## **ARCHAEOLOGICAL DESK BASED ASSESSMENT**

#### PIPELINE AT PURTON WATER TREATMENT WORKS

#### **RIDDLE STREET**

## **PURTON, BERKELEY**

#### **GLOUCESTERSHIRE GL13 9HN**

NGR: SO 69617 04034

JOB Nº: BA1132BWP







Head Office: Chapel Walk Burgess Street Leominster Herefordshire HR6 8DE

Tel: 01568 610101

Winchester Office: Unit 25 Basepoint Business Centre Winnall Valley Road Winchester Hampshire SO23 0LD

 $Email: neil@borderarchaeology.com\ Web: www.borderarchaeology.com$ 

## Contents

1.	Non-Technical Summary	3
2.	Introduction	4
3.	Methodology	5
4.	Site Specific Analysis	6
5.	Site Visit	13
6.	Conclusion	14
7.	Impact Assessment & Mitigation	15
8.	Copyright	15
9.	Bibliography	16
10.	Cartography & Aerial Photography	16
11.	Appendix 1: Engineering Plan of Route of Proposed Raw Water Pipeline – ton Water Treatment Works	

Frontispiece: View looking SE from southern perimeter of raw water reservoirs towards the Gloucester and Sharpness Canal

#### Report specification

Report Compilation: Ross Shurety BA & George Children MA MIfA

Documentary & Cartographic Research: Ross Shurety BA & George Children MA MIfA

Artwork: George Children MA MIfA Editing: Stephen Priestley MA Approved: Neil Shurety Dip.M GMInstM

## 1. Non-Technical Summary

This archaeological desk-based assessment, undertaken prior to the construction of a proposed replacement pipeline on land immediately adjacent to two raw water reservoirs to the north of Purton Water Treatment Works, has revealed limited evidence of recorded archaeological sites in the immediate vicinity of the pipeline route.

- A search of the Gloucestershire Historic Environment Record identified no evidence of prehistoric or Roman activity within a 500m radius of the proposed pipeline route.
- A small number of archaeological sites are recorded in the immediate vicinity of the development, most notably the Gloucester and Sharpness Canal (HER 11157), begun in 1794 and completed in 1827, which runs immediately S of the reservoirs.
- No evidence of wharfs or other structures associated with the Canal has been identified from documentary sources or historic mapping in the immediate vicinity of the pipeline route. The pipeline route extends from the reservoirs to an existing valve chamber connected to the Canal and consequently there will be no impact on the Canal itself.
- Analysis of historic mapping has demonstrated that the fieldscape in the area surrounding the reservoirs has undergone a marked degree of alteration since the late 19<sup>th</sup> century; in particular the construction of the two reservoirs (in about 1970) has resulted in the alteration and removal of several field boundaries in the immediate vicinity of the development
- It is likely that the construction of the reservoirs will have resulted in extensive disturbance to below-ground deposits, which would have had a significant impact upon the potential survival of any archaeological remains in this specific area.
- Analysis of aerial photographic evidence (including RAF vertical photography of the late 1940s) identified a roughly circular pond feature of possible post-medieval date approximately 60m northeast of the proposed pipeline route (HER 26089).
- Evidence of possible enclosures and associated ridge and furrow cultivation (possibly
  associated with the medieval settlement of Pockington) has been identified in fields
  adjacent to Manor Farm (HER 4090-4091), approximately 300m southwest of the
  pipeline route (to the south of the Canal); however there is no evidence from historic
  maps or aerial photography indicating the presence of settlement enclosures or
  cultivation features extending within the fields to the northeast of the Canal.
- While recognising the limited nature of the known archaeological resource and the potentially significant impact of construction groundworks associated with the reservoirs on the surviving resource, the possibility cannot be discounted, due to the likely considerable depth of estuarine alluvial coverage in this area and the depth of the proposed groundworks (in excess of 6m depth at the valve chamber at the southern end of the route) that occupation deposits and features could survive, particularly of prehistoric or Roman date, with the potential for the recovery of well-preserved, waterlogged remains of high palaeoenvironmental value.

## 2. Introduction

Border Archaeology undertook this archaeological desk-based assessment on behalf of Bristol Water to determine the nature of the archaeological resource within the vicinity of a proposed replacement raw water main pipeline, the route of which extends approximately 620m from an existing canal crossing (NGR SO 69595 03868) to a new inlet into Purton Raw Water Reservoirs (NGR SO 69567 04140). The entire route of the proposed pipeline lies within the reservoir complex (property of Bristol Water) extending around the immediate northern and eastern perimeter of the two reservoirs with its southern terminus located immediately north of the Gloucester and Sharpness Canal (Fig.1; Appendix 1).

Copies of this assessment will be supplied to Bristol Water in the first instance and to Charles Parry Esq., Senior Archaeological Officer, Gloucestershire County Council.

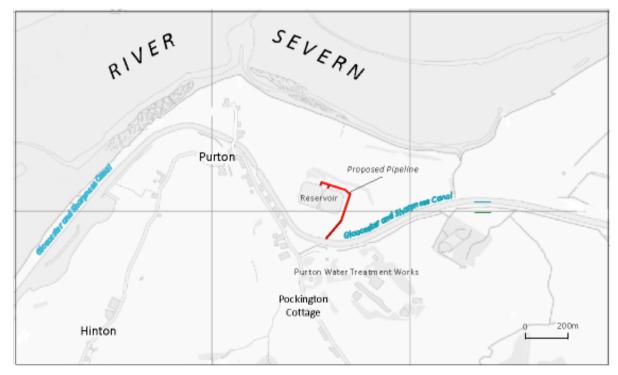


Fig 1: Site location plan showing the area of proposed replacement pipeline adjoining the two raw water reservoirs to the N of Purton Water Treatment Works

## 2.1 Soils and Geology

The soils in the vicinity of the study area are predominantly typical calcareous pelosols of the EVESHAM 2 series (411b), comprising slowly permeable calcareous clayey soils, some slowly permeable seasonally waterlogged non-calcareous clayey and fine loamy or fine silty over clayey soils, with landslips and associated irregular terrain locally. The underlying geology comprises Jurassic and Cretaceous clay (SSEW, 1983).

## 3. Methodology

#### 3.1 Archaeological Assessment

#### 3.1.1 Research Aims

This archaeological desk-based assessment seeks to identify any known or potential archaeological resource within the study area and to establish its character, extent, quality and importance, within a local, regional and national context.

#### 3.1.2 Research Methods

The research carried out for this detailed archaeological assessment consisted of the following elements:

#### 3.1.3 Evaluation and study of archaeological databases

A search was made of the National Monuments Record (English Heritage) and the Gloucestershire Historic Environment Record (HER) for any sites of archaeological or historic interest within a 500m radius of the study area.

#### 3.1.4 Evaluation and study of primary sources

Primary documentary sources relating to the study area, where deemed necessary, were consulted at Gloucestershire Archives. The British Waterways Museum in Gloucester was also consulted; however, due to stock-taking, no original records relating to the Gloucester and Sharpness Canal were available for consultation.

#### 3.1.5 Evaluation and study of secondary sources

Secondary sources relating to the study area were consulted using the collections held at the Gloucestershire Archives, including relevant articles in the *Transactions of the Bristol and Gloucestershire Archaeological Society*, and published and unpublished reports relating to archaeological work in the vicinity of the study area.

#### 3.1.6 Evaluation and study of cartographic and other pictorial evidence

Copies of the Ordnance Survey 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> edition 6 inch and 25 inch maps were obtained from the Gloucestershire Historic Environment Record and Gloucestershire Archives. A copy of the Tithe Map and Apportionment for Hinton tithing in Berkeley parish (1840) was also consulted at Gloucestershire Archives.

Aerial photographic records, including vertical and oblique photos ranging from the late 1940s to the present day, were consulted at the National Monuments Record, Swindon.

## 4. Site Specific Analysis

The specific study area comprises a 620m section of pipeline route extending from an existing canal crossing at NGR SO 69595 03868 to a new inlet entering the reservoirs to the north of Purton Water Treatment Works at NGR SO 69567 04140.

The proposed pipeline is situated within land owned by Bristol Water, with the route flanking the eastern perimeter of the extant reservoirs at Purton; consequently, a search of the Gloucestershire Historic Environment Record was requested for archaeological sites recorded within a 500m radius of the reservoirs (centred on NGR SO 69617 04034). The study area has been heavily impacted by engineering activity relating to construction of the reservoir and the archaeological potential in the immediate vicinity of the proposed pipeline would thus appear to be correspondingly reduced.

#### 4.1 Consultation of Archaeological Records

This section analyses the information available from records of archaeological work carried out in the vicinity of the proposed pipeline route and discusses its implications for the nature of the archaeological resource within the study area and the likely depth and survival of significant archaeological deposits and features.

#### 4.1.1 Conservation areas

The proposed pipeline route does not run through or near any Conservation Areas.

#### 4.1.2 Historic Landscape Characterisation

The Historic Landscape Characterisation programme provides a framework for broadening our understanding of the whole landscape and contributes to decisions affecting tomorrow's landscape. Relevant historic landscape characterisation information was supplied by Gloucestershire Historic Environment Record.

The landscape that the proposed pipeline runs through has been characterised as an 'active industrial site', which can be interpreted as relating to the Water Treatment Works and associated water mains. The wider landscape consists of 'irregular enclosure reflecting former unenclosed cultivation patterns', with the area to the north of the canal being characterised by marginally less irregular enclosure along the same lines, comprising 'rich wet grassland'; this description of varying irregular enclosure is what presumably would have been applicable to the study area prior to the construction of the reservoir and Water Treatment Works. As the impact of the pipeline will presumably augment the industrial character of this specific landscape component, no change to the existing description is anticipated.

#### 4.1.3 Scheduled Ancient Monuments

The pipeline route does not run through or near any Scheduled Ancient Monuments (SAMs), nor are there any within a 500m radius.

#### 4.1.4 Archaeological Sites

The Gloucestershire Historic Environment Record was consulted to determine the number of archaeological sites within a 500m radius of a point centred on the two reservoirs (at NGR SO 69617 04034). A total of 11 sites were identified within this 500m search radius (none of which are directly traversed by the proposed pipeline route), including two areas of possible enclosure/ridge and furrow earthworks, seven sites of post-medieval date and two sites associated with WWII military activity.

However, the limited nature of the archaeological record for this area may simply reflect a lack of previous fieldwork undertaken in this area, rather than necessarily being a true reflection of the archaeological resource.

Anticipated excavation depths, which, at the point where the pipeline connects to an existing canal crossing, are likely to be in excess of 6m, strongly suggest the exposure of deposits which could be potentially rich in palaeoenvironmental remains. Furthermore, the presence of buried archaeological features sealed beneath later alluvium cannot be discounted, as estuarine environments have attracted human settlement and exploitation since the prehistoric period.

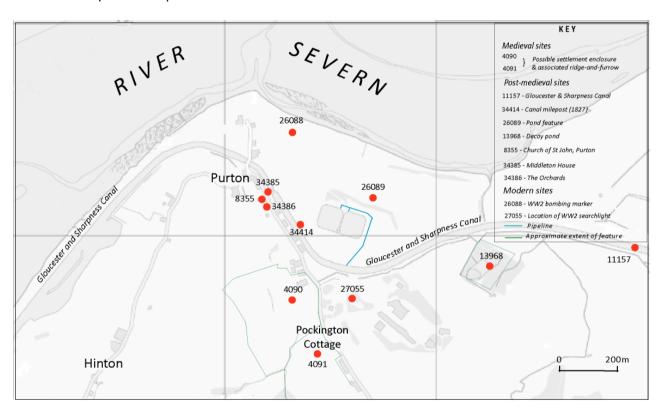


Fig.2: Map showing location of archaeological sites recorded in the Gloucestershire Historic Environment Record within a 500m radius of the pipeline route (centred on SO 69617 04034)

#### • Prehistoric and Roman

No recorded archaeological sites or find-spots of prehistoric or Roman date have been recorded within a 500m radius of the of the pipeline route.

#### Medieval

An area of possible medieval settlement has been identified approximately 200-300m SE of the southern terminus of the pipeline route at Manor Farm, where documentary evidence indicates the existence of a village recorded as 'Pocamton' (Pockington) c.1200 (Smith, 1964, 235).

To the W of Manor Farm (approximately 200m SE of the southern terminus of the pipeline route) a number of low earthwork banks are visible on RAF vertical aerial photographs of the area (dating from 1946), forming several rectilinear enclosures which have been interpreted as possibly representing evidence of settlement or agricultural activity of medieval or early post-medieval date (HER 4090). Evidence of ridge and furrow earthworks possibly associated with these enclosures has been identified in the same area, while further indications of enclosure/cultivation features have been noted in the field immediately to the S, to the W of Pockington Cottage (HER 4091). However there is no evidence, in terms of recorded archaeological sites, historic mapping or aerial photographic records, to indicate that these settlement/cultivation features extended northwards into the fields now occupied by the two reservoirs.

#### Post-Medieval

Located approximately 60m to the south of the two reservoirs is the Gloucester and Sharpness Canal, formerly known as the Berkeley Canal (HER 11157), which defines the southern edge of the site. Construction began in 1794, based on surveys undertaken by Robert Whitworth in 1784, but the Canal did not open until 1827 due to financial and engineering difficulties (Conway-Jones, 2003). Covering a distance of some 25km, the 27m-wide canal was navigable by ships of 750 to 1200 tonnes (after alterations). As the proposed pipeline utilises an existing valve chamber connected to the canal, no impact is anticipated on the canal structure itself.

In addition to the Canal, a small number of archaeological sites and listed buildings of post-medieval date are also recorded within the 500m search radius (centred on NGR SO 69617 04034), none of lie on or particularly close to the route of the proposed pipeline. No evidence of wharfs or other ancillary structures associated with the Canal has been identified in the vicinity of the reservoirs; however a surviving Grade II listed stone canal milepost dated c.1827 (HER 34414) is located at SO 69362 04031, approximately 200m south-west of the northern terminus of the pipeline route (and 40m west of the westernmost of the two reservoirs).

Two pond features of likely post-medieval date have also been identified in the vicinity of the pipeline route. The closest of these, located c.60m to the north-east of the pipeline route (HER 26089; SO 6969 0418) consists of the earthwork remains of small roughly circular pond feature, c. 16m at its widest, which appears on late 1940s RAF vertical photographs of the area. The other pond, consisting of a large rectangular feature situated c. 500m to the east of the reservoirs (HER 13968; SO 7021 0385), appears to be a duck decoy of probable 18<sup>th</sup> century date, associated with the estate of Lord Berkeley. Although it appears on later historic mapping, the decoy pond seems to have fallen out of use c. 1844, presumably due to the activity generated by the nearby canal.

The village of Purton, which lies *c*. 400m to the west of the pipeline route, largely developed as a canal-side village associated with the opening of the Gloucester and Sharpness Canal in the late 1820s (Verey & Brooks, 2002, 645-6). However a number of earlier buildings have survived, notably Middleton House (HER 34385) and The Orchards (HER 34386), both of which are Grade II listed houses of late 18<sup>th</sup>/early 19<sup>th</sup> century date. The parish church of St John, consisting of a nave with apsed sanctuary, a vestry to the S and porch to the NW, was built in 1874 (HER 8355).

The sites of two temporary military structures dating from the Second World War have also been recorded within the 500m search radius. Lying *c.* 360m north-west of the pipeline route (where it joins the reservoir) is the location of a WWII bombing marker (HER 26088). Situated approximately *c.* 180m to the south of the pipeline route where it meets the Canal, is the possible location of a 'Killer' searchlight (HER 27055), thought to be associated with No.349 Searchlight Battery.

## 4.2 Documentary Study and Map Regression (including Aerial Photography)

#### 4.2.1 *c*. 1800-1900

The study area forms a discrete parcel of land bounded to the west and south by the Gloucester and Sharpness Canal and on the north and east sides by a narrow curvilinear lightly wooded strip of land. There is a lack of detailed, topographically accurate maps of the study area prior to the early 19<sup>th</sup> century; unfortunately neither the Slimbridge enclosure award (1809) nor the Purton enclosure award (1843) cover the study area, consequently the tithe map of Hinton tithing represents the earliest detailed depiction available of the study area.

The pattern of field enclosure in eastern half of the study area as depicted on the 1840 tithe map of Hinton tithing (in Berkeley parish) consists of two sinuous, rectilinear enclosures aligned roughly NNE-SSW, marked as Plots 21 and 22 and listed in the apportionment as 'Ridings'. The place name element 'Ridings' could denote an 'assart', or area of medieval woodland that has been cleared, enclosed and cultivated. A riding, or 'ridding', refers to a clearing and is also used to describe a 'green lane' passing through a wood; it is possible that the curvilinear feature bounding the study area on the north and east sides could be the remains of such a feature and indeed it is recorded as a 'lane' (Plot No. 20) in the tithe apportionment, running roughly SE from Purton village.

Immediately to the west of Plot No. 22, the tithe map depicts another rectilinear enclosure (Plot No. 24) which may have formed a westward extension of this linear field system but which appears to have subsequently undergone truncation by a more irregular pattern of enclosure. The south end of Plot No. 24 appears to be truncated by an irregularly shaped, roughly curvilinear field (Plot No. 23) running northwest-southeast, its western and southern edges being defined by the line of the Gloucester and Sharpness Canal (1794-1827). Both Plot Nos. 23 and 24 are marked as 'Doncroft' in the tithe apportionment; they appear to have been carved out of an irregularly shaped enclosure called 'Home Ground' (Plot No. 25)occupying the northwest part of the study area. The extreme northwest corner of both Plot Nos. 24 and 25 were truncated by a curvilinear boundary delineating the southern and eastern edges of two fields (Plot Nos. 30 & 31) listed in the tithe apportionment as 'Lecturn

Land', which were both under arable cultivation. Both plots were in the ownership of the Gloucester and Berkeley (later Gloucester and Sharpness) Canal Company, with George Taylor again listed as tenant. The name 'Lecturn Land' suggests an ecclesiastical association; possibly these fields may once have been glebe land belonging to the vicar of Hinton.

At the time of the tithe survey, the study area was in the ownership of William Berkeley, Lord Segrave and tenanted by a local farmer named George Taylor. It should be noted that the tithe apportionment does not provide information regarding the usage of Plot Nos. 21-25, although it is possible that these fields were also under arable cultivation, as were the adjoining fields immediately to the west.



Fig. 3: Extract from the Tithe Map for Hinton tithing (in Berkeley parish) dated 1840 showing the pattern of field enclosure in the study area shortly after the construction of the Gloucester and Sharpness Canal

(Reproduced by courtesy of Gloucestershire Archives)

The Berkeley enclosure map of 1843 reveals little additional information in terms of landscape development. Much of the study area was already enclosed by this date and the map shows only a narrow parcel of land extending a short distance along the turnpike road leading through the settlement of Purton on the opposite side of the canal from the study area. The adjacent land appears to have been in the ownership of the Gloucester and Berkeley Canal Company. Nineteenth century enclosures thus appear largely to comprise roadside areas and verges.

The Ordnance Survey 1<sup>st</sup> Edition 25-inch map of 1885 and the 6-inch map of 1888 (Fig. 4) show the study area in much greater clarity than either the Enclosure Map or the Tithe Map. Plot Nos. 24 and 25 on the Hinton tithe map appear to have been merged into a larger enclosure (marked as Plot No. 89 on the OS 25-inch map), although the relict division between these two plots appears to be preserved in a line of trees running north-south. In addition, fields 21 and 22 are shown as having been amalgamated into a single large rectilinear enclosure (marked as Plot No. 90 on the OS 25 inch map). This pattern of smaller enclosures being absorbed by their neighbours continues further to the east, although the general fieldscape remains identifiable. A footpath or track can be seen to the north of the study area.

Due to the greater level of detail available on this map, the canal milepost can be identified (HER 34414), while the decoy duck pond to the SE of the Canal is also clearly visible (HER 13968); it is perhaps notable that the shape of the pond appears somewhat different on the Ordnance Survey map when compared to the Tithe Map, having changed from a perfect rectangle running parallel to the north-western extent of the wooded area to an oblong-diamond shape, within which two separate wooded islands are visible. The pond feature located just to the northeast of the study area might be indicated by a small, roughly circular shaped feature depicted on the map (HER 26089). No other features or landmarks are recorded within the vicinity of the study area.

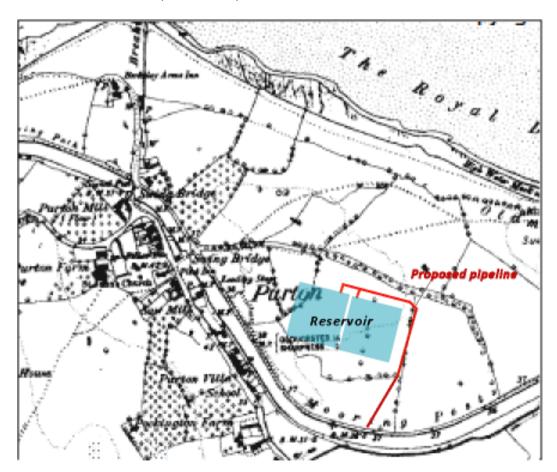


Fig. 4: Extract from the OS 1<sup>st</sup> edition 6 inch map of 1888 showing the study area at Purton (with the location of the reservoirs and the proposed pipeline route superimposed)

(Reproduced by courtesy of Gloucestershire Archives)

BA1132BWP DESK-BASED ASSESSMENT
DECEMBER 2011 PAGE 11

#### 4.2.2 *c*. 1900-1939

No discernable change in the fieldscape in and around the study area can be identified in either the Ordnance Survey 2<sup>nd</sup> Edition or 3<sup>rd</sup> Edition 6-inch maps of 1903 and 1924 respectively. Some land appears to have been reclaimed from the sea to the north-east of the study area (and to the north and east of Oldmoor Cliff) by 1903 (Fig. 5) and which remains in 1924. The suggestion that this land, albeit mud flats prone to tidal flooding, has been reclaimed is reinforced by the greater detail afforded to the course of a sluice leading from the Canal to the sea (in the 1<sup>st</sup> Edition map, the sluice stops at the Oldmoor Cliff). No other features or landmarks are recorded within the study area.

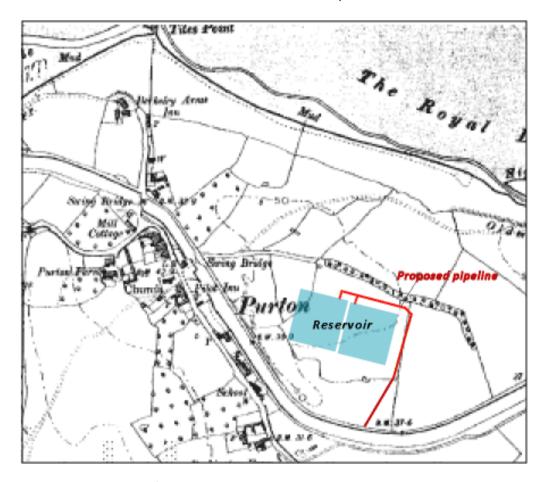


Fig. 5: Extract from the OS 2<sup>nd</sup> edition map of 1903 showing the study area at Purton (with the location of the reservoirs and the proposed pipeline route superimposed)

(Reproduced by courtesy of Gloucestershire Archives)

#### 4.2.3 *c*. 1939-Present

Analysis of vertical and oblique aerial photographs of Purton dating back to 1945 (held at the National Monuments Record, Swindon) provides useful information regarding changes to the landscape pattern within the study area. A series of RAF vertical photographs of the area covering the period 1945-59 show that the pattern of field boundaries within the study area had remained essentially unchanged since the late 19<sup>th</sup> century; most of the fields appear to have been under arable cultivation at that time, with the exception of the curvilinear shaped field immediately adjoining the Canal (Plot No. 23 on the tithe map). It is noticeable that the former boundary between Plot Nos. 21 and 22, the fields comprising the

eastern half of the study area, is still visible as a faint cropmark, as is the former boundary between Plot Nos. 24 and 25 immediately to the W. The circular pond feature marked on the OS 1<sup>st</sup> edition map to the northeast of the study area is also clearly visible on the aerial photographs.

There is no clear indication from the aerial photographs that the distinct group of enclosure/cultivation features visible to the southwest, near Manor Farm, extended north of the Canal into the study area. Within the extreme northwest corner of the study area, traces of the southern and western boundaries of what appears to have been a solitary, small rectilinear enclosure are visible as a cropmark on a single aerial photograph dated 27 July 1945 (NMR Ref. RAF/106G/UK549 no. 2050), however it does not appear on later photographs of the study area. The northern end of the pipeline route lies at least 200m to the east of this possible cropmark feature. An OS vertical photograph of 1969, taken just before the construction of the raw water reservoirs in 1970, shows little change to the landscape pattern within the study area; however another photograph taken two years later shows the significant impact of the reservoirs on the landscape, with the majority of the field boundaries having been removed, with the exception of the boundary defining the northern and eastern perimeter of the reservoir complex (NMR Refs. OS/69117; OS/71301).

### 5. Site Visit

A site visit was carried out on December 7<sup>th</sup> 2011 and a detailed photographic survey of the study area undertaken. In terms of topography, the area traversed by the proposed pipeline has been heavily impacted by modern landscaping activity associated with construction of the reservoirs, with a substantial build-up of presumably imported material. There is also a possibility that some of the landscaping immediately adjacent to the canal represents upcast material resulting from construction activity.



Plate 1: View looking W showing the northernmost of the two bunds projecting to the east of the reservoirs (in foreground to centre and right).

From its starting point on the north bank of the canal, the route proceeds north over gently rising ground before almost immediately intersecting with a substantial linear embankment aligned roughly east-west. The route then crosses a shallow gully to the north of this embankment before encountering an earthen bund, the first of two such features projecting to the east of the reservoirs (Plate 1).

The pipeline proceeds due north cutting through this bund feature and over an extensive low-lying levelled area, extending for a distance of some 85m before encountering the second bund. From the second bund, the pipeline extends to the west for a distance of 130m, before terminating in a new inlet (Plate 2). Inspection of the ground surface for any indications of earlier features proved inconclusive. It appears that any earlier features within the study area, with the possible exception of ground disturbance activity associated with the canal, has been either removed or buried beneath modern landscaping. The landscape has the overall appearance of a modern engineered landscape.



Plate 1: View looking W along the northern perimeter of the two reservoirs

## 6. Conclusion

This archaeological desk-based assessment, based on a detailed consultation of available sources of archaeological and historical information, has concluded that the proposed pipeline will have a **low impact** on the archaeological assets within its vicinity. This conclusion has been reached due to the lack of known and hitherto identified archaeological sites in the immediate vicinity of the study area; in addition, the length of the pipeline is *c*. 620m, extending around the northern and eastern perimeter of an existing reservoir complex.

Analysis of historic mapping and aerial reconnaissance has demonstrated that the fieldscape in the area surrounding the reservoirs has undergone a significant degree of alteration as a result of the construction of the two reservoirs (c.1970), which resulted in the removal of several field boundaries in the immediate vicinity of the study area. Moreover, it is reasonable to assume that the construction of the two reservoirs will have resulted in considerable disturbance to below-ground deposits, which could have a significant impact upon the potential survival of archaeological remains in this specific area.

However, due to the extensive alluvial build up in this area, combined with the depth of the pipeline (in places in excess of 6m), there remains the possibility that occupation deposits and features could survive, particularly of prehistoric or Roman date, with the potential for the recovery of well-preserved, waterlogged remains of high palaeoenvironmental value.

While no archaeological features or sites were discovered along the proposed route of the pipe, and no prehistoric of Roman sites identified within a 500m radius of the reservoir, there are a small number of medieval and post-medieval features in the wider vicinity, most notably a group of enclosure/cultivation features located some 200-300m southwest of the pipeline route and the line of the late 18<sup>th</sup>/early 19<sup>th</sup> century Gloucester and Sharpness Canal, which defines the southern boundary of the reservoir complex.

No evidence of wharfs or other ancillary buildings associated with the Gloucester and Sharpness Canal has been identified in the immediate vicinity of the pipeline route and as the proposed route extends from the reservoirs to an existing valve chamber connected to the Canal, there will be no impact on the Canal structure itself.

## 7. Impact Assessment & Mitigation

In view of the level of impact being assessed as **low** upon an already altered landscape, the potential survival of deposits at the lower levels - initially to be excavated for the new inlet at approximately 6m and then rising towards the reservoir to attain a suitable engineering depth (to be confirmed) - suggest that a watching brief on that portion of deep digging & equipment installation be undertaken. It is unlikely that this will be for a longer distance than 150m of the designated 600m although discovery and engineering depths may dictate otherwise.

An appropriate Written Scheme of Investigation will be prepared.

## 8. Copyright

Border Archaeology shall retain full copyright of any commissioned reports, tender documents or other project documents, under the Copyright, Designs & Patents Act 1988 with all rights reserved; excepting that it hereby provides an exclusive licence to the client for the use of the report by the client in all matters directly relating to the project as described in the Project Specification.

## 9. Bibliography

**Primary Sources** 

Tithe Apportionment for Hinton tithing (in Berkeley parish) - 1840

Berkeley Inclosure Award - 1843

Secondary Sources

Gloucestershire Historic Environment Record – HER Printout and Backup Files (inc. Historic Landscape Characterisation)

National Monuments Record - NMR Printout and Backup Files

Portable Antiquities Scheme - www.finds.org.uk

Allen, J.R.L., 'A short history of saltmarsh reclamation at Slimbridge Warth and neighbouring areas, Gloucestershire', *Transactions of the Bristol and Gloucestershire Archaeological Society*, Vol. 104 (1986), 139-155

Conway-Jones, H., 2003, The Gloucester & Sharpness Canal: an Illustrated History, Stroud

Smith, A.H., 1964, *The Place Names of Gloucestershire: Part II – The North and West Cotswolds,* Cambridge

SSEW, 1983, Soil Map of England and Wales Scale 1:250,000, Silsoe

Verey, D., & Brooks, A., 2002, *The Buildings of England - Gloucestershire 2: The Vale and the Forest of Dean*, London

## 10. Cartography & Aerial Photography

#### **Historic Maps**

(All maps were obtained from Gloucestershire Archives unless otherwise stated)

Slimbridge Inclosure Award Map - 1809

Tithe Map for Hinton tithing (part of Berkeley Parish) - 1840

Berkeley Inclosure Award Map - 1843

OS 1st edition 25 inch Map - 1880

OS 1st Edition 6-inch Map - 1888

OS 2<sup>nd</sup> edition 25 inch Map - 1903

OS 2<sup>nd</sup> Edition 6-inch Map - 1903

OS 3<sup>rd</sup> edition 25 inch map - 1922

OS 3<sup>rd</sup> Edition 6-inch Map - 1924

OS provisional edition 6 inch map - 1954

OS 1:10000 map - 1978

#### **Aerial Photographic Records**

RAF/106G/UK/549 - 27<sup>th</sup> July 1945 Black & White 5 x 5

RAF/106G/UK/1295 - 26<sup>th</sup> March 1946 Black & White 8.25 x 7.5

RAF/CPE/UK/1825 - 4<sup>th</sup> November 1946 Black & White 8.25 x 7.5

RAF/CPE/UK/2098 - 28<sup>th</sup> May 1947 Black & White 8.25 x 7.5

RAF/58/2773 - 29<sup>th</sup> April 1959 Black & White 8.2 x 7

OS/69117 - 18<sup>th</sup> April 1969 Black & White 9 x 9

OS/71301 - 24<sup>th</sup> June 1971 Black & White 9 x 9

OS/74001 - 2<sup>nd</sup> March 1974 Black & White 9 x 9

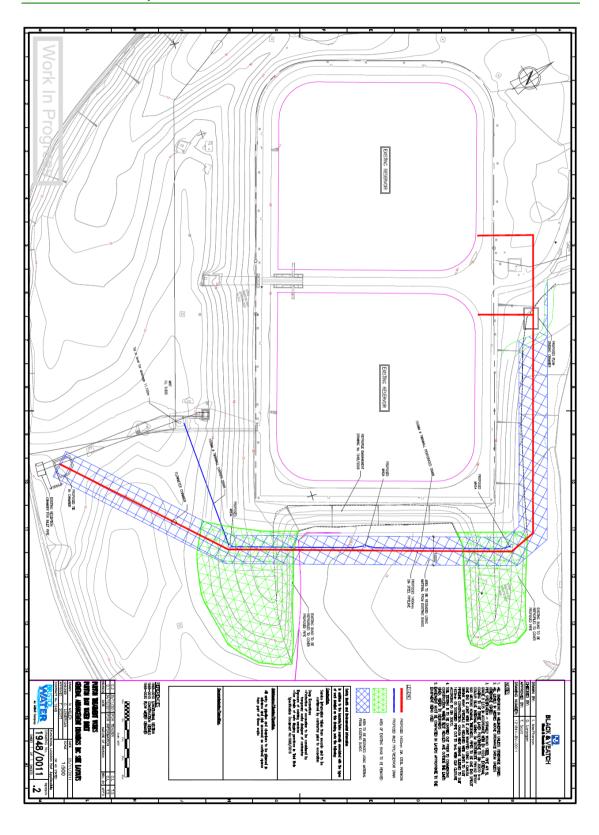
OS/74171 - 12<sup>th</sup> July 1974 Black & White 9 x 9

OS/79034 - 19<sup>th</sup> May 1979 Infra Red 9 x 9

OS/92192A - 14<sup>th</sup> June 1992 Black & White 9 x 9

OS/95679 - 4<sup>th</sup> August 1995 Black & White 9 x 9

# 11. Appendix 1: Engineering Plan of Route of Proposed Raw Water Pipeline – Purton Water Treatment Works



## **Document Control**

Pipeline at Purton Water

Treatment Works, Riddle Street, **Job No** BA1132BWP

Purton, Berkeley,

Gloucestershire GL13 9HN

Report written by

Job title

Ross Shurety BA & George Children MA MIfA

Report edited by

Stephen Priestley MA

Issue No Status Date Approved for issue

1 Final December 2011

Neil Shurety Dip M.GM Inst. M