



**Newport Effluent Outfall Replacement Scheme
offshore outfall pipe works**

**Archaeological Written Scheme of Investigation
(Update of WSI report 2022/027, May 2022)**

A report for Kaymac Marine & Civil Engineering Ltd

June 2023

by

**The Glamorgan-Gwent Archaeological Trust Ltd
(GGAT Archaeological Services)**

**Project No. P2214
Report No. 2023/024
NGR ST 34329 82363**



Contents	Page
Summary	3
Authorship and acknowledgements.....	4
Copyright notice.....	4
Abbreviations	4
1 Introduction	5
1.1 Proposal and background.....	5
1.2 Site description	5
1.3 Description of the works	5
1.4 Geology.....	5
1.5 Archaeological context.....	6
2 Specification.....	7
2.1 Purpose	7
2.2 Objectives.....	7
2.3 Scope	7
2.4 Monitoring.....	7
2.5 Timing.....	7
3 Resourcing.....	8
3.2 Staff	8
3.3 Specialists.....	8
4 Implementation	9
4.1 Standards	9
4.2 Recording.....	9
4.3 Finds recovery and recording.....	9
4.4 Human remains.....	9
4.5 Environmental sampling.....	10
4.6 Reporting.....	10
4.7 Archive and finds deposition	10
5 General.....	12
5.1 Insurance	12
5.2 Health and Safety.....	12
5.3 General limitations.....	12
5.4 Quality control and standards.....	12
5.5 Arbitration.....	12
6 References	13
7 Glossary	15

Figures

Figure 1. Location of excavation area	17
Figure 2. Line of pipe works and excavation area	17

Appendix 1. KayMac Newport Effluent Outfall Replacement Scheme Outline Method Statement & Risk AssessmentsKM-EASTMAN-RAMS-12-05-23.....end

Document Control

Version	Author	Illustrations	Peer Review	Date approved
001	SL-J	n/a	MT	12 June 2023

Summary

Kaymac Marine & Civil Engineering Ltd have commissioned the Glamorgan-Gwent Archaeological Trust to prepare an updated archaeological Written Scheme of Investigation (WSI) for offshore ground disturbance works associated with the installation of an outfall pipe for an effluent outfall replacement scheme near Nash, Newport (Marine Licence application RML2205 refers).

In archaeological terms NRW's archaeological advisors have recommended that an archaeologist should be present during all intrusive groundworks.

Associated and concurrent outfall works inland of the sea wall are to be undertaken under Newport Council planning application number 22/0387, which recommended an archaeological watching brief during the works. Information in the Historic Environment Record indicates that the application area is located in an area of archaeological potential. It is located within both the Gwent Levels Registered Historic Landscape (specifically the Nash/Goldcliff Historic Character Area (HLCA001)) and the Newport Archaeologically Sensitive Area (ASA). There are also several Roman sites in the vicinity.

The updated report is similar to the original WSI (Report no. 2022/027, May 2022) but includes updated construction details. The Scheme allows for an archaeological watching brief to be undertaken during intertidal ground intrusion works connected with the proposed development and includes detailed contingency arrangements including the provision of sufficient time and resources to ensure that any archaeological features or finds that are located are properly investigated and recorded.

It also includes provision for any sampling that may prove necessary, post-excavation/fieldwork recording and assessment and reporting, and possible publication of the results.

The archaeological monitoring will be undertaken in line with the requirements of the Chartered Institute for Archaeologists' Standard and guidance for an archaeological watching brief (2014, revised 2020). The WSI has been prepared by GGAT Archaeological Services.

Authorship and acknowledgements

The project was managed by Martin Tuck MCIfA (Head of Archaeological Services). The report was prepared Sophie Lewis-Jones ACIfA (Project Officer).

Copyright notice

The copyright of this report is held by Glamorgan-Gwent Archaeological Trust Ltd; GGAT has granted an exclusive licence to the client and their agents to use and reproduce the material it contains. Figures copyright the client and their agents unless otherwise stated.

Abbreviations

APM:	Archaeological Planning Management (GGAT)
GGAT:	Glamorgan-Gwent Archaeological Trust Ltd
HER:	Historic Environment Record (curated by the Glamorgan-Gwent Archaeological Trust)
ICON	Institute for Conservation
LPA:	Local Planning Authority
NGR:	National Grid Reference
NMR	National Monuments Record (curated by the RCAHMW)
NPRN:	National Primary Record Number (in NMR)
NRW:	Natural Resources Wales
PRN:	Primary Record Number (in HER)
RCAHMW:	Royal Commission on the Ancient and Historical Monuments of Wales

1 Introduction

1.1 Proposal and background

- 1.1.1 Kaymac Marine & Civil Engineering Ltd are undertaking the design and installation of a new outfall pipe to replace place a 1470m long concrete coated steel pipe built in 1960 at, Land to the South of Boat Road, Newport (NGR ST 34329 82363). Works are scheduled to take place on the landward and seaward side of the sea wall.
- 1.1.2 The inland works are being undertaken under Newport Council planning application number 22/0387 which recommended an archaeological watching brief during the works.
- 1.1.3 The offshore section of pipe which commences approximately 15m north of the sea defence wall and terminates in the low water zone is subject to Newport Council Planning Permission and a Natural Resource Wales Band 3 Marine License.
- 1.1.4 No archaeological features were identified during an earlier archaeological watching brief (27 and 28 May 2022) undertaken during test pitting and trial holes on the line of the existing outfall (WSI GGAT report 2022/027. GGAT Report 2022/035).
- 1.1.5 Following previous guidance (RML2205 GGATHM General Consultation 05/04/2022) and following best practice, GGAT Archaeological Services were commissioned by Kaymac Marine & Civil to update the WSI, which sets out the framework for the forthcoming offshore archaeological works.

1.2 Site description

- 1.2.1 The location of the replacement effluent pipe commences approximately 15m north of the sea defence wall and terminates in the low water zone to the South of Nash and sits at the southern edge of the RSPB Newport Wetland Reserve, at the western end of Boat Road (NGR ST 34369 82346).

1.3 Description of the works

- 1.3.1 The 'Offshore Phase' relates to the section of pipe that lies beneath MLWS. The discharge point within the Estuary is at chainage 1470m and the pipe becomes visible above the seabed at chainage 567m. Floating plant such as a Backhoe dredger or an excavator on a barge will be used to excavate a trench adjacent to the existing outfall pipe in which the new pipe will be laid. Precast concrete mattresses will be lowered from a crane barge over the new pipe for protection and to prevent future movement. The trench throughout this section will be approximately 900m in length with a depth of between 1.2 and 2.0m (see Appendix 1 for full description)

1.4 Geology

- 1.4.1 Bedrock and superficial deposits. Mercia Mudstone Group - Mudstone. Sedimentary bedrock formed between 252.2 and 201.3 million years ago during the Triassic period, overlain by Tidal Flat Deposits of clays and silts.

1.5 Archaeological context

- 1.5.1 The area is incredibly rich in archaeological features from almost all periods. Mesolithic forests, hunter gatherer settlements, human footprints and flint tool scatters have been identified eroded out of the foreshore. In addition, Neolithic Auroch skeletons, Bronze Age roundhouses and post-settings, cattle hoofprints, flint and bone tools and discrete pottery scatters and Iron Age and medieval fish-traps have all been identified. This archaeological resource, recorded along the foreshore and intertidal zone, is likely to extend inland under the later alluvium.
- 1.5.2 The site is also located within the boundary of the Gwent Levels Historic Landscape of Outstanding Historic Interest in Wales (Ref number HLW(Gt)2). The planned work area lies at the western boundary of character area HLCA 01 Nash/Goldcliff coastal zone (Cadw 2007).
- 1.5.3 The Nash/Goldcliff coastal zone is noted being a complex and diverse landscape consisting of abundant intertidal and buried archaeological remains, drainage features (reens, banks, grips, surface drainage, bridges) small irregularly shaped fields, sinuous lanes, dispersed settlements, large commons and monastic associations¹.
- 1.5.4 Although there are no archaeological features recorded within the planned works area boundary, there have been several finds of archaeological artefacts in the general area; these range from individual artefacts, such as a mattock, made from a section of reindeer antler (PRN 04888g) to faunal remains, (Auroch skeleton PRN 07590g), through to structural remains, such as a 30m long plank trackway (PRN 05734g). These features all date from the Prehistoric era. However, the general area is also rich in remains spanning the Roman period to the Second World War.

¹ GGAT Historic Landscapes

2 Specification

2.1 Purpose

- 2.1.1 The purpose of this WSI is to set out a quantifiable schedule of works against which performance, fitness for purpose and achievement of quality can be measured.
- 2.1.2 This WSI has been prepared to ensure that the work is undertaken to the standard required by the Chartered Institute for Archaeologists' *Standard and guidance for an archaeological watching brief* (2014 updated 2020).

2.2 Objectives

- 2.2.1 The objectives of this fieldwork are as follow:
- An investigation of the potential archaeological resource through monitoring of ground investigation works;
 - The presentation of these observations to be set out in a written report;
 - The preparation of an archive of data recovered and records made as a result of the project, and the deposition of this archive in a suitable receiving museum (i.e. National Museum of Wales or Newport Museum) or similar institution.

2.3 Scope

- 2.3.1 The watching brief will be carried out during excavation works for the replacement pipe trench and any other associated groundworks in the intertidal zone (See Appendix 1). Machine excavation work is also expected to take place offshore beneath MLWS. Suspension of the watching brief is suggested during these circumstances, however with the caveat that any artefacts discovered will be retained for archaeological inspection.

2.4 Monitoring

- 2.4.1 The appropriate organisations will be given reasonable advance notice by the client of the commencement of works.
- 2.4.2 If necessary, site access will be afforded to NRW's or Newport Council's archaeological advisors, in order to observe any significant archaeological features that are identified within the excavations.

2.5 Timing

- 2.5.1 Work is predicted to take place between April and September 2024 subject to conditions.

3 Resourcing

3.1.1 GGAT Archaeological Services will provide the following input to carry out the specified archaeological works.

3.2 Staff

3.2.1 The project staff involved are experienced archaeologists drawn from the team regularly used. These will include:

- Martin Tuck MCIfA, Head of Archaeological Services), responsible for the management of the project and maintaining quality;
- Project Officers(s), responsible for carrying out fieldwork.
- Project Archaeologist(s), responsible for carrying out fieldwork.

3.2.2 Additional input will be provided by:

- Finds Specialist, responsible for finds recovery policy and arrangement of specialist services;
- Project Archaeologists (finds), responsible for cleaning, cataloguing and analysing finds;

3.3 Specialists

3.3.1 Specialist expertise, if required, will be obtained from suitably qualified internal and external individuals. These specialists will be drawn from the following:

- Waterlogged wood: Prof Nigel Nayling / Dr Rod Bale (DendroArch/UWLAS (UWTSD).
- Ceramic building material: Martin Locock (freelance)/Dr Edith Evans (GGAT);
- Clay pipes: Charlotte James-Martin (Freelance);
- Coins: National Museum Wales (NMW);
- Conservation: Phil Parkes, Cardiff Conservation Services (Cardiff University);
- Flints: Elizabeth Walker (NMW);
- Glass: Joyce Compton (freelance);
- Metalwork: Dr Mark Redknap (NMW) / Prof Bill Manning (freelance);
- Medieval stone: Dr Mark Redknap (NMW);
- Medieval pottery: Joyce Compton (freelance);
- Metalwork and industrial residues: Dr Tim Young (Cardiff University and GeoArch);
- Palaeoenvironmental remains: University of Wales Lampeter, Archaeological Services (UWLAS) / Wendy Carruthers (freelance) / QUEST Reading University;
- Post-medieval pottery: Joyce Compton (freelance);
- Prehistoric pottery: Jody Deacon (NMW);
- Roman pottery: Joyce Compton (freelance)/ Peter Webster (freelance);
- Roman brick and tile: Dr Edith Evans (GGAT);

3.3.2 Further specialist expertise in other disciplines will be obtained as required.

4 Implementation

4.1 Standards

- 4.1.1 The specified archaeological works will be undertaken to the highest possible standards in line with the requirements of the Chartered Institute for Archaeologists' *Standard and guidance for an archaeological watching brief* (2014, revised 2020).

4.2 Recording

- 4.2.1 During the works, all archaeological deposits will be recorded with a single continuous context numbering system. GGAT will, upon request, submit a copy of its recording forms and manual to the client.
- 4.2.2 Where appropriate, archaeological features will be drawn at a suitable scale in plan (usually 1/20 scale) and in section (usually 1/10 scale). All significant contexts will be digitally photographed, with a resolution of no less than 10 megapixels. Survey information will be related to the Ordnance Survey National Grid and levels related to the Ordnance Survey Datum.

4.3 Finds recovery and recording

- 4.3.1 All classes of finds will be cleaned and catalogued. They will be retained until arrangements for final deposition have been agreed, in line with the requirements of the Chartered Institute for Archaeologists' *Standard and Guidance for the collection, documentation, conservation and research of archaeological materials* (2014, updated 2020). If substantial quantities of undiagnostic, residual or modern material are recovered, an on-site recording and discard policy for these classes of find will be agreed.

4.4 Human remains

- 4.4.1 Should human remains be encountered, the Coroner will be immediately informed. The nature and extent of those remains will be established and recorded, but the remains will be left in situ, with suitable measures in place to ensure their protection during backfilling. Special circumstances may dictate the need to remove human remains if they are thought to be vulnerable to further damage or obstructive to the broader aims of the development works. In such cases, and in agreement with the archaeological advisor to the LPA, the human remains will be archaeologically recorded and removed under conditions that comply with all current legislation. This will include reporting to the relevant authorities, the obtaining of proper licences, and the provision for eventual reburial following appropriate analysis.
- 4.4.2 All human remains will be excavated by hand in accordance with the Chartered Institute for Archaeologists' *Excavation and Post-Excavation Treatment of Cremated and Inhumed Human Remains: Technical Paper Number 13* (1993).
- 4.4.3 Excavation of human remains will be subject to further negotiation as a variation to the contract.

4.5 Environmental sampling

- 4.5.1 The management of any environmental recording and sampling will follow the principles and tenets laid down in Historic England's (formerly English Heritage) *Environmental Archaeology: A guide to the theory and practice of Methods, from sampling and recovery to post-excavation* (2011). All deposits with a high potential for the preservation of palaeoenvironmental material will be sampled, by column, bulk and other method as appropriate, for possible subsequent analysis, in accordance with a sampling strategy overseen by a specialist with appropriate expertise. Sampling and recording will be the responsibility of an identified member of the field team with relevant experience.

4.6 Reporting

- 4.6.1 Following a review of the potential of the recovered evidence, a programme of analysis and research will be undertaken, resulting in the preparation of a report on the findings. This will present a synthesis of the fieldwork data, together with contextualising evidence drawn from archaeological and historical sources. The report will include plans, drawings and photographs as appropriate, as well as supporting data as appendices if required.
- 4.6.2 A PDF version of the report will be supplied to the client.
- 4.6.3 Where appropriate, short archaeological digest reports will be submitted for publication in relevant regional, national and thematic learned journals. As a minimum, a report will be submitted to the annual publication of the regional CBA group or equivalent journal.
- 4.6.4 Non-technical reports may also be produced to inform the general public of the archaeological investigations, which could include web resources, posters, leaflets or other media forms.
- 4.6.5 A digital copy of the report and full archive will be deposited with the National Monuments Record (RCAHMW, Aberystwyth), and a digital copy of the report and archive index will be deposited with the regional Historic Environment Record, in accordance with the *Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)* (Welsh Archaeological Trusts, 2018).

4.7 Archive and finds deposition

- 4.7.1 An archive of archaeological records relating to the fieldwork will be prepared to the specifications in *The National Standard and Guidance to Best Practice for Collecting and Depositing Archaeological Archives in Wales* (National Panel for Archaeological Archives in Wales 2017).
- 4.7.2 The site archive will be deposited with an appropriate institution, or retained by the landowner, as required, in accordance with the ICON and the National Panel for Archaeological Archives in Wales guidelines (*The National Standard and Guidance to Best Practice for Collecting and Depositing Archaeological Archives in Wales* (2017)), and subject to the agreement of the legal landowner. The National Museum of Wales (NMW Cardiff) or Newport Museum will be approached.

- 4.7.3 Any finds, including artefacts and ecofacts, excepting those which may be subject to the laws of *Treasure Act* (1996) and/or *Treasure Order* (DCMS 1996; 2002), will be deposited with the same institution, subject to the agreement of the landowner.
- 4.7.4 An agreement with an appropriate institution to accept this material will be made on completion of fieldwork and assessment of the nature of the finds recovered.

5 General

5.1 Insurance

- 5.1.1 GGAT holds full insurance cover for this type of work including Professional Indemnity and Public Liability cover. Full details of these and other relevant policies can be supplied to the client on request.

5.2 Health and Safety

- 5.2.1 GGAT will provide to the client if requested a copy of its Health and Safety statement in accordance with *The Health and Safety at Work Act 1974*. The main contractor should prepare any documentation required by the *Construction Design and Management Regulations 2015*.
- 5.2.2 Prior to commencement of work, GGAT will carry out a formal Health and Safety Risk Assessment in accordance with *The Management of Health and Safety Regulations 1999*. A copy of the risk assessment should be kept on any site office and be available for inspection on request.
- 5.2.3 In addition to statutory requirements, GGAT follow best practice for Health and Safety in archaeology as defined in the FAME (Federation of Archaeological Managers and Employers) *Manual of Health and Safety in Field Archaeology* (2010 and as updated).

5.3 General limitations

- 5.3.1 The work outlined in this specification will be carried out to the highest professional standards, and the conclusions drawn will be based on a considered review of the evidence available. However, the archaeological resource is unpredictable, and the encountering of unexpected archaeological deposits on the site cannot be ruled out. Where examination of such deposits is beyond the scope of the present specification, their investigation and analysis must be agreed by separate negotiation.
- 5.3.2 Should there need to be a variation to the provisions of the specification, this will be agreed in advance with the client and the relevant Authority (and/or their respective agents).

5.4 Quality control and standards

- 5.4.1 GGAT will carry out all works in accordance with the following Chartered Institute for Archaeologists' documents for conduct, regulations, and standards and guidance:
- Code of Conduct;
 - Regulations for professional conduct;
 - Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment.

5.5 Arbitration

- 5.5.1 Any dispute or difference arising out of a contract in relation to this work will be referred for a decision in accordance with the Rules of the Chartered Institute of Arbitrators' *Arbitration Scheme for the Chartered Institute for Archaeologists* applying at the date of the agreement.

6 References

Legislation and technical guidelines

Cadw, 2007, *Caring for Historic Landscapes*. Welsh Government.

Cadw, 2007, *Guide To Good Practice On Using The Register Of Landscapes Of Historic Interest In Wales In The Planning And Development Process*. Welsh Government.

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GGAT Report 2022/035 June 2022. *Effluent Pipe Replacement Scheme, Newport Beach, Newport. Archaeological Watching Brief*

GGAT Report 2022/027 May 2022. *Effluent Pipe Replacement Scheme, Ground Investigation Beach Works, Newport Marine Licence No: RML2205: Archaeological Written Scheme of Investigation*

Online resources

British Geological Survey (BGS) mapping. Accessed 11 April 2022. Available at: <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

Glamorgan Gwent Archaeological Trust. Accessed 08 June 2023. Available at: http://www.ggat.org.uk/cadw/historic_landscape

7 Glossary

Archive

An ordered collection of all documents and artefacts from an archaeological project, which at the conclusion of the work is deposited at a public repository, such as a local or national museum.

Assessment

A desk-based assessment is a detailed consideration of the known or potential archaeological resource within a specified area or site (land-based, intertidal or underwater). It consists of a collation of existing written and graphic information in order to identify the likely character, extent, quality and worth of the known or potential archaeological resource in a local, regional or national context as appropriate.

Brief

An outline framework of the archaeological situation that is to be addressed, together with an indication of the scope of the works that will be required.

Cadw

Cadw is the Welsh Government's historic environment service. Cadw are responsible for the planning issues which affect statutorily protected monuments and buildings. They also grant aid repairs to historic buildings and monuments and manage monuments which are in direct State care.

Field evaluation

A limited programme of non-intrusive and/or intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site; and, if present, defines their character and extent, and relative quality. It enables an assessment of their worth in a local, regional, national or international context as appropriate. The programme of work will result in the preparation of a report and ordered archive

Historic Environment Record (HER)

A documentary record of known sites in a given area. In South-east Wales the HER is curated by the Curatorial Division of the Glamorgan-Gwent Archaeological Trust.

Natural

Archaeological term for undisturbed natural soils or geology on a site.

NGR

National Grid Reference.

RCAHMW

Royal Commission on Ancient and Historic Monuments of Wales, based in Aberystwyth.

Risk Assessment

A document prepared to meet the requirements of *The Management of Health and Safety at Work Regulations 1992* assessing all risks to the health and safety of employees and others arising from a work activity.

Specification

A written schedule of works required for a particular project (by a curator, planning archaeologist or client), set out in sufficient detail to be quantifiable, implemented and monitored. Normally prepared by or agreed with the relevant curator.

Watching brief

An archaeological watching brief is defined as a programme of observation, investigation and recording conducted during any operation carried out for non-archaeological reasons within a specified area or site, where there is a possibility that archaeological deposits may be disturbed or destroyed. The programme of work will result in the preparation of a report and ordered archive.

Welsh Archaeological Trusts

There are four Welsh Archaeological Trusts, Clwyd-Powys, Dyfed, Gwynedd and Glamorgan-Gwent. The Trusts were established between 1974 and 1975 in order to carry out rescue archaeological work in Wales. The Trusts are divided into Contracting and Curatorial Divisions. They are all charities but are also limited companies.

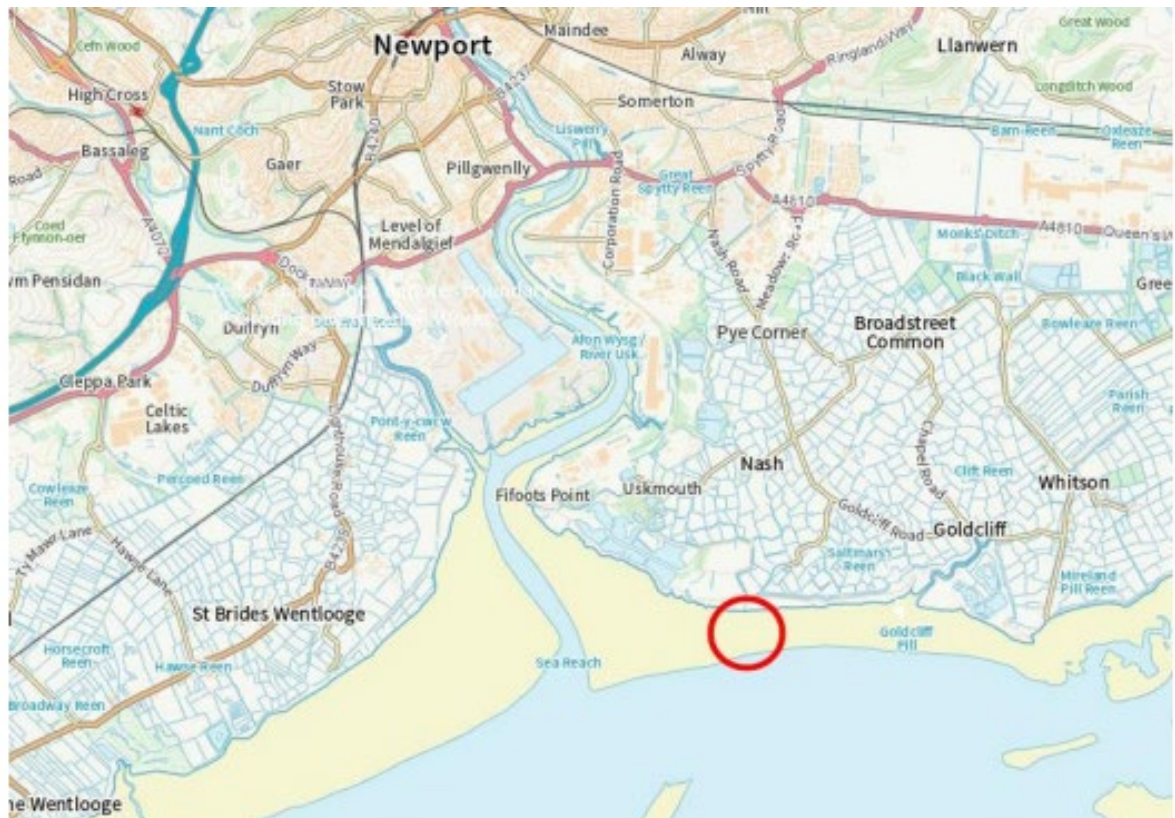


Figure 1. **Location of excavation area**
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Figure 2. **Line of pipe works and excavation area**
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EASTMAN

OUTLINE METHOD
STATEMENT &
RISK ASSESSMENTS

12th May
2023

NEWPORT EFFLUENT OUTFALL
REPLACEMENT SCHEME
BAND 3 MARINE LICENCE
APPLICATION

Document Control Sheet								
Title				Document No.				
Newport Effluent Outfall Replacement Scheme Outline Method Statement & Risk Assessments				KM-EASTMAN-RAMS-12-05-23				
Originator				Client				
 Kaymac Marine & Civil Engineering Ltd Osprey Business Park Byng Street Landore Swansea SA1 2NR Tel: 01792 301818				 Eastman Chemical Company, Corporation Road, Newport, South Wales. NP19 4XF				
Authorisation								
Prepared by:	Jon Dean	Signature		Date 12/05/2023				
Checked By:	Rhys Colcombe	Signature		Date 12/05/2023				
Approved by:	Jeff Lippiett	Signature		Date 12/05/2023				
Distribution and Revision Status								
Issue Date	Document Description		Status/Revision					
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1	NRW Marine Licensing		✓					
2	Kaymac Marine Records		✓					
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4								
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6								

Contents		
Section No.	Title	
1.0	Introduction	
1.1	Description & Purpose of the Project	
2.0	Project Details	
2.1	Project Site Location Details	
2.2	Site Location Map	
2.3	Access to site	
3.0	Legislative and Site-Specific Compliance	
3.1	Statutory Legislation	
3.2	Additional Site-Specific Compliance	
3.3	Environmental Considerations	
4.0	Project Resources	
4.1	Site Personnel	
4.2	Site Welfare and Storage	
4.3	Site Plant & Equipment	
4.4	Materials	
4.5	Personnel Protective Equipment (PPE)	
5.0	Project Directory	
5.1	General Contact Numbers	
5.2	Emergency Contact Numbers	
6.0	Method Statement	
7.0	Emergency Procedures	
7.1	Local Hospital Details	
7.2	Hospital Location Map	
7.3	Actions on Minor Injuries	
7.4	Actions on Major Injuries	
7.5	Reporting Accidents, Work Related Diseases and Dangerous Occurrences	
8.0	Risk Assessment Record	
9.0	Briefing Attendance Record	

Section 1.0

Introduction

1.1

Description & Purpose of Project

The outfall was originally constructed by Land & Marine in 1960 and is located near Nash in Newport. The offshore section of the outfall consists of a 1470m long concrete coated steel pipe that discharges treated effluent from the Eastman Chemical Plant into the Severn Estuary. The offshore section of pipe which commences approximately 15m north of the sea defence wall and terminates in the low water zone is nearing the end of its design life and is now due for replacement (see photograph below).



Photograph of the offshore outfall pipe taken in February 2022

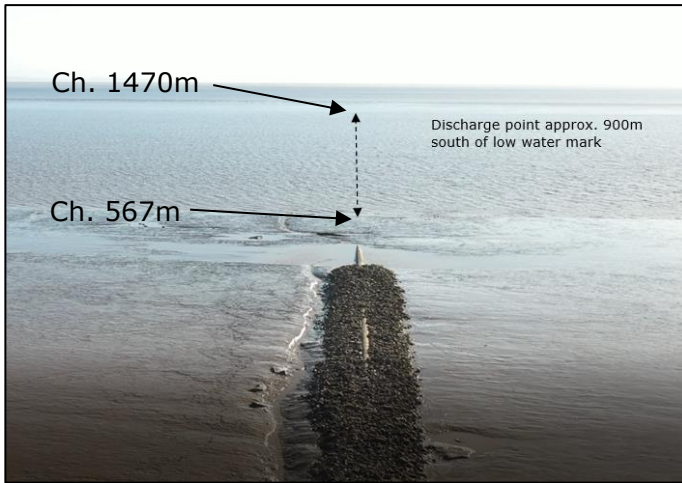
Kaymac Marine and Civil Engineering Ltd have been contracted by the Eastman Chemical Company under 'Early Contractor Involvement' (ECI) to undertake the design and installation of the new outfall pipe. The installation is programmed to take place between the months of April and September 2024 subject to Newport Council Planning Permission and a Natural Resource Wales Band 3 Marine License. The new outfall pipe will consist of 12 x 125m lengths of 560 OD HDPE pipe which will be towed from the 'Pipelife' fabrication plant in Norway to the local ABP Wet Dock facility in Newport (see typical towing example in the photograph below). The pipe will be stored in the Wet Dock facility while preparations take place on site for the final installation.



Photograph courtesy of Pipelife

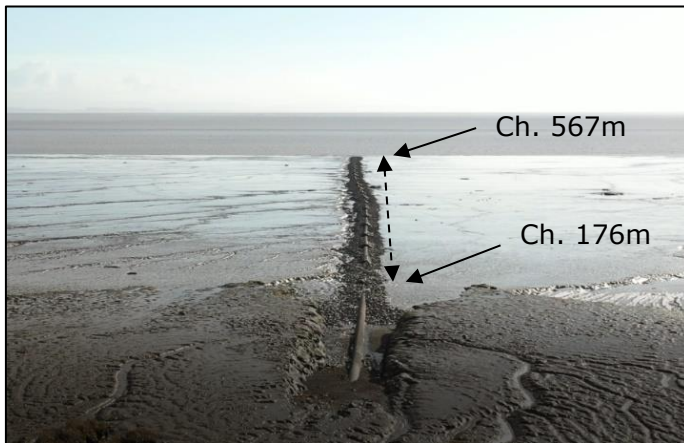
The overall installation can be defined under three main activities as described below:

1. Outfall Installation - Offshore Phase



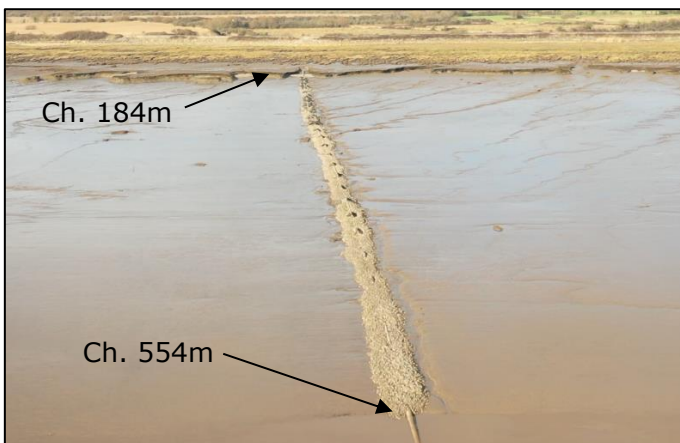
The 'Offshore Phase' relates to the section of pipe that lies beneath MLWS. The discharge point within the Estuary is at chainage 1470m and the pipe becomes visible above the seabed at chainage 567m. Floating plant such as a Backhoe dredger or an excavator on a barge will be used to excavate a trench adjacent to the existing outfall pipe in which the new pipe will be laid. Precast concrete mattresses will be lowered from a crane barge over the new pipe for protection and to prevent future movement. The trench throughout this section will be approximately 900m in length with a depth of between 1.2 and 2.0m.

2. Outfall Installation - Intertidal zone



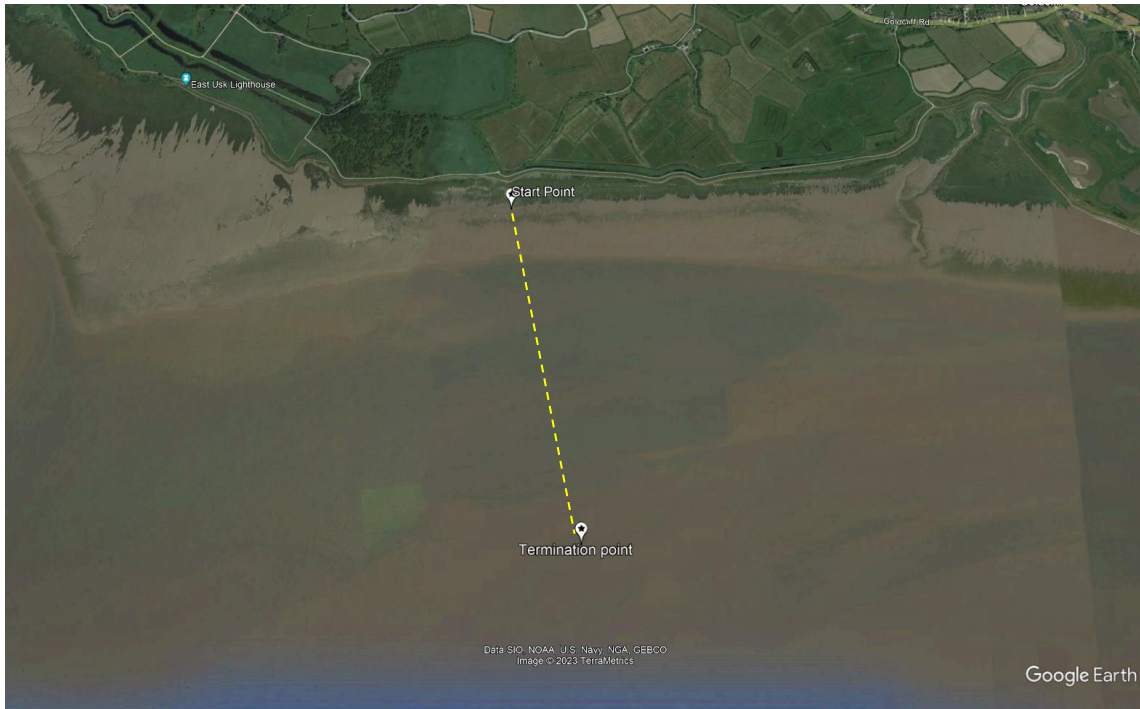
This section is within the intertidal zone between chainages 567m and 176m. This beach area will dry out during the low water periods and can be accessed by landing craft. This section can be excavated either from floating plant during high water periods or from the beach using amphibious plant during low water periods. A combination of the two will be used to maximise the working windows. Much like the offshore section, the pipe will be laid within the trench and will be covered with precast concrete mattresses for protection.

3. Removal of Existing Outfall Pipe and Stone Causeway

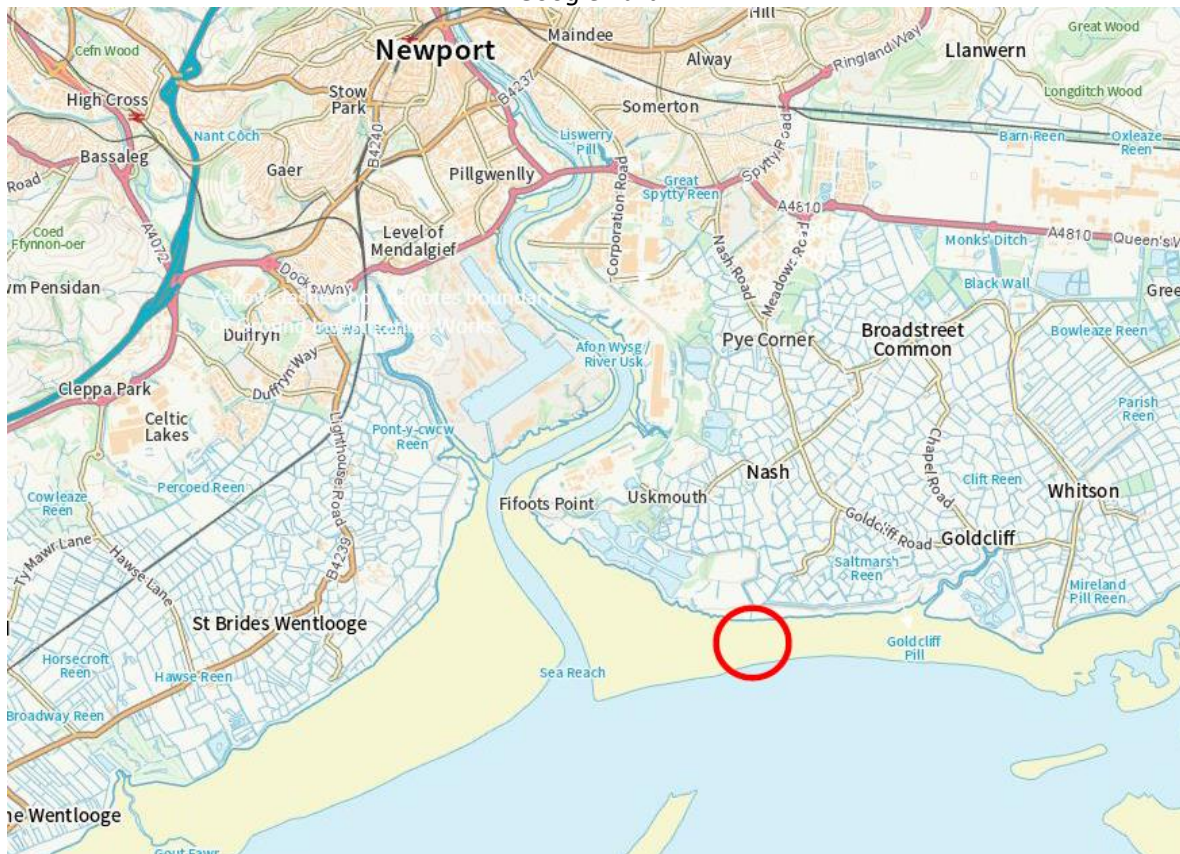


To mitigate some losses of the Benthic Habitat which may result following the installation the new pipeline, the redundant pipeline and stone causeway will be removed to allow the habitat to return to its natural state. Therefore, on completion of the outfall replacement works, the redundant exposed section of the outfall in the intertidal zone between chainage 184m and 554m will be removed.

Section 2.0	Site Location		
2.1	Project Site Location Details		
Nearest Address	Salt Marsh Lane, Goldcliff, Nash, Newport, Wales		
Post Code	NP18 2AT		
OSGB	ST 34371 82340		
Lat/Lon	51.536134, -2.9476176	Easting / Northing	334371, 182340
2.2	Site Location Map		



Approximate line of existing pipe and location of site compound north of sea defence wall - Image courtesy of Google Earth



2.3

Site Access



Access will be via marine vessels travelling from Newport Wet Dock facility with all plant and equipment required to undertake the works at a suitable state of the tide.

Section 3.0

Legislative and Site-Specific Compliance

3.1

Statutory Legislation

This document has been prepared to comply with, as far as reasonably practicable, the following current relevant legislation (as applicable):

- The Health & Safety at Work etc. Act 1974
- The Management of Health & Safety at Work Regulations 1999
- The Health & Safety (First Aid) Regulations 1981
- The Lifting Operations and Lifting Equipment Regulations 1998
- The Work at Height Regulations 2005
- The Personal Protective Equipment at Work Regulations 1992
- The Manual Handling Regulations 2002
- The Control of Substances Hazardous to Health Regulations 2002
- The Reporting of Injuries, Diseases & Dangerous Occurrences (RIDDOR) Regulations 2013
- The Environmental Protection Act 1990
- The Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)

3.2	Additional Site-Specific Compliance
- Throughout the works, Kaymac will (as far as reasonably practical) ensure that no activities will be completed in a manner that could damage or alter the existing beach profile. - Prior to demobilising from site, Kaymac will ensure that the beach profile is restored to its original state (so far as is reasonably practical) - All operatives will hold current CSCS cards. - Any excavation will be suitably graded to an acceptable angle to prevent any collapse of the sides. - Kaymac will fill out and 'self-issue' a Permit to Dig and a Permit to Break Ground prior to any excavation works. - The Client is to issue an isolation permit for Kaymac to make any connection into the existing outfall. - For purpose of this Methodology, all lifting operations will be carried out in accordance with an approved Lift Plan and all lifts will be under the control of a Lift Supervisor & Slinger/Signaller.	

3.3	Environmental Considerations
Throughout all aspects of the works, Kaymac will actively aim to conduct activities in a manner that will cause minimum detrimental effects to the local ecology and wildlife and as a result, we will carry out the works with the following Environmental Actions: - Prior to the commencement of any works, Kaymac will obtain all relevant Licenses and permits from NRW and any other regulatory authority. All works will be carried out in accordance with the above Licenses and permits. - All plant delivered to site will be sourced from a trusted reputable company and upon ordering, Kaymac will enforce the notion that any plant to be delivered will need to be cleaned and fit for purpose (no leaks or damaged pipelines, hoses, etc). - All materials to be used for installation will be inert and will not contain toxic elements which may be harmful to the marine environment, the living resources which it supports or human health. - Upon arrival to site, the Kaymac Supervisor will proceed to inspect the plant for any visible signs of leaks or un-cleanliness that could potentially damage the ecology. All plant will also come with spill kits which all Kaymac Personnel are trained in the use of. - All plant that is to be used on the beach or the floating plant will be fitted with bio-degradable hydraulic oil where possible to negate any environmental issues in the unlikely event of a spillage or leak. - No refuelling procedures are to be carried out at sea during the works. All re-fuelling will take place at the satellite compound within the nearby harbour. - All equipment being used on or near to the watercourse will be appropriately 'bunded' to prevent any possible spillages from harming the local ecology and wildlife. - If any protected species are found within the vicinity of the works, works will cease and the Client and Natural Resources Wales (NRW) representative informed. Works will not recommence until permission is granted by the Client and NRW representative. - During the works, Kaymac will (as far as reasonably practical) ensure that no activities will be completed in a manner that could damage or permanently alter the existing seabed profile. - Prior to demobilising from site, Kaymac will ensure that the seabed profile is restored to its original state (or as specified in the construction drawings). - Any waste and unused materials will be removed from site in a safe manner by a licensed waste carrier upon completion of the works. - The waste hierarchy (Reduce, Reuse, Recycle and Dispose) will be employed throughout the construction works. - Care will be taken to only order the correct quantity of required materials, reducing disposal of unused materials. - Any COSHH waste and special waste will be removed from site by a specialised waste carrier. COSHH waste should not be mixed with general waste and/or other recyclables. - No plant, equipment, or construction works are to be undertaken on the salt marsh (the Salt Marsh is only to be used infrequently for pedestrian access limited to 1 to 2 people).	

Section 4.0	Project Resources
4.1	Kaymac Site Personnel
1 x Crane Barge Master & crew (24hr) 2 x Tug Skippers 2 x Tug Deck hands 1 x Landing Craft Skipper 1 x Landing Craft Deck Hand 1 x Kaymac Site Manager 2 x Kaymac Site Supervisor / Engineer 2 x Kaymac Excavator Operator 2 x Kaymac Banksman 3 x Kaymac General Operatives / Divers 1 x Watching Brief (Archaeologist)	

PLEASE NOTE:

This is a provisional list only.
The exact staffing levels and qualifications will be confirmed after contract award and prior to commencement on site.

4.2	Site Welfare & Storage
- Welfare facilities will be available on the landing craft/ crane barge. - Welfare facilities within the harbour facility will be either within the satellite compound or in a harbour owned building with approval from the Harbour Master. - Suitably sized storage containers will be on site at the satellite compound and on crane barge if required.	

4.3	Site Plant & Equipment
- Backhoe Dredger or excavator on barge – offshore trench excavation. - Landing Craft 1 x Crane barge. 1 x Materials handling barge 2 x multicats (for manoeuvring barge above). 2 x smaller support/crew boats. 1 x 15t 360° tracked amphibious excavator with Bio Oil and digging bucket. 1 x 18t 360° tracked amphibious excavator with Bio Oil and digging bucket. - Suitably sized wheeled dumper. - Emergency stretcher for recovery to Boat Road. - GPS and surveying equipment. - Surface supplied diving equipment. - Fuel bowser. - Navi mats. - Small hand tools i.e., shovels etc. - CAT & Genny.	

PLEASE NOTE:

This is a provisional list only.
The exact items of plant will be confirmed after contract award and prior to commencement on site.



*Typical example of
Long Reach
Amphibious Excavator*

4.4	Materials
560mm OD HDPE Pipe Vertical and horizontal connectors/couplers Concrete mattresses Concrete collars	

4.5	Personal Protective Equipment (PPE)
The <u>minimum</u> PPE requirements for the site will be: - Safety Helmet to BS EN397:2012 - Safety Boots (or Wellington Boots) to ISO 20345:2011 - High Visibility Jacket/waistcoat to EN471:2003 - Safety Glasses to EN166 - Closed cell neoprene Dry Suits	

Section 5.0	Project Directory
5.1	General Contact Numbers
Eastman UK Site Representative - David Davies	
01633 754454	
Kaymac Site Supervisor – Dean Munkley	
07557 921044	
Kaymac Marine & Civil Engineering Ltd-Swansea Office	
01792 301818	
Kaymac Operations Director-Jeff Lippiett	
07971 880029	
Kaymac Project Director-Rhys Colcombe	
07950 501774	
Kaymac Project Manager – Jon Colcombe	
07771 803693	
Kaymac Project Coordinator-Jon Dean	
01792 301818	
5.2	Emergency Contact Numbers
The Grange University Hospital	
01633 493100	
HSE Incident Contact Centre	
0845 3009923	
HSE Infoline	
08701 545500	
Kaymac Health & Safety Manager-Gareth Crees	
07971 880028	
Ambulance, Police or Fire & Rescue Service	
999	

Section 6.0

Method Statement

All Kaymac personnel will attend the Eastman offices prior to commencement of the works on the start date agreed with the Client and as per the project programme. All operatives involved in the project will be site inducted to ensure they are away of:

- The site layout.
- Hazards and risks involved in carrying out the works.
- Environmental considerations and site constraints.
- The method of works and risk assessments.
- Emergency arrangements in the event of an incident, including location of the nearest hospital.

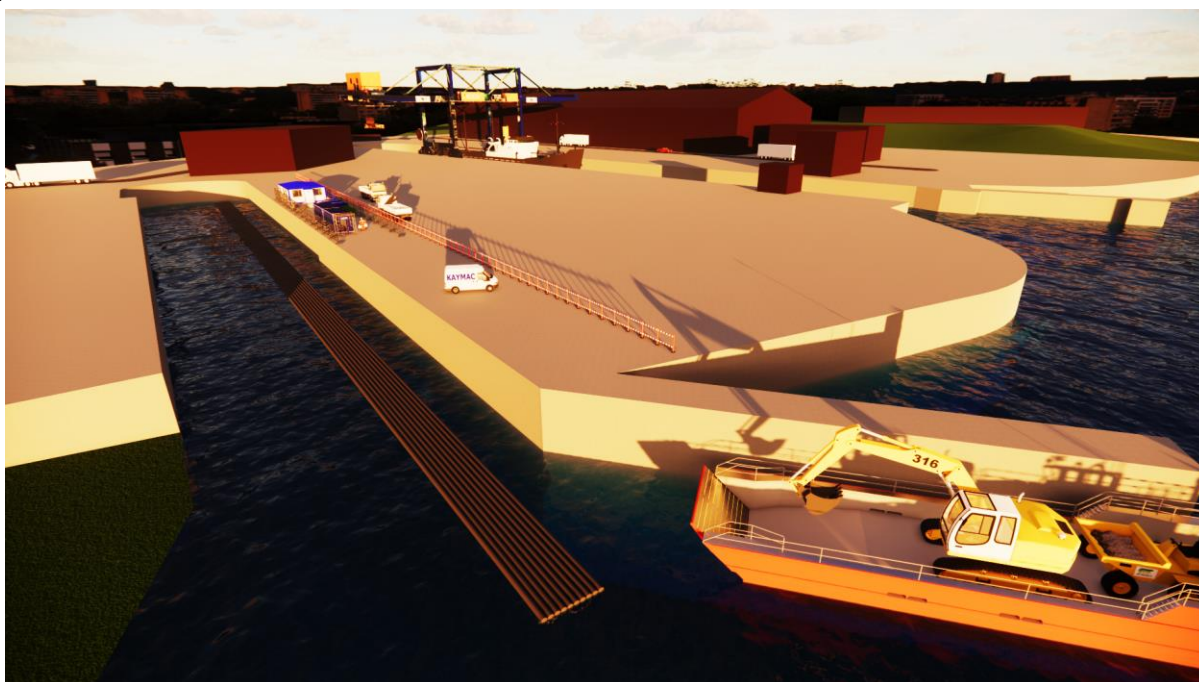
All Kaymac and sub-contract personnel will be required to sign the site attendance register prior to starting work each day, and to sign out at the end of each shift. The Kaymac Site Manager / Supervisor will be responsible for briefing the site-specific Method Statement and Risk Assessments appertaining to the project tasks to the site team.

Mobilisation and Delivery of Pipes

Ahead of mobilisation, a pre-start bathymetric survey will be undertaken by Kaymac.

Kaymac personnel will setup a satellite compound at ABP Newport Wet Docks, which will be used as storage for the marine plant and beach equipment when not in use. Note that the images shown in the following (Section 6.0) are indicative and are only included to provide a visual overview of the types of works to be undertaken.

Safety fencing will be erected around the compound to prevent any unauthorised access from other harbour users.



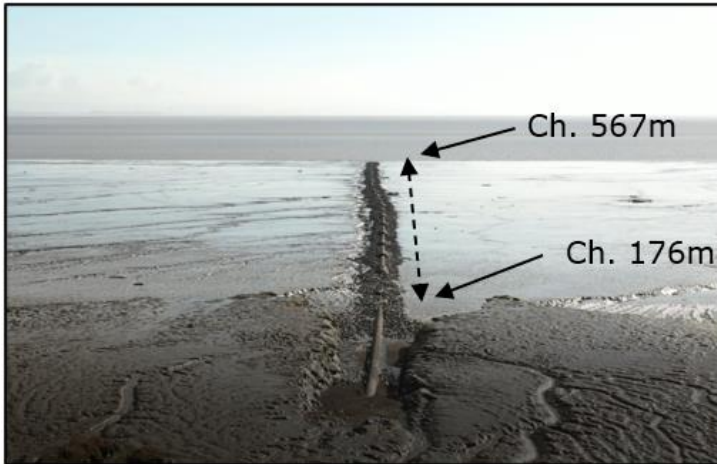
Satellite compound setup in nearby harbour facility and pipes delivered from manufacturing facility in Norway.

All the necessary plant and equipment to undertake the works will be loaded onto the relevant marine plant and sea fastened at the nearby harbour.

Completion of the site setup will coincide with the delivery date of the pipes from the manufacturing facility in Norway, whereby the 12no. pipes will arrive by sea in 125m long sections.

All inspection and testing of the pipes will be undertaken in a controlled environment within the manufacturing facility, with Kaymac personnel undertaking visual inspections for any noticeable defects on arrival of the pipes to site.

Trench Excavations between chainages 176m and 567m (intertidal zone)



At a suitable state of tide, the Landing Craft, amphibious excavators, and any other necessary plant/equipment will leave the harbour facility and will mobilise to the work site (see photo on left). An approved Biosecurity Plan will be implemented to reduce the risk of the introduction or spread of invasive non-native species. This will be available after contract award and prior to commencement on site.

If the water level at low tide is **lower** than the existing pipe at the corresponding chainage, i.e., the pipe is dry, the Landing Craft will ground itself within the vicinity of the new pipe, with the first

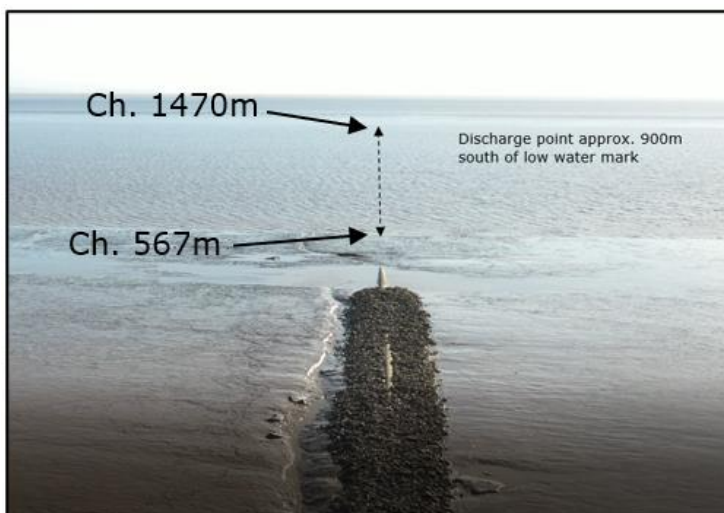
section of the new pipe being placed at chainage 176m. The marine plant will position itself to maximise the working window before the tide comes back in. The plant and equipment will be checked for any leaks before any items are tracked off the landing craft and onto the beach.

In a methodical manner, the trench will be excavated ensuring all sides are battered back to a suitable angle of repose to prevent collapse and to prevent any material from falling back into the trench. All excavated bed material will be side-cast adjacent to the trench. Side-casting the material will also provide a more efficient backfilling process later on by reducing the requirement to transport material to and from site.

The trench excavation and the subsequent pipe installation will not be completed during one low water period, therefore, an element of re-work of the trench will need to be carried out prior to works commencing on the following Low water period.

The line and level of the trench will be monitored and checked by the on-site Kaymac Engineer to ensure that the invert level is to the correct specification and is in accordance with the contract drawings.

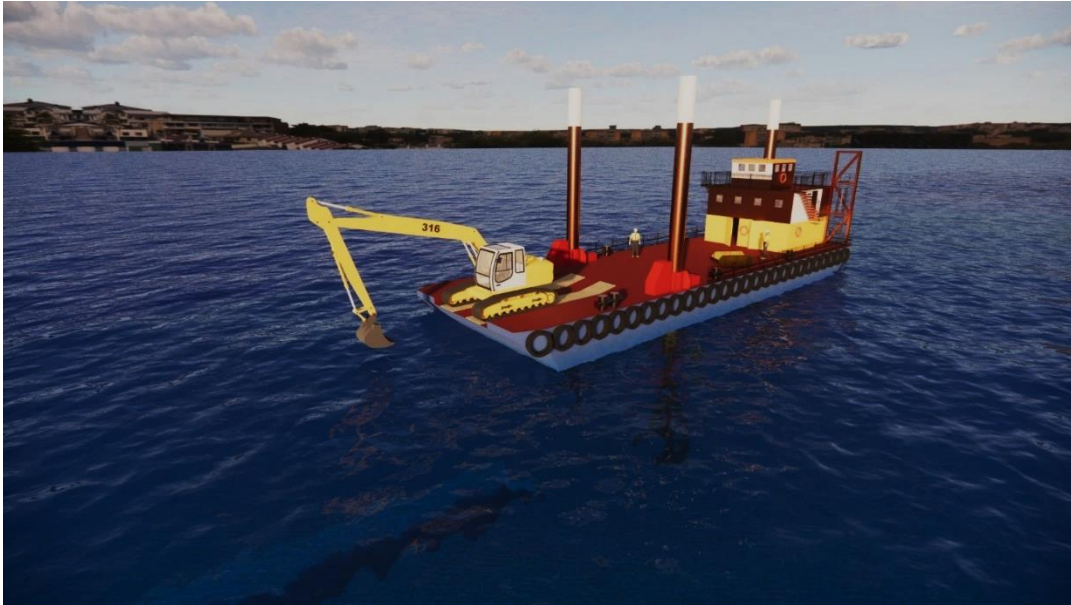
Trench Excavations between chainages 567m and 1470m (offshore zone)



If the water level at low tide is **higher** than the existing pipe at the corresponding chainage, i.e., the pipe is fully submerged, the marine vessel will be positioned above the trench in a suitable position to enable the excavator onboard to reach and dig the trench, as shown in the image below. Onboard GPS and surveying equipment will be utilised to accurately determine the position, line, and level of the trench from the water's surface. A Backhoe dredger may be used instead or in conjunction with the excavator and barge, this will be confirmed after contract award and prior to commencement on site.

As per the intertidal section, the trench will be excavated ensuring all sides are battered back to a suitable angle of repose to prevent collapse and to prevent any material from falling back into the trench. All excavated bed material will be side-cast adjacent to the trench. Side-casting the material will also provide a more efficient backfilling process later on by reducing the requirement to transport material to and from site.

In addition to using the on-board 'dig depth' surveying system, periodically during slack water periods, the Kaymac dive team will be utilised to carry out any checks that are deemed necessary by the on-site Kaymac Engineer. All diving operations will be carried out in accordance with site specific Dive Project Plan.

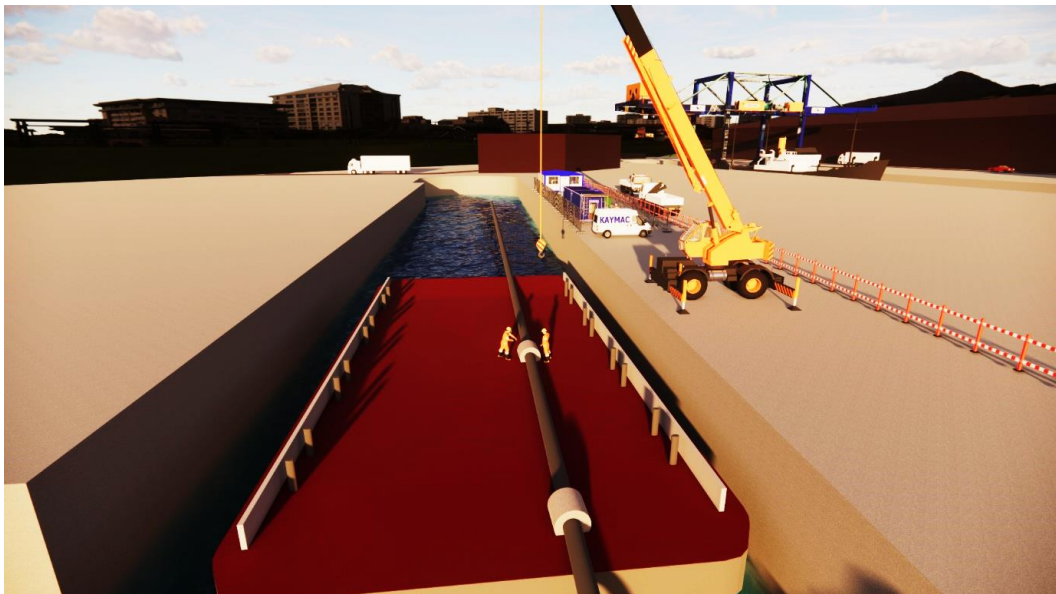


Excavator situated on the barge to excavate the trench.

Preparation of Pipes

Whilst the trench excavations are on-going, a separate Kaymac team will commence the installation of concrete collars to the pipe sections in the harbour in accordance with the design, this will aid in the submersion process of the pipe later on.

Each pipe section will be lifted over a pontoon within the harbour, enabling Kaymac personnel to fit the collars in a safe and controlled manner.



Concrete collars being installed to new pipe section in nearby harbour facility.

The collars have been designed so that when filled with air and sealed, the pipe is still able to float.

Positioning and submersion of Pipe into trench

Once a 125m section of the trench is prepared and the line and level has been checked by the Site Manager / Engineer, the first 125m length of pipe will be pulled into position by a marine vessel during a high tide, as shown below.



New pipe being transported from the harbour facility into the required position.

The weather forecast will be frequently monitored prior to transportation to ensure the pipe is only transported during calm weather. The pipe will be towed into position on a rising tide only to ensure that the maximum time window is available to position and secure the pipe above the trench prior to submerging.

Submerging procedure

The planned 'sinking route' will be marked clearly with floating buoys to the surface to ensure the pipe is placed accurately. A line of temporary "timber piles" will be driven parallel to the trench at 25m centres with the amphibious excavator, these are to assist with locating the pipe during the submerging process and will be removed when the pipe has been located within the trench.

Temporary cylindrical "pin piles" will be driven into the seabed at strategic positions along the length of the proposed pipeline. These will anchor the landward end of the pipe in position while the workboat will anchor the seaward end via tested winch cable. During the sinking procedure, the cable will be made taut to offer sufficient tension to maintain the position of the pipe.

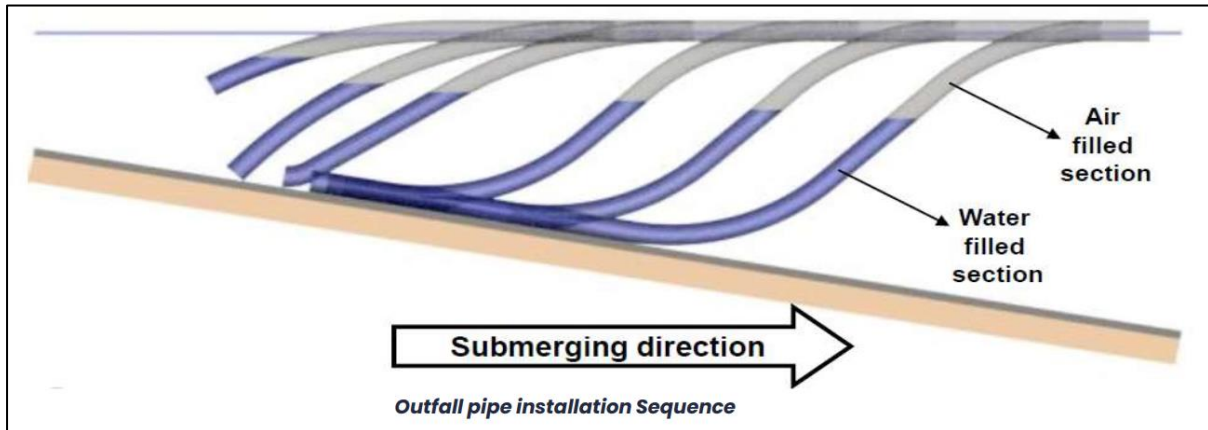
The workboat supervisor will assess the weather forecast and make the decision as to whether it is safe to begin the sinking procedure. There should be minimal wind and waves during this process.

The pipeline will be positioned to follow the correct route by the supporting vessels on site.

The 'Landward' end will be connected to the excavator via a suitably tested and certified winch line. The 'Seaward' end will then be attached to the winch on-board the workboat, to offer the necessary 'pulling force' required during the sinking process.

Diver's will then enter the water to open the inlet and outlet valves to the sinking lid on the 'seaward' end, which will allow the pipe to be sank in accordance with the manufacturer's sinking procedure (detailed in section

below). The inlet valve will be used to flood the pipe with water, whilst the outlet valve will allow air to escape to the surface via a suitable length of hosing, when required. The sinking process will be carried out in a manner to follow the manufacturer's recommended procedure, shown in the diagram below:



'S' bend installation method. Image courtesy of Pipelife.

By regulating the air pressure inside the pipeline, a controlled sinking operation with a constant speed will be achieved. The S-bend configuration shown is subject to the balance between the forces acting downwards (the concrete weight collars) and the upwards acting forces (the buoyancy force acting on the pipe).

The process will be carried out as a continuous process because if the sinking stops, the Elastic Modulus of the pipe material decreases with time and the minimum radius of curvature will be reduced analogously, which can cause buckling of the pipe. The specified ratio between the radius of curvature and the diameter of the pipe must not exceed 20, otherwise collapse or buckling of the pipe may occur.

If, for any reason, the sinking procedure needs to be stopped or disrupted, it will be necessary to start the compressor to reverse the sinking process. If required, this action must take place within the first 15 minutes of interruption.

Communication between the land and sea-based teams will be maintained at all times via radio and mobile phones.

Eventually, the S-Configuration will be transformed to a J-configuration just as the water reaches the 'Seaward' end of the pipeline. At this point, enough force must be exerted by the pulling winch to prevent any dynamic acceleration forces acting on the pipeline as the last volume of air leaves via the valve. The length of the pulling wire will be equal to the vertical distance between the seabed and winch to ensure that a 'safe' landing takes place as the pulling force is eventually reduced to zero.

On completion of the submerging process, divers will be deployed to check that the pipe is located within the trench in accordance with the contract drawings. If the pipe is out of line, then the excavator on board the floating plant will be able to adjust the position accordingly prior to placing the concrete mattresses over the top.

This process will be repeated until all the 11no x 125 lengths of pipe have been installed.

Connection of pipes underwater

Each 125m pipe is connected to the preceding length by 2 x Stainless Steel spinning flanges connected by 20nr M20 stainless steel bolts.

Please note that when backfilling over the top of the pipe, a length of 20m will be left uncovered so that the end can be brought to the surface to allow connection to the next length of pipe.

Diffuser Installation

A diffuser section will be required to be installed at the discharge position at chainage 1470m as the design depth of the pipe invert is below the seabed level.

Once the end of the pipe has been submerged and is in the correct position, the diffuser section will be attached to a crane or excavator which will be positioned on the workboat.

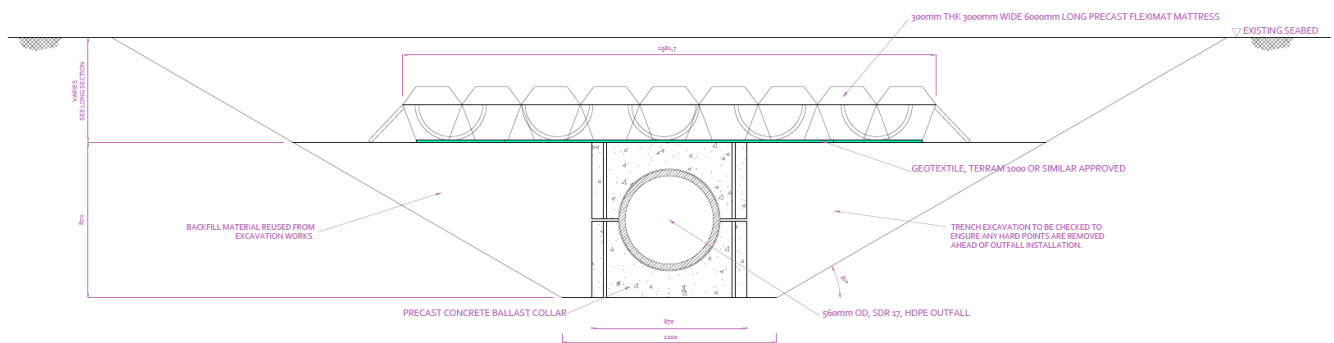
A dive team will be deployed and will remain in a position of safety (never directly under the load). The diffuser section will be lowered through the water and the position will be checked by divers.

When the diffuser is in the correct position the divers will connect the two flanges with the bolts supplied.

On completion of the installation, the dive team will be recovered from the water.

Backfill and Placement of Concrete Mattresses

Once the pipe is sunk into position within the trench, the previously excavated spoil, which was side-cast adjacent to the trench, will be used as the backfill material to fill the trench up to the top of the concrete collar level (please see typical detail below)

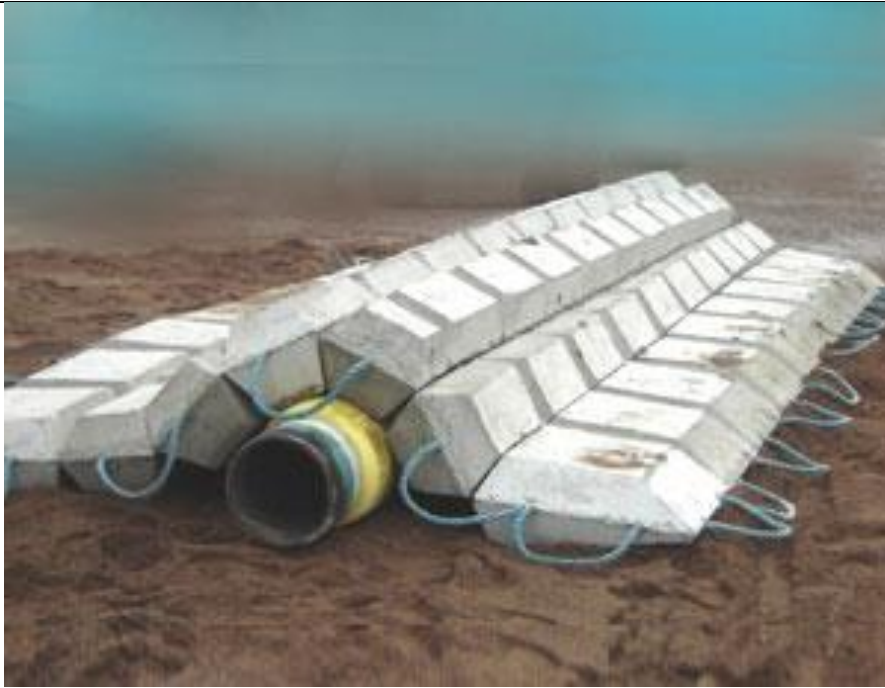


TYPICAL TRENCH PROFILE- SEABED
FRONT ELEVATION

Using the crane barge positioned either on the sand or floating (dependant on the works location relative to the tide), the concrete mattresses will be placed over the top.

Once the concrete mattresses are in position, a final layer of backfill will be placed over the pipe to achieve the specified finish level.

The image below is an example of the type of concrete mattress to be installed.



Concrete mattress example – Image courtesy of Subsea Protection Systems.

During the backfilling and installation process outlined above, the Kaymac Site Manager / Engineer will continuously check the levels to ensure the correct finished level is being achieved before moving onto the next section of pipe.

PLEASE NOTE: Between chainages 180.00m and 259.066m which is immediately south of the Salt marsh, the current fall of the pipe will not facilitate any cover over the top of the mattresses. Therefore, the top of mattresses will be exposed for a length of approximately 79 metres (based on the latest topographical data. However, an analysis of previous data sets shows there is high natural variance between data sets highlighting the mobile nature of the seabed. The 79m could fluctuate)

Connection at Chainage 176m

Once the outfall has been installed between chainage 176m and 1470m using the process outlined above (i.e., excavating the trench, sinking the pipe sections, and backfilling with bed material and concrete mattresses), excavations will be undertaken to angle the trench towards the existing pipe to allow connection onto the previously slip-lined section of the pipe during the shutdown period later.

Planned Shutdown Period

HOLD POINT - Prior to the planned shutdown period, all advance preparatory works will be checked and accepted. This will include the works to the north of the seawall, the pipe on the foreshore and the preparation of the new pipe.

On acceptance of the above, the Client will isolate the existing outfall pipe and drawback any remaining effluent, allowing Kaymac to undertake re-connection works between the existing and new pipe.

A permit will be issued by Eastman to Kaymac to allow the pipe intervention to commence.

Original outfall "host" pipe to remain in position.

Smaller 355mm OD diameter slip-lined pipe installed in 2022.

New outfall pipe to be connected onto this flange.

Temporary 560mm OD pipe installed in 2022.

KM-EASTMAN-RAMS-12-05-23

Commissioning of the Pipeline

Following the successful connection of the new and existing pipe, the new outfall will be commissioned for use.

The commissioning process will largely consist of testing the connections and valves in and around the chamber to the north of the sea wall. The diffuser at the termination point of the pipe will also be monitored to ensuring it is discharging correctly. Watching briefs will be placed in strategic positions to monitor these connection points during the initial discharge to ensure no leaks are present.

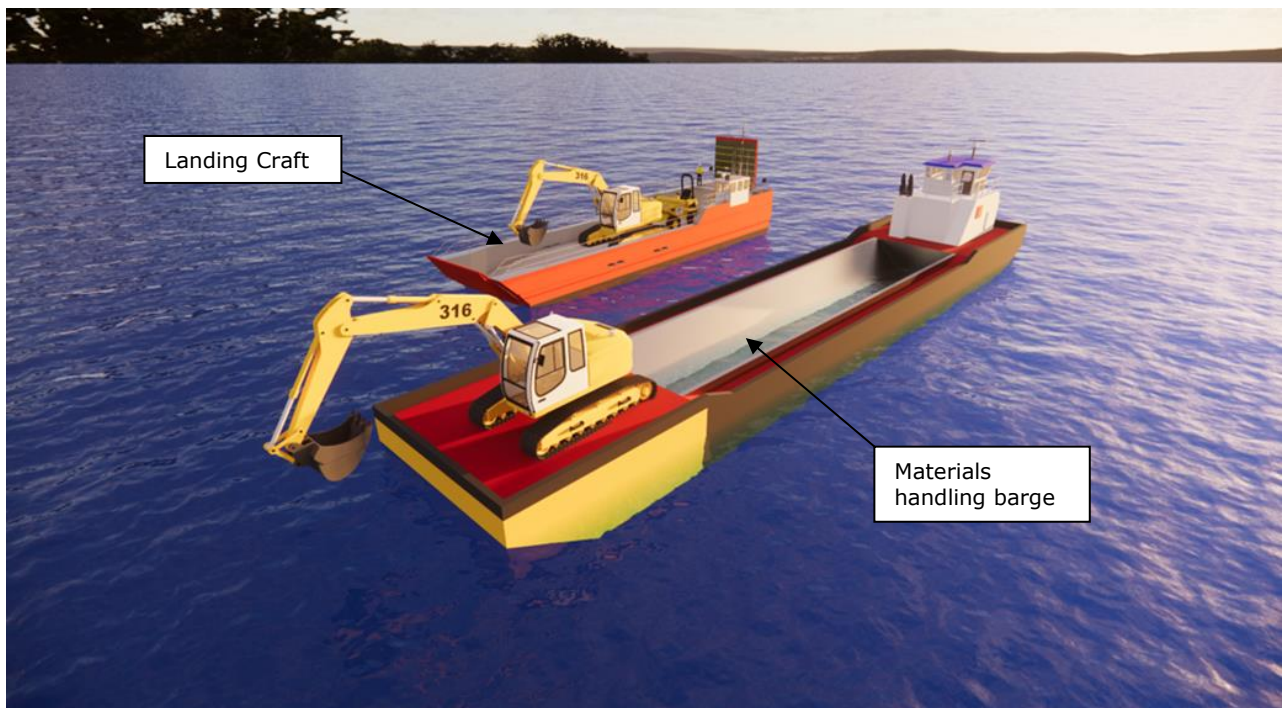
On approval from the Kaymac Site Manager and the Eastman representative that the new pipeline has been successfully installed, the shutdown period will end, enabling the Client to recommence the discharging of effluent.

Decommissioning of redundant outfall

An approved Biosecurity Plan will be implemented to reduce the risk of the introduction or spread of invasive non-native species. This will be available after contract award and prior to commencement on site.

All the necessary plant and equipment to undertake the works will be loaded onto the Landing craft and sea fastened at the nearby harbour.

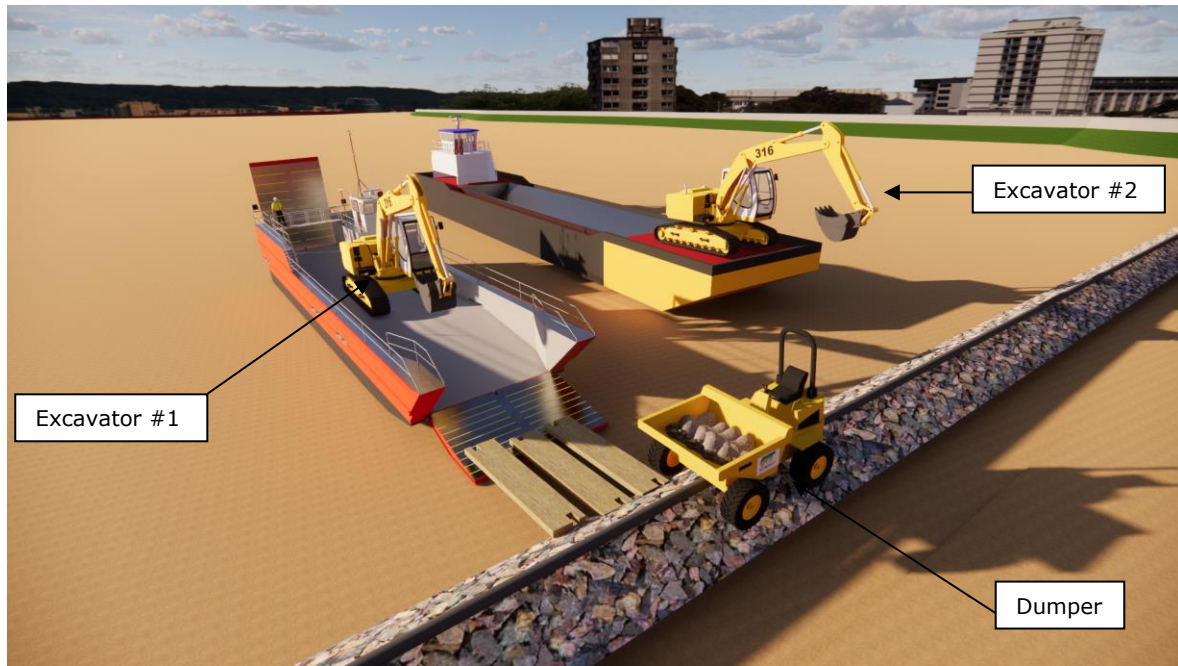
A “Materials handling Barge” will also be required to bring back the old redundant pipe sections including the rock and concrete mattresses. This may consist of a self-propelled vessel or a pontoon type platform that can be towed with a tug (we have included for a self-propelled vessel for illustration purposes within this document)



At high water, the vessels will leave the harbour and will sail the 2.5 nautical miles to the site at Newport. This will take approximately 30 mins.

On arrival at the beach, both vessels will land adjacent to the pipe at the top of the beach on the west of the existing pipeline to maximise the working window before the tide comes back in.

The vessels will be orientated perpendicularly to the pipe as shown in the illustration below:



The bow door of the Landing Craft will be opened and Navi mats will be placed on the beach between the door and the rock causeway. These will prevent the excavator and dumper from rutting the surface of the beach.

Please note that it is our intention to use the existing rock causeway as a platform to access the entire length of the exposed pipe to avoid contact with the beach.

Excavator #1 and the dumper will track off the landing craft and will proceed to the end of the pipe at the low water mark near chainage 554m.

In a methodical manner, the pipe, rock and concrete mattresses will be removed by the excavator and placed into the dumper which will then track back up the rock causeway.



Photo of chainage 554m at low water



The dumper will then take the material back to the top of the causeway where it will be placed into the materials handling barge by excavator #2. This process will be repeated until such time as the tide comes back in or the barge is full.



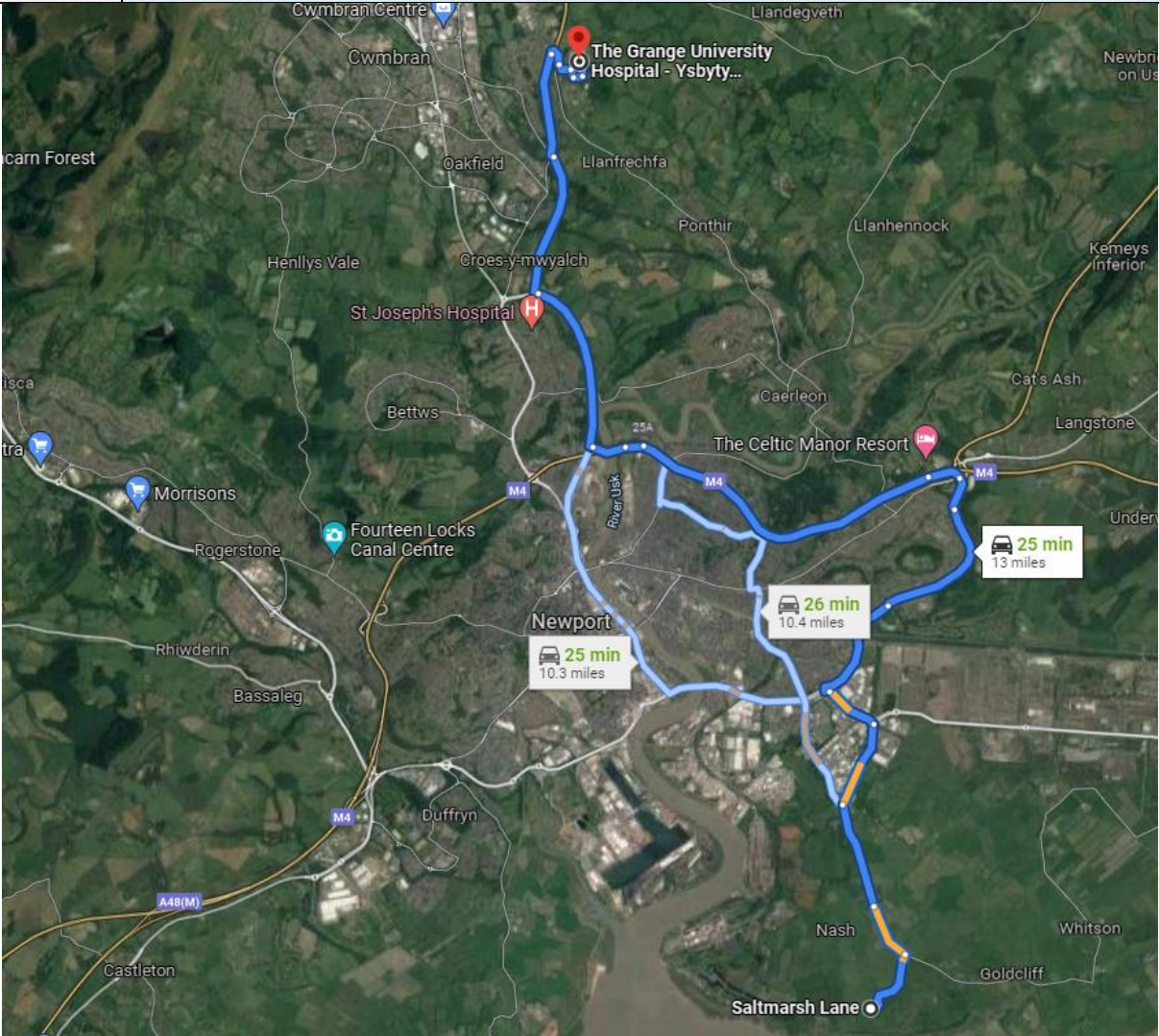
When the barge is full, the dumper and excavator#1 will be tracked back onto the Landing Craft and the navi mats will be recovered on board.

Both vessels will then sail back to the Wet Dock facility at Newport at high water and the material will be loaded into segregated RORO skips for storage and later disposal/recycling.



It is assumed that an average of approximately 20 meters of the causeway could be removed each day between tides and that the surface of the beach underneath the causeway could be regraded and levelled to match the surrounding landscape prior to leaving after every shift.

On completion of the works all plant and equipment will be demobilised from the Dock facility and the RORO skips will be taken to a licensed facility for disposal or recycling.

Section 7.0	Emergency Procedures
7.1	Local Hospital
A stretcher will be available on site at all times. In a man down scenario, the casualty will be placed on a stretcher by the remaining team and carried up the beach to Boat Road where they will be placed in a company vehicle and taken to the nearest access point for a waiting ambulance. Recovery point address and post code: Salt Marsh Lane, Goldcliff, Nash, Newport, Wales, NP18 2AT. What3Words: cluttered.blank.saddens Grid Reference: ST 34776 82709 The nearest hospital with a 24-hour accident and emergency unit has been identified as: The Grange University Hospital Caerleon Road Llanfrechfa Cwmbran NP44 8YN Transfer time by road; 25 minutes (distance: 13 miles).	
7.2	Hospital Location Map
 <i>Image courtesy of Google Maps</i>	

7.3	Action on Minor Injuries
Administer First Aid on site. From here the company vehicle will transport the injured person to the local casualty department at the above-mentioned hospital. A record of the accident is to be entered with all details in the Company Accident Book, and notify the client's responsible person.	
7.4	Action on Major Injuries
Administer First Aid on site, and then contact the emergency services requesting an ambulance to the site post code NP18 2AT. A record of the accident is to be entered with all details in the Company Accident Book, and notify the client's responsible person. Kaymac Site Manager or his deputy will record on the accident on Kaymac Accident & Incident Report form QPF11 and pass on Kaymac Health and Safety manager who will ensure H.S.E. is informed by way of form F2508.	
7.5	Reporting Accidents, Work Related Diseases and Dangerous Occurrences
<u>Reporting procedures</u> The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR) require that certain accidents that happen on site must be reported to the Health and Safety Executive. Any of the following types of accidents that occur on site have to be reported in the first instance to the company Safety Officer or Safety Manager who will then notify H.S.E. Serious or fatal accidents must be notified without delay to HSE, by calling the Incident Contact Centre (ICC) during normal office hours on 0845 300 9923. Outside these hours, the local HSE office must be contacted. For details of the nearest HSE office, telephone the HSE Infoline on 08701 545500. This must be followed up with a completed accident report form (F2508) within 10 days. For less serious injuries, where the injured person is unfit (or unable) to do their normal working job for seven consecutive days, excluding the day of the accident, a completed accident report form F2508 must be sent to HSE within ten days. If a dangerous occurrence happens on site, for example, a building, scaffold or false work collapse, failure of a crane or lifting device or contact with overhead lines, it must be reported immediately, normally by telephone, by calling the Incident Contact Centre (ICC) during normal office hours on 0845 300 9923 or the nearest HSE office. The details must be confirmed within ten days on a completed accident form (F2508). If a worker suffers from a specified disease associated with their current job, it must be reported to the HSE on a completed disease report form (F2508A). <u>Keeping records</u> A record must be kept of any reportable injury, disease or dangerous occurrence. This must include the date and method of reporting; the date, time and place of the event, personal details of those involved and a brief description of the nature of the event or disease. The record can be kept in any form preferred, but each site is supplied with a copy of the Accident Book BI 510 issued by the HSE, and this is the company's preferred method of keeping such records.	

Section 8.0		RISK ASSESSMENT RECORD										Page 1 of 4		
RISK ASSESSMENT														
RISK CALCULATION MATRIX						GUIDE BOX			RISK RATING, REVIEW AND ACTION REQUIRMENTS					
HARM	5	5	10	15	20	25	CATEGORY	HARM	LIKELIHOOD	RISK RATING	Risk rating obtained at intersection of harm and likelihood in Calculation Matrix			
	4	4	8	12	16	20	1	NON-INJURY	ALMOST IMPOSSIBLE		Review period	Action		
	3	3	6	9	12	15	2	FIRST AID	UNLIKELY		1-4	12 months	No further immediate action. Review annually.	
	2	2	4	6	8	10	3	< 7 DAYS	POSSIBLE		5-9	6 months	No further immediate action. Re-assess during next review.	
	1	1	2	3	4	5	4	> 7 DAYS	LIKELY		10-16	3 months	Reduce risk and re-assess within review period.	
		1	2	3	4	5	5	MAJOR INJURY	ALMOST CERTAIN		17-25	Immediate	Stop-reduce risks/mitigate effects, re-assess immediately.	
LIKELIHOOD														
Hazard Identified		Persons at Risk		Controls in Place				Risk Rating before control measure		Actions to Further Reduce Risk		Risk Rating after control measure		
Slips, Trips and Falls resulting in musculoskeletal injuries		Kaymac Site Operatives		Wear appropriate safety boots with good tread; avoid walking on slippery/wet surfaces, be vigilant and probe any soft ground before attempting to walk on it.				10		Take extra precautions when working in wet weather.		5		
Manual Handling; back injuries		Kaymac Site Operatives		Wherever possible, mechanical lifting should be used for lifting loads. If manual lifting is necessary, use kinetic lifting techniques, share the load if possible; ensure ground is level and stable.				10		Carry out a Manual Handling Assessment where necessary; carry out health monitoring for personnel.		5		
Working in/around contaminated water resulting in water borne infections including Leptospirosis.		Kaymac Site Operatives		Cover any cuts or abrasions with waterproof dressing prior to work. Wear gloves! Wash and disinfect hands prior to eating or drinking; report any injuries immediately to site management. Kaymac guidance notes on Leptospirosis to be available to personnel.				7		Report any flu like symptoms 7-10 days after possible infection; seek medical advice.		4		
Exposure to wet or windy conditions		Kaymac Site Operatives		Appropriate clothing to be worn during poor weather conditions-surface swimmers to wear diver’s dry suits (if applicable)				6		No further action required.		4		
Sudden increase in water flow or level through rainfall or incoming tide		Kaymac Site Operatives		Check tide table and weather report prior to commencement of works and monitor during duration of shift. If flows or water levels are predicted to/or increase to a point where a risk is perceived, works should cease and all equipment and personnel should be withdrawn from the site.				10		No further action required.		6		

Noise	Kaymac Site Operatives/Other Site Operatives	Ear defender to be available if noise levels rise to more than 80 dB(A) Daily Personal Exposure Level	9	Noise monitoring to be carried out by site management.	5
Pollution caused by leaking plant and machinery	Kaymac Site Operatives/Other Site Operatives	All plant and machinery to be checked at the start and end of each shift. All plant entering the watercourse will contain environmentally friendly Bio Oil. Spill kits to be available for all items of plant. Plant movements in the water are to be kept to a minimum	8	Checks are to be carried out daily and any issues reported straight to the site manager.	5
Substances hazardous to health i.e., diesel fuels	Kaymac Site Operatives	COSHH Assessments are to be completed and briefed to the workforce upon arrival to site.	10	All chemicals/substances, etc will be stored in a lockable COSHH storage unit on site.	6
Re-fuelling of plant & equipment	Pollution incident	No refuelling is to be carried out within 10m of the watercourse at any time.	9	No further action required.	6
Working with heavy plant i.e., 15t excavator	Kaymac Site Operatives	Select appropriate machine for the works; personnel to wear high visibility clothing, trained CPCs personnel to sling loads or direct machine operator.	10	No personnel to work under suspended load being lowered into watercourse.	5
Ecological hazards associated with wildlife	Injury/ death to animals, protected species, etc	WFD and HRA assessments to be undertaken prior to commencement on site.	9	The site will be monitored at all times for evidence of wildlife activity. Any activity will be reported to the site manager.	6
Contact with buried services.	Kaymac Site Operatives	Prior to any excavation or borehole drilling, the area is to be CAT Scanned by a trained operative.	15	Service drawing to be obtained from the Client where possible	5
Movement of company vehicles during access / egress to site	Members of the Public/ Kaymac Site Operatives	Ensure that banksman is in attendance while moving vehicles on site.	15	Ensure site fencing or barriers are erected where required	5
Public interface. Death / injury of public following entry to working area.	Members of the Public	Border around work site to be fenced, preventing public from entering the works site.	15	Kaymac to remain vigilant at all times	5
Poor weather conditions causing high waves - Overturning of floating plant/ Drowning	Kaymac Site Operatives	Weather is to be monitored by the Kaymac supervisor throughout each day. If the conditions are deemed too poor to allow works to be carried out safely, works will cease until conditions improve.	15	No further action required.	5

Section 9.0 Briefing Attendance Record

Time / Date and Subject Items of Briefing

Project Title:				Doc. Ref. No:	
Date:		Job No:		Time:	
Subject Of Briefing:					
Name Of Person Giving Briefing:			Signature:		

SIGNATURE CONFIRMS ATTENDANCE AT ABOVE BRIEFINGS.

Briefing Record

Name	Signature	Representing



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