Sandwell Metropolitan Borough Council Level 2 Strategic Flood Risk Assessment
Detailed Site Summary Tables

Site details	
Site Code	EMP2-3
Address	Direct 2, Roway Lane, Oldbury
Area	8.15ha
Current land use	Brownfield
Proposed land use	Employment
Flood Risk Vulnerability	Less vulnerable
Sources of flood risk	
Location of the site within the catchment	The site is located to the south of Roway Lane, which borders the northern site boundary. The site is in a predominantly urban area, with housing to the west and south of the site and a construction site to the east. The site is located in the River Tame catchment, the watercourse runs approximately 13m north of the site, which drains most of the borough and eventually flows into the River Trent and River Severn respectively. Additionally, the Birmingham Canal is approximately 450m north and 380m west of the site.
Topography	Environment Agency 1m resolution LiDAR across the site shows that ground levels are relatively flat. The highest point of elevation within the site is 138m AOD on the southern boundary, and the lowest elevation is 131m AOD where there is a sloping section in the northwest region of the site.
Existing drainage features	The River Tame flows 13m north of the site and the Birmingham Canal flows 450m north and 380m west of the site. As a brownfield site it is likely to drain into the surface water sewer network, which will likely drain to the River Tame.
Critical Drainage Area	The site is not located within a Critical Drainage Area (CDA).
Fluvial and tidal	**The proportion of site at risk FMFP:** **FZ3 – 0%** **FZ2 – 17.4%** **FZ1 – 82.6%** *The Flood Zone values quoted show the percentage of the site at flood risk from that particular Flood Zone/event, including the percentage of the site at flood risk at a higher risk zone. This is because the values quoted are the area covered by each Flood Zone/extent within the site boundary. For example: Flood Zone 2 includes Flood Zone 3. Flood Zone 1 is the remaining area outside Flood Zone 2 (FZ2+ FZ1 = 100%).* **Available data:**

	Proportion of the sites at flood risk are determined from the Environment Agency's Flood Map for Planning Flood Zones and River Tame Fluvial Modelled Outputs. This represents the undefended scenario. **Flood characteristics:** The FMfP shows that Flood Zone 2 encroaches the western section of the site, with further encroachment in a small section on the northern boundary of the site. Flood Zone 3 extents do not affect the site. The Fluvial data from the River Tame Model is a 1D-only model. Depth, Velocity and Hazard data are not available. Actual flood risk to the site will be required when the site is developed in the future. This will include hydraulic modelling of the site (including 2D outputs with depth, velocity and hazard outputs). The Fluvial Present Day flooding shows similar results to Flood Zone 2. However, the extents of Flood Zone 3, are greater than the modelling data.
Surface Water	**Proportion of site at risk (RoFfSW):** **3.3% AEP** – 0.39% Max depth – 0.3 – 0.6m Max velocity – 0.0 – 0.25m/s **1% AEP** – 6.53% Max depth – 0.3 – 0.6m Max velocity – 0.0 – 0.25m/s **0.1% AEP** – 35.00% Max depth – 0.9 – 1.2m Max velocity – 1 - 2m/s *The % SW extents quoted show the % of the site at surface water risk from that particular event, including the percentage of the site at flood risk at a higher risk zone (e.g. 1% AEP event includes the 3.3% AEP event).* **Available data:** The Environment Agency's Risk of Flooding from Surface Water mapping was used in this assessment. **Description of surface water flow paths:** In the 3.3% AEP the site is unaffected by surface water flooding. In the 1% AEP event ponding is present to the northwest and west of the site, however velocities and depths do not change. The extent of flooding increases significantly in the 0.1% AEP event. A flow path is present along Roway Lane, and flooding is widespread across the site. This event has maximum depths of 0.9 to 1.2m across much of the flooded area, and a velocity of 1 – 2m/s. This has an overall hazard rating of "Danger to Most". The site is shown to be at significant risk of surface water flooding and careful consideration will need to be given to how surface water can be safely managed on site, as a part of a site-specific flood risk assessment and drainage strategy.
Reservoir	The site is shown to not be at risk of reservoir flooding in the Dry Day or Wet Day scenarios according to the Environment Agency's reservoir flood mapping.
Groundwater	The JBA Groundwater Flood Emergence Mapping (5m resolution) shows the site is at no risk from ground water emergence. The site is deemed to have negligible risk from groundwater flooding due to the nature of the geological deposits. This should be confirmed through additional site investigation work.

Sewers	The site is located within a postcode area with 13 incidences of sewer flooding, according to the Severn Trent Water Hydraulic Sewer Flood Risk Register.
Flood history	The site is not located in or near historic flood outlines in accordance with the Environment Agency's Historic Flood Map and Recorded Flood Outline Map datasets.
Flood risk management infrastructure	
Defences	The Environment Agency AIMS dataset shows that there are no formal flood defences at the site, however it is defended by engineered ground to the north of the site.
Residual risk	Birmingham Canal flows approximately 500m to the north and south of the site. Despite the distance between the site and the canal, LiDAR DTM data shows that both areas of the canal are at a greater elevation than the site itself, with a difference in elevation of as much as 40m AOD. Therefore, this site is considered to be at residual risk of canal overtopping or breach.
Emergency planning	
Flood warning	The north-western area of the site is within the Upper Tame (033WAF303) Flood Alert Area, but the area is not within a Flood Warning Area.
Access and egress	Access and egress to the site is currently via Roway Lane to the east of the site. Access to the wider area is from Dudley Road (A457) to the west and south and West Bromwich Street to the east of the site. For Flood Zones 2 and 3, access to the site from Roway Lane is impeded, but access from West Bromwich Street to the east is still available. For surface water events, in the 3.3% AEP, 1% AEP and 0.1% AEP event access and egress is impeded from Roway Lane and West Bromwich Street. Maximum depths are between 0.90 to 1.20m, with a maximum velocity of 1 to 2m/s. They have a hazard rating of "Danger to Most". In the design surface water event (the 1% AEP +40%), extents are similar to the 0.1% AEP event and will likely cause similar access and egress issues. The maximum depth is 2.6m with a maximum velocity of 4.1 m/s. Extents have a maximum hazard rating of 'Danger for All' across most of the flooded area. Arrangements for safe access and egress will need to be demonstrated for the 1% AEP plus an allowance for climate change rainfall events, using the depth, velocity, and hazard outputs. Given the widespread extents of surface water flooding on site, it will be important to consider access/egress to all parts of the site. Any raising of access routes should not impede surface water flows or contribute to increasing flood risk off-site. If detailed modelling (including consideration of breach scenarios) suggests that the site is at significant risk of flooding which affects access routes, a Flood Warning and Evacuation Plan will be required.
Dry Islands	The site does not become a Dry Island.
Climate change	
Implications for the site	**Management Catchment: Tame, Anker and Mease** Increased storm intensities due to climate change may increase the extent, depth, velocity, hazard, and frequency of both fluvial and surface water flooding **Fluvial Flooding:** Fluvial data from the River Tame Model is a 1D-only model. Depth, Hazard and Velocity are not available. Climate change outputs for FZ3a are available,

	however a proxy was used for FZ3b plus Climate Change. This is represented using a 1.33% AEP event present day model. This is because the 3.3% AEP event plus climate change data is not available. A proxy was thought to be appropriate in this case due to the small proportion of the site at risk of fluvial flooding. This return period was selected by using the available event data. Fluvial peak flow estimates were available for a 50%, 2%, 1.33% and 1% AEP events. 30% (the climate change uplift) was added to the 3.33% and 2% AEP fluvial peak flow estimates. This was then compared to the other available fluvial peak flow estimates for other available return periods. The 1.33% AEP event peak flow estimate was slightly higher than 2% AEP plus climate change. This approach therefore represents a conservative approach to mapping fluvial flood extents plus climate change uplift. Flood extents are shown to increase from the 1.33% AEP (representing Flood Zone 3b plus Climate Change) to Flood Zone 3a + 30% CC. Flooding occurs along the northern boundary and within the western section of the site. Therefore, fluvial flood risk to the site is expected to increase slightly with future climate change. Because a proxy for Flood Zone 3b plus Climate change has been used for this study, actual flood risk to the site will be required when the site is developed in the future. This will include hydraulic modelling of the site (including 2D outputs with depth, velocity and hazard outputs) for Flood Zone 3b plus climate change (3.33% AEP plus 30%). **Surface Water:** The design event for rainfall intensities is the upper climate allowance for the 2070s epoch. As such the design event is the 1% AEP + 40% CC. The extent of the design event is similar to that of the present day 0.1% AEP event, with maximum depths of 0.9 to 1.2m. The extent of surface water flooding increases dramatically between the 1% AEP and 1% AEP+ 40% CC events, indicating the site is very sensitive to increased runoff in future as a result of climate change. Development proposals at the site must address the potential changes associated with climate change and be designed to be safe for the intended lifetime. The provisions for safe access and egress must also address the potential increase in severity and frequency of flooding.
Requirements for drainage control and impact mitigation	

Broad-scale assessment of possible SuDS	**Geology & Soils**
	• The geology consists of:
	  ○ Bedrock formed of mudstone, sandstone
	  ○ Superficial deposits consisting of alluvium – clay, silt, sand and gravel.
	• The soil is comprised of slightly acid loamy and clayey soils with impeded drainage.
	
	SuDS
	• The site is not considered to be susceptible to groundwater flooding, due to the nature of the local geological conditions. This should be confirmed through additional site investigation work.
	• BGS data suggests that the underlying geology is likely to have variable permeability and should be confirmed through infiltration testing. Off-site discharge in accordance with the SuDS hierarchy may be required to discharge surface water runoff.
	• The site is not in a Groundwater Source Protection Zone.
	• The site is within the River Trent (source to confluence with Derwent) Nitrate Vulnerability Zone (NVZ),and is within a Secondary A

	Superficial Aquifer designation zone. As such, infiltration techniques may not be appropriate at the site in order to preserve water quality. • The site is not within a Historic Landfill site. • Surface water discharge rates should not exceed pre-development discharge rates for the site and should be designed to be as close to greenfield runoff rates as reasonably practical in consultation with the LLFA. It may be possible to reduce site runoff by maximising the permeable surfaces on site using a combination of permeable surfacing and soft landscaping techniques. • If it is proposed to discharge runoff to a watercourse or sewer system, the condition and capacity of the receiving watercourse or asset should be confirmed through surveys and the discharge rate agreed with the asset owner.
Opportunities for wider sustainability benefits and integrated flood risk management	• Implementation of SuDS at the site could provide opportunities to deliver multiple benefits including volume control, water quality, amenity and biodiversity. This could provide wider sustainability benefits to the site and surrounding area. Proposals to use SuDS techniques should be discussed with relevant stakeholders (LPA, LLFA and EA) at an early stage to understand possible constraints. • Development at this site should not increase flood risk either on or off site. The design of the surface water management proposals should take into account the impacts of future climate change over the projected lifetime of the development • Opportunities to incorporate filtration techniques such as filter strips, filter drains and bioretention areas must be considered. Consideration should be made to the existing condition of receiving waterbodies and their Water Framework Directive objectives for water quality. The use of multistage SuDS treatment will clean and improve water quality of surface water runoff discharged from the site and reduce the impact on receiving water bodies. • Opportunities to incorporate source control techniques such as green roofs, permeable surfaces and rainwater harvesting must be considered in the design of the site. • The Risk of Flooding from Surface Water (RoFSW) mapping indicates the presence of surface water flow paths during the 0.1% AEP event. Existing flow paths should be retained and integrated with blue-green infrastructure and public open space.
NPPF and planning implications	
Exception Test requirements	The Local Authority will need to confirm that the Sequential Test has been carried out in line with national guidelines. The Sequential Test will need to be passed before the Exception Test is applied. As the site is within Flood Zone 3 and Flood Zone 2, classified as 'Less vulnerable', the Exception Test is not required for this site. However, given the significant surface water risk to the site, the LPA should carefully weigh the benefits of developing the site against the risk, and satisfy themselves that site users can be kept safe throughout it's lifetime.
Requirements and guidance for site-specific Flood Risk Assessment	**Flood Risk Assessment:** Section 2 of the Level 2 SFRA and Sections 2 and 3 of the Level 1 SFRA have more guidance on this section and any relevant policies and information applicable to development within Sandwell. • Consultation with the Sandwell Metropolitan Borough Council, South Staffordshire Water, Severn Trent Water, Canals and River Trust and the Environment Agency should be undertaken at an early stage. • Because the fluvial data for the River Tame is a 1D-only model and a proxy was used for Flood Zone 3b plus Climate Change, more detailed hydraulic modelling of the site is required. This will need to include the latest climate change allowances and 2D outputs with depth, velocity and hazard.

- Developers should consult with Severn Trent Water to ensure that the development aims to help achieve the targets of the Drainage and Wastewater Management Plan.
- Development plans should use their Level 1 and 2 SFRA for Sandwell, as well as the Local Flood Risk Management Strategies to identify cumulative flood risk issues. It should also promote an integrated approach to water management. Drainage should be designed and implemented in ways that promote multiple benefits.
- Any FRA should be carried out in line with the National Planning Policy Framework; Flood Risk and Coastal Change Planning Practice Guidance; Sandwell MBC Local Plan Policies and Sustainable Drainage Design and Evaluation Guide for developers.
- Natural flood management methods should be employed in development proposals due to their multiple benefits including increasing flood storage and creating recreational areas and habitat (where applicable).
- Developers should consult with Severn Trent Water to ensure that the development aims to help achieve the targets of the Drainage and Wastewater Management Plan.

Guidance for site design and making development safe:

- The developer will need to show, through an FRA, that future users of the development will not be placed in danger from flood hazards throughout its lifetime. It is for the applicant to show that the development meets the objectives of the NPPF's policy on flood risk. For example, how the operation of any mitigation measures can be safeguarded and maintained effectively through the lifetime of the development. (Para 048 Flood Risk and Coastal Change PPG).
- Should built development be proposed within the 0.5% AEP tidal breach extent or 1% AEP surface water flood extent, careful consideration will need to be given to flood resistance and resilience measures.
- The risk from surface water flow routes should be quantified as part of a site-specific FRA, including a drainage strategy, so runoff magnitudes from the development are not increased by development across any ephemeral surface water flow routes. A drainage strategy should help inform site layout and design to ensure runoff rates are as close as possible to greenfield rates.
- Arrangements for safe access and egress will need to be demonstrated for the 1% AEP pluvial events with an appropriate allowance for climate change, using the depth, velocity, and hazard outputs.
- Consultation with RMAs early on should be implemented to ensure an appropriate flood evacuation plan is put in place for the site.
- Flood resilience and resistance measures should be implemented where appropriate during the construction phase, e.g. raising of floor levels. These measures should be assessed to make sure that flooding is not increased elsewhere. If the floor levels cannot be raised to meet the minimum requirements, developers will need to:
    - raise them as much as possible.
    - consider moving vulnerable uses to upper floors.
    - include extra flood resistance and resilience measures.
- Other examples of flood resistance and resilience measures include:
    - using flood resistant materials that have low permeability to at least 600mm above the estimated flood level.
    - making sure any doors, windows or other openings are flood resistant to at least 600mm above the estimated flood level.
    - by raising all sensitive electrical equipment, wiring and sockets to at least 600mm above the estimated flood level.
- The scale of development in this catchment is likely to require upgrades of the water supply network infrastructure. It is recommended that the Developer and the Local Planning Authority liaise Severn Trent Water at the earliest opportunity to agree a housing phasing plan.

Key messages

The site is not at risk of fluvial present-day flooding. The site is shown to be at risk of pluvial flooding in the 1% AEP plus 40% climate change and 0.1% AEP event. More detailed hydraulic modelling of the site is required as the fluvial data for the River Tame is a 1D-only model and a proxy was used for Flood Zone 3b plus Climate Change.

There is also access and egress issues with the 0.1% AEP surface water event and the design surface water event (1% AEP plus 40% climate change allowance). The site is considered to be at residual risk of canal overtopping or breach. The development may be able to proceed if:

- To locate new development in areas of lowest risk, in line with the Sequential Test, by steering sites to river Flood Zone 1 and avoiding where possible areas with a high risk of surface water flooding. If a Sequential Test is undertaken and a site at flood risk is identified as the only appropriate site for the development, the Exception Test shall be undertaken. If development can't be avoided in a high-risk surface water Zone, then part "b" of the Exception Test should be satisfied.
- A carefully considered and integrated flood resilient and sustainable drainage design is put forward, with development to be steered away from the areas identified to be at risk of surface water flooding within the site.
- A site-specific Flood Risk Assessment that demonstrates that site users will be safe in the design surface water events, including an allowance for climate change. This will need to show that the site is not at an increased risk of flooding in the future and that development of the site does not increase the risk of surface water flooding on the site and to neighbouring properties.
- A site-specific Surface Water Drainage Strategy, and SuDs maintenance and management plan is submitted along with the FRA.
- Raise residential and commercial finished floor levels 300mm above the 1 in 100-year plus climate change flood level. Protect and promote areas for future flood alleviation schemes.
- If flood mitigation measures are implemented then they are tested to ensure that they will not displace water elsewhere (for example, if land is raised to permit development on one area, compensatory flood storage will be required in another).

Mapping Information

The key datasets used to make planning recommendations for this site were the Environment Agency's Flood Map for Planning and the Environment Agency's Risk of Flooding from Surface Water map. More details regarding data used for this assessment can be found below.

Flood Zones	Flood Zones 2 and 3 have been taken from the Environment Agency's Flood Map for Planning mapping.
Climate change	The latest climate change allowances (updated May 2022) have been applied to the EA's RoFSW and River Tame Fluvial dataset.
Fluvial extents mapping	This has been assessed using the present day results from the Environment Agency's River Tame model. The River Tame fluvial model is a 1D model only. Depth, Velocity and Hazard data are not available. Actual flood risk to the site will be required when the site is developed in the future. This will include hydraulic modelling of the site (including 2D outputs with depth, velocity and hazard outputs).
Surface Water	The Environment Agency's Risk of Flooding from Surface Water (RoFSW) map has been used to define areas at risk from surface water flooding.
Surface water depth, velocity and hazard mapping	The Environment Agency's Risk of Flooding from Surface Water (RoFSW) has been used to define areas at risk from surface water flooding.