Dŵr Cymru Welsh Water and Morgan Sindall

St. Nicholas Wastewater Treatment Works Archaeological Evaluation Project Design

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01	**12/06/2023**	**J. Ewart-Blake**	**D. Evans**			**First Draft and Checker Review**
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Contents

Figures

1 Introduction

1.1.1 Arcadis Consulting (UK) Limited (Arcadis) has been commissioned by Welsh Water ('the Client') to design a phase of evaluative archaeological trial trenching specific to the proposed extension of the St. Nicholas Wastewater Treatment Works. The project location is at St. Nicholas Wastewater Treatment Works, Cardiff, CF5 6TB (Hereafter referred to as 'The Site').

1.1.2 The archaeological evaluation will comprise a phase of non-targeted archaeological trial trenching, utilising a total of 3 trenches (30m x 2m) representative of a 5% sample size, of the trenchable area of the Site (calculated at 0.354 ha). The purpose of the works is to further understand and characterise the nature of the archaeological resource within the Site.

1.2 Project Background

1.2.1 The Proposed Development is to upgrade the existing Wastewater Treatment works by, extending it to cover 0.45ha of additional land adjacent to the existing work's eastern side. The 0.45ha area will include works for new permanent plant infrastructure, as well as a temporary works compound during the construction period to be located immediately south of the proposed permanent infrastructure.

1.2.2 The proposed new development would also require a temporary construction access road. The temporary construction access road will extend from Dyffryn Lane in the east and cross agricultural fields in an approximate west, north-west and south-west orientation where it would adjoin the main part of the Proposed Development. The temporary construction access road would utilise the existing field gateways and be approximately 4m wide. The trees and hedgerows located between the existing treatment works and the new plant to the east will require removal to facilitate the Proposed Development and site access, though the hedgerow will be replanted following construction.

1.2.3 The proposed new plant will consist of:

- An above ground inlet works and screen;
- A below ground lift pumping station;
- A 15.5m diameter partially buried trickling filter;
- 2 No. 5m diameter partially buried humus tanks;
- 3 No. buried small return pumping stations;
- An above ground 30m3 sludge holding tank;
- An above ground motor control centre kiosk;
- A 600m2 reed bed; and
- Appropriate mitigation planting and ecological mitigation measures.

1.2.4 Of the above the sludge holding tank, liquor return pumping station, alkalinity dosing kiosk, wash water booster set, and an above ground de-sludge pump are located in the existing site boundary. No demolition or modifications to the plant on the existing WwTW are required, beyond provision of connections to the new equipment. The final settlement tank on the existing site will be retained, however, no longer used.

1.3 Scope of Works

1.3.1 This specification sets out the initial strategy and methodology by which the archaeological contractor will implement the programme of archaeological works. For the purposes of the archaeological evaluation, and the remainder of this document, the Site will refer specifically to the area of the plant extension and temporary construction compound, and not to the proposed access road. The proposed access road is not proposed to be trial trenched and will instead be monitored through archaeological watching brief during construction.

1.3.2 The scope of works will comprise a 5% trenching strategy that has been developed for the accessible areas of the Site. The accessible area has been calculated by establishing no-access areas on the grounds of health and safety and ecological constraints and is estimated at 0.354 ha. The areas scoped out are the following:

- Area within a 30m buffer of the electricity pylon;
- Area within a 10m buffer of the overhead cable lines; and
- Area within a 2m buffer of hedgerows.

1.3.3 The above areas have been identified as constraints for the development and are discussed in **Section 4**.

1.3.4 In format and content, this document conforms with current best practice and to the guidance outlined in Management of Research Projects in the Historic Environment (Historic England, 2015) and the Chartered Institute for Archaeologists' (CIfA) Standard and Guidance for Archaeological Field Evaluation (CIfA, 2020). No guidance documents have yet been released by Cadw or GGAT for archaeological fieldwork, though the GGAT Guide for Archaeology and Planning in South East Wales (GGAT 2023) has been reviewed.

1.3.5 The 5% trenching strategy has been developed for the accessible areas of the Site, however this strategy is subject to agreement with the GGAT Archaeological Planning Officer, and is therefore subject to change once consultation is undertaken. The Officer is to approve this document and a detailed Written Scheme of Investigation (WSI), written by the appointed archaeological contractor, prior to fieldwork commencing.

1.4 Location, Geology and Topography

1.4.1 The existing waterworks is located 850m to the south of the village of St. Nicholas, itself 2km west of Cardiff. The treatment works are centred roughly around National Grid Reference (NGR) ST 08775 73310. The existing St. Nicholas Wastewater Treatment Works presently occupies a triangular-shaped piece of land approximately 0.32 ha in total.

1.4.2 The existing St. Nicholas Wastewater Treatment Works is currently occupied by:

- A wastewater treatment works dating to the late 1970s, comprising various tanks and biofilter units in the north of the site, the control and mess building in the centre of the site, and sludge drying beds to the south. The southern part of the site is largely vegetated with the exception of the access to the sample chamber in the south of the site.
- Landscaping on all sides of the site comprising trees, shrubbery and an access road (Brook Land) on the east side, joined to the site through hardstanding, which connects to the A48.

1.4.3 The Site is located in a topographical low point at approximately 60m Above Ordnance Datum (AOD), with the land rising to the north-east and north-west. St. Nicholas to the north is situated on a hill at 115m aOD. The topography falls slightly to the south to where the River Waycock is located, then rises further south of the river.

1.4.4 The British Geological Survey indicates that geology of the Site broadly has an underlying bedrock geology comprising of conglomerate sedimentary mudstone (Mercia Mudstone Group), with no superficial geology (BGS, 2023).

2 Historic Environment Background

2.1.1 The full heritage baseline for the Site and Study Area is available in the Cultural Heritage Desk-Based Assessment (CHDBA, Arcadis 2023). This CHDBA established the archaeological potential for the Site, by period, as follows:

- Prehistoric – **medium** potential;
- Romano-British – **low** potential;
- Early Medieval – **negligible** potential;
- Medieval – **low** potential;
- Post-Medieval – **medium** potential; and
- Modern – **low** potential.

2.1.2 The CHDBA identified that the Site and the proposed access road are situated on mostly undeveloped land and thus the survival of any potential below-ground archaeological remains associated with different archaeological periods is considered possible and should thus be investigated prior to development.

2.1.3 It recommended that further archaeological investigation be undertaken to determine the presence or absence of archaeological remains through trial trench evaluation within the footprint of the proposed new waterworks infrastructure and temporary construction compound only.

3 Archaeological Investigations

3.1 Aims and Objectives

3.1.1 This section sets out the approach to a programme of archaeological evaluation and reporting to ensure an appropriate level of recording is undertaken of archaeological assets prior to their loss or partial loss and aims to establish the character and extent of archaeological activity within the Site and relate it to the known activity within the area where appropriate.

3.1.2 The aims of these tasks will be to:

- Determine the presence and/or absence of archaeological remains with the Site not previously subject to archaeological evaluation. Where remains are present, make a full record to current CIfA and GGAT standards;
- Determine the approximate extent, condition and state of preservation of any remains;
- Confirm the approximate date or range of dates of the remains;
- Produce a report on the results of the archaeological evaluation;

- Ensure adequate provision for archival deposition of the archaeological record; and
- Inform on the need for further archaeological mitigation of all or part of the evaluated areas.

3.1.3 The overriding objective of this project design and associated archaeological works will be to inform the planning process associated with the Proposed Development.

3.2 Proposed Trial Trench Locations

3.2.1 Proposed trench locations are illustrated on Figure 1. A total of three trial trenches are proposed (all 30m x 2m). This is representative of just over a 5% sample size of the accessible area of the Site (0.354 ha). This sample size is subject to the approval of the Archaeological Planning Officer at GGAT.

3.2.2 The accessible area has been identified as the part of the Site that can be safely accessed and also accommodate the process of undertaking an archaeological field evaluation outlined in this document. The area of no-access has been determined by the presence of active services and ecologically significant hedgerows (Figure 2).

3.2.3 No archaeologically led assessment, either intrusive or non-intrusive (beyond a walkover survey) have taken place in the Site or its immediate vicinity (within 250m). Therefore, the trenching approach uses a non-targeted sample strategy. Trenches will be positioned, where practicable, based upon the plans given in Figure 1-Figure 2. This may be subject to change due to the presence of fenced-off areas within the Site that have not been recorded on available mapping but were visible during the Site Visit and will need to be avoided. Any variations will be recorded by GPS and transferred to a digital plan of the site. A shapefile of the trench layout shown in Figure 1 will be provided to the archaeological contractor.

3.3 Archaeological Research Framework

3.3.1 The evaluation programme will also seek to determine the relationship of any archaeological remains encountered with the broader archaeological landscape. An attempt will also be made to assess the regional context in which the archaeological evidence rests and will aim to highlight any relevant research issues within the Wales archaeological research framework (IFA 2008).

3.3.2 This project design uses the 2017 edition of the research framework documents (IFA 2017) where applicable, which is split by period. This review supersedes the original 2008 version. This project design reviews the research objectives for the five key periods identified in the CHDBA: Neolithic and Bronze Age, Roman, Medieval, Post-Medieval and Later Post Medieval and Industrial. The key research priorities and themes will be addressed during analysis of the results of the evaluation programme, where appropriate.

Neolithic and Earlier Bronze Age

3.3.3 In summary, research priorities include:

- Adequately assessing any evidence of Neolithic or Early Bronze Age settlement, even where ephemeral;
- Higher excavation sampling, around 50% of identified features;
- Palaeoenvironmental sampling where possible/likely;

- Analysis or artefact clusters to identify new settlement sites
- Less preservation in situ and trenching to yield more information.

3.3.4 Key research themes are:

- Everyday life in the Neolithic and Early Bronze Age;
- The transition from houses in the early Neolithic to other settlement types post 3500 BC, and why these other settlement types appear scarce in the archaeological record;
- How evidence for settlement fits into patterns of land use and the regional variations; and
- How palaeoenvironmental evidence can do to elucidate on settlement patterns.

Roman

3.3.5 It is highlighted that there is a reasonable scarcity of Roman sites (known about and researched adequately) in Wales.

3.3.6 Key research themes are:

- How the conquest of Wales proceeded under the Julio-Claudian and Flavian emperors;
- The extent that the regions of Roman Wales were integrated with the wider imperial economy;
- The relationship and interactions between conquered and conqueror in Roman Wales;
- Settlement patterns;
- Principle industries and technologies; and
- Main funerary practices, and how they varied from pre-Roman practices, regionally or according to economic or social status.

Medieval

3.3.7 In summary, priorities include assessment of:

- The location and distribution of settlement sites;
- The links between settlement type, tenure and social hierarchy;
- The wider environmental context of settlements in the agricultural landscape;
- The nature of the functioning agricultural landscape (including transhumance);
- The development of agricultural techniques, crops and livestock;
- The nature and development of structures within settlements; and
- Development of field systems and morphological relationship to tenure.

Earlier Post-Medieval

3.3.8 In summary, priorities include assessment of:

- The relationship between Wales and the wider world, with focus on the contribution of Wales to the coal, metal, and slate mining and production industries;
- Appreciation and understanding of vernacular, polite industrial, religious and agricultural buildings and gardens;
- Appreciation and understanding of the development and use of transport corridors (railways, roads and waterways);
- Preservation and appreciation of Wales' historic rural farmlands, and engagement with its rural communities;
- Better integration of finds and excavated material with written evidence;
- Developing a framework of Welsh architectural and landscape types; and
- More detailed excavations and analysis.

Later Post-Medieval and Industrial

3.3.9 In summary, priorities include assessment of:

- The significance and scale of technical change within the major industries of coal, iron, copper, tin, lead and slate, and the impact of that change within the landscape; their context and significance in terms of similar sites elsewhere in the world; their relationship with the markets they served;
- The extent to which some industrial sites might have origins predating 1750;
- The significance of military and defensive sites;
- The erosion or survival of local and regional characteristics in domestic building from the later eighteenth century onwards; the varieties of planned and unplanned settlement; evidence for migration and social diversity in housing stock;
- The extent to which the proliferation of social infrastructure and communal institutions such as chapels, churches, institutes is a distinctive feature of the period and in what ways these structures might be distinctive to Wales;
- The significance, form and archaeological survival of transport corridors – turnpikes, government-sponsored roads, canals, railways – their engineering, the industries they served and the settlements they sustained; and
- The significance, form and archaeological survival of major dock systems; their context and significance in terms of similar sites elsewhere in the world.

4 Key Constraints

4.1.1 As aforementioned in **Section 1.3**, inaccessible areas comprising constraints for the project were identified. Shown on Figure 1, they are:

- Area within a 30m buffer of the electric pylon;
- Area within a 15m buffer of the overhead cable lines; and
- Area within a 2m buffer of hedgerows.

4.1.2 Additional ecological stipulations are to ensure no trenches under the canopy of standard trees (pending a root protection zone drawing), and ensuring excavations have a sloped end to ensure nocturnal animals do not get trapped.

4.1.3 Regarding the electric pylon and overhead cable lines, these will be avoided both in the interest of health and safety and for possible ground disturbance of below-ground archaeological deposits. Prior to the excavation of trenches, a cat and genny survey will be done to ensure no additional and unrecorded services are located within the footprint of the trenches.

5 References

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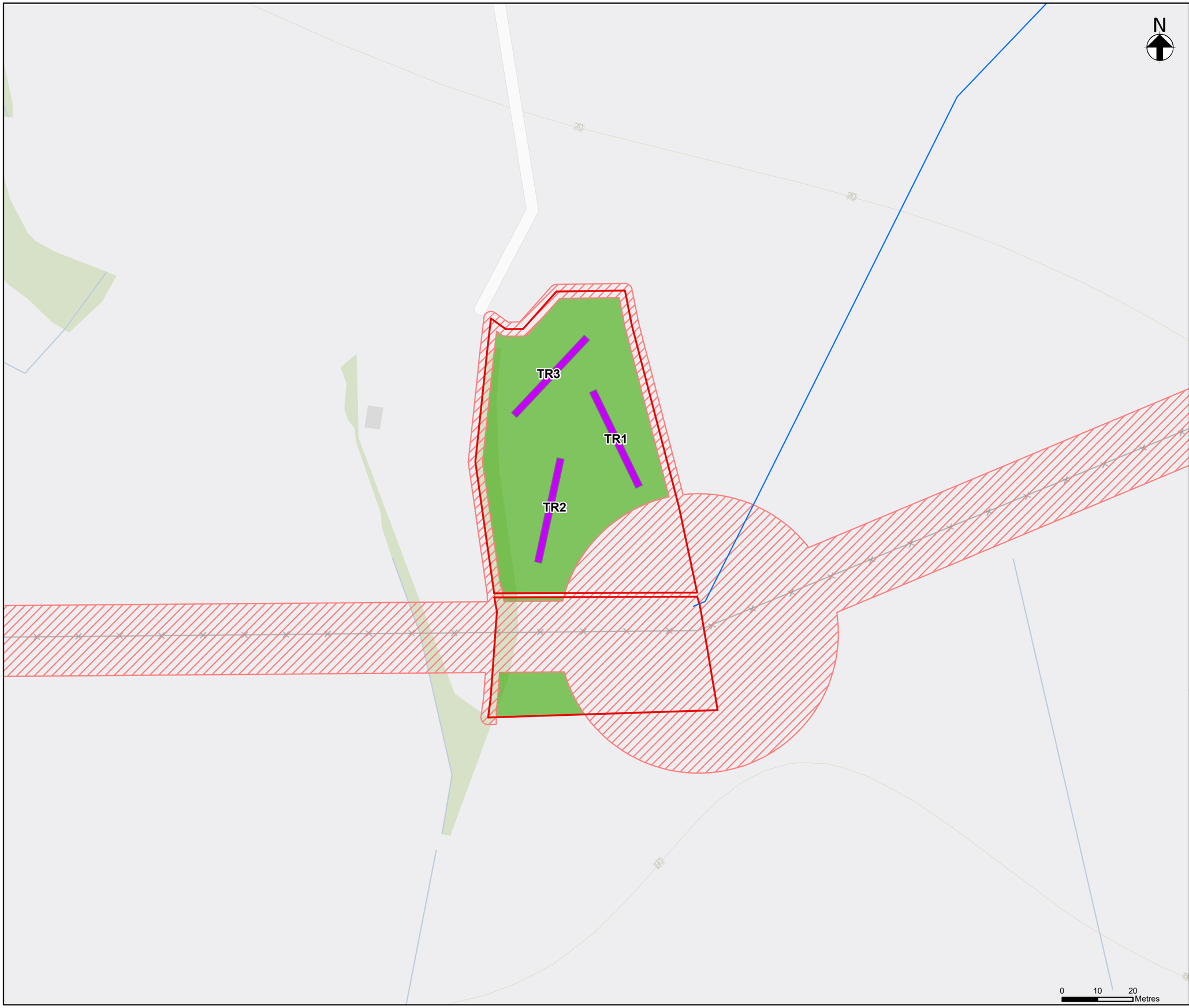
Appendix A

Figure 1

Figure 1: Indicative Trench Locations



A3

Legend

- Site Boundary
- Temporary Construction Access Route
- Indicative Trench Locations
- Accessible area
- Inaccessible areas

Rev.	Date.	Drawn.	Description.	Chkd.	Appd.	Date.
P01	23/06/23	MS	For Information	JB	DE	23/06/23

Capital Delivery Alliance
Cynghrair Cyflawni Cyfalaf
Ty Awen, Spooner Close, Coed Kernew, Newport, NP10 8FZ

Project Name.
St Nicholas WwTW

Drawing Title.
Figure 1
Indicative Trench Locations.

Suitability.	Suitability Code.
Information	S2

Originator	Designer	Date.
M. SHETYE	J. EWART-BLAKE	23JUN23

Internal Project Number	Scale	Rev.
10048098	1:1,000	P01

Drawing Number.
01

Figure 2

Figure 2: Indicative Service Locations and Safety Buffer Areas

A3

N

TR3

TR1

TR2

0 10 20 Metres

Legend

- Site Boundary
- Temporary Construction Access Route
- Indicative Trench Locations
- Hedgerows and Ecological Constraints Buffer
- Overhead Cabled Buffer

Non-Welsh Water

- Private Drain
- Private Foul

Welsh Water

- Rising Main
- Motor
- Combined

National Grid

- High-Voltage Line
- Transformer
- National Grid Services
- National Grid Services Buffer

Rev.	Date.	Drawn	Description.	Chkd.	Appd.	Date.
P01	23/06/23	MS	For Information	JB	DE	23/06/23

Capital Delivery Alliance
Cynghrair Cyflawni Cyfalaf
Ty Awen, Spooner Close, Coed Kernew, Newport, NP108FZ

Project Name.
St Nicholas WwTW

Drawing Title.
Figure 2
Indicative Service Locations and Safety Buffer Areas

Suitability.	Suitability Code.
Information	S2

Originator	Designer	Date.
M. SHETYE	J. EWART-BLAKE	23JUN23

Internal Project Number	Scale	Rev.
10048098	1:1,000	P01

Drawing Number.
02

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