




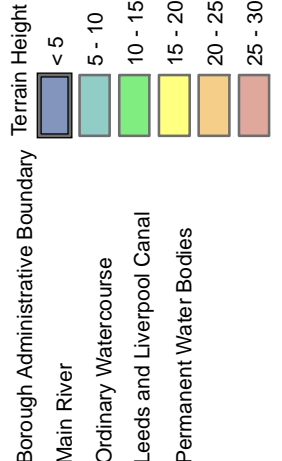








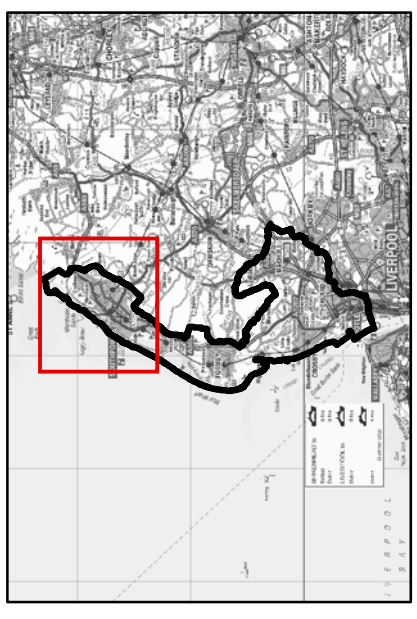
APPENDIX K: PFRA/SFRA INFORMATION

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Legend

-  Borough Administrative Boundary
-  Main River
-  Ordinary Watercourse
-  Leeds and Liverpool Canal
-  Permanent Water Bodies
-  Terrain Height (mAOD)
 -  < 5
 -  5 - 10
 -  10 - 15
 -  15 - 20
 -  20 - 25
 -  25 - 30



Notes

THERE ARE GAPS IN THE LIDAR COVERAGE WITHIN SEFTON THAT HAVE BEEN FILLED WHERE NECESSARY WITH ALTERNATIVE SOURCES OF DIGITAL TOPOGRAPHIC DATA.

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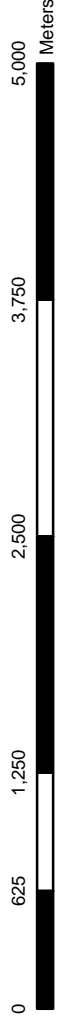
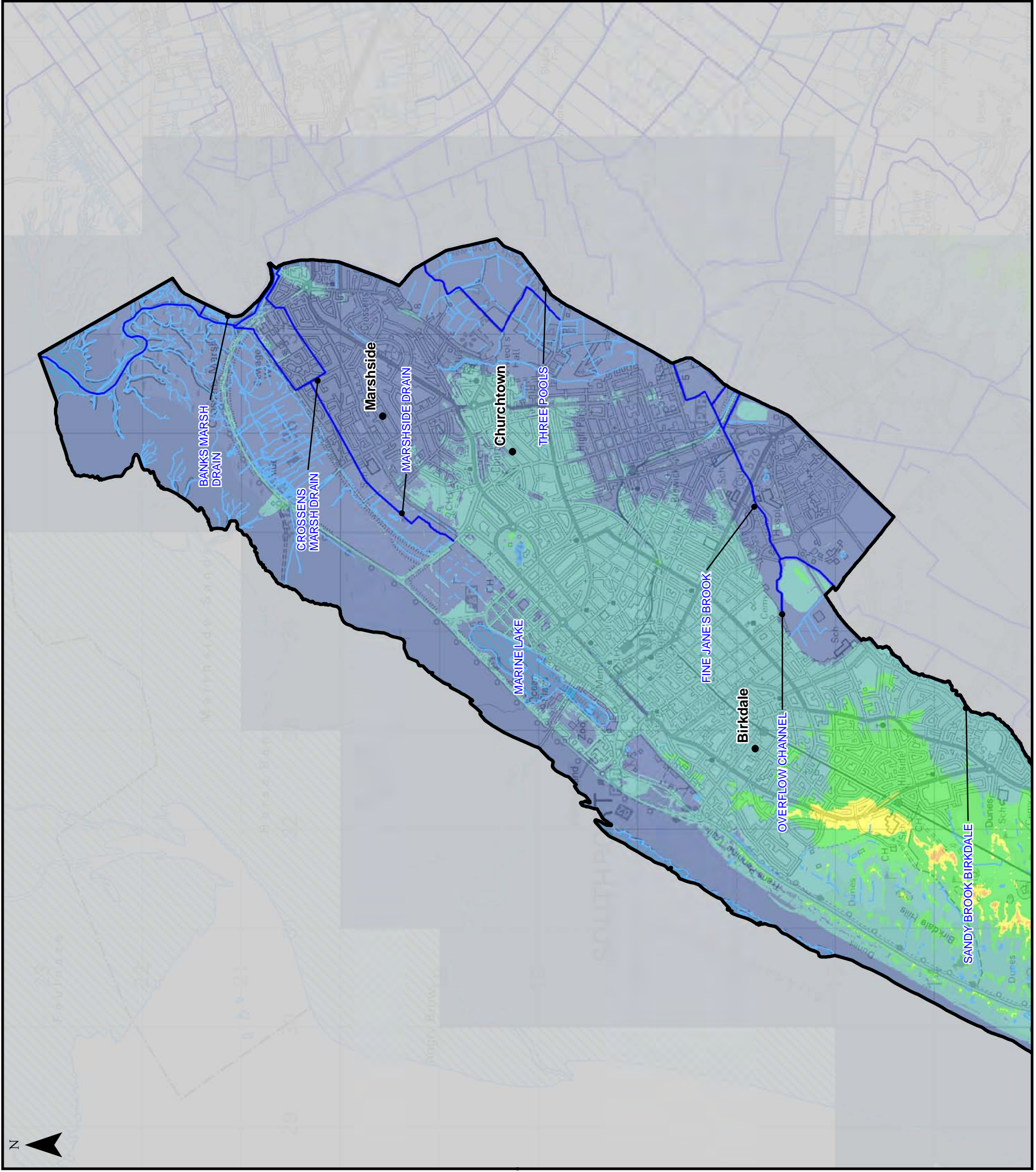
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Figure 2-1
Topographical Data

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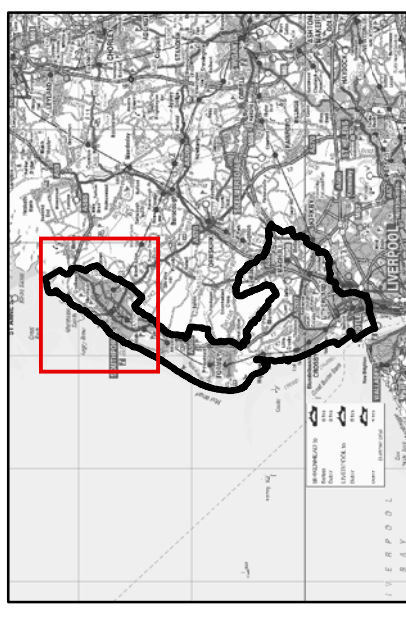
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Legend

-  Borough Administrative Boundary
-  Main River
-  Ordinary Watercourse
-  Leeds and Liverpool Canal
-  Defences
-  Permanent Water Bodies
-  Flood Zone 3 Fluvial
-  Flood Zone 2 Fluvial



Notes

FLUVIAL FLOOD ZONE 3 IS EQUIVALENT TO THE UNDEFENDED 1 IN 100 ANNUAL PROBABILITY FLOOD EVENT AND FLUVIAL FLOOD ZONE 2 IS EQUIVALENT TO THE UNDEFENDED 1 IN 1000 ANNUAL PROBABILITY FLOOD EVENT.

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Figure 3-1
EA Fluvial Flood Zones

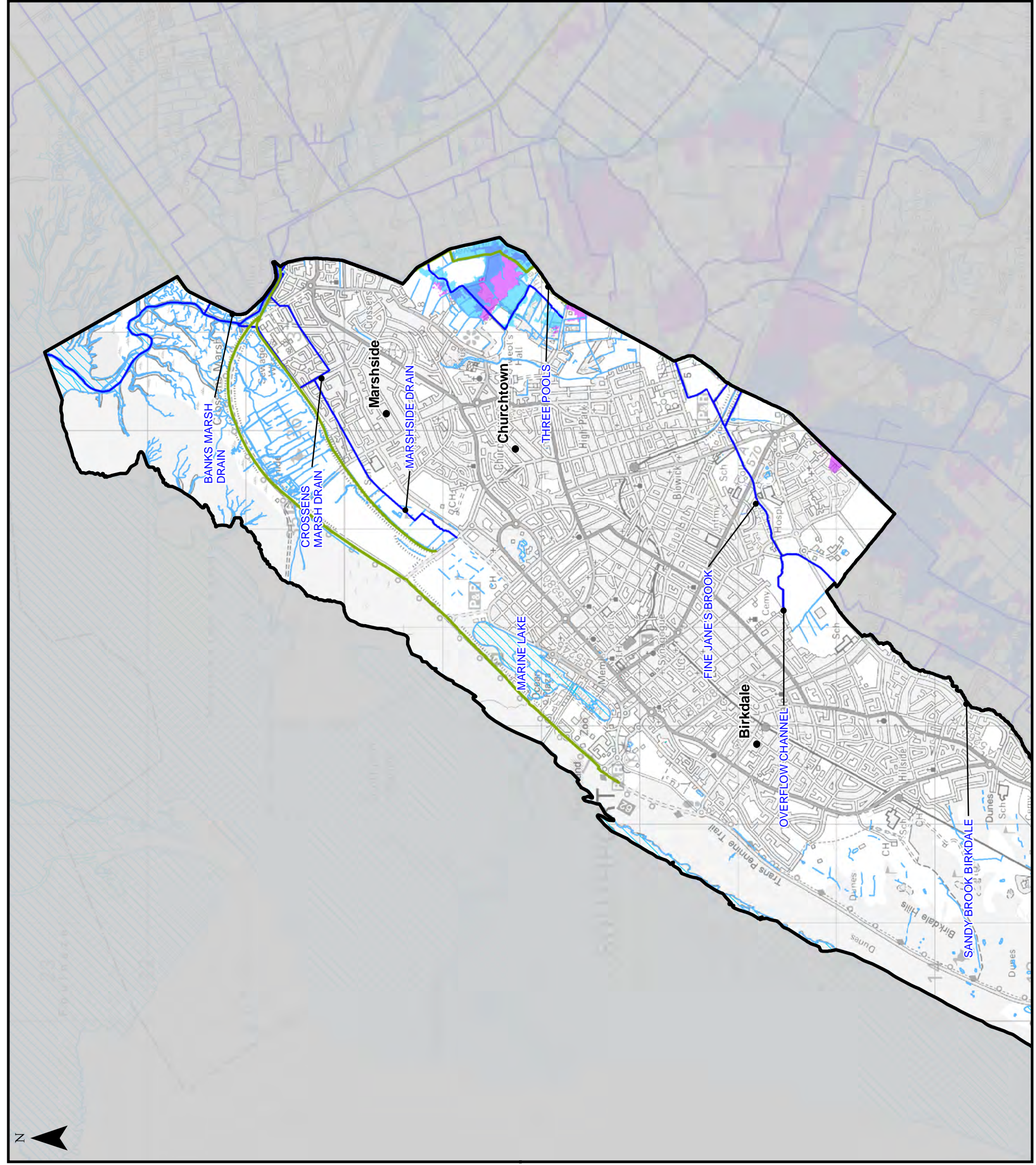
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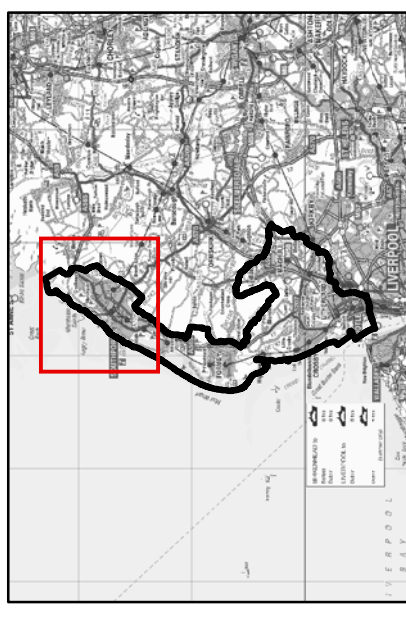


0 625 1,250 2,500 3,750 5,000 Meters

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Legend

-  Borough Administrative Boundary
-  Main River
-  Ordinary Watercourse
-  Leeds and Liverpool Canal
-  Defences
-  Permanent Water Bodies
-  Flood Zone 3 Tidal
-  Flood Zone 2 Tidal



Notes

TIDAL FLOOD ZONE 3 IS EQUIVALENT TO THE UNDEFENDED 1 IN 200 ANNUAL PROBABILITY FLOOD EVENT AND TIDAL FLOOD ZONE 2 IS EQUIVALENT TO THE UNDEFENDED 1 IN 1000 ANNUAL PROBABILITY FLOOD EVENT.

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Figure 4-1
EA Tidal Flood Zones

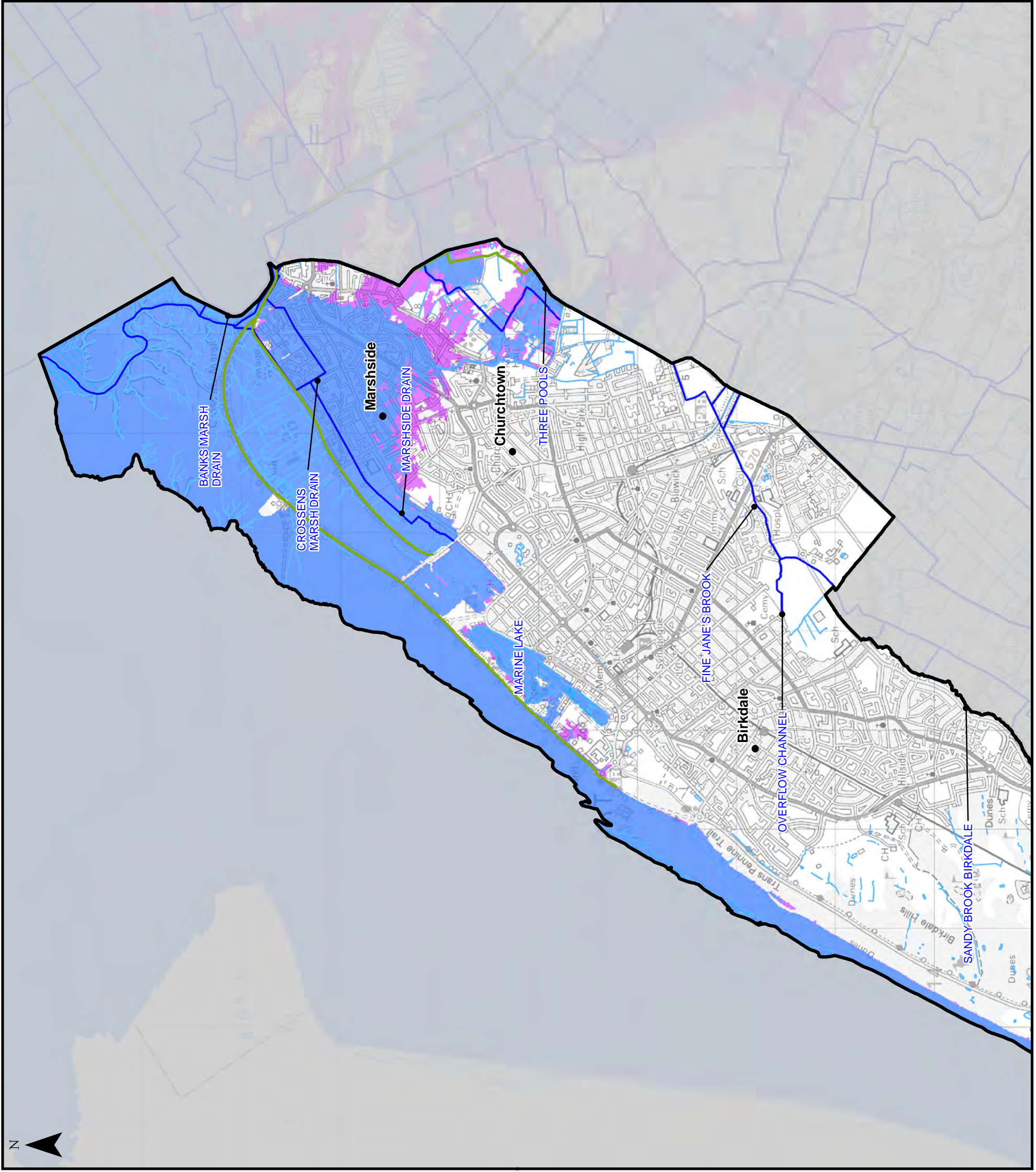
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


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0 625 1,250 2,500 3,750 5,000 Meters

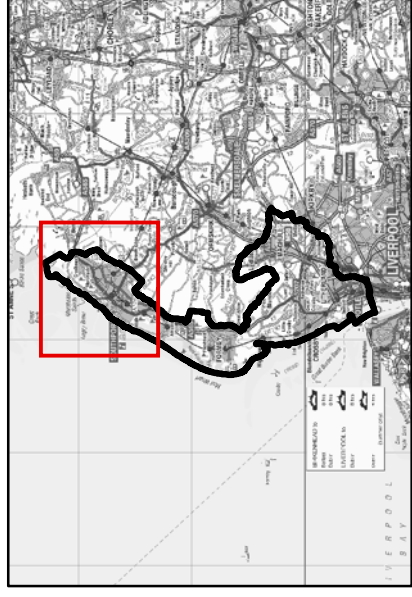
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Legend

-  Borough Administrative Boundary
-  Main River
-  Leeds and Liverpool Canal
-  Defences

Flood Depth (1 in 100 Annual Probability plus Climate Change)

-  < 0.1m
-  0.1m to 0.3m
-  0.3m to 0.6m
-  0.6m to 1m
-  1m to 1.5m
-  > 1.5m



Notes

THE INFORMATION PRESENTED HAS BEEN OBTAINED FROM AVAILABLE HYDRAULIC MODELS THAT SHOW THE POTENTIAL DEPTH OF FLUVIAL FLOODING WITHIN SEFTON IN A 1 IN 100 ANNUAL PROBABILITY EVENT WITH AN ALLOWANCE FOR CLIMATE CHANGE.

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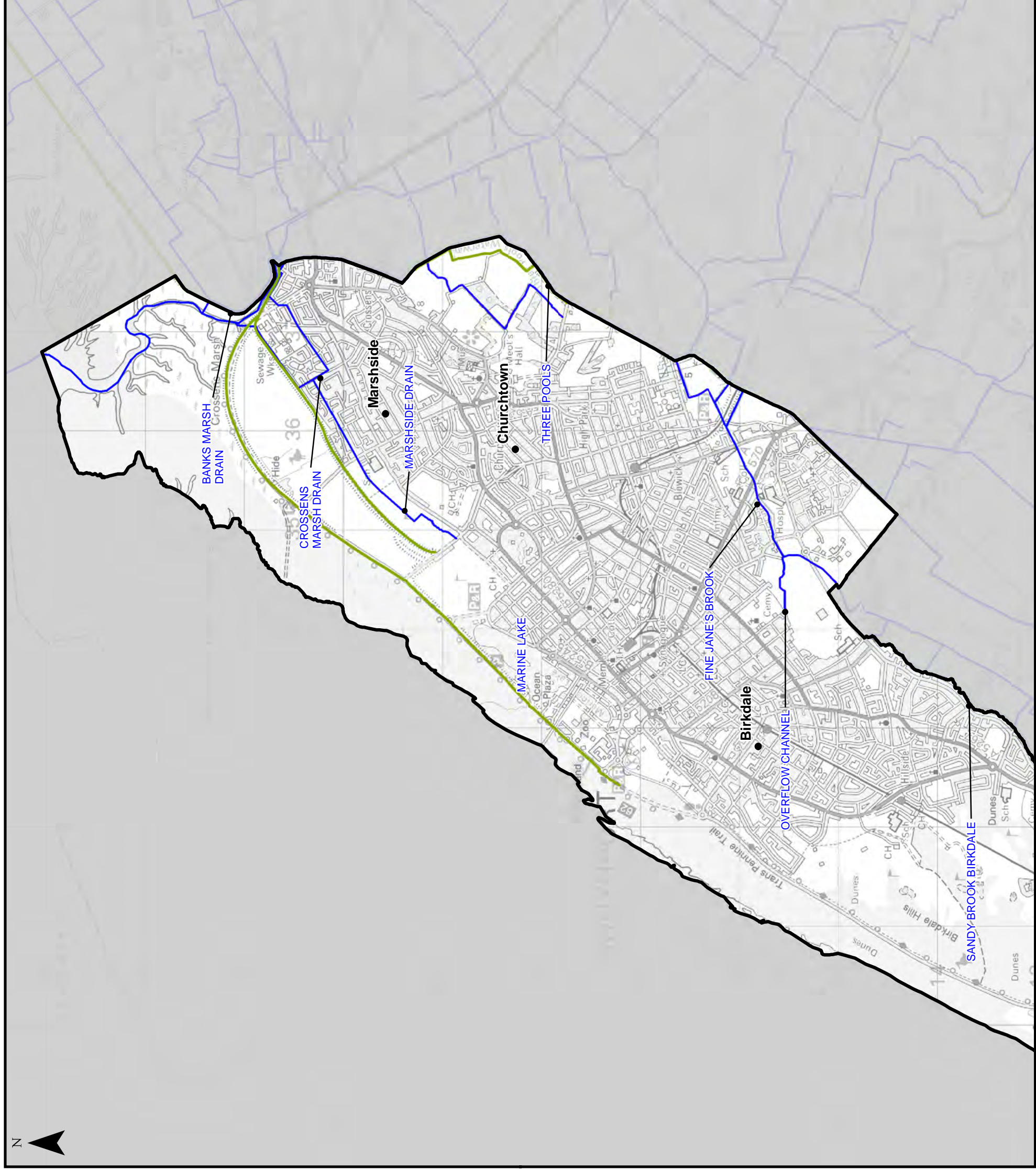
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Figure 9-1
Fluvial Flood Depths with Defences
(1 in 100 annual probability plus climate change)

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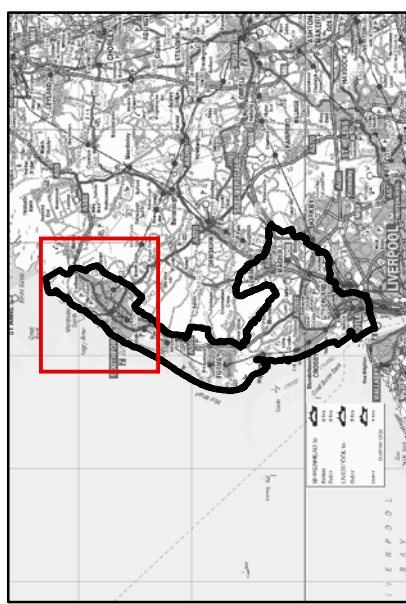
REV



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Legend

-  Borough Administrative Boundary
-  Main River
-  Ordinary Watercourse
-  Leeds and Liverpool Canal
-  Permanent Water Bodies
-  Defended fluvial model flood outlines
-  1 in 25 Annual Probability Flood Event
-  1 in 100 Annual Probability Flood Event
-  1 in 100 Annual Probability plus Climate Change Flood Event
-  1 in 1000 Annual Probability Flood Event



Notes

THE INFORMATION PRESENTED HAS BEEN OBTAINED FROM AVAILABLE HYDRAULIC MODELS THAT SHOW THE POTENTIAL CONSEQUENCES OF FLUVIAL FLOODING WITHIN SEFTON.

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**Figure 6-1
Fluvial Flood Risk Extents with Defences**

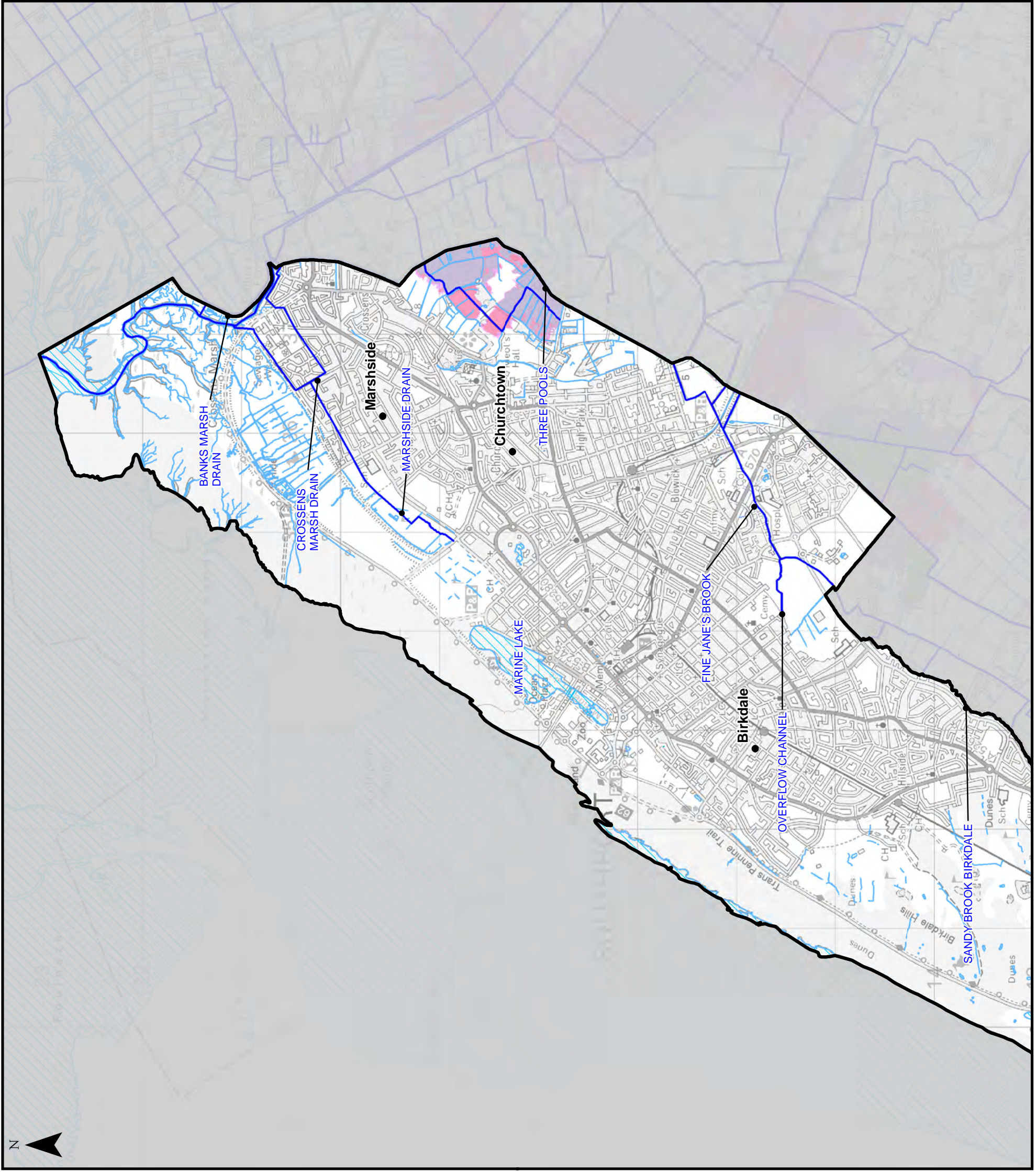
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Legend

-  Borough Administrative Boundary
-  Main River
-  Ordinary Watercourse
-  Leeds and Liverpool Canal
-  Permanent Water Bodies
-  Flood Defences - Man-made
-  Defence condition - Good (EA maintained)
-  Defence condition - Fair (EA maintained)
-  Defence condition - Poor (EA maintained)
-  Defence condition - Unspecified (EA maintained)
-  Defence condition - Good (LA maintained)
-  Defence condition - Fair (LA maintained)
-  Defence condition - Poor (LA maintained)
-  Defence condition - Unspecified (LA maintained)
-  Defence condition - Good (Privately maintained)
-  Defence condition - Fair (Privately maintained)
-  Defence condition - Poor (Privately maintained)
-  Defence condition - Unspecified (Privately maintained)

Notes

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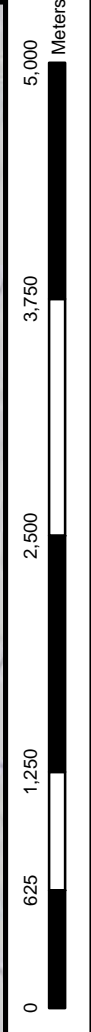
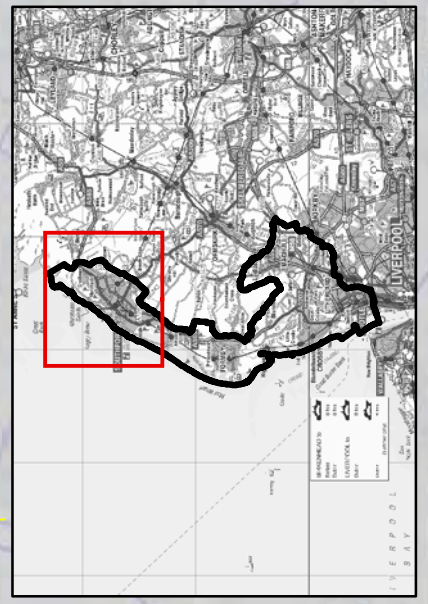
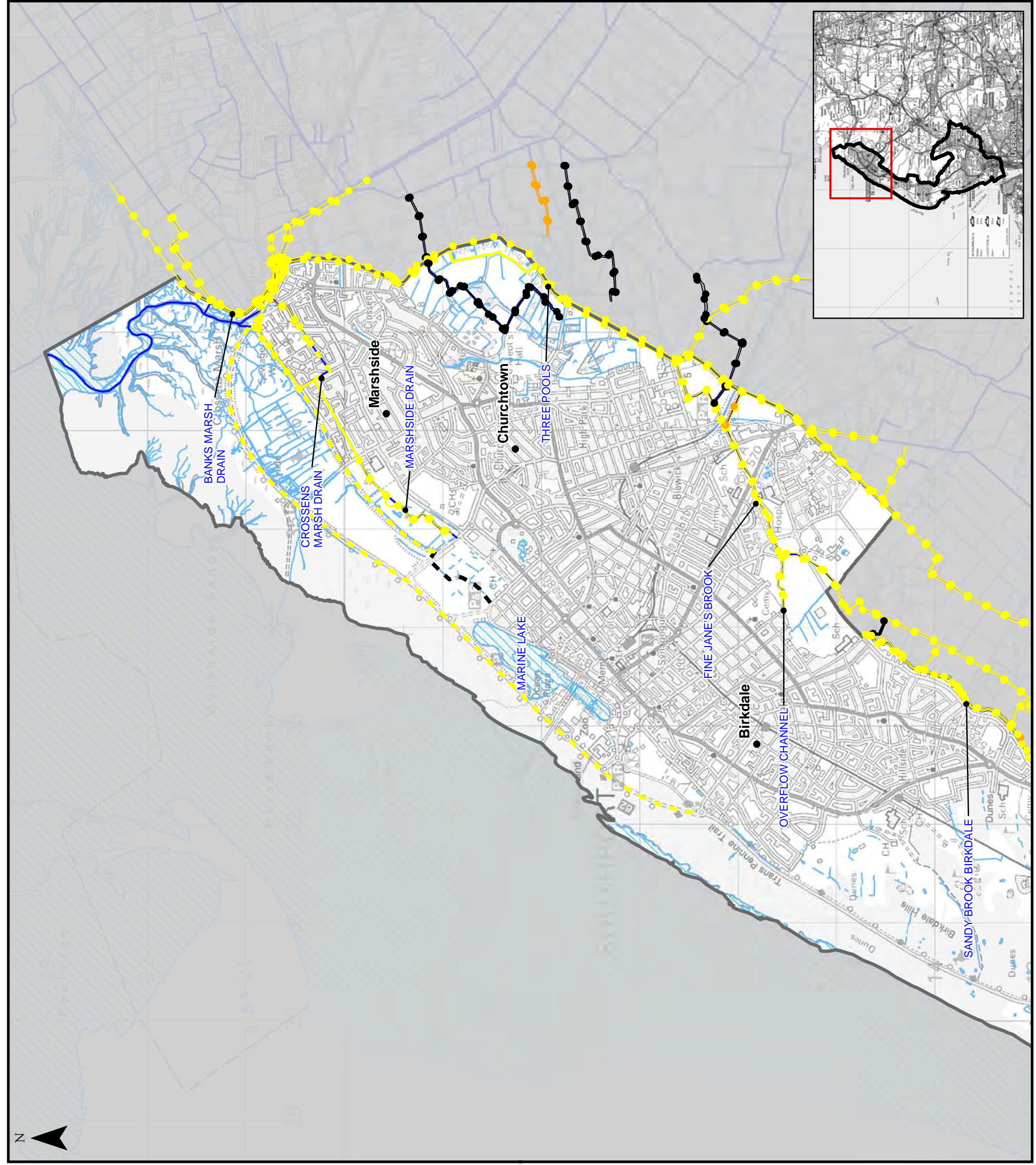
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**Figure 11a-1
 Flood Defences - Man-made**



















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Legend

-  Borough Administrative Boundary
-  Main River
-  Ordinary Watercourse
-  Leeds and Liverpool Canal
-  Permanent Water Bodies
-  Flood Defences - Natural
-  Defence condition - Good (EA maintained)
-  Defence condition - Fair (EA maintained)
-  Defence condition - Poor (EA maintained)
-  Defence condition - Unspecified (EA maintained)
-  Defence condition - Good (LA maintained)
-  Defence condition - Fair (LA maintained)
-  Defence condition - Poor (LA maintained)
-  Defence condition - Unspecified (LA maintained)
-  Defence condition - Good (Privately maintained)
-  Defence condition - Fair (Privately maintained)
-  Defence condition - Poor (Privately maintained)
-  Defence condition - Unspecified (Privately maintained)

Notes

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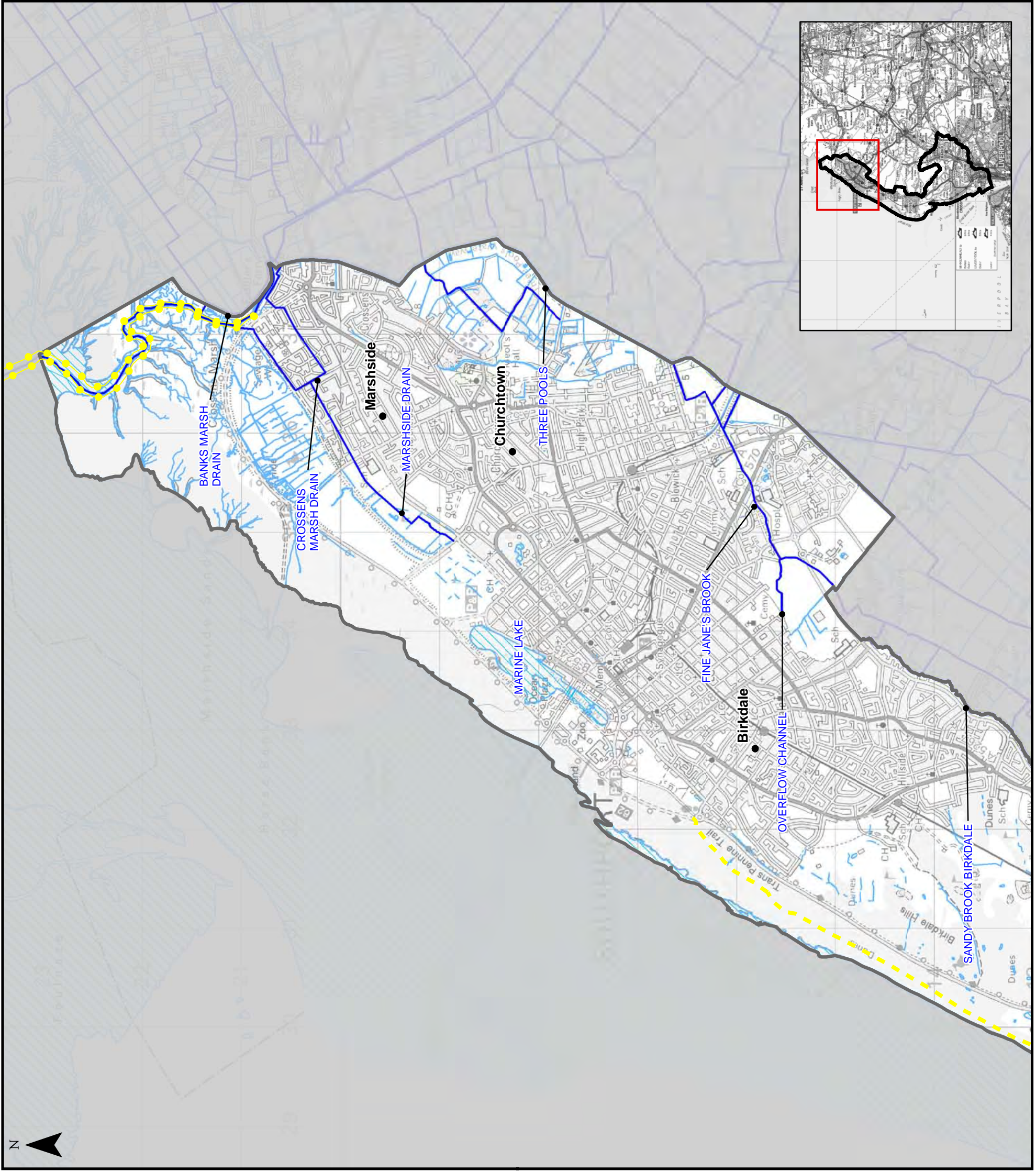
Scale at A3	Date	Drawn by	Approved by
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Figure 11b-1
Flood Defences - Natural

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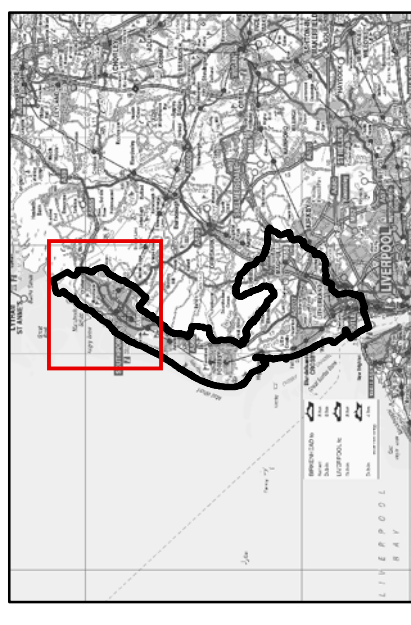
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0 625 1,250 2,500 3,750 5,000 Meters

Legend

-  Borough Administrative
-  Boundary
-  SWMP Outputs
-  5yr Rainfall Event
-  30yr Rainfall Event
-  100yr Rainfall Event
-  100yr+CC Rainfall Event



Notes

THE SWMP OUTPUTS ARE PRESENTED ONLY WHERE MODELING WAS UNDERTAKEN.

THE 1 IN 5 AND THE 1 IN 30 ANNUAL PROBABILITY EVENT OUTPUTS ARE BASED ON MODELING THE PREDICTED MAXIMUM FLOODING VOLUME AT MANHOLES AS INFLOWS THAT ARE DISCHARGED OVER A 1.5 HOUR PERIOD. THIS ASSUMES THEREFORE THAT THE SEWER SYSTEM RECEIVES ALL RAINFALL IN THESE EVENTS AND THAT FLOODING IS SOLELY CAUSED BY INADEQUACY OF THE SEWERS' HYDRAULIC CAPACITY. FOR THE 1 IN 100 ANNUAL PROBABILITY EVENT AND THE 1 IN 100 ANNUAL PROBABILITY EVENT WITH AN ALLOWANCE FOR CLIMATE CHANGE, THE OUTPUTS ARE BASED ON MODELLING OF DIRECT RAINFALL WITH A 6.5MM ALLOWANCE FOR THE CAPACITY OF THE SEWER SYSTEM PLUS MANHOLE FLOODING FROM THE 1 IN 30 ANNUAL PROBABILITY EVENT. THIS ASSUMES THAT THE SEWERS ARE LARGELY AT CAPACITY AND THAT EXCESS RAINFALL BECOMES SURFACE WATER RUNOFF.

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Figure 12-1
SWMP Outputs

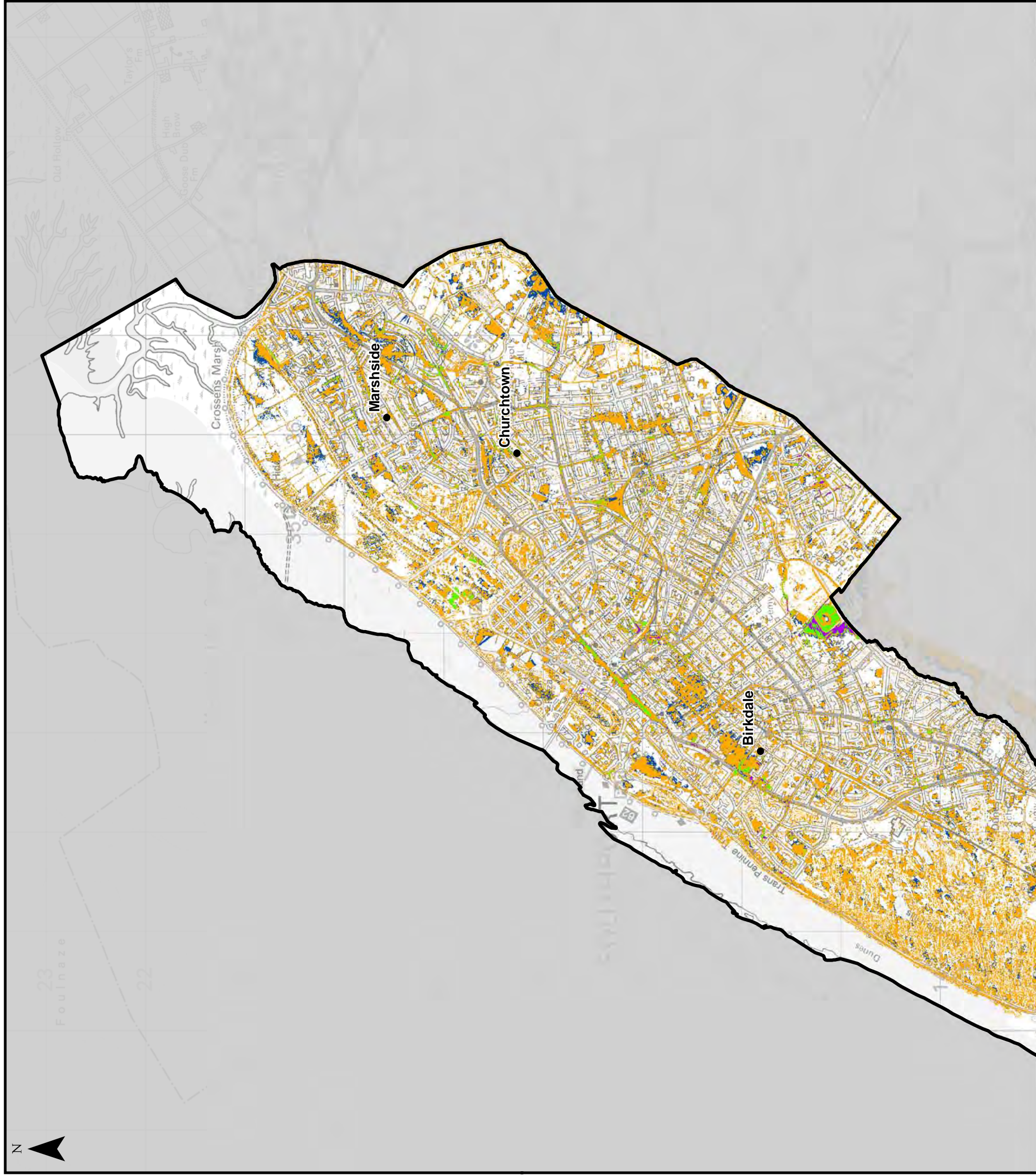
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




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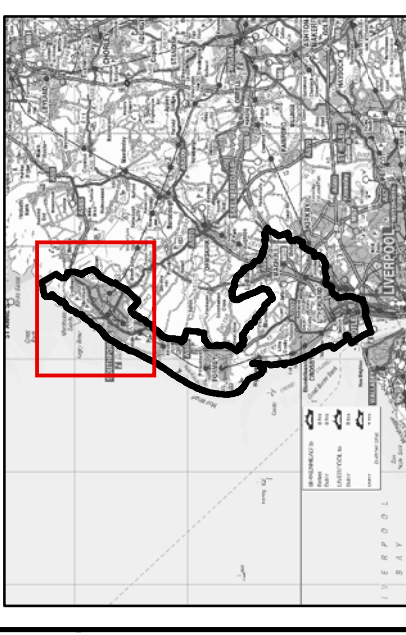


0 625 1,250 2,500 3,750 5,000 Meters

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Legend

-  Borough Administrative Boundary
-  Permanent Water Bodies
-  Main River
-  Local Flood Risk Zones*
-  Ordinary Watercourse
-  Leeds and Liverpool Canal



Notes

LOCAL FLOOD RISK ZONES ARE DISCRETE AREAS OF FLOODING THAT AFFECT AT LEAST ONE HOME, BUSINESS OR INFRASTRUCTURE ASSET. THEY REPRESENT THE AREA OF FLOODING CAUSED BY SURFACE WATER AND SEWER FLOODING THAT IS GREATER THAN 0.08M DEEP. ONLY LFRZS WITH AN AREA GREATER THN 5 SQUARE METERS ARE SHOWN.

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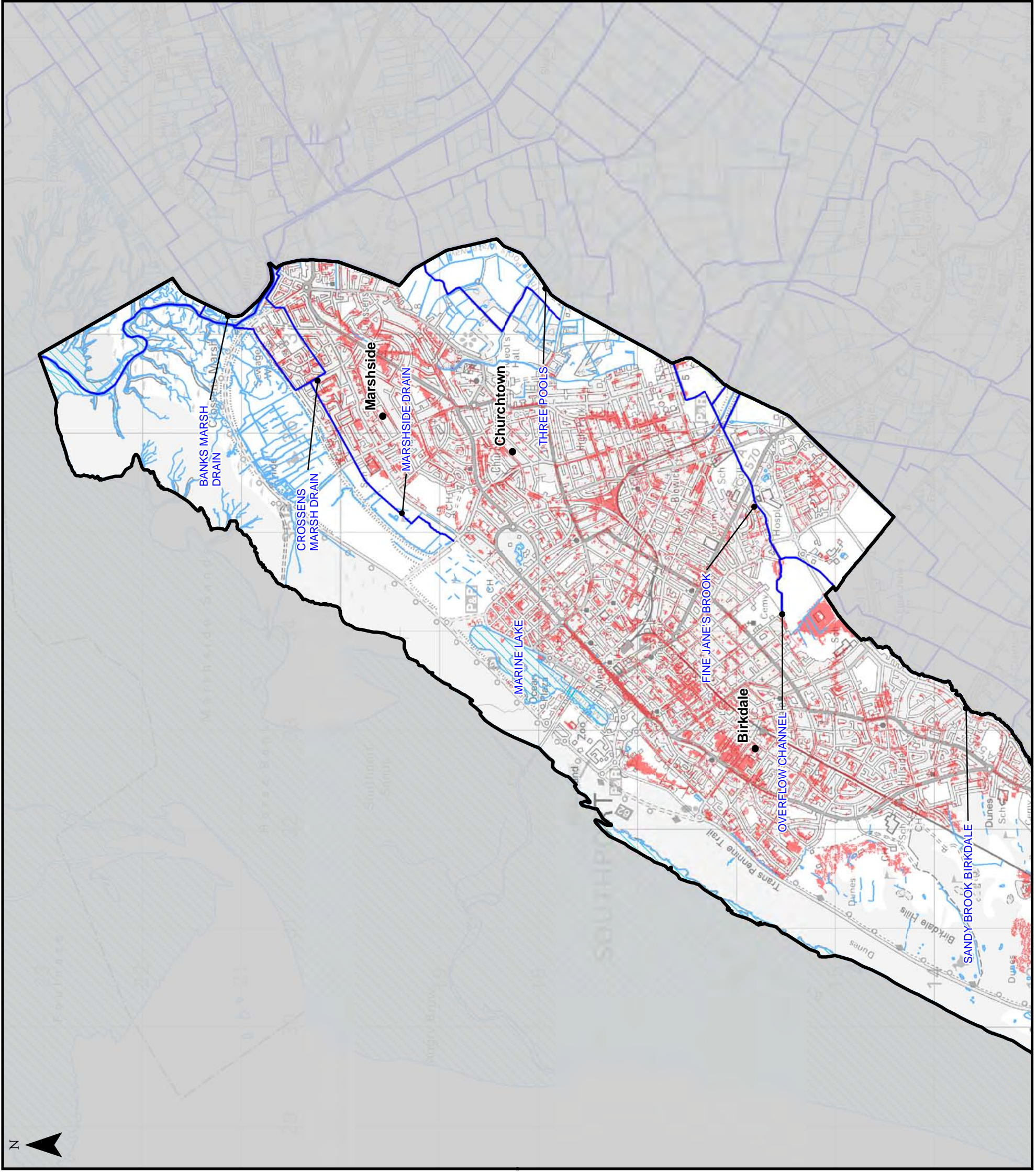
Scale at A3	Date	Drawn by	Approved by
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Figure 13-1
Local Flood Risk Zones (LFRZs)
(1 in 100 annual probability event)

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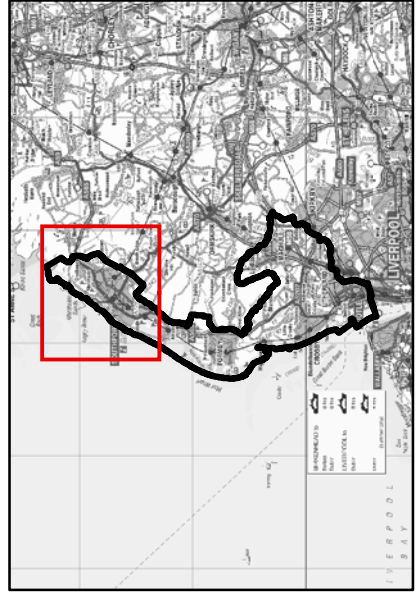
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Legend

-  Borough Administrative Boundary
-  Main River
-  Ordinary Watercourse
-  Leeds and Liverpool Canal
-  Permanent Water Bodies
-  Critical Drainage Areas



Notes

CRITICAL DRAINAGE AREAS (CDAS) HAVE BEEN DEFINED BY IDENTIFYING THE CATCHMENT AREAS THAT CONTRIBUTE TO FLOODING IN THOSE LOCAL FLOOD RISK ZONES THAT COULD RESULT IN LOCALLY SIGNIFICANT SURFACE WATER FLOODING, I.E. THOSE IN WHICH MORE THAN 8 PROPERTIES OR 20 PEOPLE MAY BE IMPACTED.

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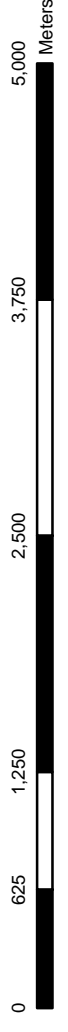
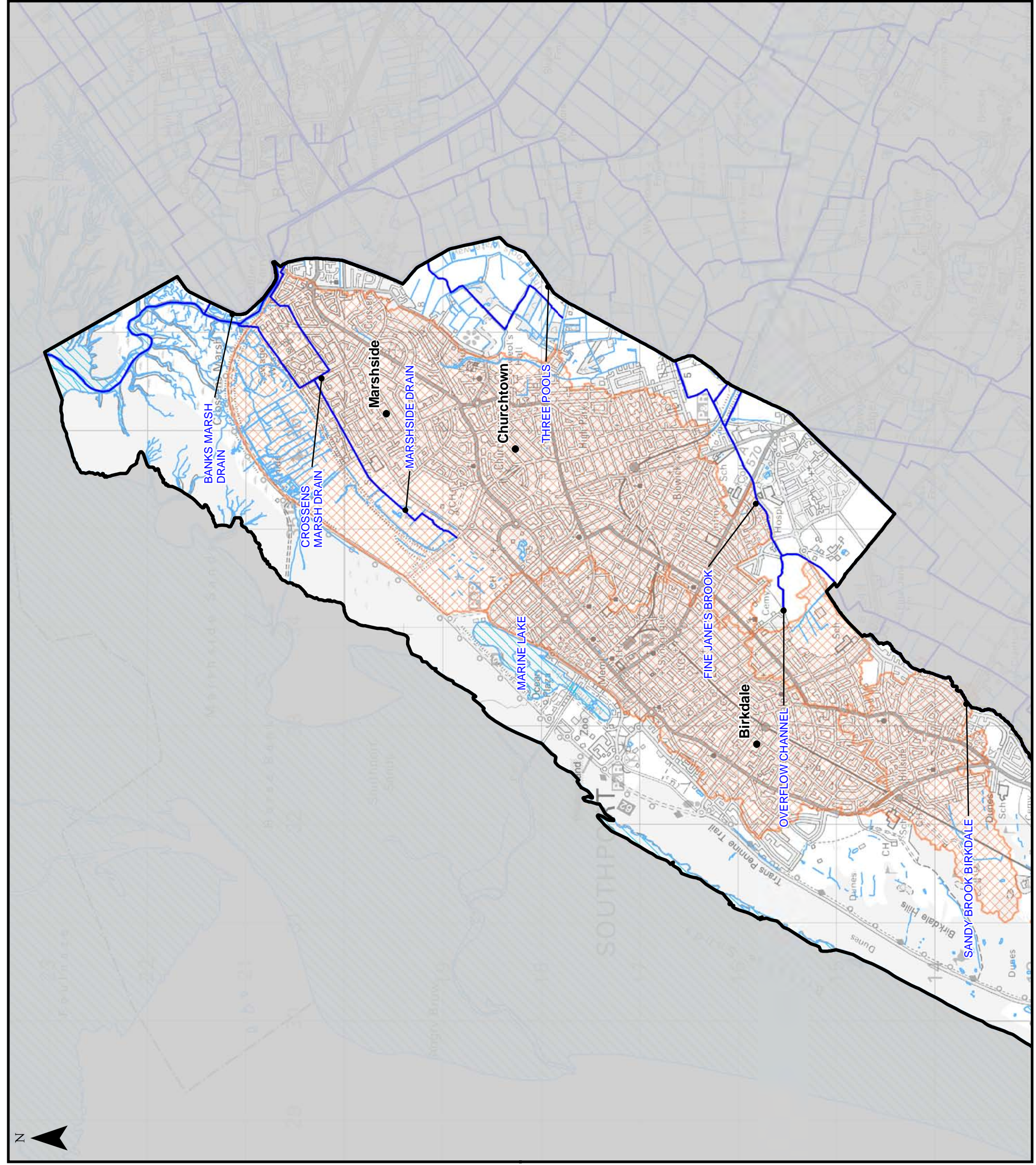
Scale at A3	Date	Drawn by	Approved by
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**Figure 14-1
Critical Drainage Areas**

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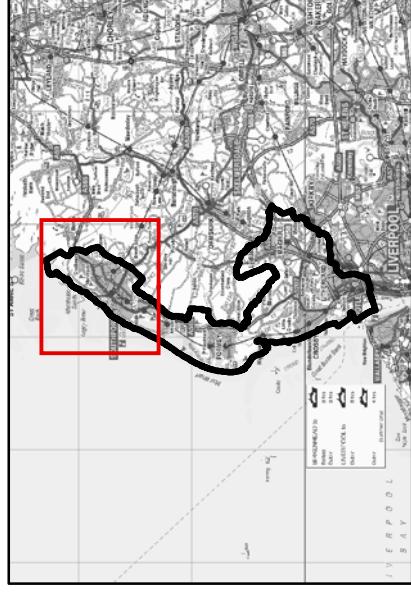
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Legend

-  Borough Administrative Boundary
-  Main River
-  Ordinary Watercourse
-  Leeds and Liverpool Canal
-  Permanent Water Bodies
-  Areas Susceptible to Surface Water Flooding
-  More Susceptible
-  Intermediate Susceptibility
-  Less Susceptible



Notes

SEFTON, ALONG WITH A NUMBER OF OTHER MERSEYSIDE AUTHORITIES, ADOPTED THE ASTSWF DATASET AS ITS LOCALLY AGREED SURFACE WATER INFORMATION WITHIN ITS PFRA. FOR THE PURPOSES OF THIS SFRA, HOWEVER, THE OUTPUTS OF THE SWMP ARE GIVEN GREATER PRIORITY THAN THE ASTSWF DATASET.

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Figure 15-1
Areas Susceptible to Surface Water Flooding

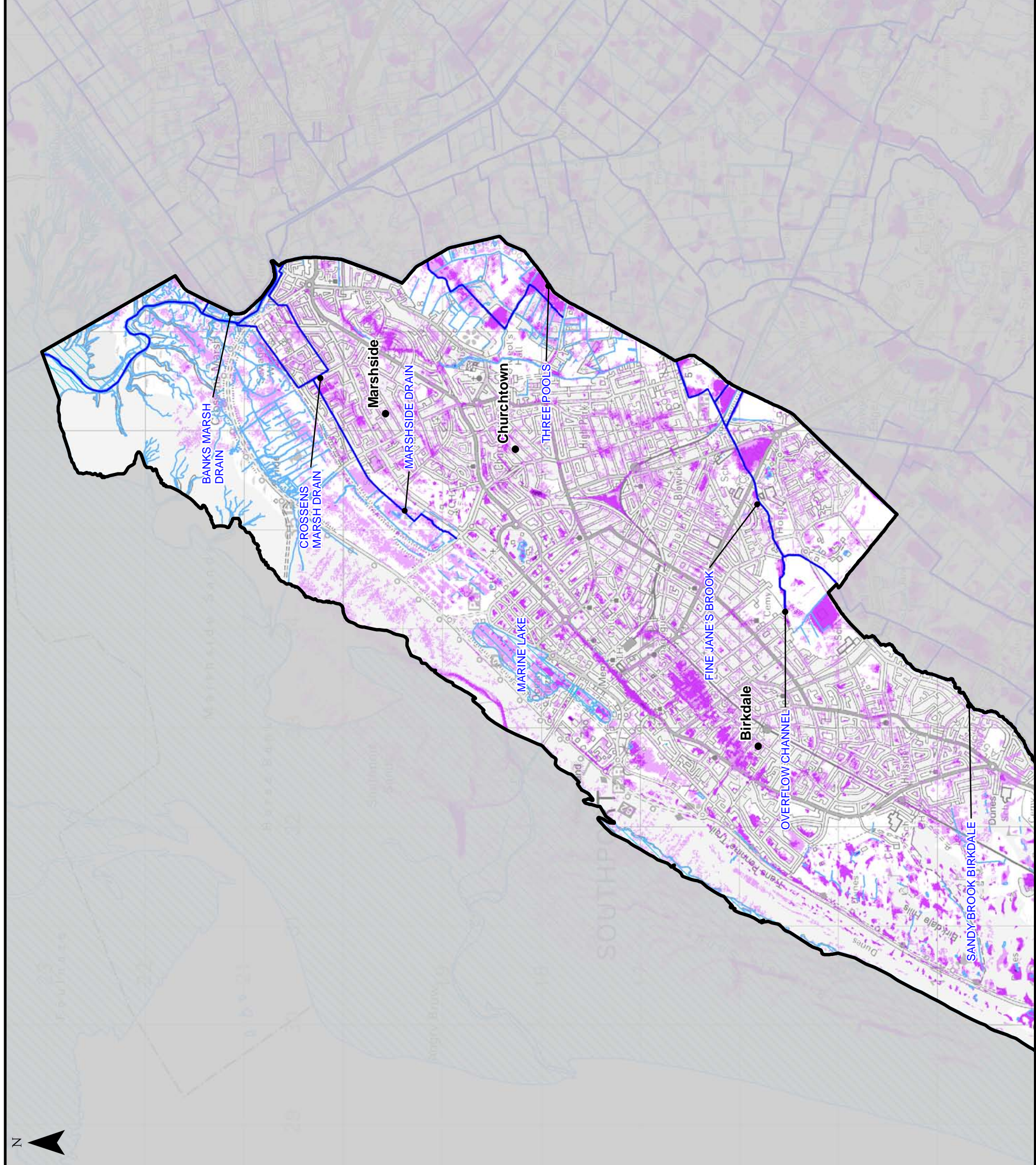
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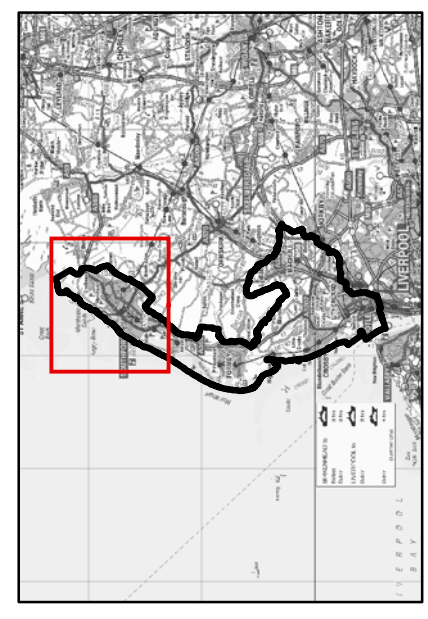
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Legend

- Borough Administrative Boundary
- Main River
- Ordinary Watercourse
- Leeds and Liverpool Canal
- Permanent Water Bodies
- Surface Water Flooding Incidents (Sefton Drainage Report data)
- Surface Water Flooding Incidents (Sefton, 2012)
- Surface Water Flooding Incidents (Sefton, 2012)
- Surface Water Flooding Incidents (Sefton, 2012)



Notes

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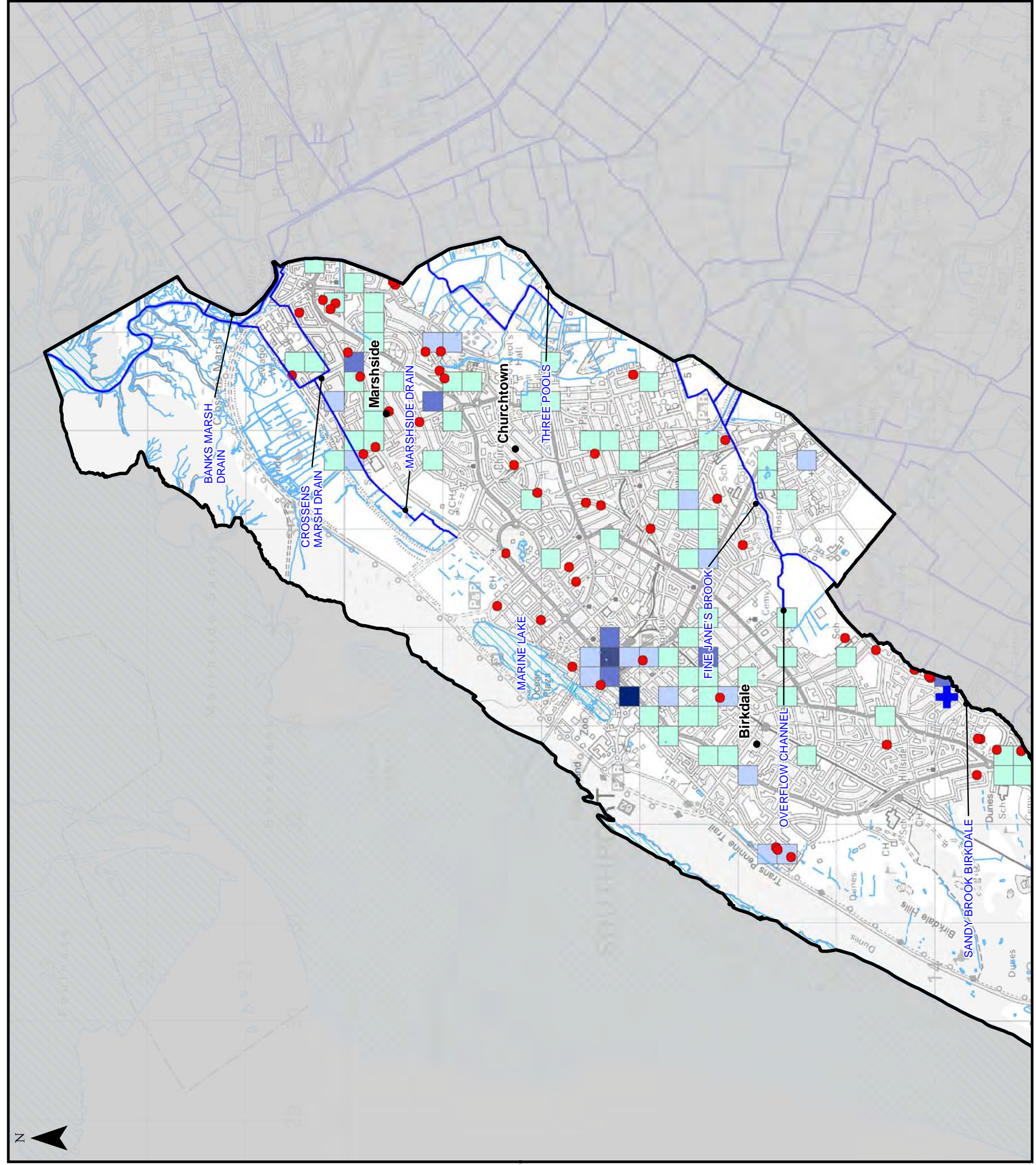
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Figure 16-1
Historical Surface Water and Sewer Flooding Incidents







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Legend

-  Borough Administrative Boundary
-  Main River
-  Ordinary Watercourse
-  Leeds and Liverpool Canal
-  Permanent Water Bodies
-  Groundwater Emergence Map



Notes

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**Sefton Level 2
 Strategic Flood Risk Assessment**

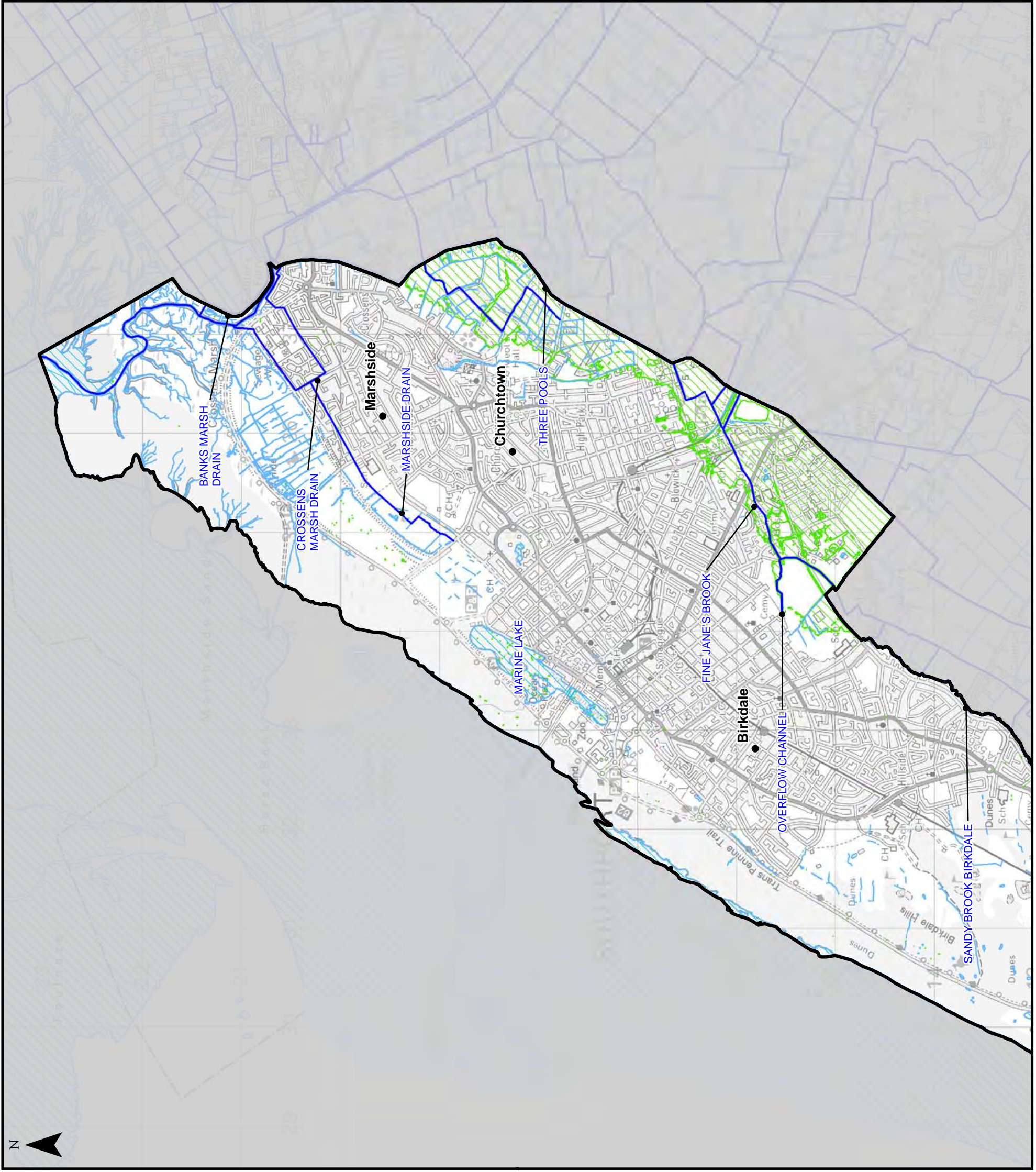
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**Figure 17-1
 Groundwater Flood Risk**

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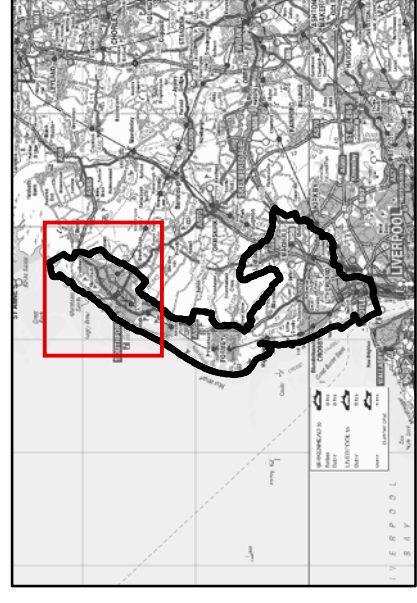
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Legend

-  Borough Administrative Boundary
-  Main River
-  Ordinary Watercourse
-  Leeds and Liverpool Canal
-  Permanent Water Bodies
-  SuDS Suitability
-  Very High
-  High
-  Moderate
-  Low
-  Very Low



Notes

THE SUDS SUITABILITY IS BASED ON A COMBINATION OF THE PERMEABILITY OF THE OVERLYING DRIFT AND THE UNDERLYING GEOLOGY. AREAS IDENTIFIED AS BEING SUSCEPTIBLE TO GROUNDWATER EMERGENCE HAVE BEEN IDENTIFIED AS 'VERY LOW' REGARDLESS OF THE UNDERLYING DRIFT OR SOLID GEOLOGY. IT SHOULD ALSO BE NOTED THAT IN AREAS WITH A BETTER SUDS SUITABILITY CLASSIFICATION THERE MAY ALSO BE SHALLOW GROUNDWATER OR POTENTIALLY CONTAMINATION THAT COULD RESTRICT OR ENTIRELY PREVENT THE USE OF INFILTRATION SUDS, WHERE INFILTRATION SUDS ARE PROPOSED IT IS STRONGLY RECOMMENDED THAT LOCATION-SPECIFIC SOAKAWAY TESTS IN LINE WITH BRE365 OR SIMILAR ARE USED TO CONFIRM THE SUITABILITY OF THE GROUND CONDITIONS. THIS SHOULD BE COMPLETED AT THE CONCEPTUAL DESIGN STAGE TO AVOID POST-PLANNING CONSENT ISSUES ARISING.

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Sefton Level 2 Strategic Flood Risk Assessment

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Figure 21-1
SuDS Suitability

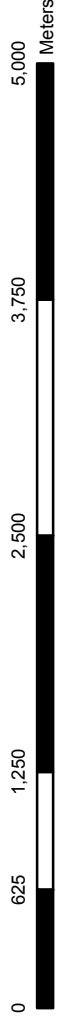
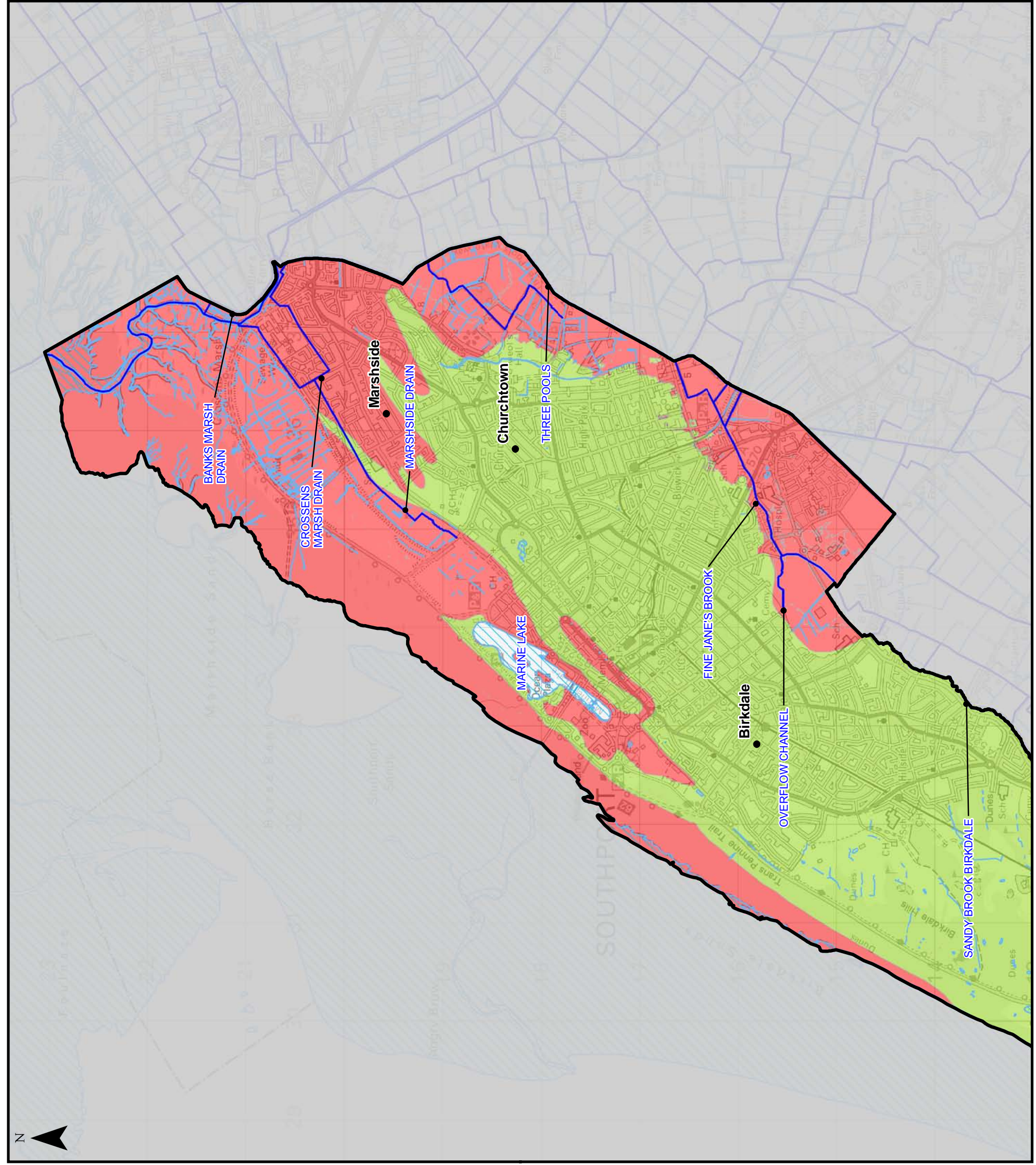
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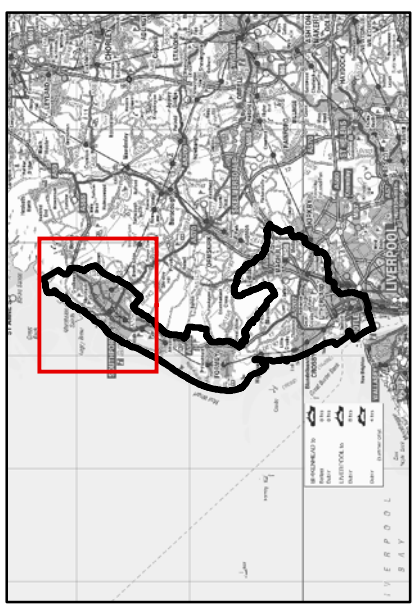
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Legend

-  Borough Administrative Boundary
-  Main River
-  Ordinary Watercourse
-  Leeds and Liverpool Canal
-  Permanent Water Bodies
-  Flood Warning Areas



Notes

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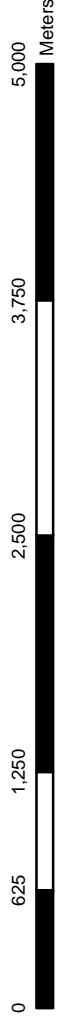
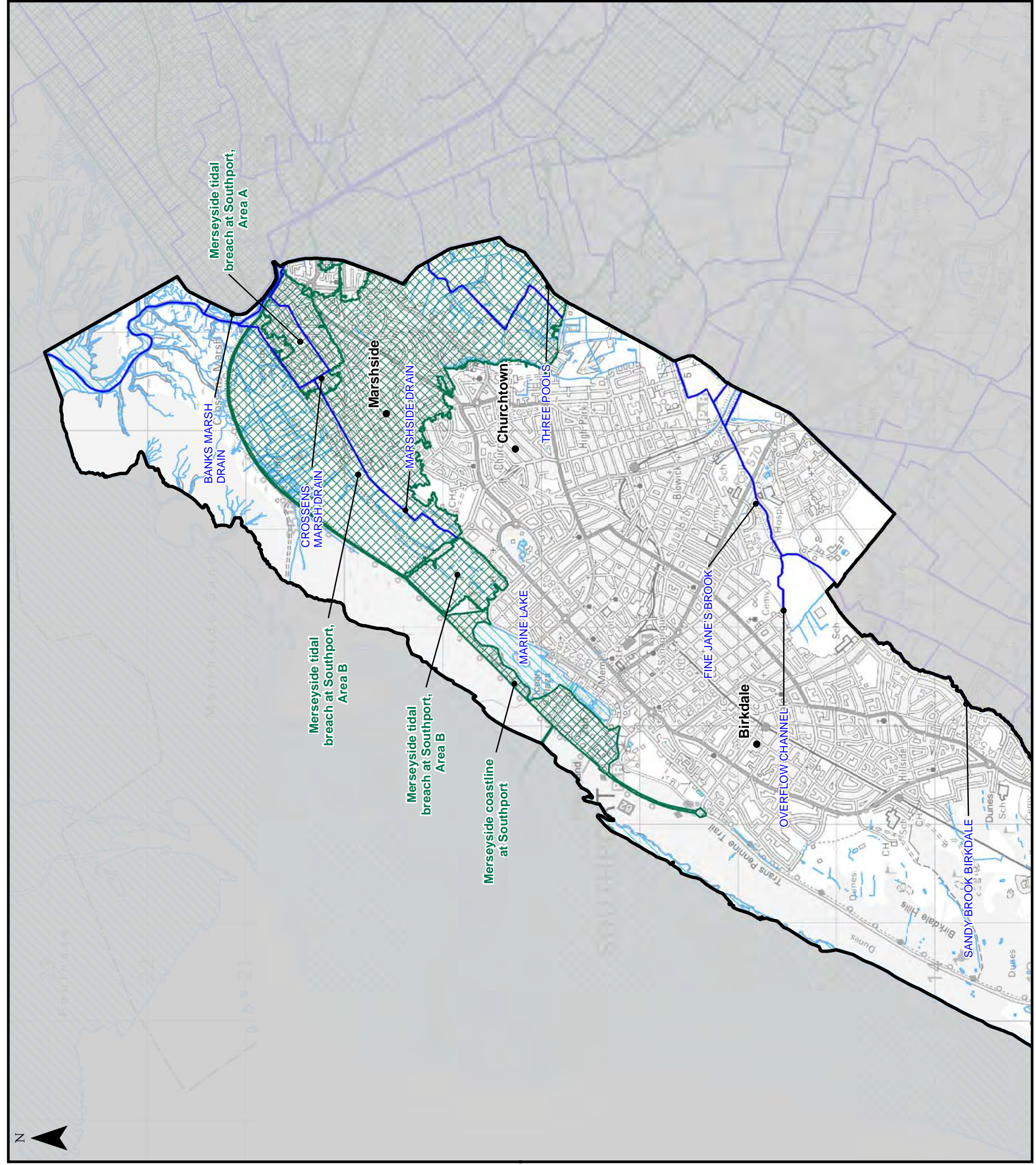
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**Figure 22-1
 Flood Warning Areas**

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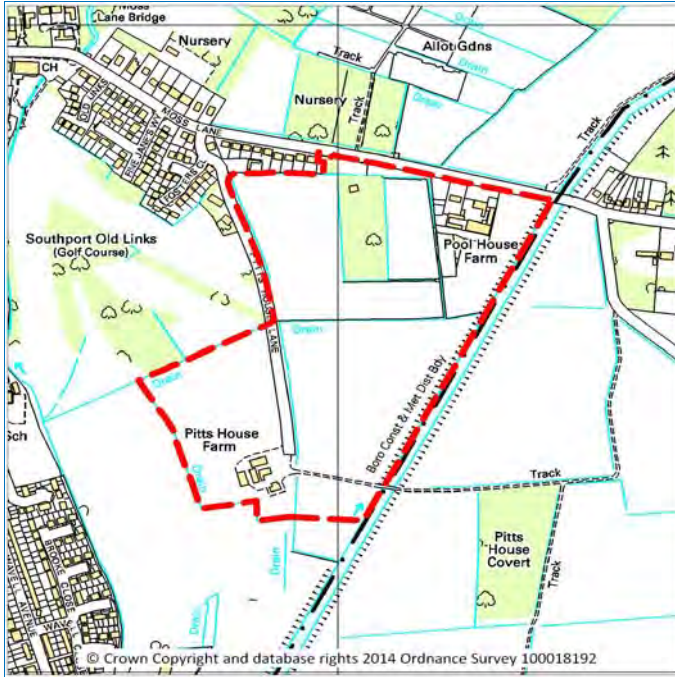
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SEFTON LOCAL PLAN: SITE ASSESSMENT FORM

Site Reference	SR4.03	Settlement Area	Southport	Policy ref (if applicable)	MN2.4
SiteAddress	Land at Moss Lane, Churchtown				
SiteType	Potential Housing Allocation			SiteArea(Ha)	19.7



Proximity of the site to key services

Proportion of Site (%) with:

	High accessibility	Medium accessibility	Low accessibility
Train Stations	0 % (<800m)	3.2 % (<1,200m)	96.8 % (>1,200m)
Frequent Bus Stops	0 % (<400m)	65.3 % (<800m)	34.7 % (>800m)
Primary School	99.2 % (<800m)	0.8 % (<1,200m)	0 % (>1,200m)
District Local Centres	52.1 % (<800m)	47.9 % (<1,200m)	0 % (>1,200m)
Neighbourhood Park	83.9 % (<600m)	16.1 % (<900m)	0 % (>900m)
GPs/Health Centres	0 % (<800m)	93.1 % (<1,200m)	6.9 % (>1,200m)

Site specific / wider benefits

Comments

1. Would site involve redevelopment of Brownfield land?	No	
2. Would the development provide new or improved Road / Rail infrastructure?	No	
3. Would the site offer any other specific benefit?	No	
4. Would the site contribute to the wider regeneration of a deprived area?	No	
5. Would the site create jobs in an area of high unemployment?	No	
6. Would the site provide affordable housing in an area of high need?	Yes	Would contribute to the high affordable housing need in Southport.
7. Would the site meet any other wider need or provide other benefits?	No	

Constraints to Development

Constraint	Constraint severity	Constraint description
1. Ecology	Minor Constraint	Potential for water voles adjacent to Three Pools Waterway.
2. HRA	Screened In	
3. Flood Risk	Moderate Constraint	Approximately 10% of the site is within Flood Zone 2, with a further 2% in Flood Zone 3 (in the north east corner of the site). However, once existing flood defences are taken into account the site would not be at risk from a 1:1000 year event. There is a risk of surface water flooding on various parts of the site. A number of ordinary water courses run through the site. Approximately one third of the site is identified as having susceptibility to ground water flooding.
4. Sequential Test	Pass	Entire site is in Flood Zone 1 once existing flood defences are taken into account, as confirmed by the SFRA.
5. Heritage	Minor Constraint	Minor impact on the North Meols Conservation Area and the listed buildings therein, by virtue of a limited increase in the sense of suburbanisation, especially in the north-eastern part of the site.
6. Pollution	No Constraint	No known issues
7. Site Access	Moderate Constraint	Satisfactory access to this site can be achieved, but will require major highways improvements to Moss Lane. There is scope to widen Moss Lane within the existing highway boundary. There is currently a poor level of accessibility for pedestrians. Footways on Moss Lane are narrow and the presence of the golf course restricts opportunities to provide any additional direct pedestrian links to the surrounding area.
8. Network Capacity	Moderate Constraint	The cumulative effect of the developments proposed would require an assessment including any proposals in West Lancashire. It is likely that substantial mitigation in the form of significant infrastructure improvements would be required.
9. Accessibility Improvements	N/A	There are limited opportunities to make the development permeable for pedestrians and cyclists. A substantial scheme of off-site improvements to enhance the accessibility of the site by sustainable travel modes is likely to be required.
10. BMV Agricultural Land	Minor Constraint	Approximately 90% of the site comprises grade 2 and 3a agricultural land and is therefore classified as 'best and most versatile agricultural land', according to the Sefton Agricultural Land Study 2012.
11. Landscape	Moderate Constraint	Mitigation in the form of provision of open space is recommended to ensure the site is integrated well into the surrounding landscape character.
12. Ground Conditions	Moderate Constraint	Sub-strata is generally sand overlying peat layers, and new developments in this vicinity are on raft or piled foundations.
13. Utility Infrastructure	Minor Constraint	Waste water network upgrade might be required
14. Other Constraint	No Constraint	No known other issues

Green Belt Purposes

	Impact	Comments
1. To check the unrestricted sprawl of large built-up areas	Moderate	Approximately 10% of the site adjoins the existing built up area. The existing Green Belt boundary is weak (largely defined by the rear of existing housing and open space). The proposed boundaries would be strong in part, being defined by Moss Lane and Three Pools Waterway. The release of this land would undermine the Green Belt function of land immediately to the west (the golf course).
2. To prevent towns merging into one-another	None	There would no impact on an existing narrow gap between settlements.
3. To safeguard the countryside from encroachment	Moderate	The site is in agricultural use.
4. To preserve the setting and special character of historic towns	None	The site is adjacent to modern development.
5. To assist urban regeneration		Unable to assess impact

Delivery Considerations

Constraint type	Yes/No	Comments
1. Does the owner wish to promote the site for developm't?	Yes	
2. Are there any known viability issues?	No	
3. Are there any known issues that would delay development?	No	

Conclusion

Land currently in the Green Belt. However, the site is relatively contained and its release would not significantly impact on any Green Belt purpose, albeit it would likely necessitate the removal of the adjacent golf course from the Green Belt. There are highways and accessibility constraints to this site that would require substantial mitigation. However, there is scope to widen Moss Lane within the existing highway boundary to achieve satisfactory access. The site would contribute to meeting Southport's high affordable housing need, and is appropriate for allocation for housing development in the Local Plan.

Flood Risk Technical Paper

Sefton Local Plan

September 2015

Proposed housing allocations in Northern Southport (MN2.1 – MN2.4)

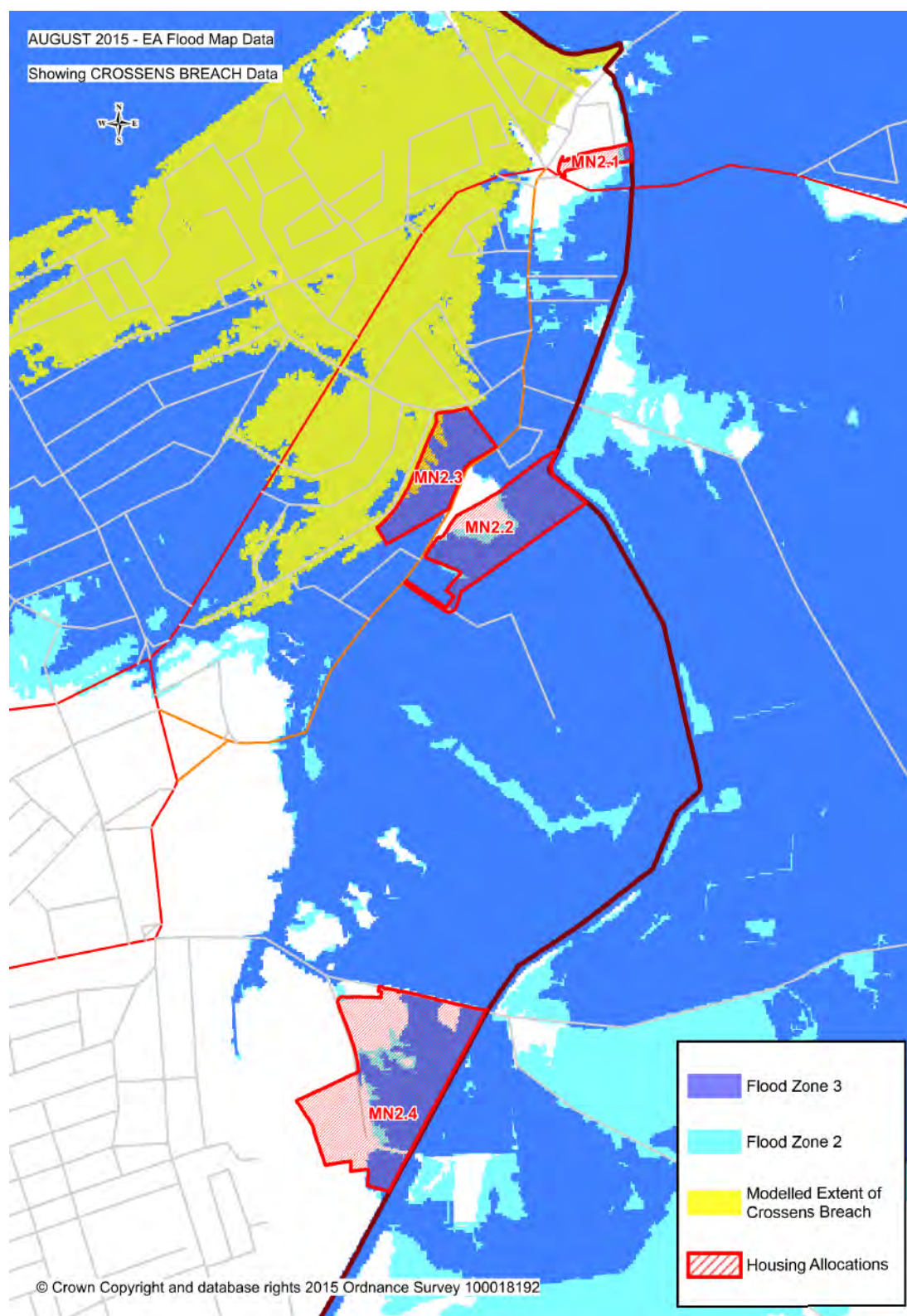
- 3.22 Large areas of northern Southport are in Flood Zones 2 and 3 for tidal flood risk. This reflects the fact that in the absence of defences, the northern part of the town would be flooded by the sea in a 1:200 year flood risk event.
- 3.23 The submitted Local Plan was based on the EA flood maps available at the time of Publication. However, on 4th August 2015 the EA published revised flood maps for northern Southport. The effect of these revisions on proposed Local Plan allocations is set out below:

Proportion of allocated sites (northern Southport) in Flood Zones 2 and 3

Proposed Allocation	EA Flood Maps at Publication stage			EA Flood Maps 04/08/15 revisions		
	FZ 1	FZ 2	FZ 3	FZ 1	FZ 2	FZ 3
MN2.1 Bartons Close, Southport	99%	0%	1%	78%	12%	10%
MN2.2 Land at Bankfield Lane, Southport	44%	56%	1%	14%	9%	77%
MN2.3 Fmr Phillips Factory, Balmoral Drive, Southport	9%	63%	27%	0%	0%	100%
MN2.4 Land at Moss Lane, Churchtown, Southport	89%	10%	1%	44%	7%	49%

- 3.24 As set out at para 2.4 above, the EA Flood Zones take no account of existing flood defences, which in this location are very strong. Northern Southport is protected by a double embankment sea defence and the Crossens Pumping Station. Sefton’s SFRA modelled the extent of flood risk in northern Southport taking account of these defences and found that most of this area would be in Flood Zone 1 if these defences were taken into account.
- 3.25 The EA has also modelled a breach scenario for the weakest part of the sea defences. This shows the area of Southport that would be inundated if the sea wall breached in this location. Importantly, this would not affect allocations MN2.1, MN2.2 or MN2.4, and would only partly affect allocation MN2.3. Therefore these sites (with the partial exception of MN2.3) would not be affected if the flood defences were to fail in this location.
- 3.26 The extent of flooding modelled in the breach scenario is illustrated below:

Environment Agency Breach Scenario – Northern Southport



3.27 Following the publication of the revised EA flood maps, sites MN2.1 - MN2.4 are now partly in Flood Zone 3 and are therefore required to meet the Exception Test.

- 3.28 As set out above, the presence of strong flood defences significantly reduces the residual flood risk in this area. In addition, only site MN2.3 would be affected under the breach scenario produced by the EA, and then only in part. The actual flood risk to the proposed Local Plan allocations in this area (taking account of defences) is therefore very low.
- 3.29 In addition, Southport has a high affordable housing need that is specific to the town. This accounts for 47% of net affordable housing need in Sefton, as set out in the table below:

Affordable Housing Need by Settlement – Sefton Strategic Housing Market Assessment (2014)

Area	Current need	Newly forming households	Existing households falling into need	Total Need	Supply	Net Need
Southport	40	273	97	410	207	203
Formby	4	71	11	86	22	64
Maghull/Aintree	8	135	28	171	53	118
Crosby	16	168	99	282	192	91
Bootle	16	152	216	384	416	-32
Netherton	9	149	189	347	356	-9
Sefton	93	948	639	1,680	1,246	434

Source: 2011 Census/CoRe/Projection Modelling and affordability analysis

- 3.30 Importantly, there are no alternative sites available in Southport to meet this need. No such sites have been promoted to the Local Plan by landowners or developers. In addition, no large alternative sites adjacent to Southport were promoted to the West Lancashire Local Plan Examination in 2013 (apart from those that are now allocated for development). Furthermore, no such sites have been promoted to the West Lancashire SHLAA that are not also in Flood Zone 3.
- 3.31 Sites MN2.1, MN2.2, MN2.3, and MN2.4 are therefore required to address Southport's high affordable housing need. In combination with the presence of strong flood defences, these factors are considered to meet part 1 of the 'Exception Test'.
- 3.32 In addition to these considerations, site MN2.3 is a large brownfield site in poor condition. Its redevelopment for housing would have a significantly beneficial effect on the surrounding area. Site MN2.1 is only partially (10%) in Flood Zone 3 and this could easily be excluded from any development area.
- 3.33 Flood Risk Assessments for sites MN2.2 and MN2.3 have been submitted, to address the second part of the Exception Test. An FRA for site MN2.4 is currently being prepared following the recent revisions to the EA flood maps.