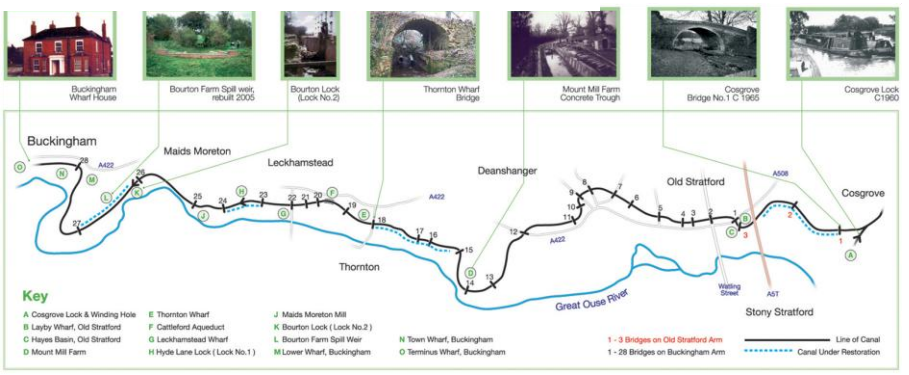
Appendices

Application to AVDC for full planning permission to rewater the Bourton Meadow section of the canal at Buckingham

Buckingham

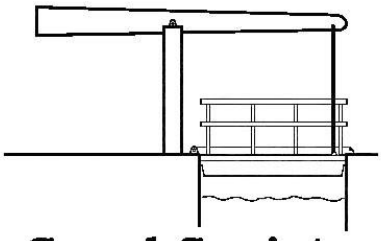
Canal Society



Appendix A

Outline Feasibility Study on Buckingham Canal Restoration: Halcrow

Buckingham



Canal Society

Buckingham Canal Restoration
Outline Feasibility Study
May 2010

Halcrow Group Limited

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Buckingham Canal Society

Buckingham Canal Restoration
Feasibility Study

Contents Amendment Record

This report has been issued and amended as follows:

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1 Executive Summary

This study was carried out in order to determine whether the restoration of the Buckingham Canal between Cosgrove and Buckingham is a feasible project.

In order to address this, an engineering assessment, environmental assessment and economic assessment have been carried out to determine whether any 'show-stopping' issues or constraints exist.

The conclusion of this report is that this is a technically feasible project. While there are a number of significant issues to address, with the appropriate work and consultation this should be possible.

From an engineering perspective, the two main constraints are crossing the A5 and bypassing Old Stratford/Deanshanger and entering Buckingham itself. Both areas are likely to require canalisation of the River Great Ouse.

While only a high level desk study was carried out to assess the environmental constraints of the scheme, no major problems were identified. Additional detailed work will be required to address this in more detail.

The restored canal will help maximise the potential of key economic drivers along its route and will create new opportunities for economic growth and prosperity. Beyond the purely economic benefits (job creation, increased visitor footfall, etc), the restored canal is likely to deliver wider social benefits.

Obtaining the required capital funding to allow construction of this scheme will pose a significant challenge for the scheme promoters. With a well planned strategy and the correct partners brought in to the project team, it may be possible to secure this money using a broad range of different funders.

2 Introduction

2.1 *Study background*

Halcrow Group Ltd was commissioned in December 2009 to undertake an outline feasibility study on the restoration of the Buckingham Canal from the junction with the Grand Union Canal at Cosgrove to Buckingham.

This feasibility study has been undertaken on behalf of the Buckingham Canal Society with whom copyright of this report lies. Additional funding has been provided by the IWA Restoration Committee and the Buckinghamshire County Council Community Leader's Fund.

2.2 *Study aims*

The aim of this study is to determine whether the restoration of the Buckingham Canal is a feasible project and to assess what the major issues relating to this restoration may be.

This study looks at the following areas:

- Engineering feasibility including a high level cost estimate
- High level ecological assessment
- Economic assessment.

2.3 *Limits of study*

This limited study has been undertaken to determine whether this is a feasible project, rather than necessarily determining what the optimum solution for the restoration may be.

It has been based on an initial walkover and using available OS mapping and Lidar data. All levels are based on available information and due to the complex topography may be subject to significant error. No detailed surveys or topographic surveys have been undertaken. No landowner consultation has been carried out.

An assessment of the water supply and management has not been undertaken as part of this study.

A number of options have been identified as part of the engineering assessment, however it has not been possible within the scope of this study to assess all possible solutions in sufficient detail to determine the optimum route.

2.4 OS Maps

British Waterways has allowed the use of their licence for the Ordnance Survey maps used in this report and its appendices; number 100019843, 2007.

3 Engineering Assessment

3.1 *Background*

The Buckingham Canal was completed in two arms; the first to Watling Street was opened in 1800 and the final section on to Buckingham opened in 1801. It was originally used to transport bricks, coal and manufactured goods and other local goods as wells as imports from the London Docks. The canal was transporting around 20,000 tons per anum for a period of fifty years.

The canal began to suffer from competition from the railways as with much of the network. The canal also suffered from siltation and sewage disposal. A lack of maintenance failed to address these issues and as boat traffic declined the problems worsened. The canal was deemed "barely navigable" in places as early as 1904. The last recorded boat movement was in 1932 and the canal was closed with a temporary dam in 1944; it was finally abandoned in 1960, although a length at Cosgrove is still owned by British Waterways and is classed as a canal, despite its dry condition.

3.2 *Water management*

While water supply and management of the canal has not been assessed, this may be an issue for the canal. Water may be available from the River Great Ouse, though an abstraction agreement would be required with the Environment Agency. A number of options are likely to exist for water supply and ultimately this could be addressed in consultation with British Waterways.

There are potential opportunities to use the canal to aid flood risk management. This should be investigated in partnership with the EA.

3.3 *Route description – Cosgrove to Buckingham*

The Buckingham Canal ran roughly east-west from its junction with the Grand Union Canal at Cosgrove, through Old Stratford and Deanshanger, following the River Great Ouse before terminating in Buckingham. A schematic illustration of this route can be seen in Figure 1 below.

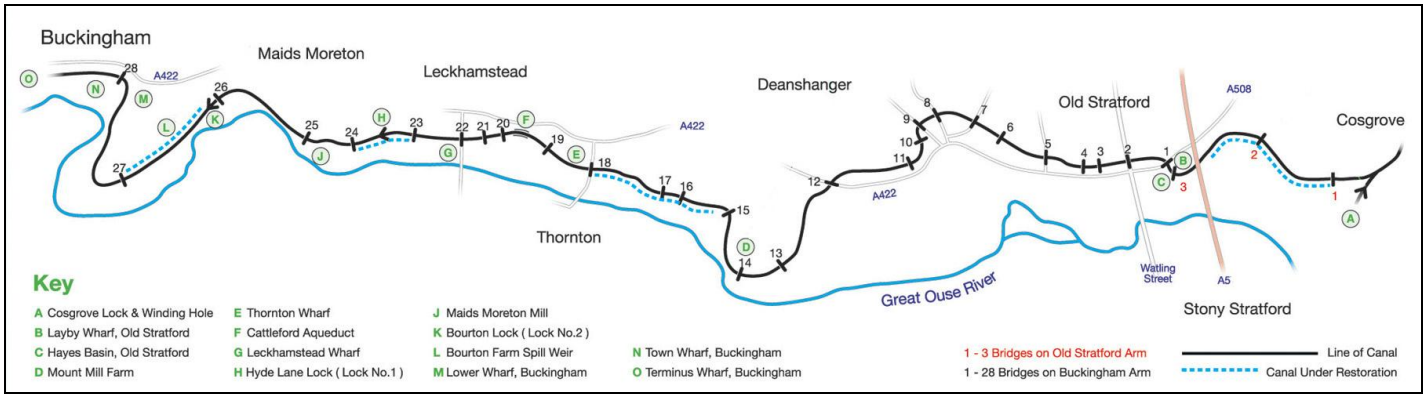


Figure 1 – schematic layout of Buckingham Canal route

Significant lengths of the old canal route remain in a rural setting; in fact the old canal exists as a dry ditch along the majority of the route. The ditch itself would require works to clear away vegetation. The existing clay liner, if still present at all, is likely to be in poor condition. Some earthworks may be required to ensure the required navigation depth is consistent along the length and some puddle clay may be required to ensure the lining is water-tight. The canal banks are present and would require ground investigation to confirm their composition and a structural assessment to ensure they are fit to impound the water. There are a number of constraints now present; along the section of the route from Cosgrove to Deanshanger, there are a number of major obstructions blocking the route, meaning that a new cut is required. The route into Buckingham itself will also require a new route.

A drawing showing the layout of the proposed route can be seen in Appendix A.

A description of the route and various works anticipated is given in the following sections below.

- Cosgrove to the A5
- Through Old Stratford
- Deanshanger
- Old Stratford and Deanshanger By-Pass
- A422 to Thornton Stone Bridge
- Thornton Stone Bridge to Buckingham Canal Nature Reserve
- Buckingham Canal Nature Reserve to Buckingham

3.3.1 *Cosgrove to the A5*

The existing canal at Cosgrove has a pound level of approximately 71.3m AOD. The ground west from here is relatively flat through a rural area to the A5. (Appendix A, Map1)

Figure 2 – Junction with Grand Union Canal at Cosgrove

The existing canal arm ends at Bridge 1. Only the line of the bridge remains – the rest of the structure is now an embankment to prevent water passing this point. The location and prominence of this bridge are such that the planning authorities would probably wish any restoration to be stone-clad with local materials.

The canal exists as a dry ditch for approximately 1000m to Bridge 2. There are a number of field crossings along this length. An agreement would have to be reached with the landowners as to the requirements for retaining these crossings. A pipeline and a sewer also cross the canal along this length. The level of these would have to be established to ensure the navigation depth will be able to pass over.

The line of Bridge 2 is still clear and there is some evidence of the old headwalls, however the majority of the structure is now an embankment. The extent and condition of any remains of the original structure would require investigation, although it will almost certainly be more cost effective to construct a new bridge rather than restore an old structure.

Beyond Bridge 2 there is an old overflow sluice that drains into the Dogsmouth Brook. The brickwork needs a great deal of attention and the requirement for this sluice should be reviewed – it may be possible to remove this altogether.

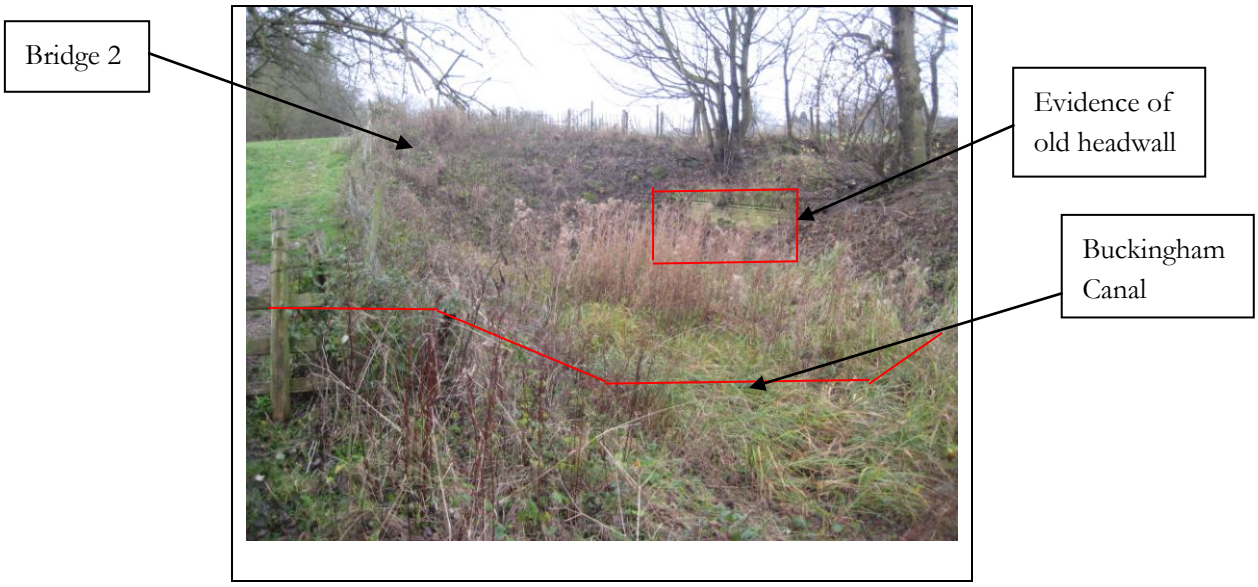


Figure 3 – Bridge 2

The well-established canal line continues for approximately 500m from Bridge 2 to the A5. Crossing the A5 will be one of the most expensive sections of the restoration. The canal is at approximately the same level as the A5. It would therefore be necessary to construct two locks either side of the road with a culvert beneath, or lower the level of the pound through Old Stratford. The latter option will make it easier to pass beneath other bridges within the village, but a canal set at a much lower level than the surrounding buildings and footpaths is unlikely to meet the aesthetic aspirations of the Canal Society.

3.3.2 *Through Old Stratford*

Crossing the A5 at this location will retain the old line of the canal into Old Stratford. The canal would enter Hayes Basin. The basin currently impounds water, suggesting that little work would be required to open this for navigation. There is a 90˚ bend west in the basin and thought should be given to keeping adjacent land clear of buildings and vegetation to try to improve sight-lines for boats. This section is approximately 200m long before it meets Cosgrove Road. In the event that the route through Old Stratford is not found to be feasible, the retention and conservation of Hayes Basin would, however, remain an option

which would preserve the historical link with Old Stratford and provide an attractive asset for the village.

The bridge at Cosgrove Road has been filled in. There would also be limited headroom beneath the bridge if the current canal level was retained; this may be less of an issue if the pound level is reduced to aid its passage under the A5, however this will have knock-on requirements for restoration of the basin.

The exit from the bridge is marked by an immediate 90˚ bend south. Sight lines will be an issue for boats again, as will the area required for turning. There may be a need to enlarge this corner to ensure there is sufficient space for the swept-path of a canal boat. This enlargement may necessitate the removal of the children's playground on the corner of Chapmans Drive.

The canal would then run for 240m to the bridge at Watling Street. The line of the canal here has been encroached upon by the gardens of houses on Cosgrove Road and Water Close. It should be possible to fit the canal along this route although a reduction to single width navigation may be required.

Beyond Watling Street the canal could pass along the rear of properties on Deanshanger Road, crossing Willow Grove. This section is approximately 220m in length and has very limited space for construction. It is likely that a number of properties will require purchase and demolition to achieve the desired line.

Beyond Willow Grove a 90m length of new excavation is required to join with what remains of the old canal close to Brookside Close. There is then a 300m length of the old canal with existing crossings at Brookside Close, Dickens Drive and a community centre off Deanshanger Road.

Figure 4 – Existing Canal through Old Stratford

The crossings do not appear to have sufficient air-draft for boat passage. The canal here would have to be lowered, possibly requiring modifications to the existing bridges. The towpath would be at a lower level than Deanshanger Road and retaining walls may be required, depending on local ground levels, to support the adjacent road. (Appendix A, Map2)

3.3.3 *Deanshanger*

In order to reach Deanshanger the canal would have to cross the A422 close to the junction with Deanshanger Road. This is at a similar level to the canal and would incur similar problems to the A5 crossing; again suggesting that lowering the pound level through Old Stratford is the most viable solution.

A crossing would then be required at Puxley Road in order to link with another short section of the old canal at Northfields Farm.

There is almost no evidence of the old line through Deanshanger due to development within the village. There is a short section of the old canal outside the village behind the petrol station at the junction of Buckingham Road and the A422, but even if this could be linked up another crossing of the A422 would be required to continue the canal. (Appendix A – Maps 2 & 3)

The technical difficulty and considerable expense required to reinstate the old route through Deanshanger make this option unfeasible.

3.3.4 *Old Stratford and Deanshanger By-Pass*

An alternative route to reinstate the canal by-passes Old Stratford and Deanshanger altogether. After crossing the Dogsmouth Brook the canal could turn southeast and run parallel to the A5. This would require a new channel to be cut for a length of around 600m with a drop in pound level from 71.3m to 64m requiring 4 locks. (Appendix A – Map 1)

The River Great Ouse could then be canalised for a length of around 950m to a new lock to the rear of properties on Manorfield Road. The existing bridges under the A5 and Watling Street can be used although some modification may be required to ensure the required air draft is present. In general canalisation is likely to require dredging of the river to achieve the required navigation depth, weirs to control the water level and locks to enter/leave the river. There are operational issues with navigation on rivers as the flow in the river is variable; in particular flood events will not allow passage under the bridges and will have high flow velocities. This will mean that there are times when travelling the length of the canal will not be possible and mooring sites will be required to accommodate boats waiting for access to be open again.

A new canal could then be cut across the fields to the road to Passenham for a length of around 1000m. The fields rise in a gentle hill in this location so a cutting will be required to guard against water supply issues. This cutting will need to be around 5m deep. The pound level here should be 64m at the interface with the river, rising to 67m through 2 locks. A new bridge will be required at the road to Passenham.

The canal will then need to turn west for 260m towards the A422/Stratford Road roundabout. There is a minor access track here that will require a small bridge. The canal will then run parallel to the A422 for 1500m before joining with the old line of the canal opposite the petrol station at the junction with Buckingham Road. This stretch will require a crossing over the small watercourse that runs from Deanshanger to the River Great Ouse. A new road bridge will also be required for the access to the Kingfisher Country Club. This section will mostly be constructed by expanding an existing ditch that runs parallel to the A422 and will have a water level of 67.5m requiring 1 lock to raise it from the previous pound. (Appendix A, Maps 1, 3 & 4)

3.3.5 *A422 to Thornton Stone Bridge*

A 1350m length of the existing line runs south to Mount Mill Farm. This pound should have a water level of 72m which will require 2 locks to raise it from the previous pound. This length will also require a field crossing bridge.

A 640m length to the south of Mount Mill Farm then follows. There is little evidence of the old line and a new channel will need to be cut. This length passes reasonably close to the River Great Ouse and the embankment will need to be able to withstand high flows when the river is in flood. There may also be the additional benefit of protecting the farm from flood events if it is currently at risk. (Appendix A – Map 5)

The existing line is then evident for 880m before arriving at an existing bridge to the rear of Little Hill Farm. This bridge is currently under restoration by volunteers. It will require inspection to ensure its integrity.

A further 800m of the existing line brings the canal to the road to Thornton. There are two crossings in this location. The road runs on an earth embankment that is sufficiently high such that a new bridge could be constructed with the water level in the canal remaining at 72m. Adjacent to the road embankment are the remains of the old canal bridge. The bridge is a stone arch with a stone/masonry wall retaining the towpath beneath. The arch, the towpath wall and the remains of the headwalls are all heavily vegetated and many bricks have been dislodged by root growth; however much of the arch is intact. The bridge only has the capacity to allow a single boat through at a time, but it does represent a link to the old canal and should be preserved for its heritage significance. (Appendix A – Map 6)

Figure 5 – Thornton Stone Bridge

3.3.6 *Thornton Stone Bridge to Buckingham Canal Nature Reserve*

The old canal line is still evident for a further 800m to Cattleford Bridge. At the bridge the canal runs adjacent to the A422, crossing the stream over an aqueduct. The integrity of the aqueduct will need to be established through a detailed structural inspection. The trough is currently vegetated and will almost certainly require replacement. A crash barrier will also be required to safely segregate the canal from the road.

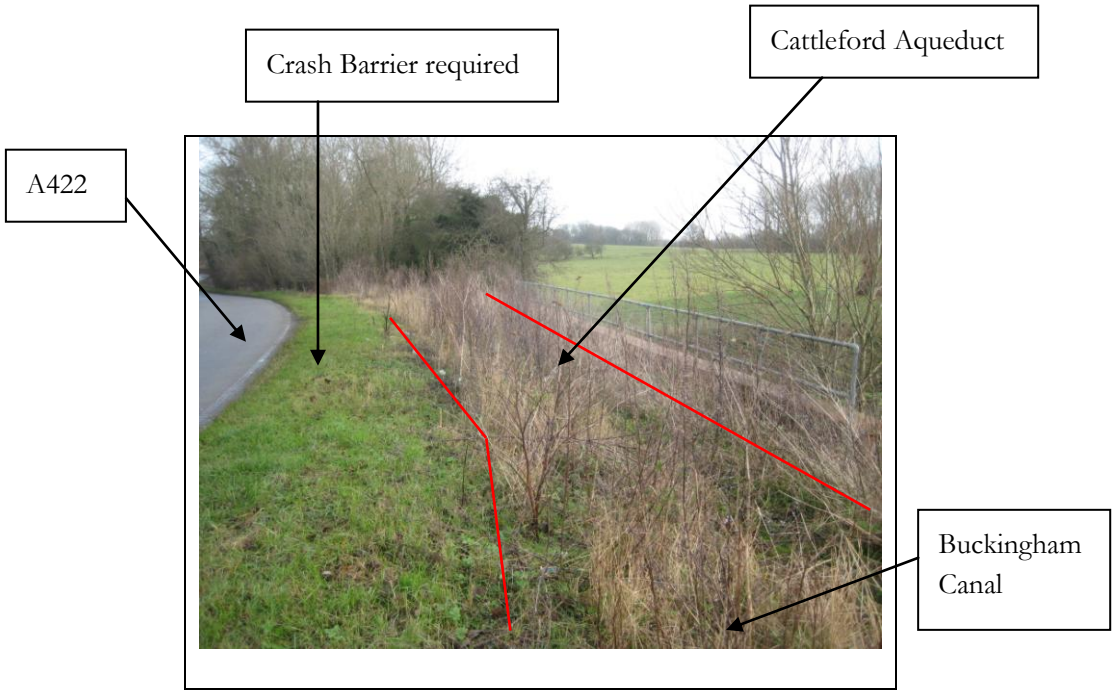


Figure 6 – Cattleford Aqueduct

The old line from Cattleford Aqueduct to the Thornborough Road has largely disappeared and would require a new channel to be cut over this 720m length. The old Leckhampstead Wharf House is now a stable and the buildings and road obstruct the old line. The road will require a new bridge crossing within this area; the buildings will either need to be purchased and demolished, or a by-pass route will need to be considered. Enlarging the drain/stream ditches to the south is a viable solution and will not disproportionably increase the length of canal.

Figure 7 – Buckingham Canal West of Leckhampstead Wharf House

The next 1000m of the old line is still very much in evidence and enters the Buckingham Canal Nature Reserve adjacent to Hydelane Farm. The water level needs to increase from the previous pound level of 72m to 73m. There is an existing lock in this location and restoration by Buckingham Canal Society has already begun. There are also some overflow weirs that regulate the intake from the adjacent reservoir. These weirs have also had some restoration work undertaken by the BCS. (Appendix A – Map 7)

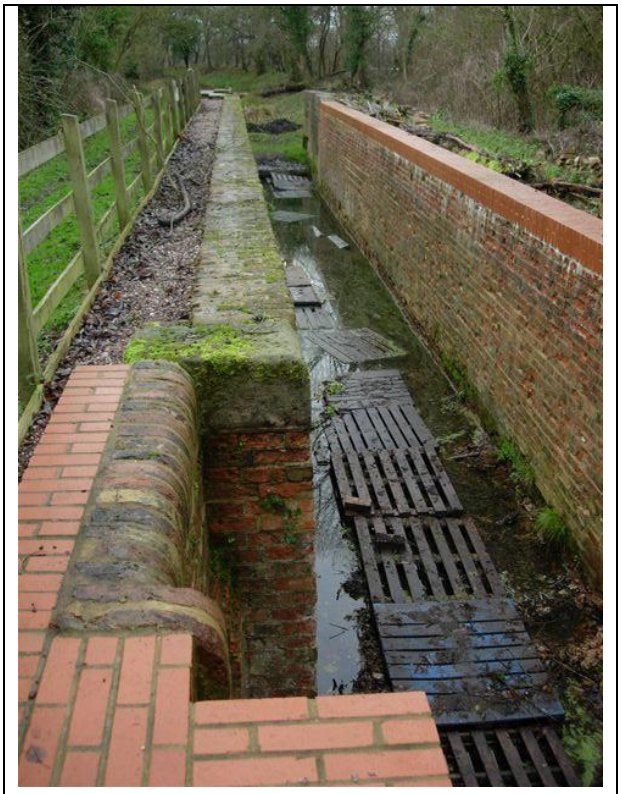


Figure 8 – Lock under restoration by Buckingham Canal Society

3.3.7 *Buckingham Canal Nature Reserve to Buckingham*

The canal then runs adjacent to the reservoir at this location for 500m. The old line is then obscured and a new channel would need to be cut for 1200m to the Old Mill House. There is a drainage ditch to follow along this route that could be expanded to form the navigation. The canal water level needs to rise to 75m at this location requiring 1 lock. It may be advantageous to raise the water level after the access road to the sewage works in order to limit the bridge works required; however this may require larger cuttings or retaining walls.

The next 375m of new-cut channel will then take the canal to the River Great Ouse. At this location the ground runs steeply from the A422 down to the river. A number of springing points release the groundwater into the river. Keeping the canal separate to the river will require a very large retaining wall to cut into the hillside – possibly even a tunnel, given the topography. This will be a technically challenging and expensive option.

Figure 9 – River Great Ouse

Historically the canal joined the river for a short stretch. There is an Environment Agency weir controlling the water level at this location. A 120m stretch of the river could be canalised and entrance and exit locks could be constructed in order to pass this location. There would be operational issues with the section closed during high flows on the river. This would require mooring points and suitable facilities for boaters who are trapped by the high river level. (Appendix A – Map 8)

Figure 10 – Environment Agency Weir

360m of new channel then need to be cut to take the canal as far as the old Lock Cottage. The cottage has been extended directly over the old lock itself. The cottage, or possibly just the extension, would need to be demolished if the lock is to be refurbished. There is no evidence of the lock on the surface and there is no information as to the foundations of the new extension and thus the condition of the lock below. It would be more feasible to divert the canal southeast around the cottage, rejoining the old line of the canal to the rear of the property.

The old line is still in evidence for a length of 440m. This runs up to the A413 at the edge of Buckingham. There is an overflow weir along this length that diverts excess water into the River Great Ouse. This has been restored by the Buckingham Canal Society.

The route into Buckingham itself is blocked by the A413, Bourton Meadow School and other developments. It would be prohibitively expensive to remove these obstructions; instead a new 220m long channel should be cut parallel to the A413. This would rejoin the canal with the River Great Ouse which would require canalisation to continue the navigation into the town itself.

The canal terminus basin could be in the park opposite Bourton Mill. The canal should be disassociated from the river to make the basin less vulnerable to changes in flow in the river. A basin would be required to allow boats to turn around. Moorings should be provided along with other facilities, such as a sanitary station, to make Buckingham a suitable destination location for boaters.

3.3.8 *Alternative Terminus*

An alternative to entering Buckingham would be to have the mooring basin terminus outside the town, to the east of the A413. This would avoid the difficulty of getting into Buckingham itself and the mooring basin could provide the focal point for a new development. A mixed-use commercial/residential development centred on the basin could be an attractive opportunity for third party developers who may even construct the basin itself, contributing to the funding and development of the restoration.

Another alternative terminus would be to take the canal further into Buckingham. This would involve further canalisation of the river as there is very little space to construct a separate canal. There are a number of weirs on the river; these would need to be changed into locks with by-pass weirs. Expanding the channel in this way may derive some flood defence benefits by increasing the capacity of the channel. This would require further investigation as although the channel will be bigger it will also be full of water impounded for navigation so it is not clear at this stage how much conveyance would be improved. It may be possible to design navigation structures, such as locks, so that they do not impede flood flows through the incorporation of sufficient by-pass weirs; existing bridges are to remain relatively unchanged and may still represent constrictions in the channel.

3.4 *Costs*

A cost estimate has been produced based on the description above for the section from Cosgrove to Buckingham.

The following assumptions have been made:

- Cost estimate based on unit costs derived on previous work done for B&MKW Trust by Halcrow and externally verified by professional QS and contractor. While this was based on a broad canal, at this level of confidence, it is not felt appropriate to reduce these.
- No cost has been included for land purchase or negotiations.
- A percentage allowance has been made for general preliminary items as would normally be included in the contract cost (sensitivity ranges included for best/worst case are 15% and 25%).
- Vertical sides of canal pounds have been supported using L8 trench sheeting with walings and anchor piles.

- Costs are at June 2009 prices with no allowance for increased costs.
- All material taken off site assumed to be inert (if much dredging of canal and river silts is required, while not contaminated, a significant amount of this material could be classed as non-hazardous rather than inert).
- No allowance has been made for contaminated land except where expressly stated.
- The risk cost included is as defined in section 6.

It may be possible to reduce some costs by use of volunteers.

Table 1 – Cosgrove to Buckingham cost estimate

	Unit	Quantity	Unit Cost	Sum	Total	Comments
			£k	£k	£k	
Site Clearance	ha	43.69	3.60	157.28	**157.28**	14.15km, 30m wide corridor
Canal Pounds						
Cosgrove to A5	m	1500	0.600	900.00		Restoration of existing channel
Cosgrove to A5	m	600	0.895	537.00		Rural Canal
Canalise River Great Ouse	m	950	1.000	950.00		River Canalisation
River Great Ouse to A422	m	1760	0.895	1575.20		Rural canal
River Great Ouse to A422	m	1000	2.085	2085.00		Rural canal in cutting
A422 to Thornton Stone Bridge	m	3030	0.600	1818.00		Restoration of existing channel
A422 to Thornton Stone Bridge	m	640	0.895	572.80		Rural canal
Thornton Stone Bridge to Bucks Canal Nature Reserve	m	2300	0.600	1380.00		Restoration of existing channel
Thornton Stone Bridge to Bucks Canal Nature Reserve	m	720	0.895	644.40		Rural canal
Bucks Canal Nature Reserve to River Great Ouse	m	1575	0.895	1409.63		Rural canal
Canalise River Great Ouse	m	120	1.000	120.00		River Canalisation
River Great Ouse to Buckingham	m	440	0.600	264.00		Restoration of existing channel
River Great Ouse to Buckingham	m	580	0.895	519.10		Rural canal
River Great Ouse to Buckingham	m	220	1.000	220.00		River Canalisation
Dogsmouth Brook Sluice	sum		200.00	200.00		
Deanshanger Brook Crossing	nr	1	50.00	50.00		
Provision for waste weirs	nr	3	100.00	300.00		Assumed
3m Footpath	m	14150	0.10	1415.00		
Landscaping	sum			1000.00	**15960.13**	
Locks						
Single lock restoration	nr	1	300.00	300.00		Bucks Canal Nature Reserve
River entrance/exit lock	nr	6	800.00	4800.00		Temporary cofferdam required
Single lock new construction	nr	8	775.00	6200.00	**11300.00**	

Bridges						
Bridge 1	nr	1	550.00	550.00		Temporary Cofferdam Required
Bridge 2	nr	1	500.00	500.00		
Passenham Road	nr	1	650.00	650.00		13m wide, 5m span, to include traffic management
Swing bridge for access track	nr	1	300.00	300.00		
Little Hill Farm Bridge		1	300.00	300.00		Restoration
Thornton Road Bridge	nr	1	650.00	650.00		13m wide, 5m span, to include traffic management
Thornborough Road Bridge	nr	1	650.00	650.00		13m wide, 5m span, to include traffic management
Old Mill House Bridge	nr	1	500.00	500.00		
Cattleford Aqueduct	nr	1	450.00	450.00		Including Crash Barrier
Works to existing bridges	nr	3	100.00	300.00	**4850.00**	A5, London Road/Watling Street, A413
Footbridges						
Field Crossings	nr	9	200.00	1800.00		
Thornton Stone Bridge	nr	1	300.00	300.00		Stone Restoration
Bucks Canal Nature Reserve	nr	1	150.00	150.00	**2250.00**	Restoration
Total Measured Cost (£k)					£34,517.41	
Add Contingencies	%	30			£10,355.22	
Total Construction Cost (£k)					**£44,872.63**	
Indirect Costs						
Service diversions				£5,000.00		
Client/Construction Supervision, admin & management	%	10		£4,487.26		
Design	%	6		£2,692.36	**£12,179.62**	
			Total Cost (£k)		**£57,052.25**	

Summary

Cosgrove to Buckingham
14.15 km length

Item	Cost / £k
Works Items	£34,517.41
Contingency	£10,355.22
Indirect Costs	£12,179.62
Total	**£57,052.25**

= £4,031.96 per km

Risk	**£7,000,000**

Grand Total inc Risk **£64,052.25**

Cost assessed June 2009.

It is recommended that for future use, this cost is inflated using the Price Adjustment Formulae for Construction Contracts, also known as the NEDO or Baxter Indices, published by the Office for National Statistics.

3.5 *Phasing*

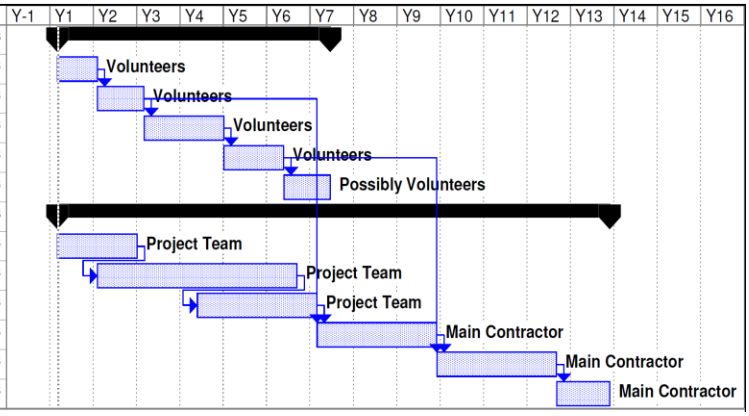
If funding were in place for the construction works, an engineering scheme of this size would be likely to take in the order of 5 – 7 years to complete.

In this case, it is difficult to determine what the likely timescale of the project may be as this will be dependent on funding availability. In order to demonstrate to external bodies that a scheme is going to happen, it can useful to have exemplar sections of channel restored.

A pragmatic approach may therefore be, in the short to medium term, to restore such sections as can be done relatively simply, with the more complex sections tackled once funding is secured.

A possible phasing approach to achieve this is shown below.

Task Name	Duration
Volunteer-led Early Works	**1640 days**
Restoration of Nature Reserve Lock	12 mons
Clearance of Cosgrove to A5	14 mons
Clearance of A422 to Thornton Stone Bridge	24 mons
Clearance of Leckhampstead Wharf House to Nature Reserve	18 mons
Restoration of Little Hill Farm Bridge	14 mons
Main Restoration Works	**3320 days**
Studies and Investigations	24 mons
Funding Applications	60 mons
Detailed Design and Planning Application Works	36 mons
Construction of Cosgrove to A422	36 mons
Construction of A422 to Buckingham	36 mons
Construction of Buckingham Basin	16 mons



4 Ecological Assessment

4.1 *Introduction*

This high level environmental review identifies the key constraints and opportunities in the study area. Data has been obtained from a brief desktop study.

As this is a high level review, further detailed environmental appraisal of the key issues identified will be required at feasibility stage.

4.2 *Protected Sites*

There is one Special Site of Scientific Interest (SSSI) approximately 1.8km north west of the canal. This is Foxcote Reservoir and Wood (Citation 1000665) (approx 50Ha) located at NGR: SP711 364. It consists of an unpolluted eutrophic freshwater reservoir of particular importance for overwintering wildfowl, surrounded by semi improved meadows and bordered to the north by mixed deciduous woodland. The standing open water and canals are in favourable condition whereas the wood is in unfavourable recovering condition.

At 1.8km from the canal it is unlikely that the special interest features at this SSSI would be affected by this scheme.

There are a number of nature reserves close to the canal route, including:

- The Buckingham Sand Pit (Site Code 1083175) located at SP 699 344 at 1.2km north west of the canal. This LNR is owned by AVDC and understood to be of earth heritage interest

- The Buckingham Canal Nature Reserve is located at NGR SP 726 352. The site is owned by the Berks, Bucks and Oxon Wildlife Trust and forms the southern boundary of the nature reserve. The canal towpath is also part of the North Ouse Valley Walk. There are ancient hedgerows on the embankment and the ponds provide a sheltered aquatic home for frogs, toads, dragonflies and damselflies.

- Stony Stratford Nature Reserve is located at NGR SP 785 409 between Queen Eleanor St, Stony Stratford, and the A5. The reserve provides a variety of artificially created wetland habitats especially for waterfowl and

waders. It was created from the gravel workings which supplied materials for the building of the A5 Trunk road

There are no statutory protected sites in the study area. Information on Ancient Woodland areas, and Countryside Stewardship agreements close to the proposed canal route are presented below.

Ancient and Semi-natural Woodland

- Bedlam Copse, 3.2Ha located at NGR SP 752 380 (Theme ID 1108095). Approximately 0.58km north of the canal route;
- Jacks Copse, 2.76Ha located at NGR SP 753 382 (Theme ID 1108096). Approximately 0.77km north west of the canal route;
- Rabbit Wood, 3.1Ha located at NGR SP 747 378 (Theme ID 1108094). Approximately 0.90km north west of the canal route;
- Great Oaken Copse, 5.13Ha located at NGR SP 744 376 (Theme ID 1108093). Approximately 1.01km north west of the canal route;
- Little Oaken Copse, 3.17Ha located at NGR SP 742 378 (Theme ID 1108092). Approximately 1.30km north west of the canal route;
- Park Copse, 16.29Ha located at NGR SP 738385 (ID 1008091), also at same site, replanted ancient woodland 2.08Ha at SP 739 383. Approximately 1.9km north west of the canal route

Countryside Stewardship Agreements

- 7.48Ha adjacent to east side of A413 straddling canal route
- 41.58Ha to south of River Great Ouse close to Thornborough Mill, approximately 0.34km south of the canal.
- 72.67Ha to south of River Great Ouse to the east of Thornton, approximately 0.35km south of the canal

- 19.36Ha to north of A422 and east of Leckhampstead, approximately 0.49km north of the canal

- 7.21Ha to south of A422 south east of Deanshanger, potentially straddling the proposed canal route.

4.3 Flora and Fauna

The Buckinghamshire and Milton Keynes and the Northamptonshire Local Biodiversity Action Plans (LBAP) comprise a series of habitat and species action plans targeted towards those features important in the area. There is no specific BAP for the canal route itself, however likely priority habitat close to or along the proposed route of the canal includes coastal and floodplain grazing marsh located between the A422 and the River Great Ouse near Deanshanger and Old Stratford. The LBAP's will be investigated in more detail at the feasibility stage. Connection of isolated water bodies may have impacts upon flora and fauna by the introduction of alien species or water of differing acidity.

4.4 Water Quality

The River Great Ouse flows parallel and in a north easterly direction to the Buckingham Canal. River Quality is generally good (EA website) (chemical quality A – very good; biological quality A-C and nitrates and phosphates high). Water quality is not thought to be a major constraint; however reconnecting/connecting previously separated water bodies can impact upon water quality and in particular sediment issues. In this instance, work will still be required to ensure this scheme had no adverse impacts particularly at locations where canalisation of the river is proposed. There may also be issues with water quality during flood events with interaction between the canal and other water courses. The EA flood map indicates that parts of the proposed canal route are within the 1 in 100year floodplain, including the area to the south and east of Deanshanger

4.5 Cultural Heritage

There are three Scheduled Monuments within 1km of the proposed canal route, as follows:

- A slight univallate hillfort covering an area of approximately 3.8Ha (monument number 29420) at NGR SP 724 347 is located immediately adjacent to the north west side of the canal.

- The Grove Close Moated Site covering an area of approximately 0.6Ha (monument number 13617) at NGR SP 749 376 is approximately 675m to the north west of the canal route.

- Motte and bailey castle, deserted village and monastic grange at Old Wolverton. The Scheduled Monument (monument number 13609) covers an area of approximately 19.4ha at NGR SP 801 411 and is located approximately 1.1km from the proposed new cut/ river canalisation to the south east of Old Stratford.

- Remains of the church and churchyard of St Mary Magdalen (Monument number 35357) covers an area of approximately 0.5Ha at NGR SP786 406. The site is approximately 0.56km from a section of proposed river canalisation at Old Stratford.

- A Roman Villa south east of Cosgrove Hall covering an area of approximately 1.86Ha straddling the canal (monument number NN119) at NGR SP 795 420

The proximity to the canal route may cause problems depending upon the nature of the ground between the canal and the monuments. It is likely that damage to both the hillfort and the roman villa were caused during the original construction of the canal.

4.6 Human Beings

The canal route starts on the eastern outskirts of the town of Buckingham. On its route in a generally north easterly direction the canal bypasses the small settlements of Thornton and Beachampton to the south, Deanshanger and Old Stratford to the north and north west before terminating at its confluence with the Grand Union Canal south of Cosgrove.

A public footpath follows the route of the disused canal from Buckingham to approximately Thornton (part of The Ouse Valley Way), where it leaves the canal to run to the south of the River Great Ouse. The Ouse Valley Way follows the original towpath of the now disused Buckingham Canal out to Thornton, then follows footpaths through the villages of Beachampton and Calverton before reaching the Milton Keynes riverside walk, the Grand Union Canal and the North Bucks Way.

A number of other footpaths cross the proposed canal route at Deanshanger and closer to Old Stratford, including another section of The Ouse Valley Way adjacent to the River Great Ouse close to Old Stratford (proposed section of river canalisation).

4.7 Traffic and Transport

The main transport links in the study area are the A422 and the A5. The A422 goes from Buckingham to Old Stratford in a roughly south west to north easterly direction, bypassing Deanshanger to the south east and between Old Stratford and Stony Stratford. The A5 travels in a south east to north west direction between Milton Keynes and Towcester. A proposed section of river canalisation passes beneath the A5 east of Old Stratford, before turning north west in a new cut running parallel to the A5.

The canal route also crosses a number of minor roads at Thornborough Mill, Thornton, Passenham and Old Stratford.

4.8 Contaminated Land

Depending on the finalised route and construction methods, contaminated land may prove an issue particularly close to mineral extraction sites close to Deanshanger, Passenham and Cosgrove. Some of these sites have subsequently been used for landfill.

- Anglian Water Services - Foxcote Pumping Station - Landfills taking non-biodegradable wastes (not construction), adjacent to the canal
- Thornton Hall Farm licensed to receive inert waste (approx 500m south of the canal)
- Kingfisher Farm, Deanshanger – inert waste
- RMC Aggregates – Passenham (non-hazardous, inert)
- RMC Aggregates – Passenham Quarry (landfills taking other wastes (construction demolition and dredgings)
- Stratford Road, Cosgrove (inert wastes)

4.9 *Key Opportunities and Constraints*

The scheme presents the opportunity to restore the canal for the benefit and use of the public with the creation of wetland habitats, and a corridor linking other areas of habitat.

Key known and potential constraints in the study area include:

- Buckingham Canal Nature Reserve
- Stony Stratford Nature Reserve
- Heritage and archaeological features
- Protected species/habitats (presence/absence to be confirmed)
- Possible contaminated land issues.
- Possible water quality issues

4.10 *Recommendations*

As a minimum, the following external consultees should be consulted to obtain further baseline information and to maximise potential environmental opportunities:

- Environment Agency Officers
- Relevant Local Authority Officers
- Natural England
- Local Wildlife Trusts
- English Heritage

An ecological walkover survey should be undertaken to ascertain the need for more detailed species surveys. It is likely that an environmental assessment of the proposals will also need to be undertaken. This will determine both positive and negative environmental impacts of the proposals, identify mitigation for adverse impacts and identify potential environmental enhancements to the proposed scheme.

5 Socio-Economic Benefits

5.1 *Introduction*

Canal restorations have the potential to deliver significant benefits for the local communities and economies. In particular, the nature and scale of such positive impacts can be determined by assessing the direct and indirect interactions between the canal and the key drivers within its context area.

Hence, in order to have an early view on the potential impacts of the envisaged restoration of the Buckingham Canal, this chapter identifies the likely impact / economic drivers within the canal's context area. This is followed with a qualitative outline appraisal of the potential impacts.

Realising any socio-economic benefits within the Buckingham Canal's context area may have direct and indirect cost implications. Additionally, the long term maintenance of a restored canal will require a regular stream of income to ensure its operational viability. Given the nature of such concerns, this section provides some initial thoughts on the deliverability of the proposals

5.2 *Context Area and Key Drivers*

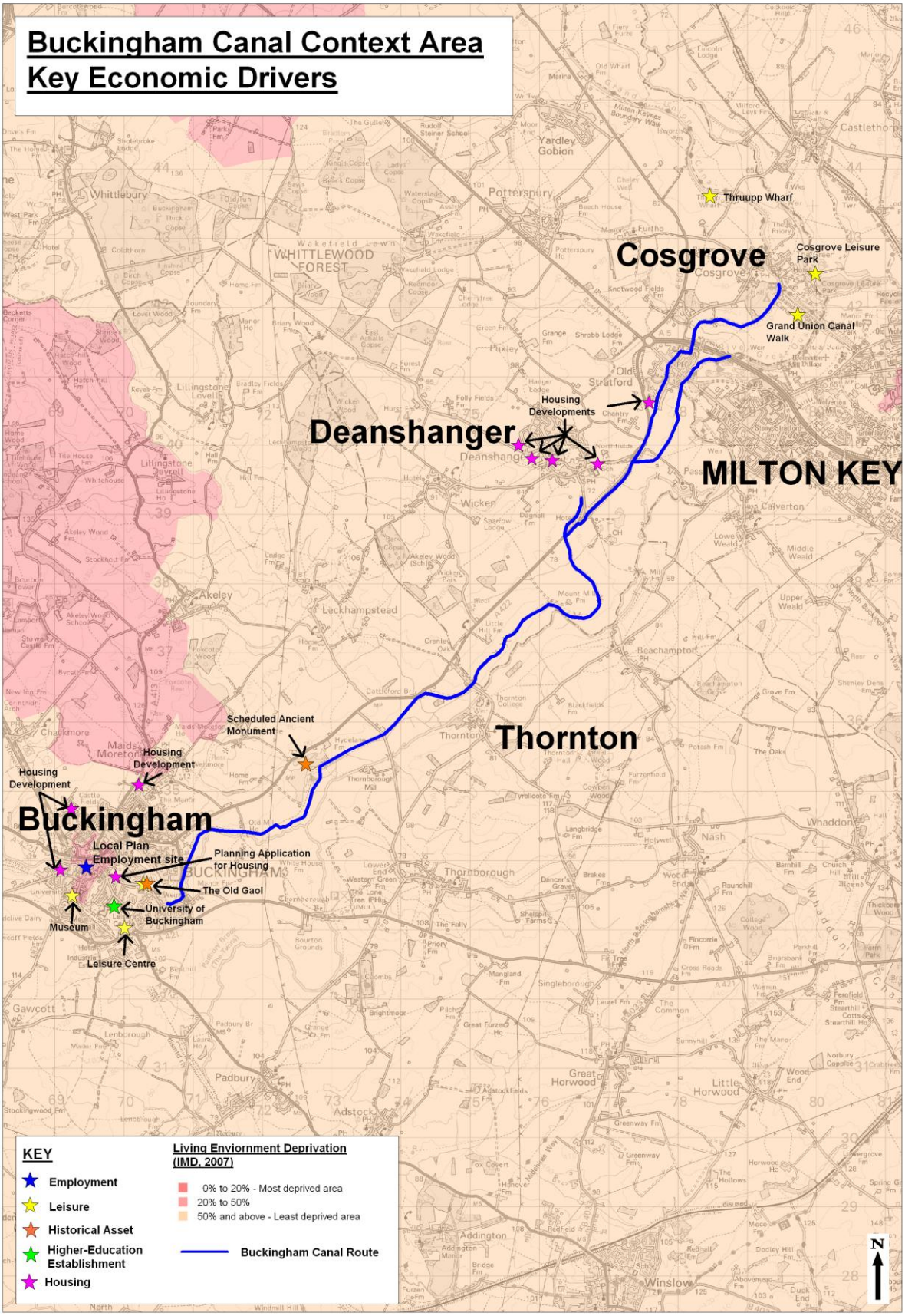
The Buckinghamshire Tourist Board suggests the Grand Union Canal is a key tourism feature within the location. The canal features in an array of tourism brochures and advertisement material, being marketed as a historic transport route. This canal is considered to be well situated within the pleasing Aylesbury Vale countryside and attracts a significant number of visitors each year. The area benefits from being in some of the most attractive countryside in the south of England, nestled between the Cotswolds and the Chilterns, this area offers unique countryside which is considered to have growing potential to attract tourism investment.

The restored canal within its wider context area will have a market town and a number of key villages, including Buckingham, Deanshanger, Passenham and Old Stratford. Milton Keynes is located to the east of the canal which provides links to the south-east and the West Midlands. The context area benefits as being fairly affluent in terms of living environment (indoor and outdoor). In particular, the attached plan shows living environment deprivation to be fairly low and consistent across the study area. Access to the canals and attractive water space for local

residents, workers and tourists, is considered a key competent for driving the high quality of living environment (outdoor) by Aylesbury Vale District Council.

Water attractions are featured in the tourism guides for canal boat tours and other marketing material e.g. Aylesbury Vale Tourism Guide. The key purpose of such promotional material is to maximise the economic gain associated with joint offer which promotes both formal and informal use of the waterways and the surrounding water space.

This proves there is potential to mirror this activity in this study's context area. The canal appears to be one of the key drivers of the tourism economy in the region. The plan indicates potential for marina development alongside the canal. This can strengthen the benefits associated with formal and informal use of waterways and water space in the neighbouring villages. Such benefits may include direct and indirect business activity, economic output and employment generation.


Buckingham Canal Context Area
Key Economic Drivers
Thruupp Wharf
Cosgrove
Cosgrove Leisure Park
Grand Union Canal Walk
Housing Developments
Deanshanger
MILTON KEY
Scheduled Ancient Monument
Thornton
Housing Development
Housing Development
Buckingham
Local Plan Employment site
Planning Application for Housing
The Old Gaol
University of Buckingham
Museum
Leisure Centre
KEY
Employment
Leisure
Historical Asset
Higher-Education Establishment
Housing
Living Enviornment Deprivation (IMD, 2007)
0% to 20% - Most deprived area
20% to 50%
50% and above - Least deprived area
Buckingham Canal Route
N

Another key attraction, which already exists in the area, is the Cosgrove Leisure Park. It is one of England's finest leisure parks and is situated to the east of Cosgrove village. It offers an array of holiday home plots with associated leisure facilities. Likewise, the Grand Union Canal Walk passes to the south of Cosgrove Leisure Park, and is another key pull factor to the area.

The market town of Buckingham benefits from being home to the thriving University of Buckingham. Interestingly, this is the only UK University that is independent from the UK government, and will not be subject to the forthcoming funding cuts proposed by government. The University is a key economic driver in the town and the wider area; it attracts a high proportion of overseas visitors along with a significant proportion of home students. The University is the largest employer in the town providing a number of a high value jobs and is a contributor to the local economy.

The context area has a diverse economic base with various small, yet no major, economic drivers. Milton Keynes and the area to the south is a commuter belt for London. The economy in Aylesbury Vale is mainly made up of rural enterprises. The economic development plan for the area points developments towards the county town of Aylesbury, in the first instance. However, Buckingham is earmarked for residential growth up until the period 2026. The plan also places emphasis upon the larger villages within the Vale. This appears to be the case in the village of Deanshanger, which has had a number of recent planning applications for housing sites. The expansion in the number of dwellings in this village suggests potential for water fronting housing and employment growth. Such developments in the right market conditions are likely to hold a premium on their end use values. Attracting a fraction of such premiums could contribute towards offsetting the significant costs associated with implementation of the canal restoration.

5.3 Conclusions and Recommendation

The restoration of the canal is likely to create additional income for the local economy by attracting formal and informal visitors and associated expenditure. There is already a good visitor base within the context area to build upon, not least due to Cosgrove Leisure Park and over The Iron Trunk, a notable heritage feature, and the Grand Union Canal Walk. Further, the University of Buckingham also attracts a significant number of students and their friends and families to the area.

The canal restoration will open up the area south of the existing network, linking Cosgrove to Buckingham, increasing accessibility to an attractive feature. This could result in greater informal use of the corridor, impacting positively on local trade and employment opportunities.

The navigable canal towards the south of Milton Keynes is a major attraction in the region for formal use of waterways and already provides significant economic benefits. This could be replicated in this section of the canal which would drive the economy around this area.

There appears to be a potential to develop a marina in south Deanshanger. The canal branches off from the main route towards the village of Deanshanger. The location is suitable for such a development not least due to adjacent / nearby uses such as a hotel and public house and other services available in the village. Such a development is likely to become another key economic driver for the local area.

Summarising the findings of the research presented in this chapter, the table below outlines various waterways and water space associated activities and the likely impacts they would generate for the local economy.

Table 5.1: Opportunities and Benefits

Activities	Benefits (outputs and / or outcomes)
Restoration of the Canal Promote the development of potential marina Explore potential to create new moorings	Formal visitors to the context area Income generation for the Canal Society Direct and Indirect expenditure into the local economy Construction jobs for the local economy Direct and indirect jobs (tourism / leisure / recreation) for the local economy
Develop a strategy which explores opportunities for canal corridor to act as catalyst for integrating all the social, commercial, heritage and landscape drivers to maximise output in the context area: Creation of walking and cycle routes along the canal corridor, creating formal links with all towns and villages within the canal's context area Creation of attractive water based gateways for key towns and villages within the canal's context area Joint strategy to create formal links with existing major attractions within the context area e.g. Cosgrove Leisure Park, Buckingham Old Gaol and University of Buckingham Actively promote creation of formal links with the major attractors / drivers in the pipeline e.g. urban extension of Deanshanger, new marina Explore (and implement) water-based passenger movement (e.g. water taxis and water buses) on the canal corridor, particularly linking rural villages to key towns for sustainable access to services Explore (and implement) hydro based power solution to meet the demands of local businesses, education facilities and the wider community Explore (and implement) opportunities for floating houses and commercial developments (hotels, offices etc) along the canal corridor Provide live project opportunities for students	Healthy living and more productive workforce Improved quality of life Practical learning opportunities for local students Community pride Increased visitors to the context area and local attractions / destinations Increased trade for local towns and villages Creation of more tourism based jobs Creation of water transport based jobs (freight and passenger movement) Power generation through renewable sources – green energy Reduced carbon foot print of the context area Improvement in land values Scope for regeneration of areas suffering from deprivation Increased income generating opportunities for the Canal Society through potential diversification of its activities: sale of renewable energy, water based freight activity, water buses / taxis, markets at key gateways and destinations and development of floating homes / commercial developments.

at universities in the vicinity studying engineering and environmental courses	
Participate in Buckinghamshire Green Infrastructure Consortium	Enhancement of Green Infrastructure
Contribute to development of Ouse Valley Regional Park	Ecological and Environmental benefits
Explore (and implement) water management based solutions for mitigating flood risk within the Ouse Valley	Reduced costs for flood damage. Increased confidence for local residents and farmers. Fewer road closures

Considering the envisaged benefits and revenues derived from formal and informal use waterways and water space, the proposed restoration may be operationally viable. However, the capital costs associated with restoring the canal are estimated to be in the region of £64 million. Considering the nature of economic benefits associated with such a provision, only a small fraction of this activity could be funded through economic development / regeneration based public sector investment streams. Further, given the current economic climate and emphasis on safeguarding and creation of new sustainable businesses, rather than seasonal tourism markets, it is unlikely that such investments would be forthcoming. Hence, deliverability of the canal restoration project would require attracting community based recreation funding, gaining local sponsorships and diversifying the activities of the Canal Society into other income generating activities such as floating developments and energy generation.

6 Risks

With any project of this type, a large number of risks are present. An initial risk register has been produced and can be seen below.

The Risk Register has considered risks which may affect the cost, quality of delivery programme for the scheme.

It is recommended that this document is reviewed, updated and maintained by the project promoters as a live document in order to keep track of and work towards mitigation of the main project risks.

Table 6.1: Risks and Mitigations

No.	Risk	Mitigation
1.	High cost of scheme. Difficulty in obtaining the necessary capital funding for construction.	Investigation into likely funding sources and what these funders' criteria are for making awards. Different parts of the project could then be mapped to different funders' criteria.
2.	Land ownership outside that of project promoters.	Early work required to identify land ownership along the route. A SWOT analysis of land owners should then be carried out to determine how they should be approached. Development of solutions that would be advantageous to both parties may address concerns of some landowners. Develop route options to give alternatives to potential problem areas.
3.	Services	Services present along the route may require significant costs to move existing services and identification of unknown services. A detailed assessment of the services present, works required and costs should be carried out.
4.	Interactions with rivers and floodplain may be unacceptable to the Environment Agency.	Early discussion should be held with the EA in order to obtain their view of the project and to establish what studies would be required to obtain their approval. This may be an opportunity to further explore the flood defence potential of the canal.
5.	Ground conditions / geotechnical risk	A number of risks relate to ground conditions; the condition of the existing embankments, the lining, new embankments and cuttings etc. Initially a geotechnical desk study should be undertaken with a site walkthrough by a qualified geotechnical engineer. A programme of detailed ground investigation works will be required for detailed design activities.
6.	Insufficient water resources available to operate canal	The River Great Ouse may be a good source of water for the canal, although this will require agreement with the EA. The locks back up from the Ouse at the A5 to the original route may be a problem and may require water to be abstracted from the Grand Union. This may not be acceptable and a pumping arrangement may be required incurring additional cost, both for construction and maintenance.

7 Additional Strategic Opportunities

This study has examined the restoration of the Buckingham Canal in isolation. This involves a single connection to the wider canal network at Cosgrove. A further study should look into the feasibility of extending the Buckingham Arm across to meet the Oxford Canal, thus creating a new cruising route, which combined with the development of the B&MK Link would significantly extend cruising in the Great Ouse valley. Navigation loops are known to be more popular than branch arms; therefore this is likely to attract wide interest

An increase in leisure and tourism through restoration of the Buckingham Canal has the potential to address social and economic deprivation along the route. Linking the canal to villages through construction of new footpaths and cycle ways can add to the revenue in village shops, cafes and pubs. This can safeguard existing jobs and may lead to the establishment of new businesses.

British Waterways has a long-standing arrangement with fibre-optic companies for placement of cables within their towpaths. It may be possible to achieve such an agreement for the Buckingham Canal. Not only would this be a valuable source of revenue, but it could also bring Broadband to many villages in the Ouse Valley that do not currently have a connection.

8 Summary

Based on this assessment, the restoration of the Buckingham Canal is a feasible project, though with some significant issues to address.

The restoration of this canal is likely to have a positive social and economic impact on the area as well as being of environmental benefit.

The section from Cosgrove to the A422 is a mix of the well-established old line and significant obstructions through Old Stratford and Deanshanger. The obstructions are such that reinstating the line through the villages is not really

feasible. A new route, making use of the river and by-passing Old Stratford, is a more achievable line. This does introduce operational issues with water supply when locking to and from the river and canal closures due to high flow on the River Great Ouse. These issues will be more easily overcome than those posed by threading the canal through the urban areas.

Much of the rest of the old line is visible as existing embankments or ditches. The rural location means that access for construction will be relatively unrestricted, although consultation and agreement with land owners will, of course, be critical.

Reinstatement of the Cattleford Aqueduct will be a technical challenge and much will depend on the condition of the existing structure.

Leckhampstead Wharf House now represents an obstacle to the old line and a diversion will be required, but the rural location means that there is ample room in which to achieve this.

Canalisation of the river near the Old Mill House will again, present operational problems during high flows. The alternative is to construct the line of the canal adjacent to the river, but not connected. This will require a sizeable cutting through a slope that currently generates a number of springs. This option is likely to incur a higher construction cost, but will avoid the canal being closed due to the river.

The Lock Cottage outside Buckingham has been built upon the old lock and this will need to be by-passed. Again, there is plenty of land in which to do this as long as an agreement with the landowner can be reached.

The route into Buckingham itself is blocked by the A413 and further development within the town. An alternative route, again using the river, could terminate in a basin situated in the park. An alternative would be to construct a terminus basin outside the A413 and use this as a focal point for a new development. This would not achieve the aim of reaching the centre of Buckingham, but it may be a more feasible method of generating funding of the scheme by attracting a private developer.

A significant complexity of the whole restoration will be how the canal interacts with the rivers and floodplain. This is an issue that will need to be addressed in some detail in order to obtain approval from the Environment Agency.

In the short term, significant funding will be required in order to undertake further more detail specific studies. While it can be relatively easy to obtain funding for small capital sums, below say £200k, it can be much harder to obtain funding for studies without being able to demonstrate the benefits the study will bring.

In the longer term a strategy will need to be developed of how capital funding in the order of £65M will be obtained.

9 Recommendations

9.1 *Introduction*

The recommendations for this scheme have been split into three categories, short-term, medium-term and long-term.

The short-term recommendations will be targeted at things that should ideally be undertaken in the next 3 - 12 months in order to keep up the momentum of the project. These include studies that should be undertaken and also tasks the promoters should consider undertaking themselves in order to position themselves for the future.

The medium-term recommendations will be issues that should be addressed in the next one to three years and the long-term recommendations are issues beyond three years.

9.2 *Short term*

In order to progress this project a more detailed feasibility study will need to be undertaken. This is likely to cost in the region of £50k - £100k. This should assess the engineering, water management and environmental aspects of the project. It is highly likely that a flood risk assessment will be required on the lower section, by Old Stratford, and on the upper section, around Buckingham, to demonstrate that the construction of a new canal would not have an adverse impact on the River Great Ouse.

It is recommended that the Buckingham Canal Society approach the Environment Agency to obtain their view of the scheme. The benefits the scheme could have in water management and environmental enhancement should be raised.

It is recommended that the requirement for a Transport and Works Act is investigated and if deemed necessary a plan is developed for what this will involve.

Where access is possible, it is recommended that all existing structures and possible locations of original structures are investigated to determine whether they still exist and where they do, what condition they are in. It may then be possible for future studies to incorporate these structures into the proposed restoration.

This study has been undertaken using LiDAR data. This has been useful in estimating the pound levels and thus the requirement for locks, embankments and cuttings. Further studies should examine the water levels in more detail and cross-reference this against Environment Agency flood maps to try to ensure the canal is out of the flood plain as much as possible. Localised site surveys may be required for additional detail.

The landowners along the whole route should be identified.

A wider study could also investigate the potential for connections to the canal network other than the Grand Union at Cosgrove.

9.3 Medium term

No further recommendations are made here for procured work that will need to be undertaken as this would be influenced and defined by the initial feasibility study. As listed above, it is likely that a flood risk assessment will be required; other studies may include further environmental surveys, geotechnical desk studies and further economic studies.

It will be necessary to engage with the service companies with assets along the route. It is possible that this may be undertaken as part of the feasibility study.

The promoters of this project need to consider in what form they wish to drive the project forward. Who will take the lead role? It may be worth considering setting up a project partnership.

The issue of ownership and operation of the restored canal needs to be considered. The owners and operators need not necessarily be the same organisation. Discussion should be opened with British Waterways on what part they may wish to play in the restoration and operation of the canal.

Work should be carried out to identify all possible benefits of the scheme. This should not be limited to large regional benefits but should also consider small scale improvements to local communities or villages.

Public engagement/consultation should be carried out within the next year to ensure the backing of all the communities in the local area and to understand their concerns and aspirations.

There are likely to be a large range of tasks that could be undertaken by volunteers. A volunteer action plan should be produced setting out what skills are required for each task and how this should be managed. It should be noted that for any volunteers carrying out clearance or construction work on site, safe systems of work should be developed with method statements and risk assessments signed off by a competent individual.

9.4 ***Long term***

In order to develop a fundable scheme, significant work will be required over the next three years to engage with all the local communities. A key requirement will be their backing.

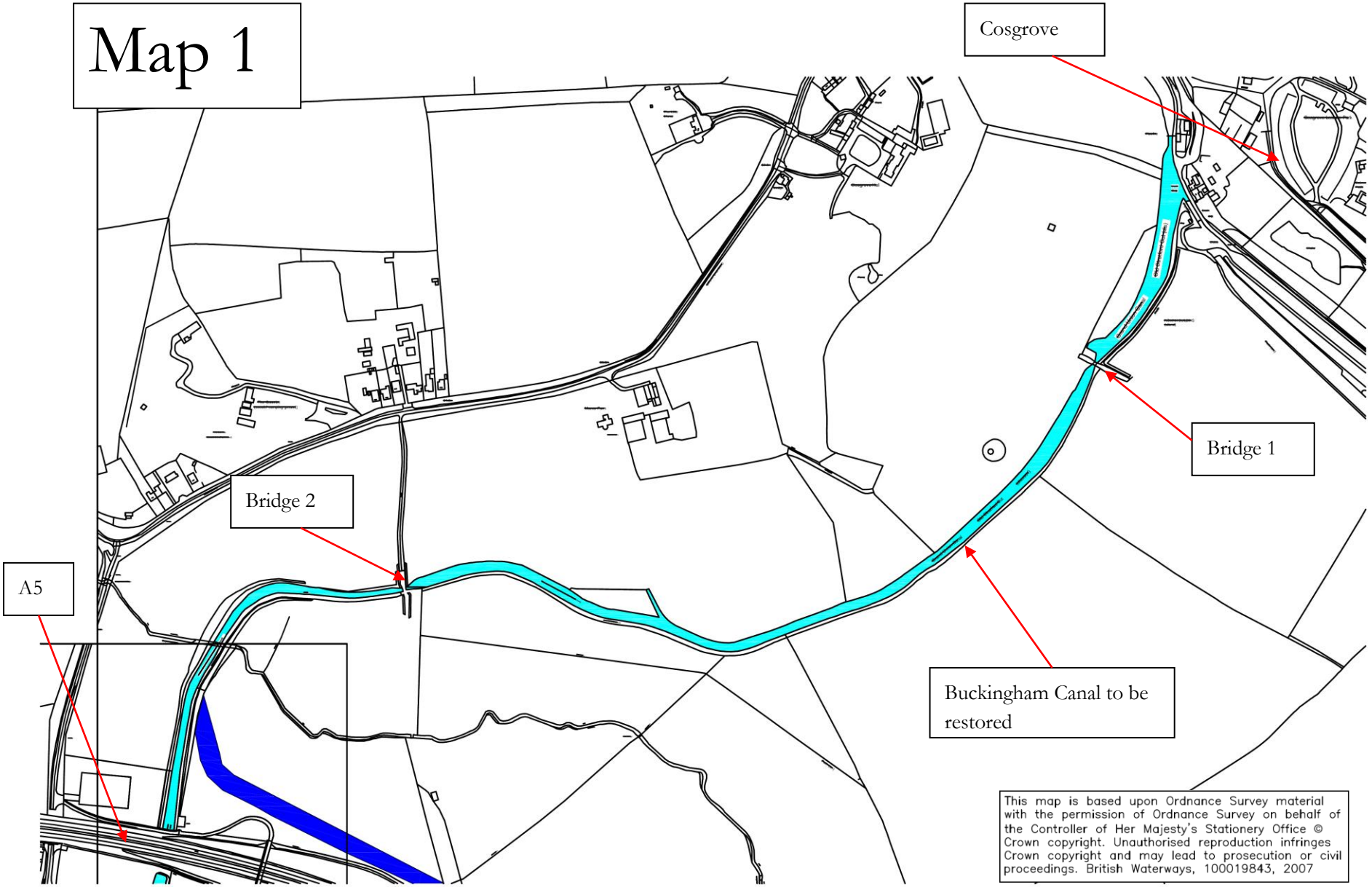
It is recommended that in the long term, the project promoters engage with these communities and work with them to develop options and designs and keep them fully informed as the project progresses.

An overall restoration plan should be developed with timescales from medium term work and also as funding becomes available, areas to concentrate on as key first bits of restoration should be identified.

Appendix A - Route Plans

The route plans that follow are indicative proposals.

Map 1


Cosgrove
Bridge 1
Bridge 2
A5
Buckingham Canal to be restored
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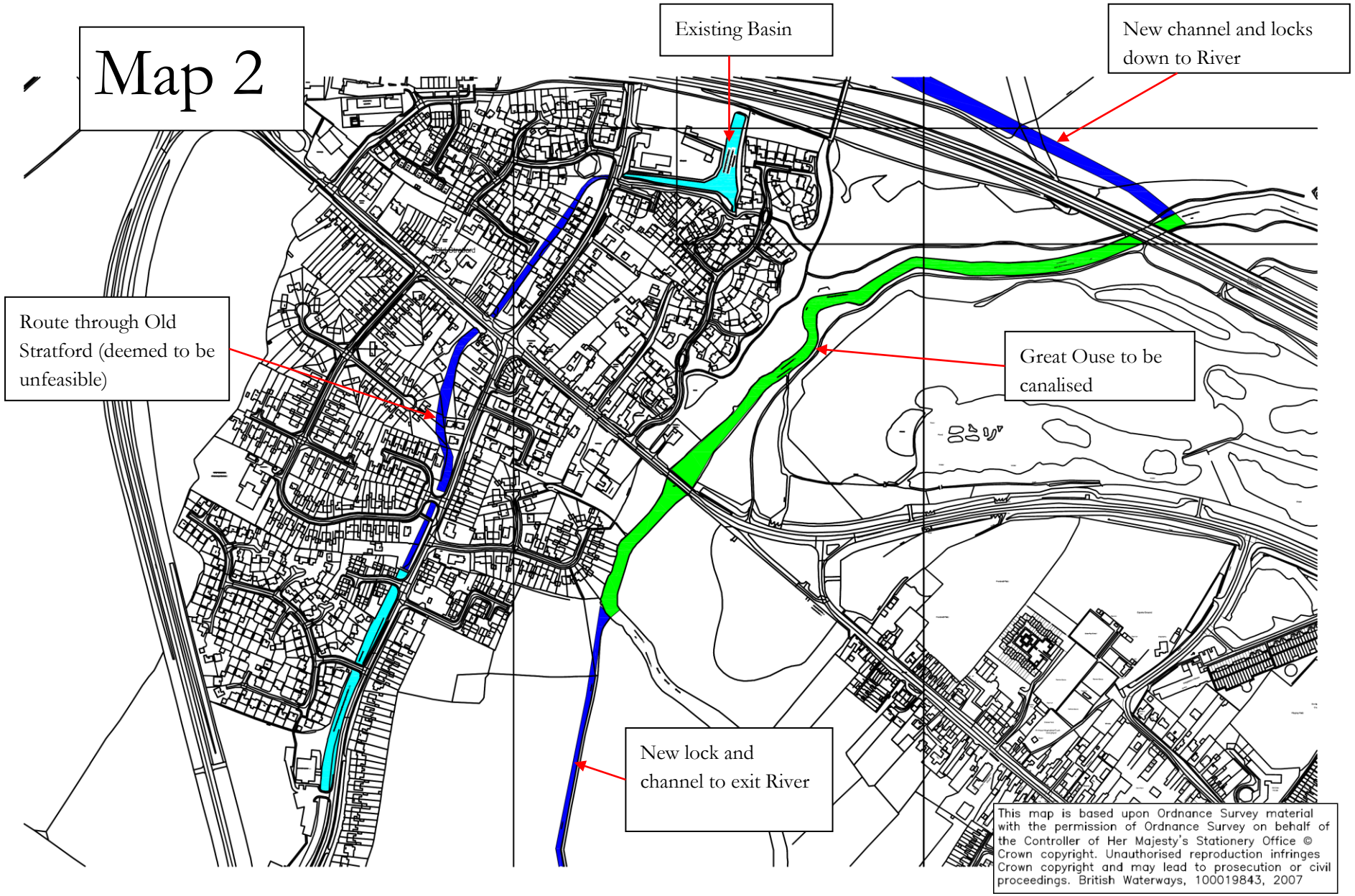
Map 2


Existing Basin
New channel and locks down to River
Route through Old Stratford (deemed to be unfeasible)
Great Ouse to be canalised
New lock and channel to exit River
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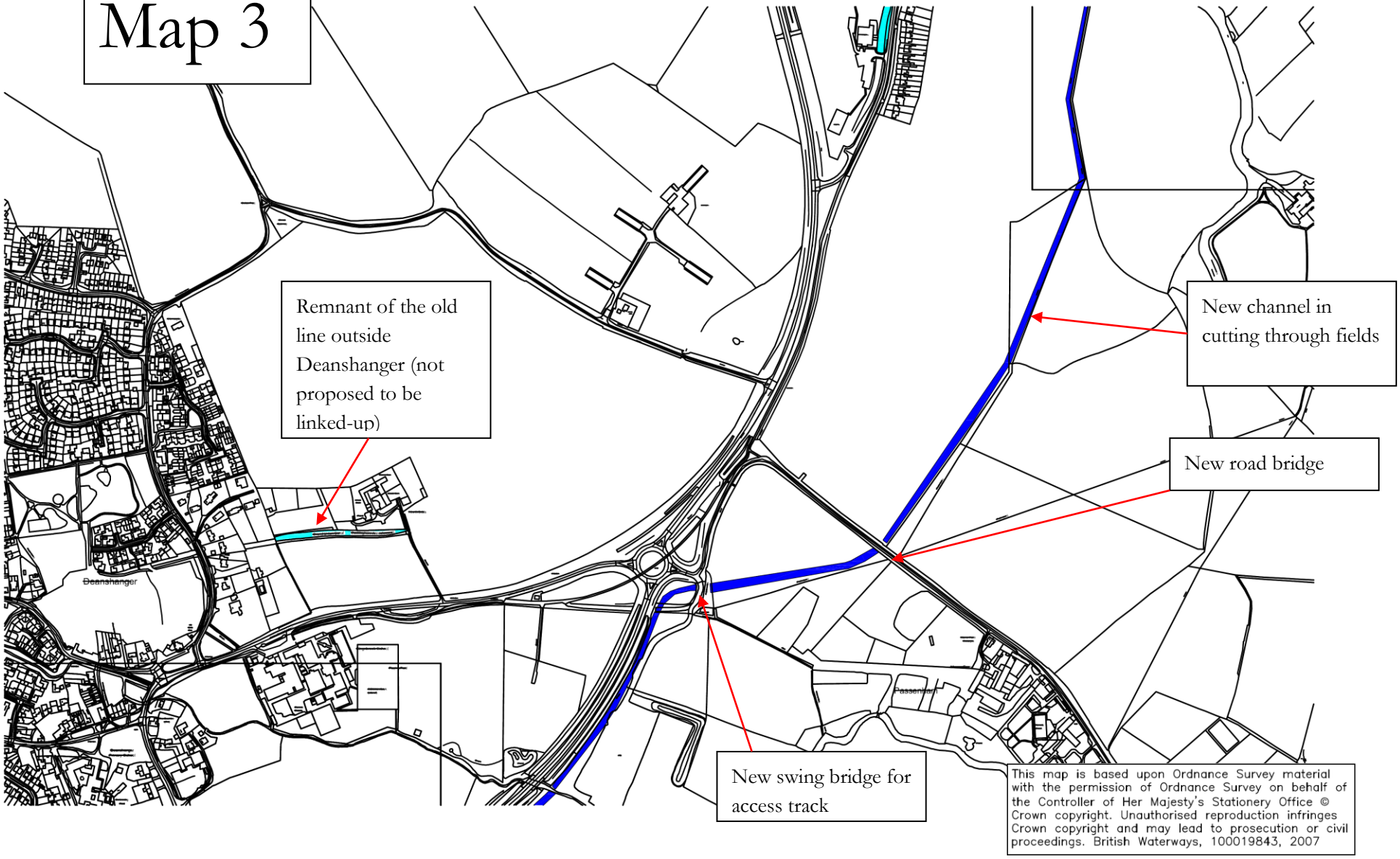
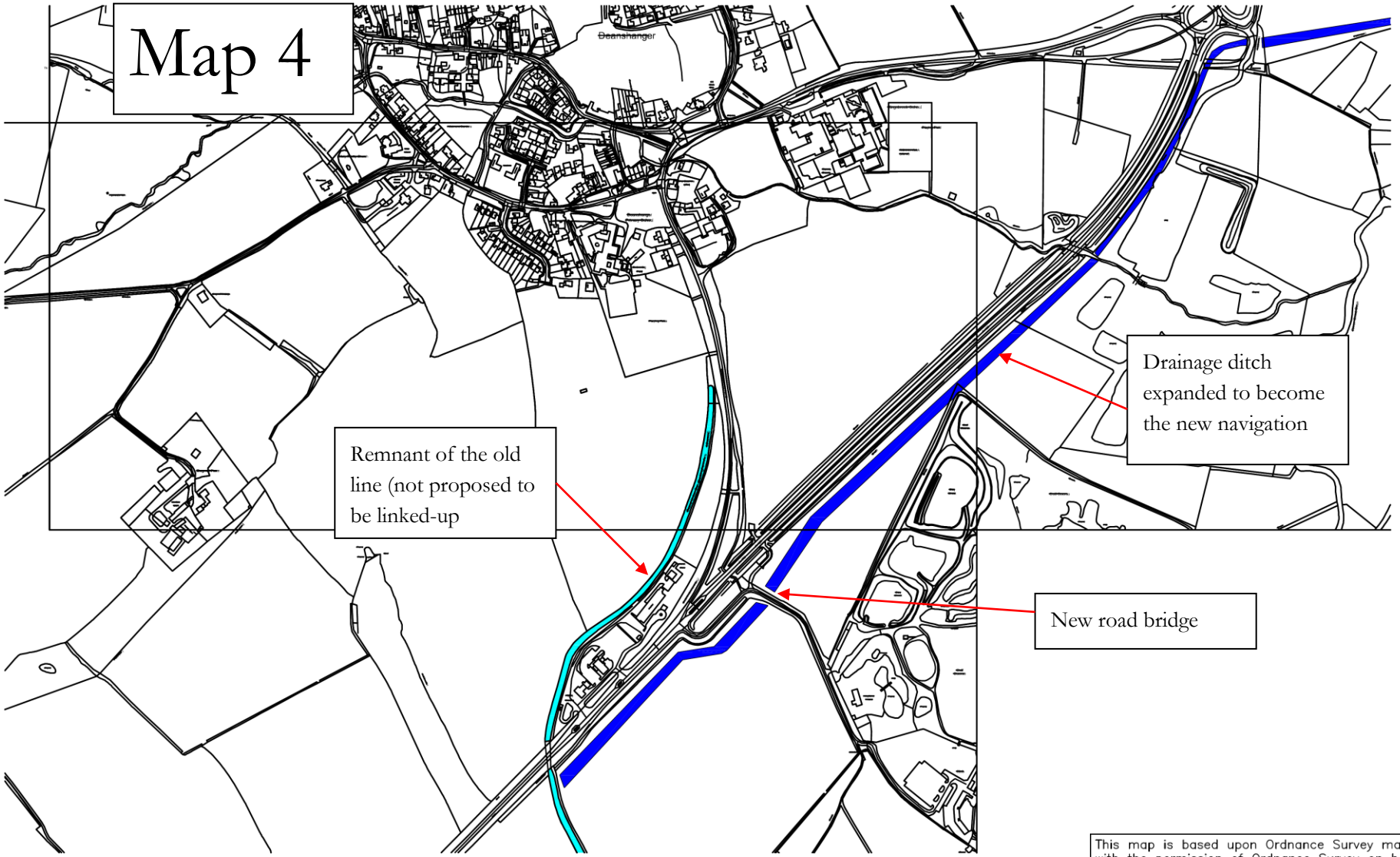
Map 3



Map 4



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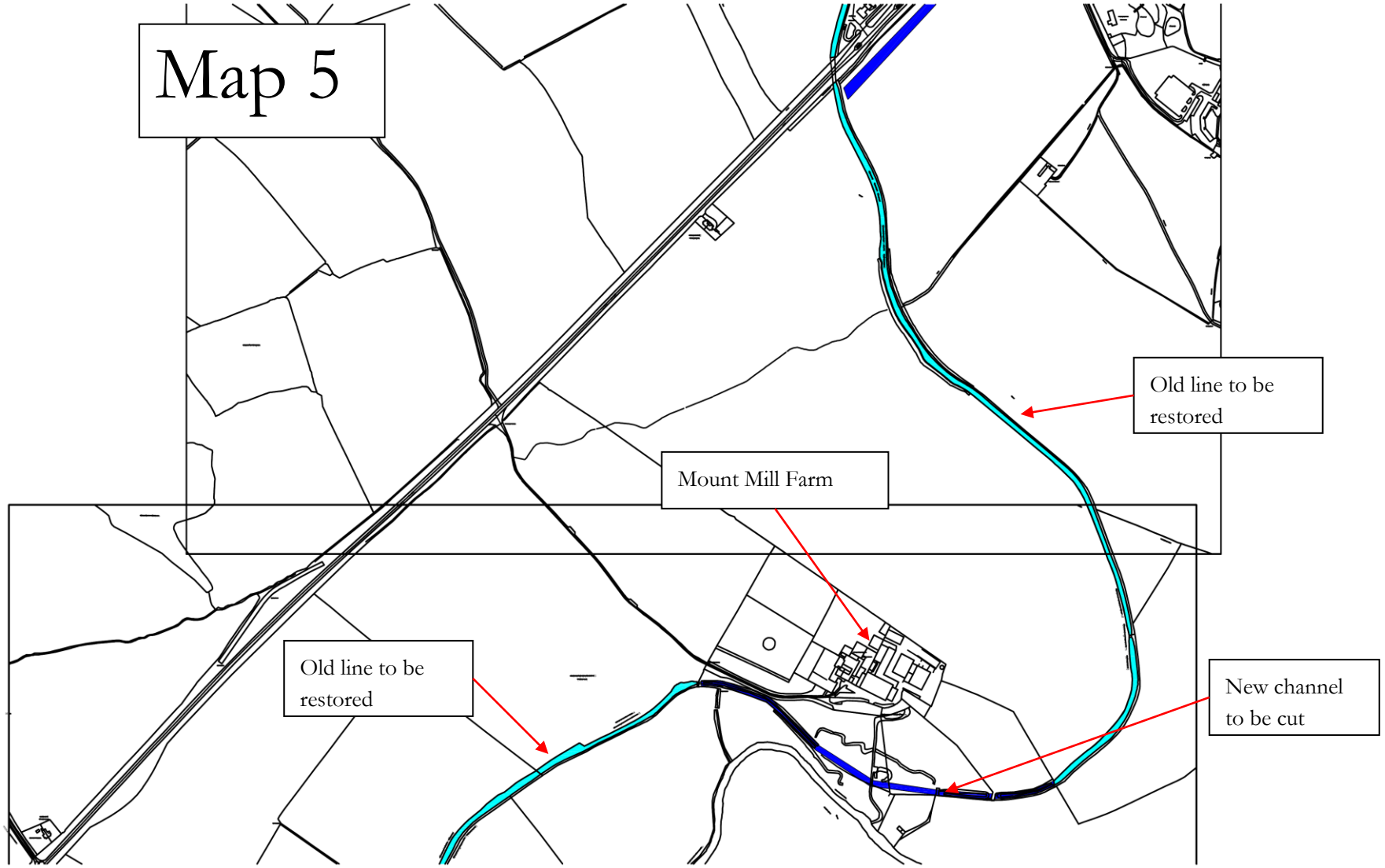

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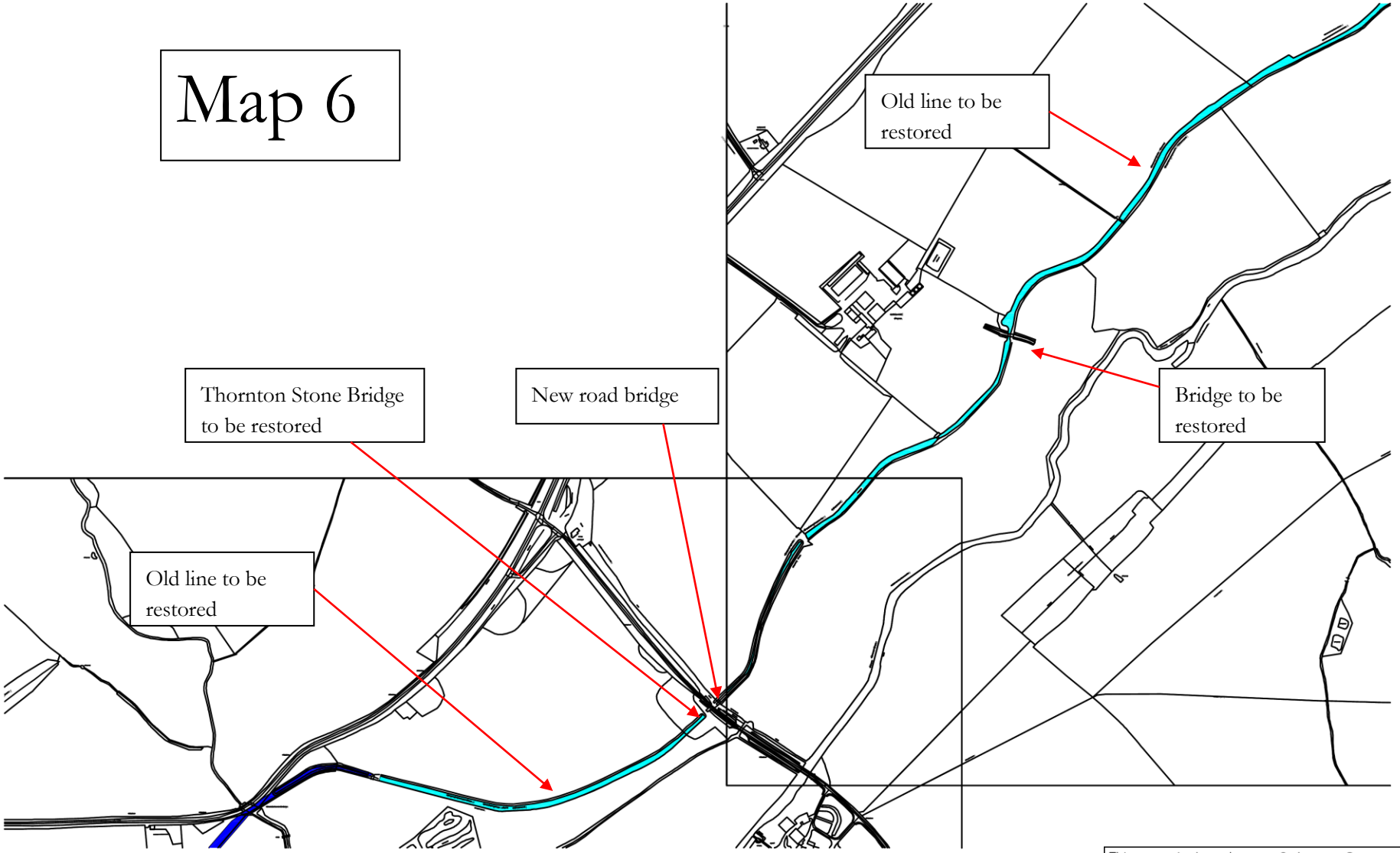

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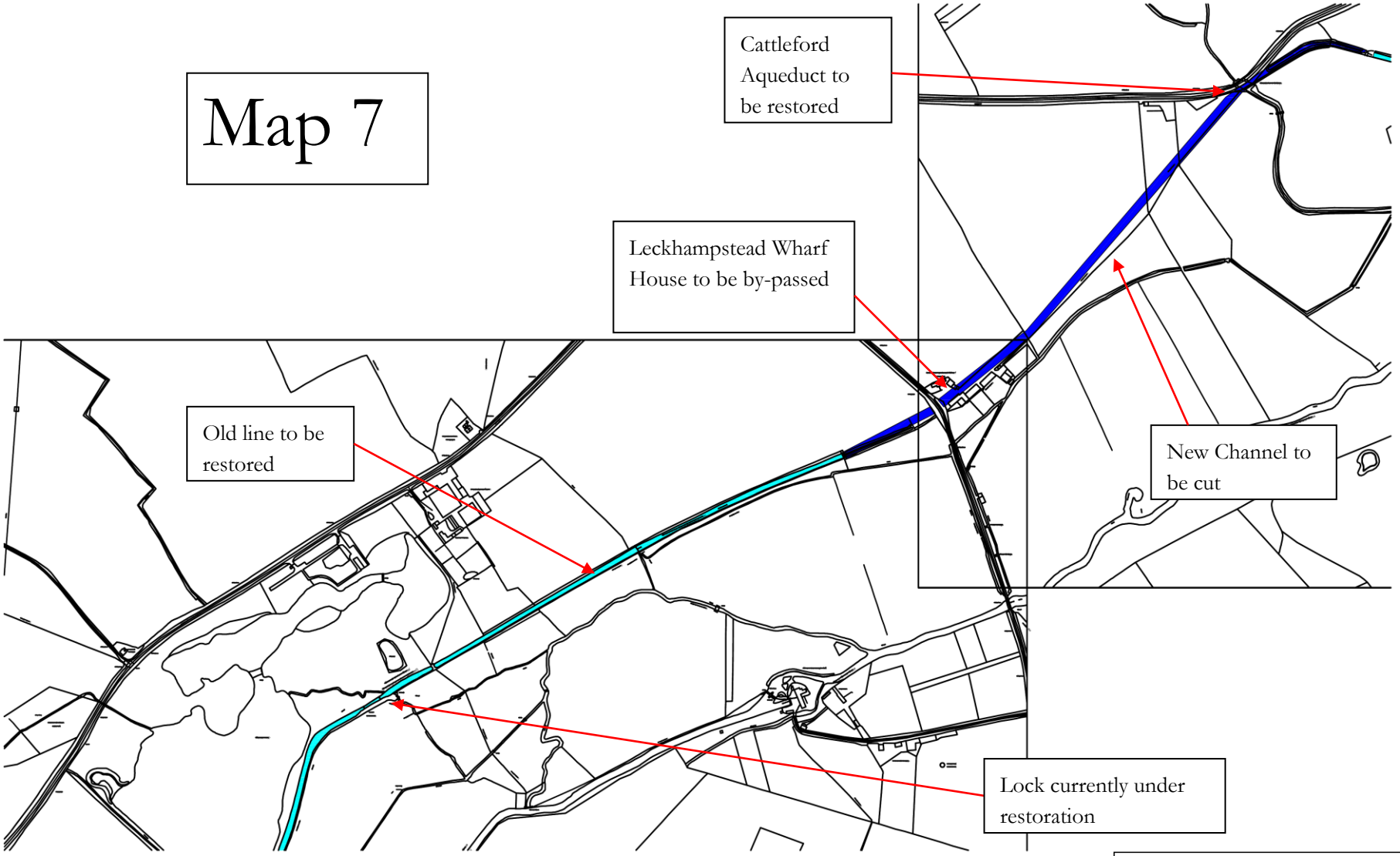

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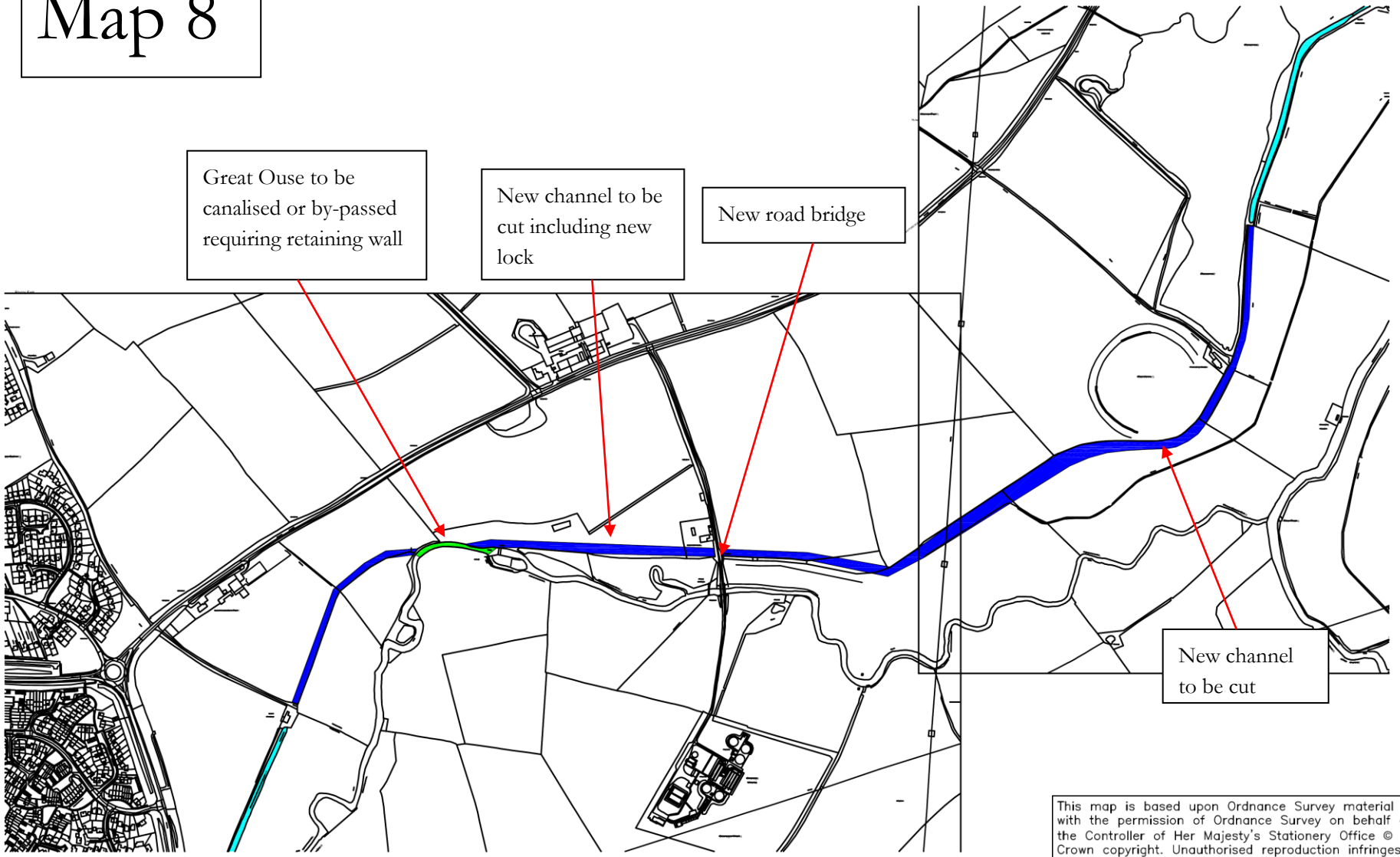

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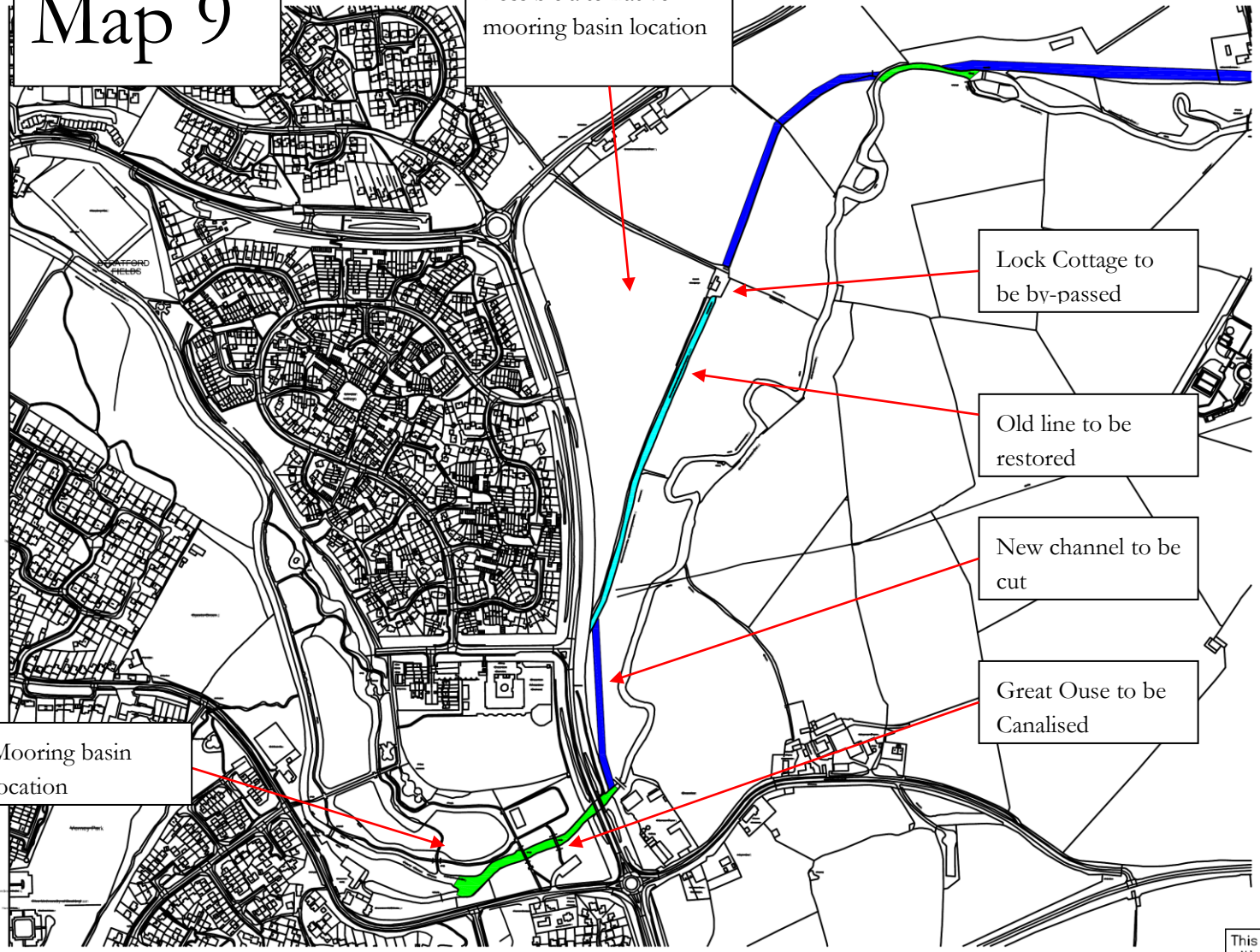

Appendix B

Buckingham Canal Society Prospectus – August 2011

PROSPECTUS

for

THE RESTORATION OF THE BUCKINGHAM CANAL

BRIEFING NOTES and OUTLINE OF PLANS AND PROGRESS

Buckingham Canal Society

supported by partnerships with…

British Waterways

The Inland Waterways Association

South Northamptonshire Council

Buckinghamshire County Council

Buckingham Town Council

AVDC Aylesbury Vale District Council

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Overview

This document has been prepared by the Buckingham Canal Society as a position paper regarding the Buckingham Arm of the Grand Union Canal. It describes the potential long-term benefits of restoring the canal, the current position and strategies for moving the project forward.

Introduction to the Buckingham Canal

The Buckingham Canal Society would like to see the Buckingham Canal re-opened, using the original line wherever possible.

The waterway to Buckingham ran a total of 10¾ miles from the Grand Union Canal at Cosgrove Lock along the Stony Stratford and Buckingham Arms; it closed down in the 1960s. It was originally completed in two arms; the first to Watling Street was opened in 1800 and the final section on to Buckingham in 1801. It was originally used to transport bricks, coal and manufactured goods and other local goods as well as imports from the London Docks. The canal was transporting around 20,000 tons per annum for a period of fifty years.

The original route from Cosgrove to Buckingham passed through Old Stratford, Deanshanger, Thornton, Leckhampstead Wharf, Thornborough Mill, Maids Moreton Mill and Bourton Meadow.

The BCS was founded in January 1992 and is a registered charity number 1072924. It is affiliated to the Inland Waterways Association and has a membership of around 150 people all over the UK. The BCS is also a member of the Milton Keynes Heritage Association.

The restoration of the canal would bring new life, new recreational opportunities and new, environmentally-friendly businesses to the countryside and towns and villages between Cosgrove and Buckingham. Restoration projects elsewhere in the UK have overcome much greater obstacles than any found on the line of the Buckingham Canal. The Society recognises that restoration is a long-term project which will involve major investment but when restored will bring considerable benefits to the areas through which the restored canal passes.

Restoration Feasibility Study by Halcrow – May 2010

The Society commissioned an initial engineering feasibility study with grateful thanks for financial support from the IWA Restoration Committee and David Polhill, County Councillor for Buckinghamshire County Council. The report indicates as follows:

- The restoration of the Buckingham Canal is a feasible project, although there are a number of issues to address.
- Restoration is likely to have a positive social and economic impact on the area as well as being of environmental benefit.
- Obstructions in Old Stratford and Deanshanger are such that reinstating the line though the villages is regrettably not really feasible in this section.
- It may be possible to achieve a route which makes use of the River Great Ouse, by-passing Old Stratford, though this would introduce operational issues to be overcome.
- Utilising sections of the river will obviously need the agreement of the Environment Agency. There will be benefits in terms of water management and environmental enhancement. The interaction of the canal with the rivers and floodplain will need to be addressed in some detail with the EA.
- Much of the rest of the old line is visible and construction would be relatively unrestricted. Extensive consultation and agreement with landowners will be needed along with relevant local authorities.
- There is a possibility of crossing the A413 into Buckingham, again utilising the river, or a terminus basin could be constructed outside the ring road and used as a focus for a new development.
- Public engagement/consultation will be needed to ensure the backing of all the communities in the local area and to understand their concerns and aspirations.
- Significant funding will be required to undertake the engineering studies required and subsequently to carry out the project. It is likely to require short, medium and long term planning and a phased approach that will leverage other initiatives.

Benefits of restoration

Economic Benefits

The restored canal will help maximise the potential of key economic drivers along its route and will create new opportunities for economic growth and prosperity. Beyond the purely economic benefits (job creation, increased visitor footfall, etc), the restored canal is likely to deliver wider social benefits in many ways including:

Tourism

The Grand Union Canal is used by many boaters wishing to savour the delights of the English countryside at a gentle pace. It also provides a long distance footpath for those who prefer to travel on foot. A restored canal would provide an excellent destination for both boaters and walkers in the historic town of Buckingham. Additionally, the canal in its own right along with its heritage could potentially be developed as a tourist attraction for the area.

Employment

A restored canal would provide employment from initial reconstruction and subsequent maintenance work; while part time and full time employment would accrue from the increased tourism spend. Training programmes for skills transfer to potential employees in rural communities along the route could be aligned with the restoration utilising such initiatives as the Future Jobs Fund.

Freight

A number of initiatives have taken place elsewhere in the UK to actively move non perishable goods including building supplies from road to waterways. Grants are available and a freight movement programme on the back of restoration would be beneficial in many ways including economic ones.

Rural Economy

A restored canal would provide additional spending in the local area, as increased visitor numbers is translated into spending in local shops, pubs and restaurants. Studies in other areas have shown the positive benefits accruing to the area surrounding a canal after restoration.
The government focus on the Rural Economy is well documented through such publications as the report from the Rural Advocate (see **http://tinyurl.com/Rural-Report**). One of the key aspects of the report includes the following excerpt which we feel is relevant to the canal restoration and associated potential:

One feature of rural deprivation is that it tends to be in small pockets, hidden in aggregated data. This means that it is often overlooked by policymakers when developing major initiatives such as the Growth Fund, improving access to affordable credit, and the Future Jobs Fund, providing jobs for the unemployed. While it may be easier to hit targets by focussing on urban areas, there is an important question of equality for rural areas to be addressed. My wish is that young people – everywhere – have aspirations for a rewarding and fulfilled life. The difference in rural areas is the distinct lack of opportunities to develop professional careers locally. Where efforts have been made to introduce high tech industries in rural areas, it has made a distinct difference to the local community. We need to ensure that the climate is right to attract high quality jobs to rural areas, break the cycle of low aspirations and inspire young people to fulfil their potential and play an active role in our society.
Lack of high speed broadband and, in many rural areas, lack of mobile phone coverage, is a significant factor – affecting local economies and services. It is also a major issue for children who live in rural areas. With social networking such a feature of youth culture, not to mention the expectation that children can access the Internet for homework purposes, lack of access can lead to frustration and exclusion.

The Buckingham Canal Society believe that through some joined up thinking, the canal's restoration can provide contribution to solutions for the rural economy ranging from creation of rural employment within the Future Jobs Fund criteria through to the possible use of the towpath and footpaths network providing disabled access to the countryside and a route for fibre optic cable delivery of broadband to rural villages along the line of the canal.

Environmental Benefits

Natural Environment and Conservation

A restored canal would increase the diversity of the natural environment, providing additional habitats for many species. A variety of plants, insects, birds, and mammals already inhabit the rich, diverse surroundings and they would all benefit from the connectivity of habitats along the line of a restored canal.

Adjacent to the Hyde Lane reservoir part of the original canal, which is in good condition, currently forms a nature reserve managed by Bucks, Berks and Oxon Wildlife Trust (BBOWT). The Buckingham Canal Society has worked closely with BBOWT to ensure that all restoration work has been in harmony with the wildlife objectives of the Trust. Work to restore the lock at this location was also carefully co-ordinated with them to minimise wildlife impact and meet common objectives.

Drainage and Flood Relief

The use of the flood headroom of the canal previously helped drainage along the northern side of the Ouse Valley through which the canal passed. This has been mooted as a possible way forward for local flood relief for Buckingham and some of the villages in the Ouse Valley by using the flood capacity of the canal in combination with balancing lakes or similar management techniques. Discussions have already been initiated on this possibility with the Environment Agency via the Buckingham Local Area Forum which is led by Buckinghamshire County Council.

Heritage

A restored canal would preserve structures and artefacts, such as the arched stone bridge at Mount Mill and the Cattleford Aqueduct, built to serve a transport system revolutionary in its heyday. It would again be possible to see these in a 'living' setting, carrying out the functions for which they were built over 200 years ago. The canal was transporting around 20,000 tons per annum for a period of fifty years, acting as a key enabler for the commercial development and growth of Buckingham as well as the Ouse Valley through which it passed. From its opening in 1801, it was used to transport bricks, coal and manufactured goods and other local goods as well as imports from London Docks. It also provided transport for agricultural produce from the farms and villages along its route.

As mentioned elsewhere, the heritage aspects of the canal can potentially be developed as a tourist interest.

Leisure

A range of excellent leisure opportunities for local people would be provided via restoration including walking, cycling, fishing, boating and nature study. This has already been recognised by Buckinghamshire County Council, which participated in the creation of the Ouse Valley Walk along the line of the towpath within the County. In order to reduce the green infrastructure deficit in North Aylesbury Vale the Buckinghamshire Green Infrastructure Consortium is promoting the proposed development of an Ouse Valley Regional Park. The towpath of the restored canal would form a significant backbone to this initiative. The Buckingham Canal Society is represented on the Consortium and hopes to contribute to the delivery of this cross-boundary project which will provide facilities for countryside recreation along the Ouse Valley.

Current activity

Involvement in Local Economy

Buckingham Canal Society regularly runs three work parties a month plus additional days as requested. These are attended regularly by volunteers, some of whom are retired, and others who are short or long-term unemployed. Volunteers learn countryside skills such as hedge-laying and other skills such as bricklaying and further develop these through practical application. Co-operative working and recognising the contribution of all, however small, is emphasised. A number of companies from within the surrounding region regularly use BCS work parties as an opportunity for their employees to exercise team-building skills outside their normal work environment.

Local Development Framework and Policy Considerations

Aylesbury Vale Landscape Character Assessment
The guidelines for this area are to "conserve and reinforce". The assessment includes, "Conserve the historic elements along the river and the redundant Buckingham Arm of the Grand Union Canal; encourage recreational access along the valley and the interpretation of historic features".

Aylesbury Vale Core Strategy 3
CS3 objectives are to protect landscape, heritage assets and biodiversity. Conservation and restoration of the heritage transport link, the Buckingham Canal, will significantly contribute to achieving these objectives.

Aylesbury Vale Vision for 2026 includes:

- enhanced flood protection for Buckingham and new and improved transport infrastructure such as road improvements, improved public transport and provision for cycling and walking
- the most valued landscape, cultural, historic and biodiversity assets will have been protected and enhanced
- there will be a sustainable and well managed green infrastructure network

Restoration of the canal can significantly contribute to achieving these visions.

Buckinghamshire Green Infrastructure Consortium
The vision of the GIC is "A network of high quality, multi-functional green spaces and links protected and managed through partnerships delivering environmental, social and economic benefits for local communities, enhancing wildlife and the historic environment." It identifies the Ouse Valley as having a green infrastructure deficit and describes the corridor of the Buckingham Canal as a Green Infrastructure Opportunity Area.

West Northamptonshire Draft LDF, Green Infrastructure Strategy

In the earlier South Northamptonshire Development Plan (1999) the council supported "the proposals by the Buckingham Canal Society for the reinstatement of the Buckingham Arm of the Grand Union Canal"**.** In the current draft LDF there is less specificity but the Ouse Valley is designated a Blue Way corridor where **"**Development will not be permitted to compromise the integrity of the green infrastructure network"**.** There is recognition of the cultural and heritage value of the canal network and there is support for the development of additional cultural and tourist facilities in canal-side villages such as Cosgrove.

BCS contributed to public consultations on a number of Local Development Frameworks for Aylesbury Vale and West Northamptonshire. Additionally BCS has been involved in consultations on Green Infrastructure Strategy in Aylesbury Vale.

Government Policy
The cross-government strategy for improving quality of place, entitled *World Class Places*, which was launched in May 2009, refers to waterways as a form of green infrastructure and makes a commitment to new planning policy on heritage and green infrastructure. It stresses the importance of continuing to maintain the built heritage and invest in green spaces and green infrastructure, even during periods of economic challenge.

Current Progress

A number of initiatives have taken place over the time the Society has been in existence. These are broadly categorised into:

- Awareness raising and public education
- Built heritage and archives preservation
- Research into land-ownership
- Development of working relationships with landowners
- Conservation of the existing line
- Environmental conservation
- On-going restoration of Hyde Lane Lock and Little Hill Bridge
- Fund-raising
- Surveys and information-gathering

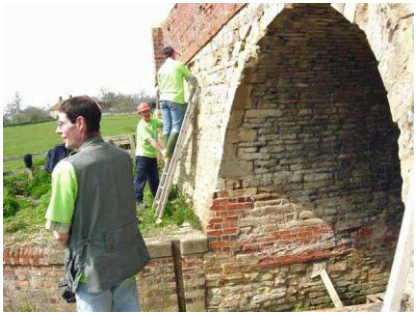
Public awareness raising

Four Interpretation Boards have been erected at key points along the canal. BCS provides talks to a wide range of community groups. An annual canal festival is held at Cosgrove Lock to promote the project and raise funds.

Data collection and surveys

A number of previous surveys have been undertaken at varying levels of detail. The society has now been awarded a grant from Buckinghamshire Community Foundation via its Grassroots Fund to collate and review this information as well as consolidate various levels of technical information held by the society. This includes LiDar data provided by the Environment Agency as well as detailed level surveys undertaken by Society members along with photographic and written records of both the past and current status of the canal and its assets.

Volunteer restoration



Volunteers have worked on four sections of the original line of the canal, clearing nearly 4km of the towpath and canal bed of scrub and trees, and improving the environment through hedge-trimming and laying. A spill-weir has been restored, the structure of Hyde Lane Lock has been saved and restored and the stone bridge at Little Hill Farm is under restoration.

Route – landowner discussions and local interest

Much of the original line of the canal is still extant but some new sections will be required to circumvent obstructions. There is an on-going programme of research into the ownership of each section of the original line and this will be extended to cover options for new alternative routes. Good relationships have been built up with some landowners, which have resulted in some useful opportunities for co-operation.

Local dialogues are under way with some of the communities along the route and awareness raising is beginning to stimulate local interest. Once the final version of the initial engineering feasibility study is complete, this will be shared with the various partner organisations that the society has identified. Extensive consultation with landowners and local communities at all stages of planning is considered to be essential in building a sense of ownership to this project.

Future Activity

Work parties will continue to maintain the parts of the canal line that have been cleared so far. Ongoing vegetation control of these sections must be a priority during all other work to minimise future damage and loss. Additionally, maintenance of structures that remain is a continuing task in order to prevent loss of these built heritage assets such as the bridge at Little Hill farm and the lock chamber at Hyde Lane..

In the short to medium term the Society is continuing to gather additional information in the form of engineering and environmental surveys, land ownership and land registration data and taking advice from British Waterways, the Inland Waterways Association and other organisations with relevant experience. It is hoped that discussions with the Environment Agency will lead to constructive options for both restoration possibilities and flood risk mitigation.

For the medium to long term, phased approaches to the work are also being developed in order that as and when opportunity arises to leverage other circumstances, the most beneficial outcome for the whole community can be obtained. An example of this is the Passenham Quarry site which is nearing the end of its renewed abstraction licence. It is hoped to approach the relevant bodies and landowners with a view to establishing the channel for the canal though the site as part of reinstatement. Additionally, the Buckingham Canal Society is currently exploring the option of setting up a Community Interest Company in order to deliver a wide range of elements of work with a range of partners in order to progress the restoration work as and when these mutually beneficial circumstances arise.

The experience of canal restoration projects is that they start very small and take some time to develop and then grow exponentially. The aspirations of the Society are that a significant asset will be achieved for Aylesbury Vale, South Northamptonshire and the community at large.

Physical restoration plans and needs

Initial projects are currently being considered that would act as exemplars of the benefits of restoration. These include

- the lining and re-watering of the length of canal in Bourton Meadow from the by-pass to Lock Meadow Cottage
- further restoration of Hyde Lane Lock as a heritage feature
- the improvement of the tow-path from Cosgrove Lock to the A5 and trial rewatering of this section.

It is expected that volunteers will continue to make a significant contribution to projects such as these but significant funding will be needed, from a wide range of sources, to provide engineering expertise, plant and materials.

Resources needed (Funding needs and plans, specialist help and knowledge, etc)

Effort and funding at all levels is the principal requirement of all aspects of the restoration. Members focus on varied aspects ranging from archive management of heritage records through to physical restoration encompassing fundraising and promoting the restoration message en route.

Using consultants such as Halcrow and the resources of the Inland Waterways Association such as the Waterways Recovery Group, the BCS approach to restoration delivery will be such that members can undertake as much work as possible. However, the use of access to specialist areas within partner organisations is the primary route to a more rapid delivery (see below)

Collaboration and consultation with groups/landowners/local authorities/trusts and funds

The building of partnerships with landowners, local authorities and other organisations is considered essential, both in the short and long term. Every opportunity will be taken to engage with local communities at all levels.

Patronage and partnerships

We are privileged to have the support of our two patrons:

Rt Hon John Bercow MP

Lord Boswell of Aynho

The support of patrons and partners in recognising the value that restoration can bring, in developing contacts within the community, and in bringing together all local authorities to provide cross-boundary access, is and will be invaluable. Pro-active advice on grant-funding and other sources of funding will be of great help, together with guidance on how the project may connect with other projects in the area.

Additionally, access to planned works along the canal route under the control of the various local authorities will enable us to co-ordinate activity and minimise disruption in addition to leveraging effort and equipment when not in use for the primary work being undertaken. Combined with possible re-use of materials this can minimise the impact on the environment and the communities.

Current formal partnerships are:

- Buckinghamshire County Council
- Inland Waterways Association
- Green Infrastructure Consortium
- British Waterways
- Buckingham Local Area Forum

Current informal partnerships are:

- Buckingham Town Council
- Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust (BBOWT)
- Thornborough Parish Council
- Cosgrove Parish Council
- Thornton Parish Meeting
- Deanshanger Heritage Society
- Aylesbury Vale District Council
- South Northamptonshire District Council

Other partnerships actively being sought in addition to those that have already been formed are:

- Environment Agency
- Northamptonshire County Council
- Old Stratford Parish Council
- Leckhampstead Parish Council
- Milton Keynes Council
- Highways Agency

The society also has the following corporate memberships and benefactors:

- Wyvern Shipping Company
- Nikon Optical Ltd
- Taverners Boat Club
- Travis Perkins Builders Merchants
- Graham Smith Groundworks Ltd

Additionally, the society also has relationships with the following:

- Milton Keynes Heritage Association

Mitigating Risk

It is important to recognise the problems that can and will arise during projects such as these. If such problems are identified and planned for then they need not be insurmountable.

Examples of possible problems could be:

- failing to gain support from the local community
- opposition to any proposed re-routing
- water supply challenges
- funding shortfalls
- flood management issues
- long term maintenance costs

Other mitigation strategies of the above problems could be achieved by:

- fully engaging with the local community over an extended period though multiple touch points including county, district, town and parish councils
- working effectively with the Environment Agency and British Waterways to plan sufficient water supply in advance of restoration
- subdividing the project into manageable phases, each of which is separately funded, to reduce the likelihood of undertaking projects beyond current resources
- working effectively with the Environment Agency and local councils to anticipate the effect of flooding events
- building partnerships with British Waterways, local councils and volunteers to deliver regular ongoing maintenance, which will reduce the likelihood of costly infrastructure failure
- Reviewing and managing the specific risks within each phase of the projects as the work is undertaken or commissioned.

Further background information

Restoration projects elsewhere and problems overcome

It has been recognised in many places across the country that apparently unrealistic restoration projects can be achieved. The project develops a momentum as the local community recognises the value of an improved environment and regeneration takes place.

This has occurred in multiple urban environments, for example Paddington Basin in London, Salford Quays near Manchester and the towns along the Huddersfield Narrow Canal. It has also occurred along rural canals. The restored Kennet and Avon Canal has large numbers of visitors, on foot by bicycle and by boat. The Ashby Canal is extending its restored sections and is a popular destination for boaters seeking peace and quiet. The Buckingham Canal would provide a route for walkers and cyclists between Buckingham and Milton Keynes and link villages such as Thornton, Deanshanger and Passenham.

Significant restoration problems can be overcome with the enthusiasm and commitment of volunteers, the local community and the support of local councils. Creative solutions in partnership with local authorities can be found for road crossings such as the lowering of a lock on the Wey and Arun Canal at Loxwood, or co-operation with developers to achieve a restored town terminus in Loughborough.

Awareness and partnership charter

The Buckingham Canal Society (BCS) aspires to use the following five topics to establish partnerships when engaging with contacts at all levels from Parish through to Parliamentary:

Strategy – when looking at strategic plans and relevant frameworks, always protect the existing line of the canal and look for opportunities to benefit its restoration. Keep BCS informed of all opportunities to contribute to such planning and ensure that all decisions made by the public body adhere to the relevant frameworks and strategic plans in order to protect and/or benefit the canal and its restoration.

Partnership – help us put the BCS conservation and restoration aims before the relevant councils in such a form that their support is forthcoming leading to a formal agreement of partnership.

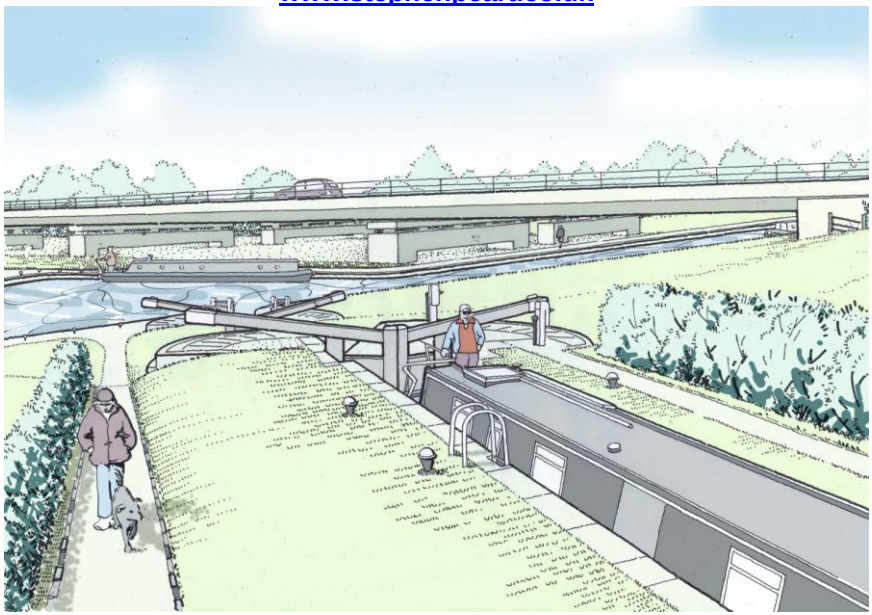
Financial – through strategic recognition and partnership, each public body will proactively ensure BCS are aware and/or included in possible grants and similar opportunities that may assist with funding the restoration and/or awareness of the canal.

Physical – each public body will communicate, in a timely manner, all and any known activities along the line of the canal to BCS. Additionally each public body will give consideration to all and any opportunities to provide benefit to the restoration aims of the canal including communication with local communities. This should include (but not be limited to) possible reuse of reclaimed/left over civil engineering materials and equipment that may bring benefit to the canal and prevent waste.

Leverage – that each public body support BCS by way of introduction to other partnership organisations that can/may assist BCS in its restoration objectives.

An illustration by Stephen Peart of how the restored canal section may look showing a boat locking up from the A5 to Cosgrove

www.stephenpeart.co.uk



www.buckinghamcanal.org.uk
email: info@buckinghamcanal.org.uk

The Secretary, 16 Mallard Drive, Buckingham, MK18 1GJ

Appendix C

Bourton Meadow : Extended Phase 1 Habitat Survey

by Middlemarch Environmental Limited

OLD STRATFORD-BUCKINGHAM CANAL
BOURTON MEADOW,
BUCKINGHAM

EXTENDED PHASE 1 HABITAT SURVEY

A Report to Buckingham Canal Society

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Report Number: RT-MME-108675

May 2011

OLD STRATFORD-BUCKINGHAM CANAL
BOURTON MEADOW,
BUCKINGHAM

EXTENDED PHASE 1 HABITAT SURVEY

CONTROLLED COPY

01 OF 02

01 BUCKINGHAM CANAL SOCIETY
02 MIDDLEMARCH ENVIRONMENTAL LTD

This report was compiled by:
James Hildreth BSc (Hons) CEnv MIEEM

Contract Number C108675

May 2011

EXECUTIVE SUMMARY

In February 2011 Buckingham Canal Society commissioned Middlemarch Environmental Ltd to undertake an initial ecological appraisal of a disused section of the old Stratford-Buckingham canal on the outskirts of Buckingham. To fulfil the above brief to assess the existing ecological interest of the site, a desk study and an Extended Phase 1 Habitat Survey were undertaken.

The ecological desk study revealed one site with statutory nature conservation status and two sites with non-statutory designations for nature conservation within 1km of the survey site. Records of protected species from within 1km of the survey site included two species of aquatic beetle.

The Extended Phase I Habitat Survey was undertaken on 1st March by James Hildreth (Senior Consultant). This survey identified the presence of the following habitats; amenity grassland, arable, broadleaved plantation woodland, dense scrub, fence, hardstanding, improved grassland, neutral semi-improved grassland, species-rich intact hedgerow and tall ruderal.

In order to ensure compliance with wildlife legislation and relevant planning policy, the following works further works are recommended:

- **Herptiles:** To ensure compliance with the Wildlife and Countryside Act 1981 (as amended), a reptile survey should be undertaken of suitable habitats within the proposed development site.

- **Nesting Birds:** To ensure compliance with the Wildlife and Countryside Act 1981 (as amended), vegetation clearance should be undertaken outside the nesting bird season. If this is not possible then any vegetation that is to be removed or disturbed should be checked by an experienced ecologist for nesting birds immediately prior to works commencing.

- **Badgers:** To ensure compliance with the Protection of Badgers Act 1992,a badger activity survey is recommended and this will consist of monitoring use of sett entrances, latrine use and recovery of hair samples over a period of 14 days.

Additional recommendations have also been made in relation to tree and hedgerow protection and biodiversity enhancement.

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1. INTRODUCTION

1.1 PROJECT BACKGROUND

In February 2011 Buckingham Canal Society commissioned Middlemarch Environmental Ltd to undertake an initial ecological appraisal of a disused section of the old Stratford-Buckingham canal on the outskirts of Buckingham.

To fulfil the above brief to assess the existing ecological interest of the site, a desk study and an Extended Phase 1 Habitat Survey were undertaken.

1.2 SITE DESCRIPTION

The disused section of canal is now a dry, grassy ditch running from the A413 on the eastern side of Bucking, eastwards to Lock Cottage. The total length of this section of disused canal is approximately 465 metres with the centre point located at National Grid Reference SP 705 341. The survey area consists of the disused canal section which is now dominated by semi-improved grassland, with hedgerows either side. Beyond the hedgerow to the west of the canal is an arable field with improved grassland field margin. To the west of the canal and hedgerow is semi-improved pasture grassland habitat.

2. METHODOLOGIES

2.1 DESK STUDY

A desk study was undertaken to determine the presence of any designated nature conservation sites and protected species that have been recorded within a 1 km radius of the site. This involved contacting appropriate statutory and non-statutory organisations which hold ecological data relating to the survey area. Middlemarch Environmental Ltd then assimilated and reviewed the desk study data provided by these organisations.

The consultees for the Desk Study were:

- Natural England - *MAGIC* website for statutory conservation sites;
- Buckinghamshire and Milton Keynes Environmental Records Centre;
- National Biodiversity Network Gateway website.

The data collected from these consultees are discussed in Section 3. Raw data are provided in Appendix 1.

2.2 EXTENDED PHASE 1 HABITAT SURVEY

An Extended Phase 1 Habitat Survey was conducted following the methodology of the Joint Nature Conservation Committee (JNCC, 1993) as modified by the Institute of Environmental Assessment (IEA, 1995). Phase 1 Habitat Survey is a standard technique for classifying and mapping British habitats. The aim is to provide a record of habitats that are present on site. During the survey, the presence, or potential presence, of protected species was noted. Data recorded during the field survey is discussed in Section 4.

3. DESK STUDY RESULTS

3.1 INTRODUCTION

From the details provided by the consultees all relevant ecological data have been reviewed. The results from these investigations for the site are summarised below in Sections 3.2 and 3.3. Data are provided in Appendix 1.

3.2 NATURE CONSERVATION SITES

Reference to the Multi Agency Geographical Information for the Countryside (MAGIC) website and the local biodiversity information indicate that three nature conservation sites with non-statutory protection occur within a 1 km radius of the survey area. These sites are summarised in Table 3.1.

Site Name	Designation	Proximity to Survey Area	Description
Statutory protection			
Buckingham Sand Pit	LNR	1000 m North-west	Designated in 2003. An area of Ice-age geological interest.
Non-statutory protection			
River Ouse, Buckingham	BNS	50 m east	Little aquatic vegetation except for occasional yellow water lilies and Ranunculus subg Batrachium. Banks mostly steep and fenced. Excellent water quality (1989). Fringes of emergent vegetation. Riffles and shoals in channel.
Holloway Hedge	BNS	50 m north	The hedge links several open spaces. By the playing field is a good hedge with a woody species count of 8 species in 30m. Crab apple is found with mature trees (oak , ash). Estimated at over 700 years old and historically an important boundary.
Key: LNR: Local Nature Reserve BNS: Biological Notification Site			

Table 3.1: Summary of Nature Conservation Sites

3.3 PROTECTED SPECIES

Table 3.2 provides a summary of protected species records within a 1 km radius of the study area. It should be noted that the absence of records should not be taken as confirmation that a species is absent from the search area. Records of UK and local Biodiversity Action Plan have also been included within this table.

Species	No. of Records	Most Recent Record	Proximity of Nearest Record to Study Area	UK BAP?	Local BAP?	NERC S.41 List?	Legislation / Conservation Status
Invertebrates							
Beetle *Anacaena bipustulata*	1	1997	400 m south	×	×	×	Nationally Scarce
Beetle *Nebrioporus depressus*	1	1999	400 m south	×	×	×	Nationally Scarce

Table 3.2: Summary of Protected/Notable Species Records Within 1 km Radius of Study Site

4. EXTENDED PHASE 1 HABITAT SURVEY

4.1 INTRODUCTION

The results of the Extended Phase 1 Habitat Survey are presented in Section 4.2. An annotated Extended Phase 1 Habitat Survey Drawing (Middlemarch Environmental Ltd Drawing Number C108675) is attached in Appendix 2. This drawing illustrates the location and extent of all habitat types recorded on site. Any notable features or features too small to map are detailed using target notes.

The survey was carried out on 1st March by James Hildreth (Senior Consultant) Table 4.1 details the weather conditions at the time of the survey.

Parameter	Condition
Temperature (ºC)	8
Cloud (%)	100
Wind (BF)	2
Precipitation	None

Table 4.1: Weather Conditions During Survey Period

4.2 SURVEY CONSTRAINTS

February is considered a sub-optimal time to complete botanical surveys. However, it is considered that due to the extent and nature of the habitats present this constraint did not prevent a robust site assessment.

4.3 HABITATS

The following habitat types were recorded on site during the field survey:

- Amenity grassland
- Arable;
- Broadleaved plantation woodland;
- Dense scrub;
- Fence;
- Hardstanding;
- Improved grassland;
- Neutral semi-improved grassland;
- Species-rich intact hedgerow; and,
- Tall ruderal.

These habitats are described below. They are ordered alphabetically, not in order of ecological importance.

Amenity grassland

A small section of this habitat falls within the surveyed area along the verge of the A413 at the southern end of the surveyed canal section.

Arable

The field to the west of the disused canal section is an active arable field, supporting a cereal crop at the time of survey. An improved grassland afield margin was present along the canal side of this field.

Broadleaved plantation woodland

At the southern end of the survey area a length of this habitat was recorded, along the length of the A413 road verge and it is anticipated to be plantation from the time of the road construction. Species recorded in this woodland include ash *Fraxinus excelsior*, sycamore *Acer pseudoplantanus*, field maple *Acer campestre,* hazel *Corylus avellana,* blackthorn *Prunus spinosa*, cherry *Prunus* sp., holly *Ilex aquifolium*, nettle *Urtica dioica* and bramble *Rubus fruticosus* agg.

Dense scrub

At the southern end of the survey area, south of the disused canal channel, there is an area of this habitat dominated by hawthorn *Crataegus monogyna* and elder *Sambucus nigra*. To the east of the centre of the disused canal section there is a nother pocket of this habitat type, also dominated by hawthorn and elder. Other species found in this habitat in both locations include blackthorn, young ash trees, nettle, bramble and ivy *Hedera helix*.

Fence

A boundary along the south east section of the canal was marked by a post and wire fence with no hedgerow. The fence did not support any vegetation.

Hardstanding

A small are of the A413 falls within the survey area and forms this habitat type.

Improved Grassland

An improved grassland field margin existed along the edge of the arable field to the west of the disused canal. This margin was approximately 10 metres wide and species recorded include nettle, creeping cinquefoil *Potentilla reptans*, creeping bent *Agrostis stolonifera*, spear thistle *Cirsium vulgare*, cow parlsey *Anthriscus sylvestris*, meadow grass *Poa* sp., hedge bedstraw *Galium mollugo*, red dead nettle *Lamium purpureum*, Yorkshire fog *Holcus lanatus* and creeping buttercup *Ranunculus repens.*

Neutral semi-improved grassland

The length of disused canal is now visible as a grassy ditch with a semi-improved nature. It appears to be infrequently cut and subject to very other management or intervention. The pasture grassland of the field east of the canal also consists of this habitat type, with wetter areas noticeable by the presence of clumps of rush

Juncus sp. Species recorded in this habitat include Yorkshire fog, cow parsley, nettle, meadow grass, lords and ladies *Arum maculatum*, wavy bitter-cress *Cardamine flexuosa*, red dead nettle, hogweed *Heracleum sphondylium*, hedge bedstraw, creeping bent, bramble, cocksfoot *Dactylis glomerata*, broad-leaved dock *Rumex obtusifolius*, dandelion *Taraxcum officinalis* agg., prickly sow-thistle *Sonchus asper*, clover *Trifolium* sp., creeping cinquefoil, creeping thistle *Cirsium arvense* , spear thistle, hard rush *Juncus inflexus*, cleavers *Galium aparine* and lady's bedstraw *Galium verum*.

Species-rich Intact Hedgerow

The disused canal was bordered on both side for the majority of the survey section by established hedgerows with only occasional gaps, some of which appeared to have been recently replanted. The western hedgerow appeared to be more intensively of recently managed, more scrub (bramble) was present along the eastern hedgerow and it was wider overall. Species recorded in this habitat include elder, cherry *Prunus* sp., blackthorn, ash, goat willow *Salix caprea*, bramble, nettle, lords and ladies, dog rose *Rosa canina*, red dead nettle, hedge bedstraw, ivy, hawthorn, hazel, sorrel *Rumex acetosa*, broadleaved dock, great willowherb *Epilobium hirsutum* and hogweed.

Tall ruderal

At the southern end of the survey area, the disused canal channel was not visible as a ditch and this southern area was dominated by a patch of ruderal vegetation, dominated by nettle, with hogweed, cleavers, Yorkshire fog and cocksfoot.

4.4 FAUNA

During the field survey field signs of faunal species were noted. The time of year at which the survey is undertaken will affect species or field signs directly recorded during the survey.

Evidence of the following faunal species was observed on site:

Birds

A range of common bird species, including woodpigeon *Columba palumbus*, coal tit *Periparus ater*, blackbird *Turdus merula* and robin *Erithacus rubecula*, were recorded on site during the field survey.

Mammals

Evidence of rabbit activity *Oryctolagus cuniculus* and possible badger *Meles meles* activity was recorded during the field survey.

5. DISCUSSIONS AND CONCLUSIONS

5.1 NATURE CONSERVATION SITES

Statutory Sites

It is anticipated that no impact upon the Buckingham Sand Pit Local Nature Reserve (LNR) will result from the proposed re-construction of this disused canal due to the distance and ecological barriers between the disused canal and this LNR.

Non-Statutory Sites

Both of the recorded Biological Notifications Sites (BNS) are within 50 metres of the disused canal section at their closest points. It is considered unlikely that negative effects will result from the proposed development if precautions are taken to avoid the use of machinery and vehicles within areas close to these BNS. For example, the work to the canal should be undertaken from the western side to avoid potential damage to the River Ouse BNS and riparian habitats along it. Similarly, works towards the northern end of this section of disused canal should take care to avoid any damage, including soil compaction caused by machinery, in the vicinity of Holloway Hedge BNS. It is recommended that consultation with the Local Authority is undertaken when devising specific working practices and designing features of the proposed new canal section in order to safeguard these locally important wildlife sites.

5.2 HABITATS

The ecological importance of the habitats present on site is assessed against their presence on the UK and Local BAPs and on Section 41 of the NERC Act and their ability to support protected or notable species. Those habitats which meet any of these criteria and are considered likely to be impacted by the proposals are highlighted as notable considerations. This is summarised in Table 5.1 and further discussed in the text below.

Habitat Type	UK BAP?	Local BAP?	NERC Act?	Is Habitat Capable of Supporting Protected / Notable Species	Is Habitat a Notable Consideration?
Amenity grassland	×	×	×	×	×
Arable	×	×	×	×	×
Broadleaved plantation woodland	×	✓	×	✓	✓
Dense scrub	×	×	×	✓	✓
Fence	×	×	×	×	×
Hardstanding	×	×	×	×	×
Improved grassland	×	×	×	✓	✓
Neutral semi-improved grassland	×	×	×	✓	✓
Species-rich intact hedgerow	✓	✓	✓	✓	✓
Tall ruderal	×	×	×	×	×

Table 5.1: Summary of Ecological Importance of Habitats on Site

Amenity grassland & Arable

Both of these habitat types are highly managed/disturbed and easily recreated. They have low potential to support protected species and for these reasons are not considered notable habitats with respect to the regeneration of this disused canal.

Broadleaved plantation woodland

This habitat is relatively young, with some trees reaching semi-maturity. There is potential for this habitat to support nesting birds and act as an ecological corridor. For this reason this habitat is deemed a notable consideration with respect to the proposed development.

Dense scrub

This habitat is relatively easy to recreate and not of particularly high ecological value in the local landscape. It does, however, have potential to provide nesting bird locations and shelter for reptiles and small mammals. The potential to support protected species makes this habitat a notable consideration in relation to the proposed development of the disused canal.

Fence & Hardstanding

These habitats did not support and flora and are easy to recreate if removed. Therefore they are not considered a notable habitat in relation to the proposed development.

Improved Grassland

This arable field margin strip of grassland is relatively low in ecological value in the local environment and easy to re-create if damaged or disturbed. There is some potential to support basking and foraging reptiles and for this reason it is considered a notable habitat in relation to the proposed development.

Neutral semi-improved grassland

This grassland habitat has a higher floristic diversity and is less easy to re-create than the improved grassland described above. The habitat has potential to support basking and foraging reptiles and for these reasons is considered a notable habitat with respect to the redevelopment of the disused canal.

Species-rich Intact Hedgerow

There is a significant length of this habitat within the close vicinity of the disused canal and it has high potential to support nesting birds and provide shelter for reptiles and small mammals. It is also a habitat that is harder to recreate in the short to medium term. For these reasons, the hedgerows within the survey area are deemed a notable consideration in relation to the re-development of the canal.

Tall ruderal

This habitat is relatively low value in the local environment and easy to recreate if disturbed. It has low potential to support protected species and is not considered a notable habitat in relation to the proposed canal regeneration.

5.3 PROTECTED/NOTABLE SPECIES

Table 5.2 summarises which species are notable considerations for any development of the survey area. It also states whether these species are targeted by national or local Biodiversity Action Plans (BAPs) or afforded some protection under the NERC Act 2006.

Species	UK BAP?	Local BAP?	NERC Act?	Is Species a Notable Consideration?
Invertebrates				
Beetle *Anacaena bipustulata*	×	×	×	×
Beetle *Nebrioporus depressus*	×	×	×	×
Herpetofauna (reptiles & amphibians)				
All species	✓	✓	✓	✓
Birds				
Nesting birds	#	#	#	✓
Mammals				
Badger *Meles meles*	×	×	×	✓
#: Species dependent				

Table 5.2: Summary of Ecological Importance of Species on Site

Invertebrates

The two invertebrate records provided during the desk study are for aquatic beetles recorded in the River Ouse. This habitat is not found within the survey area and the proposed works are unlikely to impact upon this habitat type. These species are not deemed a notable consideration in relation to the proposed canal project.

Herpetofauna (reptiles and amphibians)

No reptile or amphibian species were identified within the desk study. No ponds, ditches or other standing water habitats were identified within the survey area or within the local area (from aerial photo observations). For this reason it is unlikely that amphibian species will be using the survey site. However, reptile species (particularly grass snake) could potentially be present within the survey area due to the presence of suitable habitats for refuge, foraging, commuting, basking and hibernation sites in the hedgerows, scrub and grassland habitats. Therefore reptiles are deemed a notable consideration.

Birds

Dense scrub and hedgerows provide suitable nesting locations for a variety of bird species. This species group is considered notable with respect to the development of the site.

Badger

Potential badger sett entrances were recorded during the field survey. Levels of activity of this species are undetermined at present. However, given the scale of excavation visible and the limited number of entrances it is considered highly likely that this would form a sporadically used ‘outlier’ sett.

A summary of legislation relevant to the ecology of the site is included in Appendix 3.

6. RECOMMENDATIONS

6.1 NATURE CONSERVATION SITES

Statutory Nature Conservation Sites

No recommendations are made in relation to the Buckingham Sand Pit Local Nature Reserve identified in the desk study as it is felt that adverse impacts resulting from the development of the survey area are highly unlikely due to the distance and ecological barriers between the disused canal site and this LNR.

Non-statutory Nature Conservation Sites

It is considered that basic precautions to avoid working in areas close to the Biological Notification Sites will provide adequate protection to these locally important sites. However, consultation with the Local Authority should be undertaken to confirm suitable working practices and any specific requirements of these BNS.

6.2 HABITATS

The following recommendations are made regarding the habitats present on site:

- **Habitat Loss:** In accordance with the provision of Planning Policy Statement 9 (Biodiversity & Geological Conservation) and Local Planning Policy, a habitat/species enhancement scheme should be incorporated into the landscaping scheme of any proposed works to maximise the ecological value of the site. This will involve, for example, the planting of native seed/fruit bearing species which will be of value to wildlife. The canal project offer opportunities for aquatic and emergent / marginal vegetation planting in addition to terrestrial planting schemes. Planting along the edge of the canal, in coir rolls, woven willow bank stabilisation or other natural products should use native species.

- **Hedgerows:** It is recommended that the hedgerows along the canal proposed for redevelopment are retained to the maximum extent possible. Where sections are removed for access during construction of the canal these should be replanted with a variety of native hedging species. Existing gaps in these hedgerows should also be in-filled with native hedging species as part of the overall landscaping of the scheme. The filling of existing gaps and the replanting of any sections that are removed during construction should use a mix of native hedgerow species and is likely to fulfil the request by AVDC to plant hedgerow at a 2:1 ratio for that which is removed.

- **Trees and Hedgerows:** Any trees and/or hedgerows on site, or overhanging the site, which are not to be removed as a part of any proposed works should be protected in accordance with British Standard "Trees in relation to construction - Recommendations" BS5837:2005. Protection should be installed on site prior to the commencement of any works on site.

6.3 PROTECTED / NOTABLE SPECIES

The following recommendations are made regarding protected species that are potentially present on site:

- **Herptiles:** To ensure compliance with the Wildlife and Countryside Act 1981 (as amended), disturbance and damage to reptile populations and individuals must be avoided. It is understood that a process of habitat manipulation during the months prior to the proposed canal development has been agreed as a suitable avoidance measure during consultation between Buckingham Canal Society and Aylesbury Vale District Council. This habitat manipulation is based on regular grass cutting to keep vegetation at a very low level and therefore render the area unsuitable for use by reptile species.

- **Nesting Birds:** To ensure compliance with the Wildlife and Countryside Act 1981 (as amended), vegetation clearance should be undertaken outside the nesting bird season. The nesting bird season is weather dependent but generally extends between March and September inclusive. If this is not possible then any vegetation that is to be removed or disturbed should be checked by an experienced ecologist for nesting birds immediately prior to works commencing. If birds are found to be nesting any works which may affect them would have to be delayed until the young have fledged and the nest has been abandoned naturally.

- **Badgers:** To ensure compliance with the Protection of Badgers Act 1992, the badger activity associated with the sett on site should be monitored. A badger activity survey is recommended and this will consist of monitoring use of sett entrances, latrine use and recovery of hair samples over a period of 14 days. Badger surveys can be completed at any time of the year. Should the badger sett be identified as active, works to the badger sett will require a licence from Natural England. Badger setts can be closed between July and November inclusive.

REFERENCES AND BIBLIOGRAPHY

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APPENDICES

APPENDIX 1: Desk Study Data

APPENDIX 2: Extended Phase I Habitat Survey Drawing
Middlemarch Environmental Drawing C108675-01

APPENDIX 3: Overview of Relevant Legislation

APPENDIX 1

Desk Study Data

Site Check Report

You clicked on the point:
Grid Ref: SP 709 339
Full Grid Ref: 470927 , 233988

Counties, Metropolitan Districts and Unitary Authorities (England)

Name	Geographic Level
BUCKINGHAMSHIRE	COUNTY

NUTS1 - Government Office Regions (England)

Reference	Name	Hotlink
UKJ	SOUTH EAST	http://www.statistics.gov.uk/geography/nuts_se.asp

Scheduled Monuments (England)

There are no features within your search area.

Protected Wreck Sites (England)

There are no features within your search area.

Nitrate Vulnerable Zones (England)

NVZ TYPE
NVZ AREA

Local Nature Reserves (England)

Reference	Name
1083175	BUCKINGHAM SAND PIT

Biosphere Reserves (England)

There are no features within your search area.

National Nature Reserves (England)

There are no features within your search area.

Ramsar Sites (England)

There are no features within your search area.

Special Protection Areas (England)

There are no features within your search area.

Special Areas of Conservation (England)

There are no features within your search area.

Sites of Special Scientific Interest Units (England)

There are no features within your search area.

Sites of Special Scientific Interest (England)

There are no features within your search area.

World Heritage Sites (England)

There are no features within your search area.

Nitrate Sensitive Areas (England)

There are no features within your search area.

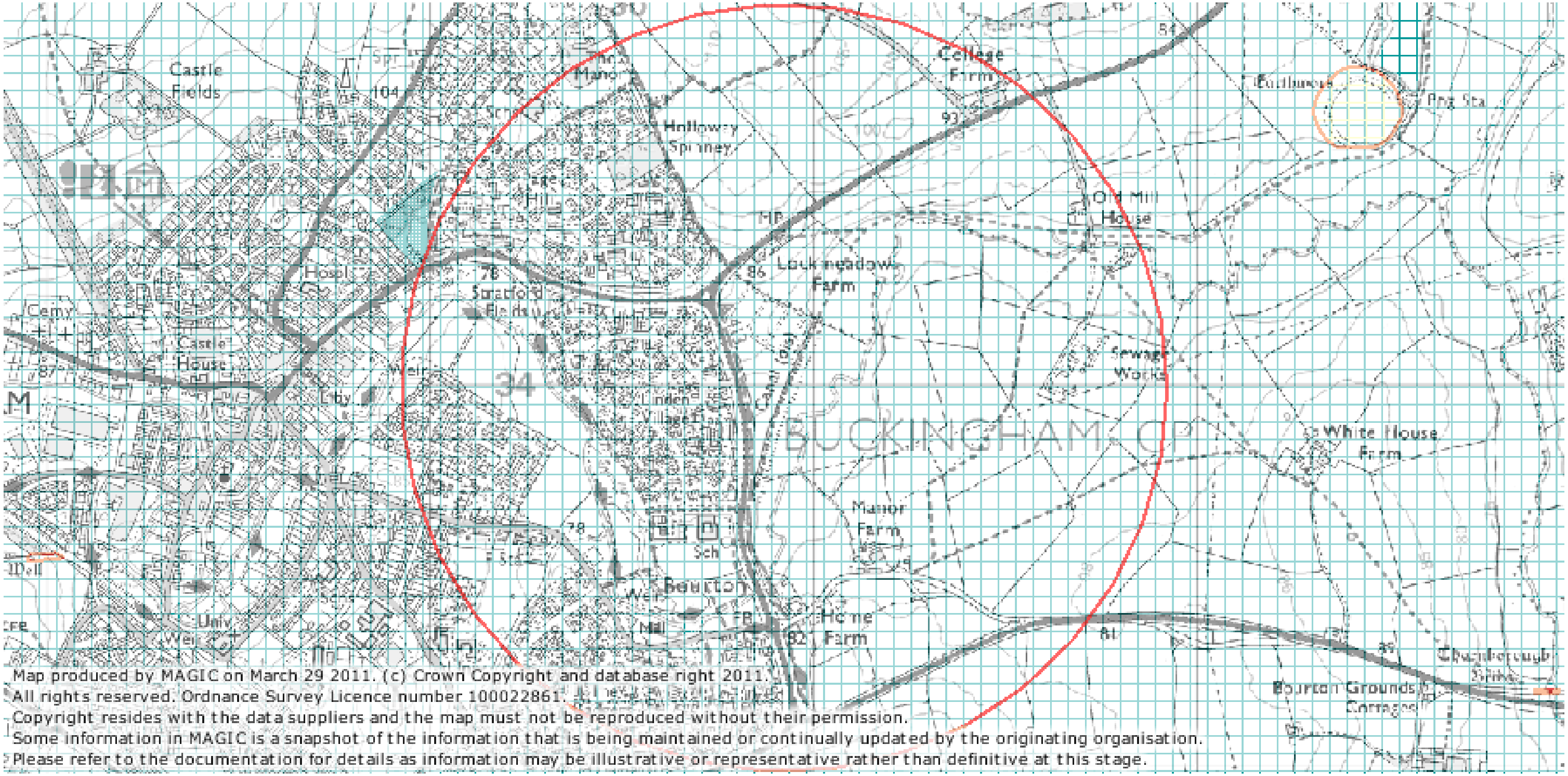
Areas of Outstanding Natural Beauty (England)

There are no features within your search area.

Environmentally Sensitive Areas (England)
There are no features within your search area.

National Parks (England)
There are no features within your search area.

Moorland Line (England)
There are no features within your search area.


Castle
Fields
College
Farm
Hollowey
Spinney
Old Mill
House
Lock meadow
Farm
Stratford
Fields
Castle
House
Cemy
Sewage
Works
Weir
BUCKINGHAM CP
White House
Farm
Manor
Farm
Sch
Bourton
Home
Farm
Mill
Univ
Bourton Grounds
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Buckinghamshire & Milton Keynes
Environmental Records Centre
Museum Resource Centre ▪ Tring Road ▪ Halton ▪ Aylesbury ▪ HP22 5PN
Tel 01296 696012 Fax 01296 624519
www.bucksmkerc.org.uk

Tina Palmer
Middlemarch Environmental
Triumph House
Birmingham Road
Allesley
Conventry, CV5 9AZ

Via email

Your ref 108675
My ref 10-230
Date 28 February 2011
Contact Fabrizia Ratto
Tel 01296 696012
Email fratto@buckscc.gov.uk

Dear Tina Palmer,

Re: Old Stratford-Buckingham Arms Canal;

Thank you for your letter of 23rd February requesting information on sites and species within 500m of the site above. The information we have is summarised below. A map is provided below showing the locations of designated sites within the search area, and the relevant species records are detailed below. Please see the 'Definitions' section below for an explanation of the terms used to describe sites and species in this report.

STATUTORY SITES

We have no indication of any statutorily protected sites within the search area.

NON-STATUTORY SITES

The search area includes the following Biological Notification Sites (BNS):

Site Code	*Site*	*Broad habitat*	*Description*
73C01	**River Ouse, Buckingham**	Large River	Little aquatic vegetation except for occasional yellow water lilies and Ranunculus subg Batrachium. Banks mostly steep and fenced. Excellent water quality (1989). Fringes of emergent vegetation. Riffles and shoals in channel.
73C11	**Holloway Hedge**	Hedge with Trees	The hedge links several open spaces. By the playing field is a good hedge with a woody species count of 8 species in 30m. Crab apple is found with mature trees (oak , ash). Estimated at over 700 years old and historically an important boundary.

HABITATS OF PRINCIPAL IMPORTANCE

The search area does not include areas mapped as UK Biodiversity Action Plan (UKBAP) Priority habitats by Buckinghamshire County Council in a recent (2009) project. These habitats are referred to as Habitats of Principal Importance in the recent PPS9 guidance.

PROTECTED AND NOTABLE SPECIES

Records of protected and/or notable species within the search area are shown in the table below.

The Buckinghamshire Badger Group (www.bucks-badgers.org.uk) also has records for this area, for further information contact Bob Simpson, the Buckinghamshire Badger Group Recorder, at 27 Waine Close, Buckingham, MK18 1FF.

The North Bucks Bat Group (www.northbucksbatgroup.org.uk) may have records for this area, for further details please contact them:
Telephone (office hours): 01296 427972
Email: records@northbucksbatgroup.org.uk
Post: c/o Haydon Mill, Rabans Lane, Aylesbury, Bucks, HP19 8RU

As agreed, I will forward an invoice for £75 + VAT for the time taken to extract this information and put together the report.

Please do not hesitate to contact me if you have any questions arising from this report.

Yours sincerely,

Fabrizia Ratto
Environmental Records Officer

Terms and conditions

Copyrights

- The data held by Buckinghamshire and Milton Keynes Environmental Records Centre (BMERC) belongs either to BMERC or to those organisations, groups and individuals from which BMERC sources information. In all respects copyrights shall remain vested in such parties notwithstanding any payments made.
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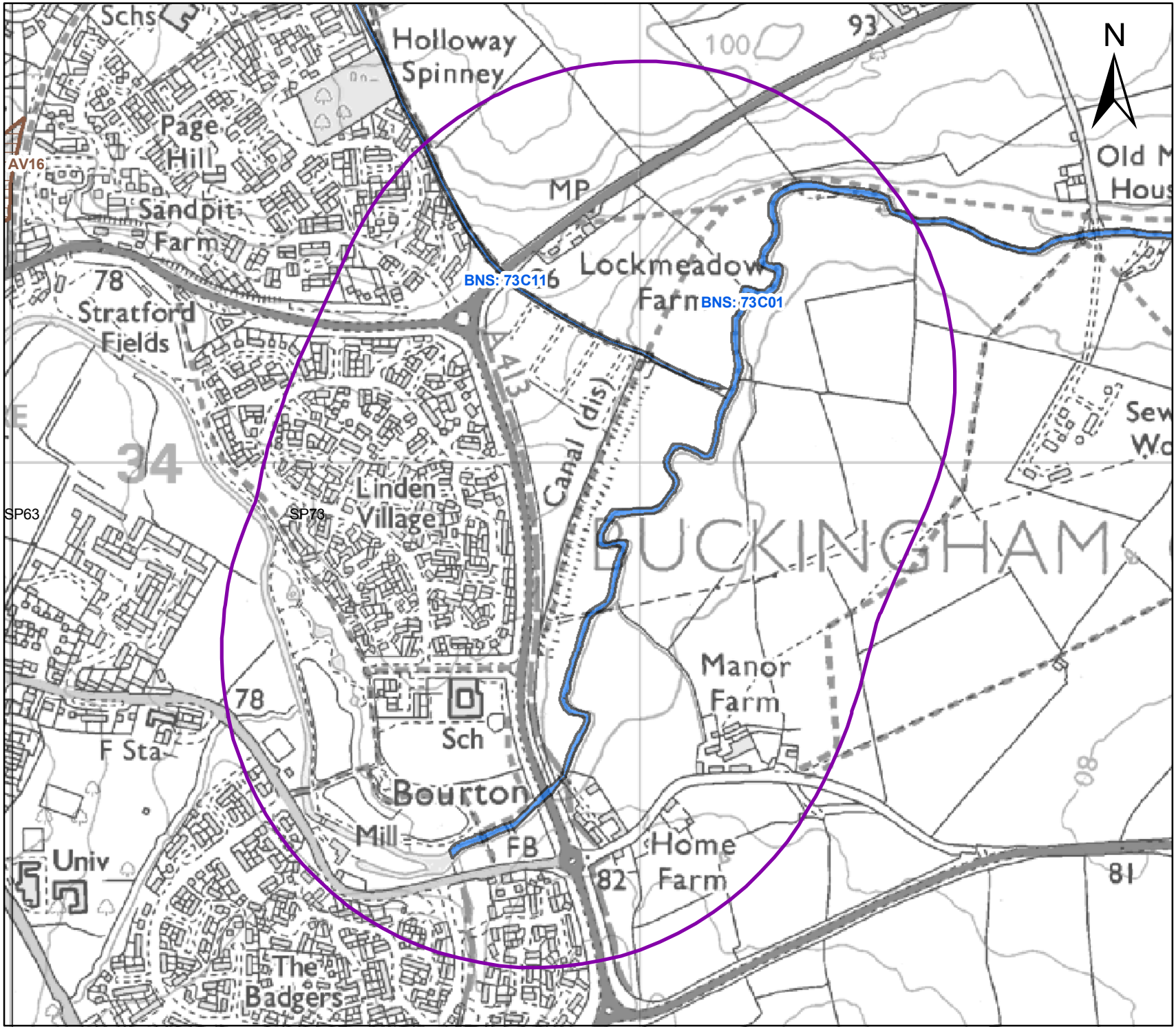
Data accuracy

- BMERC does not guarantee the accuracy of any information supplied and shall have no liability for any loss, damage or expense incurred as the result of reliance on any information supplied.
- BMERC can only provide information based on the data held by us. In particular, the absence of records for a species does not necessarily indicate that the species itself is absent, merely that we have not received records for it.

Access and use of data

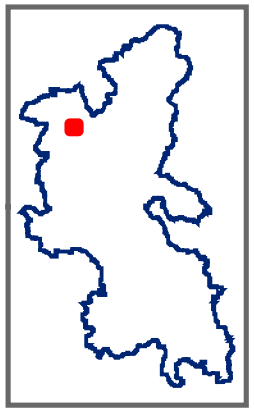
- The data in this report must not be used for commercial purposes. When publishing information derived from this data, BMERC and the date of receipt must be acknowledged.
- The data supplied in this report must not be added to a permanent database without prior permission from BMERC.
- The data held by BMERC is updated regularly and will become out-of-date. If you intend to use this data after a period of six months please contact us to confirm that we have no new records.
- Protected species records should be kept out of the public domain.



Please note that the layers held by the Environmental Records Centre are compiled from data that has been received from a variety of sources, including volunteers and professionals.

Buckinghamshire & Milton Keynes Environmental Records Centre

Non Designated Sites within 500m to Old Stratford and Buckingham Arms Canal



Legend

- Search Area
- Biological Notification Sites

0 0.0375 0.075 0.15 0.225 0.3 0.375 Km

Date created: 28/02/2011

Protected and notable species records

Taxon column:
**** = species recorded as not native (e.g. introduced plants or escaped birds)***
 # (against badger Meles meles) = record of sett
Table sorted by group and taxon
Only includes records since 1980; contact BMERC if you need records from before this
Some records may have further details (e.g. information on quantity, sex and stage), contact BMERC if you need this additional detail

Data supplied by BMERC may include data from the following organisations: Botanical Society of the British Isles; Bucks Amphibian and Reptile Group; Bucks Bird Club; National Recording Schemes for spiders, caddisflies, anthomyiid flies, ground beetles; plus many individual recorders

group	species	English name	European legislation	W+C Act	UK BAP	national status	Nationally rare plants:	local status	site	grid ref	precision	latest record
Insects: beetles	Anacaena bipustulata					Nationally Scarce/Nb			River Ouse at Buckingham	SP709335	100	1997
Insects: beetles	Nebrioporus depressus					Nationally Scarce/Nb			River Ouse at Buckingham	SP709335	100	1999

Definitions

Sites of importance for wildlife and geology in Buckinghamshire and Milton Keynes

The following statutory designations are used in Buckinghamshire and Milton Keynes:

- ***Special Areas of Conservation (SAC)***

Special Areas of Conservation are sites of international nature conservation importance and are designated under the EC Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna (the Habitats Directive).

- ***National Nature Reserves (NNR)***

National Nature Reserves are sites of national importance and are declared under section 19 of the National Parks and Access to the Countryside Act 1949 or section 35 of the Wildlife and Countryside Act 1981.

- ***Local Nature Reserves (LNR)***

Local Nature Reserves are sites of local importance and are declared under section 21 of the National Parks and Access to the Countryside Act 1949.

- ***Sites of Special Scientific Interest (SSSI)***

Sites of Special Scientific Interest are sites of national nature conservation or geological importance and are declared under section 28 of the Wildlife and Countryside Act 1981.

The following non-statutory sites have been identified in Buckinghamshire and Milton Keynes:

- ***Local Wildlife Sites (LWS)***

Local Wildlife Sites are local non-statutory nature conservation sites, formerly called County Wildlife Site and equivalent to Sites of Importance for Nature Conservation. The aim of the selection process is to identify sites that support the most important habitats and species in Buckinghamshire and Milton Keynes. A selection panel, in consultation with local authorities, designates the sites. Summary citations or survey reports are available for most, but not all, Local Wildlife Sites.

- ***Milton Keynes Wildlife Sites (MKWS)***

Sites identified as Local Wildlife Sites are referred to as Milton Keynes Wildlife Sites when they fall within the administrative area of Milton Keynes Council.

- ***Milton Keynes Wildlife Corridors***

These have been identified along the major road, rail and waterway corridors running through the Milton Keynes area. They are treated as being equivalent to Milton Keynes Wildlife Sites.

- ***Biological Notification Sites (BNS)***

Biological Notification Sites preceded Local Wildlife Sites as a local non-statutory designation. They were first designated in the late 1980s and have since been revised. There are no formal citations and for some sites we have no survey data. All Biological Notification Sites are in the process of being re-surveyed and assessed by Local Wildlife Site criteria; until this process is complete the two designations will continue to be in use. (Unfortunately, BNS within the administrative area of Milton Keynes Council have sometimes been called Local Wildlife Sites, this terminology will be phased out as soon as possible.)

- ***Local Geological Sites (LGS)***

Local Geological Sites are local non-statutory sites that recognise important earth science and landscape features. The Buckinghamshire Earth Heritage Group, in consultation with local authorities, designates the sites. They were previously known as Regionally Important Geological and Geomorphological Sites (RIGS).

- ***Key Areas for Water Vole***

Following surveys in 1997/8, the Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust have labelled some waterways as Key Areas for Water Vole. The boundaries of Key Areas are taken to be 10m from the bank-top each side of a watercourse and the buffer area is taken to be 500m from each side of the watercourse. For further information contact the Wildlife Trust on 01865 775476.

Buckinghamshire & Milton Keynes Notable Species List

The Buckinghamshire and Milton Keynes Notable Species List has been compiled in response to data requests from ecological consultants and developers. Although records of protected species are most commonly requested, national and local BAP species records and records of other notable species are often required.

As part of our standard data search we now include records of species defined by the following legislation and criteria.

1. European legislation

This column in our reports includes species listed in Regulations 39 (European protected animal species) and 42 (European protected plant species) of *The Conservation (Natural Habitats, &c.) Regulations* 1994. These provide protection for key species and habitat types and enacts the EU Habitats Directive into UK Law. The Habitats Directive requires the formation of a network of protected areas and the direct protection of specific species. It is an offence to deliberately capture, kill or disturb a wild animal of a European protected species or to deliberately take or destroy the eggs or destroy a breeding site or resting place of such an animal. It is also an offence to deliberately pick, collect, cut, uproot or destroy a wild plant of a European protected species.

On 21 August 2007 an amendment to the Habitats Directive came into force. The *Conservation (Natural Habitats &c.) (Amendment) Regulations 2007* have a variety of consequences for the protection of European Protected Species, including the removal of many defences that were previously allowed. This includes the commonly relied upon 'incidental result defence', which previously covered acts that were the incidental result of an otherwise lawful activity and which could not reasonably have been avoided. For more details see:
http://www.naturalengland.org.uk/conservation/wildlife-management-licensing/habsregs.htm#houseguidance

2. W+C Act

This column includes species listed in The Wildlife & Countryside Act 1981 (and later amendments), plus Badger (see below). The Wildlife and Countryside Act consolidates and amends existing national legislation to implement the Bern Convention and the EU Birds Directive in Great Britain. Various amendments have been made to the Act, e.g. in the Countryside and Rights of Way (CRoW) Act 2000.

- *Schedule 1 (protected birds)* – It an offence (with exception to certain species) to intentionally kill, injure, or take any wild bird or the eggs or nests of species listed in Part 1. Part 2 lists birds protected during the closed season.
- *Schedule 5 (protected animals, other than birds)* – The intentional or reckless killing, injuring, taking, possessing, disturbing or selling, of animals listed in Schedule 5 is prohibited, along with the damaging or disturbing of the places used for their shelter or protection. Protection of some species is limited to certain sections:
    - Section 9(1) – Limited to intentional killing, injury or taking.
    - Section 9(2) – Limited to processing and controlling.
    - Section 9(4a) – Limited to damaging, destroying or obstructing access to any structure or place used by the animal for shelter or protection.
    - Section 9(4b) – Limited to disturbing an animal whilst it is occupying any structure or place used for shelter or protection.
    - Section 9(5) – Limited to selling, offering for sale, possessing or transporting for sale or advertising for sale of any live or dead animal, part of or derived from. (Not included in list)
- *Schedule 8 (protected plants and fungi)* – The intentional picking, uprooting, trade in, or possessing of any wild plant listed in Schedule 8 is prohibited. Also, all wild plants are protected from intentional uprooting by an unauthorised person.

This column also shows records for badgers, which are protected under The Protection of Badgers Act 1992. This makes it an offence to wilfully kill, injure or take, or attempt to kill, injure or take, a badger and to interfere with a badger sett either by intent or by negligence. A licence, issued by English Nature, is required for works within 30 metres of a badger sett.

3. UK BAP

This column shows species listed as UK Biodiversity Action Plan Priority species, and as Species of Principal Importance. The UK Biodiversity Action Plan lists Priority species for conservation in the UK. The species list was reviewed and extended in 2007. The list of Species of Principal Importance was originally published under Section 74 of the Countryside and Rights Way Act 2000, and carried forward into the NERC Act 2006. It is referred to in PPS9 and other guidance. The list of Species of Principal Importance is very similar to the list of Priority species in the UK Biodiversity Action Plan (there are some species that are BAP Priority but not Species of Principal Importance, and there is one species – Hen Harrier – that is a Species of Principal Importance but not a BAP Priority).

4. National status

This column shows all species that have been listed in Red Data Books, or in reviews of Nationally Scarce species, or are red- or amber-listed birds. A number of criteria have been devised for assessing the conservation status of species. In the UK, official lists of Red Data Book species are published by the government's Joint Nature Conservation Committee (JNCC). NB that the Red Data Books use different criteria for different groups, e.g. for plants the criteria give priority to declining and threatened species, whereas those for invertebrates are based more on rarity in terms of distribution. The more recent Red Data Book lists use international criteria developed by the World Conservation Union (IUCN), and include these categories:

- Extinct (EX)
- Extinct in the wild (EW)
- Critically endangered (CR)
- Endangered (EN)
- Vulnerable (VU)
- Near threatened (NT)
- Data deficient (DD)

The CR, EN and VU categories are considered to be threatened categories. Near threatened species are close to qualifying for one of these categories. Data deficient is not a threatened category, but indicates a need for more information in order to determine the appropriate category.

In addition to IUCN criteria, there are older Red Data Book and Nationally Scarce criteria used to define nationally rare and nationally scarce species:

- Red Data Book (= Nationally Rare): Occurring in 15 or fewer 10km-squares in Great Britain
- Nationally Scarce: Occurring in 16–100 10km-squares in Great Britain. For some groups this is further subdivided:
    - Nationally Scarce/Na: Occurring in 16–30 10km-squares
    - Nationally Scarce/Nb: Occurring in 31–100 10km-squares

For birds, the following categories apply, taken from *Birds of Conservation Concern 2002–2007* (RSPB):

- *Red List* – Species that are globally threatened according to IUCN criteria; those whose population or range has declined rapidly in recent years; and those that have declined historically and not shown a substantial recent recovery.
- *Amber List* – Species with an unfavourable conservation status in Europe; those whose population or range has declined moderately in recent years; those whose population has declined historically but made a substantial recovery; rare breeders; and those with internationally important or localised populations.

5. Nationally rare plants

This column uses distribution data from the Botanical Society of the British Isles to show those plants that have restricted national distributions, i.e. equivalent to the old Red Data Book categories.

6. Local status

This column shows the local statuses that have been applied to plants, butterflies and moths. For the plants the source is the BSBI County Rare Plant List for Bucks, compiled by Roy Maycock in 2007 (NB this is a substantial change from the previous county rare/scarce plant list of the 1980s). The categories are:

- County Rare: generally confined to three or fewer tetrads (2km × 2km squares) in the county
- County Scarce: generally confined to between four and ten tetrads in the county

For butterflies and moths the source is Butterfly Conservation's Regional Action Plan for the Thames Region (Clarke and Bourn 2000). Species are given a High, Medium or Low priority based on rarity, decline and threat (NB that the "Low Priority" category does include species of conservation importance, but simply those which are considered a lower priority than the others).

- ***Bird records***

Under the EC Birds Directive and the Wildlife and Countryside Act it an offence to intentionally kill, injure, or take any wild bird or their eggs or nests (with the exception of certain species). Records of wild birds in general are not included in BMERC reports unless they are of species falling into one of the other categories listed here.

A full Notable Species list is available on request.

International and European Obligations

In the UK, species receiving protection under international legislation and agreements are protected through the Wildlife and Countryside Act, so are not shown separately in the BMERC notable species lists. For reference, the relevant categories are shown below.

- ***Bern Convention on the Conservation of European Wildlife and Natural Habitats***

The Bern Convention aims to ensure the conservation of wild flora and fauna species and their habitats.

- *Appendix 1 (strictly protected flora)* – Plants for which contracting parties will prohibit deliberate picking, collecting, cutting or uprooting.
- *Appendix 2 (strictly protected fauna)* – Animals for which contracting parties will prohibit deliberate capture, possession, killing, damage to or destruction of breeding or resting sites, disturbance or destruction or taking of eggs.
- *Appendix 3 (protected fauna)* – Animals for which contracting parties will include closed seasons and regulate their sale, keeping for sale, transport for sale or offering for sale of live and dead wild animals. (Not included in Notable Species List)

- ***Bonn Convention on Migratory Species***

The Bonn Convention aims to conserve terrestrial, marine and avian migratory species throughout their range.

- *Appendix 1 (migratory species threatened with extinction)* – Species for which contracting parties will strictly protect and endeavour to conserve or restore the places where they live, mitigating obstacles to migration and controlling other factors that might endanger them.
- *Appendix 2 (migratory species that need or would benefit from international co-operation)* – Species for which contracting parties will be encouraged to conclude global or regional agreements for the conservation and management of individual species or, more often, of a group of species. (Not included in Notable Species List)

- ***The EC Council Directive on the Conservation of Wild Birds***

The Birds Directive provides a framework for the conservation and management of all wild birds in Europe. As well as designating important sites for birds as Special Protection Areas, birds are generally protected from deliberate killing or capture and destruction of or damage to their nests or eggs, and deliberate disturbance. Allowances are made for game birds.

APPENDIX 2

Middlemarch Environmental Ltd Drawing C108675-01
Extended Phase 1 Habitat Survey

Legend

- Survey boundary
- Fence
- Species-rich intact hedgerow
- A — Amenity grassland
- A — Arable
- Broad-leaved plantation woodland
- Dense scrub
- Hardstanding
- I — Improved grassland
- SI — Neutral semi-improved grassland
- Tall ruderal

N

Client: Buckingham Canal Society	Project: Old Stratford-Buckingham Arms
Drawing: Extended Phase 1 Habitat Survey	Drawing Number: C108675-01
Revision: 00	Date: March 2011
Scale at A4: 1:2,500	Drawn By: SKS
Approved By: JH	Notes: -

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C108675-01

APPENDIX 3

Overview of Relevant Legislation

GENERAL LEGISLATION AND POLICY OVERVIEW

This section provides an overview of the framework of legislation and policy which underpins nature conservation and is a material consideration in the planning process in England.

CONSERVATION OF HABITATS AND SPECIES REGULATIONS 2010 (HABITATS REGULATIONS 2010)
The Habitats Regulations 2010 consolidate and update the Conservation (Natural Habitats, &c.) Regulations 1994 and all its various amendments. The Habitats Regulations 2010 are the principal means by which the EEC Council Directive 92/43 (The Habitats Directive) as amended is transposed into English and Welsh law.

The Habitats Regulations 2010 place duty upon the relevant authority of government to identify sites which are of importance to the habitats and species listed in Annexes I and II of the Habitats Directive. Those sites which meet the criteria are, in conjunction with the European Commission, designated as Sites of Community Importance, which are subsequently identified as Special Areas of Conservation (SAC) by the European Union member states. The regulations also place a duty upon the government to maintain a register of European protected sites designated as a result of EC Directive 79/409/EEC on the Conservation of Wild Birds (The Birds Directive). These sites are termed Special Protection Areas (SPA) and, in conjunction with SACs, form a network of sites known as Natura 2000. The Habitats Directive introduces for the first time for protected areas, the precautionary principle; that is that projects can only be permitted having ascertained no adverse effect on the integrity of the site. Projects may still be permitted if there are no alternatives, and there are imperative reasons of overriding public interest.

The Habitats Regulations 2010 also provide for the protection of individual species of fauna and flora of European conservation concern listed in Schedules 2 and 5 respectively. Schedule 2 includes species such as otter and great crested newt for which the UK population represents a significant proportion of the total European population. It is an offence to deliberately kill, injure, disturb or trade these species. Schedule 5 plant species are protected from unlawful destruction, uprooting or trade under the regulations.

THE WILDLIFE AND COUNTRYSIDE ACT (WCA) 1981 (AS AMENDED)
The WCA, as amended, consolidates and amends pre-existing national wildlife legislation in order to implement the Bern Convention and the Birds Directive. It complements the Conservation (Natural Habitats. &c.) Regulations 1994 (as amended), offering protection to a wider range of species. The Act also provides for the designation and protection of national conservation sites of value for their floral, faunal or geological features, termed Sites of Special Scientific Interest (SSSIs).

Schedules of the act provide lists of protected species, both flora and fauna, and detail the possible offences that apply to these species. All relevant species specific legislation is detailed later in this Appendix.

THE COUNTRYSIDE AND RIGHTS OF WAY (CROW) ACT 2000
The CROW Act, introduced in England and Wales in 2000, amends and strengthens existing wildlife legislation detailed in the WCA. It places a duty on government departments and the National Assembly for Wales to have regard for biodiversity, and provides increased powers for the protection and maintenance of SSSIs.

The Act also contains lists of habitats and species (Section 74) for which conservation measures should be promoted, in accordance with the recommendations of the Convention on Biological Diversity (Rio Earth Summit) 1992.

THE NATURAL ENVIRONMENT AND RURAL COMMUNITIES (NERC) ACT 2006
Section 40 of the NERC Act places a duty upon all local authorities and public bodies in England and Wales to promote and enhance biodiversity in all of their functions. Sections 41 (England) and 42 (Wales) list habitats and species of principal importance to the conservation of biodiversity. These lists supersede Section 74 of the CRoW Act 2000. These species and habitats are a material consideration in the planning process.

THE HEDGEROW REGULATIONS 1997
The Hedgerow Regulations make provision for the identification of important hedgerows which may not be removed without permission from the Local Planning Authority.

UK BIODIVERSITY ACTION PLAN

The United Kingdom Biodiversity Action Plan (UKBAP), first published in 1994 and updated in 2007, is a government initiative designed to implement the requirements of the Convention of Biological Diversity to conserve and enhance species and habitats. The UKBAP contains a list of priority habitats and species of conservation concern in the UK, and outlines biodiversity initiatives designed to enhance their conservation status. Lists and Broad and Local habitats are also included. The priority habitats and species correlate with those listed on Section 41 and 42 of the NERC Act.

The UKBAP requires that conservation of biodiversity is addressed at a County level through the production of Local BAPs. These are complementary to the UKBAP, however are targeted towards species of conservation concern characteristic of each area. In addition, a number of local authorities and large organisations have produced their own BAPs.

UKBAP and Local BAP targets with regard to species and habitats are a material consideration in the planning process.

PLANNING POLICY

Planning Policy Statement 9

Planning Policy Statement 9 provides guidance to local authorities regarding the protection of biodiversity and geology through the planning system in England. Key principles relating to biodiversity include:

- Development plan policies and planning decisions should be based upon up-to-date information about the environmental characteristics of their areas. These characteristics should include the relevant biodiversity and geological resources of the area. In reviewing environmental characteristics local authorities should assess the potential to sustain and enhance those resources.

- Plan policies and planning decisions should aim to maintain, and enhance, restore or add to biodiversity and geological conservation interests. In taking decisions, local planning authorities should ensure that appropriate weight is attached to designated sites of international, national and local importance; protected species; and to biodiversity and geological interests within the wider environment.

- Plan policies should promote opportunities for the incorporation of beneficial biodiversity and geological features within the design of development.

National planning policy is implemented through local and regional planning policies.

SPECIES SPECIFIC LEGISLATION

REPTILES

All of the UK's native reptiles are protected by law. The two rarest species – sand lizard (*Lacerta agilis*) and smooth snake (*Coronella austriaca*) benefit from the greatest protection.

Common lizard (*Lacerta vivipar*a), slow-worm (*Anguis fragilis*), adder (*Vipera berus*) and grass snake (*Natrix natrix*) are protected under the Wildlife and Countryside Act 1981 as amended from intentional killing or injuring.

Sand lizard and smooth snake are protected under the Wildlife and Countryside Act 1981 (as amended) and The Conservation of Habitats and Species Regulations 2010 which together make it illegal to kill, injure, capture, handle or disturb these animals. Places they use for breeding, resting, shelter and protection are protected from being damaged or destroyed. It is also illegal to obstruct these animals from using such areas.

In England and Wales, this Act has been amended by the Countryside and Rights of Way Act 2000 (CRoW), which adds an extra offence, makes species offences arrestable, increases the time limits for some prosecutions and increases penalties. The Natural Environment and Rural Communities (NERC) Act 2006 places a duty on Government Departments to have regard for the conservation of biodiversity and maintains lists of species and habitats which are of principal importance for the purposes of conserving biodiversity in England and Wales. All native reptile species are included on these lists.

The reader is referred to the original legislation for the definitive interpretation.

This is a simplified description of the legislation. In particular, the offences mentioned here may be absolute, intentional, deliberate or reckless. Note that where it is predictable that reptiles are likely to be killed or injured by activities such as site clearance, this could legally constitute intentional killing or injuring.

English Nature (2004) has stated that:

Reptiles are likely to be threatened, and the law potentially breached, by activities such as the following:

- *Archaeological and geotechnical investigations*
- *Clearing land, installing site offices or digging foundations*
- *Cutting vegetation to a low height*
- *Laying pipelines or installing other services*
- *Driving machinery over sensitive areas*
- *Storing construction materials in sensitive areas*
- *Removing rubble, wood piles and other debris.*

In general English Nature would expect reasonable avoidance to include measures such as altering development layouts to avoid key areas, as well as capture and exclusion of reptiles.

For sand lizards and smooth snakes, licences may be issued for some activities (such as disturbance and capture) that would otherwise be prohibited.

NESTING BIRDS

Nesting and nest building birds are protected under the Wildlife and Countryside Act WCA 1981 (as amended). Some species (listed in Schedule 1 of the WCA) are protected by special penalties.

Subject to the provisions of the act, if any person intentionally:

- kills, injures or takes any wild bird;
- takes, damages or destroys the nest of any wild bird while that nest is in use or being built; or
- takes or destroys an egg of any wild bird,

he shall be guilty of an offence.

'Reckless' offences with regard to the disturbance of nesting wild birds included in Schedule 1 of the Wildlife and Countryside Act were added by the Countryside and Rights of Way Act 2000.

The Natural Environment and Rural Communities (NERC) Act 2006 places a duty on Government Departments to have regard for the conservation of biodiversity and maintains lists of species and habitats which are of principal importance for the purposes of conserving biodiversity in England and Wales. These lists include a number of bird species.

MIDDLEMARCH ENVIRONMENTAL LTD

QUALITY ASSURANCE

TITLE: OLD STRATFORD- BUCKINGHAM CANAL

EXTENDED PHASE 1 HABITAT SURVEY

A Report to Buckingham Canal Society

Contract Number: C108675

Report Number: RT-MME-108675

Revision Number: 01

Description: Final

Date: May 2011

Checked by:

Tom Docker
Ecological Consultant

Approved by:

Dr Philip Fermor
Managing Director

Appendix D

Species Details

LIST OF WILDLIFE ATTRACTING PLANTS

Species	Height/Spread	Colours	Flowers/Berries	Wildlife benefits	Plant conditions and notes	Deciduous or Evergreen
Native Trees						
Field Maple *Acer campestre*	To 25m	Leaves: Green then amber in Autumn. Flowers: Yellow/green. Seeds: Green then brown with wings.	Flowers May to June	51 species of insects/mites and 24 species of lepidoptera. Fruits eaten by small mammals.	Calcareous or clay soils preferably in full sun.	Deciduous
Alder *Alnus glutinosa*	6-15m	Leaves: Green, Catkins: Yellow/brown, Fruits: Cone-like, small and brown.	Catkins in March to April	141 species of insects/mites and 71 species of lepidoptera. Seeds are good for birds such as siskins.	Damp soil. Plant hardwood cuttings in the open in late autumn.	Deciduous
Silver Birch *Betula pendula*	To 18m	Leaves: Green turning yellow in Autumn, Catkins: Yellow/brown then seeding, Bark: White.	Catkins open in April and break up in winter releasing it's seeds.	Excellent for insects and to attract inset eating birds. Best tree for moth larvae. Catkins good food source for birds such as redpolls and tits.	Dry acid best.	Deciduous
Downey Birch *Betula pubescens*	To 24m	Leaves: Green turning yellow in Autumn, Catkins: Yellow/brown then seeding, Bark: White.	Catkins open in April and break up in winter releasing it's seeds.	Excellent for insects and to attract inset eating birds. Catkins good food source for birds.	Favours wetter more peaty soil.	Deciduous
Hornbeam *Carpinus betulus*	To 24m	Leaves: Green, Catkins: Green/crimson then seeding.	Flowers in May	51 species of insects/mites and 32 species of lepidoptera. Seeds for birds. Can provide dense nesting cover.	Woods and copses on clay soils, will tolerate shade. Sow seeds or fruits in spring.	Deciduous

Hazel *Corylus avellana*	To 10m	Leaves: Green, Flowers: Long Yellow/Crimson tassels. Seeds: Brown nuts.	Flowers in February	106 species of insects/mites and 68 species of lepidoptera. Nuts eaten by birds and mammals i.e. squirrels, mice and jays.	Hedgerows, scrub and woodland in well-drained soil. Full sun or light shade preferable. Remove and plant rooted suckers or offsets in autumn.	Deciduous
Beech *Fagus sylvatica*	To 46m	Leaves: Green then orange to red/brown in Autumn, Flowers: Green/white. Seeds: Brown nuts encased in a brown husk.	Flowers March to April.	98 species of insects/mites and 51 species of lepidoptera. The masts are eaten by birds and mammals including wood mice and Jays.	Well-drained soils. Can survive in shallow soil. Sow seeds or fruits in autumn.	Deciduous. Can hold dead leaves through the winter.
Ash *Fraxinus excelsior*	To 37m	Leaves: Green, Flowers: Green/Purple prior to the leaves. Seeds: Green single seeds in bunches with a long wing.	Flowers: April-May	68 species of insects/mites and 32 species of lepidoptera. Seeds eaten by birds and mammals.	Will survive on most soils with reasonable light. Sow seeds or fruits in autumn.	Deciduous
Juniper *Juniperus communis*	Shrub or tree to 7m	Leaves: Spiky Green needles, Flowers: Small green to yellow flowers, Berries: Green ripening to purple in the second year.	Flowers May to June. Berries take two years to ripen.	32 species of insects/mites and 14 species of lepidoptera.	Well-drained limestone and acid sandstone.	Evergreen
Crab Apple *Malus sylvestris*	To 10m	Leaves: Green, Flowers: White and pink. Fruits: Green/yellow/red apples.	Flowers: April to May. Fruits ripen in Autumn.	118 species of insects/mites and 76 species of lepidoptera. Fruits are eagerly consumed by birds and mammals despite its bitter taste.	Well-drained soil in full sun.	Deciduous

Scots Pine *Pinus sylvestris*	To 36m	Leaves: Green needles, Flowers: Yellow and crimson, Cones: Short and brown.		172 species of insects/mites and 36 species of lepidoptera. Cones are a valuable food source for birds and other mammals.	Prefers sandy well-drained soil in full sun.	Evergreen
Black Poplar *Populus nigra*	33m	Leaves: Green turning yellow in Autumn, Flowers: Green and crimson catkins, turning fluffy when fruiting.	Catkins produced in March.	153 species of insects/mites and 69 species of lepidoptera found within all the poplar species. Good for larger moth species i.e. Hawk moths	Fertile soil near water. Remove and plant rooted suckers or offsets in autumn. Reduced in numbers due to easy hybridisation with other poplars	Deciduous
Aspen *Populus tremula*	To 24m	Leaves: Green turning yellow in Autumn, Flowers: Green and brown catkins, turning fluffy when fruiting.	Catkins arrive in March and set seed in May.	Good for invertebrates and birds. Food plant of the hairstreak butterfly.	Will survive on most soils with full sun or partial shade.	Deciduous
Wild Cherry *Prunus avium*	9-12m	Leaves: Green turning crimson in Autumn, Flowers: White, Berries: Bright red.	Flowers: April, Berries: July	Birds feed on the cherries.	Prefers fertile soil, will tolerate some shade.	Deciduous
Bird Cherry *Prunus padus*	Shrub or tree to 19m	Leaves: Green, Flowers: White, Berries: Black cherries.	Flowers in May.	9 species of lepidoptera. Berries eaten by birds	Woods and scrub. Well-drained soil with full sun or light shading.	Deciduous
Oaks (native) *Quercus spp.*	To 42m	Leaves: Green, Flowers: Slim yellow catkins, Seeds: Green acorns turning brown when ready to fall.	Flowers in May. Acorns produced in Autumn.	423 species of insects/mites and 193 species of lepidoptera. Acorns eaten by a variety of birds and mammals. Very important for insect eating birds.	Variety of soils with reasonable depth and preferably in full sun, below 300m altitude. Sow seeds or fruits in autumn.	Deciduous

Willows *Salix spp.*	To 25m (species dependent)		Flowers February to March.	450 species of insects/mites and 166 species of lepidoptera.	Damp areas. Plant hardwood cuttings in the open in late autumn.	Deciduous
Goat Willow aka 'pussy willow' *Salix caprea*	Shrubby tree to 10m	Leaves: Oval, dark grey/green on top with a hairy underside, Flowers; Green and yellow short catkins turning fluffy when seeding.	Flowers March to April	Early provider of pollen and nectar for insects.	Most soils as long as they are at least slightly damp.	Deciduous
Grey Willow *Salix cinerea*	Shrubby tree to 6m	Leaves: Grey/green on top with a lighter hairy underside, Flowers; Yellow catkins turning fluffy when seeding.	Flowers March to April	Good for insects and birds.	Most soils as long as they are at least slightly damp.	Deciduous
Crack Willow *Salix fragilis*	Can reach 25m	Leaves: Long, shiny green on top with a grey/green underside, Flowers; Green and yellow catkins turning fluffy when seeding.	Flowers in April with the catkins appearing in May and ripening in the summer.	Good for insects and birds.	Most soils as long as they are at least slightly damp.	Deciduous
Bay Willow *Salix pentandra*	To 10m	Leaves: Long, shiny green on top with a grey/green underside, Flowers: Yellowish catkins,fluffy when seeding.	Flowers May to June	Good for insects and birds.	Wet ground by water.	Deciduous
Elderberry *Sambucus nigra*	To 10m	Leaves: Green, Flowers: Small creamy white flowers in large numbers. Berries: Dark purple/black in bunches.	Flowers May to June	Berries for birds and nectar for insects.	Sun or partial shade.	Deciduous

Whitebeam *Sorbus aria*	10 to 24m	Leaves: Green with white hairy underside turning yellow/crimson in Autumn, Flowers: White, Berries: Green ripening to bright red.	Flowers: May	Flowers attract insects and the fruits are eaten by birds.	Prefers calcareous soil.	Deciduous
Rowan *Sorbus aucuparia*	18m	Leaves: Pinnate green leaves turning crimson in Autumn, Flowers: Small white flowers in clusters, Berries: Bright red.	Flowers in May. Produces berries in autumn.	58 species of insects/mites and 28 species of lepidoptera. The ripe berries attract birds such as redwings and field-fares.	Will tolerate most soils apart from very heavy soils.	Deciduous
Wild Service Tree *Sorbus torminalis*	To 20m	Leaves: Shiny green with a lighter coloured underside, turning purple/red in Autumn, Flowers: Creamy white in clusters, Seeds: Brown speckled seeds in clusters.	Flowers: May or June Fruit: September	Good for insects. Fruits eaten by birds	Withstands shade. Prefers clay and limestone soil.	Deciduous
Lime *Tilia europaea*	To 46m	Leaves: Green heart-shaped with slightly hairy underside, Flowers: Greenish/ yellow flowers, Seeds: Small round and hairy with a grey-brown colour.	Flowers June to July.	57 species of insects/mites and 31 species of lepidoptera. The nectar is highly sought by bees.	Needs well-drained soil with full or partial sun.	Deciduous

Wych Elm *Ulmus glabra*	To 37m	Leaves: Green turning yellow in autumn , Flowers: very small purplish flowers, Seeds: Circular winged fruits with the seed in the centre.	Flowers produced in spring prior to the leaves, with winged fruits produced in July.	Good tree for insects and birds.	Full sun or light shade on most soils especially limestone. This species is less suseptable to Dutch elm disease.	Deciduous
Dutch Elm *Ulmus hollandica*	To 32m	Leaves: Green, Seeds: Circular winged fruits with the seed in the centre.	Winged fruits produced in July.	Good tree for insects and birds.	A native tree which has occurred naturally as a hybridisation between two other elms. Full sun or light shade. This species is less suseptable to Dutch elm disease.	Deciduous
English Elm *Ulmus procera*	To 33m	Leaves: Green, Flowers: Small crimson flowers, Seeds: Circular winged fruits with the seed in the centre.	Crimson flowers produced in spring with winged fruits produced in July.	124 species of insects/mites and 24 species of lepidoptera are associated with elm trees.	Full sun or light shade. 1 in 5 trees have caught Dutch elm disease which the English elms are suseptable to.	Deciduous

Species	Height/Spread	Colours	Flowers/Berries	Wildlife benefits	Plant conditions and notes	Deciduous or Evergreen
Introduced Trees						
Sweet Chestnut *Castanea sativa*	To 35m	Leaves: Green, Flowers: Long yellow tassels. Seeds: Brown nuts encased in a green spiky husk.	Flowers July. Seeds produced in autumn decreasing in size the further north the plants are situated.	11 species of insects/mites and 1 species of lepidoptera. Seeds eaten by a variety of mammals.	Well-drained soil, in full or partial sun. Sow seeds or fruit in spring.	Deciduous
European Larch *Larix decidua.*	To 46m	Leaves: light green needles, Flowers Yellow/dull-red small globes, Cones: Light brown	Spring	38 species of insects/mites and 15 species of lepidoptera. Cones provide food for tits and finches.	Likes plenty of space in full sun.	Deciduous
Magnolia *Magnolia*				Early source of nectar for insects		
Apple *Malus domestica*	To 11m	Leaves: Green, Flowers: Deep pink. Fruits: Reddish-purple.	Flowers: April to May. Fruits ripen in Autumn.	Good for invertebrates. Fruits are eagerly consumed by birds and mammals.	Well-drained soil in full sun.	Deciduous
Purple Crab *Malus purpurea*	To 10m	Leaves: Green, Flowers: White and pink. Fruits: Green/yellow/red apples.	Flowers: April to May. Fruits ripen in Autumn.	Good for invertebrates. Fruits are eagerly consumed by birds and mammals.	Well-drained soil in full sun.	Deciduous

Norway Spruce *Picea abies*	To 46m	Leaves: Green needles, Flowers: Yellow and pink, Cones: Long and brown.	Flowers open in May. Cones ripen in autumn.	70 species of insects/mites and 13 species of lepidoptera. The cones are eaten by birds and mammals which include crossbills, treecreepers and red squirrels.	Any reasonable soil, preferably in good sun.	Evergreen
White Poplar *Populus alba*	24m	Leaves: Dark green upper with pale hairy underside, Flowers: Green catkins, turning fluffy when fruiting.	Catkins produced in March.	Good for invertebrates and birds especially larger moth species.	Full sun or partial shade. Remove and plant rooted suckers or offsets in autumn. Can tolerate pollution well, but the roots can damage pipelines and paving.	Deciduous
Wild Plum *Prunus domestica*	To 8m	Leaves: Green, Flowers: White, Fruits: Small purple plums.	Flowers: March to May. Fruits ripen in Autumn.	Nectar and fruits for invertebrates. Fruits are eagerly consumed by birds and mammals.	Well-drained soil in full sun.	Deciduous
Peach *Prunus persica*	6m	Leaves: Dark green, Flowers: Deep pink, Fruits: Usual peach.	Flowers: April to May. Fruits ripen in Autumn.	Nectar and fruits for invertebrates. Fruits are eagerly consumed by birds and mammals.	Well-drained soil in full sun.	Deciduous
Pear *Pyrus communis*	To 15m	Leaves: Dark glossy green, Flowers: White, Fruits Yellow-green to brown.	Flowers: April to May. Fruits ripen in Autumn.	Good for invertebrates. Fruits are eagerly consumed by birds and mammals.	Well-drained soil in full sun.	Deciduous
Wild Pear *Pyrus pyraster*	To 15m	Leaves: Dark glossy green, Flowers: White, Fruits Yellow-red to brown, 1-4cm. The tree/shrub is usually spiny.	Flowers: April to May. Fruits ripen in Autumn.	Good for invertebrates. Fruits are eagerly consumed by birds and mammals.	Well-drained soil in full sun.	Deciduous

Native Shrubs						
Box *Buxus sempervirens*	To 3m	Leaves: Small, dark green and glossy, Flowers: Small green/yellow, Seeds: Black encased in blue green capsules turning brown in September	Flowers April to May	Provides good nesting cover and winter roosting cover for birds.	Calcareous soils in full sun or partial shade.	Evergreen
Heather *Calluna vulgaris*	50-100cm	Leaves: Green and minute, Flowers: Pink/purple, Seeds: Very small replacing flowers.	Flowers in July to November	Good for invertebrates with a late supply of nectar	Well-drained acid soil in full sun.	Evergreen
Dogwood *Cornus sanguinea*	To 4m	Leaves: Green and hairy turning crimson an Autumn, Flowers: Greenish white in groups, Berries: Black in clusters.	Flowers in June. Produces bitter black berries in August-September.	17 species of lepidoptera. Larval food plant of the green hairstreak butterfly. Flowers produce an unpleasant smell which is attractive to insects. Some birds manage to eat the berries.	Woods and scrub on limestone or base rich clays.	Deciduous
Hawthorn *Crataegus monogyna*	6m	Leaves: Small and green, Flowers: Bright yellow, Seeds: In green pods.	Flowers: White – mid May. Berries: Red/orange in Autumn	Nectar. Berries good food source for thrushes, redwings and fieldfares. Good nesting if dense. Excellent for moth larvae.	Any soil.	Deciduous
Broom *Cytisus scoparius*	2.5m	Leaves: Small green and deeply lobed, Flowers: White, Berries: Red.	Yellow flowers April-June	Good for 39 species of lepidoptera. Food plant of the hairstreak butterfly.	Calcifuge, heathland, sandy banks, open woodland and rough ground. Well drained soil in full sun. Plant semi-ripe cuttings in a cold frame in summer.	Semi-evergreen

Spurge Laurel *Daphne laureola*	1m	Leaves: Light green, Flowers: White/green, Berries: Black.	Flowers in February to April	Early source of nectar for insects. Berries for birds which are poisonous to man.	Well-drained humus-rich or chalky soil in full sun or deep shade.	Evergreen
Mezereon *Daphne mezereum*	1m	Leaves: Light green with cream tinged edges, Flowers: Bright pink, Berries: Red.	Flowers in February to April	Early source of nectar for insects.	Well-drained humus-rich soil in full sun or light shade.	Deciduous
Heath 'Bell' *Erica cinerea*	To 50cm	Leaves: Green and minute, Flowers: Pink/purple, Seeds: Very small replacing flowers.	Flowers July to August.	Provides nectar for invertebrates.	Well-drained acid soil in full sun.	Evergreen
Heath 'Cross-leaved' *Erica tetralix*	To 50cm	Leaves: Green and minute, Flowers: Pink/purple, Seeds: Very small replacing flowers.	Flowers July to August.	Provides nectar for invertebrates.	Damp acid soil in full sun	Evergreen
Spindle *Euonymus europaeus*	5m (8m max)	Leaves: Light green turning to crimson in Autumn, Flowers: Greenish yellow, Seeds: encased in a four lobed pink capsule.	Fruit October to December.	10 species of lepidoptera. Nectar is good for insects. Berries are good for birds but induce vomiting in people.	Woods, hedgerows and scrub on calcareous or base rich clays. Plant semi-ripe cuttings in a cold frame in summer	Deciduous
Alder Buckthorn *Frangula alnus*	2.5m	Leaves: Shiny green, Flowers: very small greenish flowers, Berries: Green berries turning red then purple.	Flowers: Early summer. Berries: Autumn	Berries for birds. Important food plant for brimstone butterfly larvae.	Damp acidic soil/peat	Deciduous
Tutsan *Hypericum androsaemum*	80cm	Leaves: Green turning red in autumn, Flowers: Yellow, Berries: Black	Flowers June to October followed by berries.	Flowers attract insects especially bees. Berries are eaten by birds and small mammals.	Full sun or light shade in damp soil. Plant semi-ripe cuttings in a cold frame in summer.	Deciduous

Holly *Ilex aquifolium*	300 x 150+ cm	Leaves: spiky glossy green, Flowers: Small pink/white, Berries: Bright red.	Flowers: May. Berries: (only on female trees) October to December.	Berries good for birds and small mammals. Caterpillars of the holly blue butterfly feed on the leaves. Holly leaf miner provides winter food for birds.	Not wet. Layer stems in spring. Need male and female plants near each other to produce berries.	Evergreen
Privet *Ligustrum vulgare*	3m	Leaves: Green, Flowers: White, Berries: Small black berries	Flowers: July.	24 species of insects/mites, nectar for the butterflies. Berries eaten by birds.	Hedgerows and scrub, especially on base rich soil. Plant hardwood cuttings in the open in late autumn.	Deciduous or semi-evergreen in mild areas.
Shrubby Cinquefoil *Potentilla fruticosa.*	1m	Leaves: Green, Flowers: Yellow.	Flowers May to September.	Nectar source for bees and butterflies	Well-drained soil in full sun or light shade. Semi-ripe cuttings in a cold frame in summer.	Deciduous
Blackthorn *Prunus spinosa*	4m	Leaves: Green, Flowers: White, Berries: Blue/black.	Flowers: spring.	Good for nesting birds if grown as thicket or in hedge. Rich in insects. Fruit for birds. Black hairstreak butterfly lays its eggs mainly on blackthorn.	Well-drained soil preferably in a sunny location.	Deciduous
Buckthorn *Rhamnus catharticus*	5m	Leaves: Yellow green, Flowers: Yellow/green, Berries: Black. Stems with spines.	Flowers: May to June	Larval food plant for brimstone butterfly.	Damp, peat or base-rich soils.	Deciduous
Dog Rose *Rosa canina*	3-4m	Leaves: Green , Flowers: Pink/white, Hips: Red.	Flowers: June to July. Hips: autumn	Provides nectar for bees and butterflies. Hips good for small birds and mammals.	Dislikes wet or exposed sites Can tolerate poor fertility.	Deciduous
Sweet Briar *Rosa rubiginosa*	240 x 240cm	Leaves: Green , Flowers: Pink, Hips: Red/orange.	Flowers: mid summer. Berries: autumn	Hips food source for small mammals and birds. Good nesting cover.	Prefers sun and well drained soil.	Deciduous

Raspberry *Rubus idaeus*	1.5-2.5m	Leaves: Green with thorns on underside, Flowers White, Berries: Red, Stems also have thorns.	Flowers May to August with berries following.	Nectar source for bees and butterflies. Berries for birds and mammals.	Any reasonable soil in full sun or partial shade.	Deciduous shrub
Gorse *Ulex europaeus*	2-2.5m	Leaves: Thin and spiky, green in colour, Flowers: Yellow.	Autumn flowers, can flower throughout the year.	29 species of insect. Provides good protection for birds nests frequently used by linnets, whinchats and stonechats.	Sandy or peaty well-drained soil in full sun. Grassland, heathland and open woods. Plant semi-ripe cuttings in a cold frame in summer.	Evergreen
Wayfaring Tree *Vibernum lantana*	3m	Leaves: Green, Flowers: Whitish yellow, Berries: Red then becoming black.	Flowers in June to July.	Berries for birds and nectar for insects.	Most soils especially base rich.	Deciduous
Guelder Rose *Viburnum opulus*	300 x 250cm	Leaves: Green, Flowers: White, Berries: Bright red.	Flowers: May to June. Berries: autumn	Nectar for insects, particularly hoverflies. Fruits for birds and small mammals, especially liked by woodmouse. Note: leaves, bark and berries are all poisonous.	Plant semi-ripe cuttings in a cold frame in summer.	Deciduous
Introduced Shrubs						
Juneberry *Amelanchier lamarkii*	To 6m	Leaves: Pink when unfolding, turning green then yellow-brown in Autumn, Flowers: White in large quantities, Berries: Round red fruits turning purple when ripe.	Flowers April to May with berries in the summer.	Nectar source for bees and butterflies. Berries for birds.	Full sun or partial shade on light acid soils.	Deciduous

Spotted Laurel *Aucuba japonica*	2-3m	Leaves: Dark green with yellow speckles, leathery in texture, Flowers: Small and white, Berries: Green, ripening to red the following spring	Berries: October-January	Berries for birds.	Sun or deep shade, all soils.	Evergreen
Darwin's Barberry *Berberis darwinii*	To 3m	Leaves: Sharp holly-like green leaves, Flowers: Orange in small clusters, Berries: Blue berries in bunches, Stems: with spines.	Flowers in spring. Berries in autumn.	Berries for birds and nectar for insects. Can provide good nesting cover for small passerines.	Sun or light shade. Various propagation methods. Note: this shrub is a winter host for wheat rust - agricultural fungal pest.	Evergreen
Hooker's Barberry *Berberis hookeri*	To 3m	Leaves: Sharp green leaves, Flowers: Yellow in small clusters, Berries: Black berries in bunches, Stems: with spines.	Flowers in spring. Berries in autumn.	Berries for birds and nectar for insects. Can provide good nesting cover for small passerines.	Sun or light shade. Various propagation methods. Note: this shrub is a winter host for wheat rust - agricultural fungal pest.	Evergreen
Hedge Barberry *Berberis stenophylla*	To 3m	Leaves: Small sharp green leaves, Flowers: Yellow in small clusters, Berries: Blue/black berries in bunches, Stems: with spines.	Flowers in spring. Berries in autumn.	Berries for birds and nectar for insects. Can provide good nesting cover for small passerines.	Sun or light shade. Various propagation methods. Note: this shrub is a winter host for wheat rust - agricultural fungal pest.	Evergreen
Thunberg's Barberry *Berberis thunbergii*	To 1.5m	Leaves: Bright red in Autumn, Flowers: Yellow in small clusters, Berries: Red berries in bunches, Stems: with spines.	Flowers in spring. Berries in autumn.	Berries for birds and nectar for insects. Can provide good nesting cover for small passerines.	Sun or light shade. Various propagation methods. Note: this shrub is a winter host for wheat rust - agricultural fungal pest.	Deciduous

Thunberg's Barberry *Berberis thunbergii 'Atropurpurea'*	To 2m	Leaves: Bronze leaves bright red in Autumn, Flowers: Yellow in small clusters, Berries: Red berries in bunches, Stems: with spines.	Flowers in spring. Berries in autumn.	Berries for birds and nectar for insects. Can provide good nesting cover for small passerines.	Sun or light shade. Various propagation methods. Note: this shrub is a winter host for wheat rust - agricultural fungal pest.	Deciduous
Thunberg's Barberry *Berberis thunbergii 'Atropurpurea Nana'*	60cm	Leaves: Bronze leaves bright red in Autumn, Flowers: Yellow in small clusters, Berries: Red berries in bunches, Stems: Almost spineless.	Flowers in spring. Berries in autumn.	Berries for birds and nectar for insects. Can provide good nesting cover for small passerines.	Sun or light shade. Various propagation methods. Note: this shrub is a winter host for wheat rust - agricultural fungal pest.	Deciduous
Barberry *Berberis vulgaris*	To 3m	Leaves: Green leaves, Flowers: Yellow in small clusters, Berries: Red berries in bunches, Stems: with spines.	Flowers in spring. Berries in autumn.	Berries for birds and nectar for insects. Can provide good nesting cover for small passerines.	Sun or light shade. Various propagation methods. Note: this shrub is a winter host for wheat rust - agricultural fungal pest.	Deciduous
Alternate-Leaved Butterfly-Bush *Buddleia davidii*	Willow like shrub to 8m	Leaves: Green , Flowers: Lilac found on long drooping stems covered in globular shaped flower bunches, Seeds: Found in the flower heads which stay on the plant for most of the winter.	Flowers July to September	Nectar for bees and butterflies. The best bush available for butterflies especially if planted in a sun trap.	Dryish soil in full sun or partial shade. Plant semi-ripe cuttings in a cold frame in summer or plant hardwood cuttings in the open in late autumn.	Deciduous

Buddleia (butterfly-bush) *Buddleia davidii*	300 x 180cm	Leaves: Dark green above with a lighter hairier underside, Flowers: Long spikes with a lavender colour, Seeds: Found in the flower heads which stay on the plant for most of the winter.	Flowers July to September	Nectar for bees and butterflies. The best bush available for butterflies especially if planted in a sun trap.	Dryish soil in full sun or partial shade. Plant semi-ripe cuttings in a cold frame in summer or plant hardwood cuttings in the open in late autumn.	Deciduous
Orange Ball Tree *Buddleia globosa*	To 5m	Leaves: Dark green above with a lighter hairier underside, Flowers: Orange in a globular shape, Seeds: Found in the flower heads which stay on the plant for most of the winter.	Flowers May to June	Nectar for bees and butterflies.	Dryish soil.	Deciduous to semi-evergreen
Weyer's Butterfly-Bush *Buddleia weyeriana*	300 x 180cm	Leaves: Green, Flowers: Yellow found on inflorescence which is interrupted with spaces slightly globular in shape, Seeds: Found in the flower heads which stay on the plant for most of the winter.	Flowers May to June	Nectar for bees and butterflies. Flowers slightly later then *davidii* attracting the butterflies from these bushes.	Dryish soil in full sun or partial shade. Plant semi-ripe cuttings in a cold frame in summer or plant hardwood cuttings in the open in late autumn.	Deciduous to semi-evergreen
Blue Spiraea *Caryopteris clandonensis*	1m	Leaves: Blue/green, Flowers: Blue in clusters.	Flowers, September to October.	Provides a late source of pollen and nectar.	Requires well-drained soil in full sun.	Deciduous
Californian Lilac *Ceanothus 'Autumnal Blue'*	1.8 x 1.8+m	Leaves: Green and shiny, Flowers: Purple in clusters.	Flowers in July to October.	Nectar for bees and butterflies.	Fertile soil in a sunny location.	Evergreen

Californian Lilac *Ceanothus 'Gloire de Versailles'*	1.8 x 1.8m	Leaves: Dark green and shiny, Flowers: Light blue in clusters.	Flowers in July to October.	Nectar for bees and butterflies.	Fertile soil in a sunny location.	Deciduous
Japanese Quince *Chaenomeles japonica*	1m	Leaves: Green , Flowers: Red, Fruits: Large, golden brown.	Flowers March-May followed by fruits which ripen in October.	Berries for birds and mammals.	Full sun	Deciduous
Quince variety *Chaenomeles speciosa*	Bush to 1.5m or train as a Climber to 3m x 30cm thick	Leaves: Green sparser then *japonica* , Flowers: depends on variety, Fruits: Large, golden brown.	Flowers March-May and the fruits ripen in October.	Nectar source for bees and butterflies. Berries for birds and mammals. Good for birds to nest in as branches are sturdy with spines to deter cats.	Sun or shade.	Deciduous
Smoke Bush Cotinus coggygria	3m	Leaves: Green turning orange or red in autumn, Flowers: Light pink feathery flowers.	Flowers June - July	Good for bees and birds	Sandy infertile soil best, full sun preferred.	Deciduous
Cotoneaster 'Coral Beauty' *Cotoneaster conspicuous 'Decorus'*	Spreading shrub To 1.5m	Leaves: Small green, Berries: Red.	Berries October to January.	Berries good for birds and small mammals. Nectar for invertebrates.	Any reasonable soil, preferably in good sun. Plant semi-ripe cuttings in a cold frame in summer.	Evergreen
Francchet's Cotoneaster *Cotoneaster franchetii*	To 3m	Leaves: Small green and glossy with silvery hairy underneath, Flowers: Light Purple, Berries: Orange.	Berries October to January.	Berries good for birds and small mammals. Nectar for invertebrates.	Any reasonable soil, preferably in good sun. Plant semi-ripe cuttings in a cold frame in summer.	Semi-evergreen

Cotoneaster *Cotoneaster frigidus*	To 8m	Leaves: Small green and glossy, Flowers: White, Berries: Red.	Berries October to January.	Berries good for birds and small mammals. Attracts waxwings and pheasants.	Plant semi-ripe cuttings in a cold frame in summer.	Deciduous to semi-evergreen
Daphne *Daphne odora*	1m	Leaves: Dark green, Flowers: Bright pink.	Flowers in February to April	Early source of nectar for insects.	Well-drained humus-rich soil in full sun or light shade.	Evergreen
Broad-leaved Oleaster *Elaeagnus macrophylla*	To 3m	Leaves: Silvery when unfolding turning dark glossy green, Flowers: Creamy yellow bell shaped, Berries: Red	Flowers in October to November.	Provides a late source of pollen and nectar.	Any reasonable soil, preferably in good sun.	Evergreen
Spreading Oleaster *Elaeagnus umbellata*	2-6m	Leaves: Silvery when unfolding turning bright green, Flowers: Creamy yellow bell shaped, Berries: Red	Fragrant flowers in May to June. Berries in October to December.	Provides nectar for bees and butterflies, and food for wild birds	Any reasonable soil, preferably in good sun.	Deciduous
Escallonia *Escallonia macrantha*	1-3m (Species dependent)	Leaves: Dark green and glossy, Flowers: Pinkish red, Berries:	Flowers June to September	Provides nectar for bees and butterflies.	Full sun or light shade.	Evergreen
Fuchsia *Fuchsia magellancia*	2-3m	Leaves: Dark green leaves, Flowers: Purple and red.	Flowers: July to October	Attracts bees.	Full sun or light shade.	Deciduous
Hebe *Hebe spp.*	80cm		Flowers May-September (depending on variety).	Food source for 26 species of butterfly including the Speckled Wood	Well-drained soil in full sun. Plant semi-ripe cuttings in a cold frame in summer.	Evergreen
Hebe *Hebe albicans.*	30cm x 90cm	Leaves: Small and Green, Flowers: White	Flowers in June to July.	Nectar for bees and butterflies.	Well-drained soil in full sun. Plant semi-ripe cuttings in a cold frame in summer.	Evergreen

Hebe *Hebe andersonii 'variegata'.*	To 2m	Leaves: Small and Green, Flowers: Mauve	Flowers in August to September.	Good for invertebrates with a late supply of nectar	Well-drained soil in full sun. Plant semi-ripe cuttings in a cold frame in summer.	Evergreen
Hebe *Hebe brachysiphon.*	To 2m	Leaves: Small and Green, Flowers: White	Flowers in June to July.	Nectar for bees and butterflies.	Well-drained soil in full sun. Plant semi-ripe cuttings in a cold frame in summer.	Evergreen
Hebe *Hebe salicifolia.*	90-150cm	Leaves: Small and Green, Flowers: White	Flowers in June to September.	Nectar for bees and butterflies.	Well-drained soil in full sun. Plant semi-ripe cuttings in a cold frame in summer.	Evergreen
Shrubby Helichrysum *Helichrysum italicum*	60cm	Leaves: Grey-green silvery leaves, Flowers: Yellow.	Yellow flowers in June to August.	Nectar source for bees and butterflies	Well-drained sandy soil in full sun.	Evergreen
Hydrangea *Hydrangea spp.*	1-2.5m	Leaves: Green, Flowers: Depends upon species/varieties.	Flowers July to September	Provides nectar for bees and butterflies.	Well-drained fertile soil in full sun. needs watering through dry spells.	Deciduous
St. John's Wort aka 'Rose of Sharon' *Hypericum calycinum*	To 1m	Leaves: Green turning red in autumn, Flowers: Yellow, Berries: Red	Flowers June to October.	Flowers attract insects especially bees. Berries are eaten by birds and small mammals.	Full sun or light shade. Plant semi-ripe cuttings in a cold frame in summer.	Semi-evergreen
Hyssop *Hyssopus officinalis*	60cm	Leaves: Green, Flowers: Small blue flowers on spikelets.	Low evergreen shrub	Attractive for some butterflies	Well-drained fertile soil in full sun.	Semi-evergreen
Holly 'Golden King' *Ilex altaclerensis*	300 x 150+ cm	Leaves: Glossy green with yellow borders and small spines, Flowers: Small pink/white, Berries: Bright red.	Flowers: May. Berries: (only on female trees) October to December.	Berries good for birds and small mammals. Holly leaf miner provides winter food for birds.	Any reasonable soil in full sun or partial shade. Need male and female plants near each other to produce berries.	Evergreen
Lavender *Lavandula angustifolia*	75 x 75 cm	Leaves: Greyish-green, Flowers: Blue/purple.	Flowers: July to September	Attracts butterflies	Plant semi-ripe cuttings in a cold frame in summer.	Evergreen

Oregon Grape *Mahonia aquifolium*	1m	Leaves: Green and glossy with small spikes, Flowers: Yellow.	Flowers March to April	Nectar for bees and butterflies.	Thrives best in partial shade.	Evergreen
Daisy Bush *Olearia haastii*	1-2m	Leaves: Green and glossy, Flowers: White.	Flowers white, July to August	Nectar for bees and butterflies.	Well drained soil in full sun.	Evergreen
Russian Sage *Perovskia atriplicifolia*	1m	Leaves: Greyish-green, Flowers: Blue/purple.	Flowers: August to October	Good for bees	Full sun essential	Deciduous
Mock Orange *Philadelphus coronarius*	1.5-3m	Leaves: Yellow and green, Flowers: White.	Flowers June to July.	Nectar for bees and butterflies.	Full sun.	Deciduous
Firethorn *Pyracantha atalantioides*	3m	Leaves: Dark green, Flowers: White, Berries: Red/orange	Berries: October-January	Good for nesting thrushes and a site or an open robin box. Nectar for bees, berries for birds.	Thrives in most good soils.	Evergreen
Firethorn *Pyracantha coccinea*	To 3.5m	Leaves: Dark green, Flowers: White, Berries: Red/orange	Berries: October-January	Good for nesting thrushes and a site or an open robin box. Nectar for bees, berries for birds.	Thrives in most good soils.	Evergreen
Black Current *Ribes nigrum*	2m	Leaves: Green , Flowers: Pink, Berries: Black.	Flowers: April.	Good for bees, birds and small mammals	Thrives in full sun or partial shade.	Deciduous
Ornamental Current *Ribes odoratum*	2m	Leaves: Green turning purple in Autumn, Flowers: Yellow, Berries: Black.	Flowers: April.	Good for bees and birds	Thrives in full sun or partial shade.	Deciduous
Flowering Currant *Ribes sanguineum*	2m x 1.5m	Leaves: Green , Flowers: Pink, Berries: Black.	Flowers March to April	Provides nectar for bees and butterflies.	Full sun or light shade.	Deciduous

Rosemary *Rosemarinus officinalis*	1.5m	Leaves: Green and thin, Flowers: Lilac.	Flowers April to May.	Nectar source for bees and butterflies	Well-drained soil in full sun.	Evergreen
Blackberry *Rubus fruticosus*	Sprawling plant 1.5-2.5m	Leaves: Green with thorns on underside, Flowers White, Berries: Red turning black when ripening	Flowers May to September with berries following the flowers until mid September.	Nectar source for bees and butterflies. Berries for birds and mammals.	Any soil in full sun or partial shade. Can be very invasive.	Deciduous shrub
Loganberry *Rubus loganobaccus*	1.5-2.5m	Leaves: Green with thorns on underside, Flowers White, Berries: Dark red, Stems also have thorns.	Flowers May to August with large berries following.	Nectar source for bees and butterflies. Berries for birds and mammals.	Any reasonable soil in full sun or partial shade.	Deciduous shrub
Shrubby Ragwort *Senecio greyi*	1m	Leaves: Bluish green upper with silvery hairy underside, Flowers: Yellow.	Flowers in June.	Nectar source for bees and butterflies	Well-drained soil in full sun.	Evergreen
Skimmia *Skimmia japonica*	To 1m	Leaves: Dark glossy green, Flowers: White, Berries: Red (but only if male and female trees are located near each other).	Flowers in April to May.	Nectar source for bees and butterflies	Well-drained, neutral to acid soil in full sun or partial shade.	Evergreen
Bridal Wreath *Spiraea arguta*	2m	Leaves: Green, Flowers: Masses of white flowers.	Flowers April to May	Nectar for bees and butterflies.	Full sun on most soils	Deciduous
Snowberry *Symphoricarpos albus*	1-2m	Leaves Green, Flowers: Small and pink in terminal spikes, Berries: White.	Flowers: June to September.	Caterpillars of the death's head hawk moth feed on the leaves. Good ground cover. Birds may feed on the berries when other food is scarce.	Forms dense thickets unless regularly pruned.	Deciduous

Lilac *Syringa vulgaris*	150 x 300cm	Leaves Green, Flowers: Colour depends on variety, in terminal spikes.	Flowers May to June	Nectar for bees and butterflies.	Best in full sun.	Deciduous
Viburnum *Viburnum bodnantense*	1-2.5m	Leaves: Green, Flowers: Pink.	Flowers January to March.	Provides early nectar source for invertebrates and berries for birds. One of the most valuable winter flowering shrubs.	Sun or shade in most soils.	Deciduous
Laurustinus *Viburnum tinus*	2-6m	Leaves: Green, Flowers: White to pink, Berries: Blue/black.	Flowers November - February	Provides late nectar source for invertebrates and berries for birds.	Sun or shade in most soils.	Evergreen
Weigela *Weigela florida*	1.2m x 1.2m	Leaves: Green or green with yellow tinges (variety dependant), Flowers: Pink.	Flowers May to June	Provides nectar for bees and butterflies.	Rich, moist soils in full sun or partial shade.	Deciduous
Native Herbaceous						
Teasel *Dipsacus fullonum*	2m	Leaves: Green, Flowers: Light purple.	Flowers: July to August.	A food source of the Brimstone butterfly. Attracts other insects for its nectar and birds for its seeds.	Well-drained soil in full sun or light shade.	Biennial
Purple Loosestrife *Lythrum salicaria*	To 1.8m	Leaves: Green, Flowers: Purple.	Flowers in June to September.	Provides nectar for bees and butterflies.	Humus-rich soil in full sun or light shade with plenty of water, preferably boggy.	Border perennial
Musk Mallow *Malva moschata*	60cm	Leaves: Green Flowers: Pink	Flowers between July and August.	Provides nectar for bees and butterflies.	Well-drained soil in full sun.	Border perennial
Cat-mint *Nepeta cataria*	60-90cm	Leaves: Green above, white below. Flowers: White	Flowers July to September	Berries for birds and nectar for insects.	Well-drained soil in full sun.	Perennial

Wild Marjoram *Origanum vulgare*	50-70cm	Leaves: Green Flowers: Pale pink	Flowers July to September	Good plant for butterflies and bees	Dry soil preferably on calcareous soil.	Perennial
Tormentil *Potentilla erecta*	30-45cm	Leaves: Green, Flowers: Yellow.	Flowers June to September	Good plant for butterflies and bees	Well drained soil preferably acidic.	Perennial
Goldenrod *Solidago virgaurea*	70-100cm	Leaves: Green. Flowers: Yellow	Flowers July to September	27 species of lepidoptera.	Open woodland, grassland and hedgerows. Well-drained soil. Full sun or light shade.	Perennial
Betony *Stachys officinalis*	To 60cm	Leaves: Green. Flowers: Pink/purple	Flowers June to September	Nectar source for bees and butterflies	Well-drained soil in full sun or partial shade.	Border perennial
Common Valerian *Valeriana officinalis*	Stems to 1m	Leaves: Green. Flowers: Pink/white.	Flowers June to September	Provides nectar for bees and butterflies.	Dry or damp grassy or rough ground.	Perennial
Introduced Herbaceous						
Rockery Alyssum *Alyssum saxatile*	20cm	Leaves: Green, Flowers: Bright yellow.	Flowers April to June	Provides nectar for bees and butterflies.	Grows well in poor, well-drained soil in full sun. It can soon spread if left unchecked.	Perennial
Michaelmas Daisy *Aster novae-belgii*	To 75cm	Leaves: Green, Flowers: Dark pink.	Dark pink flowers in September to October.	Good for invertebrates with a late supply of nectar.	Well-drained soil in full sun. Needs watering in dry weather.	Border perennial
Perennial Wallflower *Erysimum 'Bowles Mauve'*	To 75cm	Leaves: Dark green, Flowers: Mauve.	Blooms nearly all year round.	Provides nectar for insects.	Well-drained non-acid soil in full sun.	Evergreen perennial
Dame's-violet *Hesperis matronalis*	60-100cm	Leaves: Green Flowers: Pink	Flowers May to July.	Very good nectar source for bees and butterflies.	Well-drained soil in full sun or partial shade.	Border perennial

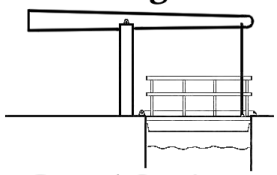
Candytuft *Iberis sempervirens*	20cm high with 60cm spread.	Leaves: Dull yellowish green, Flowers: White.	Flowers May to June	Very good nectar source for bees and butterflies.	Well-drained soil in full sun.	Rocky perennial
Golden Rays aka Leopardplant *Ligularia dentata*	To 1m	Leaves: Bluish green, Flowers: Yellow.	Flowers July to September	Provides nectar for bees and butterflies.	Humus-rich soil in light shade with plenty of water, preferably boggy.	Border perennial
Ice Plant *Sedum spectabile*	60 x 30cm	Leaves: Grey/green. Flowers: Pink	Flowers, June to October.	Provides nectar for bees and butterflies. The plant is extremely good for butterflies.	Average garden soil in full sun	Perennial
Nasturtium *Tropaelumm majus*	1.8m	Leaves: Green. Flowers: Red, orange and yellow.	Flowers: June-October	Good for bees and beetles. Seeds eaten by birds and small mammals. Good insect plant.	Plant in sun or partial shade. Likes poor soil.	Climbing annual
Native Climbers						
Clematis 'Old Mans Beard' *Clematis vitalba*	Climber to 30m	Leaves: Green. Flowers: White/green	Flowers in July	Provides nectar for bees and butterflies.	Prefers calcareous and alluvial soils	Deciduous
Ivy *Hedera helix*	Climber	Leaves: Dark green, shiny. Flowers: Green/yellow. Berries: Black	Flowers October to November.	Provides late nectar source and cover/hibernating sites for invertebrates. Food source for the Holly Blue butterfly larva.	Trees, banks, rocks and crawling over the floor. Thrives in shade. Remove and plant rooted runners in spring.	Evergreen
Hop *Humulus lupulus*	Climber to 8m	Leaves: Yellowish-green, Flowers: Small yellowish brown.	Flowers July to August	Provides nectar for bees and butterflies.	Well-drained soil in full sun or light shade.	Perennial
Honeysuckle *Lonicera periclymenum*	Climber to 6m	Leaves: Dark green on top and bluish underneath. Flowers: red outside cream within Berries: Bright red.	Flowers July to August	Excellent food source for invertebrates including the Speckled Wood butterfly. Berries eaten by birds.	Woods, scrub and hedges. Sun or light shade. Plant semi-ripe cuttings in a cold frame in summer or Layer stems in spring	Deciduous

Introduced Climbers						
Everlasting Pea *Lathyrus latifolius*	Spreading climber to 1.8m.	Leaves: Green, Flowers: Pink-purple. Has long thin seed pods.	Flowers in July to September.	Provides nectar for bees and butterflies.	Well-drained soil in full sun or light shade.	Border perennial
Japanese Wisteria *Wisteria floribunda*	Climber (needs tying)	Leaves: Yellowish-green Flowers: Blue-purple in large drooping clusters.	Flowers early to mid summer but may not flower for the first year or two.	Provides nectar for bees and butterflies.	Well-drained soil in full sun or light shade. Needs plenty of space.	Evergreen

Appendix E

Buckingham Canal Society: Health and Safety Policy Statement

Buckingham



Canal Society

Registered Charity No 1072924

BUCKINGHAM CANAL SOCIETY

HEALTH & SAFETY POLICY STATEMENT

Version 1.0 : 13 October 2011

1 BUCKINGHAM CANAL SOCIETY'S COMMITMENT TO HEALTH & SAFETY

1.1 Buckingham Canal Society (BCS) believes that its members and volunteers are its most important assets. The Society is committed to ensuring that, so far as is reasonably practical, all our activities are carried out in such a way as to safeguard the health, safety and welfare of anyone and everyone associated with, or affected by them. This includes all work sites, indoor premises, vehicles and any other operation. All staff, committee members and key volunteers will be made aware of the Health and Safety Policy and are expected to comply with that policy. The Society will work to provide a safe and healthy working environment for all our volunteers, members and others (eg, visitors, contractors, members of the public, etc).

2 STATEMENT OF INTENT

BCS will work to meet this commitment by:

2.1 promoting a genuine awareness of Health, Safety and Welfare matters;

2.2 using its best endeavours to prevent accidents and cases of work related ill health and providing adequate control of health and safety risks arising from volunteering activities

2.3 co-operating closely with land owners, Inland Waterways Association, Waterway Recovery Group, Local Councils, British Waterways (and its successors), Environment Agency, Health & Safety Executive and safety advisers to ensure, so far as is reasonably practical, that procedures and practices are satisfactory and fit for purpose;

2.4 providing a safe and healthy working environment, with suitable welfare and first-aid facilities;

2.5 maintaining plant, equipment and machinery and ensuring safe storage and use of substances;

2.6 maintaining a register of active work site volunteers including emergency contact details;

2.7 engaging and consulting with members and volunteers on day-to-day health and safety conditions and providing advice and supervision on occupational health;

2.8 implementing emergency procedures in the event of fire or other significant incident;

2.9 displaying the Health and Safety Law poster at each work site;

2.10 providing a first-aid box and accident reporting instructions at each work site;

2.11 providing competent people to advise staff and others on meeting its obligations;

2.12 providing sufficient skilled supervision, relevant instructions and appropriate training to all levels, in both health and safety and job specific skills.

2.13 identifying and assessing significant hazards to which people will be exposed prior to construction/restoration works and/or operational activities, and use specific measures communicated by way of defined method statements to eliminate or reduce the risks arising from them;

2.14 continuing to build develop, adopt and review a body of safe and healthy working practices, safety precautions and accident prevention procedures, which will comprise a BCS Health & Safety Plan/File;

2.15 making every reasonable effort to ensure that all members, volunteers, visitors and contractors comply with relevant health and safety requirements, including the use of Personal Protective Equipment and Safety Equipment as required in the identified Risks and documented method statements;

2.16 consulting with the BCS committee when any new or changed safety procedures are being introduced or planned or suggested by members and volunteers. Agreed changes will be incorporated into the developing Health and Safety Plan/File, including any caveats from third party organizations;

2.17 monitoring the developing Health and Safety Plan/File, including collecting and analysing information on accidents, incidents and task-related ill-health and revising it when necessary. Formal reviews shall take place every 12 (twelve) months and shall be signed by competent officers of the Buckingham Canal Society.

2.18 Keeping this policy under review and revising it when necessary.

3 ROLES AND RESPONSIBILITIES FOR HEALTH & SAFETY POLICY IMPLEMENTATION

3.1 Committee

The BCS Committee has overall responsibility for Health & Safety. In particular the committee:

3.1.1 shall ensure there is an effective Health & Safety policy;
3.1.2 shall give full support to this policy and any person implementing it;
3.1.3 shall ensure the necessary resources are made available;
3.1.4 give guidance and support to the Health and Safety Officer;
3.1.5 facilitate lines of communication (committee to Health and Safety Officer to Work Party Leaders to all others and in reverse);
3.1.6 shall periodically inspect and check standards are being implemented and that the Policy is effective;
3.1.7 monitor the Health and Safety Plan/File annually;
3.1.8 countersign all Standard Risk Assessments;
3.1.9 shall set a good example on Health and Safety matters.

3.2 Health and Safety Officer

The Health and Safety Officer will be appointed by the committee and is responsible for the execution of this policy. In particular they will:

3.2.1 ensure the policy is implemented and arrange preparation of H&S Plans for all construction, restoration, and operational activities;

3.2.2 develop, maintain and update a Health and Safety File which includes all relevant documentation, and which accords with the Buckingham Canal Society Health and Safety Policy and all current legislation;
3.2.3 keep up to date with legislation and guidance on Health and Safety;
3.2.4 consult and communicate with all interested parties (staff, members, volunteers, contractors and public) on matters affecting their health and safety so enabling BCS to meet its legal responsibilities;
3.2.5 ensure staff and key volunteers are fully aware of their responsibilities under this policy, are correctly trained and certified in all relevant areas and that training is reviewed regularly;
3.2.6 ensure inspections, risk assessments and records are up-to-date;
3.2.7 ensure regular servicing, maintenance and certification of plant, tools and equipment is carried out in accordance with recommended procedures;
3.2.8 ensure fire precautions are in place;
3.2.9 ensure that adequate and appropriate Employer's and Public Liability insurances are in place and renewed annually;
3.2.10 be responsible for ensuring sufficient key volunteers have relevant and up-to-date first aid qualifications;
3.2.11 investigate, record and report all accidents and incidents;
3.2.12 report, record and analyse training, procedures and incidents to the committee annually;
3.2.13 write and review risk assessments for all activities;
3.2.14 ensure policy, guidelines and Risk Assessments are disseminated to all interested parties (via email, web-site, meetings etc);
3.2.15 set a good example on Health and Safety matters.

3.3 Work Party Leaders

Work Party Leaders shall:
3.3.1 ensure their staff/volunteers are aware of the contents of this Health and Safety Policy and H&S Plans;
3.3.2 identify any training needs;
3.3.3 follow day-to-day health and safety compliance;
3.3.4 ensure adequate and appropriate provision of Personal Protective Equipment and Safety Equipment is available to all volunteers;
3.3.5 ensure additional hazards, accidents and near-misses are reported to the Health and Safety Officer;
3.3.6 through active management and training recognise the worth of volunteers;
3.3.7 set a good example on Health and Safety matters.

3.4 All employees, members and volunteers

All members and volunteers are expected to take reasonable care of their own Health and Safety and that of others who may be affected by their actions. In particular they should:
3.4.1 comply and co-operate with BCS procedures and Health and Safety rules;
3.4.2 identify and report building and equipment defects, problems and other concerns;
3.4.3 report additional hazards, accidents and near-misses to the Work Party Leader;
3.4.4 complete additional specific Risk Assessments as required by the Work Party Leader or Health and Safety Officer;
3.4.5 not interfere with or misuse anything provided for their health, safety or welfare;
3.4.6 use correctly all work items provided in accordance with their training and the instructions they receive to enable them to use those items safely;
3.4.7 not undertake any work for which they do not feel they have been properly trained.

4 CONTACTS AND REPORTING

4.1 For correspondence and reporting purposes the contact is The Secretary, Buckingham Canal Society, 16 Mallard Drive, Buckingham, MK18 1GJ

4.2 BCS policy is to comply with the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR 1995).

4.3 BCS views accident investigation as a valuable tool in the prevention of future incidents. In the event of an accident resulting in injury a report will be drawn up by the Work Party Leader detailing:

- 4.3.1 The circumstances of the accident including photographs and diagrams wherever possible
- 4.3.2 The nature and severity of the injury sustained
- 4.3.3 The identity of any eye witnesses
- 4.3.4 The time, date and location of the incident
- 4.3.5 The date of the report

4.4 All eyewitness accounts will be collected as near to the time of the accident as is reasonably practicable.

4.5 The completed report will then be submitted to and analysed by the BCS Committee who will attempt to discover why the accident occurred and what action should be taken to avoid a recurrence of the problem.

4.6 If deemed necessary the BCS Committee will submit the report to the company's insurance providers.

4.7 A follow up report will be completed after a reasonable period of time examining the effectiveness of any new measures adopted.

5 ACCIDENT PROCEDURE

5.1 A first aid box is carried to all work sites by the Work Party Leader who will be a qualified first aider

5.2 Only minor injuries (ie where there is no significant risk to the patient) will be treated at the work site, by the Work Party Leader or other person whose First Aid qualifications are recognised by the BCS Committee.

5.3 The nearest casualty departments are situated at:

- 5.3.1 Northampton General Hospital, Cliftonville Road, Northampton NN1 5BD - tel 01604 634700
- 5.3.2 Milton Keynes Hospital, Standing way, Eaglestone, Milton Keynes MK6 5LD - tel 01908 660033

5.4 The Health and Safety Officer is responsible for reporting cases of accident and disease to the relevant enforcing authority under the RIDDOR 1995 Regulations where applicable.

6 APPROVAL

This Health & Safety Policy was approved by the committee of the Buckingham Canal Society on 12 October 2011

Appendix F

Central Network Utility Search and mitigation

terry cavender bt

From: Payne, Darren [Darren.Payne@central-networks.co.uk]
Sent: 28 March 2011 11:41
To: terry cavender bt
Subject: RE: GS6 OVERHEAD WORKING CLEARANCES

Hi Terry

I have no objections, regards the works detailed below in your email.
Please don't hesitate to call or email if any assistance is required.

Regards

Darren Payne
Proximity & EMF Engineer
Central Networks
M: +44 (0) 7720 555238
darren.payne@central-networks.co.uk

Central Networks
Pegasus Business Park, East Midlands Airport
Castle Donington
Derbyshire, DE74 2TU
www.central-networks.co.uk

From: terry cavender bt [mailto:terry.cavender@btinternet.com]
Sent: Sunday, March 27, 2011 5:01 PM
To: Payne, Darren
Subject: RE: GS6 OVERHEAD WORKING CLEARANCES

Hi Darren

I trust you are well

Following on from our meeting back in February, we have now dug a trial hole at the site for the canal restoration as discussed and I attach some of the photos we have taken

The cable markers are at a depth of 2.1m below the surface of the infilled canal and the cable is 0.5m deeper still (i.e. at 2.6m) so I plan for a method statement tot eh effect that no mechanical excavation will occur deeper than

1.5m within the 2m either side of the cable for its passage across the site (we will obvious also work to the other advice regarding overheads etc)

Please can you confirm that this would seem acceptable

Many thanks

Terry Cavender

Akeley Parish Councillor - www.akeleyparishcouncil.gov.uk

Buckingham Canal Society - Partnership Manager

Buckingham Canal Society website www.buckinghamcanal.org.uk ✉ terry.cavender@buckinghamcanal.org.uk

7 Buckingham Road, Akeley, Buckinghamshire MK18 5HL

☏ +44 1280 860316 (Home) +44 7976 629440 (Mobile)

✉ terry.cavender@btinternet.com personal website: www.terrycavender.com

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From: Payne, Darren [mailto:Darren.Payne@central-networks.co.uk]
Sent: 28 February 2011 15:41
To: terry.cavender@btinternet.com
Subject: GS6 OVERHEAD WORKING CLEARANCES

e·on | Central Networks

OHPLG:0019795

Avoiding Danger From Overhead Electric Power Lines
Essential Information

Suitable clearances can be achieved	The information in the table below should be referred to in conjunction w all works in proximity of Overhead Lines				
Site: **FIELD OFF A413** **GRID REF:470.92km / 233.87km**	**Voltage of Overhead Line**	**Height of Overhead Line taken by (C/N)**	**Maximum Safe working height**	**Min. horizontal clearance to be maintained from outside conductor**	**Min. safety clearance from conduc**
A			**33,000V**	**7M**	**4M**	**3**
B			**11,000V**	**8.65M**	**5.65M**	**3**
C						

D					
Additional	**1,3,4,5,6&7**				
Precautions	**MIN 3M FROM POLE MOUNTED TRANSFORMER (B)**				
Central Networks :-	**Name: D PAYNE**	**Date:28/2/11**			

1	**Suitable fencing and barriers in accordance with HSE• Guidance Document GS6 are required to c a safe working zone and prevent any unauthorized crossing points**
2	**Goal posts in accordance with HSE Guidance Document GS6 are required. The maximum height c crossbar must not exceed the maximum working height indicated in the table.**
3	**"Danger Overhead Electric Power Cables" signs should be erected and maintained at prominent positions to warn workers of the danger area.**
4	**The height of vehicles (including their loads) passing under the line must not exceed the maximu working height indicated in the table.**
5	**People working in the vicinity should understand the hazard and control measures they must take avoid contact with the overhead electricity power lines.**
6	**Close supervision of people and/or machinery passing or working under the overhead electricity power lines is required to ensure their safety.**
7	**Any plant or machinery that can encroach the minimum safety clearance to the overhead electrici power line should be fitted with mechanical or electronic restrictors.**
8	**Cranes should be positioned such that they cannot topple into the over head electricity power lin loads controlled so that the minimum safety clearance is not breached.**
9	**Excavations must not encroach within 3 metres of any poles or stays to ensure their supporting ground is not disturbed.**

Ground-level barriers

Ground-level barriers can be constructed using:

• Posts and rail fences;

• a high-tension wire fence earthed at both ends (this should have warning flags or flicker tape on the wire so that it is clearly visible),

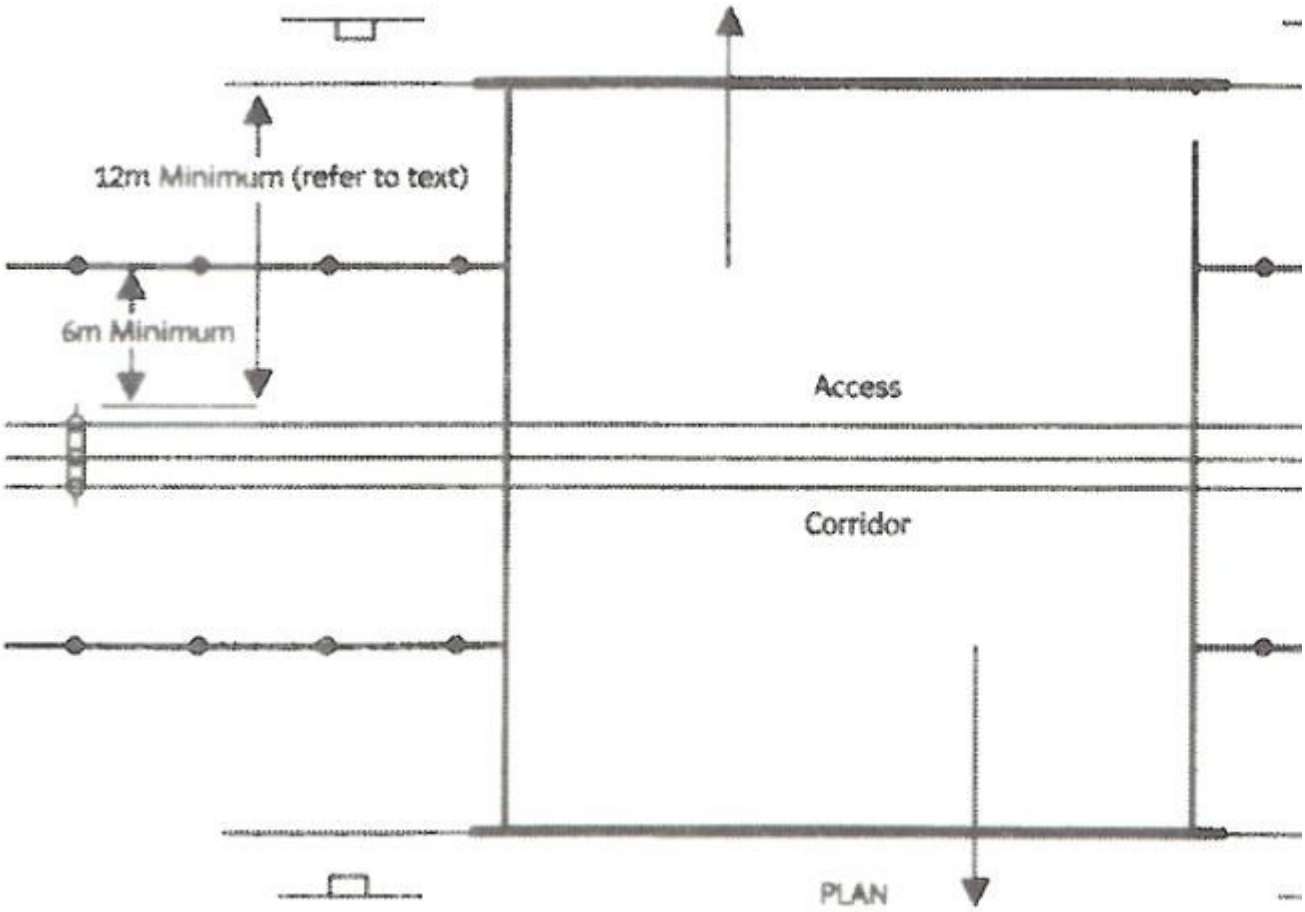
• large steel drums, such as 182 litre oil drums, brightly painted, filled with rubble and placed at frequent intervals,

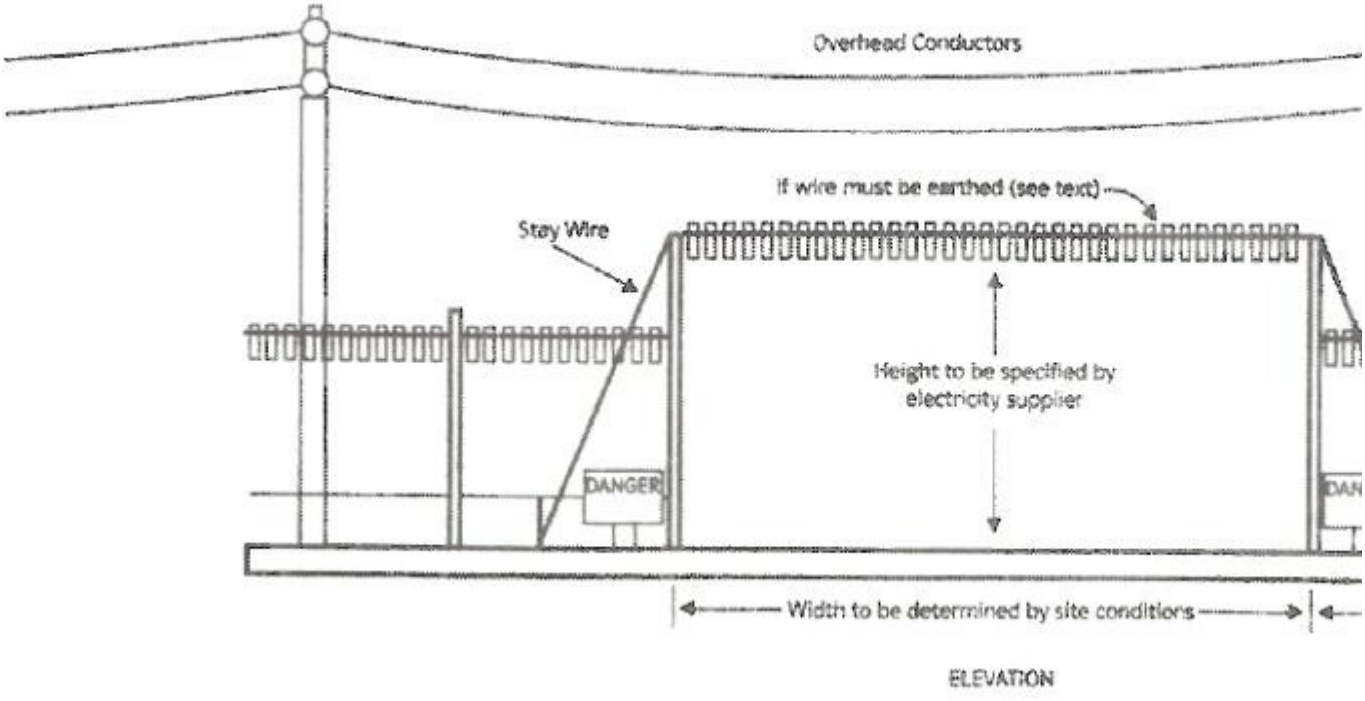
- An earth bank at least 1 m high and marked by posts,

• Timber baulks which act as wheel stops.

Ground-level barriers must be easy to see. If steel drums are used, paint them with red and white horizontal stripes, or use red and white alternating flags on wire fences.
Make sure the barriers will be visible at night, e.g. paint them with white or fluorescent paint or attach reflective strips to them.
Goalposts
Goalposts also need to be highly visible. They should be made out of rigid material which does not conduct electricity such as timber or plastic pipe. Paint them with red and white stripes and in areas of particularly high risk, consider using small flags, bunting
or flicker tape on them as well. -
Place warning signs on goalposts where they will be easy for drivers to see. These should show the height of the crossbar and instruct drivers to keep any extending parts of their machinery lowered.
Goalposts need to be erected at the entrance to any area where machinery or equipment might pass near to OHPLs. The local electricity company can advise on the correct height for the crossbar.
Where barriers should be placed?
If machinery does not have to pass directly under OHPLs then there should be a minimum distance of 6 m

the line and the barrier Remember, these distances are always measured horizontally along the ground OHPL runs.





If machinery or vehicles have to pass beneath lines, then barriers can be used to make a passageway. There should be goalposts to limit the height of vehicles which pass beneath the lines. There may be occasions when work must be

carried out beneath OHPLs, e.g. pipes may have to be laid. In this case, barriers and goalposts must be erected and additional safety measures put in place. HSE and Central Networks can advise how this should be done.

If the Worst Happens

If a machine or its attachments comes into contact with an OHPL, it could be fatal for anyone who touches the machine. Do not rely on rubber tyres or rubber-soled boots for protection - they may not insulate against a high-voltage shock. Tyres can burst into flames and boots can be destroyed.

Keep clear

The driver of a vehicle which comes into contact with OHPLs will usually remain safe in the cab of the vehicle. People are at risk if they make contact with the vehicle and earth. Do not touch the vehicle or anything attached to it.

Get help

You, or someone else, should contact the electricity company and ask them to disconnect the power immediately. If you have a mobile phone or CB radio, use that. You should have the electricity company's telephone number taped into the cab.

Jump!

If you have to leave the cab, jump well clear so that no contact is made between you and the vehicle. Land on your feet, if you can, and RUN! The line could become live again and you could still be close enough to be electrocuted.

Stay clear

Do not go back to the vehicle even if you think it is safe to do so. It could still be live. Nobody should approach the vehicle until the electricity company has confirmed the power is switched off.

Safe operation

If the vehicle is not tangled with the OHPL and can still be operated, back it carefully away until contact is broken. It may also be possible to lower a tipper or withdraw a high-lift attachment - but you need to take extreme care. Do not climb out of the vehicle.

Emergency Number in the event of contact with the Overhead Electricity Power lines or electricity cable damage: 0800 0150921

HSE Guidance Documents

1. HSE Guidance Notes GS6 "Avoidance of danger from overhead power lines" ISBN 0 7176 1348 8 and HS(G)47 "Avoiding danger from underground services" ISBN 0 7176 1744 0 are available from HSE Books, P0 Box 1999, Sudbury, Suffolk, CO10 2WA (telephone 01787 881165) or via the internet at www.hsebooks.com.
2. HSE Agriculture Information Sheets AIS8 'Working safely near overhead power lines' AIS6 "Safe use of combine harvesters' and
INDG389 "SHOCK HORROR - safe working near overhead power lines" are available free of charge from the HSE Internet site
(www.hse.gov.uk/pubns/agindexhtm). They can also be obtained from HSE Books, P0 Box 1999, Sudbury, Suffolk CO10 2WA
(telephone 01787 881165) or via the internet at www.hsebooks.com.

Contacting Central Networks

Postal Address:

Central Networks
Pegasus Business Park
Castle Donington
Derbyshire
DE74 2TU

Telephone: - Proximity & Cablesafe Help Line 0800 015 09 27
Telephone: - General Enquiry Line 0800 096 30 80

REGARDS

Darren Payne
Proximity & EMF Engineer
Central Networks
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terry cavender bt

From: Payne, Darren [Darren.Payne@central-networks.co.uk]
Sent: 28 February 2011 15:41
To: terry.cavender@btinternet.com
Subject: GS6 OVERHEAD WORKING CLEARANCES
Attachments: mps_scan.pdf; hsg47.pdf; gs6.pdf

e·on | Central Networks

OHPLG:0019795

Avoiding Danger From Overhead Electric Power Lines
Essential Information

Suitable clearances can be achieved	The information in the table below should be referred to in conjunction with all works in proximity of Overhead Lines

Site: **FIELD OFF A413 GRID REF:470.92km / 233.87km**	Voltage of Overhead Line	Height of Overhead Line taken by (C/N)	Maximum Safe working height	Min. horizontal clearance to be maintained from outside conductor	Min. safety clearance from conduc
A			**33,000V**	**7M**	**4M**
B			**11,000V**	**8.65M**	**5.65M**
C					
D					
Additional	**1,3,4,5,6&7**				
Precautions	**MIN 3M FROM POLE MOUNTED TRANSFORMER (B)**				

Central Networks :-	Name: D PAYNE	Date:28/2/11

1	Suitable fencing and barriers in accordance with HSE• Guidance Document GS6 are required to cr a safe working zone and prevent any unauthorized crossing points
2	Goal posts in accordance with HSE Guidance Document GS6 are required. The maximum height o crossbar must not exceed the maximum working height indicated in the table.
3	"Danger Overhead Electric Power Cables" signs should be erected and maintained at prominent positions to warn workers of the danger area.
4	The height of vehicles (including their loads) passing under the line must not exceed the maximu working height indicated in the table.
5	People working in the vicinity should understand the hazard and control measures they must take avoid contact with the overhead electricity power lines.
6	Close supervision of people and/or machinery passing or working under the overhead electricity power lines is required to ensure their safety.

7	**Any plant or machinery that can encroach the minimum safety clearance to the overhead electrici power line should be fitted with mechanical or electronic restrictors.**
8	**Cranes should be positioned such that they cannot topple into the over head electricity power lin loads controlled so that the minimum safety clearance is not breached.**
9	**Excavations must not encroach within 3 metres of any poles or stays to ensure their supporting ground is not disturbed.**

Ground-level barriers

Ground-level barriers can be constructed using:

• Posts and rail fences;

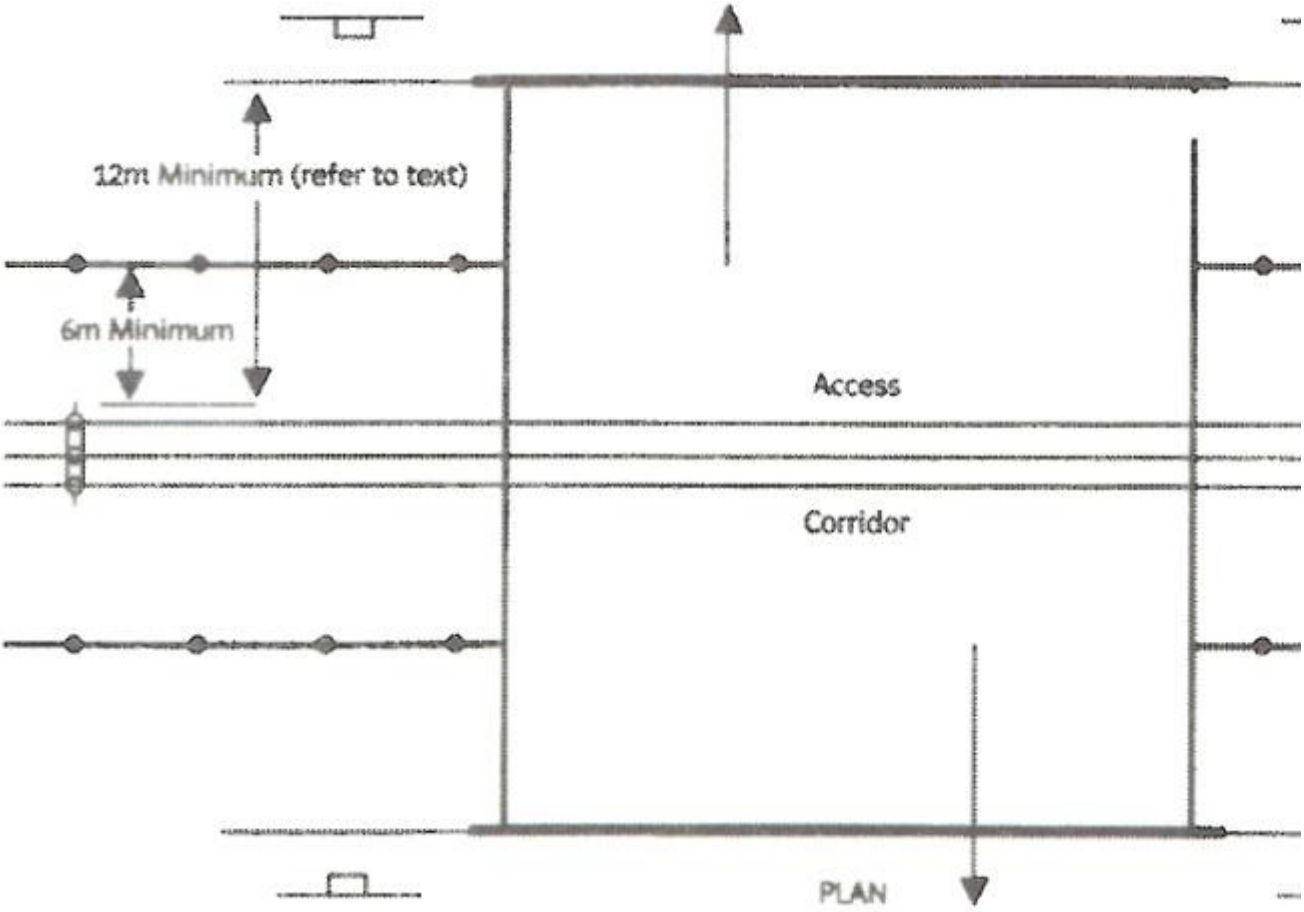
• a high-tension wire fence earthed at both ends (this should have warning flags or flicker tape on the wire so that it is clearly visible),

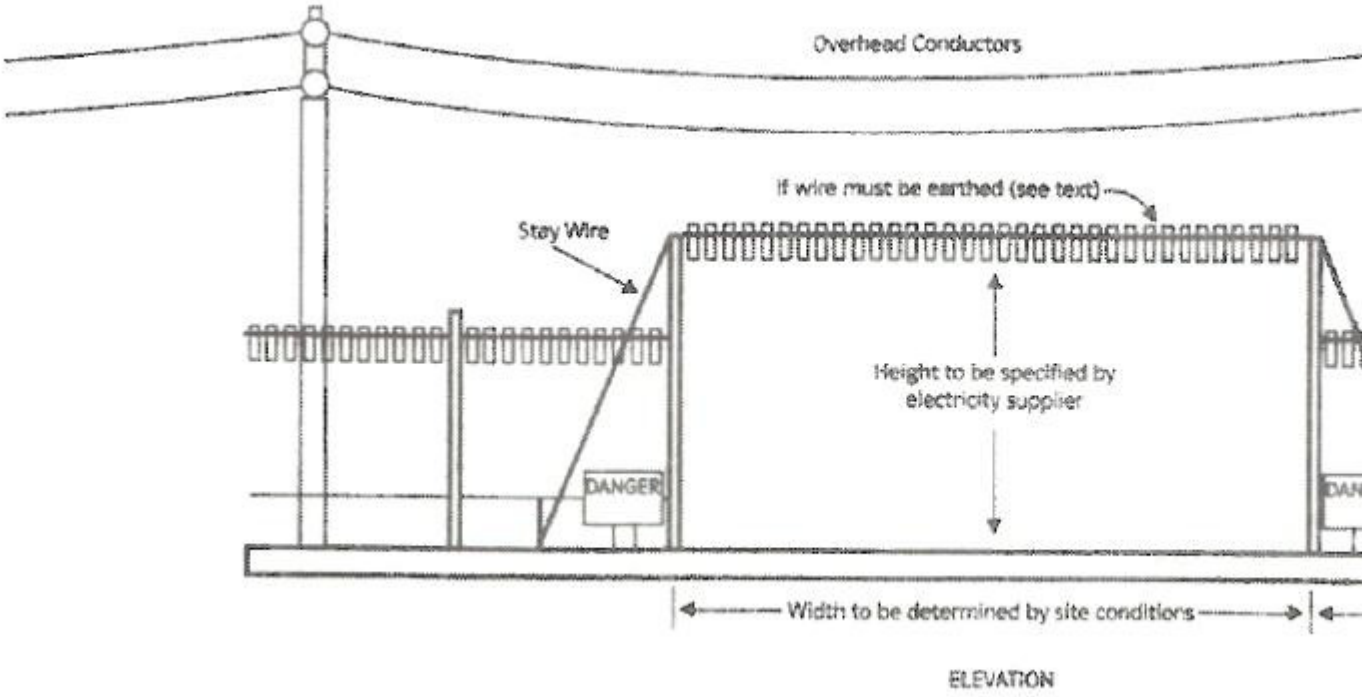
• large steel drums, such as 182 litre oil drums, brightly painted, filled with rubble and placed at frequent intervals,

- An earth bank at least 1 m high and marked by posts,

• Timber baulks which act as wheel stops.

Ground-level barriers must be easy to see. If steel drums are used, paint them with red and white horizontal stripes, or use red and white alternating flags on wire fences.
Make sure the barriers will be visible at night, e.g. paint them with white or fluorescent paint or attach reflective strips to them.
Goalposts
Goalposts also need to be highly visible. They should be made out of rigid material which does not conduct electricity such as timber or plastic pipe. Paint them with red and white stripes and in areas of particularly high risk, consider using small flags, bunting
or flicker tape on them as well. -
Place warning signs on goalposts where they will be easy for drivers to see. These should show the height of the crossbar and instruct drivers to keep any extending parts of their machinery lowered.
Goalposts need to be erected at the entrance to any area where machinery or equipment might pass near to OHPLs. The local electricity company can advise on the correct height for the crossbar.
Where barriers should be placed?
If machinery does not have to pass directly under OHPLs then there should be a minimum distance of 6 m
the line and the barrier Remember, these distances are always measured horizontally along the ground
OHPL runs.





If machinery or vehicles have to pass beneath lines, then barriers can be used to make a passageway. There should be goalposts to limit the height of vehicles which pass beneath the lines. There may be occasions when work must be carried out beneath OHPLs, e.g. pipes may have to be laid. In this case, barriers and goalposts must be erected and additional safety measures put in place. HSE and Central Networks can advise how this should be done.

If the Worst Happens

If a machine or its attachments comes into contact with an OHPL, it could be fatal for anyone who touches the machine. Do not rely on rubber tyres or rubber-soled boots for protection - they may not insulate against a high-voltage shock. Tyres can burst into flames and boots can be destroyed.

Keep clear

The driver of a vehicle which comes into contact with OHPLs will usually remain safe in the cab of the vehicle. People are at risk if they make contact with the vehicle and earth. Do not touch the vehicle or anything attached to it.

Get help

You, or someone else, should contact the electricity company and ask them to disconnect the power immediately. If you have a mobile phone or CB radio, use that. You should have the electricity company's telephone number taped into the cab.

Jump!

If you have to leave the cab, jump well clear so that no contact is made between you and the vehicle. Land on your feet, if you can, and RUN! The line could become live again and you could still be close enough to be electrocuted.

Stay clear

Do not go back to the vehicle even if you think it is safe to do so. It could still be live. Nobody should approach the vehicle until the electricity company has confirmed the power is switched off.

Safe operation

If the vehicle is not tangled with the OHPL and can still be operated, back it carefully away until contact is broken. It may also be possible to lower a tipper or withdraw a high-lift attachment - but you need to take extreme care. Do not climb out of the vehicle.

Emergency Number in the event of contact with the Overhead Electricity Power lines or electricity cable damage: 0800 0150921

HSE Guidance Documents

1. HSE Guidance Notes GS6 "Avoidance of danger from overhead power lines" ISBN 0 7176 1348 8 and HS(G)47 "Avoiding danger from underground services" ISBN 0 7176 1744 0 are available from HSE Books, P0 Box 1999, Sudbury, Suffolk, CO10 2WA (telephone 01787 881165) or via the internet at www.hsebooks.com.
2. HSE Agriculture Information Sheets AIS8 'Working safely near overhead power lines' AIS6 "Safe use of combine harvesters' and
INDG389 "SHOCK HORROR - safe working near overhead power lines" are available free of charge from the HSE Internet site
(www.hse.gov.uk/pubns/agindexhtm). They can also be obtained from HSE Books, P0 Box 1999, Sudbury, Suffolk CO10 2WA
(telephone 01787 881165) or via the internet at www.hsebooks.com.

Contacting Central Networks

Postal Address:

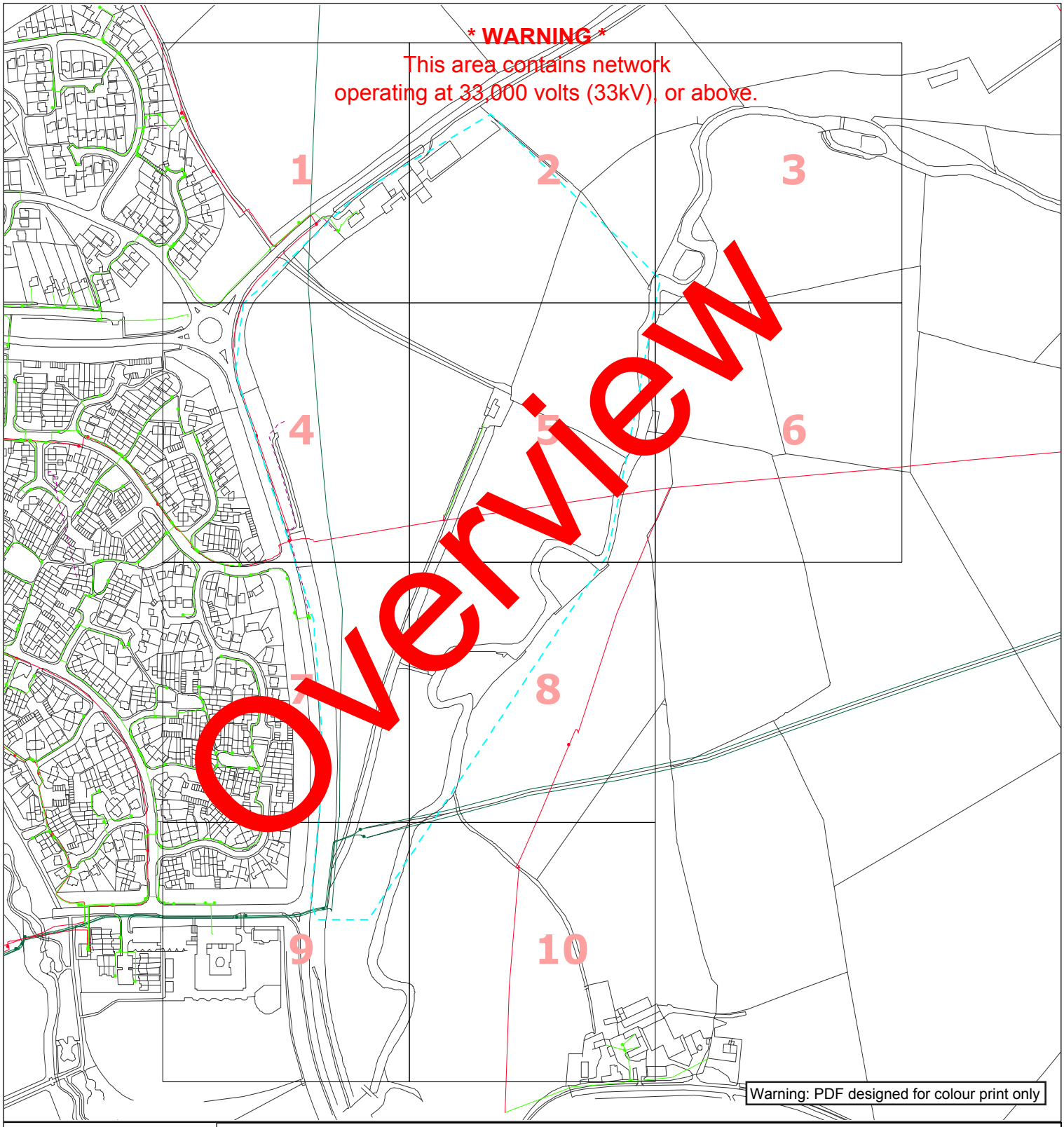
Central Networks
Pegasus Business Park
Castle Donington
Derbyshire
DE74 2TU

Telephone: - Proximity & Cablesafe Help Line 0800 015 09 27
Telephone: - General Enquiry Line 0800 096 30 80

REGARDS

Darren Payne
Proximity & EMF Engineer
Central Networks
M: +44 (0) 7720 555238
darren.payne@central-networks.co.uk

Central Networks
Pegasus Business Park, East Midlands Airport
Castle Donington
Derbyshire, DE74 2TU
www.central-networks.co.uk



e·on Central Networks

Asset Information Management
Central Networks
Toll End Road
Tipton DY4 0HH
Phone 02476 186502

Job Reference: 13875
Date Requested: 13/10/2010
Your Scheme/Reference:
Bourton Meadow

Requested by:
Terry Cavender

Electricity Network is Colour Coded: Low Voltage 6.6kV 11kV 25kV 33kV 66kV 132kV

Underground Cables — Area of Non CN Network — Dig Site Area — Point

Overhead Line — Ducts — Poles and Towers

Substations — Distribution Boxes — Joints

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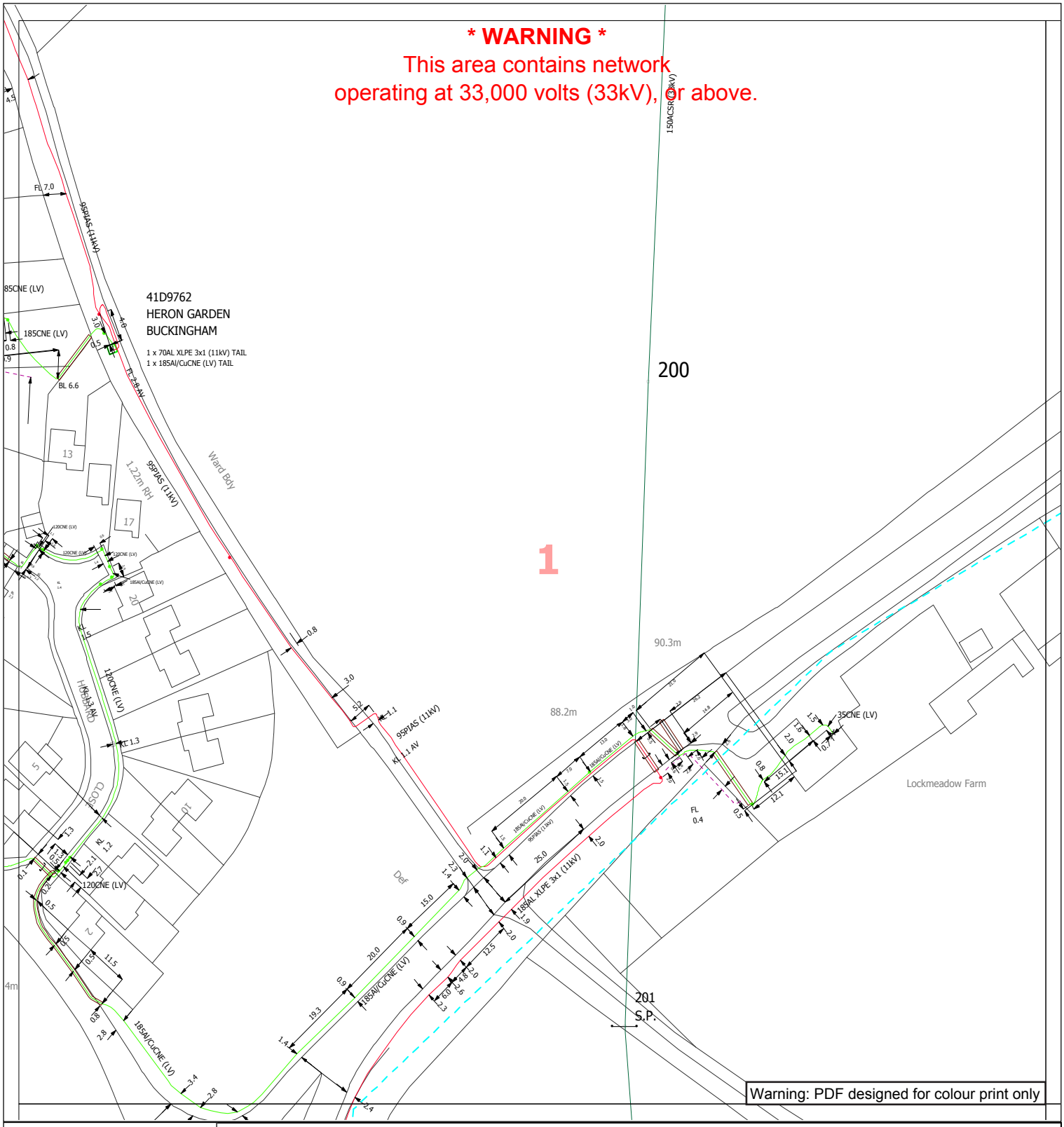
- For further advice on working near our electricity cables or lines, call our CableSafe team free on 0800 015 0927.
- **Report damage to 0800 0150921 immediately – KEEP EVERYONE AWAY FROM THE AREA**

*** WARNING ***

This area contains network operating at 33,000 volts (33kV), or above.



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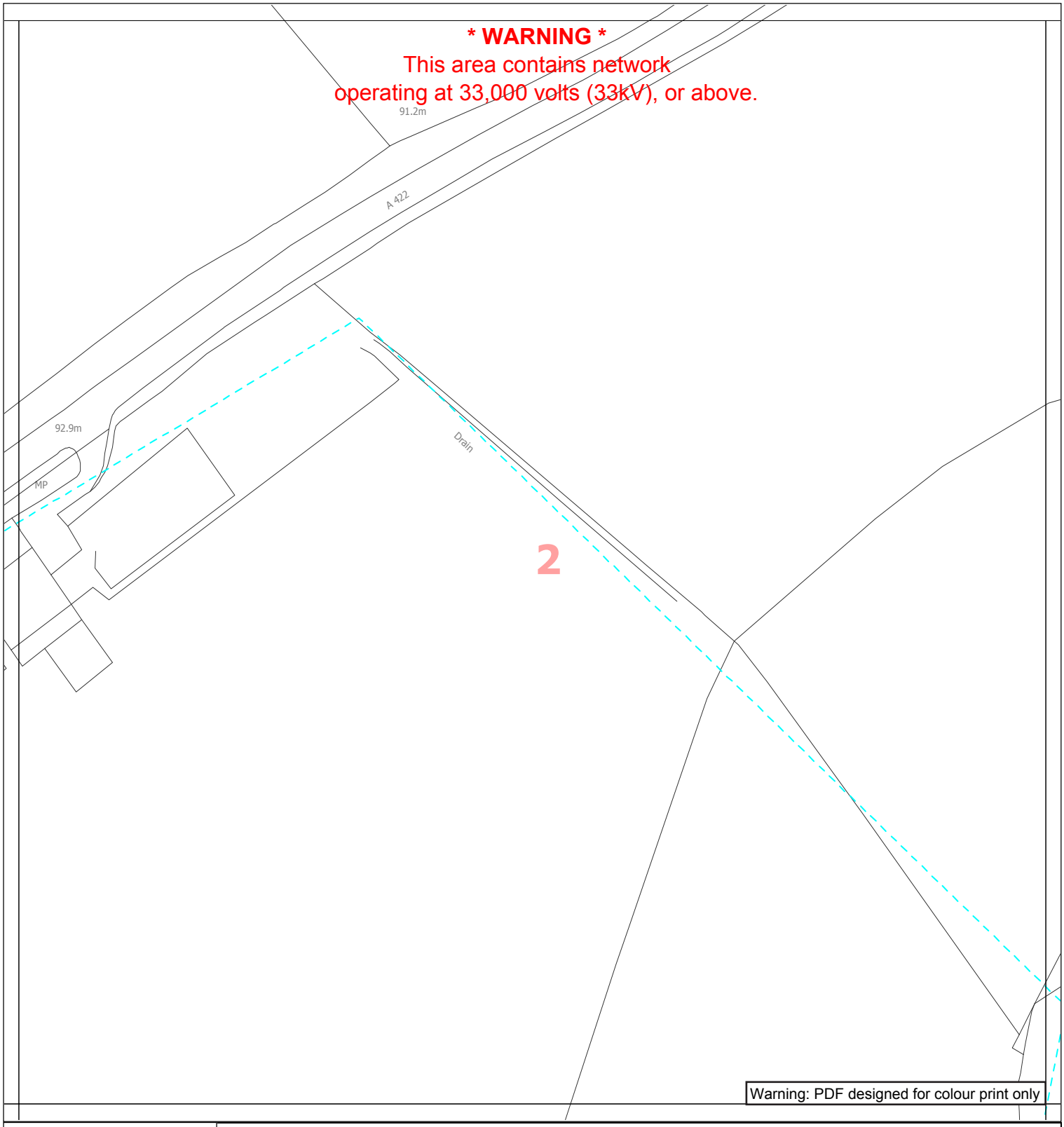

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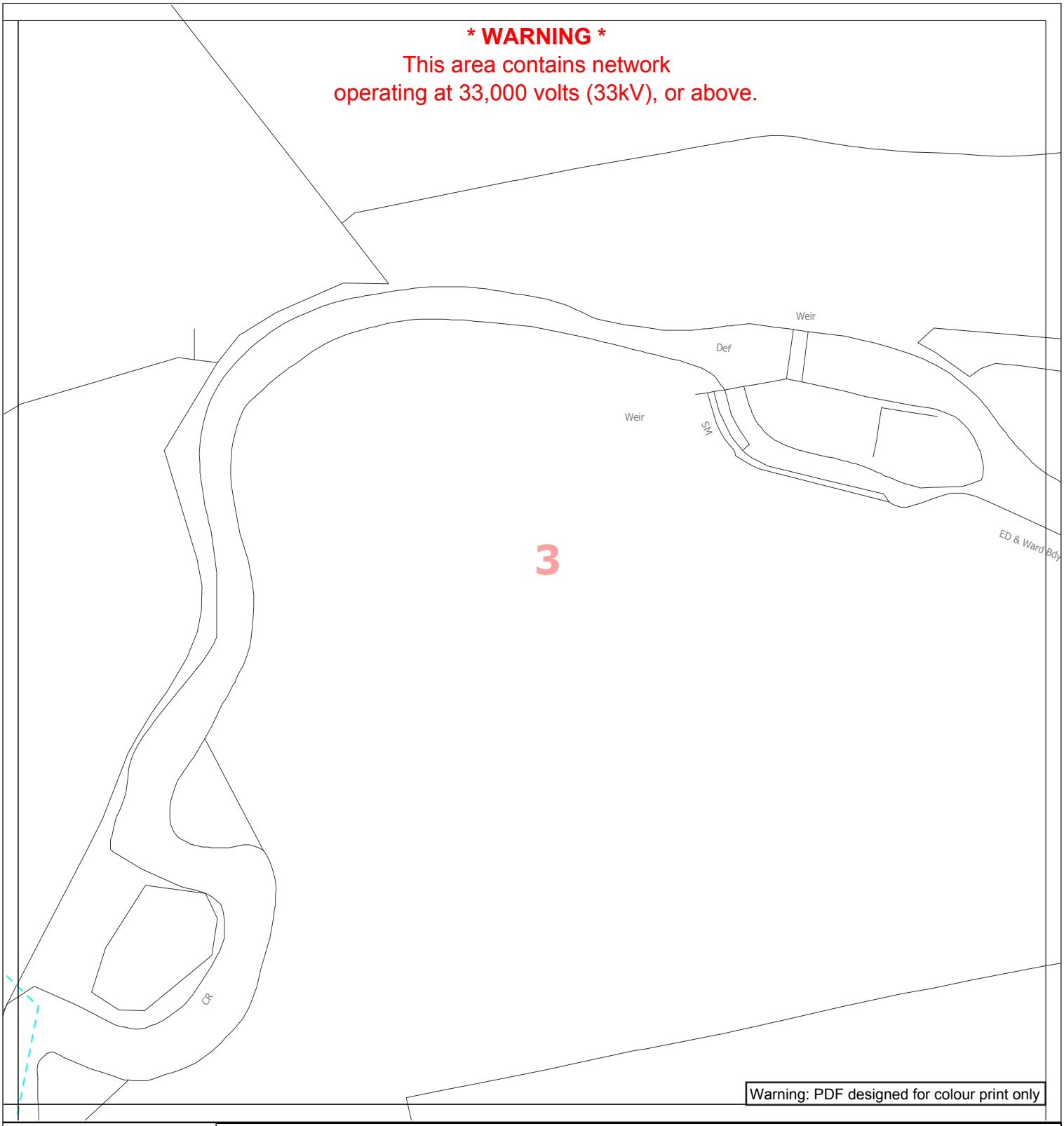

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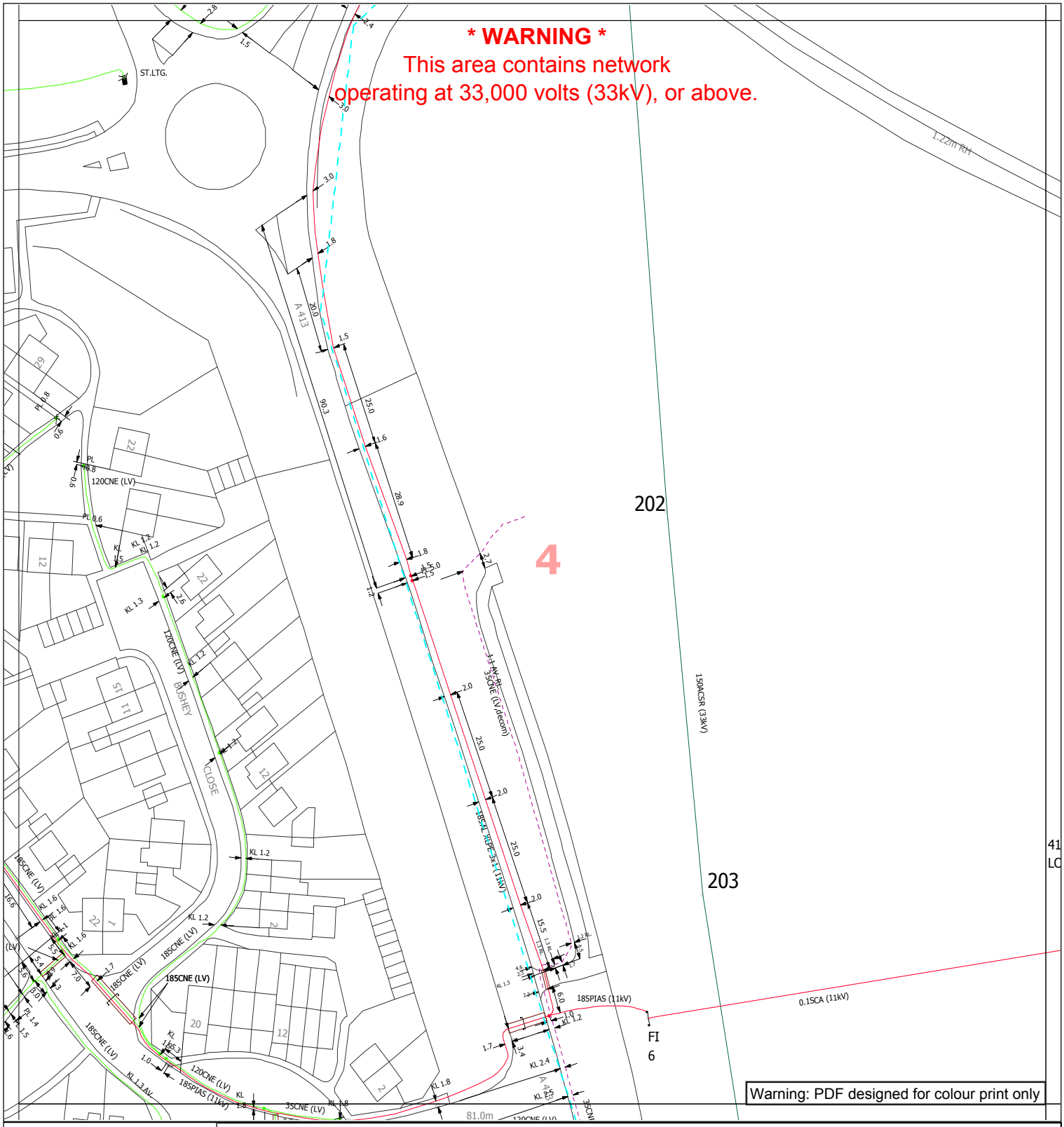

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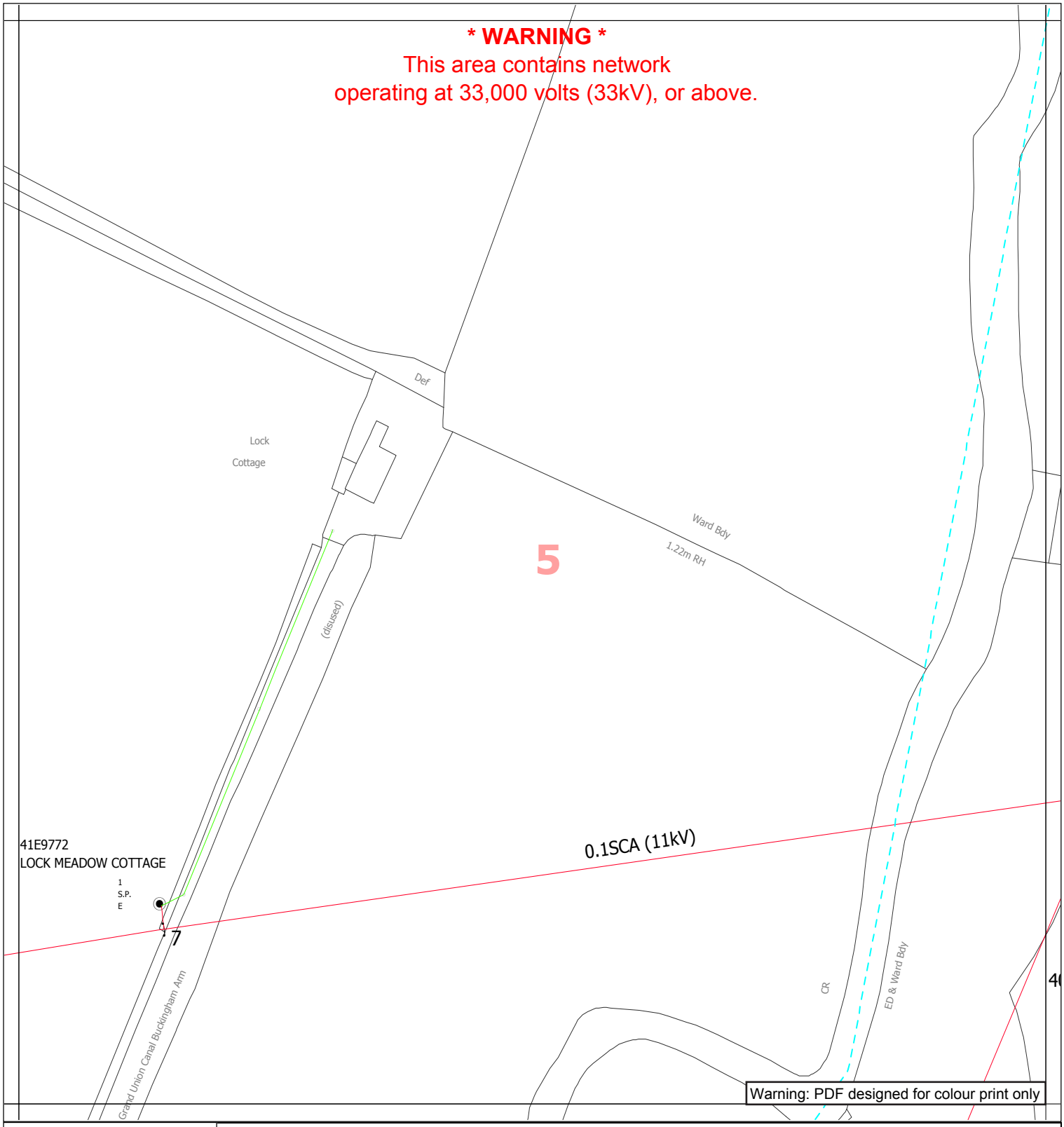

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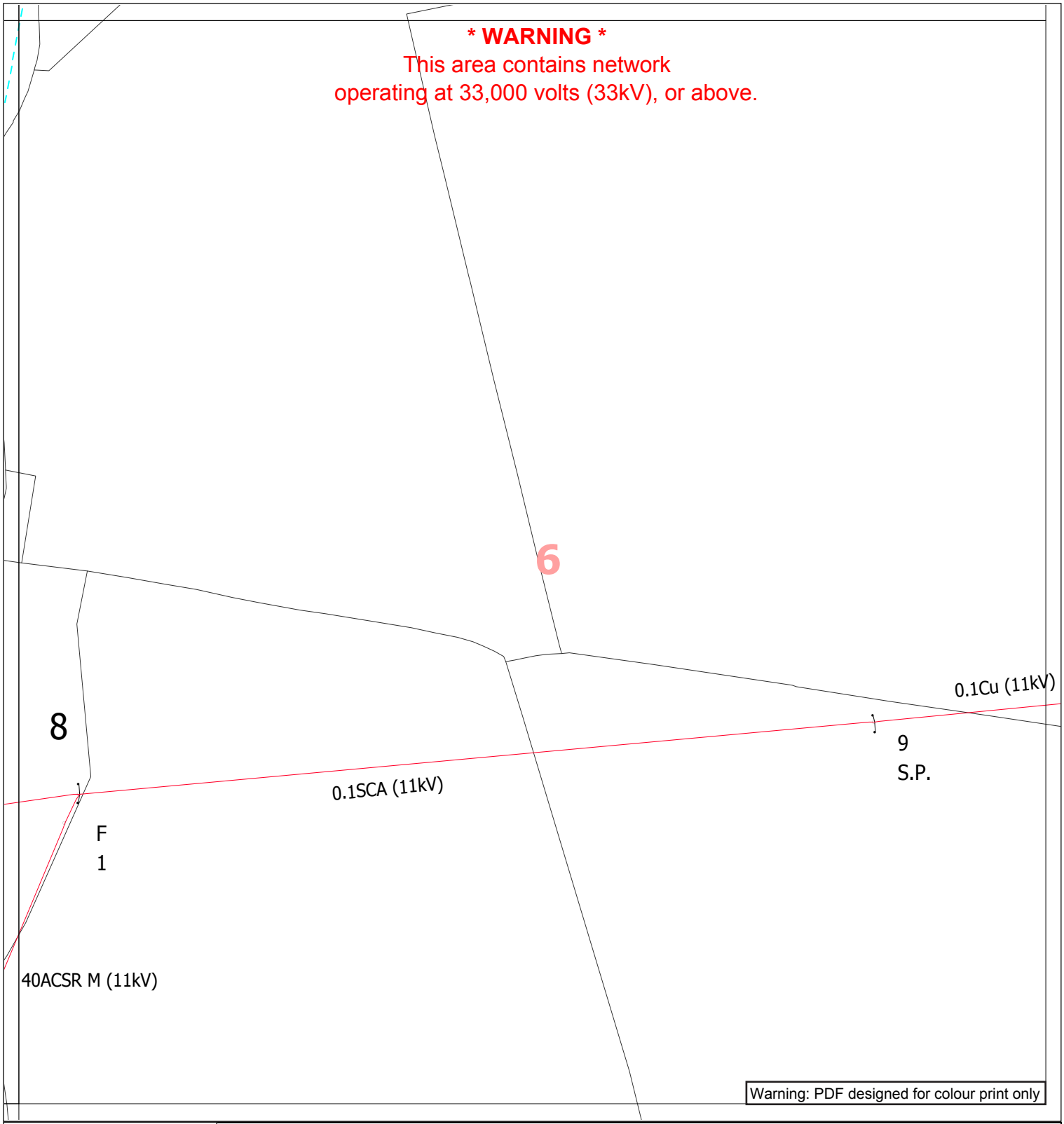

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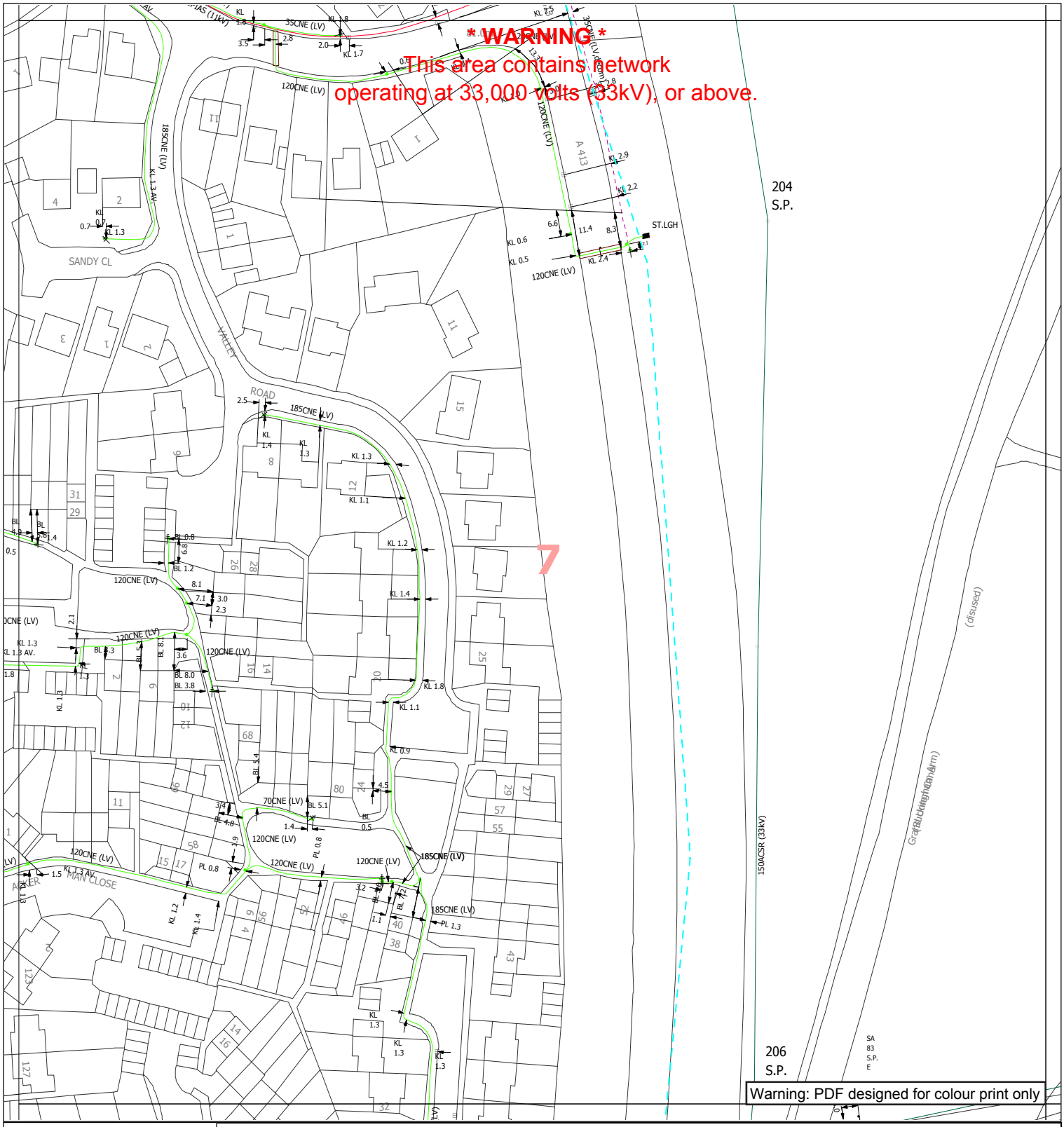

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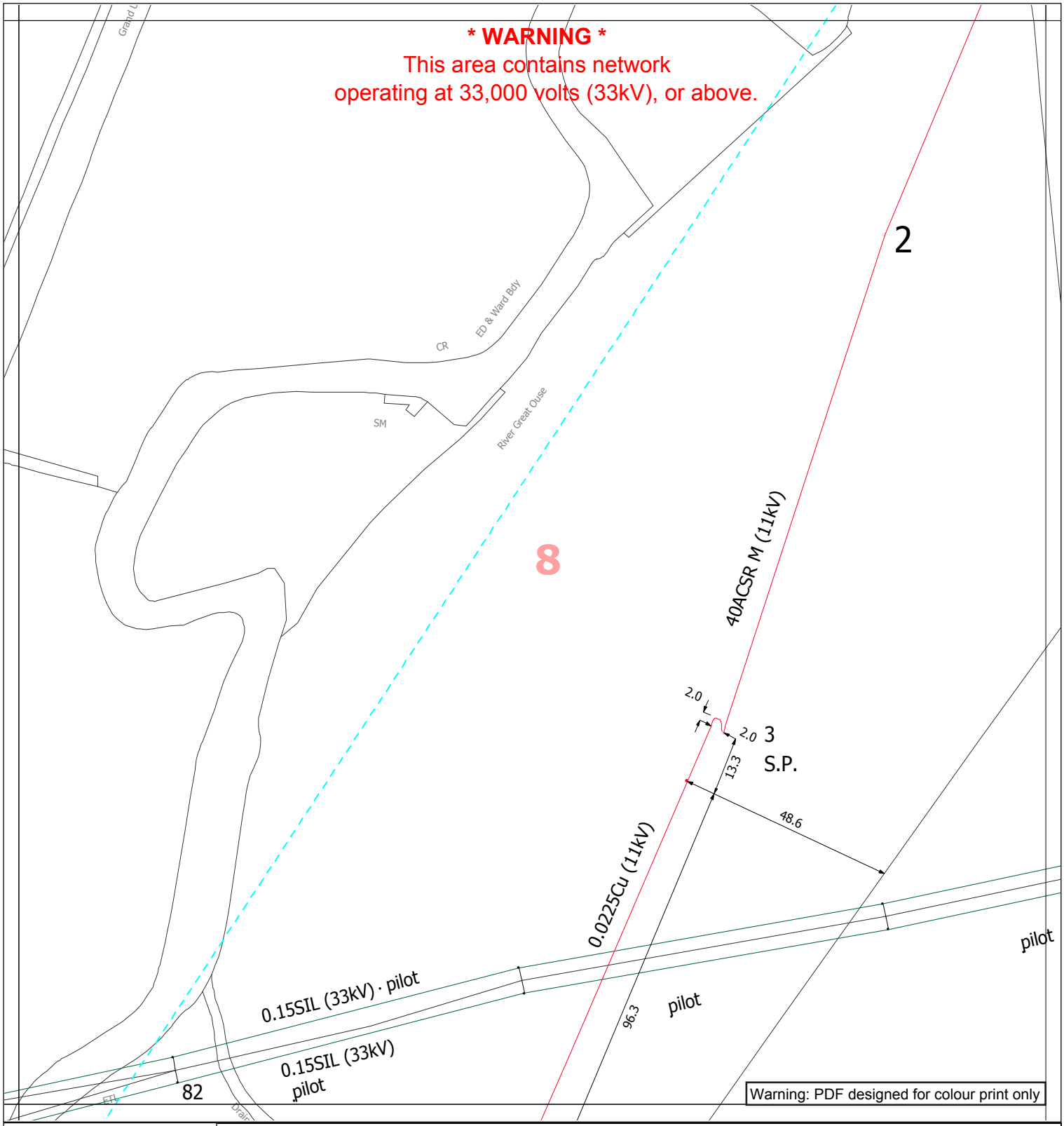

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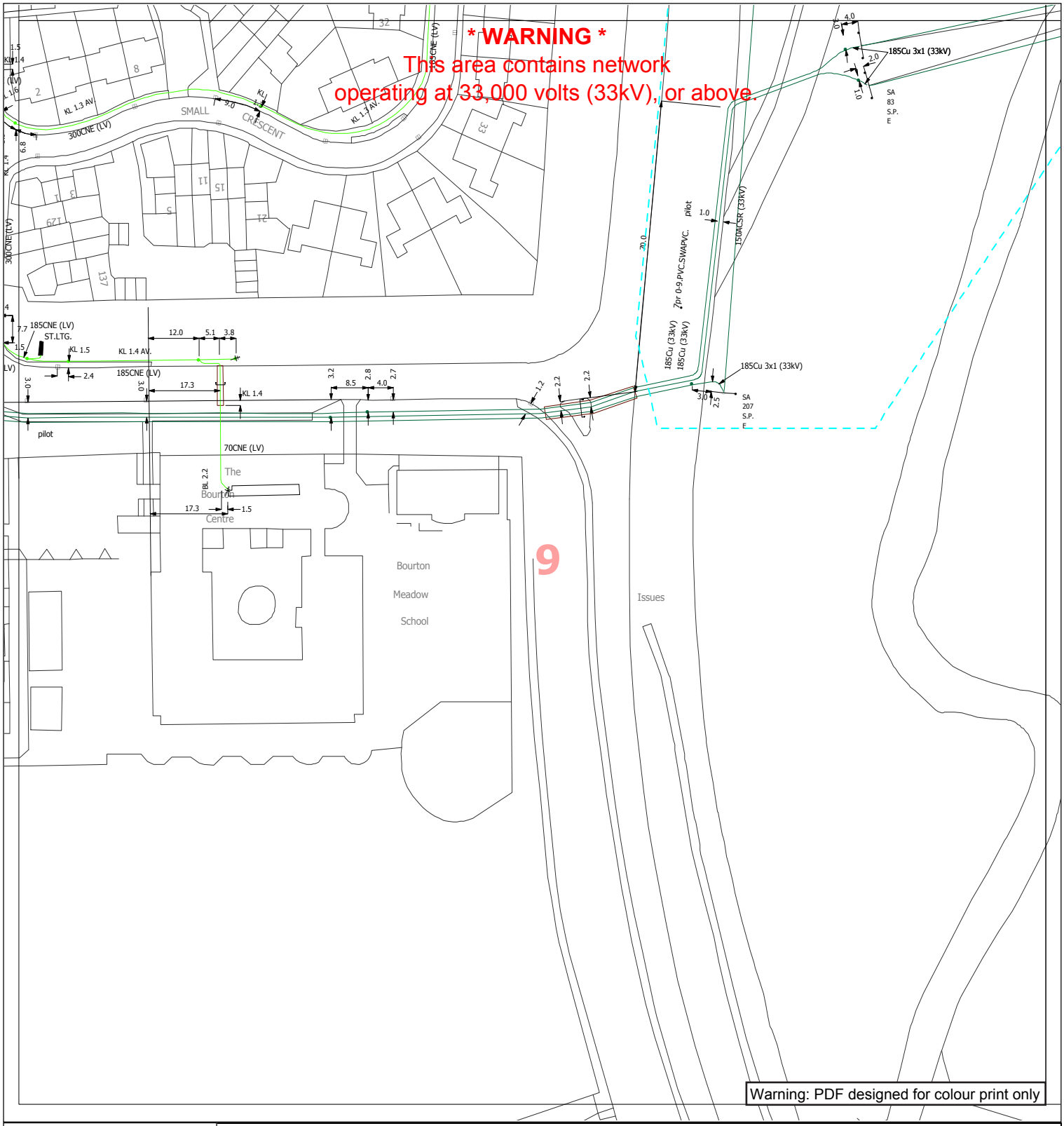

Warning: PDF designed for colour print only

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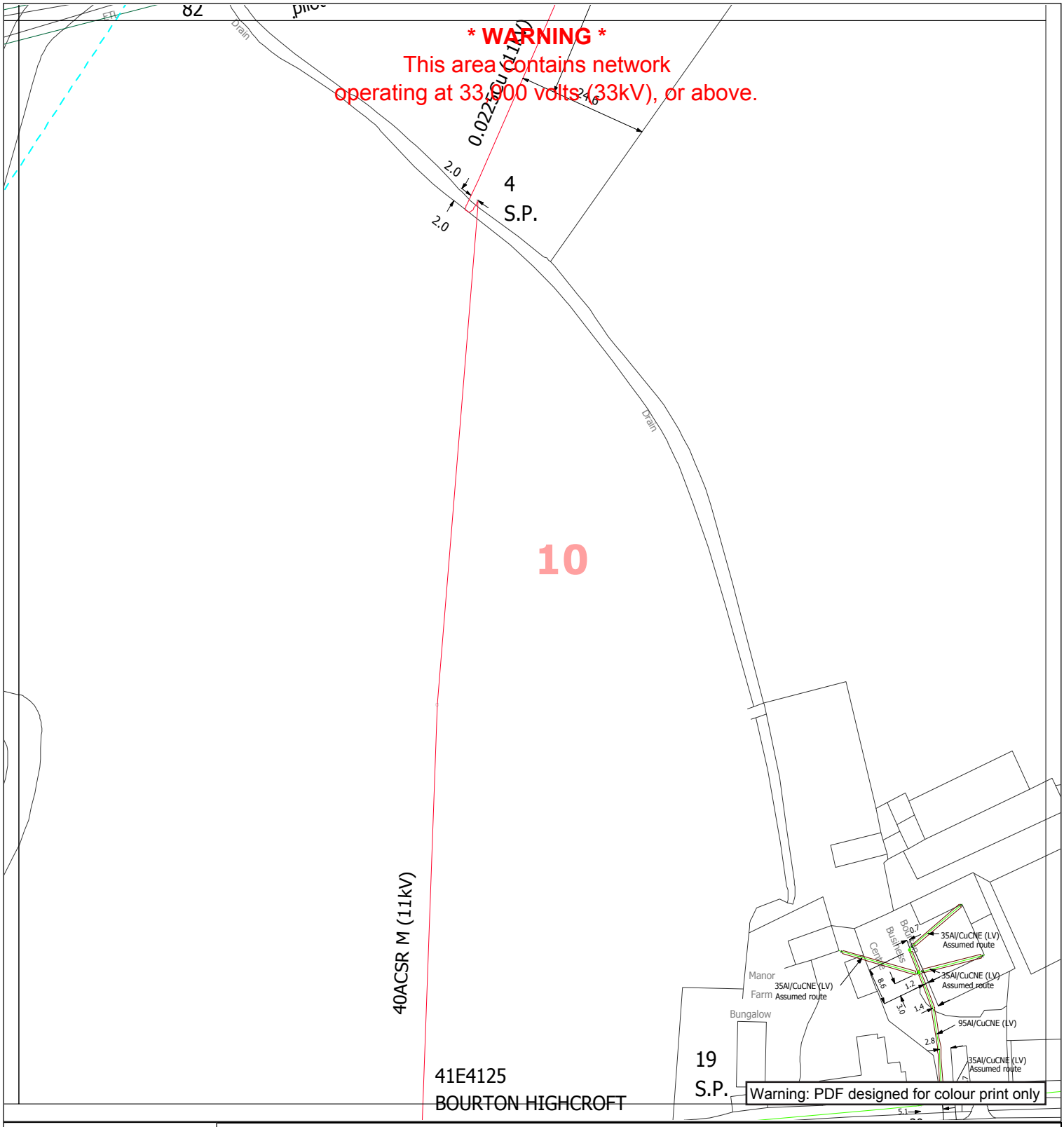

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Appendix G

Correspondence

Buckingham Canal Society

Registered Charity No 1072924

16 Mallard Drive
BUCKINGHAM
Buckinghamshire
MK18 1GJ

01280 821 232
secretary@buckinghamcanal.org.uk

Nick Hawes
Briar Hill Farm
Steeple Claydon
Buckinghamshire
MK18 2EP

25th October 2011

Dear Nick

Restoration of the Buckingham Arm – Bourton Meadow Section

I would like to update you regarding our activities at Bourton Meadow and with respect to our plans for the re-watering of Bourton Meadow.

Our volunteers are continuing to keep the foliage down in the canal bed. The whole canal bed was strimmed in the summer and volunteers are now giving it an extra trim which should last until Spring. This was requested by Matt Dobbs, Environmental Officer for AVDC Council.

We now have an ecological study of the canal area of Bourton Meadow which was undertaken by Middlemarch Environmental Ltd and which will be helpful in putting our case for planning permission.

We have established that the canal area is not subject to restrictions from Countryside Stewardship although Natural England has asked us to undertake some further research on species distribution in the adjacent fields.

In order to simplify our application we will only be applying for the straight length of canal to be re-lined and put into water. However it is a complex process and preparation of the planning application is taking us some time. It is our intention that the application will be ready for submission before Christmas at which point you will, of course, receive formal notification of the application.

Should you need any further information feel free to contact me on 01280 821232 or email: secretary@buckinghamcanal.org.uk.

With all good wishes,

HELEN PRESTON
Secretary

Buckingham
Canal Society

Registered Charity No 1072924

16 Mallard Drive
BUCKINGHAM
Buckinghamshire
MK18 1GJ

01280 821 232
secretary@buckinghamcanal.org.uk

Nick Hawes
Briar Hill Farm
Steeple Claydon
Buckinghamshire
MK18 2EP

13th December 2011

Dear Nick

Restoration of the Buckingham Arm – Bourton Meadow Section

The Canal Society committee has been working hard and has now almost completed preparing a planning application to re-water the Bourton Meadow length of the canal. In accordance with AVDC requirements I am enclosing a copy of the formal notice informing you that we will be submitting the application on or after 5th January 2012. As promised we will provide you with a copy of the application when it is submitted.

Should you have any queries please do not hesitate to contact me.

With all good wishes for Christmas and the New Year,

H. J. P.

HELEN PRESTON
Secretary

NOTICE TO BE SERVED BY APPLICANT ON OWNER OF ANY LAND NOT OWNED BY APPLICANT TO WHICH A PLANNING APPLICATION RELATES

Pursuant to the Town and Country Planning Legislation*

AYLESBURY VALE DISTRICT COUNCIL

NOTICE NO. 1

Notice under Section 66 of application for planning permission

NOTE: This notice is to be sent to the owner of the land

Insert address or location of proposed development	Proposed development at Buckingham Canal Bourton Meadow, Buckingham
	TAKE NOTICE that application is being made to the **AYLESBURY VALE DISTRICT COUNCIL**
Insert name of applicant	by Buckingham Canal Society
Insert description of proposed development	for planning permission to restore a demonstration length (466m) of canal with enhanced environment.
Insert date not less than 20 days later than the date on which the notice is served	If you should wish to make representations about the application, you should make them in *writing not later than* 5th January 2012 *to*

DEVELOPMENT CONTROL DIVISION
DEPARTMENT OF ENVIRONMENT AND PLANNING
AYLESBURY VALE DISTRICT COUNCIL
66 HIGH STREET
AYLESBURY
BUCKS HP20 1SD

Signed .....
Secretary
***On behalf of** Buckingham Canal Society
Date 13th December 2011

*Delete where appropriate

* Town and Country Planning Act 1990

CERTIFICATE B

I hereby certify that:-

†"owner" means a person having a freehold interest or a leasehold interest the unexpired term of which was not less than 7 years.

1. *I have/~~the applicant has~~ given the requisite notice to all persons other than *myself/ the applicant who, 21 days before the date of the accompanying application, were owners† of any part of the land to which the application relates, viz:-

   Name of owner† : Mr N. Hawes

   Address : Briar Hill Farm, Steeple Claydon, Bucks. MK18 2EP

   Date of service notice: 13th December 2011

*2a. None of the land to which the application relates constitutes or forms part of an agricultural holding;

or

‡If you are the sole agricultural tenant enter "None".

*2b. ~~I have /the applicant has given the requisite notice to every person other than - *myself/ himself who, 21 days before the date of the application, was a tenant of any agricultural holding of any part of which was comprised in the land to which the application relates, viz:-~~

Name of tenant‡ :

Address :

Date of service notice:

When complete please send this certificate to the Development Control Division, with the completed application form.

Signed .....
Secretary

***On behalf of** ..... BUCKINGHAM CANAL SOCIETY

Date ..... 13th December 2011

*Delete where appropriate