Appendix D – Summary of flood risk in Surrey Heath Borough

The tables below summarise the areas where there are notable flood risks within Surrey Heath Borough. For this summary the study area has been delineated into three sub-areas, as shown in Figure 1-1. Further information on these sub-areas can be found in Section 4.11 of the Main Report.

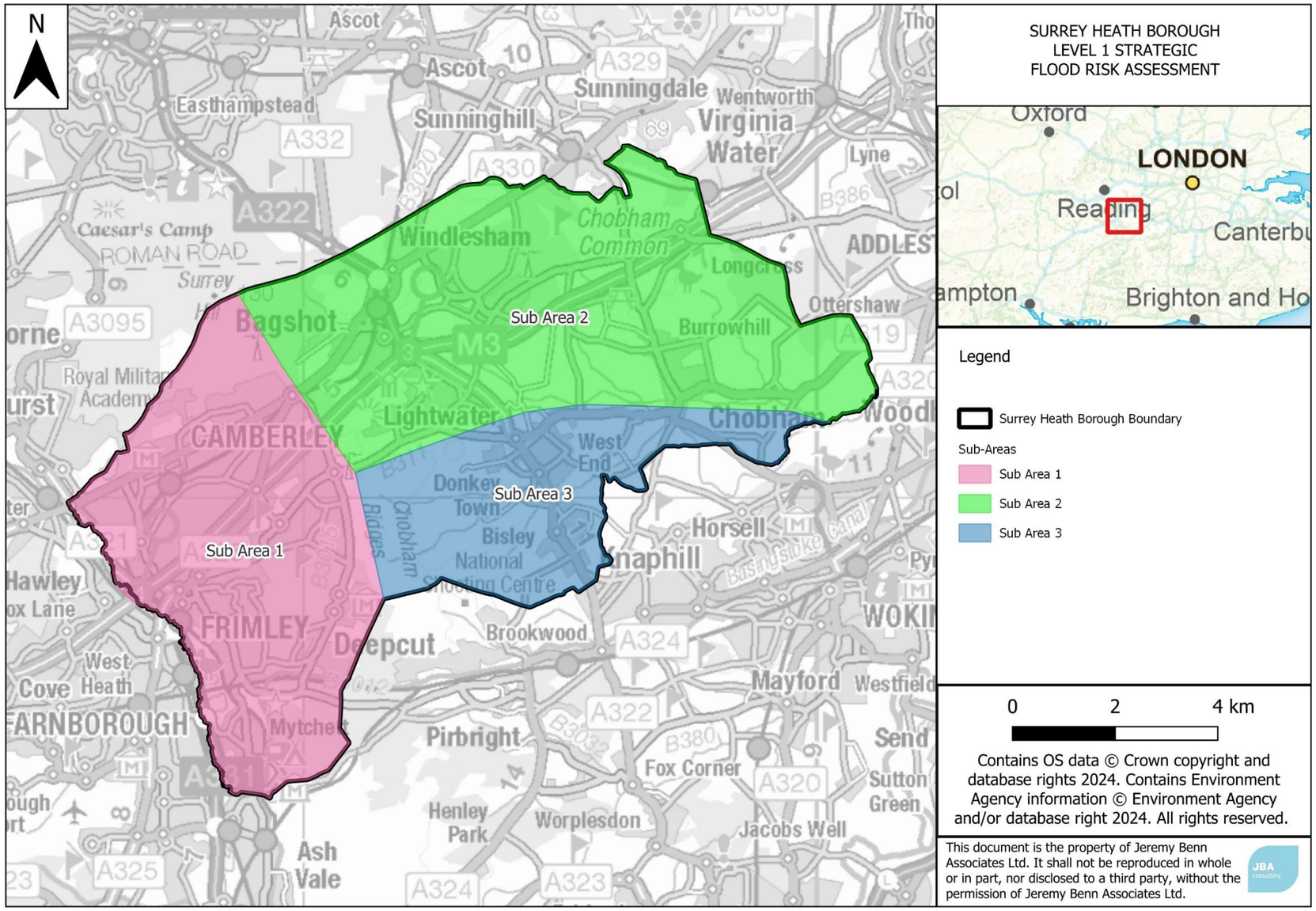

Figure 1-1: Sub-areas used to summarise the flood risk to the study area.

Sub-area 1: Camberley, Frimley and Mychett

Location	This sub-area covers the western areas of the borough. This sub-area is largely urban with the settlements of Camberley, Frimley, Frimley Green, Mytchett and Deepcut.
Fluvial flood risk	The main source of fluvial flood risk within this sub-area is from the River Blackwater which flows in a northerly direction along the western border of the borough, adjacent to the settlements of Mytchett, Frimley and Camberley. The western border of the borough is generally shown to be quite sensitive to increases in flow, with the Flood Zone 2 extents shown to extend considerably further into the borough than the Flood Zone 3a extents. South of the South Western Main Line railway, the fluvial risk is mainly predicted to impact lakes and parkland however these is fluvial flood risk shown to the main A331 road and Coleford Bridge Road, which is a key access road into Mychett. Within Frimley there are several unnamed tributaries of the River Blackwater which flow west through the settlement. The main areas of fluvial flood risk are found at the confluences of these smaller tributaries and the River Blackwater. In the southwest of the settlement several residential properties are located within Flood Zone 3a including along Hollytree Gardens, Bailey Close, and Bridgemead. Flood Zone 2 extends considerably further with properties along Trafford Road, Lendore Road, and Sheridan Road shown to be at risk. The Albany Park Industrial Estate is also shown to lie within the Flood Zone 3a extent, with the risk in Flood Zone 2 extending further to the surrounding residential areas to the south. To the north of the M3 there is an unnamed ordinary watercourse which arises from the ponds adjacent to Verran Road, Camberley, and is culverted beneath Frimley Road. The Flood Zone 3a extent shows a flow path which flows in a westerly direction through the southwest corner of Camberley with several residential properties at risk. Further properties are located within the Flood Zone 2 extent particularly in the west where the water is impounded by the railway embankment. In the west side of Camberley a further unnamed main river joins the River Blackwater near Admiralty Way. Industrial buildings across the south end of the York Town Industrial Estate and Admiralty Park are shown to be at risk in the Flood Zone 3a extent. The Flood Zone 2 extent is considerably larger, with greater risk to these industrial areas along the Watchmoor Industrial Park and part of the Thames Water Camberley Sewage Treatment Works (STW). Mapping showing these flood extents can be seen in the Council's Interactive Mapping Portal (surreyheath.hub.xmap.cloud).
Existing defences	The Environment Agency AIMS dataset shows two short sections of flood wall within this sub-area: one along a tributary of the River Blackwater offering protection to the north end of Frimley Business Park and one along a tributary of the River Blackwater adjacent to Surrey Heath Borough Council Depot. The Environment Agency AIMS dataset is shown in the mapping in the Council's Interactive Mapping Portal (surreyheath.hub.xmap.cloud).
Surface water flood risk	Surface water flood risk in this sub-area is channelled in a westerly direction towards the low-lying topography of the River Blackwater along the western border. There are considerable flow paths along the main roads (particularly the M3) and railway line. Raised infrastructure in the sub-area (namely the M3 and Ascot to Aldershot line) are shown to impound surface water behind them. The most significant areas of surface water risk are where water is impounded along the east side of the railway line through Frimley and the south end of Camberley, particularly in the 1% and 0.1% AEP events.

	There is also significant risk across the industrial and commercial areas in the west and centre of Camberley, with the risk mostly confined to the roads in the 3.3% AEP event, but increasing in extent across the areas in the 1% and 0.1% AEP events. Users should refer to the Council's Interactive Mapping Portal (surreyheath.hub.xmap.cloud) for more detail on which areas have the greatest risk of flooding from surface water.
Susceptibility to groundwater flood risk	The ASGWF map shows that large parts of the sub-area have less than 25% susceptibility to groundwater flooding. In the southwest area of the borough, around Mychett and Frimley Green, the ASGWF map shows greater than a 50% susceptibility to groundwater flooding. The JBA Groundwater Emergence Map shows the highest risk of groundwater emergence along the western border along the floodplain of the River Blackwater, with predicted groundwater emergence levels within 0.025m of the ground surface. The risk of groundwater emergence decreases away from the watercourse although most of the sub-area has emergence levels between 0.025m and 0.5m below the surface. The lowest risk of emergence is along the higher elevations in the east of the sub-area with predicted groundwater emergence levels at least 5m below the ground surface. The ASGWF dataset is shown in the Council's Interactive Mapping Portal (surreyheath.hub.xmap.cloud).
Reservoir inundation risk	The EA Reservoir Flood Risk Mapping shows that this sub-area is at risk from several reservoirs located both within and outside the sub-area. Following the direction of the River Blackwater; the low-lying areas of Mytchett are shown to be at risk from Mytchett Lake. During the 'Wet Day' event, these flood extents follow the path of the River Blackwater northwards and inundate areas of Frimley and Camberley. Cove Brook Flood Storage Reservoir and Hawley Lake Reservoir are both located outside of the sub-area, however during the 'Dry Day' flood event, water is predicted to cross into the sub-area near to the Thames Water STW. During the 'Wet Day' flood event, both extents of reservoir flooding inundate the majority of York Town Industrial Estate and the A331 located in the northwest of the sub-area. Surrey Hill Reservoir is located to the northeast sub-area boundary. Mapping indicates that during the 'Dry Day' flood event, flooding occurs along northern boundary of the sub-area, following the path of the Wish Stream to Sandhurst Lower Lake Reservoir. These extents overlap both Sandhurst Upper and Lower Reservoir 'Dry Day' extents, extending into the northwestern parts of Camberley and York Town Industrial Estate. During the 'Wet Day' Flood event, the flood extents from the Sandhurst Upper and Lower Lake notably increase across Camberley and within the low-lying areas adjacent to the River Blackwater. The 'Dry Day' and 'Wet Day' reservoir extents are shown in the Council's Interactive Mapping Portal (surreyheath.hub.xmap.cloud).
Historic, recorded flood events	The Environment Agency Recorded Flood Outlines dataset shows one record of historic flooding within this sub area-from the River Blackwater overtopping in September 1968. The flood extent was shown to mainly affect the industrial areas along the west side of Camberley. Data provided by Surrey County Council shows several incidences of property flooding across Frimley and Camberley. The Environment Agency Historic Flood Map and Recorded Flood Outlines are shown in the Council's Interactive Mapping Portal (surreyheath.hub.xmap.cloud).

Sub-area 2: Bagshot, Lightwater, Windlesham and Chobham

Location	This sub-area is located in the north central and eastern parts of the borough. This sub-area is largely rural and includes the small settlements of Bagshot, Lightwater, Windlesham and Chobham.
Fluvial flood risk	The main source of fluvial flood risk within this sub-area is from the statutory main rivers of Windle Brook, Hales Bourne, Mill Bourne and The Bourne, which flow in a south-easterly direction through the sub-area. Large parts of the floodplain are shown to be rural but there is some fluvial risk to settlements within the sub-area. The upstream areas of the watercourses are shown to be most sensitive to increases in flow with considerable difference between the Flood Zone 3a and Flood Zone 2 extents around Bagshot and Lightwater. The extents are more similar downstream at Chobham. Windle Brook flows through the centre of Bagshot, where residential and commercial properties along the A30 (London Road), Bridge Road, Wardle Close and Guildford Road are located within areas of Flood Zone 2 and 3a. Residential properties located to the east of the Ascot to Guildford Railway Line, along Gloucester Road, B3029 (Guildford Road) and Freemantle Road are also situated in areas of Flood Zone 2 and 3a. There is an unnamed tributary of Windle Brook which flows through the east side of Lightwater with a small number of properties along Guildford Road, Meadowbank Road, Riverside Avenue and The Willows located in Flood Zones 2 and 3a. There is considerable fluvial flood risk in the south side of Chobham between Chertsey Road and Station Road where the flood extents widen considerably. Although large parts of this area are rural, there are several properties at flood risk in Flood Zone 3a along the south side of Chertsey Road and along Catstle Grove Road. A number of properties along the High Street are shown to be at risk in Flood Zone 2. Mapping showing these flood extents can be seen in the Council's Interactive Mapping Portal (surreyheath.hub.xmap.cloud).
Existing defences	The Environment Agency AIMS dataset shows one flood embankment adjacent to Windle Brook, providing protection to the Bagshot Community Recycling Centre. The Environment Agency AIMS dataset is shown in the mapping in the Council's Interactive Mapping Portal (surreyheath.hub.xmap.cloud).
Surface water flood risk	There is an extensive surface water flood risk across the sub-area with the flow paths generally channelled by the topography in a south-easterly direction. There is some impounding of surface water flood risk behind the raised infrastructure of the M3 and Ascot to Guildford Railway line. There are several flow paths flowing through Bagshot in northerly and southerly directions towards the lower topography along Windle Brook in the centre of the settlement. Surface water risk is shown to be minimal in the 3.3% AEP event and is mainly confined to the roads within the settlement but with some impounding against the railway line, particularly to the north of the B3029. The flow paths increase in extent in the 1% AEP event with several properties at risk, particularly in the central area of the settlement between Station Road and the B3029. There is a considerable increase in risk in the 0.1% AEP event through the centre of the settlement, particularly in areas of impounding behind the railway line and the Bagshot Bypass. There is minimal surface water risk in Lightwater in the 3.3% and 1% AEP events but in the 0.1% AEP event there are several flow paths which develop in the west of the settlement, flowing in an easterly direction affecting several residential properties, particularly along Ambleside Road and in the residential areas to the south of this. There are two flow paths in Windlesham in the 3.3% AEP event: one through the centre of Windlesham along Chertsey Road and Thorndown Lane impacting the residential area to the south of Chertsey Road and one

	along Pound Lane and Church Road around the west side of the settlement with the risk confined to the roads in the 3.3% AEP event. These flow paths increase in extent in the 1% and 0.1% AEP events impacting the surrounding residential areas. There are several surface water flow paths which flow in a southerly direction through Chobham towards the lower topography of Mill Bourne. The risk in the 3.3% AEP and 1% AEP events is mainly confined to the roads and parkland areas. The surface water extents increase considerably in the 0.1% AEP event. The most significant risk is to the residential areas between Chertsey Road and Mill Bourne. Users should refer to the Council's Interactive Mapping Portal (surreyheath.hub.xmap.cloud) for more detail on which areas have the greatest risk of flooding from surface water.
Susceptibility to groundwater flood risk	The ASGWF map indicates that the majority of this sub-area has less than a 50% a susceptibility to groundwater flooding. There are two areas shown to have greater than a 50% susceptibility to groundwater flooding: in the west of the sub-area in the west side of Bagshot and in the centre of the area south of the M3, between Windlesham and Chobham. The JBA groundwater emergence map shows large parts of the centre of the sub-areas are shown to have negligible risk of groundwater emergence due to the underlying geology. The highest groundwater emergence levels are predicted to be in the southeast of the sub-area, across Chobham, with emergence levels within 0.025m of the surface. Groundwater emergence levels along the western side of the sub-area through the western sides of Bagshot and Lightwater are predicted to be between 0.025m and 0.5m below the ground surface. The ASGWF dataset is shown in the Council's Interactive Mapping Portal (surreyheath.hub.xmap.cloud).
Reservoir inundation risk	The Environment Agency Reservoir Flood Risk Mapping shows that this sub-area is affected by the Surrey Hill Reservoir during the 'Dry Day' scenario. The Surrey Hill Reservoir is located just outside of the northwest sub-area boundary within sub-area 1. The flood extents cross into sub-area 2 through the woodland located to the north of Bagshot Heath and then follows the path of Windle Brook and then Mill Bourne to Chobham. Properties at Bagshot, Halebourne Lane and Chobham are predicted to be at risk. The 'Dry Day' scenario extents from this reservoir are shown in the Council's Interactive Mapping Portal (surreyheath.hub.xmap.cloud).
Historic, recorded flood events	The Environment Agency Recorded Flood Outlines dataset includes the following historic flood events: • September 1968 – fluvial flooding along Windle Brook / Mill Bourne due to overtopping. The flood extent reaches from Bagshot at the upstream end, downstream through the length of the sub-area. The impacts are shown to have largely affected rural areas, roads within the sub-area and farm properties at the downstream end. • January 2003, November 1974, and March 1947 – fluvial flooding along Mill Bourne due to overtopping affecting rural areas south of Fairoaks Airport. Data provided by Surrey County Council shows several incidences of property flooding across Bagshot, Windlesham, Lightwater, and Chobham. The Environment Agency Historic Flood Map and Recorded Flood Outlines are shown in the Council's Interactive Mapping Portal (surreyheath.hub.xmap.cloud).

Sub-area 3: West End, Bisley, Castle Green and Mimbridge

Location	This sub-area is located in the south central and eastern parts of the borough. This sub-area is largely rural and includes the small settlements of West End and Bisley.
Fluvial flood risk	The main source of fluvial flood risk within this sub-area is from the statutory main rivers of Trulley Brook and The Bourne. In Flood Zone 3a, the flood extents along Trulley Brook / The Bourne remain confined to the channel through much of the sub-area with the risk predominantly limited to rural areas and local roads. There are a small number of properties in the south end of Chobham predicted to be at risk. There are larger areas of risk in the east side of the sub-area where the flood extents from Mill Bourne extend into the sub-area, affecting a number of residential properties in the southeast side of Chobham and Station Road (A3046). The area is shown to be quite sensitive to increased flows with considerably larger extents shown in Flood Zone 2. A lot of the risk only impacts rural areas but there are some residential properties shown to be at fluvial risk between West End and Bisley and further risk in the south end of Chobham. Mapping showing these flood extents can be seen in the Council's Interactive Mapping Portal (surreyheath.hub.xmap.cloud).
Existing defences	The Environment Agency AIMS dataset indicates that there are no existing formal defences within the sub-area.
Surface water flood risk	The Environment Agency Risk of Flooding from Surface Water mapping shows that there is an extensive flood risk across the sub-area with several surface water flow paths flowing to the low lying areas adjacent to the Trulley Brook and The Bourne. The most significant surface water risk is across the south end of Chobham, due to the low-lying topography between Mill Bourne and The Bourne with extensive risk affecting residential properties in this area, particularly in the 1% and 0.1% AEP events. There are a number of surface water flow paths which flow in a southerly direction through West End, following the roads through the settlement. There is minimal risk in the 3.3% AEP event with the extents largely confined to the roads within the settlement. The flow paths increase in the 1% and 0.1% AEP events, particularly in the west side of the settlement, with a number of properties shown to be at risk, particularly along Rubus Close, Abelia Close, Erica Close, and Fenns Lane. The surface water risk in Bisley is limited in the 3.3% AEP and 1% AEP events, remaining mostly confined to the roads. The surface water flow paths increase in extent in the 0.1% AEP event, particularly in the north of the settlement with risk to a small number of residential properties, particularly between Iris Road and Church Lane. Users should refer to the Council's Interactive Mapping Portal (surreyheath.hub.xmap.cloud) for more detail on which areas have the greatest risk of flooding from surface water.
Susceptibility to groundwater flood risk	The ASGWF map shows that the majority of this sub-area is located within areas shown as having no susceptibility to groundwater flooding due to the underlying geology. The JBA Groundwater Emergence Map emulates this across the central part of the sub-area, showing negligible risk of groundwater emergence due to the underlying geology covering West End and Bisley. However, groundwater emergence levels in the east side of the sub-area are predicted to be within 0.025m of the ground surface. The risk of groundwater emergence along the western border of the sub-area is also predicted to be greater, with emergence levels predicted to be within 0.5m of the ground surface The ASGWF dataset is shown in the Council's Interactive Mapping Portal (surreyheath.hub.xmap.cloud).

Reservoir inundation risk	The Environment Agency Reservoir Flood Risk Mapping shows that this sub-area is not impacted by any reservoir flooding during both ‘Dry Day’ and ‘Wet Day’ scenarios.
Historic, recorded flood events	The Environment Agency Recorded Flood Outlines dataset has one record of flooding in September 1968. Fluvial flooding occurred along the main rivers of Trulley Brook and The Bourne as a result of channel capacity exceedance. Flooding is shown to have occurred between the settlements of West End and Bisley across Lucas Green Road, A322 (Guildford Road) and Scotts Grove Road. Further downstream, flooding inundated large areas of land bounded by Lovelands lane and Pennypot Lane, and impacted properties along Castle Grove Road and Station Road between Chobham and Castle Green. Data provided by Surrey County Council shows incidences of property flooding in West End and Bisley. The Environment Agency Historic Flood Map and Recorded Flood Outlines are shown in the Council’s Interactive Mapping Portal (surreyheath.hub.xmap.cloud).