Govan Basin Infilling
EIA Non-Technical Summary

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1 INTRODUCTION

1.1 Structure of this Non-Technical Summary

The NTS is set out in the same chapter format as the EIAR, to facilitate cross-referencing and to offer a summary of the environmental findings that are contained within the full EIAR. The sections within this NTS are therefore as follows:

1. Introduction
2. Proposed Development
3. EIA Methodology and Scoping
4. Water Environment
5. Airborne Noise
6. Land Quality
7. Cultural Heritage
8. Other Issues (inc. Air Quality, Biodiversity, Climate Change, Landscape and Visual, Population/Human *Health, Material Assets, Major Accidents and Natural Disasters)*
9. Schedule of Mitigation
10. Summary of Environmental Effects

The NTS summarises the key findings from the environmental impact assessment (EIA) process. Where the assessment results in potential negative effects on the environment, measures to address and control effects, known as mitigation measures, are identified. The assessment then presents the overall effects remaining after mitigation has been applied; these are referred to as the residual effects.

The overall suite of documents associated with the EIA includes the following:

- The Environmental Impact Assessment Report (EIAR) – which reports upon the potentially significant environmental effects of the enabling works upon the receiving environment, comprising:
    - Volume 1: Written Statement – this includes the written assessment and contains discussion of potentially significant environmental effects;
    - Volume 2: Figures – this volume includes figures, drawings and diagrams which support Volume 1; and
    - Volume 3: Technical Appendices – this volume contains the technical background reports written and used to derive the environmental assessment.
    - Non-Technical Summary (NTS) – this document.

2 THE PROPOSED DEVELOPMENT

2.1 Site Description

2.2 Site and the Surrounding Area

2.2.1 The General Area

Govan shipyard is situated in an urban area to the southwest of Glasgow City Centre. The surrounding area comprises a mixture of uses including industrial, business, commercial, residential along with the Queen Elizabeth University Hospital complex.

Govan shipyard is located on the southern bank of the River Clyde and is bounded to the south by Govan Road, Elder Park and a residential area with further residential areas to the east. Glasgow Harbour residential area lies opposite the site on the northern bank of the River Clyde. To the west of the site is the A739, the Queen Elizabeth University Hospital, and a large area comprising industrial, business and commercial activities.

2.2.2 The Site

The existing BAE Systems shipyard at Govan has been used for ship building since the middle of the 19th century.

It covers approximately 10 hectares of land adjacent to the River Clyde with an existing waterfront 590m in length (Refer to Drawing No. 175756-GIS001 for site location). A combination of inclined slipways, masonry walls, sheet piled wharf structures and an extent of informal riverbank forms the water frontage to the site (northern boundary) with the wet basin located on the western area of the shipyard.

The wet basin itself is currently not in use.

2.3 The Need for Development

BAE Systems have been exploring their options for developing Govan shipyard to support the long-term future of shipbuilding at the site. The aim was to create a modern, undercover building that enables construction within an enclosed controlled environment to support future ship building at the shipyard.

The Strategic Development phase identified a number of high-level considerations that needed to be taken into account. These were:

1. To reduce end-to-end ship build time;
2. To reduce downtime during ship construction;
3. To increase productivity. Through creation of an enclosed ship manufacturing facility, leading to more activities being completed in-situ at Govan before transfer to Scotstoun Yard;
4. To improve quality through reduced weather impact;
5. The facility will fully support Digital Shipbuilder enablement; and

6. To ensure the long term viability of the ship yard.

2.4 Alternatives Considered

A Baseline scenario and 3 alternative options were considered during the Strategic Development phases of this project.

- The Baseline scenario looked to extend an existing building on site. This required significant modifications and demolition work so was discounted on the grounds that significant disruption to business operation was highly likely.
- Option 1 was a Riverside development. This option was discounted for principally the same reasons as the Baseline scenario, though the effects of disruption to business operations were not considered to be as severe.
- Option 2 was the wet basin infill. This option was identified as being the most feasible to allow the expansion of the shipyard assembly line within a controlled environment without significant disruption to business as usual.
- Option 3 looked to develop the area to the west of the wet dock. This Option offered less disruption; however, this option was discounted due to significant engineering challenges causing unknown cost increases.

The Strategic Development identified Option 2 as being the most favourable for developing the Govan shipyard to support the long-term future of shipbuilding at the site

2.5 Construction Works Description

It is envisaged that construction works will involve the activities listed below. Two options for the methodology of infill are identified depending in the source of the infill material. A visual description of the works is provided in Drawing No 225010-BAE-AHN-ZZ-XX-DR-C-0004, Volume 2 of this EIAR.

Infilling Option 1 – Infilling Works based on Crushed Aggregate from Land Based Quarry.

- Infilling Works (due to potential tidal constraints for marine navigation in the maintained channel it is anticipated that infilling works will be permitted 24 hours a day, 7 days a week)
- Install silt curtain and/or bubble curtain at entrance to Govan Basin (including a demountable section to allow passage of tug / barges into the basin area)
- Aggregate for infilling the basin will be loaded onto a barge / vessel at a separate facility
- Tug to tow barge to site with aggregate for infilling the basin.
- On arrival at the Govan Basin the demountable section of silt curtain will be opened to allow passage of the barge into the basin area and reclosed once the barge has passed through and prior to discharge of infill material.
- A long reach excavator will be loaded onto the barge at the quayside and will initially place 4Nr. 0.5m thick layers of infill material totalling 2m deep over the soft layer of material in the basin working in a north to south direction. This material will be placed methodically in a 2m x 2m grid to stabilise the soft bed material. The long reach excavator will be fitted with a GPS machine control system for the accurate placement of the infill material
- In advance of the barge exiting the infill area of the basin a period of time will be accommodated to allow for a reduction in the level of suspended solids prior to the demountable section of the silt curtain being opened to allow the barge to exit and it will be reclosed once the barge has passed through.
- The above process will be repeated until the 2m thick stabilisation layer is complete.

- The bulk infilling works to the basin may continue to be infilled using barges and excavators or a self-discharging vessel.
- As the basin is infilled the available draft and under keel clearance for barges / vessels will reduce and infilling to a more localised location within the basin infill area will be necessary. This infilled material will be placed inside the silt curtain encapsulation area and placed to a level above MHWS, at periods of low tide this material will be dozed further south within the basin infill area until filling is complete
- Infilling of the wedge void behind the existing sheet pile wall forming the perimeter of the Govan Basin will be filled concurrent with the bulk infilling works (this may require local demolition of the existing cope beam and cutting down or extraction of sheet piles)
- Existing drainage discharging around the perimeter of the existing Govan basin will be collected by newly installed new carrier drain and discharge will be via a number of new outfalls to be installed through the new piled wall
- Depending on final detailed design compaction of the infill material may be necessary above mid tide level. If this is necessary, it may be compacted in nominal layers using conventional rollers or using dynamic compaction such as Rolling Impact Compaction (RIC) / High Energy Impact Compaction (HEIC) / Vibro Compaction (VC)

Infill Option 2 – Infilling Works based on suitable Marine Dredged Material (beneficial reuse marine dredged material)

- Infilling Works (due to potential tidal constraints for marine navigation in the maintained channel it is anticipated that infilling works will be permitted 24 hours a day, 7 days a week)
- Install silt curtain or bubble curtain at entrance to Govan Basin (including a demountable section to allow passage of tug / barges into the basin area)
- Subject to final methodology and material sources a berm of material may be placed towards the northern end of the dock infill area
- Aggregate for infilling the berm in the basin will be loaded onto a barge / vessel at a separate facility
- Tug to tow barge to site with aggregate for infilling the basin.
- On arrival at the Govan Basin the demountable section of silt curtain will be opened to allow passage of the barge into the basin area (bubble curtain will permit the vessel to sail through) and reclosed once the barge has passed through and prior to discharge of infill material.
- If a berm is required this material may be discharged from a split hopper barge by bottom dumping or a long reach excavator will be loaded onto the barge at the quayside and will place the material on the basin bed, depending on the final height of the berm a temporary water discharge box weir may be installed for the infilling works
- The primary source of infill material may come from marine dredged aggregates using a Trailer Suction Hopper Dredger (TSHD) (recovery of this material is under a separate MS-LOT Licence)
- Again, depending on final methodology, a shallow layer of material may be placed over the existing basin bed material to cap it, this may be undertaken by a combination of rainbowing directly from the TSHD or discharged via a floating pipeline and spreader barge with a discharging nozzle circa 0.3m thick layers of infill material totalling up to 2m deep over the soft layer of material in the basin working in a north to south direction. This material will be placed methodically to stabilise the soft bed material. The spreader barge will be controlled by a mooring spread fastened to the existing bollards in the basin and fitted with a GPS machine control system for the accurate placement of the infill material
- The TSHD will subject to navigational constraints and harbour master approval either moor in the river channel or in an area within the basin that is not to be infilled.
- A temporary mooring spread will be installed along with the floating pipeline and the land side fixed pipeline

- Once the vessel is moored the floating pipeline will be connected to the TSHD and the dredged sand material discharged into the basin with excess pump water discharged through the silt curtain / bubble curtain or weir box
- As material builds up in front of the landside discharge pipeline the material will be dozed forward (north), and the pipeline extended as necessary to achieve the final levels
- Infilling of the wedge void behind the existing sheet pile wall forming the perimeter of the Govan Basin will be filled concurrent with the bulk infilling works (this may require local demolition of the existing cope beam and cutting down or extraction of sheet piles)
- Existing drainage discharging around the perimeter of the existing Govan basin will be collected by newly installed new carrier drain and discharge will be via a number of new outfalls to be installed through the new piled wall
- Depending on final detailed design compaction of the infill material may be necessary above mid tide level. If this is necessary, it may be compacted in nominal layers using conventional rollers or using dynamic compaction such as Rolling Impact Compaction (RIC) / High Energy Impact Compaction (HEIC) / Vibro Compaction (VC)

Piling Works for New Quay Wall

To accommodate the construction of the new piled wall, the infill will temporarily extend beyond the plan footprint of the northern boundary of the proposed piled wall. It is proposed to construct the new piled wall from the newly placed infill material

- The piled wall is subject to detailed design but may consist of a combi tubular pile / infill sheet pile with tie rods connected back to a sheet piled anchor wall
- A temporary piling gate will be supported from a series of spud piles driven into the existing bed material using vibro or impact piling hammers and the piling gate positioned
- Once the pile gate has been successfully erected the first tubular pile will be pitched.
- The crane will then use a combination of a vibro and impact piling hammers to drive the pile to the final design level. The above procedure will be repeated until the first gate of tubular piles are complete. The pile guide frame will then be removed and repositioned for the next gate of piles with the temporary spud piles extracted using the vibro piling hammer
- As the installation of the tubular piles progresses along the wall the crawler crane will pitch and drive the infill piles between the tubular piles using both Vibro and impact piling hammers.
- The tubular combi piles may require a rock socketed spigot pile at the toe drilled into the bed rock, this will be undertaken by rotary percussive piling rig with a down the hole hammer. Once the rock socket is drilled a steel spigot pile will be installed inside the combi tubular pile and into the rock socket and concreted into place.
- The anchor pile wall will be installed using a combination of vibro and impact piling techniques
- The tie rods will be installed from the front combi tubular piles to the sheet pile anchor wall
- Relieving platform piles between the front combi piled wall and the rear anchor wall will be installed using a combination of vibro and impact piling techniques
- The temporary over filled material to the north of the new piled wall will be excavated and recovered to land.
- The concrete capping beam will be constructed onto the combi tubular pile wall
- Following completion of the capping beam installation of quay furniture and fenders will commence
- Demobilisation

3 GENERAL EIA METHODOLOGY

This section discusses the rationale and general methodological approach behind undertaking an EIA.

The purpose of an EIA is to identify and evaluate the likely significant effects of a proposed development on the environment, and then to identify measures to mitigate or manage any significant adverse effects before a planning application is determined.

The process involves identifying the sensitivity of the baseline conditions/receptors; predicting the magnitude of potential impacts; predicting the significant effect of the impacts; detailing mitigation measures; predicting the potential residual effects as well as the potential cumulative impacts.

The results and findings are presented within the EIAR.

3.1 Scope of the EIA

Based on the consultation and screening responses received to date, a view was reached on the key topics to be assessed and included as a full impact assessment chapter as part of the EIA. These were:

1. Water Environment
2. Noise
3. Land Quality
4. Cultural Heritage
5. Other Issues (*inc. Air Quality, Biodiversity, Climate Change, Landscape and Visual, Population/Human Health, Material Assets, Major Accidents and Natural Disasters)*

On the basis of the limited potential for significant environmental effects, full impact assessments were not undertaken for the following topics: Biodiversity, Landscape and Visual, Cultural Heritage, Air Quality, Population and Human Health, Climate Change and Natural Disasters. However, to provide a suitable level of supporting information, Desk Based Assessments were undertaken for certain topics i.e. “Other Issues”, and these form part of the Technical Appendices contained within Volume 3 of the EIAR.

Table 3-1: Project Team

Organisation/Consultant	Project Role
BAE Systems Limited	Client
Arch Henderson	Lead Designer/Engineer.
EnviroCentre Ltd	EIA Co-Ordination, Water Environment and Noise, Other Issues (Biodiversity, Landscape and Visual, Air Quality, Population and Human Health, Material Assets, Climate Change, Major Accidents, and Natural Disasters).
Mott Macdonald	Cultural Heritage

4 WATER ENVIRONMENT

4.1 Introduction

This chapter presents an assessment of the likely significant effects of the development on the water environment. A key focus of the assessment is consideration of the likely significant effects in relation to impact to water quality and flooding.

The objectives of this chapter are to:

- Provide detail on the legislative context for the assessment.
- Detail the methodology used to undertake the assessment;
- Discuss the current and expected future baseline conditions at the site and surroundings;
- Identify mitigation measures (where required) to address identified likely effects; and
- Assess potential residual effects.

The assessment is informed by a Water Framework Directive Assessment (provided in Technical Appendix 5-2).

4.2 Potential Impacts

The local reach of the River Clyde would be regarded as having a medium importance as a habitat, based on its Water Framework Directive classification. Given the density of development on both banks of the River Clyde, any flood risk detriment has the potential to impact a large number of (predominantly commercial and industrial) properties, such that the local reach would be regarded as having a very high significance/importance in relation to flood risk.

The key potential environmental impacts on the water environment during construction and operation have been identified and are outlined below:

- Potential changes in local drainage and flood risk;
- Potential contamination of water environment and sediments through spillages and/or sediment transfer (oil, fuels and suspended solids); and
- Potential interactions between water environment and associated ecology and environmental designations.

4.3 Potential Effects after Mitigation

The assessment concluded that the magnitude of effects in relation to water quality impacts were deemed to be minor or negligible with suitable mitigation measures in place and therefore **not significant**.

In relation to flood risk, the assessment identified there was a Medium to High Risk of Tidal-Fluvial (Coastal-River) flooding. However, as the ultimate end use would be water compatible in conjunction with consideration of suitable free-board allowances within the end design, **No significant effects** are predicted.

The infilling of the wet basin is not predicted to detrimentally impact the flood risk of surrounding areas therefore **no significant effects** are predicted.

The table below provides a summary of flood risk from all sources, inclusive of proposed mitigation and management measures.

Table 4-1: Summary of Flood Risk

Flood source or mechanism	Risk Classification (with mitigation & management)	Proposed Management Measures
Tidal-Fluvial (Coastal-River)	Medium to High Risk	The infilled basin will be subsequently developed for water compatible usage; flood management measures for this development should be considered separately, accounting for the fact that the combi wall crest level is predicted to provide only marginal protection against flooding of the infilled platform for the 1 in 200 year extreme tidal event; it may be overtopped if there is significant wind coincident with the tidal surge peak, and will be at increased risk of overtopping in the future due to sea level rise associated with climate change.
Surface Water	Low or No Risk	The infilled wet basin will itself be lower than surrounding ground, with the combi wall preventing discharge into the river. In the interim period until the site is fully developed, and while the infill material may have sufficient infiltration to manage this risk, it is recommended that one or more flap valved outfalls should be integrated into the combi wall as a contingency to allow rapid drainage of any surface water flooding (as well as any tidal-fluvial overtopping of the combi wall crest) from the site.
Infrastructure	Low or No Risk	None.
Groundwater	Low or No Risk	None.

An Incident Management Plan will be prepared for construction phases of the project, taking full consideration of best practice, statutory requirements and identification of areas of highest sensitivity. This will provide site spill response procedures, emergency contact details and equipment inventories and their location. All construction staff will be made aware of this document, and its content, during site induction and it will be available in the site office

Prior to the commencement of demolition and construction, a Construction Environmental Management Plan (CEMP) and a monitoring programme will be prepared. The CEMP will describe in detail the nature of works proposed and the environmental protection measures being applied to ensure that all activities are carried out with due regard to the (water) environment and the prevention of pollution. The monitoring programme will likely include water quality sampling (incorporating assessment of pre-construction baseline conditions).

During the construction phase the following specific mitigation measures have been identified:

- Construction Sustainable Urban Drainage System (SuDS) shall be in place and maintained regularly;
- Infilling and dredging method to be designed to limit release of sediment during works;
- A physical silt barrier, bubble curtain or isolation barrier will be placed between the infill area and the River Clyde during infill and prior to establishment of the coffer dam;
- A fish rescue and translocation exercise will be undertaken within the wet basin.

- Discharges from the temporary construction drainage system will be routed through settlement lagoons, silt busters or other treatment systems as required to prevent pollution of the river;
- The site roads will be regularly brushed and kept free from dust and mud deposits. Dust suppression measures may be applied if required;
- Requirement of stockpiling will be reduced through material management. If stockpiles are required, material will be situated within bunded areas at least 10m away from the river and out with areas at risk of flooding to minimise any sediment mobilisation.
- Installation of oil separators to reduce risk of pollution from fuel/oil spills;
- All wastes will be stored in designated areas that are isolated from the surface drainage system and out with flood prone areas and bunded to contain any spillage;
- Fuel, oil and chemical storage will be sited on an impervious base within a bund in a secured area;
- Any refuelling facilities will be inspected regularly, and the maintenance record will be available for inspection;
- Weekly inspection of machinery, oil storage area bunds, tanks and pipework for signs of damage;
- If working from floating plant, oils and chemicals will be prevented from entering the river, e.g. during a spillage incident on board or machinery failure;
- Accessibility to all parts of any installed separator will be maintained as and when required and
- Concrete management (if required) will be implemented including careful choice of concrete product. This includes the usage of ready-mix concrete which will reduce the potential for spills and usage of ‘environmentally friendly’ products to protect the concrete in the marine environment (PPG5). Pouring of concrete will take place within well shuttered pours to prevent egress of concrete from the pour area. Concrete pouring will be avoided during adverse weather conditions.
- Discharges from any dewatering activities will be routed through a suitable construction SuDS which could include silt busters or other treatment systems if required to prevent pollution of the river;
- In the event of a pollution incident, pumping will be immediately stopped. In case of an oil or fuel spillage, any free product would be isolated by containment booms to prevent wider contamination. Oil will then be skimmed from the surface before dewatering is resumed; and
- All dewatering activities will be undertaken in accordance with relevant regulations and guidance including CAR General Binding Rules

5 NOISE.

5.1 Introduction

EnviroCentre Limited were commissioned to undertake a noise impact assessment in relation to the proposed basin infilling works.

This study benefits from a site inspection and sound level monitoring undertaken in June and July 2022.

An assessment of the potential impact of the proposals at noise-sensitive premises within the vicinity of the site has been made by comparison of predicted noise levels with relevant guidance and criteria.

The overall noise impact of the proposed construction works has been evaluated and where necessary mitigation measures have been recommended.

5.2 Potential Impacts

The noise impact assessment demonstrates that construction noise levels will generally have a neutral or slight impact to receptors (as detailed in Drawing No 176756-GIS005 in Volume 2).

Scenario modelling for specific construction phases, particularly weekend construction work, has identified potential for moderate to large impact in relation to specific potential receptors assessed. This impact is predicted due to concurrent infill, dredging, spreading and ground compaction activities.

A range of best practice measures to minimise noise emissions from the site are presented in Section 6 of Volume 1 of the EIA. However, in addition to this, more specific mitigation measures are described below, given that the assessments indicate adverse impacts without any mitigation in place.

5.3 Potential Effects after Mitigation

Piling will be carried out initially using a vibratory hammer, with the impact hammer being used to drive the piles into their final position. The use of the impact hammer generates the greatest level of noise during this process. Compaction is also carried out using vibratory rollers in addition to the mobile rapid impact compactor which generates greater amounts of noise. In order to reduce the level of impact during the most sensitive weekend daytime period at receptors across the river, the following measures are recommended;

- The use of impact hammers on piles and rapid impact compaction hammering on reclaimed land should, where practicable, be scheduled for weekdays and avoided at weekends;
- The use of quiet hammer systems and acoustic shrouding techniques should be considered during impact piling.

Compaction is carried out using vibratory rollers in addition to the mobile rapid impact compactor which generates greater amounts of noise. In order to reduce the level of impact during the most sensitive weekend daytime period at receptors across the river, the following measures are recommended;

- The use of rapid impact compaction hammering on reclaimed land should, where practicable, be scheduled for weekdays and avoided at weekends.

It is recommended that best practice construction noise management techniques should be employed following guidance provided in BS5228-1:2009. This includes Best Available Techniques (BAT) for reducing noise from vehicle movements and tipping of materials and upkeep of plant and machinery so as to prevent faults and minimise operational noise. The general principles of the Considerate Constructors Scheme should be followed where practicable.

Noise generated by construction activities is temporary in nature, therefore there are no predicted long-term residual effects.

Following mitigation it is considered that there would be no significant effects associated with noise during the construction works.

6 LAND QUALITY

6.1 Introduction

An assessment of the potential impacts associated with land quality and ground contamination was undertaken. This was informed by a Geotechnical and Geo-Environmental Assessment undertaken by Mott MacDonald which is provided in Volume 3, Technical Appendix 7-1.

The assessment has incorporated a review of desk based information relating to geology, historical site use information and previous site investigation findings.

The assessment incorporated generation of a site conceptual model detailing the potential contamination risks associated with the proposed development.

6.2 Potential Impacts

The following potential impacts were identified as part of the assessment.

Water Environment – Historical investigations have recorded contaminated sediments within the wet basin associated with the former site use.

The contaminated sediments are currently in contact with the River Clyde and overlie the Govan Sand & Gravel superficial groundwater body and potentially pose a risk to these receptors. Following development, the sediments are likely to be cut off from the river by a piled basin closure structure. The design of the closure structure is to be determined but may reduce the potential for lateral contaminant migration to the River Clyde.

Contaminated soil and groundwater could also be present on land associated with the historical land use . Contaminants associated with the historical land use are considered to pose a moderate risk to the quality of the River Clyde and the superficial groundwater body.

Ground investigation is required to confirm the ground conditions and contaminant concentrations within the soil, wet basin sediment and groundwater in order to facilitate water environment risk assessment.

Human Health – The contaminant sources identified by the desk study pose a potential risk to construction workers and future site users. Given the industrial nature of the development, the risk to future site users may potentially be mitigated by capping of contaminants below buildings, upfill material and hardstanding. However, ground investigation testing and risk assessment is required to quantify the risk in consideration of the final development proposals.

Construction workers are more likely to be exposed to contaminants during possible earthworks, excavations, trafficking or other activities which may generate dust or involve dermal contact. Ground investigation and risk assessment is recommended to inform future planning of the works and facilitate implementation of risk mitigation to protect construction workers.

Made ground, basin sediments and organic rich natural deposits (if present) have the potential to generate elevated ground gas concentrations which could pose a risk to future site users and construction workers. The risk is likely to be highest in confined spaces and within the proposed accommodation building. Ground investigation, borehole installations, ground gas monitoring and risk

assessment is recommended to determine the risk posed to sensitive receptors and the requirement for ground gas protection easures in buildings.

Asbestos Containing Materials –It is noted that asbestos was visually identified in the Dames & Moore historical GI undertaken to the west of the wet basin. Asbestos is a contaminant that is often encountered on former shipbuilding sites. It is therefore possible that asbestos containing materials could be encountered during future ground investigation and/or construction work and could pose a risk to human health.

It is recommended that future planned works (including ground investigation activities) consider the risk from asbestos in soil and sediment within the wet basin. If asbestos is detected in future ground investigation works, it is likely that an asbestos risk assessment will be required and should be undertaken by a competent specialist consultant.

Buried concrete & water supply pipes - The risks to buried concrete from aggressive ground conditions should be assessed in accordance with the guidance presented in BRE Special Digest 1: 2005. This will involve laboratory testing of soil and groundwater samples to inform concrete class specification.

Installation of new potable water supply pipes will be required for the proposed Assembly Hall. A water supply pipe risk assessment should be undertaken in accordance with UKWIR Report Ref: 10/WM/03/21 to ensure that pipe materials are suitable for the site-specific ground conditions. This will involve collection, testing and assessment of soil samples along the route of proposed pipe alignments.

Existing Sediment -

The preliminary development proposals do not include dredging and disposal of basin sediment. However, it is recommended that characterisation and testing of the sediment is completed in the event that future dredging is required and to inform contaminated land risk assessment should the material remain in-situ or require off-site land disposal as waste. Investigation and testing should be completed in accordance with Marine Scotland guidance and extend to the base of the recent sediment potentially impacted by shipbuilding activities (estimated to be 5-8m below the riverbed). The investigations should also target a potential slag disposal area in the south west of the basin.

6.3 Potential Effects after Mitigation

On the basis that the proposed site investigation and subsequent risk assessment works are undertaken (and any remedial measures identified following this adopted), it is considered that there would be no significant effects with respects to land quality or contamination that would be considered to be significant in relation to the EIA regulations.

A summary of the identified mitigation measures for the development are provided below.

- Site investigation to further assess the identified significant source-pathway-receptors of concern.
- Risk to site construction and maintenance personnel should be mitigated by site specific risk assessment and method statements and, where necessary, the use of personal protective equipment (PPE).
- Installation and validation of appropriate ground gas protection measures (if identified as a requirement from the site investigation) within all future structures being constructed.
- Construction methodology such as appropriate piling to minimise the risk of creating ground gas and vapour pathways and design of the piling approach informed by Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination (EA 2001).

- Appropriate assessment of any proposed material for use as infill to ensure that the material does not pose a risk to human health or the environment as part of the re-use.

7 CULTURAL HERITAGE

7.1 Introduction

An assessment of the proposed scheme's likely effects on cultural heritage receptors, a collective term used to describe archaeological assets, built heritage features and historic landscapes, was undertaken.

The assessment incorporated desk based review of readily available historical and archaeological records and site survey visits.

7.2 Potential Impacts

Temporary

No significant temporary construction effects are expected upon the heritage value of any of the cultural heritage receptors assessed. This is largely due to the industrial nature of the shipyard and surrounding area which means the character of conservation areas and the setting of the heritage assets can accommodate change from the noise and presence of construction machinery. The protection afforded by proposed additional mitigation such as the implementation of a Construction Environment Management Plan (CEMP), will reduce or eliminate effects during the construction phase. As such, the effect for all receptors is considered to be Neutral.

Permanent

Construction of the proposed scheme is likely to result in a Slight Adverse, Non-significant effect upon the heritage value of the Category A listed '1048 Govan Road, Govan Shipbuilders' Store' and the 'Former Engine Works'. This will be as a result of partial changes to the building's setting and an impact on its associative value with the Wet Basin.

Construction of the proposed scheme is likely to result in a Moderate Adverse, Significant effect upon the heritage value of the Wet Basin as it will involve infilling the basin. This will also impact how the basin contributes to the value of associated cultural heritage assets within the shipyard, including original fabric associated with the basin.

Construction of the proposed scheme is likely to result in a Moderate Adverse, Significant effect upon the heritage value of the mooring posts as they may need to be removed during construction.

Construction of the proposed scheme is likely to result in a Moderate Adverse, Significant effect upon the heritage value of the shipyard winches as they may need to be removed during construction.

No significant effects are expected upon the heritage value of other cultural heritage receptors included within this chapter. This is due to the protection afforded by proposed embedded mitigation alongside additional and enhancement measures, with the effect being considered Neutral.

7.3 Potential Effects after Mitigation

The construction works will result in Moderate Adverse significant effects on the Wet Basin as it will be infilled, and the new assembly built over this.

Construction works will result in non-significant permanent effects to the heritage value of the Category A listed Former Engine Works as a result of changes to the building's setting and impact on its heritage value due to its association with the Wet Basin. This will be ensured through mitigation measures, including sympathetic design, delineating the former edge of the wet basin through the reinstatement of the mooring posts and winches, the use of physical ground markings to highlight the relationship between the wet basin and building, and the use of interpretation panels or artwork. This is designed to ensure some of the heritage value due to association with the wet basin is retained. As such, following appropriate mitigation, the proposed scheme is considered to have a Slight Adverse, Non-significant effect on the heritage value of the asset.

Construction works will also result in non-significant effect on the mooring posts) and two winches surrounding the wet basin. They will need to be removed as part of the construction of the proposed scheme. However, the residual effect after the reinstatement of some of these features in an appropriate position around the former edge of the Wet Basin and/or elsewhere within the shipyard, is considered to have a Slight Adverse, Non-significant effect on the heritage value of the asset.

8 OTHER ISSUES

Air Quality, Landscape and Visual, Population and Human Health, Material Assets, Climate Change, Major Accidents and Natural Disasters were scoped out of full impact assessment while those which were reduced in scope included Landscape and Visual and Biodiversity.

Desk-based assessments and technical reports were compiled to support those studies which were reduced in scope, including Water Environment, Biodiversity (including habitats and Protected Species).

The following mitigation measures were identified in relation to the topics covered under Other Issues.

- Mitigation is proposed to deal with potential dust issues. Good practice activities such as the development of a Dust Management Plan would be prepared as part of the CEMP.
- General mitigation including installation of protective Heras fencing, sensitive timings of work, sensitive working methods, sensitive storage of building materials and covering of any open trenches overnight.
- Implementation of an Invasive Species Management Plan.
- Implementation of a sensitive lighting strategy.
- Fish rescues and translocations will take place at the outset of construction to reduce fish mortality. This will commence following installation of a silt curtain/bubble screen or barrier across the wet basin to prevent fish re-entering the wet basin infill area.
- A Fish Rescue Method Statement will be agreed in advance with the relevant Statutory Nature Conservation Bodies (SNCBs) to target fish species which may inhabit the basin.
- Installation of swallow nesting cups

9 SUMMARY OF ENVIRONMENTAL EFFECTS

This NTS summarises the findings of the Govan Basin Infilling EIA Report. This has been shaped by several months of survey, consultation and assessment. The purpose of the EIA process is to establish potentially significant environmental effects and avoid or mitigate these where applicable.

The EIA identified some potential effects, none of which are considered to be significant in nature barring moderate adverse impact to the wet basin as a result of the infilling works. Mitigation proposals have been identified to address the significant effects.

A full appraisal of the wet basin will be undertaken to ensure that the basin is preserved through record and appropriately archived with Historic Environment Scotland. The approach to this assessment will be agreed with West of Scotland Archaeology Services and Glasgow City Council.

A detailed schedule of mitigation is included in the EIA Report. The below table shows all effects of the works after mitigation has been applied.

Table 9-1: Summary of Significance of Impacts

	Construction Phase Impacts	**Operational Phase Impacts**
Water Environment	Not Significant	Not Significant
Airborne Noise	Subject to the mitigation measures specified, airborne noise is anticipated to not be of significance over a short timescale.	Not Applicable
Land Quality	Not Significant	Not Significant
Cultural Heritage	Not Significant for all receptors barring the Wet Basin which is considered to result in a Moderate Adverse effect.	Not Significant for all receptors barring the Wet Basin which is considered to result in a Moderate Adverse effect.
Other Issues (inc. Biodiversity, Landscape and Visual, , Air Quality, Population and Human Health, Material Assets, Climate Change, Major Accidents and Natural Disasters)	Subject to the mitigation measures specified in Chapter 10: Schedule of Mitigation there are anticipated to be no significant effects across all topics.	