

Appendix B
Assessment of Flood Risk Posed to Potential Site Allocations in the River Severn/Rea Brook Study Area

Number	Site Location	Site Area	Development Type	Watercourse	Model?	Modelled outlines?	Site Overview	Site Description (including description of flood hazard)	Flood Risk Suitability Criteria	Recommendations
1	Mill Road, Abbey Foregate (SABC investigating allocation status)	0.76	Housing/Live-Work	Rea Brook	Yes	2, 3a, 3a+cc, 3b	Half of the site lies in Flood Zone 2 and 3a	The site is located approximately 100m from Rea Brook. Flood Zone 3b does not encroach the site. Flood Zone 3a covers half the site and the hazard is low to moderate, or 'danger for some'. In the 100 year plus climate change event, all of the southern half of the site is flooded and the hazard is moderate. For the 1000 year event, the same area of the site is affected but the hazard increases in the centre of the site to high. The breach scenario indicates that the site would be inundated to the same extent and hazard as the 100 year plus climate change event.	2	Sites available fully in Flood Zone 1 should be considered in preference to this site, due to the large area of the site affected by Flood Zone 3a and the increases in risk arising from climate change and a potential breach of the defences. Should the Sequential test indicate that this site is required for development, the Exception Test will need to be carried out if the proposed use is housing. It must be demonstrated that there are no other reasonably available site in areas of lower flood risk. The flood hazard information indicates that the hazard is sufficiently low for all flood events to be adequately mitigated against through raised floors and flood resistant and resilience measures. The Abbey Foregate access road is not inundated for any events and would provide safe access and egress to the south east. The site should be developed sequentially, with the most vulnerable aspects of the development (housing) directed towards the north of the site by Abbey Foregate Road, which lies fully in Flood Zone 1. A development easement should be applied along the southern boundary of the site, which would flood first in a flood event greater than 1 in 20 years. Guidance for development in Flood Zone 3a must be followed.
2	Ellesmere Road, Shrewsbury	0.39	Employment	River Severn (Bagley Brook Section)	Yes	2, 3a, 3a+cc, 3b	Site lies fully in Flood Zones 2 and 3a. The northern part of the site is marginally affected by Flood Zone 3b.	The Bagley Brook is located to the north of the site, and enters a culvert in the north eastern corner before appearing to be culverted beneath the site. A railway line is located to the east of the site. Flood Zone maps indicate that flood water backs-up behind the railway and the railway structure is acting as a barrier to floodplain flow. The flood hazard information indicates that for Flood Zone 3a, the hazard is moderate across the site, and this remains the same for the 100 year climate change event. For the 1000 year event the flood hazard again remains the same.	1	Sites available fully in Flood Zone 1 should be considered in preference to this site, due to the fact that the site lies fully in Flood Zone 3a. Should the Sequential Test indicate that this site is required for development, employment uses are permitted in this Flood Zone, but it must be demonstrated that there are no other reasonably available site in areas of lower flood risk. The flood hazard information indicates that the hazard is sufficiently low for all flood events to be adequately mitigated against through raised floors and flood resistant and resilience measures. However, the access road is flooded for the 100 year event, though the flood waters are of low hazard. For the 1000 year event the area of inundation along the road is larger, but the hazard is moderate. Safe access and egress would have to be ensured for the 100 year plus climate change event, which may require road raising works (without increasing flood risk). Guidance for development in Flood Zone 3a must be followed.
86	Travis Perkins, Wood Street, Shrewsbury	2.8	Housing	River Severn (Bagley Brook Section)	Yes	2, 3a, 3a+cc, 3b	Site lies almost fully in Flood Zone 3b*.	The Bagley Brook is located along the eastern boundary of the site*. NFCDD indicates a culvert is located along the eastern boundary of the site. The OS map shows some embankments along the eastern boundary of the site. Historic flood outlines indicate that a large part of the site was affected by fluvial flooding in November 2000.	1	The site lies fully in Flood Zone 3b*. Only water-compatible development is permitted in this Flood Zone, therefore the proposed use for housing is not suitable and alternative sites in lower risk Flood Zones must be considered instead.
118	Land at Ellesmere Road	3.71	Housing	River Severn	Yes	2, 3a, 3a+cc, 3b	Site is substantially affected by the 100 year plus climate change event, and by Flood Zone 2.	Bagley Brook is located approximately 470m to the east of the site. A water body is located along the south western boundary of the site. Site is located between two railway lines and flood water appears to back up behind them.	3	Sites available fully in Flood Zone 1 should be considered in preference to this site, due to the large area of the site affected by Flood Zone 2 and the increases in risk arising from climate change for the 100 year event. It is considered that climate change will contribute towards more frequent flooding of the site than is currently experienced, precluding its consideration for future housing development.
160	Land adj. Curia Close, Monkmoor, Shrewsbury	1.404	Housing	River Severn	Yes	2, 3a, 3a+cc, 3b	Site lies fully in Flood Zone 1.	The River Severn is located approximately 160m from the western boundary of the site. The Environment Agency flood map indicates that this site lies in Flood Zone 2 (derived from JFLOW), but modelling undertaken as part of this study has confirmed that Flood Zone 2 does not affect the site.	5	Any type of development in suitable for this site. Follow guidelines for development in Flood Zone 1.

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190	Land at Old Coleham, Shrewsbury	3.31	Housing	River Severn/Rea Brook	Yes	2, 3a, 3a+cc, 3b	The northern end of the site lies in Flood Zones 2, 3a and 3b.	Rea Brook flows from east to west along the northern boundary of the site. The site is bounded on the eastern boundary by a railway line. The flood hazard increases significantly for the 100 year plus climate change and 1000 year events, and as a result of a potential breach of the defences.	3	Sites available fully in Flood Zone 1 should be considered in preference to this site, due to the flood risk posed at the north of the site. However, should this site pass the Sequential Test, and as this site involved re-development of existing buildings, there is opportunity to provide flood risk reduction benefits both on-site and elsewhere by developing the site sequentially. Opportunities to revert the northern part of the site to natural floodplain should be explored, and built development guided to the area of the site falling in Flood Zone 1. The flood hazard information indicates that this area is an important flood storage/flow area and should ideally be reverted to open space.
197	Land at Pengrove, Shrewsbury	0.62	Housing	River Severn	Yes	2, 3a, 3a+cc, 3b	The northern part of the site falls in Flood Zones 2, 3a and 3b.	The northern side of the site fronts on to the River Severn which flows from west to east. The flood hazard progressively increases with higher return periods.	3	Sites available fully in Flood Zone 1 should be considered in preference to this site, due to the flood risk posed at the north of the site. Should the Sequential test indicate that this site is required for development, the flood risk areas to the north of the site should remain as open space, with all built development directed to the area of Flood Zone 1.
254	Land at Ellesmere Road	0.823	Housing	River Severn	Yes	2, 3a, 3a+cc, 3b	Site lies fully in Flood Zone 2 and is substantially affected by the 100 year plus climate change event.	Bagley Brook is located approximately 470m to the east of the site. Site is located between two railway lines and flood water appears to back-up behind the railway lines.	3	Sites available fully in Flood Zone 1 should be considered in preference to this site, due to the large area of the site affected by Flood Zone 2 and the increases in risk arising from climate change for the 100 year event. It is considered that climate change will contribute towards more frequent flooding of the site than is currently experienced, precluding its consideration for future housing development.
298	Land at Ellesmere Road	23.95	Housing	River Severn	Yes	2, 3a, 3a+cc, 3b	Site lies predominantly in Flood Zone 1, being only marginally affected by Flood Zones 2, 3a and 3b along the northern boundary.	A drain is located along the northern boundary of the site and is culverted beneath the railway which is located along the western boundary of the site. The flood hazard is low to moderate for all modelled flood events.	4	This site is suitable for development provided the flood risk areas to the north of the site remain as open space. The main issue that arises from this development is whether or not safe access and egress can be provided for the 100 year plus climate change event. The A528 (also called Ellesmere Road) is the only route serving the site. In the 100 year plus climate change event, the road is flooded to the north, where the average depth is approximately 2m, and to the south, where the average depth is less than 0.5m. Access/egress is likely to be possible to the south, but not possible to the north due to the depth. It may therefore be necessary to ensure that road raising works are carried out as part of this development. Follow guidance for development in Flood Zone 1.
519	Land at Westbury (& 238)	0.861	Housing	Not found on GIS layer		2, 3a, 3a+cc, 3b			Refer to Site 238	
SH22	Land off Castle Foregate, Shrewsbury	2.34	Housing	River Severn (Bagley Brook Section)	Yes	2, 3a, 3a+cc, 3b	Site lies almost fully in Flood Zone 3b*.	Bagley Brook is located to the west of the site but does not enter the site itself*. A culvert is located at the south eastern corner of the site and the Flood Zone maps indicate that water backs-up behind the culvert and a railway located along the eastern boundary of the site appears to act as a barrier to floodplain flow. A series of embankments surround the site. Historic flood outlines indicate that part of the site was affected by flooding in November 2000.	1	The site lies fully in Flood Zone 3b*. Only water-compatible development is permitted in this Flood Zone, therefore the proposed use for housing is not suitable and alternative sites in lower risk Flood Zones must be considered instead.
SH3	Land off Severn Bridge Junction, Shrewsbury	0.72	Housing	River Severn	Yes	2, 3a, 3a+cc, 3b	Site lies almost fully in Flood Zone 3b**.	Rea Brook lies some 250m to the south of the site while the River Severn lies approximately 250m to the west of the site. The site is in an area benefitting from the Coleham flood defences. As a result of climate change, the site lies predominantly in a high hazard area for the 100 year plus climate change event.	1	The site lies fully in Flood Zone 3b**. Only water-compatible development is permitted in this Flood Zone, therefore the proposed use for housing is not suitable and alternative sites in lower risk Flood Zones must be considered instead. Though the site does benefit from the Coleham defences, the flood risk increases substantially as a result of climate change (as the defences are shown to overtop and the flood hazard is significant - danger for all), precluding its consideration for future housing development.

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SH38	Land to rear of Holy Cross Alms Houses, Abbey Foregate, Shrewsbury	0.1	Housing	River Severn	Yes	2, 3a, 3a+cc, 3b	Approximately half the site lies in Flood Zone 3b, the remainder on Flood Zone 3a.	Rea Brook lies some 250m to the south of the site while the River Severn lies approximately 250m to the west of the site. The site is in an area benefitting from the Coleham flood defences. As a result of climate change, the site lies in a moderate flood hazard area for the 100 year plus climate change event.	2	Half the site is affected by Flood Zone 3b, with the remainder in Flood Zone 3a***. Housing is not permitted in Flood Zone 3b and must pass the Exception Test for development in 3a. Though the site does benefit from the Coleham defences, the flood risk increases as a result of climate change (as the defences are shown to overtop), precluding its consideration for future housing development.
SH52	Railtrack Land, Shrewsbury	0.57	Housing	River Severn	Yes	2, 3a, 3a+cc, 3b	Site lies fully in Flood Zone 1.	The River Severn lies some 200m to the north and 400m to the west of the site.	5	Any type of development in suitable for this site. Follow guidelines for development in Flood Zone 1.
SH55	Land at St Michaels Street and New Park Road, Shrewsbury	0.75	Housing	River Severn (Bagley Brook Section)	Yes	2, 3a, 3a+cc, 3b	Site lies fully in Flood Zone 1.	The Bagley Brook lies to the west of the site, opposite the railway line. The River Severn lies some 300m to the south of the site. An unnamed drain exits a culvert in the eastern corner of the site and flows parallel to the eastern boundary of the site for approximately 65m before entering a culvert immediately upstream of the southern boundary of the site. There are no Flood Zones for the unnamed drain although in reality some risk is posed.	5	Any type of development in suitable for this site. A development easement for development from the top of the bank of the drain should be negotiated with the EA (typically 8m), and the potential residual risk arising from a blockage of the culvert to the south of the site should be assessed as part of an FRA. Follow guidelines for development in Flood Zone 1.
SH57	Land off Hubert Way, Shrewsbury	0.19	Housing	River Severn	Yes	2, 3a, 3a+cc, 3b	The eastern half of the site falls in Flood Zone 3b. The remainder of the site falls in Flood Zone 3a and 2.	The site is located approximately 40m from the Bagley Brook. The flood hazard is typically moderate. Historic flood outlines indicate the majority of the site has been affected by fluvial flooding in the past.	1	Half the site is affected by Flood Zone 3b, with the remainder in Flood Zone 3a and 2. Housing is not permitted in Flood Zone 3b and must pass the Exception Test for development in 3a. Given the increases in flood risk arising as a result of climate change (the entire site become inundated at moderate hazard) it is recommended that this site is not considered for future housing development.
SH76A	Ditherington Flax Mill, Shrewsbury	2.41	Housing	River Severn (Bagley Brook Section)	Yes	2, 3a, 3a+cc, 3b	Site lies fully in Flood Zone 1.	The Bagley Brook lies to the west of the site, opposite the railway line. The River Severn lies some 500m to the west of the site.	5	Any type of development in suitable for this site. Follow guidelines for development in Flood Zone 1.

*Flood Zone 3b for Bagley Brook, gathered from the Environment Agency for the Shropshire Level 1 SFRA, indicates that **sites SH22 and 086** lie almost fully in Flood Zone 3b. However, modelling undertaken as part of this commission indicates that these sites are not in Flood Zone 3b. It is assumed that there has been a manual adjustment to the Environment Agency's Flood Zone 3b in this area. The sites have therefore been assessed as if lying fully in Flood Zone 3b.

Flood Zone 3b in this area, gathered from the Environment Agency for the Shropshire Level 1 SFRA, indicates that **site SH3 lies fully in Flood Zone 3b. Modelling undertaken as part of this commission indicates that this site is not in Flood Zone 3b, because the Coleham defences have been included in the model. The site is therefore in an area benefitting from flood defences, and has been assessed accordingly.

Flood Zone 3a and 3b in this area, gathered from the Environment Agency for the Shropshire Level 1 SFRA, indicates that **site SH38 lies in Flood Zones 3a and 3b. Modelling undertaken as part of this commission indicates that this site is not in Flood Zones 3a or 3b, because the Coleham defences have been included in the model. The site is therefore in an area benefitting from flood defences, and has been assessed accordingly.