ISIS – Islington Wharf

Environmental Statement Appendices

Volume 2 of 2

December 2004

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Continued From Volume 1

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Appendix 14.1 – Technical Summary of the Key Assumptions and Figures Relating to the Risk Posed by the Canal

Ashton Canal Technical Summary

This appendix summarises the findings from the investigations made in to the flood risk posed by the canal on the Islington Wharf Development. It summarises the estimates of volumes, flows and fill times to support the Environmental Impact Assessment document.

Spare capacity volume

This is an estimate of the spare canal volume available between the normal water level and the top of the canal /toe path level. It is provided through the canals freeboard.

Pound 1-2	1,000 m^3
Pound 2-3	1,000 m^3
Pound 3-4	12,240 m^3

Volume of water stored in canal pounds

This is an estimate of the volume of water stored in the canal when at the normal operating water level

Pound 1-2	3,000 m^3
Pound 2-3	3,000 m^3
Pound 3-4	14,000 m^3

Theoretical worst case volume that could be released if Lock 3 failed

Pound 3-4	26,240 m^3

(Normal volume + freeboard)

Lock Flow Rates

Flow rates through the lock structures have been estimated with the lock gates shut

Lock 1

Flow through Lock1 structure with gates closed and water level at canal full

Lock No. 1 (bye wash)	0.6 cumecs
Lock No. 1 (over gate)	0.1 cumecs
Total Lock No. 1	0.7 cumecs

(bye wash + gates)

Lock 2

Flow rates through Lock 2 paddles if left open

Lock No. 2 (paddles)	1.4 cumecs

Time based estimates

Time taken for Lock Structure 1 to pass stated volumes of water downstream to the Rochdale Canal

29,000 m^3	12 hours
2,000 m^3	1 hour

Time taken fro Pound 1 to use up freeboard (spare capacity) volume if gates at Lock 2 were vandalised

25 minutes

Key assumptions

Flow rate through bye wash channel at Lock 1 has been estimated using broad crested weir equations from BS3680
Flow over canal gates at Lock 1 have been estimated using thin plate weir equations from BS3680
Flow rate through paddles of Lock 2 has been based on a fill time of lock structure of 2 minutes
Volume estimate of pounds have been based on approximate plan areas

These calculations are intended as a rough estimate only to quantify approximate volumes and flow rates and are not based on detailed analysis.

CHAPTER 15
Transport and Highways

Appendix 15.1 – Technical Appendices

Islington Wharf
215/01

TIA
Transport and Highways

Introduction

The Site

The Islington Wharf site is located to the North East of the city centre bounded by Manchester's Inner Relief Road, Great Ancoats Street, Old Mill Street, Vesta Street and the Ashton Canal.

Great Ancoats Street is part of the Primary route network and is an element of the very busy Manchester and Salford Inner Relief Road. We have adopted an approach which assumes that we limit the impact on Great Ancoats Street to a sensible minimum.

Old Mill Street, which was once a busy through route into Manchester City Centre connecting directly to the ring road, is currently undergoing a transformation. From Vesta Street up to Weybridge Road its focus is changing, from one of only through traffic to one which also serves the people living, working and visiting the area. The aim is to civilise the road by reducing speeds and changing the priority to favour cyclists and pedestrians which will in turn improve the general environment.

The section of Old Mill Street which runs from Vesta Street to Great Ancoats Street acts as a transition from the heart of New Islington Millennium Village to the Inner Relief Road. The proposal for this section of Old Mill Street is of four lanes as you turn off/ turn onto Great Ancoats Street. This will allow vehicles wishing to turn off Old Mill Street into the Islington Wharf development to do so without impeding vehicles turning off Great Ancoats Street onto Old Mill Street.

It has been agreed with Manchester City Council Highways that we would use and modify the numerical model which had been produced for the New Islington development.

Using the relevant information from the New Islington model an analysis has been carried out to gauge the increase in movement on Old Mill Street and in particular on Great Ancoats Street.

Other factors such as pedestrian and cycle movement, public transport and servicing all play a part in the TIA and have been looked at individually below.

Pedestrian and Cycle Movement

Given its near city centre location, it is anticipated that a significant number of the residents of the apartments might work within Manchester City Centre and therefore would have the choice of walking or cycling.

Pedestrian and cycle movement has been predicted by looking at the existing movement around the site and of new access points, Figure 1.
Figure 2, a walking contour diagram, gives an indication of the distance a pedestrian can walk from the centre of the site in 3 minutes. This shows that the public transport points are extremely close and that the city centre is within a short walk from the centre of the site.

Secure cycle parking will be provided within the development. Completion of Phase One will provide 15% ratio of secure cycle parking.

Public Transport Access

The existing public transport connections have been analysed and are shown on Figure 3.

This site is very well provided for by bus routes in and out of the city along Old Mill Street and Great Ancoats Street. Piccadilly Station is a ten minute walk for trains to all major cities and the existing Metrolink stop. The proposed Metrolink station on Pollard Street is also only a few minutes walk away.

The residential apartments, retail units and hotel will be well served by public transport – major bus corridors, the Metrolink and Piccadilly train station.

Parking

All residential and some retail parking is located within the site. Access to this parking is from Old Mill Street. The proposed residential parking provision ratio for the site is 64%.

The high degree of access to public transport allows a level of private parking provision below 1:1 which is in line with Government guidelines to discourage use of private vehicles. Secure space will be provided in the covered car parks for storage of private bicycles.

Some retail parking will also be provided on site to the rear of the retail units as well as 10 spaces along the edge of the widened footway of Old Mill Street.

Vehicle Movement

The majority of residential and service vehicle movement will take place off Old Mill Street onto the Islington Wharf site at the new junction with a small number of service vehicles using the managed Great Ancoats Street junction. These vehicles will service the small restaurant/bar unit beside the canal and will include delivery of stocks and removal of refuse. All of these service movements will be managed by the operators on site.

Using the New Islington model we have been able to estimate the likely trip generation figures for the completion of the development. We have estimated the likely additional numbers of vehicles on Old Mill Street, both residential and retail, at peak times at the Great Ancoats Street junction and Weybridge Road junction. Figure 4.

As a result of good public transport links and city centre location the traffic generation is likely to be low. The predicted numbers of additional trips from the TIA has been based on the number of apartments and not parking spaces. There is only a 64% provision of parking provided indicating that the traffic generation will be lower than the figures predicted.

Service Access

All vehicles delivering to the site will be managed by the operators on site.

Servicing vehicles will be able to access the site via Old Mill Street into the area of parking behind the small retail unit.

The servicing of the large retail unit will take place on Old Mill Street. The vehicles will be able to drive onto the widened footpath from the access point to the car park on Old Mill Street. The footpath will be modified structurally to allow vehicles to drive over without damage to services in the ground. Vehicles will park up temporarily, parallel to the retail unit to load/ unload and drive off onto Old Mill Street towards the junction with Great Ancoats Street. There will only be one access/ egress point and only room for one large service vehicle at a time. Servicing vehicles from Great Ancoats Street will be able to pull onto the footpath alongside the entrance point until the access point has been opened.
Access and egress will have to be a left turn in, left turn out only due to Great Ancoats Street layout.

We have designed these access/egress points to allow a large rigid vehicle to turn in and out safely. Figures 5 and 6.

Emergency vehicles will be able to access the site at both the Old Mill Street and Great Ancoats Street entrance points.

Model Analysis

From our analysis, at the AM peak hour of 08.00 to 09.00 an additional 58 trips will be generated at the Weybridge Road junction of Old Mill Street and an additional 60 trips at the Great Ancoats Street junction in Option One and 80 and 86 in Option Two. This is an addition of 4.8% in Option One and 6.6% in Option Two to the current figure at the Weybridge Road junction and 1.7% in Option One and 2.3% in Option Two at Great Ancoats Street junction.

At the PM peak hour of 17.00 to 18.00 and additional 65 trips are generated at the Weybridge Road junction and 69 trips at the Great Ancoats street junction in Option One and 105 and 112 in Option Two. This is an increase of 4.8% in

Option One and 7.8% in Option Two to the current figures at Weybridge Road and1.7% at In Option One and 2.8% in Option Two at Great Ancoats Street.

These predicted numbers of additional trips are based on the number of apartments on the development and not the number of parking spaces. As there is only a 64% provision of parking these actual figures should be lower.

It is felt a 100% provision is not necessary as a combination of very good public transport access and close proximity to the city centre will encourage residents and retail users to walk or cycle to and from the site. Good bus routes are available on Old Mill Street, Great Ancoats Street and Pollard Street all of which are within very short walking distance from the site.

Conclusion

Generally the site has been designed to be accessed from Old Mill Street with a very small provision of service access from Great Ancoats Street.

On site parking has been provided at a ratio of 64% for the residential content on the basis of excellent access to public transport and easy access to the city centre.

Some parking for the proposed retail units has been provided on site and a major widening of the existing footpath allows some further parking along the footpath edge without encumbering pedestrian movements.

The likely impact of the additional vehicle movements on the local network and in particular on Great Ancoats Street has been modelled and the impact is found to be insignificant.

Islington Wharf

Option 1
Vehicle Movement Figures Using the TIA
(All figures based on numbers of apartments not parking spaces.)

VESTA STREET
139 apartments
44 parking spaces

- Residential

139 units = 139 trips
Reduction of 40% as city centre = 83 trips

	Arrival	Departure	Total
AM peak	4	19	23
PM peak	16	7	23

- Retail

343m2 unit space = 11 trips
Reduction of 40% as city centre = 8 trips

	Arrival	Departure	Total
AM peak	3	1	4
PM peak	3	4	7

OLD MILL STREET
402 apartments
302 residential parking spaces and 35 retail parking spaces

- Residential

402 units = 402 trips
Reduction of 40% as city centre = 241 trips

	Arrival	Departure	Total
AM peak	12	55	67
PM peak	46	19	65

- Retail (A1 and A3 use)

2005m^2 unit space = 105 trips
Reduction of 40% as city centre = 63 trips

	Arrival	Departure	Total
AM peak	16	8	24
PM peak	17	22	39

VESTA STREET

Residential Units – 139
Residential Parking Spaces - 44

Trip Rates

Residential	Arrivals	Departures	Totals
AM (8-9)	0.05	0.23	0.28
PM (5-6)	0.19	0.08	0.27

Resultant Trip Rates
(with 40% reduction) – 83 trips

Residential	Arrivals	Departures	Totals
AM (8-9)	4	19	23
PM (5-6)	16	7	23

VESTA STREET

Retail Space (A1 and A3 use) – 343m^2

Trip Rates

Retail	Arrivals	Departures	Totals
AM (8-9)	1.3	0.67	1.97
PM (5-6)	1.44	1.84	3.28

Resultant Trip Rates
(with 40% reduction) – 8

Retail	Arrivals	Departures	Totals
AM (8-9)	3	1	4
PM (5-6)	3	4	7

OLD MILL STREET

Residential Units – 402
Residential Parking Spaces – 302

Trip Rates

Residential	Arrivals	Departures	Totals
AM (8-9)	0.05	0.23	0.28
PM (5-6)	0.19	0.08	0.27

Resultant Trip Rates
(with 40% reduction) – 241

Residential	Arrivals	Departures	Totals
AM (8-9)	12	55	67
PM (5-6)	46	19	65

OLD MILL STREET

Retail Space – 2,005m^2
Retail Parking Spaces – 35

Trip Rates

Retail	Arrivals	Departures	Totals
AM (8-9)	1.3	0.67	1.97
PM (5-6)	1.44	1.84	3.28

Resultant Trip Rates
(with 40% reduction) – 1,203m^2

Retail	Arrivals	Departures	Totals
AM (8-9)	16	8	24
PM (5-6)	17	22	39

Additional Vehicles (Residential & Retail) from Islington Wharf and New Islington

	Islington Wharf		New Islington		Total	
	No. of vehicles	% Increase to vehicle figs.	No. of vehicles	% Increase to vehicle figs.	No. of vehicles	% Increase to vehicle figs.
Weybridge Road – AM Peak	58	4.8%	339	22%	396	26.7%
Great Ancoats Street – AM Peak	60	1.7%	245	16%	303	17.6%
Weybridge Road – PM Peak	65	4.8%	193	5%	265	10.3%
Great Ancoats Street – PM Peak	69	1.7%	167	4%	242	5.9%

Islington Wharf

Option II
Vehicle Movement Figures Using the TIA
(All figures based on numbers of apartments not parking spaces.)

VESTA STREET
171 apartments
44 parking spaces

- Residential

171 units = 171 trips
Reduction of 40% as city centre = 103 trips

	Arrival	Departure	Total
AM peak	5	24	29
PM peak	19	8	27

- Retail

343m^2 unit space = 11 trips
Reduction of 40% as city centre = 8 trips

	Arrival	Departure	Total
AM peak	3	1	4
PM peak	3	4	7

OLD MILL STREET
348 apartments
302 residential parking spaces and 35 retail parking spaces

- Residential

348 units = 348 trips
Reduction of 40% as city centre = 209 trips

	Arrival	Departure	Total
AM peak	10	48	58
PM peak	44	17	61

- Retail (A1, A3 and D use)

6338m^2 unit space = 276 trips
Reduction of 40% as city centre = 197 trips

	Arrival	Departure	Total
AM peak	49	25	72
PM peak	55	70	125

VESTA STREET

Residential Units – 171
Residential Parking Spaces - 44

Trip Rates

Residential	Arrivals	Departures	Totals
AM (8-9)	0.05	0.23	0.28
PM (5-6)	0.19	0.08	0.27

Resultant Trip Rates
(with 40% reduction) - 103

Residential	Arrivals	Departures	Totals
AM (8-9)	5	24	29
PM (5-6)	19	8	27

VESTA STREET

Retail Space – 343m^2

Trip Rates

Retail	Arrivals	Departures	Totals
AM (8-9)	1.3	0.67	1.97
PM (5-6)	1.44	1.84	3.28

Resultant Trip Rates
(with 40% reduction) – 12

Retail	Arrivals	Departures	Totals
AM (8-9)	3	1	4
PM (5-6)	3	4	7

OLD MILL STREET

Residential Units – 348
Residential Parking Spaces – 302

Trip Rates

Residential	Arrivals	Departures	Totals
AM (8-9)	0.05	0.23	0.28
PM (5-6)	0.19	0.08	0.27

Resultant Trip Rates
(with 40% reduction) – 209

Residential	Arrivals	Departures	Totals
AM (8-9)	10	48	58
PM (5-6)	44	17	61

OLD MILL STREET

Retail/ Hotel Space (A1, A3 and D use) – 6338m^2
Retail Parking Spaces – 35

Trip Rates

Retail	Arrivals	Departures	Totals
AM (8-9)	1.3	0.67	1.97
PM (5-6)	1.44	1.84	3.28

Resultant Trip Rates
(with 40% reduction) – 3803m^2

Retail	Arrivals	Departures	Totals
AM (8-9)	49	25	74
PM (5-6)	55	70	125

Additional Vehicles from Islington Wharf and New Islington

	Islington Wharf		New Islington		Total	
	No. of vehicles	% Increase to vehicle figs.	No. of vehicles	% Increase to vehicle figs.	No. of vehicles	% Increase to vehicle figs.
Weybridge Road – AM Peak	80	6.6%	339	22%	417	28.4%
Great Ancoats Street – AM Peak	86	2.3%	245	16%	327	18.3%
Weybridge Road – PM Peak	105	7.8%	193	5%	297	12.8%
Great Ancoats Street – PM Peak	112	2.8%	167	4%	276	6.7%



Notes:

This drawing is to be read in conjunction with all relevant Architects' and Engineer's drawings and the specification.

All dimensions are to be verified by the contractor on site. Any discrepancies should be referred to the C.A. prior to commencement of the works.

Key:

Existing access points and pedestrian routes.

New access points and new strong pedestrian link.

Proposed introduction of pedestrian crossing or existing crossing might need to be improved.

DATE:	REV:	DESCRIPTION:	DRWN:	CHKD:
17.11.04	P01	Issued for Information	LS	MS

Martin Stockley Associates
CONSULTING ENGINEERS
MANCHESTER LONDON BATH
www.martinstockleyassociates.co.uk

PROJECT:
Islington Wharf

TITLE:
Site Plan
Pedestrian Routes To and From the Site

STATUS:
INFORMATION

SCALE:	DATE:	DRAWN:	CHECKED:
1:2500	March 04	VP	MS

JOB No:	DRG. No:	REV:
215/01	SK (03)	P01

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Notes:

This drawing is to be read in conjunction with all relevant Architect's and Engineer's drawings and the specification.

This drawing should not be scaled.

All dimensions are to be verified by the contractor on site. Any discrepancies should be referred to the C.A. prior to commencement of the works.

3 Minutes

Note: Piccadilly Station is a 10 minute walk from the starting point

-5m 0m 25m

DATE:	REV:	DESCRIPTION:	DRWN:	CHKD:
17.11.04	P01	Issued for information	LS	MS

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CONSULTING ENGINEERS
MANCHESTER LONDON BATH
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PROJECT:
Islington Wharf

TITLE:
3 Minute
Walking Contours

STATUS:
INFORMATION

SCALE:	DATE:	DRAWN:	CHECKED:
1:1000	April 04	LS	VP

JOB No:	DRG. No:	REV:
215/01	(SK) 01	P01

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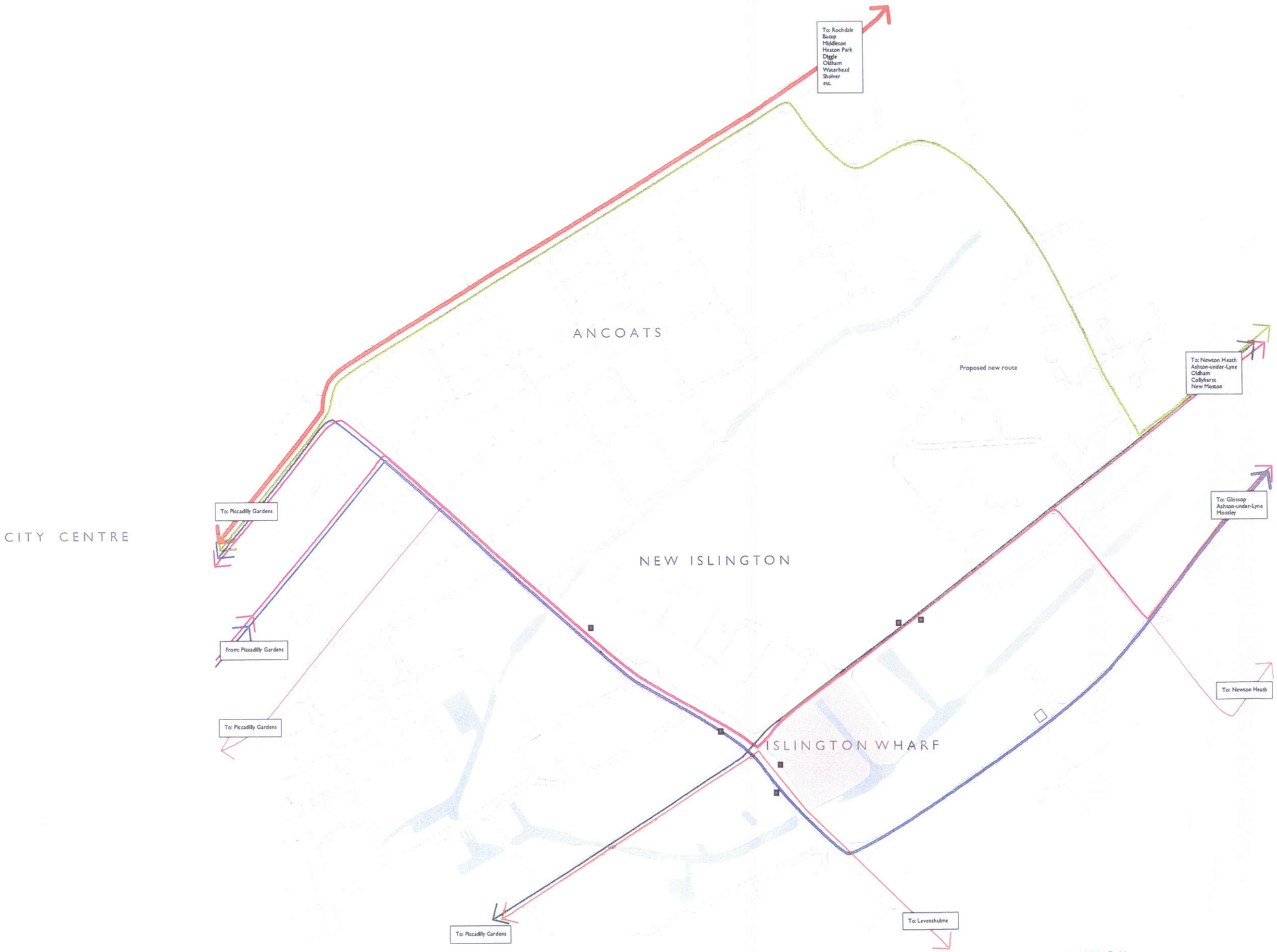

Notes:

This drawing is to be read in conjunction with all relevant Architect's and Engineer's drawings and the specification.

All dimensions are to be verified by the contractor on site. Any discrepancies should be referred to the C.A. prior to commencement of the works.

Key:

Existing bus routes

Existing bus stop

DATE:	REV:	DESCRIPTION:	DRWN:	CHKD:
17.11.04	P01	Issued for Information	LS	MS

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PROJECT:
Islington Wharf

TITLE:
Site Plan
Public Transportation Routes
Bus Routes

STATUS:
INFORMATION

SCALE:	DATE:	DRAWN:	CHECKED:
1:2500	April 04	LS	MS

JOB No:	DRG. No:	REV:
215/01	SK (04)	P01

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CHAPTER 16
Ecology

Appendix 16.1 – Correspondence with Greater Manchester Ecology Unit, Greater Birds Database and South Lancashire Bat Group

APPENDIX

Contents

a - Desktop Study Response from Greater Manchester Ecology Unit

b - South Lancashire Bat Group Records

c - Greater Manchester Bird Database Records

a

Desktop Study Response from Greater Manchester Ecology Unit

GREATER MANCHESTER ECOLOGY UNIT

Council Offices, Wellington Road,
Ashton-under-Lyne, Tameside OL6 6DL

Telephone: 0161 342 3597
Fax: 0161 342 3599
E-mail: gmeu@[redacted]tameside.gov.uk

Principal Ecologist
Derek Richardson M.I.E.E.M

27 APR 2004

·A·G·M·A·
ASSOCIATION OF GREATER MANCHESTER AUTHORITIES

Your ref HH/HH/040307
Our ref DR/0999-0619-04
Doc ref MJE/DR21-1
Contact Derek Richardson
Date 21ST April 2004

Helen Hamilton
Senior Ecologist
Penny Anderson Associates Ltd
Park Lea
60 Park Road
Buxton
Derbyshire SK17 6SN

Dear Ms Hamilton

DATA REQUEST – ISLINGTON WHARF, MANCHESTER

There are two Sites of Biological Importance located in the area of search:

1) Rochdale Canal, Stotts Lane – Ducie Street Basin
2) Ashton Canal (West)

Both canals support important populations of floating water plantain (*Luronium natans*) and important assemblages of pondweed species.

There are three other species of note recorded in the search area:

i) There is a known pipistrelle bat roost 200m away from the development site. For further details contact the South Lancashire Bat Group (Steve Parker, 14 Kent Drive, Bury BL9 9DL).

ii) Black Redstarts have been recorded close to the development site.

iii) As you mention, the plant *Potamogeton compressus* is found in the short canal section within the site. We hold no other records for this plant in central Manchester.

Please note that a lack of retrieved records does not imply the absence of a particular species.

I have enclosed an invoice for £41.12 (incl. VAT). If further details of the SBI's are needed, these are available for a further fee of £25/SBI.

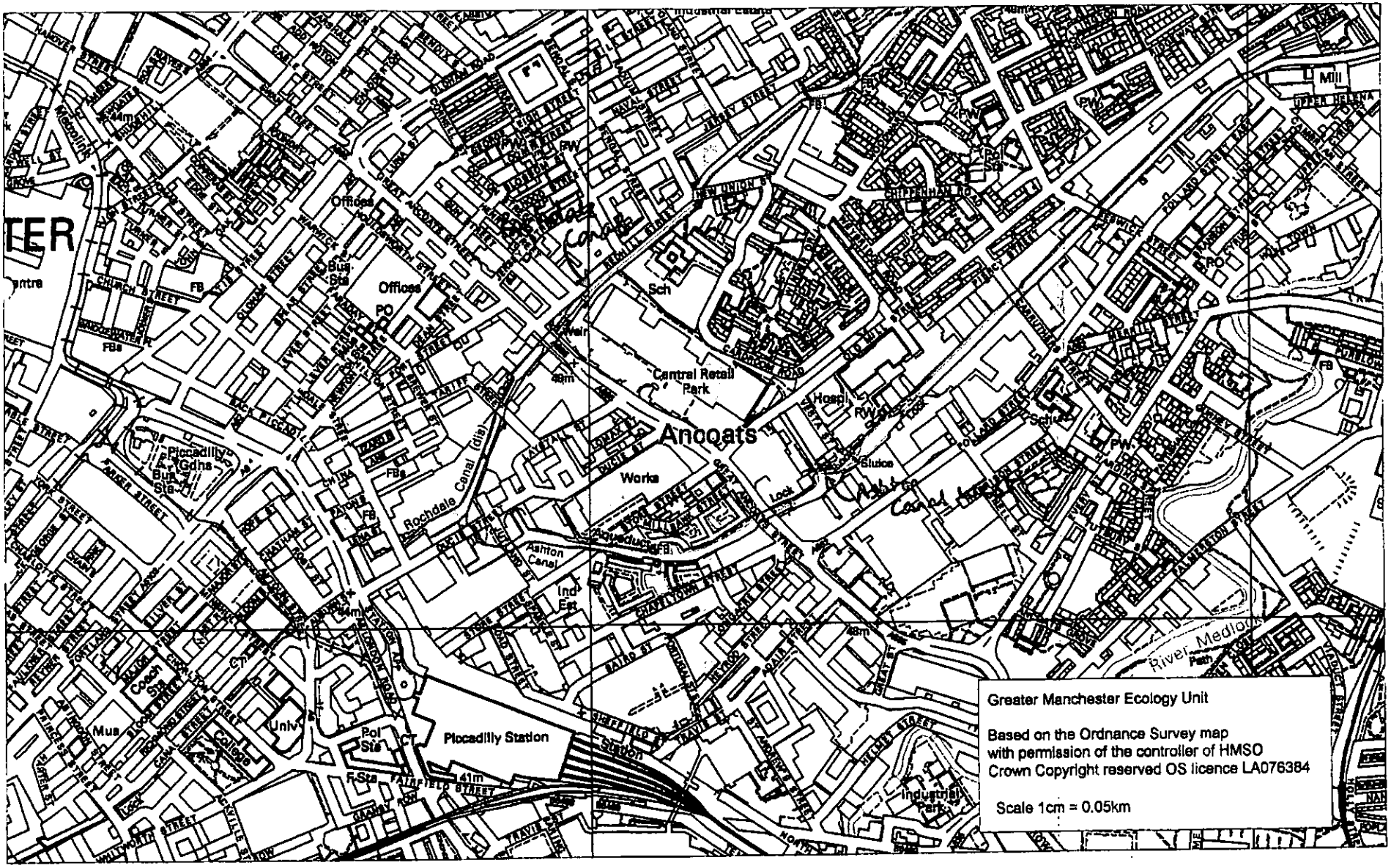
If you have any further queries, please do not hesitate to contact me.

Yours sincerely,

Derek Richardson

DEREK RICHARDSON M.I.E.E.M
PRINCIPAL ECOLOGIST

Encs


Greater Manchester Ecology Unit
Based on the Ordnance Survey map
with permission of the controller of HMSO
Crown Copyright reserved OS licence LA076384
Scale 1cm = 0.05km
Piccadilly Station
Piccadilly Gdns Bus Sta
Central Retail Park
Ancoats
Rochdale Canal (dis)
Ashton Canal
River Medlock
Industrial Park

GREATER MANCHESTER ECOLOGY UNIT
Council Offices, Wellington Road,
Ashton-under-Lyne, Tameside OL6 6DL

Telephone: 0161 342 3596
Fax: 0161 342 3599
E-mail: gmeu@tameside.gov.uk

Principal Ecologist
Derek Richardson M.I.E.E.M.

26 MAY 2004

A·G·M·A
ASSOCIATION OF GREATER MANCHESTER AUTHORITIES

Helen Hamilton
Senior Ecologist
Penny Anderson Associates Ltd
Park Lea
60 Park Road
Buxton
Derbyshire SK17 6SN

Your ref	*ISIS01*
Our ref	*MJE/0999-0644-04*
Doc ref	*MJE/25-1*
Contact	*Mandy Elford*
Date	*25th May 2004*

Dear Helen

ASHTON CANAL (WEST) – SITE OF BIOLOGICAL IMPORTANCE

Please find enclosed the citation sheets for the above SBI, together with a Conditions of Use form which should be signed and returned to this office at your earliest convenience. An invoice for this service of £25 plus VAT is also enclosed.

Yours sincerely

MANDY ELFORD
GMEU

Encs

SITES OF BIOLOGICAL IMPORTANCE IN GREATER MANCHESTER

Greater Manchester Ecology Unit

Council Offices, Wellington Road, ASHTON-UNDER-LYNE OL6 6DL

(Private & Confidential)

SITE NAME : Ashton Canal (West)		**DISTRICT** : Manchester
LOCATION : Openshaw to Ancoats	**GRID REF** : SJ890979 – SJ848981	**GRADE** : A

SITE LOCATION MAP (1:25000)

Based on Ordnance Survey Map with permission of the Controller of H.M.S.O. Crown copyright Reserved.



CD: SBI MAPS/CURRENT SBI MAPS/F-MANCHESTER/F34-4

Date: 21.5.01

SITES OF BIOLOGICAL IMPORTANCE IN GREATER MANCHESTER
Greater Manchester Ecology Unit
Council Offices, Wellington Road, ASHTON-UNDER-LYNE OL6 6DL
(Private & Confidential)

SITE NAME Ashton Canal (West)		**DISTRICT** : Manchester
LOCATION Openshaw to Ancoats	**GRID REF** SJ890979 - SJ848981	**GRADE** : A

SITE DESCRIPTION

Navigable canal, dredged in early 1970's and reopened in 1974, important for its submerged aquatic flora, despite reasonably heavy usage.

The canal contains locally abundant perfoliate pondweed, curly pondweed, hair-like pondweed, broad-leaved pondweed, fennel pondweed, Nuttall's pondweed, spiked water milfoil, least bur-reed, arrowhead and common water plantain. Water violet has also been recorded from one location. The European Protected Species floating water plantain (*Luronium natans*) is also present in the canal.

Fringing vegetation recorded includes marsh woundwort, water mint, angelica, broad buckler fern, water forget-me-not, fool's watercress, gipsywort, common skullcap, reed sweet-grass, bulrush (*Typha latifolia*), great hairy willowherb, remote sedge, ground elder and nettle. The invasive Japanese knotweed has also been recorded.

An arm of the canal called the Islington Branch was found to support populations of both floating water plantain and the nationally scarce grasswrack pondweed as well as arrowhead, broad-leaved pondweed and least bur-reed and has been included within the SBI boundary. Both floating water plantain and grasswrack pondweed are UK Priority Biodiversity Species. Grasswrack pondweed has also been located at Ducie Wharf in 2001.

The canal is said to be rich in invertebrate life, with common blue damselfly, blue-tailed damselfly, large brown hawker, emperor dragonfly and broad bodied chaser dragonfly recorded. Other invertebrates recorded include great ramshorn snail, wandering snail, mayfly, water louse, pond skater, water boatman, leaches, watermite and various species of water flea. Small copper and large white butterflies have also been recorded.

Birds observed during the current site visit include moorhen and Canada goose. Fish recorded include perch, tench, roach, bream, carp, chubb and occasional pike. There are reports of breeding smooth newt.

SITES OF BIOLOGICAL IMPORTANCE IN GREATER MANCHESTER
GREATER MANCHESTER ECOLOGY UNIT
COUNCIL OFFICES, WELLINGTON ROAD, ASHTON-UNDER-LYNE OL6 6DL
(PRIVATE & CONFIDENTIAL)

SITE NAME : Ashton Canal (West)			**DISTRICT** : Manchester
LOCATION : Openshaw to Ancoats			**GRID REF** : SJ890979 – SJ848981
GRADE : A	**AREA (HA)** : 8.5 (5km)	**ALTITUDE (M)** : 60-80	**DATE** : 21.5.01
STATUS :	**SURVEYOR** : S Waymont		**INITIAL SURVEY DATE** : 9.6.85
NO OF REVISIONS : 3	**OWNER** : BW		**DISTRICT REF** : F34

HABITATS PRESENT	Area (ha)	FEATURES OF INTEREST	Importance
Woodland broadleaved (semi-nat)		Vegetation type	3
Woodland plantation		Ferns	1
Scrub		Bryophytes	
Acid grassland	0.1	Fungi	
Neutral/basic grass (species-rich)		Mammals	
Neutral/basic grass	1.9	Birds	1
Tall herbaceous		Amphibia	1
Ericaceous heath		Reptiles	
Bog		Lepidoptera	1
Marsh/fen	0.1	Odonata	2
Reedbed	1.0	Other invertebrates	2
Lake/pond/dam		Geological	
Canal	5.4	Other: fish	1
River/stream/ditch		Other	
Quarry/cliff/rock/wall			
Ruderal			
Other			

AREA
Areas of habitat covering less than 0.1ha. recorded as 0.01

IMPORTANCE
Blank - Not known 1 - Small but significant
2 - Substantial 3 - Great

COMPLETE FOR GAINS AND PARTIAL LOSSES ONLY

Loss since Last Survey : 0	Loss since First Survey : 9.0
Primary cause :	Secondary cause :
Gain since Last Survey : 6.2	Gain since First Survey : 6.2
Primary cause : Technical gain – more accurate mapping tool	Secondary cause : Resurvey
Net change since Last Survey : +6.2	Net change since First Survey : -2.8

Ref: CURRENT SBIS/MANCHESTER/F34/F34-3

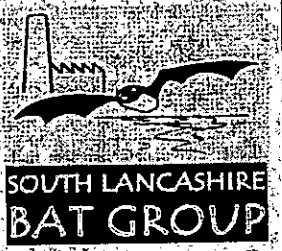
Date: 21.5.01

b

South Lancashire Bat Group Records

South Lancashire Bat Group Report

Attn.: Max Robinson
PAA
Park Lea
60, Park Road,
Buxton
Derbyshire
SK17 6SN



Chair
Martin Prescott
330, Hollins Lane
Hollins
Bury
BL9 8BS
Equiries@slbg.org.uk

South Lancs
Bat Group
Ref : PAA.2.2004

4.5.2004

Bat Records For : Islington Wharf, Manchester
REF.: HH/HH/040308

Neither the general area around the site, or the site itself on your plan has been surveyed for bats, however casual sightings have been found in the area around your site as detailed below.

Please Note: These records are to be used only for the specific survey requested.

Bat Species	Date	Grid Ref.	Detail
Pipistrelle	9.9.2003	SJ860989	Ancoats, M/c - feeding
"	18.7.2001	SJ8597	Beswick, M/c - sighting
"	23.4.1996	SJ841975	M/c City Centre - casualty
"	25.6.1996	SJ844976	" - sighting
"	8.1.1997	SJ839983	" - casualty
"	25.8.1997	SJ845975	" - caught
"	25.8.2000	SJ841981	" - caught
"	18.9.2001	SJ838982	" - caught
"	1.8.2002	SJ839986	" - casualty
"	7.8.2002	SJ847982	" - caught
"	10.3.2003	SJ840976	" - sighting
"	18.3.2003	SJ841981	" - caught
"	16.1.1998	SJ845966	M/c University, Oxford Rd. - casualty
"	24.9.1998	SJ9496	" - possible roost

Please note : Lack of records does not indicate that bats do not use the area but simply that they have not been reported to the Bat Group.

If you have any queries about this report please contact : Kathryn Berry on 01204 332197 or e-mail *kath.berry@bolton.gov.uk*

c

Greater Manchester Bird Database Records

KEY TO ABBREVIATIONS USED IN PRINTOUTS FROM THE GREATER MANCHESTER COUNTY BIRD DATABASE

The categories used to describe the possible, probable or proved breeding are those established by the European Ornithological Atlas Committee in 1979 and the BTO has adopted a series of letter codes (shown in the printouts) which correspond with the categories.

ACT = Activity

FO	Flying over	**FNE**	Flying North East
FN	Flying North	**FNW**	Flying North West
FS	Flying South	**FSW**	Flying South West
FE	Flying East	**FSE**	Flying South East
FW	Flying West		

Br = Breeding

Present

O – **Observed** in breeding season

Possible

H Species observed in breeding season in possible nesting **habitat**

S **Singing** male(s) present or breeding calls heard in breeding season

Probable

P **Pair** in suitable habitat in breeding season

T Permanent **territory** presumed through registration of territorial behaviour (song etc.) on at least two different days, at least a week apart, at the same place

D **Display** and courtship

N Visiting possible **nest** site

A **Agitated** behaviour or anxiety calls from adults

I Brood patch on adult examined in hand indicating probable **incubating**

B **Building nest** or excavating hole

Confirmed

DD **Distraction display** or injury feigning

UN Used nest or egg shells found (occupied or laid within the survey period)

FL Recently **fledged** young (nidicolous species) or downy young (nidifugous species)

ON Adults entering or leaving nest site in circumstances indicating **occupied nest** (including high nests or nest holes, the contents of which cannot be seen) or adult sitting on a nest

FY Adults carrying **food** for **young** or faecal sacs

NE **Nest** containing **eggs**

NY **Nest** with **young** seen or heard

Plm = Plumage

V	Various age/sex/flock	**S**	1st Summer
J	Juvenile	**T**	2nd Summer
A	Adult	**U**	3rd Summer
I	Immature	*Sex*	
1	1st Winter	**M**	Male
2	2nd Winter	**F**	Female
3	3rd Winter	**P**	Pair
4	4th Winter		

A number (may include the letter c before it or the symbol + after it) preceding the place seen is the number of birds seen.

In Comments line, if a **BBS square** is the site, the numbers separated by a slash indicate the numbers seen on each of the two visits (first visit normally mid April to mid May, 2nd visit mid May to mid June) The two dates are given.

WWT Winter Wildfowl Counts (WeBS): where these are included, the observers is given as Webs and the number present is always 1+. In the Comments line, the actual counts are given for each month eg S12 is 12 on the Sept. count.

Black Redstart 1 Manchester City Centre /06/01 ①
Act B Br S Plm GRef SJ835988
John Ireland
singing from Mr Toms chophouse on Corporation St about 2 wks prior to
9 July per DS-stopped when building work began

Black Redstart 1 Manchester City Centre 06/06/01
Act B Br S Plm 1S GRef SJ835988
Pete Berry
Kennedy St/Cooper St- 3rd day

Black Redstart 1 Manchester City Centre 06/06/01
Act B Br S Plm GRef SJ835988
David Steel
brief song from rear of Exchange Station - not refound

Black Redstart 1 Manchester City Centre 07/06/01
Act B Br S Plm GRef SJ835988
David Steel
on buldings adj Princess St seen from canal

Black Redstart 1 Manchester City Centre 08/06/01
Act B Br S Plm GRef SJ835988
David Steel
on buldings adj Princess St seen from canal

Black Redstart 1 Manchester City Centre 10/06/01
Act B Br S Plm GRef SJ835988
D id Steel
St Anne's Sq - only heard

Black Redstart 1 Manchester City Centre 11/06/01
Act B Br S Plm GRef SJ835988
David Steel
Princess St by Union PH and Whitworth St junction

Black Redstart 1 Trinity, Central M/Cr 11/06/01 ②
Act B Br S Plm GRef SJ835990
David Steel
possibly another back of old Exchange station but could not verify

---

Black Redstart 2 Manchester City Centre 17/06/01
Act B Br S Plm P GRef SJ835988
Judith Smith
1st S m and f present, prob also 1st S - canal at Whitworth St

---

Report prepared on 26 Apr 2004 using AVIANSTORE bird recording software
(c) Wes Halton

Black Redstart — 1 Dale St Car Park — 20/05/99-20/06/99
Jeff Clarke — Act — Br — Plm M/1S — GRef SJ847982
Lever St area

Black Redstart — 1 Dale St Car Park — 25/05/99
Anthony Phelps — Act B — Br S — Plm — GRef SJ847982
corner of Farraday and Newton St

Black Redstart — 1 Manchester City Centre — 09/06/99-10/06/99
David Steel — Act B — Br S — Plm — GRef SJ835988
singing at Basil House, 1 Portland St

Black Redstart — 1 Manchester City Centre — 12/06/99-17/06/99
Jeff Clarke — Act — Br — Plm M/A — GRef SJ835988
Dickinson St

Black Redstart — 1 Manchester City Centre — 14/06/99
Observer Nk — Act — Br — Plm — GRef SJ835988
singing Basil House, Portland St

Black Redstart — 1 Manchester City Centre — 15/06/99-16/06/99
Observer Nk — Act B — Br S — Plm — GRef SJ835988
Basil House, Portland St

Black Redstart — 1 Dale St Car Park — 16/06/99
Birdline Nw — Act F — Br — Plm — GRef SJ847982

Black Redstart — 1 Manchester City Centre — 16/06/99
Birdline Nw — Act B — Br S — Plm — GRef SJ835988
Dickinson St/Goerge St, same as Basil House, Portland St, heard by D
Steel for a week there

Black Redstart — 1 Manchester City Centre — 16/06/99
Birdline Nw — Act B — Br S — Plm 1S — GRef SJ835988
Royal Mail, Lever St

Black Redstart — 1 Manchester City Centre — 16/06/99
Vaughan Grantham — Act — Br — Plm — GRef SJ835988
George St/Dickinson St

Black Redstart — 1 Dale St Car Park — 17/06/99-18/07/99
T y O'mahoney, — Act — Br — Plm I/M — GRef SJ847982
Tariff St these dates

Black Redstart — 1 Dale St Car Park — 19/06/99
Judith Smith — Act B — Br S — Plm 1S — GRef SJ847982

Black Redstart — 2 Dale St Car Park — 23/06/99
A Phelps — Act — Br — Plm M — GRef SJ847982
AP saw a proper black male moving between here at Lever St; we saw a
1st S m singing Dale St CP 20th June

Black Redstart — 1 Manchester City Centre — 01/07/99
Tony Coatsworth — Act — Br — Plm — GRef SJ835988
Portland St

Black Redstart 1 Dale St Car Park 04/07/99
Judith Smith Act B Br S Plm M/1S GRef SJ847982 (1)
Little Pitt St

Black Redstart 1 Salford (General) 13/07/99
J. Peter Day Act Br Plm GRef SD820970 (2)
on Pen & Wig pub opp station; not sexed, not singing

Black Redstart 1 Salford (General) 14/07/99
J. Peter Day Act Br Plm GRef SD820970
on Pen and Wig derelict Pub, opp Salford station

Black Redstart 1 Dale St Car Park 19/07/99-03/09/99
Anthony Phelps Act Br Plm F GRef SJ847982 (3)
was this a female or the 1S male?? (AP not familiar with sp.) but a very late date - these 2 dates only

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Report prepared on 26 Apr 2004 using AVIANSTORE bird recording software
(c) Wes Halton

Appendix 16.2 – Floating Water Plantain Action Plan

FLOATING WATER PLANTAIN (*Luronium natans*)

DESCRIPTION

General Ecology

Floating water plantain is a rare aquatic perennial plant that is endemic to Europe. The species usually occurs as an inconspicuous, submerged plant with rosettes of grass-like leaves, often surviving in deep water. It can also be found as a floating-leaved plant with distinctive oval leaves and white flowers. It can occur with great local abundance because it reproduces vegetatively to form dense colonies. The species appears to have poor competitive ability and in more eutrophic waters it seems to require disturbance to prevent succession and enable it to survive. In the more open structured vegetation of nutrient poor waters, it is more able to survive within a limited and species-poor community of plants.

The submerged form tends to be found at a depth of between 0.5m and 4m in nutrient-poor lakes and pools, or in shallower water where there is a degree of disturbance. The floating leaved flowering form acts more like a ruderal colonist and has a tendency to be associated with shallower waters characterised by high light levels and open conditions associated with changing environmental conditions. However, little is known of its life cycle and research continues to improve knowledge on its habitat requirements and management

Key Habitats

Throughout the country, floating water plantain is found in deep lakes, ditches, rivers and canals, with a distinct preference for nutrient poor sites such as acidic and oligotrophic lakes.

Management Requirements

Floating water plantain requires very specific management of its habitat in order to survive in canals.

Too little disturbance to the waterway and the habitat becomes dominated by highly competitive species, such as reed sweetgrass, which suppress its growth. Too much disturbance, particularly from propeller driven recreational boat traffic and the plant cannot survive. It therefore requires careful management that creates disturbance but not in excess.

CURRENT STATUS

International

Floating water plantain is listed on Annexes II & IV of the EC Habitat Directive and Appendix I of the Bern Convention.

National

It is on the Priority List of globally threatened/declining species in the UK Biodiversity Steering Group Report.

Greater Manchester Resource and Distribution

In Greater Manchester floating water plantain largely occurs in canals including the Ashton Canal SBI, the Rochdale Canal SSSI and cSAC and the Peak Forest Canal SBI. It also occurs in the Huddersfield Narrow Canal SSSI/SBI, but it is not as prolific as it once was, although there is evidence that it is recurring since the restoration of the canal. It was formally recorded in the Hollinwood Branch Canal SSSI/SBI. It also occasionally occurs in upland lakes/pools.

Legal

Floating water plantain is listed on Annexes II & IV of the EC Habitat Directive and Appendix I of the Bern Convention.

In Britain floating water plantain is protected under Schedule 4 of the Conservation (Natural Habitats, etc.) Regulations 1994 and Schedule 8 of the Wildlife and Countryside Act.

The following sites receive a degree of protection as SSSIs:

Hollinwood Branch Canal SSSI
Huddersfield Narrow Canal SSSI.
Rochdale Canal SSSI/cSAC

CURRENT FACTORS AFFECTING THE SPECIES

International

There is a commitment by EU countries to conserve the species. This is presently undertaken through the legal mechanism of the Habitats and Species Directive.

National

From the national SAP:

- The main threat to canal populations is from the re-opening of waterways, with subsequent high levels of motorised recreational boat traffic. This can directly suppress growth of the plant through increased turbidity of the water.

- Water acidification.

Physical habitat destruction, often of a temporary nature, can reduce the potential for colonisation. Dewatering of canals and river engineering threaten some surviving populations.

In addition, there are a number of factors affecting canals and other water bodies that are relevant:

Positive factors	Negative factors
Development of conservation guidelines by British Waterways and the Environment Agency.	Large scale developments such as marinas.

Positive factors	Negative factors
Commitments made by bodies such as British Waterways and the Environment Age ncy with regard to conservation of the species.	Development of plant succession where lack of disturbance is a factor; this has led to the loss of open water and associated species in some localities.
	Eutrophication of water resulting from human use of waterways.
	Growth and management of invasive alien species such as *Crassula helmsii.*
	Growth and management of native species such as *Typha latifolia, Glyceria maxima*.
	Fluctuation of water levels from maintenance activities and poor use/misuse of locks.
	Pollution from adjacent agricultural and industrial sources.

Greater Manchester

Most of the factors in the National list above are relevant for Greater Manchester, in particular:

- The reopening of the Rochdale Canal and the Huddersfield Narrow Canal for navigation are likely to have some impact on the species; the extent of this is not yet clear. However, the Appropriate Assessment of the Rochdale Canal found that there would no impact on the integrity of the site. It is likely that an increase in boat traffic on the canals could affect the floating water plantain populations and careful conservation measures will need to be taken.

- Natural vegetation succession can result in a loss of plant populations.

- Canal dredging creates problems such as loss of aquatic vegetation. However, mitigation and avoidance measures can be incorporated into working practices.

- Invasion by non-native species such as *Crassula helmsii,* Japanese Knotweed and Himalayan Balsam can swamp aquatic plants or result in the decrease of diversity of marginal vegetation.

- There is potential for colonies of floating water plantain, such as that at Wilderness Quarry in Rochdale, to come under threat from development.

LONG TERM TRENDS AND POTENTIAL THREATS

Changes to drainage patterns in watershed across the country, for example through changing rainfall patterns and management of flood defences, may well affect levels of disturbance in slower flowing rivers. The impact of climate change on such environmental factors is, as yet, unclear.

CURRENT ACTION

International

Four sites in England containing this species have been proposed as candidate SACs under the EC Habitats Directive. The Rochdale Canal is now a candidate SAC as a result of internationally significant populations of floating water plantain.

National

- A species action plan has been prepared for floating water plantain as part of the UK Biodiversity Action Plan. A steering group, made up of representatives from British Waterways, The Countryside Council for Wales, English Nature, Scottish Natural Heritage, the National Museum of Wales, the universities of Loughborough, Liverpool and Glasgow and the Environment Agency, has been established to oversee the implementation of the SAP.
- CCW carried out a survey of lakes in North Wales in 1994 which confirmed the presence of this species at a number of sites.
- Ecological surveys in 1997/8 reconfirmed the presence of floating water plantain in the Montgomery, Huddersfield Narrow and Huddersfield Broad canals.
- English Nature commissioned the University of Hertfordshire to survey Canals and Meres in the Midlands in 1999.
- CCW and EN are liaising with British Waterways to produce management guidelines for canals containing this plant.
- Recent genetic studies have indicated the importance of Welsh Lakes as source sites for this plant.
- Isozyme work has been carried out on Welsh populations to study genetic relationships and therefore translocation issues. Further studies on English populations are proposed to determine their origin.
- British Waterways has published a BAP which includes a species action plan for floating water plantain.
- British Waterways has undertaken the relocation of individual plants to refuge sites as part of the restoration of the Montgomery Canal.
- English Nature is in the process of developing detailed conservation objectives and assessment guidelines for all SSSIs. These guidelines will enable more accurate monitoring of the condition of SSSIs, including habitats such as canals.

Greater Manchester

- A Site Management Statement has been agreed by English Nature and British Waterways for the Huddersfield Narrow Canal SSSI
- A biodiversity-style management plan is being developed for the Huddersfield Narrow Canal SSSI.
- In addition to the British Waterways' Environmental Code of Practice Appraisal process, all work affecting floating water plantain requires a DEFRA licence. British Waterways has developed standard impact avoidance measures and translocation methods and has a licence from DEFRA that ensures that floating water plantain is addressed during operational activities.

OBJECTIVES

National

Favourable Conservation Status in Canals

It is important to note that the current understanding of the requirements of Floating water plantain are being continually updated. Therefore, the attributes and targets set for maintaining the favourable conservation status of the species are likely to change as new research and information becomes available. The programme outlined is extensive and focuses on identifying key issues and removing any 'noise' from the monitoring work. Therefore, as baseline data is accumulated and interpreted it may be appropriate to reduce or stop monitoring certain attributes. This will be undertaken on an iterative basis in consultation with English Nature.

Subject to natural change, to maintain the habitat of floating water plantain in favourable condition. Favourable condition is achieved when the following criteria have been met:

- Annual mean pH 6 to 8
  Annual mean total phosphorous (15) 35 ~ 50 (65) μ g l□'
- Water level fluctuations are minimised during April to October (inclusive)
- Water clarity is maximised (Minimise turbidity)
- Preferred sediment type and depth are maintained – within confidence limits yet to be determined.
- Current proportions of floating leaves, spatulate leaves, basal rosettes and flowers are maintained within confidence limits yet to be determined
- Existing status of floating water plantain within community is maintained, within confidence limits (yet to be determined),
- Populations of invasive species (e.g. *Glyceria maxima, Elodea canadensis/nuttalli, Crassula helmsii*) are limited to benefit species of conservation concern
- A maintenance regime is adopted that maintains and, where possible, enhances the current population of floating water plantain and its supporting community within confidence limits yet to be determined.

- Engineering works are carried out to restore canal, phasing works affecting floating water plantain, and its supporting community. (Opportunities for conserving populations of floating water plantain are maximised in on-line and offline refuges such as wide sections, basins, and side-arms.)
- Navigation levels which allow existing status of floating water plantain within community are maintained within confidence limits (yet to be determined),
- Boat numbers are being managed to assess the effect of boat traffic in areas of Floating water plantain and its supporting community. Boat traffic will be modified in an iterative manner if damage occurs.
- A traditional mixed, coarse fishery exists that does not compromise existing aquatic community interest

In addition, there are more general objectives from the national SAP:

- Maintain the present range.
- Where the potential exists, increase the size of individual populations.
- Restore populations to former sites.
- Extend the geographical range of the species.

Greater Manchester

The objective developed for national use is suitable for use in Greater Manchester. The Rochdale Canal will be assessed using the national objective automatically, as it is an SSSI and cSAC.

The objective may require a slight alteration for use when assessing populations in non-canal sites (e.g. oligotrophic upland reservoirs and ponds).

TARGETS

The criteria in the objective provide measurable targets. This approach follows national guidance.

PROPOSED ACTION

Action	Lead body	Timetable for Action
1. Policy		
Ensure the importance of floating water plantain and its habitats are recognised and site protection policies are included in appropriate plans and strategies e.g. UDP, Community Strategies, nature conservation strategies, supplementary planning guidance.	**EN/GMEU/ LA's'/BW/ EA**	**2006**
Produce/update Supplementary Planning Guidance notes for floating water plantain	**LAs/BW**	**Ongoing**

Action	Lead body	Timetable for Action
Ensure all planning applications are adequately assessed in relation to their impact on floating water plantain: that loss or damage is avoided and that opportunities are taken for enhancement.	**LA's/WTs**	**Ongoing**
Ensure that UDPs take full account of the UK Biodiversity Action Plan, A Biodiversity Audit for North West England and the Greater Manchester Biodiversity Action Plan.	**LAs/EN/ GMEU**	**2006**
2. Site and Species Safeguard		
Give full consideration to inclusion of all floating water plantain sites within the SBI or LNR series.	**GMEU/EN/ LAs**	**2007**
Ensure that all the best examples of floating water plantain sites are protected by recognised designations.	**EN/GMEU/ BW**	**2007**
Identify and secure areas for potential expansion of floating water plantain (to reduce isolation and fragmentation of sites).	**All BAP Partners**	**2006**
Contribute to the implementation of relevant species and habitat action plans associated with floating water plantain.	**All BAP partners**	**Ongoing**
Ensure regular review of floating water plantain habitats.	**BW/GMEU**	**Ongoing**
Undertake management to control undesirable species e.g. to bring species to within acceptable limits.	**BW/WTs/ LAs**	**Ongoing**
3. Land management		
Promote and encourage positive management where floating water plantain is known to occur with landowners, occupiers and voluntary conservation bodies through long-term conservation management plans or agreements.	**All BAP Partners**	**Ongoing**
Complete or update existing conservation management plans to promote long-term positive management of floating water plantain habitats with land owners/occupiers and voluntary conservation bodies.	**All BAP Partners**	**Ongoing**
4. Advisory		
Develop and promote training on the conservation and management of floating water plantain. Training to be targeted at those involved in canal management and other habitat supporting the species. **Note:** training for those involved in habitat management can be combined with training for management of this species.	**BW**	**Ongoing**

Action	Lead body	Timetable for Action
Establish a small number of demonstration sites to show good practice in floating water plantain conservation and management.	**BW/EN/ Identified by GM Biodiversity Project**	**2008**
Provide advice to those involved in floating water plantain site management on appropriate management regimes for the species and its habitats. Ensure guidelines widely available and accessible to interested parties.	**All BAP partners**	**Ongoing**
Make information available through a range of media e.g. Internet, booklets at a number of locations.	**All BAP partners**	**Ongoing**
5. Future Research and Monitoring		
1. Collate existing records and identify gaps in knowledge of floating water plantain. 2. If necessary undertake survey of floating water plantain using standardised and repeatable methodology.	**Relevant GMBAP Working Group** **All BAP Partners**	**2004** **Start 2004**
Establish and maintain a central register of all floating water plantain sites including details of the condition of associated habitats and potential expansion areas. Make this information available to key partners.	**GMEU/ Bolton Museum**	**2004**
Develop and refine methods for defining and assessing the condition of floating water plantain and the effectiveness of conservation management. Seek to incorporate these into site management plans.	**Relevant GMBAP Working Group**	**2005**
Contribute to increasing information on UK floating water plantain by submitting information from GM register to National Biodiversity Network web based catalogue of survey information. Such information should also be widely available locally.	**Biodiversity Project Officer**	**When established**
Submit details of relevant conservation achievements to the national biodiversity reporting system, BARS, to meet requested deadlines.	**Biodiversity Project Officer**	**2003 onwards**
Develop and implement appropriate surveillance and monitoring programmes to assess progress towards achieving action plan targets.	**Biodiversity Steering Group**	**2003**
Produce distribution map of floating water plantain populations	**GMEU/EN/ BW**	**2004**

Action	Lead body	Timetable for Action
Develop links with universities and encourage research on floating water plantain and associated flora and fauna	**Relevant GMBAP Working Group/ Academic Institutions**	**2003 onwards**
Encourage the dissemination and use of ongoing research results, and commission further research where necessary, to improve understanding of the ecology of floating water plantain. Key research topics will include the presence and distribution of the species, vegetation responses to different management approaches and the impact of competitive species.	**Relevant GMBAP Working Group**	**Ongoing**
6. Communication and Publicity		
Seek opportunities to raise the profile of floating water plantain and associated habitats in the media and improve public awareness of its wildlife and conservation value. Make information available through a range of media e.g. Internet, booklets, GM BAP and at a number of locations	**All BAP partners**	**Ongoing**
Produce information aimed at capturing the interest and co-operation of local residents in conserving floating water plantain.	**All BAP partners**	**Ongoing**
Publicise existing sites demonstrating good practice in the management and conservation of floating water plantain habitats ensuring information widely available to landowners/managers.	**BW/WTs**	**Ongoing**

Abbreviations

BW	British Waterways
EN	English Nature
GMEU	Greater Manchester Ecology Unit
LAs	Local Authorities
LNR	Local Nature Reserves
SBI	Site of Biological Importance
SSSI	Site of Special Scientific Interest
WTs	Wildlife Trust

RESOURCE IMPLICATIONS

UK BAPs

No information presently available.

Greater Manchester

Locally British Waterways has already established an extensive monitoring program for key aquatic plants in the Rochdale and Huddersfield Narrow canals. Environmental assessments of engineering works are also providing additional data as are the development of operational management regimes.

In addition detailed water quality data is being collected in relation to the species of specific interest.

- Ongoing costs incurred through restoration (e.g. ecological works involved in the Huddersfield Narrow Canal Restoration are thought to have cost approximately £100,000)
- Costs resulting from additional ecological commitments. Eg: British Waterways allocates three weeks of bank staff time to ecological works for each canal.
- Establishment and maintenance of a central database
- Promotion of positive management
- Establishment of monitoring programme
- Publicity and awareness raising
- Staff and volunteer time.

Possible Sources of Funding

Wildlife Enhancement Scheme for SSSIs

RELATED ACTION PLANS

UK BAPs

There is presently no national Canal Habitat Action Plan, however, canals are included in the broad category of Open Standing Waters and Canals.

White clawed crayfish

British Waterways corporate BAP, "*British Waterways and Biodiversity: A framework for waterway wildlife strategies*". This includes a species action plan for floating water plantain together with plans for other varied habitats and species associated with waterway corridors, as well as British Waterways' wider estate e.g. tunnel spoil heaps, reservoirs and reservoir feeders.

Greater Manchester BAPs:

Canals, Water vole, Bats

Proposed for 2nd Tranche of GMBAP: Grasswrack pondweed

Other BAPs:

Bolton BAP:	Canals, Water Vole
British Waterways Local Waterway BAPs:	Huddersfield Narrow East, Rochdale Canal East, *Luronium natans, Potomogeton compressus*, Water voles, White clawed crayfish
North Merseyside BAP:	Canals
Oldham BAP:	Water vole

CONFLICTS WITH OTHER ACTION PLANS

None have been identified.

CONTACTS FOR FLOATING WATER PLANTAIN BAP GROUP:

Organisation	Contact	Tel. Number
GMEU	Teresa Hughes	0161 342 2928
Stockport Urban and Countryside Service	Roger English	0161 474 4552
English Nature	Rebecca Jackson	01942 820342
Bolton Institute of Higher Education	Pat Waring	01204 903150
	Alan Price	01457 810828
British Waterways	Jason Leach	0161 819 5847
Environment Agency	Mark Wiseman	01925 840000

PROPOSED REVIEW OF THE PLAN

The Biodiversity Action Plan for Floating Water Plantain will be reviewed in 2008, and thereafter every five years.

REFERENCES

- Anon. (Undated) *Floating water-plantain (Luronium natans) Action Plan (contained in UK BAP).* Biodiversity Secretariat
- British Waterways (undated) "*A Framework for waterway wildlife strategies*"
- Environmental Management Consultants 1992. *Rare Plants in the Canals of the Metropolitan Counties of North West England. Volume 1: Survey and Evaluation of Status and Distribution.* Bradford.
- Wilby N J & Eaton J W 1993. The Distribution, Ecology & Conservation of Luronium natans (L) Raf. in Britain. *Journal of Aquatic Plant Management 31:70-76.*
- Ferguson, C., Briggs, J. and Willby, N. (1998) *Floating Water-plantain in Britain - Under-recorded and Overlooked?* British Wildlife 9(5) 298-303.

- GMEU (2000) *'Greater Manchester Biodiversity Action Plan: Volume 1 - Biodiversity Audit"*. Greater Manchester Ecology Unit

- UK Biodiversity Group 1995. *Biodiversity: The UK Steering Group Report, Volume 2: Action Plans.* HMSO, London

- Waring, P. (2000) Bolton LBAP – *"Canals"*. Bolton MBC

Internet

- http://www.ccw.gov.uk/biodiv/floating.htm
- http://www.oldhamagenda21.demon.co.uk/biodiversity/floating_plantain.htm
- http://www.southpenninering.co.uk

Appendix 16.3 – Grasswrack Pondweed Action Plan

Species Action Plan

Grass-wrack Pondweed (*Potamogeton compressus*)

- Current status
- Current factors causing loss or decline
- Current action
- Action plan objectives and targets
- Proposed actions with lead agencies
- Policy and legislation
- Site safeguard and management
- Species management and protection
- Advisory
- Future research and monitoring
- Communications and publicity
- Links with other plans
- Lead partner
- Local implementation
- Publication details
- Related links
- 1999 - Lead partner reporting form
- 2002 - Online reporting form
- Search the NBN for this species



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Image enquiries: Alex Lockton

Current status

Grass-wrack pondweed is a species of still or slow flowing, calcareous, mesotrophic water and it has been recorded from rivers, canals, ox-bows, drainage ditches and lowland lakes. Flowers and fruits are produced rather sparingly, with plants in grazing marsh ditches perhaps producing more than those in other habitats. New plants are generally formed from turions (reduced branches) which begin to develop in late June.
The distribution of this species is concentrated in central England, the Welsh borders and the Norfolk coast, but it has also been recorded from Scotland and is widespread elsewhere in Europe. It has been in decline for a long period in Britain.
In GB this species is now classified as *Nationally Scarce.* It receives general protection under the Wildlife and Countryside Act 1981.

Current factors causing loss or decline

Eutrophication of its aquatic habitats.
Neglect and drying out of canals and ditches.
Increase in pleasure boat traffic and associated disturbance and pollution.

Current action

Off-line reserves have been created beside the Montgomery Canal (eastern Wales) for this and other species. However, the value of this measure in the long term is as yet unclear.

Action plan objectives and targets

Maintain the geographical range of grass-wrack pondweed in the UK.
Enhance the total population size of grass-wrack pondweed in the UK.
Facilitate colonisation of new sites.

Proposed actions with lead agencies

Policy and legislation

Consider how relevant agri-environment schemes could benefit grass-wrack pondweed. (ACTION: MAFF, SOAEFD, WOAD)
Ensure that the requirements of this species are considered during the production of relevant Local Environment Agency Plans and examine applicability of catchment plans to Scotland. (ACTION: EA, SEPA, SNH)

Site safeguard and management

Consider the value of buffer strips and other measures alongside watercourses in reducing the impacts of nutrient enrichment and pollution on key populations of grass-wrack pondweed. These measures are likely to be most valuable in Broadland, where grass-wrack pondweed grows in drainage ditches that are highly vulnerable to eutrophication. (ACTION: Broads Authority, CCW, EA, EN, MAFF, SNH, SOAEFD, WOAD)

As far as possible, ensure that no further sites for grass-wrack pondweed are lost through water abstraction, land drainage or inappropriate watercourse management. (ACTION: EA, IDBs)
Devise and implement measures to restrict boat traffic speed in areas where grass-wrack pondweed occurs. Provide off-line refuges where appropriate. (ACTION: British Waterways, Broads Authority, EA)
Ensure that the requirements of grass-wrack pondweed are considered during canal restoration work. (ACTION: British Waterways)

Species management and protection

Assess the feasibility and desirability of re-establishing grass-wrack pondweed at suitable sites from which it has been lost. (ACTION: CCW, EN, JNCC, SNH)

Advisory

Advise landowners and managers who manage waters containing grass-wrack pondweed of its presence, importance and appropriate management for its conservation. (ACTION: CCW, EA, EN, SEPA, SNH)
As far as possible, ensure that all agri-environment project officers and members of appropriate liaison groups and partner organisations are advised of locations of this species, its importance and appropriate management for its conservation. (ACTION: CCW, EN, MAFF, SNH, SOAEFD, WOAD)

Future Research and Monitoring

Collate information, and resurvey sites where necessary to determine the current distribution and status of grass-wrack pondweed in Britain. (ACTION: CCW, EN, JNCC, SNH)
Undertake detailed ecological recording at selected viable sites with a view to improving understanding of the requirements of grass-wrack pondweed and refining techniques for its conservation. (ACTION: JNCC)
Where possible, undertake monitoring to determine the effectiveness of the relevant agri-environment schemes in improving water quality and in assisting with the conservation of threatened aquatic plants such as grass-wrack pondweed. Use the results to aid the review process of various schemes. (ACTION: EA, JNCC, MAFF, SOAEFD, WOAD)
Investigate the impact of boat traffic speed on grass-wrack pondweed populations. (ACTION: British Waterways, Broads Authority, EA)

Communications and Publicity

Raise awareness amongst boating groups of the presence and importance of grass-wrack pondweed. (ACTION: CCW, EN, SNH)

Links with other action plans

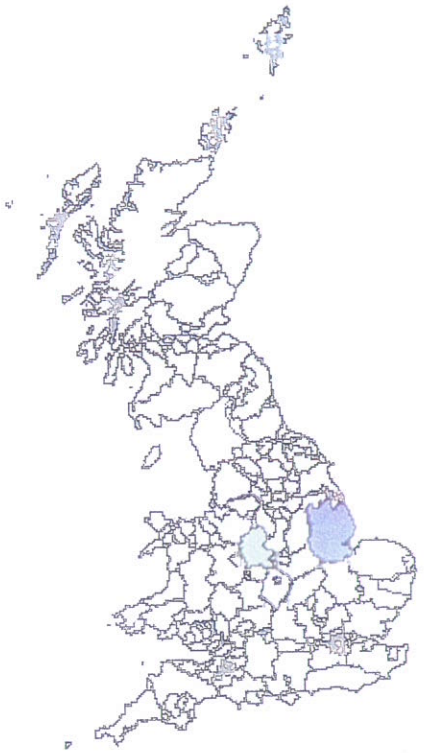
None given.

Lead partner(s)

Jonathan Brickland, British Waterways Tel:0113 284 5271

Local implementation

The following LBAPs are working on *Potamogeton compressus*:



Greater Manchester Biodiversity Action Plan
Lincolnshire Biodiversity Action Plan
Staffordshire Biodiversity Action Plan
Warwickshire, Coventry and Solihull Local Biodiversity Action Plan

Publication details

Originally published in: UK Biodiversity Group Tranche 2 Action Plans - Volume I: Vertebrates and vascular plants (June 1998, Tranche 2, Vol I, p217)

Related links

ARKive Visit the ARKive website to view images and further information relating to this species

email us

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Appendix. Habitat Descriptions for Islington Wharf, 5th May 2004

Habitat	Description
Canal Arm	The canal arm is connected to the Ashton Canal. The walls of this are stone blocks. Water depth in the arm appears to be between 1 and 2 metres. A lot of litter is present and the arm is used to store British Waterways items such as lock gates which must be kept wet. The side-arm in known to contain the protected plant species *Luronium natans* (not seen on survey) and a large colony of the nationally scarce species *Potamogeton compressus*. No water vole activity is known in the vicinity of the site, and white-clawed crayfish are not thought likely to live here either. The Ashton Canal is a Grade A SBI, including the canal arm which falls within the development area. This designation relates mainly to the aquatic flora of the canal.
Mown grass	Mown amenity grass at canal edge, grazed by Canada geese.
Buildings	The four buildings on site are described in the bat survey.
Compacted Ground	Appear to be tracks dating from the demolition of past buildings on the site. They support few plant species – those that are able to grow are common and widespread plants typical of compacted/disturbed ground.
Concrete hard standing	The broken bases of former buildings on the site. The cracks are colonised by ruderal species and plants of disturbed ground, including species such as common ragwort, dandelion, creeping bent, common nettle and coltsfoot.
Earth mounds	Recently created earth mounds, presumably constructed to obstruct vehicle access onto site.
Scattered scrub, tall herb and grassy areas	A mosaic of young scrub encroaching onto tall herb and grassy areas which cover the majority of the site.
Young standard trees	These maples have probably been planted as part of amenity maintenance/improvements along the Ashton Canal.
Dense scrub	Well grown shrubs create dense cover in patches across site. These provide secluded areas for both breeding birds and anti-social uses. The under storey is mostly dominated by bramble, ivy or nettle stands.
Japanese knotweed stands	Several stands are present in the north west part of the site, associated with disturbed ground. The stands nearest the Depot are large and reasonably well-established. The other plants were individual stems, which are probably colonising shoots from the larger stands. Later in the year, these were found to have disappeared, indicating unsuccessful spread this season.
British Waterways Depot	The Depot contains two buildings, one of which is the main workshop and the other houses stores. The depot land is disturbed compacted hard standing used for canal maintenance including storing dredged material. Rats are evident and fox cubs were seen indicating a den – otherwise the area contains little wildlife opportunity save for some scrub in the narrow gap behind the main building.

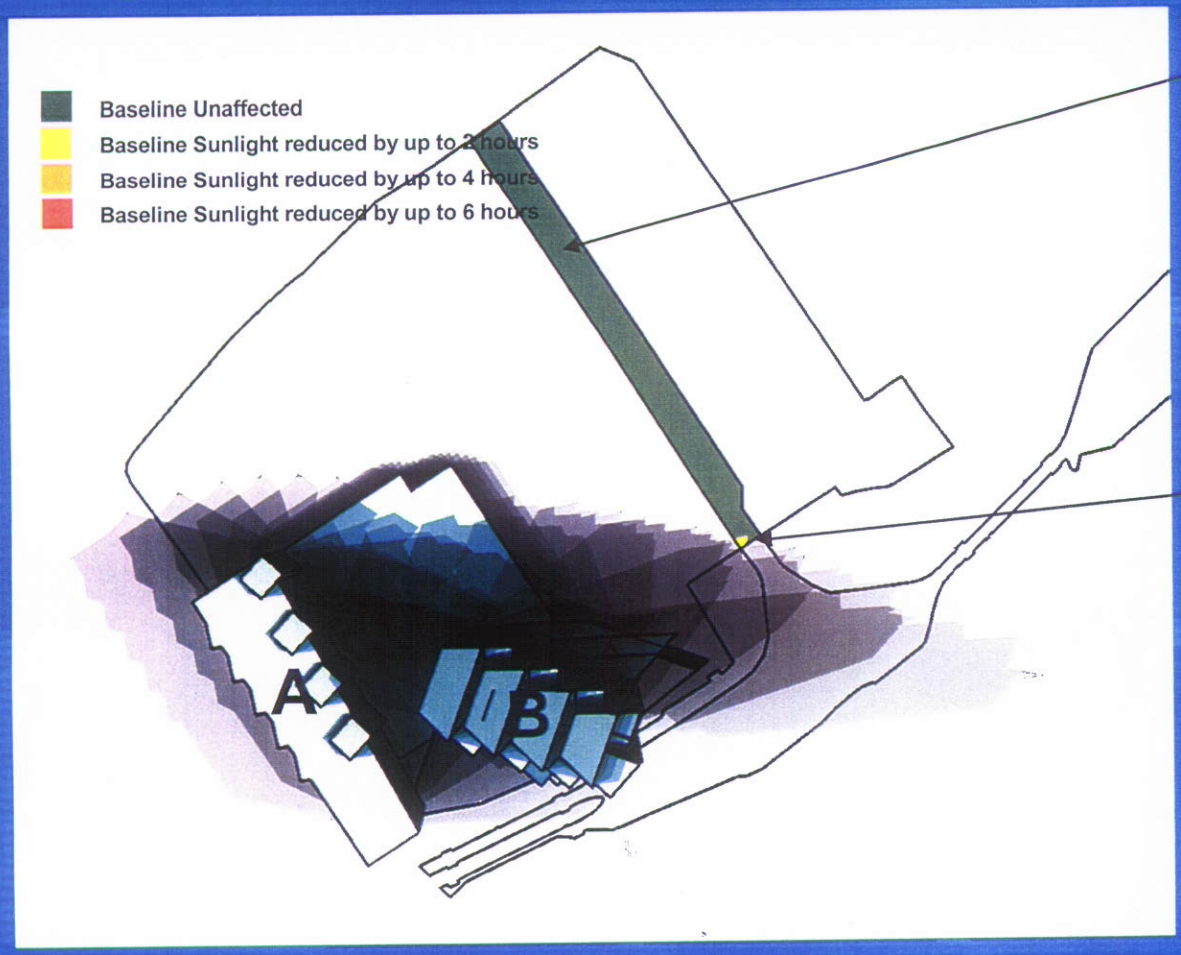
Appendix. Plant species list for Islington Wharf, 5th May 2004

Common Name	Scientific Name	Scattered scrub, tall herb and grassy areas	Dense scrub	Young standard trees	Canal arm	Build-ings
Herbaceous species						
Annual meadow-grass	*Poa annua*	lo				
Bird's-foot trefoil	*Lotus corniculatus*	lo				
Bramble	*Rubus fruticosus agg.*	la-ld				
Broad-leaved dock	*Rumex obtusifoilum*	r-lo				
Canary reed-grass	*Phalaris arundinacea*	r				
Cleavers	*Galium aparine*	la-ld				
Cock's-foot	*Dactylis glomerata*	o-la				
Colt's-foot	*Tussilago farfara*	o-la				
Common couch	*Elytrigia repens*	o-la				
Common mouse-ear	*Cerastium fontanum*	r				
Common nettle	*Urtica dioica*	la-ld				
Common ragwort	*Senecio jacobaea*	o				
Common sorrel	*Rumex acetosa*	r				
Cow parsley	*Anthriscus sylvestris*	r				
Creeping bent	*Agrostis stolonifera*	la-ld				
Creeping buttercup	*Ranunculus repens*	lo				
Creeping cinqufoil	*Potentilla reptans*	lr				
Creeping thistle	*Cirsium arvense*	r-lo				
Curled dock	*Rumex crispus*	r				
Cut-leaved cranes-bill	*Geranium dissectum*	r				
Dandelion	*Taraxacum officinale agg.*	a				
False-oat grass	*Arrhenatherum elatius*	lo				
Field bindweed	*Convulvulus arvensis*	r				
Field horsetail	*Equisetum arvensis*	o-ld				
Foregt-me-not species	*Myosotis sp.*	r-lo				
Garlic mustard	*Aillaria petiolata*	r				
Grass-wrack pondweed	*Potemogeton compressus*				la	
Great heariy willowherb	*Epilobium hirsutum*	r-lo				
Hairy bittercress	*Cardamine hirsuta*	lo				
Hawkweed species	*Hieraceum sp.*	r				
Hedge bindweed	*Calystegia sepium*	lo				
Hedge mustard	*Sisymbrium officinale*	lo				
Hedge woundwort	*Stachys sylvestris*	lo				
Herb Robert	*Geranium robertianum*	lo				
Japanese knotweed	*Fallopia japonica*	r-ld				
Lesser trefoil	*Trifolium dubium*	o-r				
Male fern	*Dryopteris filix-mas*	r				
Meadow vetchling	*Lathyrus pratensis*	r-lo				
Michaelmas-daisy	*Aster sp.*	la				
Mugwort	*Artemisia vulgaris*	r				
Oxford ragwort	*Senecio squalidus*	r				
Ragged robin	*Lychnis flos-cuculi*	r				
Red clover	*Trifolium pratensis*	r				
Red fescue	*festuca rubra*	r-la				
Ribwort plantain	*Plantago lanceolata*	a				
Rose-bay willowherb	*Chaemorus angustifolium*	lo				
Scentless mayweed	*Matricaria inodorum*	r-lo				
Selfheal	*Prunella vulgaris*	r-lo				
Sow-thistle species	*Sonchus sp.*	r				
Spanish bluebell	*Hyacintoides hispanica*	r				
Spear thistle	*Cisrium vulgare*	r-o				
Vetch species	*Vicia sp.*	r				
White clover	*Trifolium repens*	lo				
Yorkshire fog	*Holcus lanatus*	la				
Woody species						
Alder species	*Alnus cf. viridis*	r				
Blackthorn	*Prunus spinosa*	r				
Buddleija	*Budleija davidii*	a	o			
Cherry cultivar	*Prunus sp.*	r				
Common whitebeam	*Sorbus aria agg.*	r				
Cotoneaster cultivar	*Cotoneaster sp.*	r				
Elder	*Sambucus nigra*	o				
Firethorn species	*Pyracantha sp.*		r			
Goat willow	*Salix caprea*	r	a			
Grey willow	*Salix cinerea*	r	a			
Hawthorn	*Crataegus monogyna*		r			
Himalayan balsam	*Impatiens glanduilifera*	lo				
Ivy	*Hedera helix*		r-ld			lo
Lonicera cultivar	*Lonicera sp.*	r				
Maple species	*Acer sp.*			lr		
Rose species	*Rosa rugosa*		r			
Rowan	*Sorbus aucuparia*	r-lo				
Silver birch	*Betula pendula*	r	o			
Snowberry species	*Symphoricarpos sp.*		r			
Sycamore	*Acer pseudoplatanus*	o	o			

Appendix 16.6 – Analysis of Canal Shading for Phase 1

Islington Wharf – ISIS Waterside Regeneration

Analysis of Shadowing : 21 June (Summer)



The Canal arm is unaffected by the new development proposals. This study shows the shadow falling on the site at hour intervals between 08:00 to 17.00.

The proposal overshadow a very small proportion of the canal arm adjacent to the Bridge for no more than two hours.

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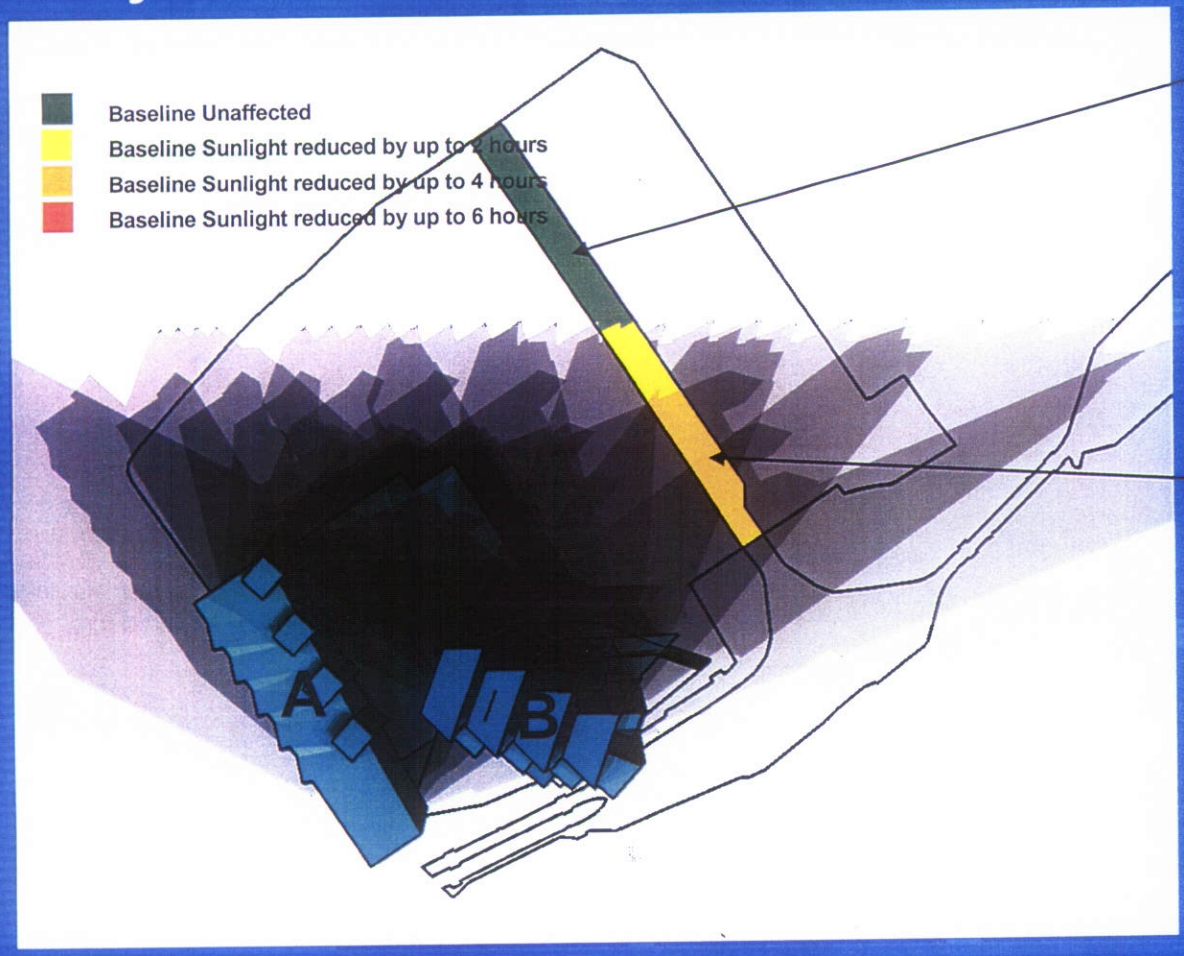
Islington Wharf – ISIS Waterside Regeneration

Analysis of Shadowing : 21 March / September (Equinox)



The northern half of the Canal arm is unaffected by the new development proposals. This study shows the shadows falling on the site due to the proposals at hour intervals between 08:00 to 17.00.

The proposal for Phase 1 overshadow the south-eastern end of the arm by two to four hours out of a total nine hours of light available. This area should be monitored during the construction period to determine if this has any affect on the aquatic vegetation.

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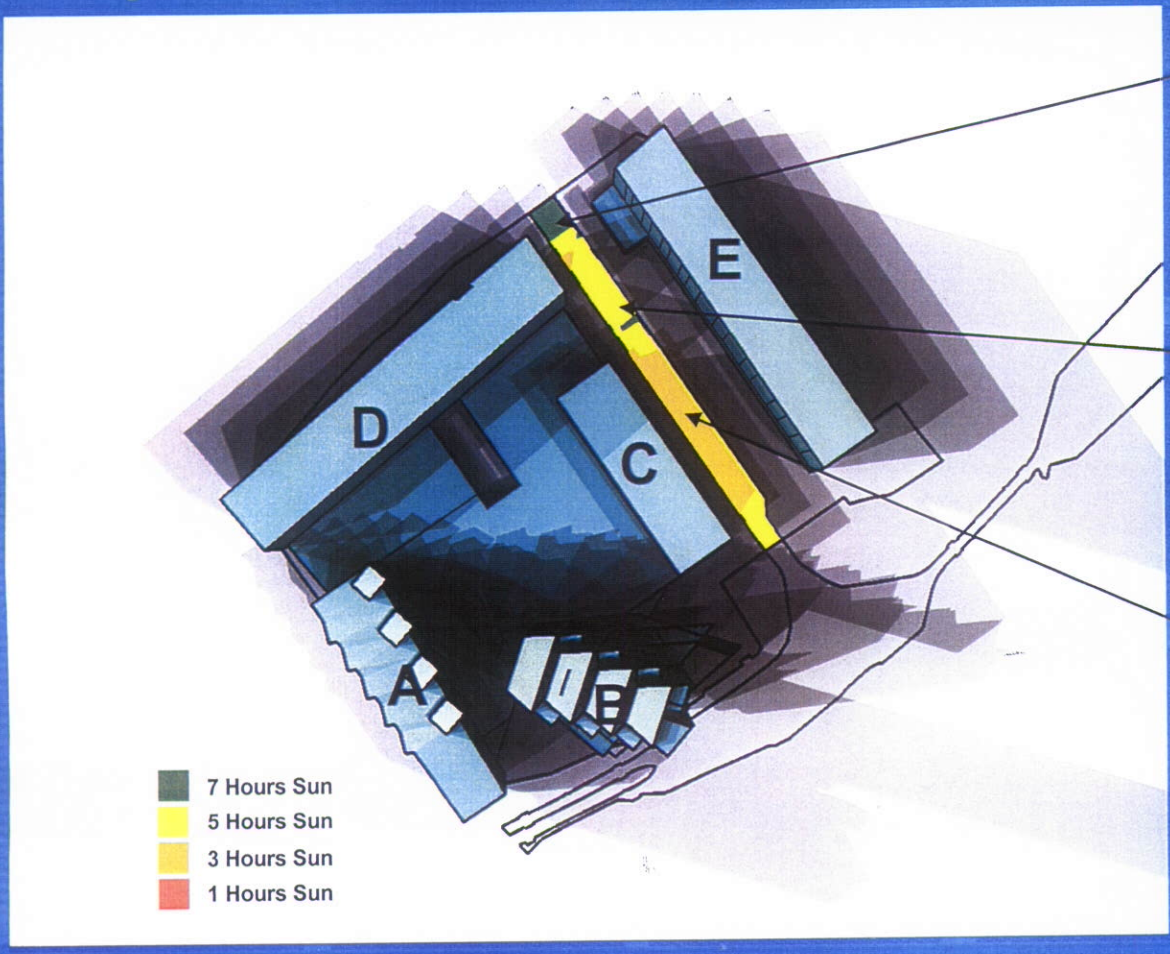
Appendix 16.7 – Analysis of Shading for Phase 2

Islington Wharf – ISIS Waterside Regeneration

Analysis of Shadowing : 21 June - Mid Summer



The end of Canal Arm adjacent to Old Mill Street receives sunlight for 7 hours out of a total of 9 hours sun on a typical day in the peak of summer.
(Between 09:00 to 18.00)

Moving South East along the canal arm, a stretch of approximately 40 meters continues to receive 5 hours of sunlight on a typical summer day.

Immediately adjacent to Block C, the Canal arm experiences at least 3 hours of sun.

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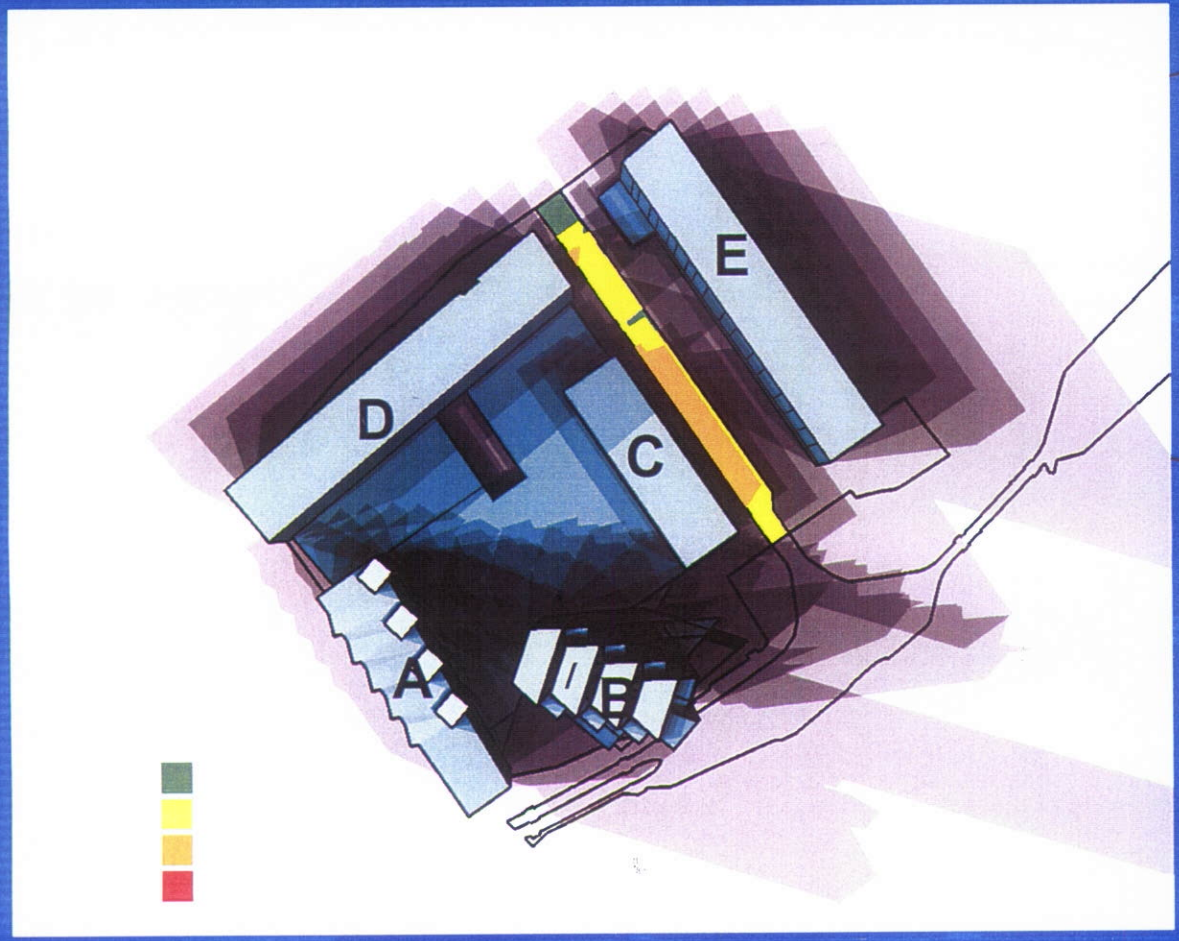
Islington Wharf – ISIS Waterside Regeneration

Analysis of Shadowing : 21 March / 21 September (Equinox)



The end of Canal Arm adjacent to Old Mill Street receives sunlight for 3 hours out of a total of 7 hours sun on a typical day in the Spring / Autumn, with some patches receiving a total of 5 hours. These conditions are achievable in the first 30 meters of the canal arm. (Between 09:00 to 16.00)

Immediately adjacent to Block C, the Canal arm experiences at least 1

hours of sun in the worst location.

BroadwayMalyan

Appendix 16.8 – Guidance for Bat Roost Design and Location

Appendix. Specifications for Artificial Bat Roosting Sites in Buildings at Islington Wharf

The specification below is intended as a *general* description for incorporation of roosting provision in new buildings.

Cavity wall/wall roosting units – aimed principally at pipistrelle bats.

- Cavity within wall to be approx. 200mm x 300mm in extent and 500mm tall (cavity dimensions could vary depending on structure of building).
- Interior surface to be composed of a rough, non-toxic surface (eg. mortar, brickwork, non-treated wood).
- Cavities can be faced with brick/concrete with access gaps left in mortar or walling bricks of varied shape which can be used to allow bat access.
- Entrance dimensions approx 2cm high by 5cm wide.
- Cavity to created in fabric of wall (can be difficult to do) or using one of the commercially available pre-formed units.
- At least six cavities incorporated at varying orientations along the canal frontage, to provide a choice of locations.

Appendix 16.9 – Floating Water Plantain and Grasswrack Pondweed Mitigation Strategy

Appendix. Strategy for floating water plantain and grasswrack pondweed at Islington Wharf, Manchester

The Species' Status

Floating water plantain *Luronium natans* is a European protected species, and a licence is required from Defra for any works which may affect the plant e.g. canal repairs. It is nationally scarce (i.e.16 to 100 10km squares contain the species in the UK) and occurs in only 53 10km squares across the UK (Preston *et. al.* 2004).

Grasswrack pondweed *Potamogeton compressus* is offered the standard protection for all native wild plants under the WCA1981, but is not specifically protected. It is nationally scarce with only 28 10km squares supporting the species in the UK (Preston *et. al.* 2004).

Both species are UK BAP species, and British Waterways is the lead organisation for both species on the UK BAP.

Assumptions:

- Spring light levels are important for the growth of *Potamogeton compressus* and *Luronium natans*, which at that time are rooted at the base of the water column.

- Boat mooring in the canal arm to be temporary (i.e. day visits for visitor, community or commercial purposes), occasional, limited to the southern quarter of the arm and subject to the results of monitoring for the rare plants.

Phasing of the Development

Phase 1 comprises Blocks A & B, located in the south west corner of the site furthest from the canal arm. Full planning permission is sought in 2004/5 with the timeframe for development of these buildings following this.

Shadowing analysis indicates that at the equinoxes there is a potential total of 9 hours of direct sunlight on the canal arm. The northern half of the canal arm is unaffected by the Phase 1 development. The southern half of the canal arm is overshadowed up to 4 hours of the day.

Phase 2 comprises Blocks C & D in the north east corner of the site lying west of the canal arm. Outline planning permission is sought in 2004/5, with reserved matters being finalised for full permission at a later date.

The buildings in Phase 2, particularly Block C, have the greatest potential effect upon the protected and rare plant species in the canal arm. Shadowing analysis on the present outline designs indicates a potentially unacceptable level of shading and thus risk of harm to the protected and rare plant species in the canal arm.

Phase 3 comprises Block E located to the east of the canal arm. Outline planning permission is sought in 2004/5. Full planning will be sought at a later date. This

building has no shading effect upon the protected and rare plant species in the canal arm.

Strategy for Floating Water Plantain and Grasswrack Pondweed

- Obtain Defra licence for works to canal arm structure – licence may require survey data. Works likely to involve draining the canal arm temporarily.

- Exclude boats completely from canal arm during the 5 year construction period and for a further two years thereafter. A silt screen to be placed at the bridge as indicated 'A' in Appendix 10.

- Baseline population to be established throughout 5 year construction period via monitoring, following a method to be agreed with GMEU, English Nature and British Waterways. Also agreed will be criteria for determining favourable status (or not) for the rare plants within the site. Post-construction monitoring will establish trends in response to shading from Block C, and advise whether silt screen can be moved back to position 'B' (Appendix 10) to allow a single boat mooring, without causing unacceptable detriment to the colonies.

- Long-term monitoring should continue after the initial 7 years so that favourable condition can be reassessed, and boat traffic controlled, if found to be a factor in population declines. This to include studies of species populations and boat use/water turbidity/empirical measurements of light levels etc. Management of the canal arm may also be required as neither species can compete with tall emergent reed vegetation if this gets established.

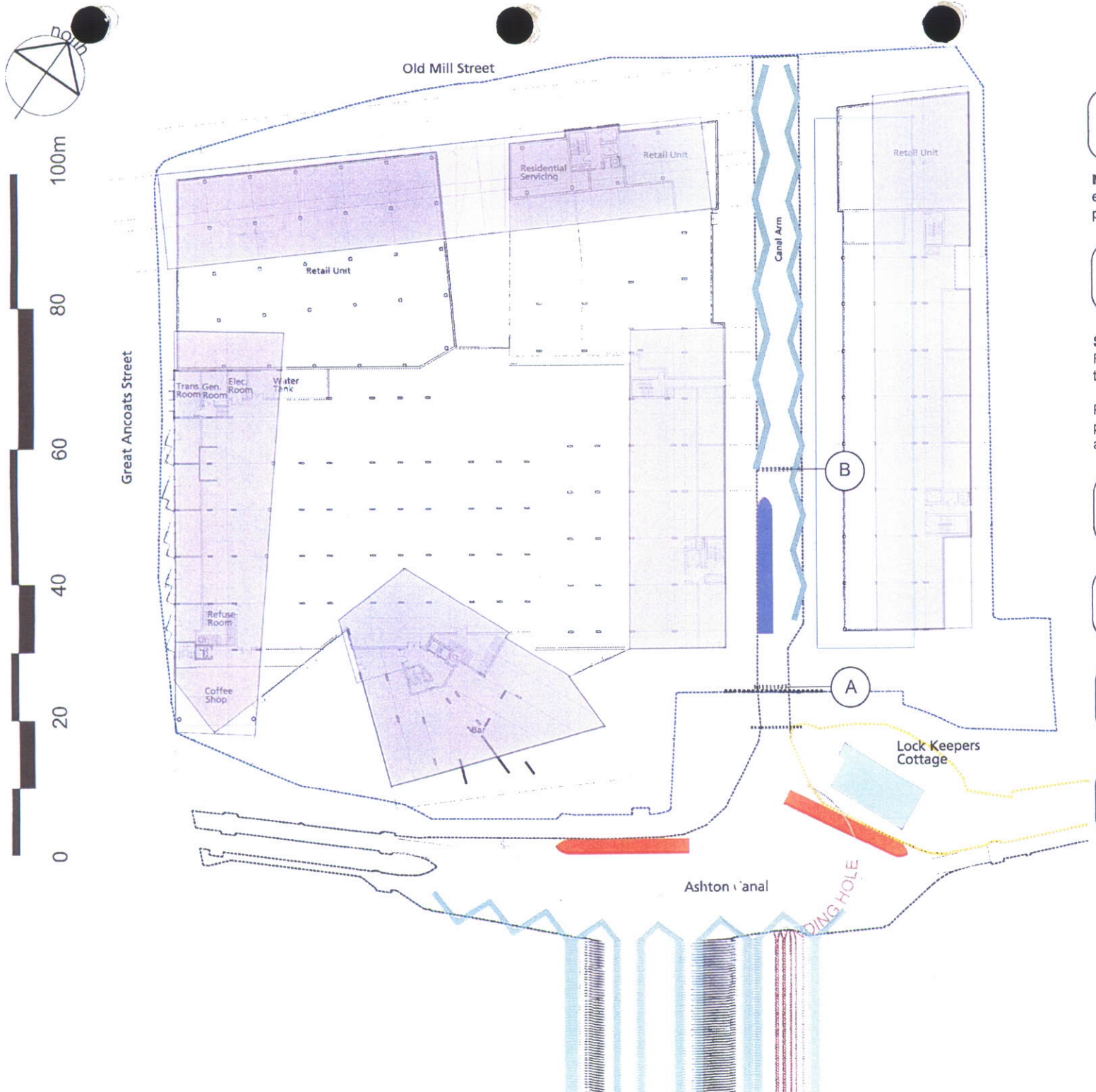
- Input to detailed designs for Phases 2 and 3, to maintain light levels in the canal arm sufficient to sustain colonies of protected and rare plant species *in situ* in the long term, e.g. changes to design (not siting), light-maximising building materials, use of artificial lighting and/or mirrors.

- Establish a minimum of 2 additional sites (mainly for grasswrack pondweed, but both if possible), preferably on the Ashton Canal, or if not possible, in Manchester City Council area, then within Greater Manchester. These should be established prior to works on Phase 2 commencing. These will also require long-term monitoring, following methods to be agreed, as above.

Appendix 16.10 – Waterspace Plan

Table B. An Evaluation Framework (after DETR 1998)

Category		Relevant Sites
A	International	All internationally important sites
B	National	SSSIs and other nationally important sites
		Areas hosting red data book species and species in Schedules 1, 5 and 8 of the Wildlife and Countryside Act 1981
C	Regional	Local Nature Reserves
		Other sites with BAP priority habitats or species not included above
		County Wildlife Sites
		Other natural or semi-natural sites of significant biodiversity
		Nationally Scarce species
D	Local	Sites with some biodiversity
E		Sites with little or no biodiversity.



KEY

FLEXIBLE MOORING
-possible visitor, community or commercial mooring

NB: A mooring will be provided subject to the result of the ecological monitoring programme confirming the aquatic plant population in the arm remaining viable.

SILT SCREEN
-removable for maintenance and management

Silt Screen Strategy
Position A - location of silk screen during construction and two years post construction monitoring.

Position B - should monitoring indicate a viable aquatic plant population, the silt screen will be moved to position B, and the mooring established

LOCK APPROACH
-resesrve for lock operation, no waiting

NAVIGATIONAL REQUIREMENT
-illustrates navigational access and alignment

WINDING HOLE
-boat turning point

NO MOORINGS

Table C – Local Context – Assessment of Nature Conservation Value

Table C. Relative Importance of Nature Conservation Features

Evaluation Grade	Significance	Area
A	International value	European Union or possibly Global, depending on context.
B	National	UK, GB or British Isles, depending on context and information available.
C	Regional	Mostly Greater Manchester, but could possibly include Northwest England (depending on context and available information)
D	Local value	Islington Wharf and its surroundings
E	Little or none	Sub-local, i.e. the feature is of little or no ecological value at any scale

Table D – Impact Magnitudes

Table D. Impact Magnitude Categories (after DETR 1998)

Impact Magnitude Category	Criteria
Major negative impact	Proposal adversely affects integrity of site or feature, in terms of the coherence of ecological structure and function, across its whole area, that enables it to sustain the habitat, habitat complex, or population levels of species of interest.
Intermediate negative impact	No adverse effect on site integrity but significant effects in terms of its ecological objectives.
Minor negative impact	Minor negative impacts predicted.
Positive impact	A net positive wildlife gain. This can be minor, intermediate or major, and includes, for example, connections, buffers to important sites, new habitats, improvements to existing habitats. A major positive net gain would be one of national importance.
Neutral impact	No observable impact, positive or negative.

Table E – Possible Impact Significance

Table E. Assessing the Significance of Impacts (DETR 1998)

Magnitude of Impact	Site Value Category				
	A	**B**	**C**	**D**	**E**
Major negative	Very large adverse	Very large adverse	Large/ moderate adverse	Slight adverse	Neutral
Intermediate negative	Large adverse	Large adverse	Moderate adverse	Slight adverse	Neutral
Minor negative	Slight adverse	Slight adverse	Slight adverse	Slight adverse	Neutral
Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Minor positive	Slight positive	Slight positive	Slight positive	Slight positive	Slight positive
Intermediate positive	Moderate positive	Moderate positive	Moderate positive	Moderate positive	Moderate positive
Major positive	Large positive	Large positive	Large positive	Large positive	Large positive

Table F – Bat Survey Results

Table F. Results of Building Search for Bat Roosts at Islington Wharf, 2004.

Building Name	Building 1 Vesta Street Depot Store			Building 2 Vesta Street Depot Main		Building 3 Office Block	Building 4 Lock Keepers Cottage	Bridge	Canal Walls
General description	Old single storey brick building with slate roof and inaccessible roof void. Interior is old lath and plaster walls and ceilings (not renovated). 3 rooms. Gaps in tiles especially at S end would allow access for bats, but pigeons nest in roof void, so bat use unlikely.			Recent brick building with double corrugated asbestos roof (with insulation) over timber frame, mostly open to rafters. Ceiling installed at north end above canteen, toilet and office space. Access to void through hatch in toilet. Brick work well pointed and no gap visible behind gutterboard. Small ivy vine around canteen window.		Modern brick building with tiled roof over timber. Severe fire damage from about 18 months ago, which gutted much of the interior and damaged the roof. Building is listed due to being attached to listed structure (bridge), but of low value in itself.	Old 18th or 19th Century listed 2 storey red brick cottage adjacent to canal with 15-year old slate tiled roof underlain by felt. Overgrown garden to north side, with ivy vine growing on the cottage wall. Partial renovation has taken place, with re-plastering in the downstairs. Visual access to full length of roof void through inspection holes in upstairs rooms and loft hatch. Access to British Waterways office in downstairs of east end of building through separate door. Outbuilding has no roof.	Listed bridge structure over canal arm.	Stone/ concrete/ brick built walls of canal arm.
Building inspection	(a) Room at north end of building (adjacent to Old Mill Street). Access via outside door. Used as store for bolts etc. No bat signs found.	(b) Access via internal door from (a) which was locked so no access gained.	(c) Room at south end of building. Access via outside door. Used as paint store. Strong paint smell. No bat signs found probably unsuitable because of paint smell.	(a) Main building area: all horizontal surfaces searched, mouse droppings occasional. Walls examined with binoculars. No bat signs found.	(b) Roof void over office/ kitchen/ toilet: dusty. Contains water tank. Rat droppings found. No bat signs.	All surfaces examined for bat signs - none found. Roof void visible from main room on S side of building - but no access due to health & safety considerations. Bat potential thought to be low on account of the sootiness of the interior.	Cracks in walls inspected where visible, but no bat use found (cobwebs). Floors of cottage upstairs partially swept last week during structural inspections (may have removed evidence of bats). However, roof void very dusty with soot and old lath and plaster, so bat use appears unlikely, and no bat signs were found. Downstairs office: no signs of bats, mouse droppings found. Bat potential remains on the exterior of the structure - under ridge tiles and between slates. **Emergence survey required to investigate further.**	Inspected from canal edge: brickwork appears in good condition. However, some cracks seen which could potentially admit bats. Closer inspection was not possible unless boat/scaffolding used. **Emergence survey required to investigate further.**	Inspected from bank during habitat survey. Most areas with low rise above water - low potential for bat roosts. Higher walls below office block (B3) near bridge lack suitable gaps.
Date	24/05/2004	24/05/2004	24/05/2004	24/05/2004	24/05/2004	24/05/2004	24/05/2004	24/05/2004	05/05/2004
Bat Search Notes	No signs	No signs	No signs	No signs	No signs	No signs	No signs	-	-
Potential	Low	Low	Low	Low	Low	Low	Medium	Medium	Low

Table G – Bat Survey Results

Table G. Summary of bat surveys carried out at Islington Wharf, 2004.

Survey Type	Visit date	Times	Temperature (C)	Weather conditions	Notes
Building Search	14-May-04	Daylight hours	-	-	No signs of bats found in areas searched. Lock keeper's Cottage and the bridge considered to have medium bat roost potential, all other buildings low potential. Emergence survey recommended on the medium potential structures.
Emergence & activity surveys of Lock-keeper's Cottage and bridge	Visit 1: 27-May-2004	*c.* 2020 to *c.* 2220	-	Fine, mild.	Very occasional bat activity noted from 2150, with activity concentrated under the bridge. Possible Daubenton's noted feeding close to water surface. Probable pipistrelles also noted.
	Visit 2: 2-June-2004	2050 to 2220	14	Thin high cloud, light breeze.	Occasional probable Pipistrelle bat passes heard from 2110 onwards, with most local foraging activity taking place on canal arm. However, bats appeared to be passing through to more productive sites elsewhere.
Pre-dawn swarming survey of Lock-keeper's Cottage and bridge	05-May-04	0400 to 1630	4	Variable dry overcast /light drizzle. Still.	No bats were observed swarming on or adjacent to the site. Little insect activity: may have been too cold for bats, although birds were active.

Table H – Breeding Bird Species

Table H. Bird species recorded during 5 visits to Islington Wharf, 2004.

Bird Species	Latin name	Conservation Status
Blackbird	*Turdus merula*	
Blackcap	*Sylvia atricaria*	
Blue tit	*Parus caeruleus*	
Carrion crow	*Corvus corone corone*	
Collard dove	*Streptopelia decaocto*	
Canada goose	*Branta canadensis*	
Dunnock	*Prunella modularis*	Amber List[1]
Goldfinch	*Carduelis carduelis*	
Great tit	*Parus major*	
Greenfinch	*Carduelis chloris*	
Kestrel	*Falco tinnunculus*	Amber List
Magpie	*Pica pica*	
Mallard	*Anas platyrhynchos*	
Moorhen	*Gallinula chloropus*	
Robin	*Erithacus rubecula*	
Song thrush	*Turdus philomelos*	Red List, BAP
Whitethroat	*Sylvia communis*	
Wren	*Troglodytes troglodytes*	
Woodpigeon	*Columba palumbus*	

[1] Refers to 'Red and Amber' lists of birds of conservation concern in Eaton *et. al.* 2003.

Table I – Summary Evaluation of Receptors

Table I. Summary Evaluation of Ecological Receptors at Islington Wharf.

Site/Feature	Grade	Rationale
Bats	B	European protected species with a roost within 200m of the site. Bats utilize the canal habitats for commuting and feeding, although no roosts are present on the site.
Black redstart	B	UK protected species found on derelict sites in central Manchester. Not found to be present on the site in summer 2004, although suitable habitats do exist.
Floating water plantain	B	European protected species which has been recorded from the Islington Branch canal arm, although not recorded in the site survey.
Ashton Canal SBI	C	Grade A Site of Biological Importance for Greater Manchester. Important for its submerged aquatic flora, including the European Protected Species floating water plantain (*Luronium natans*) and a colony of the nationally scarce grasswrack pondweed (*Potamogeton compressus*) in the Islington Branch canal arm.
Grasswrack pondweed	C	Nationally scarce species, known from 2 other locations in Greater Manchester, and located in the Islington Branch canal arm.
Breeding birds	D	Breeding activity of a range of common and widespread birds was noted on the site. Song thrush is a UK and Greater Manchester Biodiversity Action Plan species on the RSPB list of birds of conservation concern (Eaton *et. al.2003*), which also includes kestrel and dunnock. The small size of the site means that numbers affected by loss of habitat are not likely to be significant at the population scale.
Terrestrial habitats	D/E	Habitats of disturbed post-industrial sites, common in Greater Manchester, and supporting common and widespread species.

Table J – Impact Magnitude Summary

Table J. Ecology - Summary of Impact Magnitudes: Phases 1 to 3 (● denotes Phases associated with each potential impact).

Activity	Ecological Receptor	Evaluation Grade	Nature of Impact (direct/indirect)	Magnitude	Phase 1	Phase 2	Phase 3
Site clearance, especially scrub	Breeding birds	D	Direct: local permanent loss of habitat; disturbance	Minor negative	●	●	●
Construction traffic	Breeding birds	D	Indirect: potential reduction in success of bird breeding due to noise disturbance and dust deposition	Minor negative	●	●	●
Dewatering and repair to canal arm	Floating water plantain	B	Direct: damage or loss of colony	Intermediate negative	●	●	
	Grasswrack pondweed	C	Direct: damage or loss of colony	Major negative	●	●	
Removal of existing buildings	Black redstart	B	Direct: potential habitat loss	Neutral (none present)	●	●	●
	Bats	B	Direct: potential habitat loss	Neutral (no roosts present)	●	●	●

Table ctd.

Activity	Ecological Receptor	Evaluation Grade	Nature of Impact (direct/indirect)	Magnitude	Phase 1	Phase 2	Phase 3
Shading of canal arm by new buildings	Floating water plantain	B	Indirect: increased shading reducing suitability of site for growth	Intermediate negative		●	
	Grasswrack pondweed	C	Indirect: increased shading reducing suitability of site for growth	Major negative		●	
Increased boat traffic in canal arm	Floating water plantain	B	Direct: shading from moored boats. Indirect: increased turbidity reduces light available for plants	Intermediate negative		●	●
	Grasswrack pondweed	C	Direct: shading from moored boats. Indirect: increased turbidity reduces light available for plants	Major negative		●	●
Increased night time lighting	Bats	B	Direct: altered flight patterns to avoid light, especially for Daubenton's bat	Intermediate negative	●	●	●

Table K – Summary Impact Assessment and Outline of Proposed Mitigation Measures - Phase 1

Table K. Summary Impact Assessment and Outline of Proposed Mitigation Measures - Phase 1

Ecological Receptor	Nature of Impact	Probability	Duration	Ecological Value	Magnitude	Significance	Safeguard and Mitigation measures	Residual impacts
Bats	Direct: Potential roost loss in existing site buildings	None – no roosts present	Permanent	B	Neutral	Neutral	Install bat roost provision in new buildings	Slight Positive
	Indirect: increased night-time lighting	High	Permanent	B	Intermediate negative	Large adverse	(i) Avoid 'feature' lighting of canal (ii) Use low-level bollard lighting for footpaths	Neutral
Black redstart	Direct: potential loss of buildings and terrestrial habitats	Low – none found	Permanent	B	Neutral	Neutral	Incorporate suitable nest and feeding habitats in new buildings	Slight Positive
Floating water plantain	Direct: damage or loss of plants during dewatering	High	Temporary	B	Intermediate negative	Large adverse	(i) Follow Defra licensing procedure incl. Method Statement (ii) survey before works so plants can be safeguarded (iii) monitor post dewatering	Neutral to slight positive, as plant can benefit from slight disturbance
Grasswrack pondweed	Direct: damage or loss of colony during dewatering	High	Temporary	C	Major negative	Large adverse	(i) method for works to contain safeguard for colony (ii) monitor post dewatering	Slight adverse to neutral
Breeding birds	Direct: disturbance during site clearance	High	Temporary	D	Minor negative	Slight adverse	Avoid bird breeding season March-August inclusive	Neutral
	Indirect: disturbance from site construction traffic	High	Temporary	D	Minor negative	Slight adverse	Clear habitats before bird breeding starts, to discourage nesting	None
	Direct: loss of habitat in scrub	High	Permanent	D	Major negative	Large adverse	Landscape planting will contain new habitats for invertebrates and dbirds	Neutral

Table L - Summary Impact Assessment and Outline of Proposed Mitigation Measures - Phase 2

Table L. Summary Impact Assessment and Outline of Proposed Mitigation Measures - Phase 2

Ecological Receptor	Nature of Impact	Probability	Duration	Ecological Value	Magnitude	Significance	Safeguard and Mitigation measures	Residual impacts
Bats	Direct: Potential roost loss	None – no roosts present	Permanent	B	Neutral	Neutral	Install bat roost provision in new buildings	Slight Positive
	Indirect: increased lighting of canal	High	Permanent	B	Intermediate negative	Large adverse	(i) Avoid 'feature' lighting of canal (ii) Use low-level bollard lighting for footpaths	Neutral
Black redstart	Direct: potential loss of buildings and terrestrial habitats	Low – none found	Permanent	B	Neutral	Neutral	Incorporate suitable nest and feeding habitats in new buildings	Slight Positive
Floating water plantain	Direct: damage or loss of plants during dewatering	High	Temporary	B	Intermediate negative	Large adverse	(i) Follow Defra licensing procedure inc. Method Statement (ii) survey before works so plants can be safeguarded (iii) monitor post dewatering	Neutral to slight positive, as plant can benefit from slight disturbance
	Indirect: increased shading from new buildings	High	Permanent	B	Intermediate negative	Large adverse	Adhere to Strategy, Appendix 9	Neutral to Slight positive
	Indirect: shading from increased turbidity from boat traffic	High	Permanent	B	Intermediate negative	Large adverse	Adhere to Strategy, Appendix 9	Neutral to Slight positive
Grasswrack pondweed	Direct: damage or loss of colony during dewatering	High	Temporary	C	Major negative	Large adverse	(i) method for works to contain safeguards for colony (ii) monitor post dewatering	Slight adverse to neutral

	Indirect: increased shading from new buildings	High	Permanent	C	Major negative	Large adverse	Adhere to Strategy, Appendix 9	Neutral to Slight positive
	Indirect: shading from increased turbidity from boat traffic	High	Permanent	C	Major negative	Large adverse	Adhere to Action Plan, Appendix 9	Neutral to Slight positive
Breeding birds	Direct: disturbance during site clearance	High	Temporary	D	Minor negative	Slight adverse	Avoid bird breeding season March-August inclusive	Neutral
	Indirect: disturbance from site construction traffic	High	Temporary	D	Minor negative	Slight adverse	Clear habitats before bird breeding starts, to discourage nesting	None
	Direct: loss of habitat in scrub	High	Permanent	D	Minor negative	Slight adverse	Landscape planting will contain new habitats for invertebrates and birds	Neutral

Table M - Summary Impact Assessment and Outline of Proposed Mitigation Measures - Phase 3

Table M. Summary Impact Assessment and Outline of Proposed Mitigation Measures - Phase 3

Ecological Receptor	Nature of Impact	Probability	Duration	Ecological Value	Magnitude	Significance	Safeguard and Mitigation measures	Residual impacts
Bats	Direct: Potential roost loss	None – no roosts present	Permanent	B	Neutral	Neutral	Install bat roost provision in new buildings	Slight Positive
	Indirect: increased lighting of canal	High	Permanent	B	Intermediate negative	Large adverse	(i) Avoid 'feature' lighting of canal (ii) Use low-level bollard lighting for footpaths	Neutral
Black redstart	Direct: potential loss of buildings and terrestrial habitats	Low – none found	Permanent	B	Neutral	Neutral	Incorporate suitable nest and feeding habitats in new buildings	Slight Positive
Floating water plantain	Indirect: shading from increased turbidity from boat traffic	High	Permanent	B	Intermediate negative	Large adverse	Adhere to Action Plan, Appendix 9	Neutral to Slight positive
Grasswrack pondweed	Indirect: shading from increased turbidity from boat traffic	High	Permanent	C	Major negative	Large adverse	Adhere to Action Plan, Appendix 9	Neutral to Slight positive
Breeding birds	Direct: disturbance during site clearance	High	Temporary	D	Minor negative	Slight adverse	Avoid bird breeding season March-August inclusive	Neutral
	Indirect: disturbance from site construction traffic	High	Temporary	D	Minor negative	Slight adverse	Clear habitats before bird breeding starts, to discourage nesting	None
	Direct: loss of habitat in scrub	High	Permanent	D	Minor negative	Slight adverse	Landscape planting will contain new habitats for invertebrates and birds	Neutral

Figure 1 – Building Referencing for Bat Survey

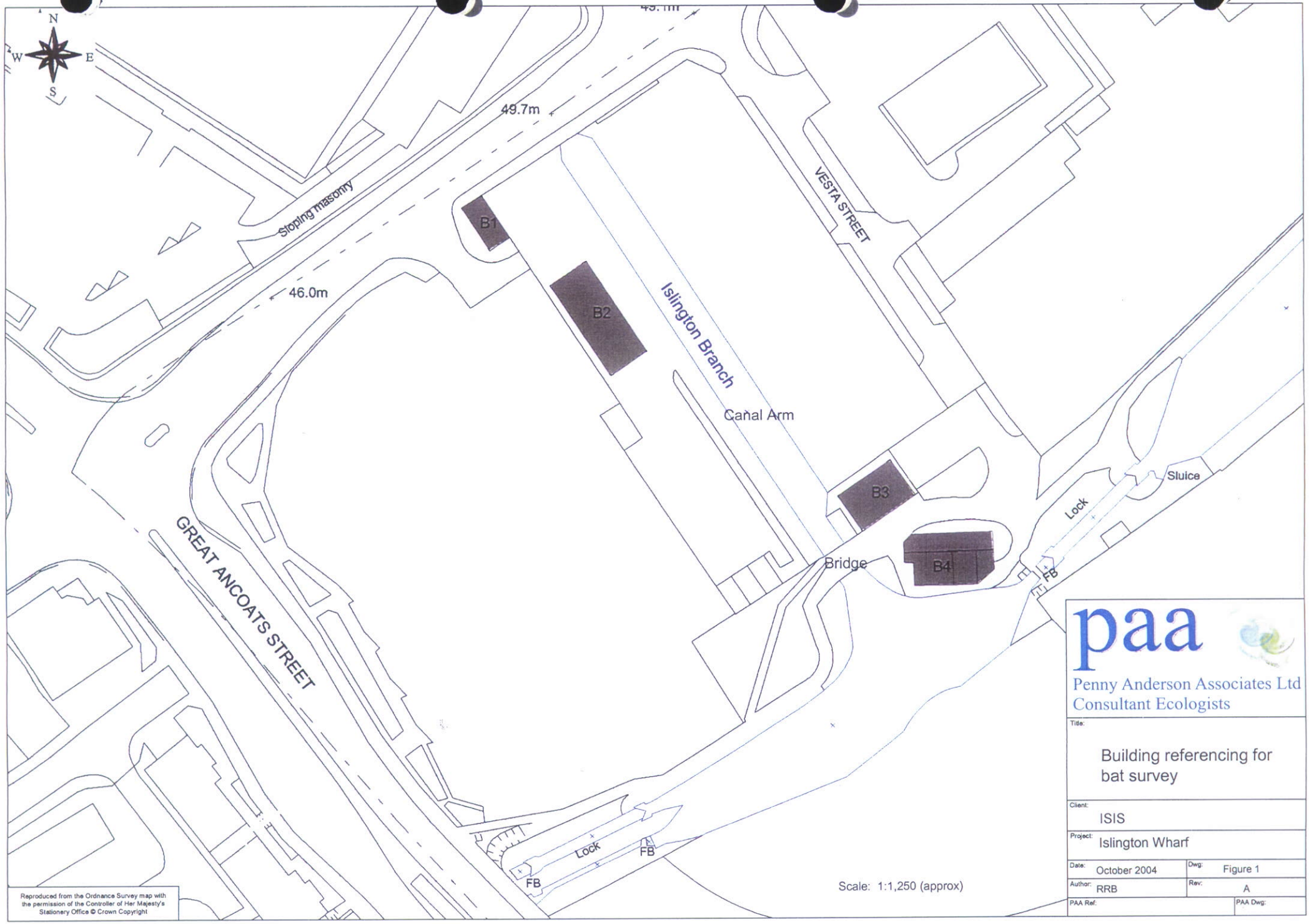

N
W
E
S
49.7m
46.0m
Sloping masonry
B1
B2
B3
B4
Islington Branch
Canal Arm
VESTA STREET
GREAT ANCOATS STREET
Bridge
Lock
Sluice
FB
Lock
FB
FB
Scale: 1:1,250 (approx)
Reproduced from the Ordnance Survey map with the permission of the Controller of Her Majesty's Stationery Office © Crown Copyright
paa
Penny Anderson Associates Ltd
Consultant Ecologists
Title:
Building referencing for bat survey
Client:
ISIS
Project:
Islington Wharf
Date:
October 2004
Dwg:
Figure 1
Author:
RRB
Rev:
A
PAA Ref:
PAA Dwg:

Figure 2 – Distribution of Habitats on Site and Building Numbers

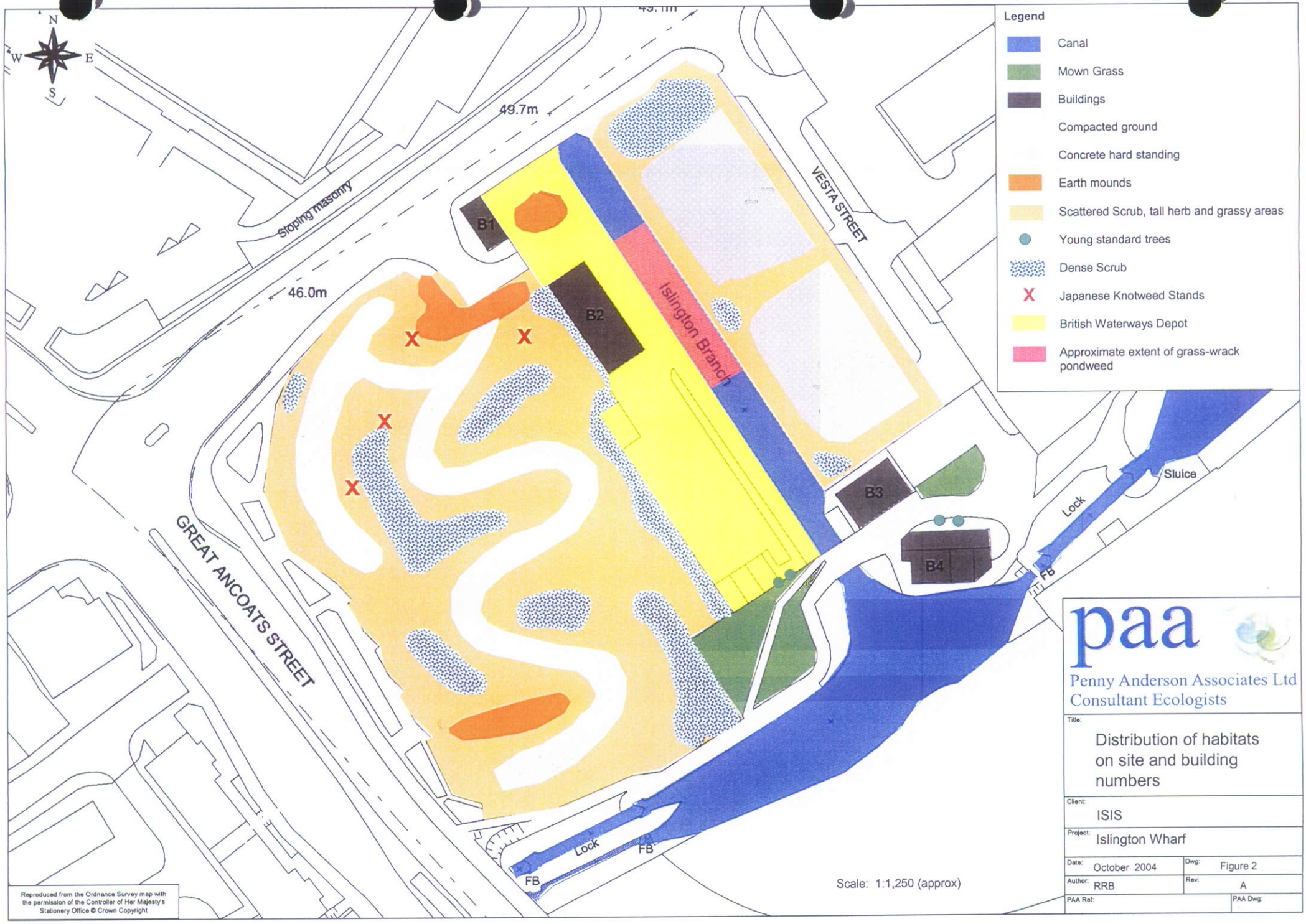

N
W
E
S
49.7m
46.0m
Stoping masonry
VESTA STREET
GREAT ANCOATS STREET
Islington Branch
B1
B2
B3
B4
X
X
X
X
Lock
Sluice
Lock
FB
FB
FB
Legend
Canal
Mown Grass
Buildings
Compacted ground
Concrete hard standing
Earth mounds
Scattered Scrub, tall herb and grassy areas
Young standard trees
Dense Scrub
Japanese Knotweed Stands
British Waterways Depot
Approximate extent of grass-wrack pondweed
Scale: 1:1,250 (approx)
Reproduced from the Ordnance Survey map with the permission of the Controller of Her Majesty's Stationery Office © Crown Copyright
paa
Penny Anderson Associates Ltd
Consultant Ecologists
Title:
Distribution of habitats on site and building numbers
Client:
ISIS
Project:
Islington Wharf
Date: October 2004
Dwg: Figure 2
Author: RRB
Rev: A
PAA Ref:
PAA Dwg:

Plate 1 – Grasswrack Pondweed in the Islington Branch Canal Arm

PLATE

Plate 1. Grasswrack pondweed (circled) in the Islington Branch canal arm, adjacent to lock gate. 24 May 2004.



CHAPTER 17
Air Quality

No Appendices

CHAPTER 18
TV and Radio Reception

Appendix 18.1 – TV and Radio Technical Survey

TV RECEPTION SURVEY

ISLINGTON WHARF
OLD MILL STREET
MANCHESTER

TAYLOR

Electronic Systems Engineers

Project Installation Engineers For
V & Radio Transmitters
CTV Public Address
Terrestrial & Satellite Distribution Systems
ccess Control Systems

Taylor Bros. Installations (Bolton) Ltd.
Taylor Building,
247 Crompton Way,
Bolton BL2 2RY.
Tel: 01204 380726
Fax: 01204 380724
e-mail: taylors@taylorbros-uk.com
www.taylorbros-uk.com

TV RECEPTION SURVEY

ISLINGTON WHARF
OLD MILL STREET
MANCHESTER

THIS TV RECEPTION SURVEY REPORT WAS CARRIED OUT ON BEHALF OF:

DRIVERS JONAS
26 YORK STREET
MANCHESTER
M1 4JB

THIS SURVEY WAS CARRIED OUT BY:

TAYLOR BROS. INSTALLATIONS (BOLTON) LTD
TAYLOR BUILDING
247 CROMPTON WAY
BOLTON
BL2 2RY

AS PART OF THE PLANNING CONDITION

DATE OF SURVEY: **8TH, 9TH & 10TH NOVEMBER 2004**

INTRODUCTION

Theory predicts, and practical evaluation has confirmed, that the introduction of new buildings/structures into an area can cause impairment to terrestrial TV reception.

These impairments can be caused by shadowing, where the new building shadows existing properties from the TV transmitter, subsequently reducing signal strength and quality or by reflections where the new building reflects signals from the TV transmitter. These unwanted reflected signals are received by the TV aerials on existing properties along with the direct signal from the TV transmitter resulting in effects causing ghosting.

The purpose of this survey is to ascertain any possible properties that could have their TV reception impaired by the introduction of the proposed site.

Taking into account the proposed buildings heights and locations in conjunction with surrounding buildings, existing obstructions to TV reception and local aerial direction, we can plot an area to be surveyed. This area is where we envisage possible impairments to TV reception could occur.

THE PROPOSED SITE

The proposed buildings are to be located within an area of Manchester that was once predominantly commercial/industrial, consisting of mills, factories and warehouses. This area is presently undergoing renewal and many of the existing buildings and new developments are for residential purposes.. Please note that the previous buildings on the proposed site are no longer present subsequently height comparisons could not be taken into consideration during the survey.

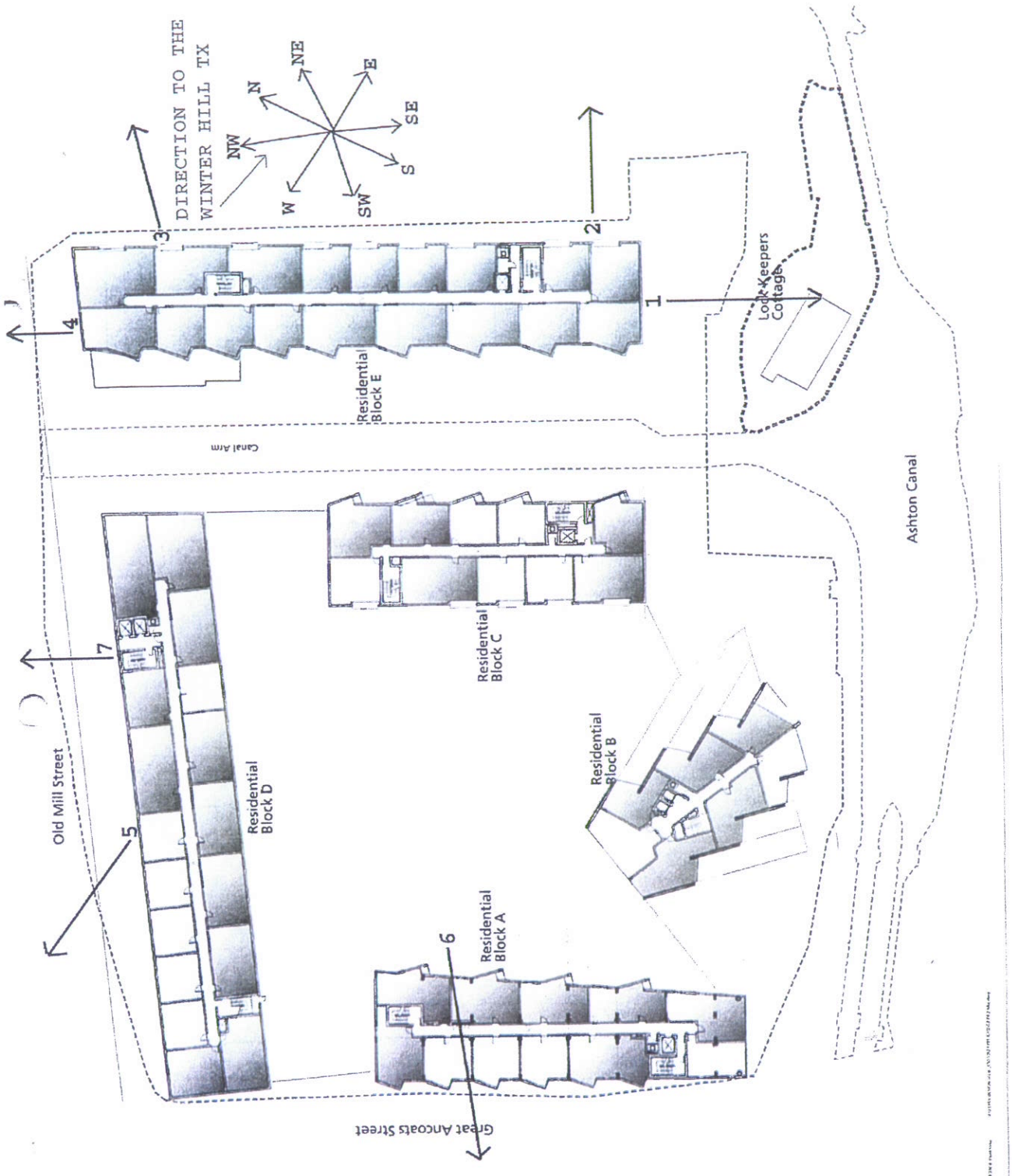
SURROUNDING BUILDINGS AND EXISTING OBSTRUCTIONS TO TV RECEPTION

1. At present there are several multi storey buildings within the surrounding area to the proposed site. Theses buildings are either new build or conversions of existing mills/factories. These properties will be acting as existing obstructions to TV reception.

2. In the local area to the proposed site there is a land undulation (drop off in height). This area is where there are a number of residential properties. The land undulation is acting as an existing obstruction to TV reception.

3. There is a new construction site located to the Southeast of the proposed site and at present high level cranes are operating. These cranes will be affecting TV reception and acting as an existing obstruction to TV reception.

A series of photographs have been taken from the location of the proposed site to highlight the surrounding buildings. Please refer to Plan 1, which corresponds with the photographs and highlights the position and direction they were taken in.


DIRECTION TO THE WINTER HILL TX
N
NE
E
SE
S
SW
W
NW
1
2
3
4
5
6
7
Residential Block E
Residential Block C
Residential Block B
Residential Block D
Residential Block A
Lock Keepers Cottage
Ashton Canal
Canal Arm
Old Mill Street
Great Ancoats Street

PLAN 1



PHOTOGRAPH 1 – EXISTING BUILDINGS LOCATED TO THE SOUTH AND SOUTHEAST OF THE PROPOSED SITE. PLEASE NOTE THE CRANES THAT ARE PRESENT LOCATED ON THE NEW CONSTRUCTION SITE OFF GREAT ANCOATS STREET



PHOTOGRAPH 2 – EXISTING BUILDINGS LOCATED TO THE EAST OF THE PROPOSED SITE



PHOTOGRAPH 3 – EXISTING BUILDINGS LOCATED TO THE NORTHEAST OF THE PROPOSED SITE



PHOTOGRAPH 4 – EXISTING BUILDINGS LOCATED TO THE NORTH AND NORTHWEST OF THE PROPOSED SITE

SITE LOCATION

Islington Wharf
Old Mill Street
Manchester

Block A

NGR C : SJ8524998240
Approximate Ground Height : 46mtrs
Approximate Building Height : 23mtrs

NGR D : SJ8526898216
Approximate Ground Height : 46mtrs
Approximate Building Height : 23mtrs

Block B

NGR F : SJ8532098226
Approximate Ground Height : 45mtrs
Approximate Building Height : 49.5mtrs

Block C

NGR E : SJ8530698286
Approximate Ground Height : 47mtrs
Approximate Building Height : 20.3mtrs

Block D

NGR A : SJ8529598300
Approximate Ground Height : 46mtrs
Approximate Building Height : 32mtrs

NGR B : SJ8524998262
Approximate Ground Height : 46mtrs
Approximate Building Height : 32mtrs

Block E

NGR G : SJ8533298295
Approximate Ground Height : 46mtrs
Approximate Building Height : 32mtrs

MAIN TV TRANSMITTER SERVING THIS AREA

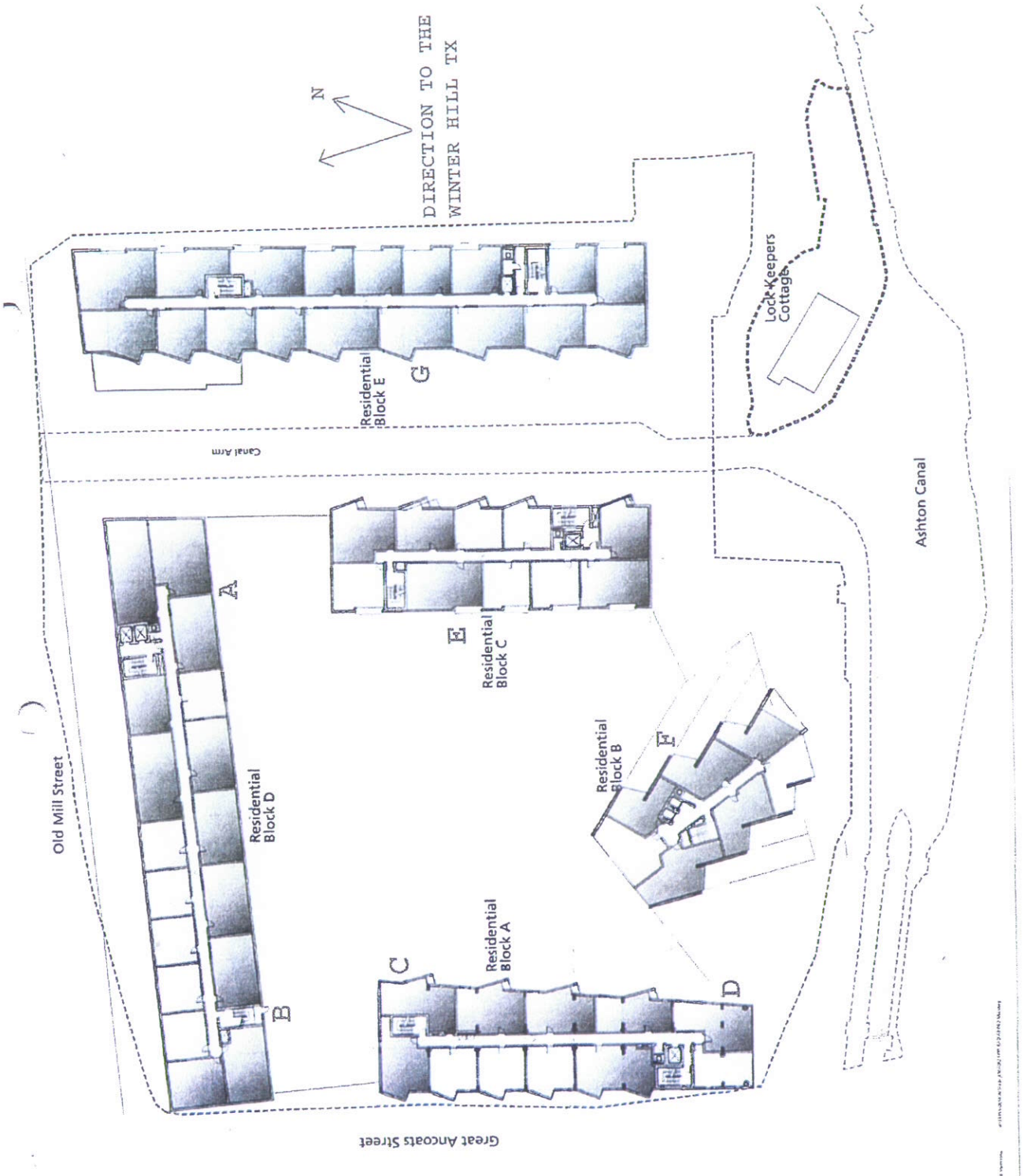
Winter Hill Transmitter
TX NO:- 103.00
NGR :- SD660144

DISTANCE FROM THE PROPOSED SITE

Approximately 25.1km

BEARING FROM THE PROPOSED SITE

Approximately 310° BRG


N
DIRECTION TO THE
WINTER HILL TX
Lock Keepers
Cottage
Residential
Block E
G
Canal Arm
Ashton Canal
A
E
Residential
Block C
Residential
Block B
F
Old Mill Street
Residential
Block D
Residential
Block A
C
D
B
Great Ancoats Street

PLAN 2

REFERENCE OF TERMS

Channel:	The UHF channel allocation for the programme from the transmitter.
Level (dbmv):	This is the signal strength. 0db is the industry standard. Modern television sets work between –5dbmv and +20dbmv.
CCIR:	5 Point impairment scale as below.

Quality	Impairment	Grade
Excellent	Imperceptible	5
Good	Perceptible	4
Fair	Slightly Annoying	3
Poor	Annoying	2
Bad	Very Annoying	1

CSI:	Level of carrier signal to interference. Up to 20% is an acceptable level, however, there may be no disruption up to 35%.
BER:	Bit Error Rate. A measure of digital demodulation or decoding accuracy. -7 and below is the best result. -4 and above the carrier can become disrupted.
Digital Level (dbmv):	These carriers work on a lesser level down to –14dbmv before disruption occurs.
BRG:	Bearing from North.
Tx:	Transmitter.

TEST POINT LOCATION: 1 - MILL BANK STREET

Analogue Radio Results

Frequency	Programme	Level (dbmv)
98.9	Radio 1	+2
89.3	Radio 2	+3
91.5	Radio 3	+3
93.7	Radio 4	0
95.1	GMR	-9
103.0	Key 103	-6

DAB Results

Frequency	Level (dbmv)
225.648	+15



PHOTOGRAPH 7 – TYPICAL AERIAL AT TEST POINT 1

TEST POINT LOCATION 2

POLLARD STREET

NGR : SJ8543598196
Alt : 51mtrs
Mast Height: 14mtrs

Existing Aerial Arrays: High gain aerial on 3m masts mounted at 6 storey height directed towards the Winter Hill Tx feeding communal TV system.

Existing Obstructions: City Centre buildings.

Analogue Results

Channel	Programme	Level (dbmv)	CCIR Grade	Audio
48	Channel 5	-5	4	Good
55	BBC1	+6	4	Good
59	ITV	+12	4	Good
62	BBC2	-3	4	Good
65	Channel 4	+7	4	Good

Digital Results

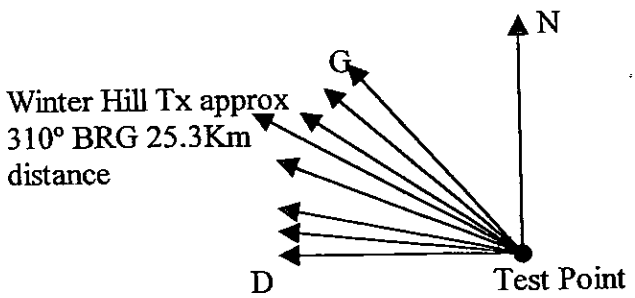
Channel	Level	BER	CSI	Quality
56	-8	-7	11%	Pass
60	-10	-7	12%	Pass
63	-8	-7	13%	Pass
66	-8	-7	25%	Pass
67	-8	-7	10%	Pass
68	-9	-7	24%	Pass

Report

At present there is good quality reception on both analogue and digital terrestrial services (there is marginal ghosting on the analogue channels).

Impact

We envisage impairment to TV reception in this area.



G – approx 320° BRG 158m distance
A – approx 312° BRG 180m distance
E – approx 311° BRG 162m distance
F – approx 294° BRG 120m distance
B – approx 293° BRG 198m distance
C – approx 289° BRG 190m distance
D – approx 282° BRG 164m distance

TEST POINT LOCATION: 2 – POLLARD STREET

Analogue Radio Results

Frequency	Programme	Level (dbmv)
98.9	Radio 1	+2
89.3	Radio 2	+3
91.5	Radio 3	+3
93.7	Radio 4	-1
95.1	GMR	-8
103.0	Key 103	-8

DAB Results

Frequency	Level (dbmv)
225.648	+16



PHOTOGRAPH 8 – VIEW OF PROPOSED SITE FROM TEST POINT 2 IN THE DIRECTION OF THE WINTER HILL TX

TEST POINT LOCATION 3

HARRISON STREET

NGR : SJ8562898237
Alt : 54mtrs
Mast Height: 10mtrs

Existing Aerial Arrays: 10 element aerials on 2m masts mounted at 2 storey height directed towards the Winter Hill Tx.

Existing Obstructions: 5 and 6 storey buildings on Pollard Street.

Analogue Results

Channel	Programme	Level (dbmv)	CCIR Grade	Audio
48	Channel 5	-3	4	Good
55	BBC1	+11	4	Good
59	ITV	+12	4	Good
62	BBC2	+4	4	Good
65	Channel 4	+8	4	Good

Digital Results

Channel	Level	BER	CSI	Quality
56	-6	-7	11%	Pass
60	-8	-7	12%	Pass
63	-8	-7	11%	Pass
66	-6	-7	25%	Pass
67	-7	-7	11%	Pass
68	-8	-7	24%	Pass

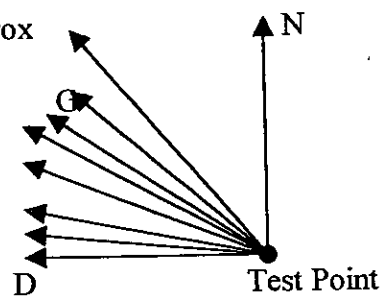
Report

There is ghosting present on the analogue channels. Overall reception is good on both digital and analogue services.

Impact

We envisage impairment to TV reception in this area.

Winter Hill Tx approx 310° BRG 25.4Km distance



G – approx 282° BRG 309m distance
A – approx 281° BRG 347m distance
E – approx 280° BRG 329m distance
B – approx 274° BRG 386m distance
C – approx 271° BRG 384m distance
F – approx 270° BRG 311m distance
D – approx 268° BRG 362m distance

TEST POINT LOCATION: 3 – HARRISON STREET

Analogue Radio Results

Frequency	Programme	Level (dbmv)
98.9	Radio 1	+4
89.3	Radio 2	+4
91.5	Radio 3	+3
93.7	Radio 4	+2
95.1	GMR	-8
103.0	Key 103	-5

DAB Results

Frequency	Level (dbmv)
225.648	+16



PHOTOGRAPH 9 – TYPICAL AERIALS AT TEST POINT 3



PHOTOGRAPH 10 – EXISTING OBSTRUCTIONS TO TV RECEPTION AT TEST POINT 3

TEST POINT LOCATION 4

JUNCTION OF BADBY CLOSE AND CARRUTHERS STREET

NGR : SJ8578298347
Alt : 48mtrs
Mast Height: 10mtrs

Existing Aerial Arrays: 10 element aerials on 1 and 2m masts mounted at 2 storey roof top and gutter height directed towards the Winter Hill Tx.

Existing Obstructions: 4 storey building located on Carruthers Street and Pollard Street.

Analogue Results

Channel	Programme	Level (dbmv)	CCIR Grade	Audio
48	Channel 5	-7	3	Good
55	BBC1	+5	3	Good
59	ITV	+4	3	Good
62	BBC2	0	3	Good
65	Channel 4	+1	3	Good

Digital Results

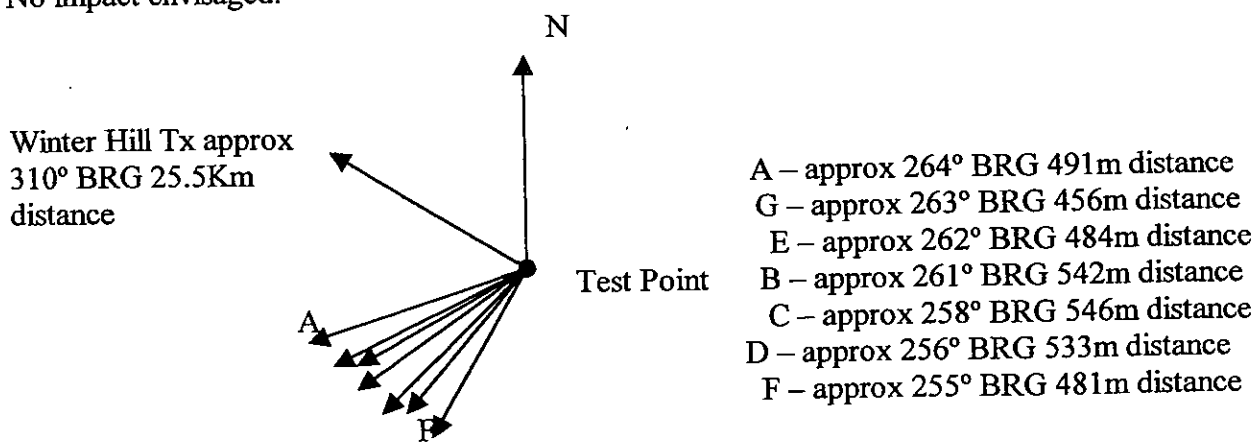
Channel	Level	BER	CSI	Quality
56	-10	-7	12%	Pass
60	-14	-7	13%	Pass
63	-14	-7	15%	Pass
66	-13	-7	28%	Pass
67	-11	-7	11%	Pass
68	-13	-7	30%	Pass

Report

Analogue reception is ghosting. The digital services are satisfactory.

Impact

No impact envisaged.



TEST POINT LOCATION: 4 – JUNCTION OF BADBY CLOSE AND CARRUTHERS STREET

Analogue Radio Results

Frequency	Programme	Level (dbmv)
98.9	Radio 1	+5
89.3	Radio 2	+4
91.5	Radio 3	+5
93.7	Radio 4	+1
95.1	GMR	-10
103.0	Key 103	-9

DAB Results

Frequency	Level (dbmv)
225.648	+14



PHOTOGRAPH 11 – TYPICAL AERIALS ST TEST POINT 4



PHOTOGRAPH 23 – TYPICAL AERIALS LOCATED IN THE AREA OF TEST POINT 13



PHOTOGRAPH 24 – EXISTING OBSTRUCTIONS IN THE DIRECTION OF THE WINTER HILL TX FROM TEST POINT 13

TEST POINT LOCATION 14

GURNEY STREET

NGR : SJ8594798305
Alt : 38mtrs
Mast Height: 10mtrs

Existing Aerial Arrays: 10 and high gain aerials on 1,2 and 3m masts mounted at 2 storey height directed towards the Winter Hill Tx.

Existing Obstructions: Land undulation, existing 4 and 5 storey buildings located in the Carruthers Street area.

Analogue Results

Channel	Programme	Level (dbmv)	CCIR Grade	Audio
48	Channel 5	-14	3	Good
55	BBC1	0	3	Good
59	ITV	+2	3	Good
62	BBC2	-4	3	Good
65	Channel 4	-6	3	Good

Digital Results

Channel	Level	BER	CSI	Quality
56	-16	-7	14%	Pass
60	-18	-7	15%	Pass
63	-20	-6	20%	Pass
66	-23	-4	44%	Fail
67	-22	-7	22%	Pass
68	-23	-4	44%	Fail

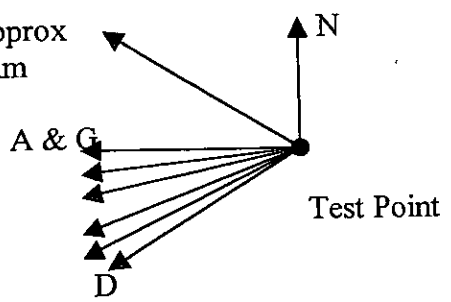
Report

Analogue reception is suffering from ghosting. The digital services are being disrupted.

Impact

A marginal impact is envisaged in this area.

Winter Hill Tx approx 310° BRG 25.6Km distance



G – approx 269° BRG 609m distance
A – approx 269° BRG 645m distance
E – approx 268° BRG 634m distance
B – approx 266° BRG 692m distance
C – approx 264° BRG 694m distance
F – approx 263° BRG 625m distance
D – approx 262° BRG 678m distance

PHOTOGRAPH 25 – EXISTING AERIALS LOCATED IN THE AREA OF TEST POINT 14

TEST POINT LOCATION 15

JUNCTION OF BLISWORTH CLOSE AND PATTISHALL CLOSE

NGR : SJ8586598237
Alt : 42mtrs
Mast Height: 10mtrs

Existing Aerial Arrays: 10 and 18 element aerials on 2,3 and 4m masts mounted at 2 storey height directed towards the Winter Hill Tx.

Existing Obstructions: 4-6 storey buildings in the area of Carruthers Street.

Analogue Results

Channel	Programme	Level (dbmv)	CCIR Grade	Audio
48	Channel 5	-12	3	Good
55	BBC1	0	3	Good
59	ITV	+4	4	Good
62	BBC2	0	3	Good
65	Channel 4	+4	4	Good

Digital Results

Channel	Level	BER	CSI	Quality
56	-14	-7	13%	Pass
60	-15	-7	13%	Pass
63	-14	-7	14%	Pass
66	-11	-7	26%	Pass
67	-11	-7	14%	Pass
68	-12	-7	27%	Pass

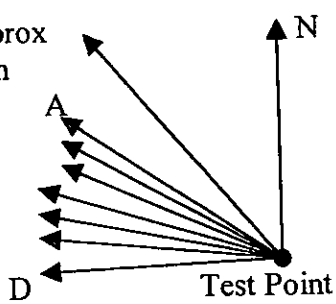
Report

Analogue reception is ghosting. The digital services are satisfactory.

Impact

We envisage impairment to TV reception in this area.

Winter Hill Tx approx 309° BRG 25.6Km distance



A – approx 277° BRG 567m distance
G – approx 276° BRG 562m distance
E – approx 275° BRG 552m distance
B – approx 273° BRG 609m distance
C – approx 270° BRG 607m distance
F – approx 269° BRG 535m distance
D – approx 268° BRG 588m distance



PHOTOGRAPH 26 – TYPICAL AERIALS LOCATED IN THE AREA OF TEST POINT 15

TEST POINT LOCATION 16

JUNCTION OF TUTBURY STREET AND HARDING STREET

NGR : SJ8582398104
Alt : 39mtrs
Mast Height: 12mtrs

Existing Aerial Arrays: 10 element and high gain aerials on 2 and 3m masts mounted at 2 storey roof top height directed towards the Winter Hill Tx.

Existing Obstructions: Land undulations, trees, local buildings.

Analogue Results

Channel	Programme	Level (dbmv)	CCIR Grade	Audio
48	Channel 5	-13	3	Good
55	BBC1	0	3	Good
59	ITV	+6	4	Good
62	BBC2	0	4	Good
65	Channel 4	+1	4	Good

Digital Results

Channel	Level	BER	CSI	Quality
56	-12	-7	13%	Pass
60	-14	-7	12%	Pass
63	-14	-7	13%	Pass
66	-15	-7	29%	Pass
67	-16	-7	14%	Pass
68	-16	-7	32%	Pass

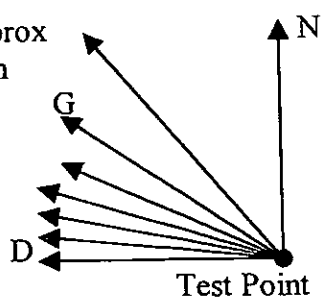
Report

Analogue reception is suffering from ghosting. Digital services are satisfactory.

Impact

We envisage impairment to TV reception in this area.

Winter Hill Tx approx 310° BRG 25.7Km distance



G – approx 291° BRG 527m distance
A – approx 290° BRG 565m distance
E – approx 290° BRG 550m distance
B – approx 286° BRG 597m distance
F – approx 284° BRG 517m distance
C – approx 283° BRG 591m distance
D – approx 282° BRG 567m distance



PHOTOGRAPH 27 – TYPICAL AERIALS LOCATED IN THE AREA OF TEST POINT 16

TEST POINT LOCATION 17

MAYES GARDENS

NGR : SJ8572098206
Alt : 44mtrs
Mast Height: 12mtrs

Existing Aerial Arrays: 10 element aerials on 2m masts mounted at single storey height and 2 storey roof top height directed towards the Winter Hill Tx.

Existing Obstructions: Land undulations, 4-5 storey buildings on Pollard Street.

Analogue Results

Channel	Programme	Level (dbmv)	CCIR Grade	Audio
48	Channel 5	-14	3	Good
55	BBC1	-3	3	Good
59	ITV	+1	3	Good
62	BBC2	-1	3	Good
65	Channel 4	+3	3	Good

Digital Results

Channel	Level	BER	CSI	Quality
56	-18	-7	14%	Pass
60	-16	-7	13%	Pass
63	-16	-7	14%	Pass
66	-15	-7	27%	Pass
67	-16	-7	14%	Pass
68	-17	-7	34%	Pass

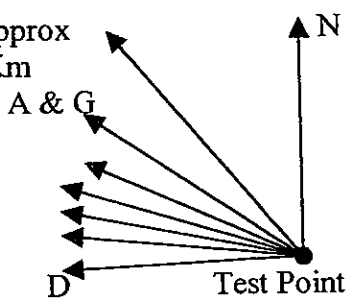
Report

Analogue reception is suffering from ghosting. The digital services are satisfactory.

Impact

We envisage impairment to TV reception in this area.

Winter Hill Tx approx 309° BRG 25.5Km distance



G – approx 282° BRG 395m distance
A – approx 282° BRG 430m distance
E – approx 280° BRG 416m distance
B – approx 276° BRG 468m distance
C – approx 273° BRG 466m distance
F – approx 272° BRG 396m distance
D – approx 270° BRG 446m distance



PHOTOGRAPH 28 – TYPICAL AERIALS IN THE AREA OF TEST POINT 17

CONCLUSIONS

1. The beam path (direction) for television aerials located in the surrounding area is to the Northwest where the Winter Hill Tx is sited. Due to this factor we would anticipate properties located to the Southeast of the proposed site whose aerial beam path crosses through or in close proximity to the proposed site to experience impairment to TV reception.

2. A large proportion of the surrounding area is industrial and commercial in use. These areas are located to the North, Northwest, West and East of the proposed site. During the survey we noticed that there are only a small amount of TV aerials visibly sited on individual commercial units.

3. The main residential area close to the proposed site is located to the Southeast. The survey shows that this area already has impairments to TV reception due to existing obstructions, they are as follows :-

    a) Land undulation – the ground height decreases from every street to Palmerston Street subsequently causing impairments to TV reception.
    b) Existing buildings located on Pollard Street and Carruthers Street varying in height from 4 storey to 8 storey and located on the higher ground are acting as existing obstructions to TV reception from the Winter Hill Tx.
    c) A new construction site is in progress located in the area of the Old Vulcan Works off Great Ancoats Street. Operating on this site are high level cranes. These cranes are having adverse affects on TV reception to properties in the surrounding area and have been noted on several occasions throughout the survey.

4. The existing buildings located along Pollard Street will shadow the proposed site from a large portion of the residential area located to the Southeast of the proposed site. This will reduce any affects caused to TV reception by the proposed site to the residential area located to the Southeast.

    Note : These same existing buildings located along Pollard Street have undergone conversion into residential properties. We can only assume that the new construction site is for residential purpose as well. These buildings will have their TV reception impaired by the proposed site.

Taking into account the points mentioned in conclusions and the test results recorded during the survey, we have plotted an area on Map 1 showing where we envisage impairment to TV reception could occur.

NOTES:

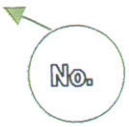
1. The existing aerials recorded on the survey test sheets do not account for all the aerials in the area. They are the aerials which are visible from the ground at the test point location and are used as a guide during the survey.

2. If high level cranes are used on site they could cause interference to TV reception on a larger scale than the completed proposed building. This interference would be for the duration of time that the cranes are present.

KEY TO MAP



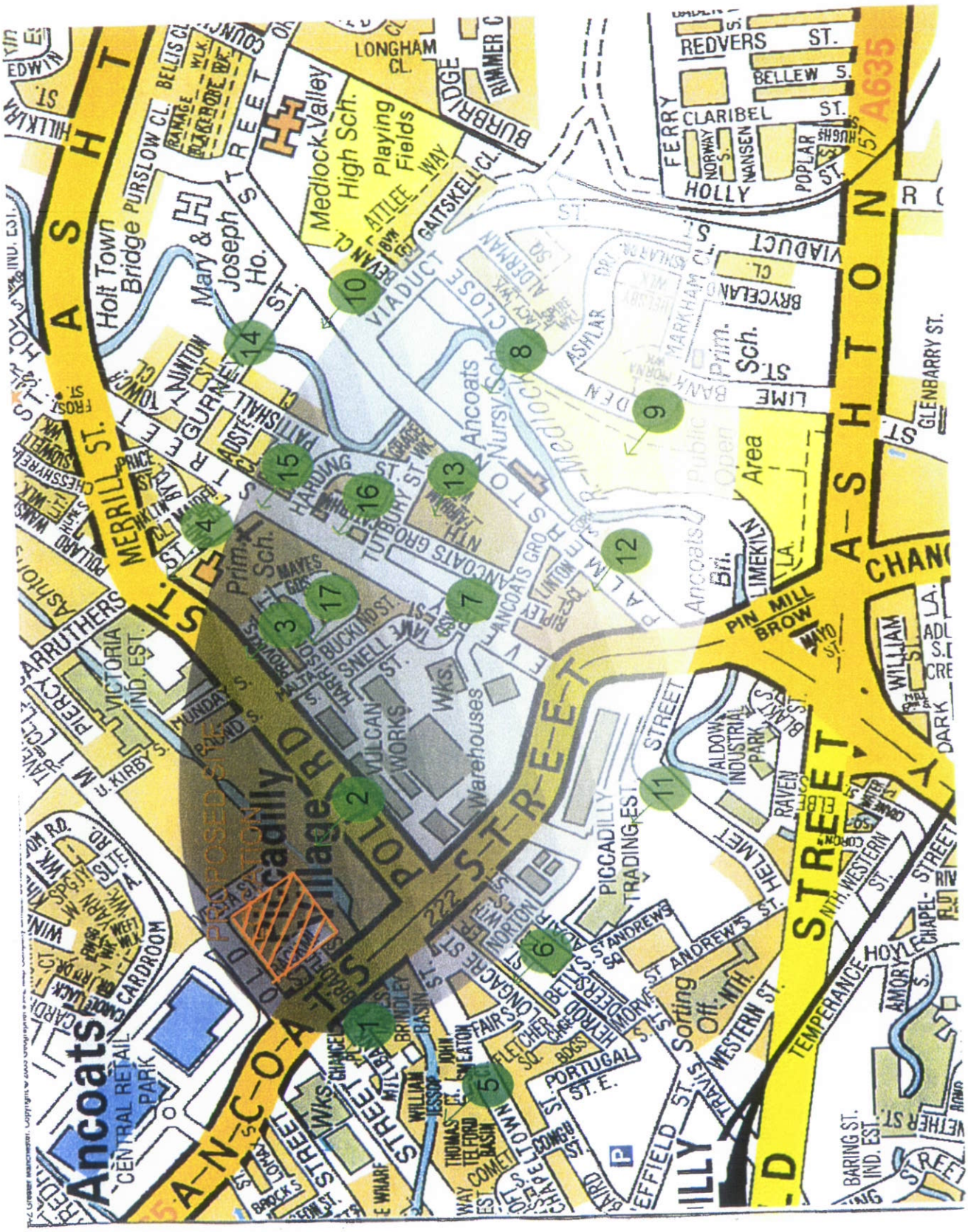
PROPOSED SITE



TEST POSITION SHOWING LOCAL AERIAL DIRECTION



PREDICTED EFFECTED AREA SHOWING EXTREMITIES OF EFFECTS


A S H T O N
A635
REDVERS ST.
BELLEW S.
CLARIBEL ST.
HOLLY
POPLAR ST.
FERRY
NORWAY S.
NANSEN S.
LONGHAM CL.
BURBRIDGE
RUMMER C
Medlock Valley High Sch.
Playing Fields
ATTLEE WAY
GAITSKELL CL.
Holt Town Bridge
PURSLOW CL.
Mary & Joseph Ho.
ST.
VIADUCT
CLOSE
ALDERMAN
ASHLAR
MARKHAM CL.
BRYCELAN CL.
Prim. Sch.
LIME
GLENBARRY ST.
Ancoats Nursy. Sch.
Medlock R.
Public Open Area
Ancoats Bri.
LIMEKILN LA.
PIN MILL BROW
MAYO ST.
WILLIAM ST.
MERRILL ST.
HARDING ST.
TUTBURY ST.
ANCOATS GRO
Prim. Sch.
MAYES GDNS
ASHTON
ARRUTHERS
VICTORIA IND. EST.
PIERCY
MUNDAY S.
U. KIRBY S.
BUCKLAND ST.
SNELL ST.
VULCAN WORKS
Wks.
Warehouses
PIGGADILLY
TRADING EST
STREET
ALDOW INDUSTRIAL PARK
RAVEN
HEYWOOD ST.
NTH. WESTERN
CHAPEL-STREET
HOYLE
AMORY ST.
TEMPERANCE
WESTERN ST.
Sorting Off. NTH.
ST ANDREWS SQ
ST ANDREWS ST.
PORTUGAL ST. E.
PORTUGAL ST.
LONGACRE
FAIRS
BRINDLEY
BASIN
JOHN EATON
FLETCHER
BOXES
HEYWOOD
MORLEY ST.
NORTON
222
PROPOSED STATION
Ancoats Village
CENTRAL RETAIL PARK
CARDROOM
A-N-C-O-A-T-S
STREET
WKS
CHANCE
MILLS
WILLIAM JESSOP
THOMAS TELFORD BASIN
COMET
WAY
EST.
SHAFT
LONG ST.
EFFIELD ST.
TRAVIS
ILLY
BARING ST. IND. EST.
STREET
P
EDWIN ST.
HILLKIRK
BELLIS CL.
WLK
GARAGE
BLACKBURN RD.
COUNTY OK
FROST ST.
JUNCTION
GUARNEY ST.
TOWER
PARKFIELD ST.
PARKFIELD
PRICE ST.
CHESSHYRE WK
SUMNER WK
POLLARD ST.
ASHTON
WASH
WK
MAYFIELD
PARKFIELD
ST.
MALTA
ST.
ROLAND S.
WORKS
WKS.
WORKS
WORKS
WORKS



PHOTOGRAPH 12 – EXISTING OBSTRUCTIONS TO TV RECEPTION FROM TEST POINT 4

TEST POINT LOCATION 5

CHAPELTOWN STREET

NGR : SJ8498697968
Alt : 42mtr
Mast Height: 14mtrs

Existing Aerial Arrays: High gain aerials on 3 and 4m masts mounted at 4 and 5 storey height directed towards the Winter Hill Tx possibly feeding communal systems on new apartment blocks.

Existing Obstructions: 6,7 and 8 storey buildings on beam.

Analogue Results

Channel	Programme	Level (dbmv)	CCIR Grade	Audio
48	Channel 5	-15	3	Good
55	BBC1	-9	3	Good
59	ITV	+1	3	Good
62	BBC2	0	3	Good
65	Channel 4	+3	3	Good

Digital Results

Channel	Level	BER	CSI	Quality
56	-20	-7	20%	Pass
60	-14	-7	13%	Pass
63	-13	-7	12%	Pass
66	-14	-7	28%	Pass
67	-14	-7	13%	Pass
68	-15	-7	32%	Pass

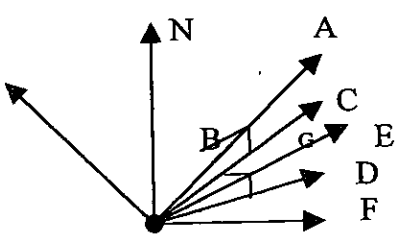
Report

Analogue reception is suffering from ghosting. Digital reception is satisfactory.

Impact

No impact envisaged.

Winter Hill Tx approx 311° BRG 25.1Km distance



A – approx 45° BRG 491m distance
B – approx 45° BRG 430m distance
C – approx 46° BRG 403m distance
E – approx 47° BRG 473m distance
G – approx 47° BRG 490m distance
D - approx 50° BRG 396m distance
F – approx 53° BRG 442m distance

TEST POINT LOCATION: 5 – CHAPELTOWN STREET

Analogue Radio Results

Frequency	Programme	Level (dbmv)
98.9	Radio 1	-3
89.3	Radio 2	-2
91.5	Radio 3	-3
93.7	Radio 4	-5
95.1	GMR	-12
103.0	Key 103	-4

DAB Results

Frequency	Level (dbmv)
225.648	+12



PHOTOGRAPH 13 – TYPICAL AERIALS LOCATED AT TEST POINT 5

TEST POINT LOCATION 6

JUNCTION OF ADAIR STREET AND BETLEY STREET

NGR : SJ8526997921
Alt : 41mtrs
Mast Height: 14mtrs

Existing Aerial Arrays: None visible. This area is industrial and commercial.

Existing Obstructions: 4-6 storey buildings.

Analogue Results

Channel	Programme	Level (dbmv)	CCIR Grade	Audio
48	Channel 5	-9	4	Good
55	BBC1	0	4	Good
59	ITV	+5	3	Good
62	BBC2	+2	3	Good
65	Channel 4	+3	4	Good

Digital Results

Channel	Level	BER	CSI	Quality
56	-13	-7	13%	Pass
60	-12	-7	11%	Pass
63	-12	-7	13%	Pass
66	-16	-6	31%	Pass
67	-16	-7	16%	Pass
68	-17	-5	33%	Marginal

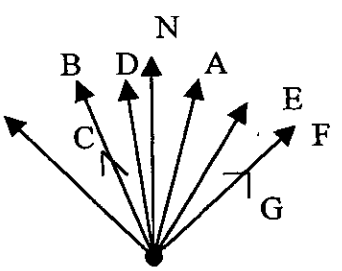
Report

Analogue reception is suffering from ghosting and there is disruption to the digital services.

Impact

No impact is envisaged.

Winter Hill Tx approx 310°
BRG 25.4Km distance



Test Point

B – approx 356° BRG 339m distance
C – approx 356° BRG 317m distance
D – approx 359° BRG 297m distance
A – approx 3° BRG 380m distance
E – approx 5° BRG 369m distance
F - approx 9° BRG 311m distance
G – approx 9° BRG 380m distance

PHOTOGRAPH 14 – EXISTING OBSTRUCTIONS TO TV RECEPTION FROM TEST POINT 6

TEST POINT LOCATION 7

JUNCTION OF ANCOATS GROVE AND RIPLEY CLOSE

NGR : SJ8567298007
Alt : 45mtrs
Mast Height: 10mtrs

Existing Aerial Arrays: 10 and 18 element and high gain aerials on 1,2 and 3m masts mounted at 2 storey height directed towards the Winter Hill Tx.

Existing Obstructions: New construction site off Great Ancoats Street, high level cranes operating.

Analogue Results

Channel	Programme	Level (dbmv)	CCIR Grade	Audio
48	Channel 5	-16	2	Good
55	BBC1	-4	2	Good
59	ITV	-12	2	Interference
62	BBC2	-14	2	Interference
65	Channel 4	-12	2	Interference

Digital Results

Channel	Level	BER	CSI	Quality
56	-25	-5	27%	Marginal
60	-26	-4	30%	Fail
63	-20	-4	29%	Fail
66	-21	-3	38%	Fail
67	-22	-3	29%	Fail
68	-22	-3	42%	Fail

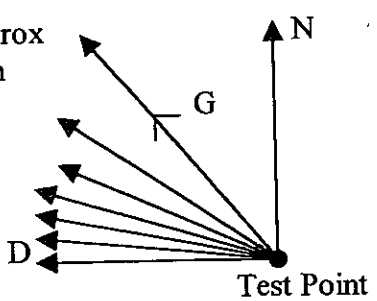
Report

Both analogue and digital services are poor. The signals are varying causing impairment and ghosting due to the movements of the cranes.

Impact

We envisage impairment to reception in this area.

Winter Hill Tx approx 310° BRG 25.6Km distance



G – approx 310° BRG 449m distance
A – approx 308° BRG 474m distance
E – approx 307° BRG 401m distance
F – approx 302° BRG 416m distance
B – approx 301° BRG 492m distance
C – approx 299° BRG 483m distance
D – approx 297° BRG 455m distance



PHOTOGRAPH 15 – TYPICAL AERIALS LOCATED IN THE AREA OF TEST POINT 7

PHOTOGRAPH 16 – NEW CONSTRUCTION SITE LOCATED OFF GREAT ANCOATS STREET ACTING AS AN OBSTRUCTION TO TV RECEPTION FROM TEST POINT 7

APPENDIX IV

'SUBJECTIVE IMPACT OF GHOSTING'

For an acceptable picture, the maximum permissible strength of the 'reflected' signal relative to the direct signal (known as the 'protection ratio') varies according to the length of the delay. The International Telecommunication Union is the organisation responsible for world radio standards, and ITU-R Report 478-1 contains the following results obtained experimentally.

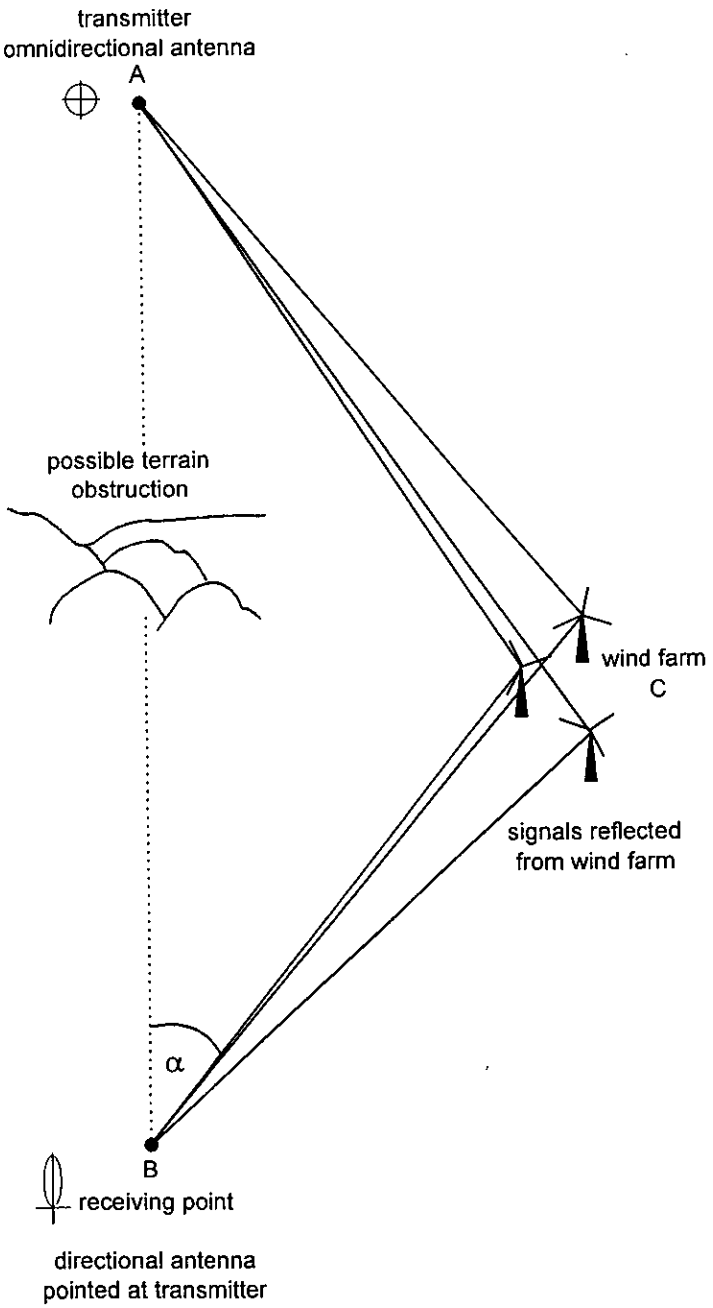
Impairment Grade ITU-R (Rec. 500)	*Protection ratio (dB) for delay:*		
	*0.4 μs**	*0.8 μs**	*1.4 μs**
5 (imperceptible)	*18*	*26*	*30*
4 (just perceptible)	*12*	*18*	*20*

* Note that 0.4μs, 0.8μs and 1.4μs correspond approximately to the 'ghost' being offset to the right from the main picture by 3 mm, 7 mm and 12 mm on a screen of a television set which is 50 cm (20 inches) wide.

APPENDIX V

REFLECTION EFFECTS FROM A WIND-FARM

The figure and text below shows the geometry associated with reflected signals from a wind-farm, and how directional receiving aerials provide rejection of the unwanted signal.



- The problem will be worse if path AB is more obstructed by terrain than paths AC and CB.

- The spacing of the delayed image (ghost) is dependent on the path difference (AC+CB)-AB. A path difference of 2 km gives a delayed image of one eighth of the picture width.

- If α is greater than 60° a standard aerial will normally provide sufficient discrimination against the reflected signals.

For α between 15° and 60°, a more directional receiving aerial can be used to reduce the level of reflected signals 'seen' by the receiver.

For α less than 15° even changing to the best available aerial will not help.

TEST POINT LOCATION 8

JUNCTION OF ADEN CLOSE AND SPIRE WALK

NGR : SJ8598797971
Alt : 50mtrs
Mast Height: 10mtrs

Existing Aerial Arrays: 10 element aerials on 1m masts mounted at 2 storey roof top height directed towards the Winter Hill Tx.

Existing Obstructions: Construction site off Great Ancoats Street with high level cranes operating.

Analogue Results

Channel	Programme	Level (dbmv)	CCIR Grade	Audio
48	Channel 5	+2	4	Good
55	BBC1	+15	4	Good
59	ITV	+17	5	Good
62	BBC2	+15	5	Good
65	Channel 4	+15	5	Good

Digital Results

Channel	Level	BER	CSI	Quality
56	0	-7	10%	Pass
60	0	-7	11%	Pass
63	0	-7	10%	Pass
66	+1	-7	23%	Pass
67	0	-7	10%	Pass
68	+1	-7	22%	Pass

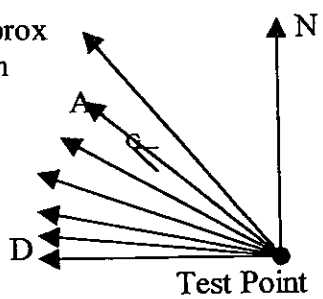
Report

At present both analogue and digital services are of a good quality. Note – cranes were not operating.

Impact

A marginal impact is envisaged in this area.

Winter Hill Tx approx 310° BRG 25.9Km distance



A – approx 296° BRG 768m distance
G – approx 296° BRG 728m distance
E – approx 295° BRG 750m distance
B – approx 292° BRG 795m distance
F – approx 291° BRG 710m distance
C – approx 290° BRG 786m distance
D – approx 289° BRG 759m distance

TEST POINT LOCATION 9

MORNA WALK

NGR : SJ8592097862
Alt : 49mtrs
Mast Height: 10mtrs

Existing Aerial Arrays: 10 and 18 element aerials on 1m masts mounted at roof top 2 storey height directed towards the Winter Hill Tx.

Existing Obstructions: Construction site located off Great Ancoats Street, high level cranes operating.

Analogue Results

Channel	Programme	Level (dbmv)	CCIR Grade	Audio
48	Channel 5	-2	4	Good
55	BBC1	+11	4	Good
59	ITV	+7	4	Good
62	BBC2	+11	4	Good
65	Channel 4	+14	4	Good

Digital Results

Channel	Level	BER	CSI	Quality
56	-1	-7	10%	Pass
60	-2	-7	11%	Pass
63	0	-7	11%	Pass
66	-1	-7	22%	Pass
67	-1	-7	11%	Pass
68	-2	-7	24%	Pass

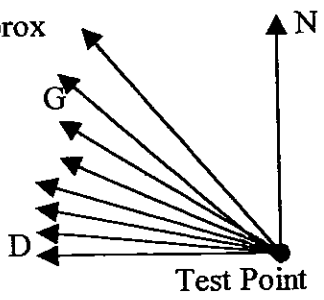
Report

Both analogue and digital reception is good with marginal ghosting present on the analogue channels. Note – high level cranes present but not operating.

Impact

A marginal impact is envisaged in this area.

Winter Hill Tx approx 311° BRG 26Km distance



G – approx 306° BRG 728m distance
A – approx 305° BRG 759m distance
E – approx 305° BRG 743m distance
F – approx 301° BRG 698m distance
B – approx 300° BRG 777m distance
C – approx 299° BRG 766m distance
D – approx 298° BRG 738m distance



PHOTOGRAPH 18 – TYPICAL AERIALS LOCATED IN THE AREA OF TEST POINT 9



PHOTOGRAPH 19 – NEW CONSTRUCTION SITE LOCATED OFF GREAT ANCOATS STREET ACTING AS AN OBSTRUCTION TO TV RECEPTION

TEST POINT LOCATION 10

BEVAN CLOSE

NGR : SJ8608398069
Alt : 46mtrs
Mast Height: 10mtrs

Existing Aerial Arrays: 10 element aerials on 1and 2m masts mounted at 2 storey height directed towards the Winter Hill Tx.

Existing Obstructions: Construction site off Great Ancoats Street with high level cranes operating, trees on beam.

Analogue Results

Channel	Programme	Level (dbmv)	CCIR Grade	Audio
48	Channel 5	-3	3	Good
55	BBC1	-5	3	Good
59	ITV	+3	4	Good
62	BBC2	-3	3	Good
65	Channel 4	-1	3	Good

Digital Results

Channel	Level	BER	CSI	Quality
56	-17	-7	13%	Pass
60	-16	-7	12%	Pass
63	-20	-6	15%	Pass
66	-13	-7	24%	Pass
67	-14	-7	12%	Pass
68	-14	-7	28%	Pass

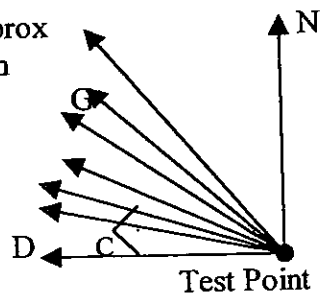
Report

The analogue reception is suffering from ghosting. Digital reception is satisfactory.

Impact

A marginal impact is envisaged in this area.

Winter Hill Tx approx 310° BRG 25.9Km distance



G – approx 287° BRG 783m distance
A – approx 286° BRG 819m distance
E – approx 285° BRG 805m distance
B – approx 283° BRG 853m distance
F – approx 281° BRG 777m distance
C – approx 281° BRG 849m distance
D – approx 280° BRG 825m distance



PHOTOGRAPH 20 – TYPICAL AERIALS LOCATED IN THE AREA OF TEST POINT 10

TEST POINT LOCATION 11

HELMET STREET

NGR : SJ8543797808
Alt : 39mtrs
Mast Height: 14mtrs

Existing Aerial Arrays: High gain aerials on 2m mast mounted at 2 storey height directed towards the Winter Hill Tx. Note : area is commercial/industrial.

Existing Obstructions: Piccadilly Trading Estate.

Analogue Results

Channel	Programme	Level (dbmv)	CCIR Grade	Audio
48	Channel 5	-22	2	Good
55	BBC1	-11	2	Good
59	ITV	-12	2	Good
62	BBC2	-22	1	Good
65	Channel 4	-13	2	Good

Digital Results

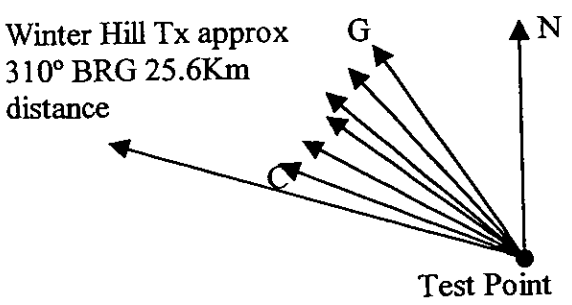
Channel	Level	BER	CSI	Quality
56				
60				
63	Not Receivable			
66				
67				
68				

Report

Analogue reception is poor suffering from multi path ghosting. The digital services are not receivable.

Impact

No impact is envisaged in this area.



G – approx 348° BRG 499m distance
E – approx 345° BRG 496m distance
F – approx 345° BRG 434m distance
A – approx 344° BRG 515m distance
D – approx 338° BRG 442m distance
B – approx 337° BRG 494m distance
C – approx 336° BRG 472m distance



PHOTOGRAPH 21 – AERIALS LOCATED ON A COMMERCIAL UNIT IN THE AREA OF TEST POINT 11

TEST POINT LOCATION 12

PALMERSTON STREET

NGR : SJ8571197904
Alt : 38mtrs
Mast Height: 14mtrs

Existing Aerial Arrays: 10 and 18 element and high gain aerials on 1,2,3 and 4m masts mounted at 2 storey height directed towards the Winter Hill Tx.

Existing Obstructions: Land undulation, construction site off Great Ancoats Street with high level cranes operating.

Analogue Results

Channel	Programme	Level (dbmv)	CCIR Grade	Audio
48	Channel 5	-26	1	Intermittent
55	BBC1	-16	2	Intermittent
59	ITV	-9	2	Good
62	BBC2	-6	2	Good
65	Channel 4	-3	3	Good

Digital Results

Channel	Level	BER	CSI	Quality
56	-30	-2	35%	Fail
60	-23	-2	31%	Fail
63	-20	-2	29%	Fail
66	-26	-2	54%	Fail
67	-30	-3	38%	Fail
68	-35	-1	61%	Fail

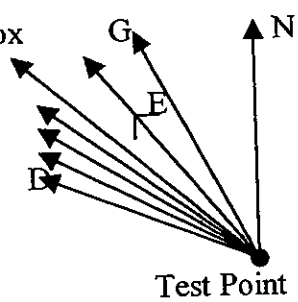
Report

Very poor reception on both digital and analogue services. The signal strengths and quality are varying due to the cranes movements.

Impact

Impairment to reception is envisaged in this area.

Winter Hill Tx approx 310° BRG 25.7Km distance



G – approx 315° BRG 548m distance
A – approx 313° BRG 580m distance
E – approx 313° BRG 561m distance
F – approx 309° BRG 510m distance
B – approx 307° BRG 591m distance
C – approx 306° BRG 577m distance
D – approx 305° BRG 547m distance



PHOTOGRAPH 22 - VIEW IN THE DIRECTION OF THE WINTER HILL TX SHOWING THE CRANE OPERATING ON THE CONSTRUCTION SITE OFF GREAT ANCOATS STREET

TEST POINT LOCATION 13

FAIRHAM WALK

NGR : SJ8580198038
Alt : 36mtrs
Mast Height: 14mtrs

Existing Aerial Arrays: 10 element aerials on 2,3 and 4m masts mounted at 2 storey roof top height directed towards the Winter Hill Tx.

Existing Obstructions: Land undulations, local buildings located on Pollard Street, new construction site with high level cranes located off Great Ancoats Street.

Analogue Results

Channel	Programme	Level (dbmv)	CCIR Grade	Audio
48	Channel 5	-14	2	Good
55	BBC1	-9	2	Good
59	ITV	-3	3	Good
62	BBC2	-11	2	Good
65	Channel 4	-5	3	Good

Digital Results

Channel	Level	BER	CSI	Quality
56				
60				
63	Not receivable			
66				
67				
68				

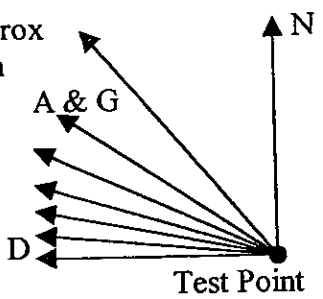
Report

Very poor reception on both analogue and digital services. Both signal strength and quality is varying with the cranes movements.

Impact

Impairment to TV reception is envisaged in this area.

Winter Hill Tx approx 309° BRG 25.7Km distance



G – approx 298° BRG 535m distance
A – approx 298° BRG 573m distance
E – approx 296° BRG 553m distance
B – approx 292° BRG 598m distance
F – approx 291° BRG 516m distance
C – approx 290° BRG 590m distance
D – approx 288° BRG 563m distance

POSSIBLE REMEDIES

1. **Improved Receiving Aerial**

One or all of the following may assist in reducing affects caused to TV reception :-

a) Change of aerial type.

b) Change of aerial height.

c) Re-site of existing aerial.

2. **Alternative Transmitter**

Where an alternative transmitter located in a different direction to the proposed site is used to receive TV signals. This will usually entail a new aerial installation directed towards the alternative transmitter.

Note:
During the survey for Islington Wharf, no alternative transmitter could be received of an acceptable quality or strength.

3. **DTTV – Digital Terrestrial Television (Freeview)**

Digital reception is less likely to be affected by reflections and can be an alternative to analogue reception when ghosting interference is being received. To receive these services an aerial upgrade and a set top box are usually required.

4. **Satellite TV**

Receiving television from one of the satellite services e.g Sky. This would require the installation of a satellite dish and set top box and possibly incur monthly subscriptions.

5. **Cable TV**

Connection to the local cable network. This would require liaison with the local cable operator for availability and cost incurments.

Signed: ..... Dated: 18 OCTOBER 2004

pp K BODEN

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The Impact of Large Buildings and Structures (including Wind Farms) on Terrestrial Television Reception

BBC

RA
RADIOCOMMUNICATIONS AGENCY

iTc
Independent Television Commission
PUTTING VIEWERS FIRST

The Impact of Large Buildings and Structures (including Wind-Farms) on Terrestrial Television Reception

Preface

It is well known that large buildings and other structures such as wind farms can adversely affect terrestrial television reception. The broadcasters, the BBC and the Independent Television Commission (ITC), are keen to ensure that disruption to both analogue and digital terrestrial television distribution and reception is kept to a minimum.

To achieve this, the broadcasters wish to bring to the attention of architects, building developers and planning authorities the potential for problems. Typically, the type of buildings that cause reception problems are those with a sizeable side elevation over 15 metres high. Mechanical constructions such as wind turbines, cranes, non-domestic satellite ground stations, etc., can also cause difficulties. There are two services the broadcasters wish to protect; permanent broadcast links and domestic reception.

- **Permanent broadcast links**

  In the UK, television programme distribution links are provided to more than 1300 transmitters by means of land-lines, microwave links and 'UHF In-Band' re-broadcast links (RBL). It is the latter that form the major part of the distribution system. Both microwave and re-broadcast links, between sites which can be up to 70 km apart, may be affected. The map in Appendix I illustrates the density of transmitters and RBL paths only. The transmission network within the UK is provided and operated on behalf of the broadcasters by Crown Castle and ntl.

- **Domestic television reception**

  Domestic television may be affected at distances up to 20 km from the large buildings causing the problem. Wind turbines affect reception up to a maximum distance of 5 km.

Terrestrial analogue television within the UK is the joint responsibility of the BBC and the ITC. The UK is sub-divided into areas for which one or other organisation is responsible. The map in Appendix II shows the two areas. The responsibility for digital terrestrial television is shared equally between the BBC and the ITC.

Contact details for the BBC Reception Advice, the ITC, ntl and Crown Castle are given in Appendix III.

This document discusses the measures that can be taken to minimise the effects of large buildings and other structures, and what can be done to restore viewers' reception.

The Impact of Large Buildings and Structures (Including Wind-Farms) on Terrestrial Television Reception

1.0 FOREWORD

The development of large buildings and other structures can cause television reception difficulties - a matter of concern to viewers, broadcasters and developers alike. Whilst it is often impossible to avoid such problems completely, the following text aims to provide a source of general guidance to help minimise the adverse impact of such developments on broadcast services.

2.0 INTRODUCTION

Both theory and practical experience have shown that large developments can have a disruptive effect on television reception. Reports of picture degradation linked with the construction of masts, towers, wind-turbines, and of domestic, commercial or industrial buildings[1], are unfortunately not uncommon.

This document contains a general consideration of how such problems can arise, and how, with care, they can be minimised. Both analogue and digital terrestrial reception can be affected.

A full analysis of any case requires detailed information about the design and dimensions of the structure, along with knowledge of the local terrain. If this information is available, computer modelling by experts will, in most cases, enable an assessment to be made of whether a given structure is likely to cause problems. It will also be possible to predict the areas where reception difficulties are likely to occur, and to estimate the number of households that could be affected. It will also be possible in most cases to offer suggestions on how potential problems could be minimised.

There are some complex circumstances however where even modern computing techniques do not give the whole answer. When this is the case, local measurements might be needed to help assess the impact of a development and the possible steps necessary to reduce any problems which might arise.

In some very complex cases, accurate prediction, by any method, is extremely difficult; in such cases careful judgement made by those experienced in this field can however still be helpful.

Wind farms, with their added complexity of moving blades, require additional consideration to static structures and this specific type of development is dealt with in Section 7.

3.0 MECHANISMS THAT CREATE TELEVISION RECEPTION PROBLEMS

Any structure will produce two zones of potential disruption to television reception. One zone is where the development creates a 'shadow' and the other where it gives rise

[1] For the purpose of this document, the contents of this list will be generically referred to as 'structures'.

to a 'reflection'. At the frequencies used for broadcasting, the processes of creating a 'shadow' or a 'reflection' are somewhat more complicated than with visible light, but thinking of the problem in these terms is still a helpful way of approaching the matter.

3.1 'SHADOWING' EFFECTS

In an area behind the structure, the television transmitter is effectively screened from the viewer and the strength of the signal is reduced; see Figs. 1 and 2.

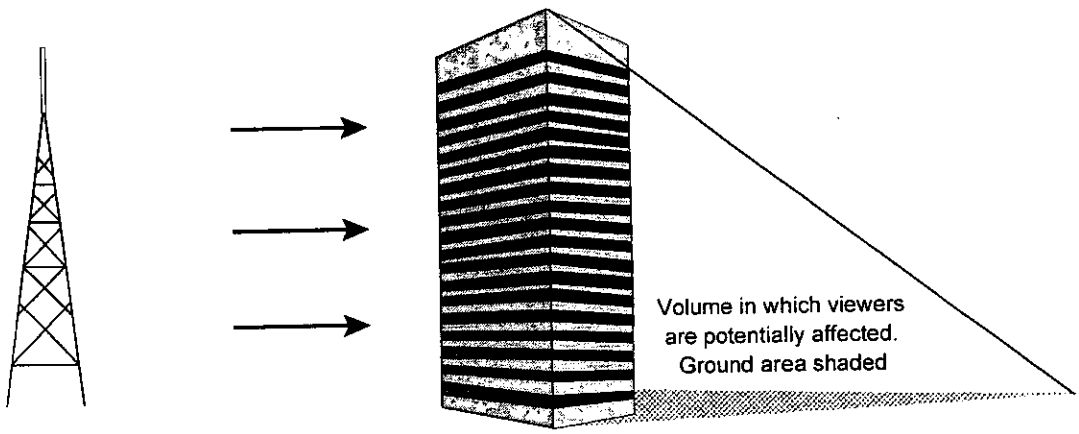


Fig. 1: Affected area in the 'shadow' zone behind the structure

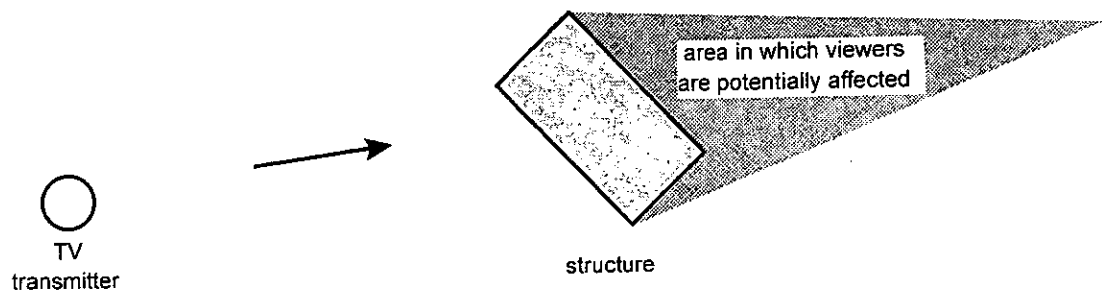


Fig. 2: Plan view of the 'shadow' zone

Television signals do not create such a 'hard' shadow as visible light, and for the purposes of explanation, a 'shadow' zone must be considered which is divided into three sub-zones.

i. Within a few tens of metres from a solid structure, over the region where optical view of the transmitter is lost, the reduction in signal strength is critically dependent on the specific design and composition of the structure. For most brick and concrete buildings the reduction is severe and in some cases almost total. For non-solid structures such as metallic

lattice towers, the signal reduction is dependent on the density of the lattice and the wavelength of the signal.

ii. Further away from the structure (say beyond 250 m, but this varies depending on its size) the limit of the 'shadow' zone and the signal reduction are determined by diffraction at the edges of the structure and reflection off surrounding structures. The simple condition of whether or not a location has an optical view of the transmitter is not enough to classify the potential interference zone adequately. In general, the effect is that the signal appears to bend around the sides of the structure; the shadow zone reduces in size and the signal strength is reduced by much less than simple ray optics would suggest.

iii. Even further away from the structure (say 5 km) complex multiple reflections and diffraction, caused by structures in the locality, may result in the 'shadow' zone becoming almost non-existent.

3.2 'REFLECTION' EFFECTS

The second zone of potential interference is produced by 'reflection' or 'scattering' of the incident signal, see Fig. 3. Analogue reception is more likely to be affected than digital terrestrial reception, which is more robust.

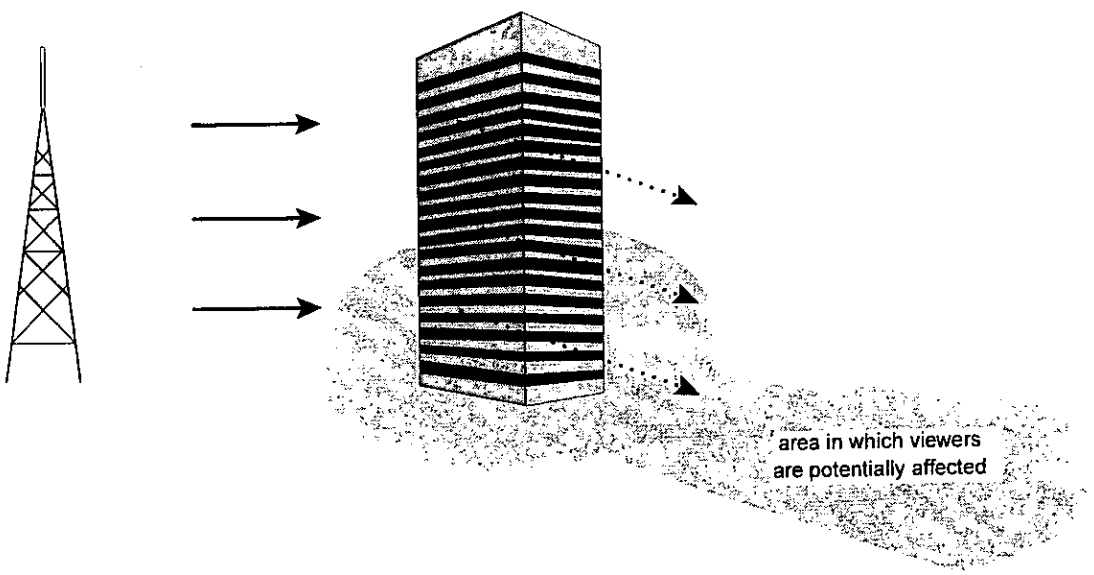


Fig. 3: Affected areas in the 'reflected' zone of the structure

As can be seen in Fig. 4, (shown on the following page) the direct signal travels a distance D1 to the viewer, whilst the signal reflected from the structure travels slightly further, a distance D2 + D3. Even though television signals travel at the speed of light, the different path lengths can mean that one signal arrives with a significant delay relative to the other. This results in a second image appearing on the viewer's screen,

displaced from the first. This type of interference is known as 'delayed image' or, 'ghosting'. If the reflecting signal is complex, several such ghost images can result. Photograph 1 shows the 'ghost' image produced as a direct consequence of a building development in London.

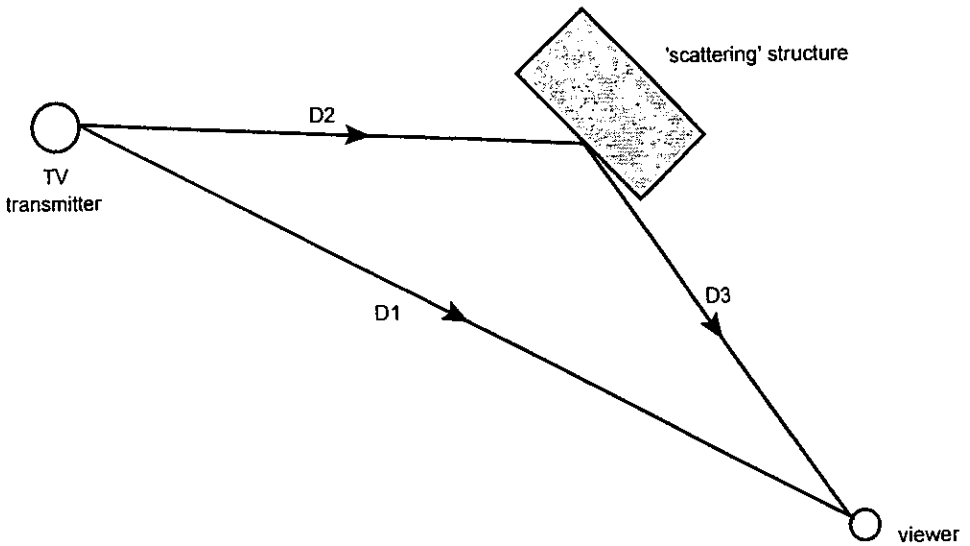


Fig. 4: Plan view showing how delayed images (ghosts) are produced on a television picture



Photograph 1: An example of severe delayed image interference or 'ghosting' affecting analogue television reception.

The general location of the 'reflection' zone depends on the angle of the incoming signal and the orientation of the structure. The extent of the zone and the degree of interference within the zone depend on the relative strengths of the direct signal and the reflected signal, determined by the radio-frequency reflectivity of the structure, and also on the delay between the two signals.

The greater the relative strength of the reflected signal, and the longer the delay, the more subjectively intrusive this problem becomes. Appendix IV indicates the levels of impairment introduced for different amounts of delay and different strengths of reflected signal relative to the wanted signal, within the range of impairments which is generally acceptable.

Another factor which significantly affects the size and shape of the 'scattered' or 'reflected' interference zone is the radiation pattern of the viewer's receiving aerial. Consider a location where the delayed signal has a relative amplitude and delay consistent with unacceptable interference. If the angle between the source of the direct signal and the source of the delayed signal is greater than about 45°, an aerial whose pointing is optimised to receive the direct signal will discriminate against the delayed signal. For critical applications, a very narrow beamwidth aerial may be used to reduce the strengths of delayed images to acceptable levels. The internationally-recommended minimum performance for receiving aerials is reproduced in Fig. 5.

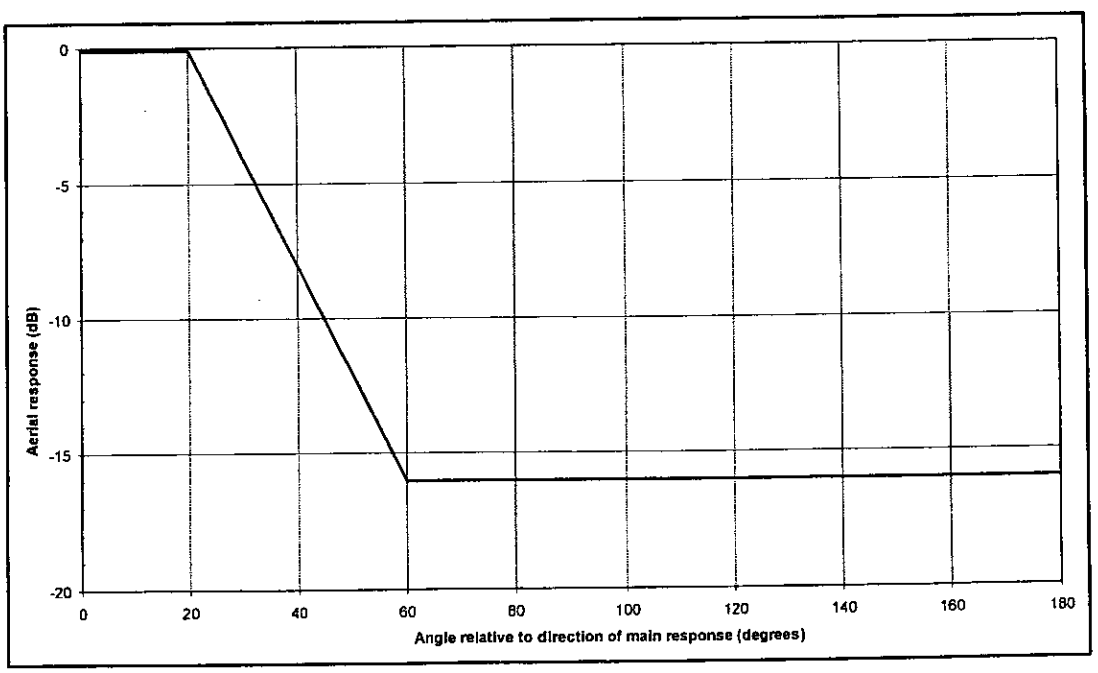


Fig. 5: Discrimination obtained by use of directional receiving aerials in broadcasting.

In practice, domestic receiving aerials have performances similar to those shown in Figs. 6 and 7. The radiation patterns indicate the aerial response (dB) on the radial axis versus the azimuth. In the case of the narrow beam-width aerial there is an arc about 20 degrees wide over which the response is at a maximum, and in the case of the wide beam-width aerial this is about 40 degrees wide. The smaller peaks in aerial response away from the main beam are known as side-lobes. These are unwanted, and in order to reject reception of the reflecting signal (as shown in Fig. 4) they should be as small as possible.

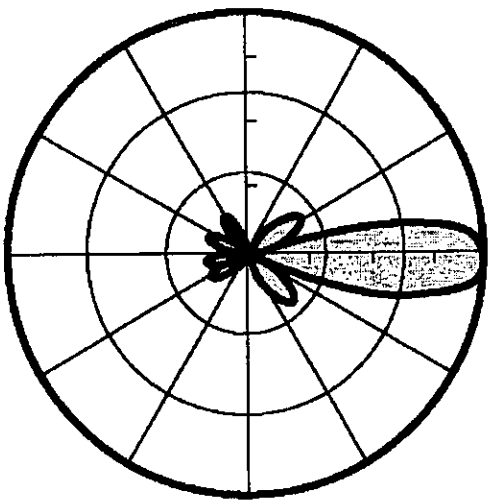


Fig. 6: Typical Narrow Beam-Width Aerial Radiation Pattern

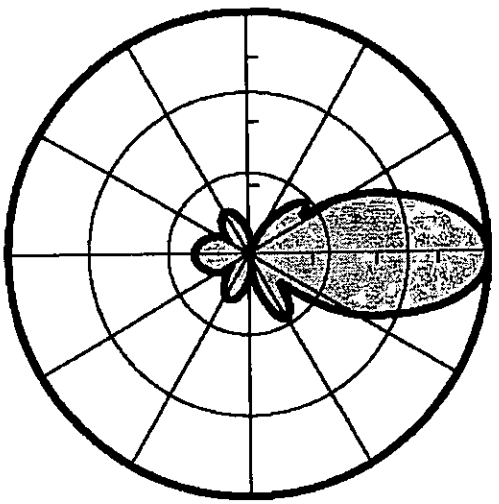


Fig. 7: Typical Wide Beam-Width Aerial Radiation Pattern

4.0 ASSESSING IMPACT

One useful 'rule of thumb' to judge the likelihood of a problem is the 'sky-line check'. If, from a given location, the proposed structure significantly modifies the sky-line, then there is the possibility that it may cause television reception difficulties at that location. This is equally true in a dense urban environment where the sky-line already consists of large structures which themselves might already create some reception difficulties, but for which viewers have already made attempts to cope.

5.0 REDUCTION OF IMPACT

The 'shadow' region, of any solid structure is mainly determined by its size. Very little can be done, either at the design stage or after development, to reduce these effects themselves, but the damage done can sometimes be 'made-good' by providing those affected with an alternative means of receiving television. More information on this is offered in Section 6.2.

The 'reflected' interference region is entirely dependent on the structure design. If the face of a structure is shaped so that it distributes its reflected signal over a large region,

the resulting reflected signal strength is less than if it were concentrated over a small region.

A large area of structure presenting a single flat face will concentrate signals over a small region. The same area consisting of several smaller flat faces at differing angles will distribute the signals over as many geographical regions. A convex reflecting surface will disperse signals equally over an arc.

It may also be possible to arrange the structure's face(s) to direct the reflected signal(s) away from large areas of population, or to direct the reflected signals such that the receiving aerials can adequately discriminate against them.

The choice of building materials will also affect the strength of the reflected signal. For materials such as bricks, concrete, etc., the reflection coefficient is low; the reflectivity of the total structure being determined more by the metallic content, steel joists, steel reinforcing members, window frames, etc. In modern constructions, the density of metal, throughout the structure, may be sufficiently high to increase the reflection coefficient dramatically.

Metallic cladding in conjunction with metallised windows has been known to produce the worst reflections, with nearly the whole incident signal being reflected.

In practice, the avoidance of large flat areas is the best overall approach. The deliberate dispersion of signals by non-flat services, or the direction of reflected signals away from populated areas, are the best ways of avoiding significant 'ghosting' problems.

6.0 REDUCTION OF RECEPTION PROBLEMS AFTER DEVELOPMENT

Remedial action can either be taken at the structure, or at the homes affected. Usually the former is of limited value and the latter offers the only practical way forward.

6.1 ON THE STRUCTURE ITSELF

Whilst changes at the structure seldom offer the most practical way of minimising problems once they have occurred, it is nonetheless useful to assess this option first, because, if practical, it addresses the problem at source. The possibilities are shown below, and their applicability to specific structures should be addressed on a case-by-case basis. They only address the problem caused by reflections, and offer no solution to those in the shadow of a new development.

- **Use a radio absorbing coating**

  This technique has been considered prohibitively expensive, restricting its use to the military. However we have recently received a report outlining how a large building in Japan utilised a ferrite-tile coating to reduce its adverse impact on television reception.

- **Construct 'irregularities' on flat walls**

  Provided that the irregularities are of an appropriate size, this would tend to scatter the incident signal. If the wall were a truly irregular structure, the signal would be

scattered over much of the hemisphere containing the direction of the incident signal. The strength of the reflected signal, in any direction, should then be below the value expected to cause interference. In view of the size of the walls of typical structures of concern, and the wavelengths of the incident signals, this is not really a practical option.

- **Angled cladding**

  Fig. 4 shows the area affected by a signal reflected from the face of a building. It might be thought that the reflected signals could be re-directed to a less critical area or even upwards by applying, to the face of the building, a large number of individual strips or panels, at an angle different from that of the overall angle of the face of the building. Such measures should be treated with some caution; the angle at which the signals are actually reflected from the building is not dependent solely on the angle of the cladding, but also on the size and position of elements of cladding, and also the wavelength of the signal. Whilst in some circumstances this may indeed change the angle of reflection and the area affected, it is unlikely to result in the angle of reflection or the area of interference expected and it is entirely possible to end up with angled cladding making absolutely no difference.

- **Pebbledash**

  This is an often-quoted solution which, practically, is unlikely to show any benefit whatsoever.

6.2 IN THE LOCATION OF THE AFFECTED VIEWERS

- **Replace receiving aerials for affected households**

  Receiving aerials with superior performance to the discrimination template shown in Fig. 5 are available. These can produce a narrower receiving beam-width (so they will discriminate better against unwanted signals arriving from other directions) and also a higher gain (so the receiver can be made to work in areas of lower signal strength). Log-periodic aerials, which have the ability to reject signals arriving from the sides and rear of the transmission path, are also known to be effective in combating reflections. Clearly, these measures will not work if the reflected signal is coming from the same direction as the transmitter.

- **Re-tuning television receivers at affected households**

  If the affected area is served adequately by transmissions from an alternative transmitter, receivers can simply be re-tuned to the unaffected service. This will also require changing the direction in which the receiving aerials are pointing, and maybe even replacement of the receiving aerial as most aerials will not cover the entire range of broadcast frequencies.

- **Construction of a new 'analogue' television transmitter station**

  This solution has been used in the past but now, apart from in rural areas, offers few opportunities. The channels used for any proposed new station must avoid mutual interference with existing services. Throughout the UK, all television channels are re-used many times, and therefore meeting this requirement is, in many instances not possible. Only in exceptional circumstances would the broadcasters consider this solution. However channels may be available for very low powered self-help television transmitting stations that may be operated, on behalf of households, and usually funded by the developer.

- **Provision of a 'self-help : cable system'**

  Self-help cable systems, also known as CATV systems, are ideally suited for compact groups of houses. A single 'master receiving aerial' able to receive a signal that is free of interference, feeds an RF signal, by way of a cable and series of amplifiers, to each of the properties affected.

If either of the last two solutions is chosen, the developer may be required to fund, construct and maintain the transmitter or system. This may be required as part of an agreement between interested parties, and enforceable under Section 106 of the Town and Country Planning Act 1990 (England and Wales) or Section 75 of the Town and Country Planning Act 1997 (Scotland).

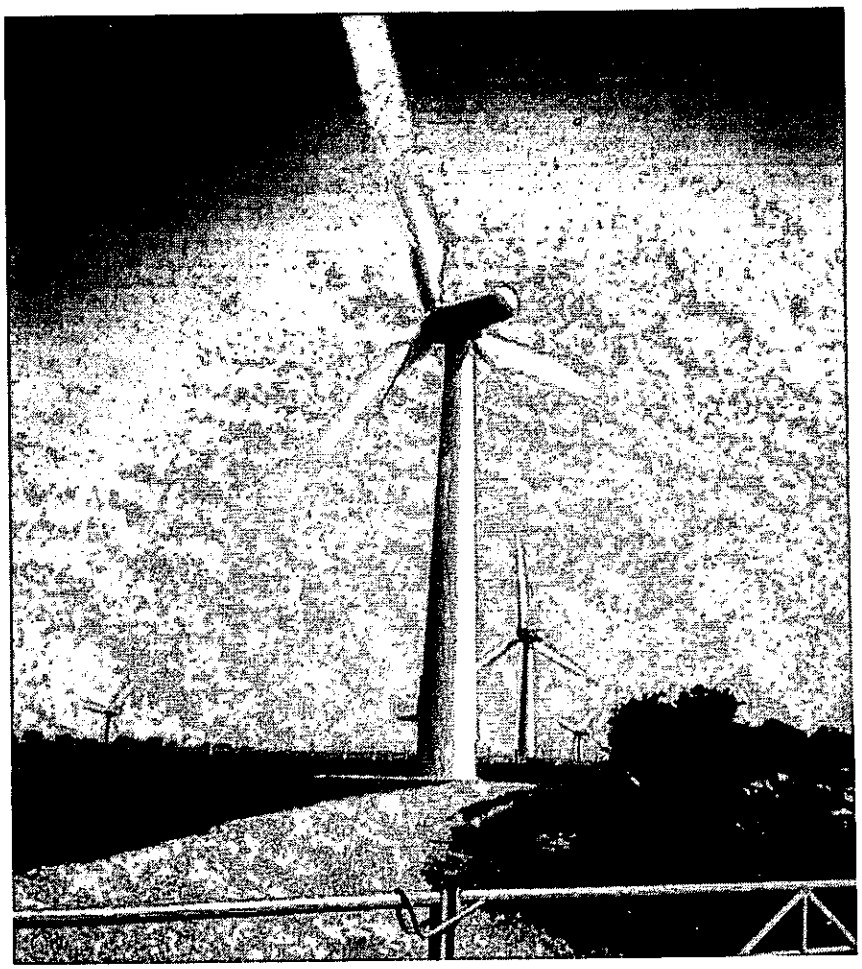
7.0 WIND TURBINES AND WIND-FARMS

Photograph 2, on the following page, shows the type of wind turbine referred to in this section. Virtually all commercially available machines, currently in operation, are of this general type having a horizontal axis of rotation with two or three blades.

Generally, turbines have a number of common characteristics. These are:

1. rarely sited closer than 250 metres away from domestic properties
2. the nacelle (the generator housing at the centre of blade rotation) and the blades are typically mounted on a narrow, cylindrical, concrete tower
3. normally, the blades are constructed of non-metallic material such as GRP, although they invariably contain metallic components such as a strengthening member, lightning conductor and balancing weights
4. the orientation of the blades corresponds to the wind direction
5. the usual speed of blade rotation is between 15 and 30 RPM

In practice rarely does the tower or nacelle have any effect on reception; the impact on reception is solely on account of the rotating turbine blades. As the blades are moving objects, in terms of both their rotational speed and orientation, their effect is variable and hard to predict. When the combined effects of a number of turbines that comprise a wind farm are considered, the result is considerably more difficult to predict.



Photograph 2: Typical wind turbines in a wind-farm

7.1 SHADOWING AND REFLECTION EFFECTS

The two mechanisms responsible for the interference, as with buildings, are 'shadowing' effects and 'reflection' effects, as described in sections 3.1 and 3.2, respectively.

The size of the 'shadow' zone is dependent on the orientation of the blades and is at a maximum when the axis of the rotor is in line with the direction of the transmitted signal. The received signal strength varies in a cyclic manner, in time with the blades' rotation.

'Reflection' effects vary with the rotation of the blades and the orientation of the nacelle. To complicate matters further, the strength of the reflected signal is dependent on the length and area of the metallic components inside the blade.

7.2 THE AREA AFFECTED

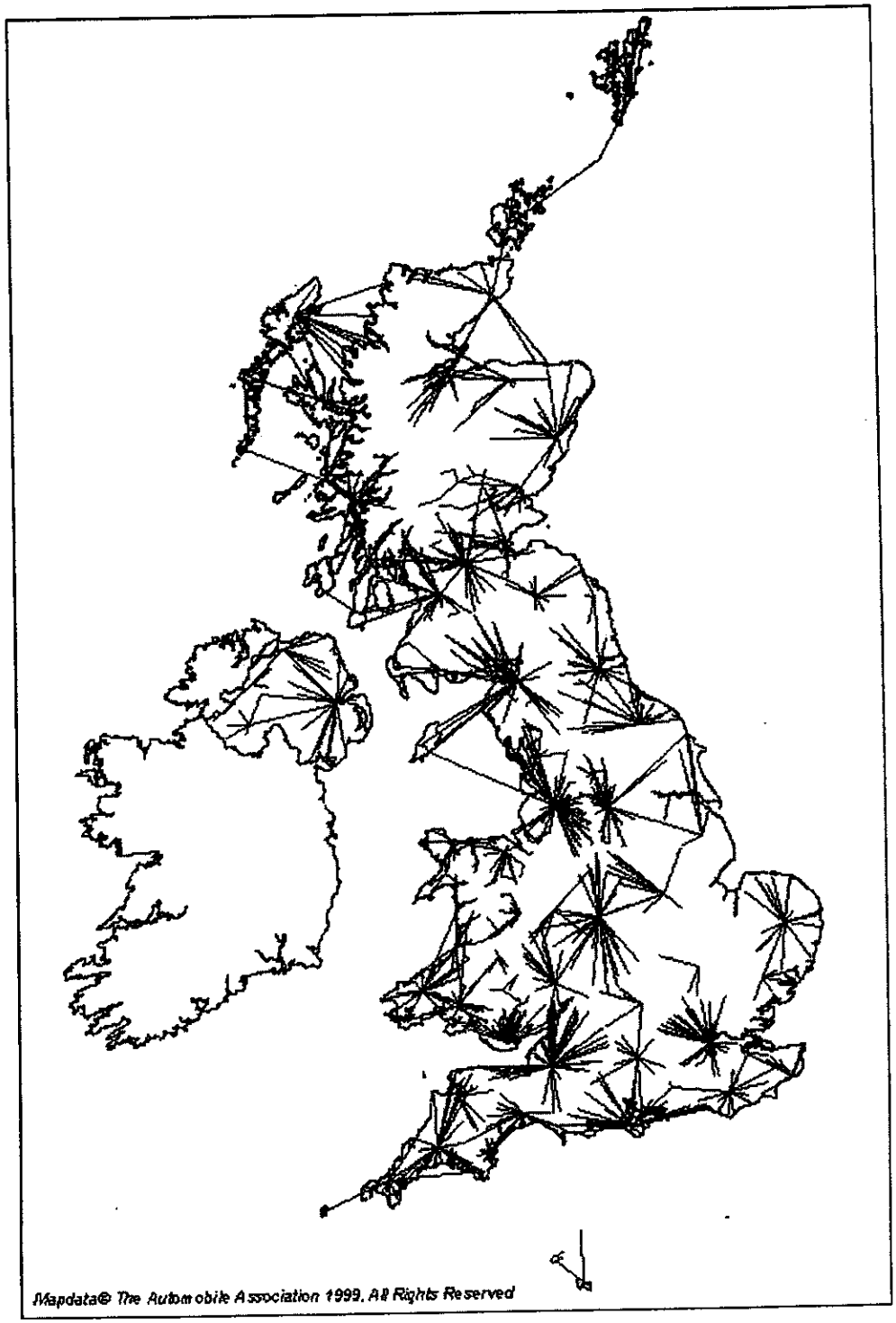
Interference to analogue television reception is shown as a characteristic flickering of the picture. The affected area around the turbine, a combination of the 'shadow' zone, and the 'reflection' zone, is roughly shaped like a keyhole (like that shown in Fig. 3). The actual shape and size of this is dependent on the type of turbine and the topography between: the broadcasters' transmitter and the turbine; the broadcasters' transmitter and the viewers' receiving aerials; and the turbine and the viewers' receiving aerials. Nevertheless, for the purposes of assessing the likelihood of interference, the 'shadow' zone may be considered to be a sector with a radius up to about 5 km, and the 'reflection' zone a circle of radius of about 500 m.

7.3 REDUCTION OF INTERFERENCE

The siting of the turbine or turbines can reduce the severity of interference. If possible, turbines should be at least 500 metres from any viewer. Interference caused by wind farms with more than one turbine may be reduced if one turbine could be placed within the 'shadow' area of another. The measures to reduce interference at the location of the affected viewers, outlined in Section 6.2, are also relevant to interference from wind turbines. Appendix V illustrates the reflection effect, and explains in which situations a more directional receiving aerial can be used to reduce the level of delayed image interference.

APPENDIX I

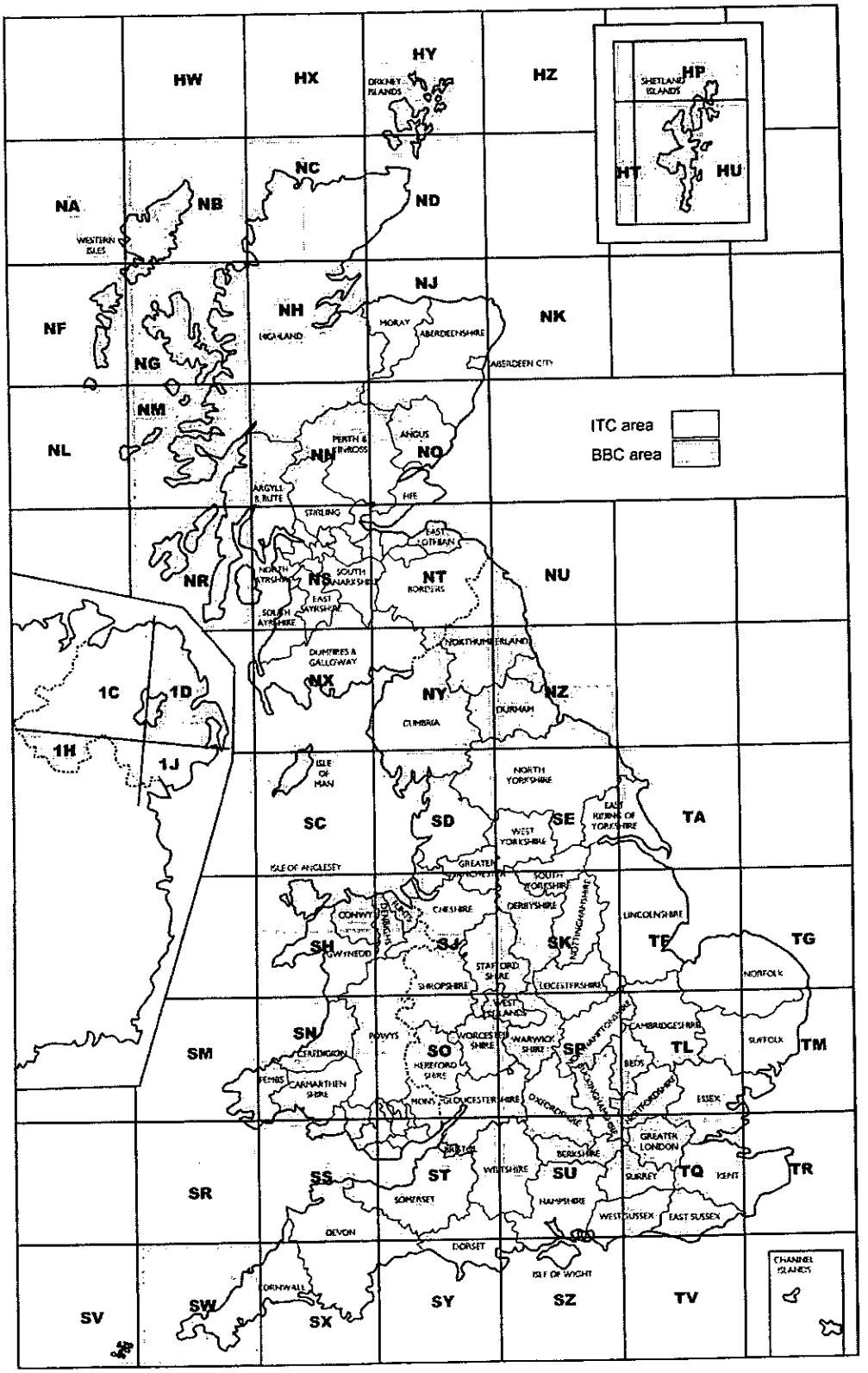
UHF TELEVISION - TRANSMITTER SITES AND RE-BROADCAST LINKS



This map is indicative of the RBL network and subject to change.

APPENDIX II

TELEVISION PLANNING RESPONSIBILITY MAP



APPENDIX III

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