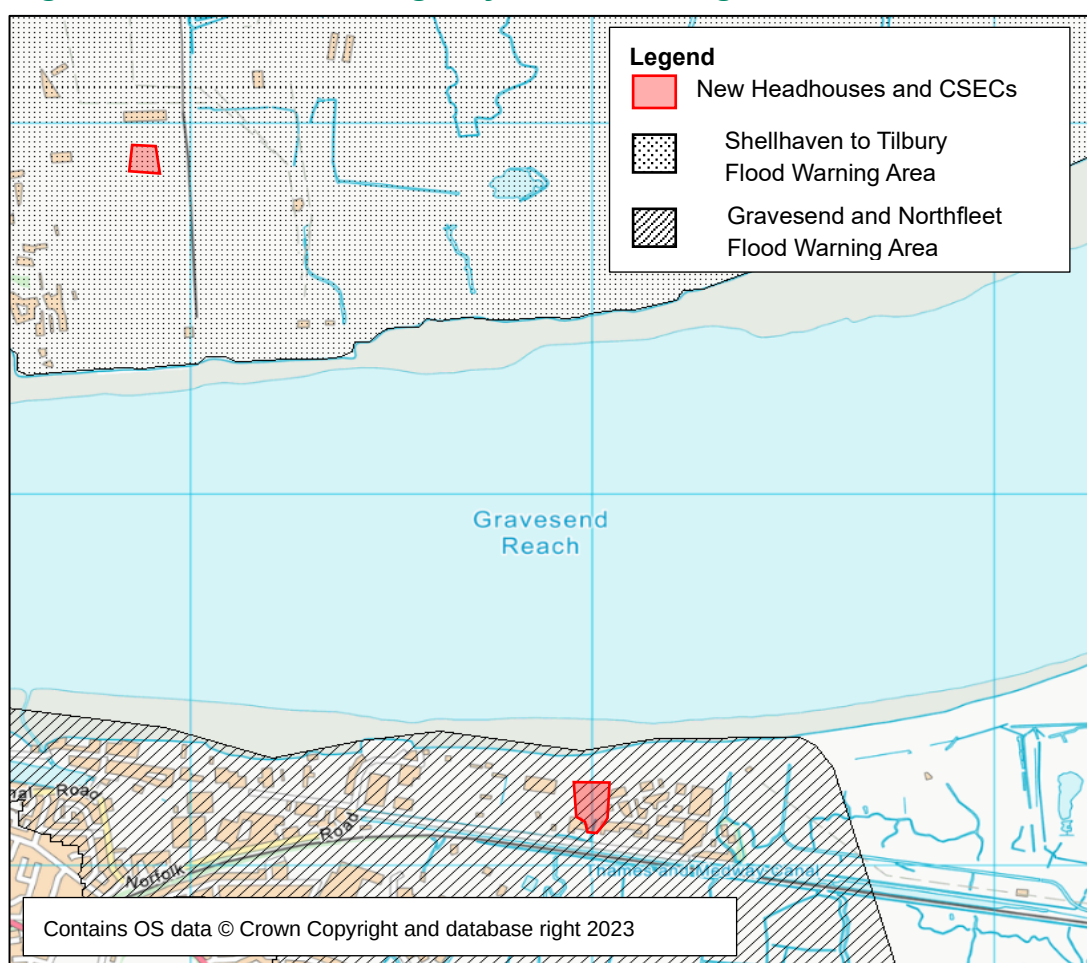
Warning	What it means	When it's used	Advice
FLOOD ALERT 	Flooding is possible, be prepared.	Two hours to two days in advance of flooding.	Be prepared to act on your flood plan. Prepare a flood kit of essential items. Monitor local water levels on the Environment Agency website www.environment-agency.gov.uk .
FLOOD WARNING 	Flooding is expected, immediate action required.	Half an hour to one day in advance of flooding.	Protect yourself, your family and help others. Move family, pets and valuables to a safe place. Turn off gas, electricity and water supplies if safe to do so. Put flood protection equipment in place.
SEVERE FLOOD WARNING 	Severe flooding, danger to life.	When flooding poses a significant risk to life or significant disruption to communities.	Stay in a safe place with a means of escape. Be ready should you need to evacuate from your home. Co-operate with the emergency services. Call 999 if you are in immediate danger.
Warning no longer in force	No further flooding is currently expected for your area.	When a flood warning or severe flood warning is no longer in force.	Be prepared to act on your flood plan. Be careful. Floodwater may still be around for several days. If you've been flooded, ring your insurance company as soon as possible.

⁸ A guide to the Environment Agency's flood warning codes (2012): https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/business/public-sector/hazard-manager/user_guide_flood_warning_codes.pdf (Accessed July 2023)

3.2 What Flood Warnings / Alerts are available at the Site?

- 3.2.1 The Environment Agency provides online maps showing the areas where flood warnings are issued. Areas are divided into 'Flood Warning Areas' and 'Flood Alert Areas'.
- 3.2.2 Owners and occupiers of properties within Flood Warning Areas can sign up to the automated Flood Warning Service. The purpose of Flood Warnings is to alert people that flooding is expected, and they should take action to protect themselves and their property. For subscribers, this service provides automated messages (via telephone, mobile, email, SMS message) for the different levels of warning issued, in addition to issuing via a variety of publicly accessible media (such as the Environment Agency website, television channels, radio stations and social media).
- 3.2.3 Occupiers of properties within Flood Alert Areas only (associated with river flooding), are generally not covered by the automated Flood Warning Service, but can view issued flood alerts via the publicly accessible media options. In some circumstances, automated flood alerts can be made available by the Environment Agency to some properties or land managers.
- 3.2.4 The Tilbury site is located within the 'Shellhaven to Tilbury' Flood Warning Area, and the Gravesend site is located within the 'Gravesend and Northfleet' Flood Warning Area, as illustrated in Figure 3-1⁹.

Figure 3-1: Environment Agency Flood Warning Areas



⁹ Environment Agency Flood Warning Areas. Available at: <https://www.arcgis.com/home/webmap/viewer.html?url=https%3A%2F%2Fenvironment.data.gov.uk%2Farcgis%2Frest%2Fservices%2FEA%2FFloodWarningAreas%2FMapServer&source=sd> (Accessed July 2023)

3.3 How do I Receive Automatic Flood Warnings / Alerts

- 3.3.1 It is recommended that the sites are signed up to the Environment Agency's Flood Warning service so that automated flood warnings are received. To sign-up to receive automatic flood warnings call Floodline on 0345 988 1188 or Typetalk on 0345 602 6340. Alternatively visit Flood Warnings Direct: <https://www.fws.environment-agency.gov.uk/app/olr/home>.
- 3.3.2 When a Flood Warning is issued it is recommended that site users evacuate the premises. A designated Flood Co-ordinator should monitor the Environment Agency's Flood Warning codes through one of the forms of media outlined above and make users aware of changes in warning codes. It is recommended that a method of disseminating the Flood Warning messages is established so the sites can be evacuated safely. The procedure for evacuation is explained further in Section 4. It is important to note that this Flood Warning and Evacuation Plan should be reviewed at regular intervals throughout the lifetime of the development.

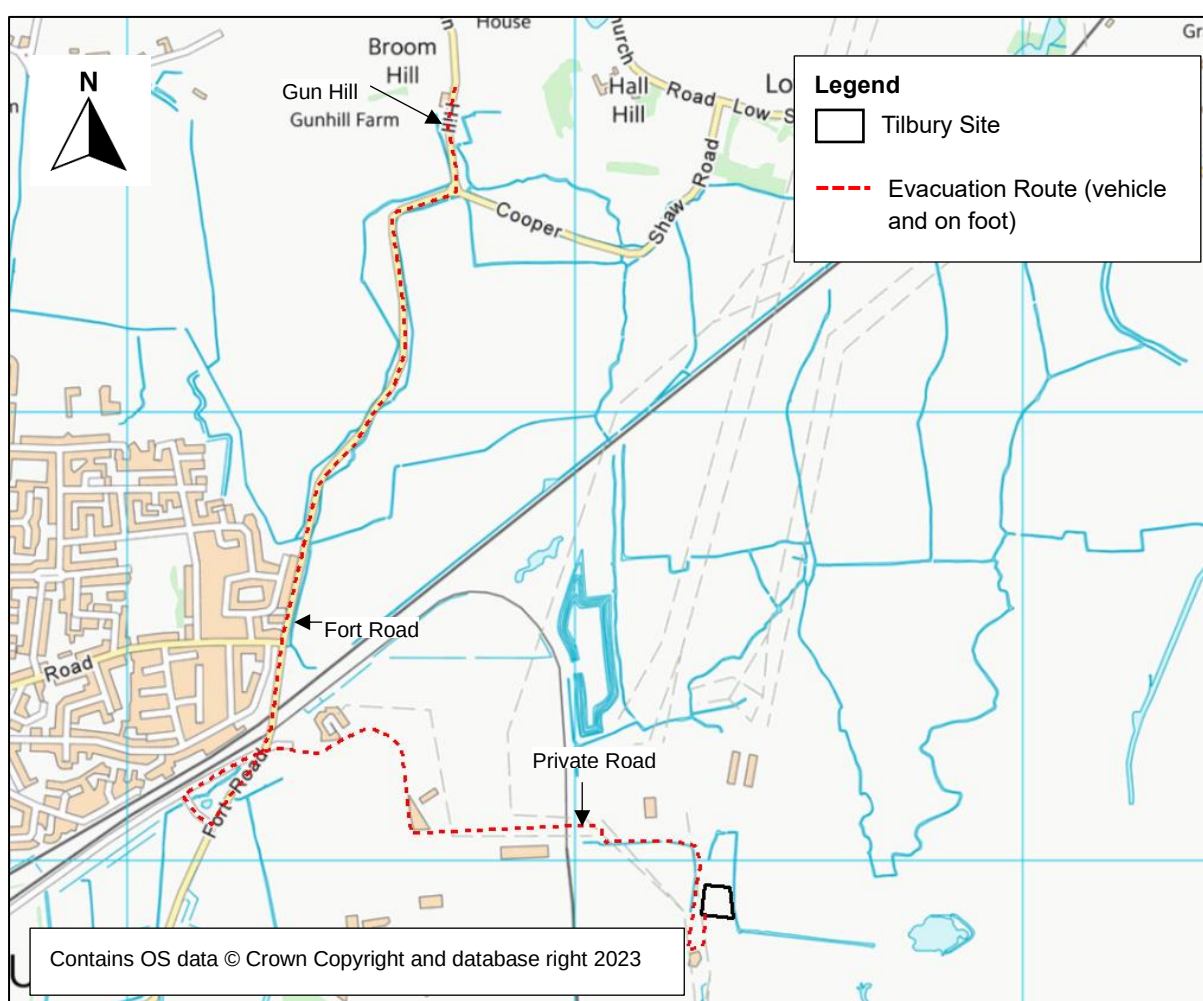
4 Flood Event Procedure

4.1 Tilbury

Designated Evacuation Route

- 4.1.1 In the event of a failure in the flood defences along the Thames Estuary during a 0.5% AEP (2116) event, it would take approximately 3 hours for floodwater to reach the Tilbury site and approximately 2 hours for floodwater to begin inundating the designated evacuation route. It is therefore crucial that site users are aware of the quickest and safest route away from the floodwater.
- 4.1.2 Following the receipt of a flood warning it is recommended that site users evacuate the site using the route shown in Figure 4-1. Users should leave the site via the private road to the south of the site and follow this road in a north-westerly direction to join onto Fort Road. Users should travel approximately 1.6km northwards on Fort Road where they should then turn left onto Gun Hill. Users should travel approximately 0.2km northwards on Gun Hill where they should be outside of the flood inundation area associated with the breach event.

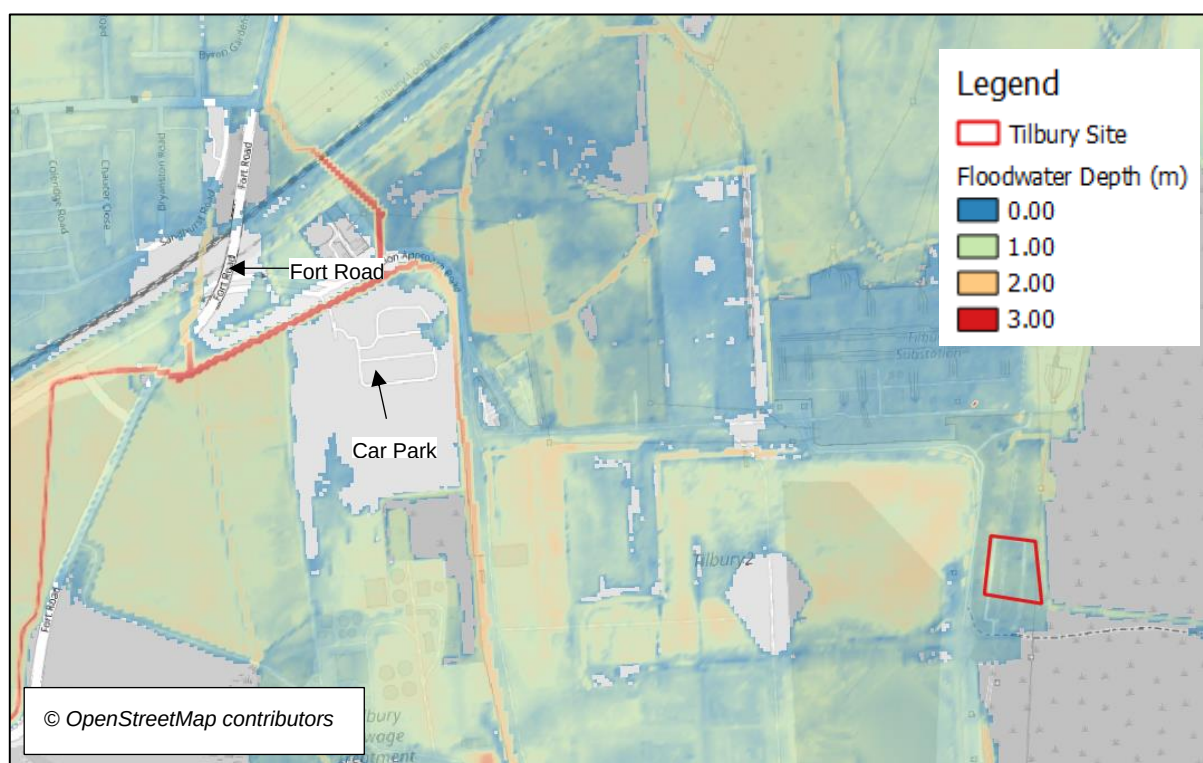
Figure 4-1: Tilbury Site Flood Evacuation Route



- 4.1.3 Due to the cyclic nature of tidal flood events, sufficient warning should be available to shut down the site and instruct site users to evacuate to an area outside the tidal Thames Estuary breach flood extent.

- 4.1.4 Areas along the private road begin to be inundated before the site itself, therefore, the designated evacuation route is only considered safe to use up until 2 hours after the breach. Depths along this route reach approximately 1m 2 hours and 10 minutes after the breach and a maximum of approximately 3m 5 hours after the breach.
- 4.1.5 There are other locations outside of the flood inundation area (likely to be raised from the surrounding ground level) which users could evacuate to in the event that the northern section of Fort Road is impassable, including a car park and an area on Fort Road which is elevated above ground as it passes over a railway line. These areas can be seen on Figure 4-2. The car park appears to be accessed by a private road but may be possible to access for evacuation purposes during a flood event.

Figure 4-2: Tilbury Site - Locations Outside of Maximum Breach Flood Inundation Area (0.5% AEP, 2116)



Safe Refuge

- 4.1.6 Safe Refuge is a designated area where site users can congregate and seek refuge should they be unable to leave the site prior to a flood event. This area should remain dry and, if possible, provide shelter for the duration of a flood event. The Safe Refuge area should be an elevated part of the site, preferably with safe access and accessible to rescue boats coming to the aid of site users.
- 4.1.7 There is no specific Safe Refuge area on the Tilbury site as the site will not be permanently manned and will only be accessed occasionally for maintenance. Flood Warnings should be checked prior to any visits to the site and should a Flood Warning be in place, the site should be closed to visitors. An evacuation route has been identified which site users can use to leave the site should they be present when a flood occurs.
- 4.1.8 It is emphasised again that site users should evacuate as advised (i.e. when a Flood Warning is issued) before floodwaters encroach on the site. Given the scale of flooding that a potential breach event could cause, it is likely that the Emergency Services will be stretched, and it is not possible to guarantee when they will be able to provide rescue services to this site.

Flood Warning and Evacuation Notice

- 4.1.9 The following Flood Warning Notice should be prominently displayed on the site. When a warning code is issued by the Environment Agency, it should be inserted onto the Flood Warning Notice. Where this is not possible, any visitors at the site should be made aware. Site users should be made familiar with the Flood Warning codes issued by the Environment Agency and the designated Flood Evacuation Route.

Flood Warning Notice

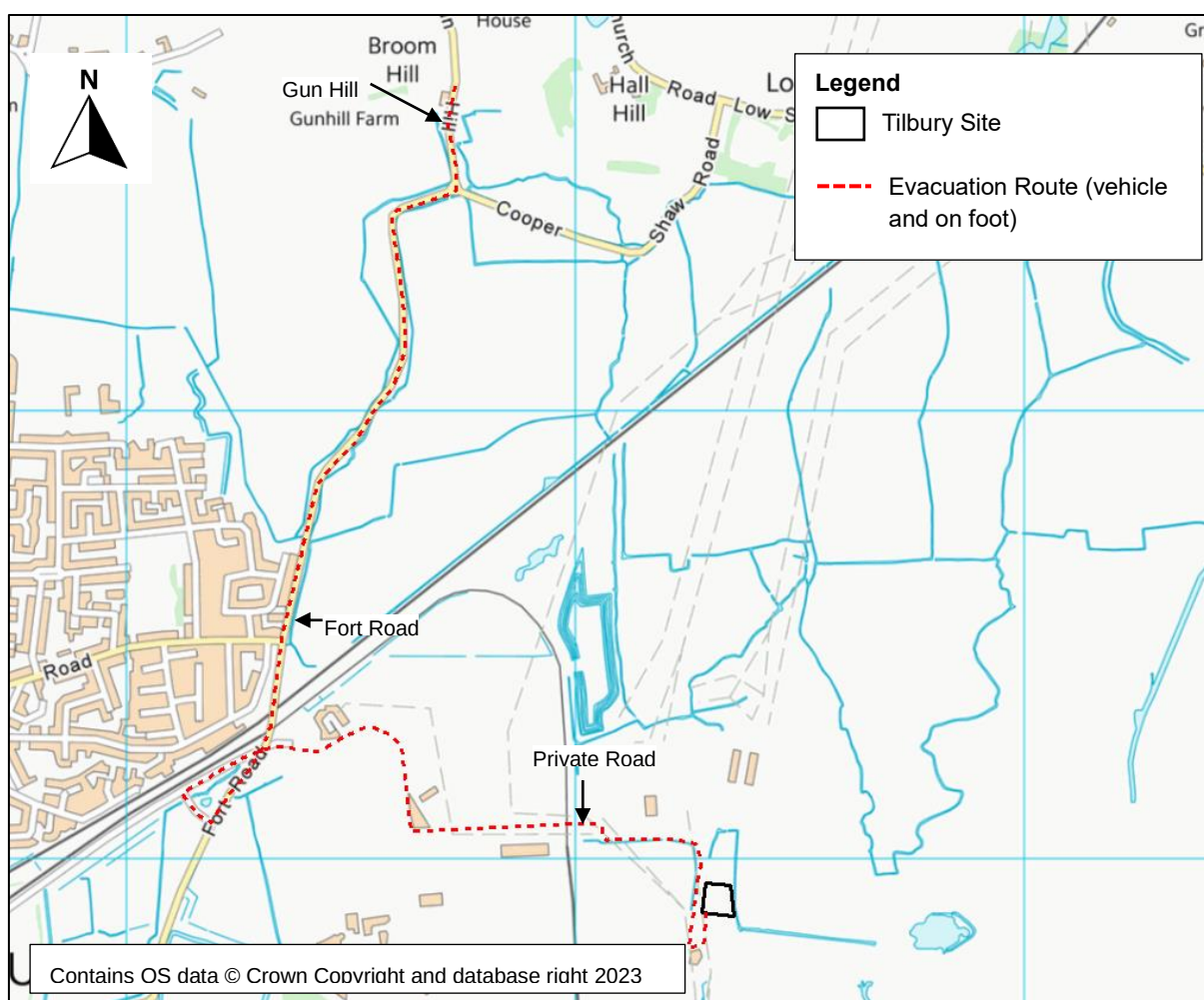
This site is located within an area at risk of flooding. Flooding may occur during bad weather conditions and/or when high tides coincide, should flood defences fail.

The current Flood Warning, issued by the Environment Agency is:

(Insert appropriate Flood Warning Code here)

Up to date Flood Warning information is available 24 hours a day:
Online at <https://www.gov.uk/government/organisations/environment-agency>
By Calling Floodline on 0345 988 1188

In the event of receipt of a Flood Warning, leave immediately using the route shown below. If this route is flooded contact your Flood Co-ordinator.

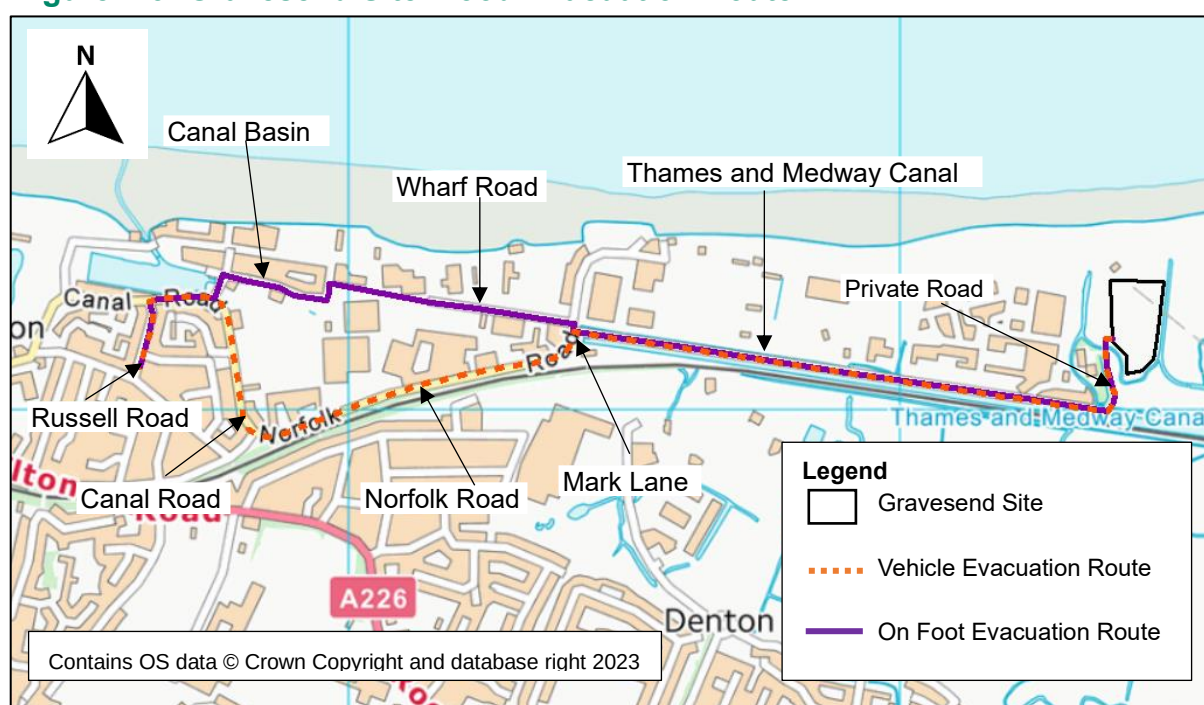


4.2 Gravesend

Designated Evacuation Route

- 4.2.1 Following the first encroachment of floodwater on the Gravesend site, they may quickly reach significant depths. It is therefore crucial that site users are aware of the quickest and safest route away from the floodwater.
- 4.2.2 Following the receipt of a flood warning it is recommended that site users evacuate the site using the route shown in Figure 4-3. Users evacuating by vehicle should leave the site using the private road to the west of the site and travel south onto the Thames and Medway Canal (Road). Users should travel west along the Thames and Medway Canal (Road) and then turn left onto Mark Lane. Mark Lane leads onto Norfolk Road which users should continue to travel on until Norfolk Road turns right and becomes Canal Road. Users should travel along Canal Road north-westwards for approximately 0.4km when they should turn left onto Russell Road. Users should travel along Russell Road for approximately 0.1km where they should be outside of the flood inundation area.
- 4.2.3 Users evacuating on foot should leave the site using the private road to the west of the site and travel south onto the Thames and Medway Canal (Road). The users should travel west along the Thames and Medway Canal (Road) and then turn right onto Mark Lane. Users should then turn left onto Wharf Road and travel westwards until turning left onto Canal Basin. Users should continue along Canal Basin until turning right onto Canal Road. Users should travel along Canal Road westwards for approximately 0.15km when they should then turn left onto Russell Road. Users should travel along Russell Road for approximately 0.1km where they should be outside of the flood inundation area.

Figure 4-3: Gravesend Site Flood Evacuation Route



- 4.2.4 Due to the cyclic nature of tidal flood events, sufficient warning should be available to shut down the site and instruct site users to evacuate to an area outside the tidal Thames estuary flood extent.
- 4.2.5 As it is uncertain when the site will become inundated following a breach event and the flooding mechanism once a breach has occurred is unknown, it should be stressed that site users should evacuate when instructed to (i.e. when a Flood Warning is issued), before floodwater reaches the site.

Safe Refuge

- 4.2.6 Safe Refuge is a designated area where site users can congregate and seek refuge should they be unable to leave the site prior to the flood event. This area should remain dry and, if possible, provide shelter for the duration of a flood event. The Safe Refuge area should be an elevated part of the site, preferably with safe access and accessible to rescue boats coming to the aid of site users.
- 4.2.7 There is no specific Safe Refuge area on the Gravesend site as the site will not be permanently manned and will only be accessed occasionally for maintenance. Flood Warnings should be checked prior to any visits to the site and should a Flood Warning be in place, the site should be closed to visitors. An evacuation route has been identified which site users can use to leave the site should they be present when a flood occurs.
- 4.2.8 It is emphasised again that site users should evacuate as advised (i.e. when a Flood Warning is issued) before floodwaters encroach on the site. Given the scale of flooding that a potential breach event could cause, it is likely that the Emergency Services will be stretched, and it is not possible to guarantee when they will be able to provide rescue services to this site.

Flood Warning and Evacuation Notice

- 4.2.9 The following Flood Warning Notice should be prominently displayed on the site. When a warning code is issued by the Environment Agency, it should be inserted onto the Flood Warning Notice. Where this is not possible, any visitors at the site should be made aware. Site users should be made familiar with the flood warning codes issued by the Environment Agency and the designated Flood Evacuation Route.

Flood Warning Notice

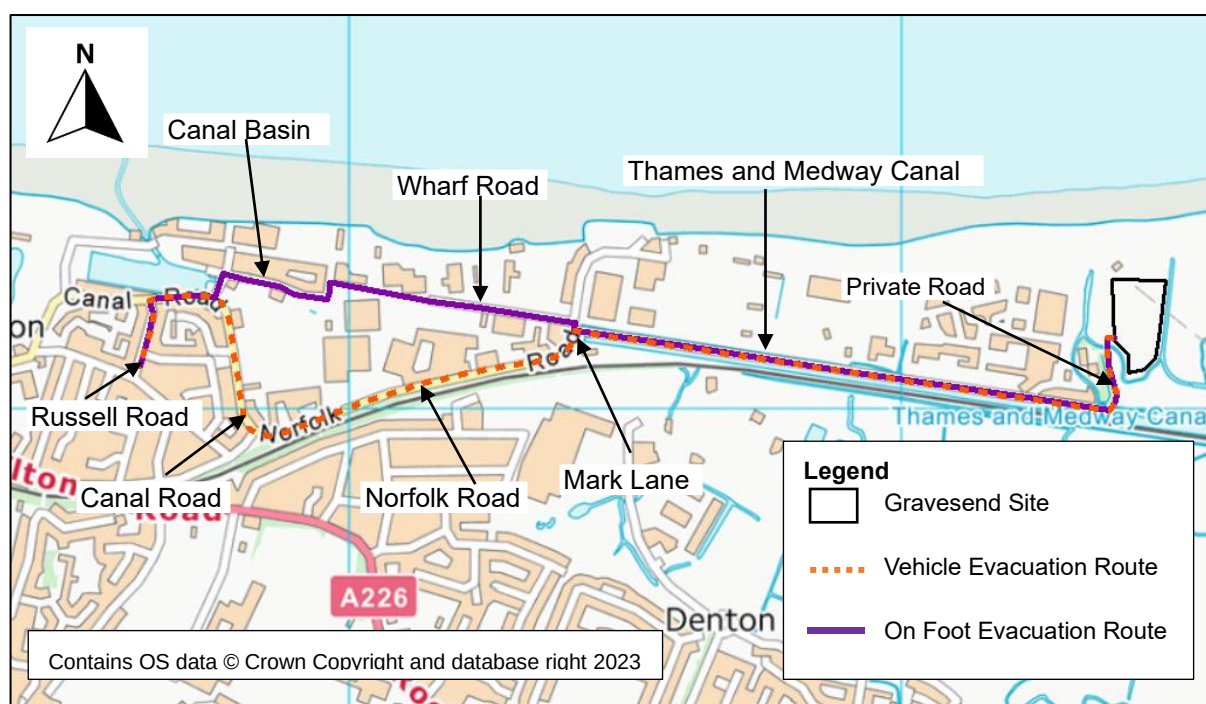
This site is located within an area at risk of flooding. Flooding may occur during bad weather conditions and/or when high tides coincide, should flood defences fail.

The current Flood Warning, issued by the Environment Agency is:

(Insert appropriate Flood Warning Code here)

Up to date Flood Warning information is available 24 hours a day:
Online at <https://www.gov.uk/government/organisations/environment-agency>
By Calling Floodline on 0345 988 1188

In the event of receipt of a Flood Warning, leave immediately using the route shown below. If this route is flooded contact your Flood Co-ordinator.



5 Roles and Responsibilities

- 5.1.1 The safe and effective implementation of the FWEP will depend in part on the adoption of certain roles and responsibilities. This will ensure messages are delivered clearly and that the users of the site remain aware of the flood risks and how to respond in the event of a flood.
- 5.1.2 This section defines the roles and responsibilities of people required to ensure the effective implementation of this FWEP.

5.2 Flood Co-ordinator

- 5.2.1 A Flood Co-ordinator should be appointed to implement the FWEP at the site. The responsibilities of the Flood Co-ordinator are listed below. An assistant should take on the role of Flood Co-ordinator in their absence, providing relevant support.

Six Monthly or as required

- Review and revise FWEP at regular intervals as necessary;
- Monitor the Environment Agency's Flood Warnings through one of the preferred mediums noted in Section 3;
- Ensure the Flood Warning Notice is prominently displayed and familiar to all site users;
- Ensure site users are familiar with the Flood Evacuation Routes and that the Flood Evacuation Route Maps are prominently displayed on site;
- Maintain an up-to-date list of contacts using Tables A-1 and A-2 (included in Appendix A). This will ensure that the correct people can be contacted to advise them that the site should not be visited because of flooding or to advise that evacuation is necessary;
- Locate key service cut-off points using a copy of Table B-1 (included in Appendix B); and
- Once the checks have been completed fill out the Flood Emergency Plan Review Log, using a copy of Table C-1 (included in Appendix C).

During a Flood Event (if on site)

- Switch off all services (where safe to do so) or advise others to do so if not present on site;
- Co-ordinate all site users to evacuate the site quickly and safely, following the designated evacuation route;
- Ensure all of the site users are safely off-site; and
- Contact the Emergency Services to tell them an evacuation is being undertaken.

5.3 Thurrock Council

- 5.3.1 Thurrock Council is responsible for ensuring the maintenance of essential services normally provided by the Council and co-ordinating efforts to restore those services that have been adversely affected as soon as practicable.

5.4 Environment Agency

- 5.4.1 The role of the Environment Agency is to provide adequate flood forecasting and flood warning service for the local area and to maintain river channels and flood defence structures.

5.5 Police, Fire and Rescue Service

Police, fire and rescue services are responsible for the co-ordination of rescue and evacuation following flooding events and the protection of life and property.

Appendix A Contacts

Table A-1: Useful Contacts

	Company Name	Contact Name	Telephone	Mobile
Floodline				
Gas Provider				
Electricity Provider				
Water Company				
Telephone Provider				
Local Public Transport				
Local Council Emergency Services				
Insurance Company and policy number				
Local radio station				

Table A-2: Site User Contacts

Name	Home Telephone and Address	Mobile	Emergency Contact

Appendix B Location of Services

Table B-1: Key Locations of Service Cut-Off Points

Service Cut-Off	Description of Location

Appendix C Emergency Plan Review

Table C-1: Emergency Plan Review

Date	Items Replaced	Comments	Signature

