

Halton Borough Council Local Plan Site Screening

**Level 2 Strategic Flood Risk
Assessment – Site Screening**

Draft Report

July 2019

www.jbaconsulting.com



Municipal Building

Kingsway

Widnes

WA8 7QF

JBA Project Manager

Mike Williamson
Mersey Bank House
Barbould Street
WARRINGTON
Cheshire
UNITED KINGDOM
WA1 1WA

Revision history

Revision Ref/Date	Amendments	Issued to
P01 / July 2019	N/A	Alasdair Cross

Contract

This report describes work commissioned by Anne Moyers, on behalf of Halton Borough Council, by an email dated 3 May 2019. Hannah Bishop, Joseph Landells-Molloy and Mike Williamson of JBA Consulting carried out this work.

Prepared by Hannah Bishop BSc (Hons)

Technical Assistant

Joseph Landells-Molloy MEng (Hons) GMICE

Assistant Engineer

Reviewed by Mike Williamson BSc MSc CGeog FRGS EADA

Principal Flood Risk Analyst

Approved by..... Howard Keeble MPhil BEng BSc CEng CEnv CSci CWEM
MICE MCIWEM MCMi IMaPS

Technical Director

1 R78 (DALP Sub)

Proposed Site	R78 (DALP Sub)
Site area (ha)	1.18
Existing use	Quasi agricultural
Existing flood risk vulnerability classification	Less vulnerable
Proposed use	Residential
Proposed development flood risk vulnerability classification	More vulnerable
Proposed development impermeable area (ha)	1.00

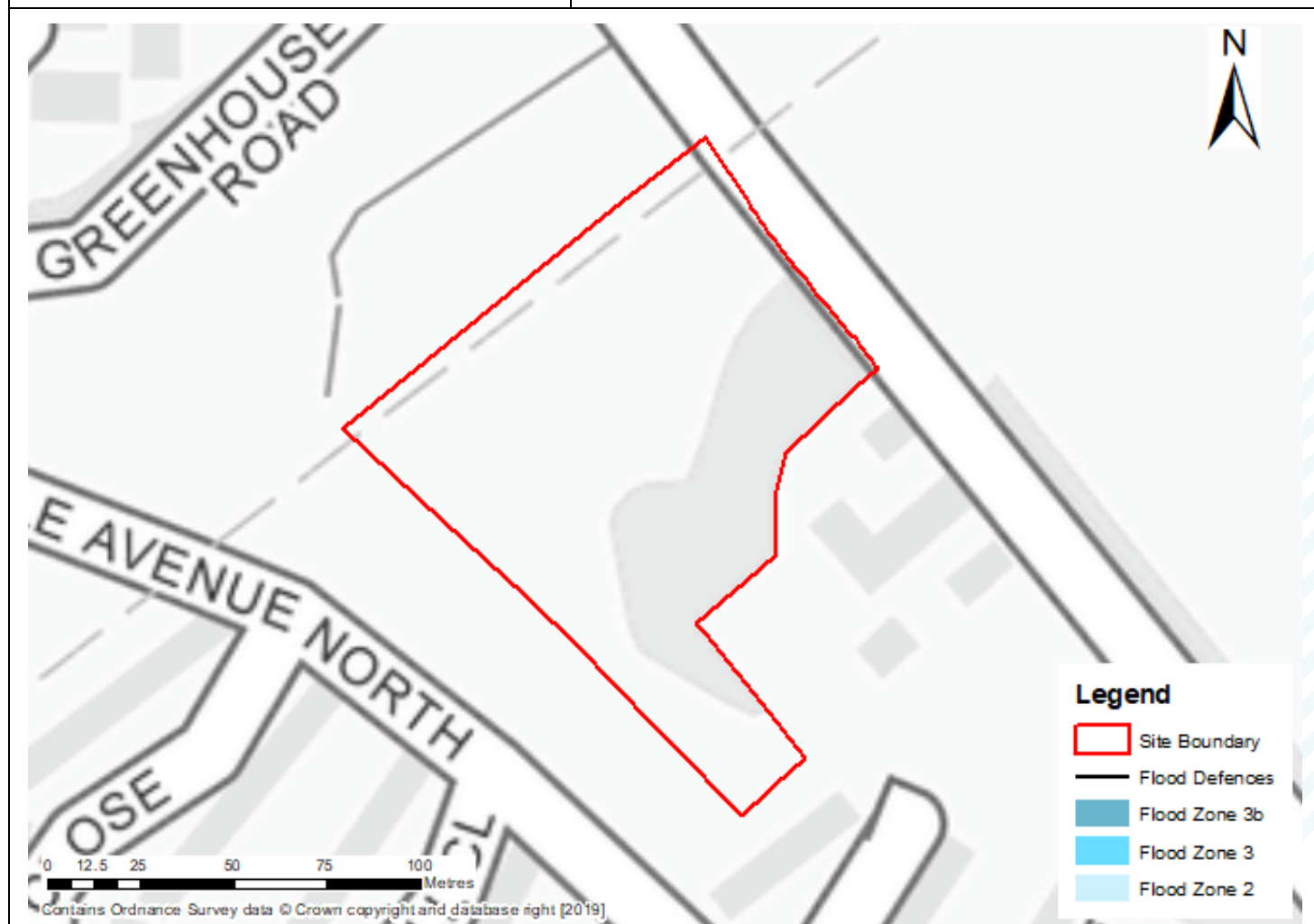


Figure 1-1: Site boundary (entirely within Flood Zone 1)

Proposed Site

R78 (DALP Sub)

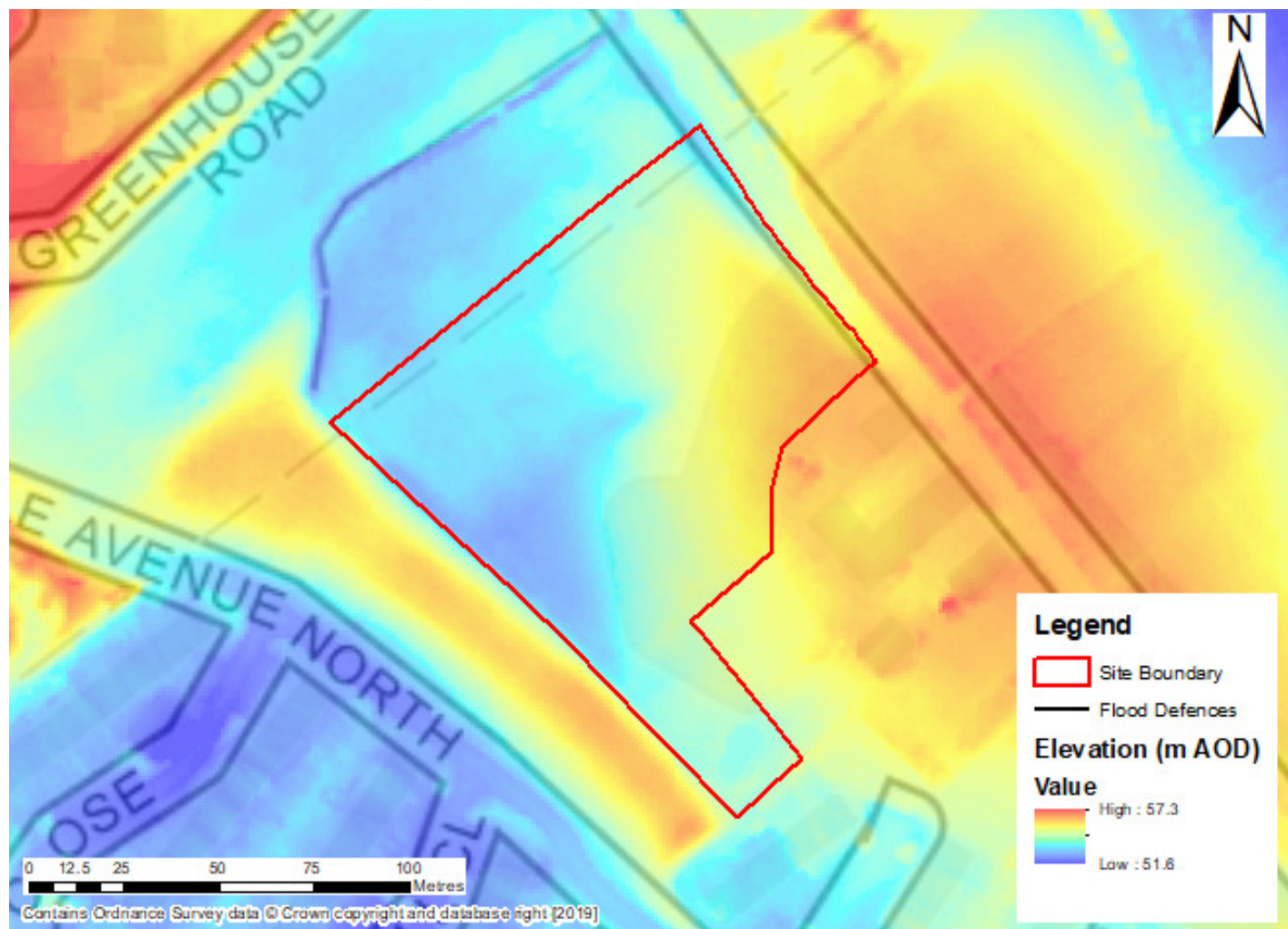


Figure 1-2: Site with 1m LIDAR (elevation data)

- The site has an average elevation of 53m AOD across its entirety with the site's surroundings remaining at a consistent elevation with the site itself.

© Crown Copyright, All rights reserved. 2019 License number 100018552.

Contains OS data © Crown copyright and database right (2019).

Contains public sector information licensed under the Open Government Licence v3.0.

Contains Environment Agency information © Environment Agency and/or database right.

Observations

- Given the site is wholly within Flood Zone 1, allocation should be possible.
- A significant area of surface water ponding occurs at the southern and western part of the site (see Figure 1-3).
- The proposed use of development would see a change in risk classification from less vulnerable to more vulnerable according to the NPPF.
- Approximately 10% of the total site area is at risk of surface water flooding in the 1% AEP event to a maximum depth of 0.30-0.60m. The extent of flooding in the 1% AEP event is limited to the localised depression at the western bound of the site.
- The proposed development site is bounded by a drainage ditch to the north-west of the site, although this is outside of the site boundary, the area that it drains may be greater than the

Proposed Site		R78 (DALP Sub)	
proposed development site and therefore, flow from the wider catchment may pass through the site - this should be quantified and managed as part of an FRA. Safe access and egress are achievable via Stockham Lane based on the 1% AEP outline.			
Flood Source: Fluvial/Tidal			
	Flood Zone 2	Flood Zone 3a	Flood Zone 3b
Flood Zones (%)	0.00	0.00	0.00
Tidal: Depth (m)	N/A	N/A	N/A
Tidal: Hazard	N/A	N/A	N/A
Modelled Flood Risk and Climate Change	This site lies outside any modelled flood risk outlines from fluvial and/or tidal sources.		
Historic Flooding	The site lies outside of the Environment Agency’s historical flood map.		
Defences	There are no EA flood defences located near to the site.		
Flood Warning Area (FWA)	The site is located outside of any EA FWAs.		
Mitigation options & site suitability	The entirety of the site lies within Flood Zone 1, outside fluvial or tidal modelled risk outlines and could therefore be allocated under the NPPF, assuming the surface water risk can be controlled and mitigated following an FRA.		
Flood source: Groundwater			
Flood risk: groundwater	Data unavailable. Possible risk from groundwater must be assessed as part of an FRA.		
Flood Source: Infrastructure Failure – Reservoirs			
Flood risk: reservoirs	There is no residual risk of reservoir inundation according to the EA’s Reservoir Flood Map (RFM).		
Flood Source: Infrastructure Failure – Canals			
Flood risk: canal	Data unavailable. Residual risk from canals (if applicable) must be assessed as part of an FRA.		

Proposed Site

R78 (DALP Sub)

Flood Source: Surface Water

Surface Water Flood Risk to Proposed Development Site

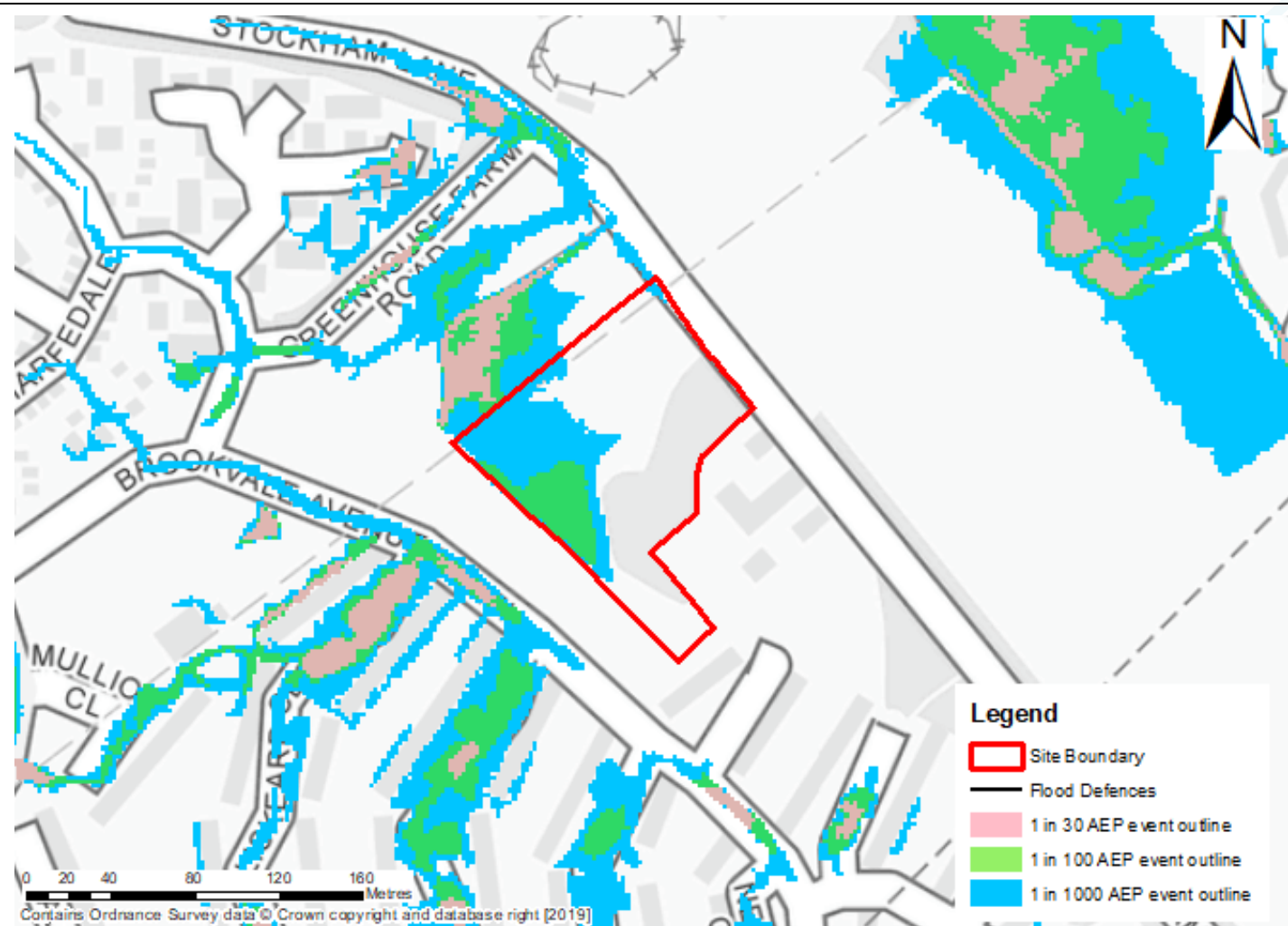


Figure 1-3: Surface water risk to the site

Existing development risk of flooding from surface water (%)	High Risk (3.33% AEP outline)	Medium Risk (1% AEP outline)	Low Risk (0.1% AEP outline)
	0.00	10.02	31.25
Surface water flooding depths	Max: N/A	Max: 0.30-0.60m	Max: 0.60-0.90m
Surface water hazards	N/A	Max: Moderate Mean: Moderate	Max: Significant Mean: Moderate
Climate change	The current day 0.1% AEP outline provides an indication of the likely increase in extent of the more frequent events.		

Proposed Site		R78 (DALP Sub)
Surface water: flood risk to development site		- Approximately 10% of the total site area is at risk of surface water flooding in the 1% AEP event to a maximum depth of 0.30-0.60m. - The extent of flooding in the 1% AEP event is limited to a localised depression at the western bound of the site. - It is noted that the proposed development site is bounded by a drainage ditch to the north-west of the site, although this is outside of the site boundary, the area that it drains may be greater than the proposed development site and therefore, flow from the wider catchment may pass through the site - this should be quantified and managed as part of an FRA. - The main access route via Stockham Lane on the north east facing boundary is at very low risk of surface water flooding.
Surface water: mitigation options & site suitability		An FRA is required to address the surface water risk and to investigate appropriate site layout and design, including SuDS options as part of a drainage strategy. Development should avoid the ponded area in the north of the site. This area should remain as open space with infiltration SuDS if possible. Safe access and egress are achievable via Stockham Lane based on the 1% AEP outline. Surface water runoff should be fully attenuated to the greenfield runoff rate, and as such, ensure that there is no increase in surface water flood risk elsewhere. The required volumes of attenuation have been calculated below. The site is greenfield and therefore, infiltration SuDS may be feasible (subject to ground investigation) where existing low-lying areas that are currently showing localised ponding may be utilised for attenuation. The minimum discharge rate for the site has been set at 5l/s/ha to provide a practical limit below which it is not reasonable to limit flows based on Rainfall runoff management for developments. Risk from the offsite drainage ditch should be assessed as part of the FRA.

Proposed Site		R78 (DALP Sub)				
Indicative Surface Water Flood Risk from Proposed Development (for Proposed Site in its Entirety)						
Proposed Development limiting runoff rate: Greenfield – FEH Statistical		Qbar: 5 l/s Q30: 5 l/s Q100: 5 l/s				
Design flood event (inc CC)	Critical storm duration (Hrs)	Inflow volume (m³)	Outflow volume (m³)	Attenuation required (m³)	Time to empty assuming no infiltration (Hrs)	Total storage required: Area (ha) and % of site area
3.33% AEP Rainfall + 20%	11.75	654	148	505	40	0.034 ha 2.853 %
3.33% AEP Rainfall + 40%	12	766	151	615	48.7	0.041 ha 3.475 %
1% AEP Rainfall + 20%	14	911	176	735 (230 exceedance storage)	58.1	0.049 ha 4.153 %
1% AEP Rainfall + 40%	16	1090	202	889 (274 exceedance storage)	70.3	0.059 ha 5.023%
Climate change	Application of the central (20%) and upper band (40%) potential change anticipated for climate change in the table above shows the estimated attenuation volumes for the 1% AEP and 3.33% AEP rainfall events.					
Surface water: flood risk impacts from development site & mitigation	- As part of this Level 2 Screening we have included calculations to provide an estimated land take if a pond with an assumed depth of 1.5m was included as part of the development. - Attenuation volumes are presented for the critical storm duration for the 1 in 30-year events with exceedance flows quantified up to the 1 in 100-year event. To prevent development worsening flood risk elsewhere, surface water runoff must be managed on site.					

Offices at:

Coleshill
Doncaster
Dublin
Edinburgh
Exeter
Glasgow
Haywards Heath
Isle of Man
Limerick
Newcastle upon Tyne
Newport
Peterborough
Saltaire
Skipton
Tadcaster
Thirsk
Wallingford
Warrington

Registered Office:

1 Broughton Park
Old Lane North
Broughton
Skipton
North Yorkshire
BD23 3FD
United Kingdom

+44(0)1756 799919
info@JBA - consulting.com
www.JBA - consulting.com
Follow us:  

Jeremy Benn Associates
Limited

Registered in England
3246693

JBA - Group Ltd is certified
to:
ISO 9001:2015
ISO 14001:2015
OHSAS 18001:2007