REPORT

Caol No1 & Caol Transfer Outfalls

Marine Licence Environmental Report

Client: Catchment Ltd

Reference: PC1651-RHD-ZZ-XX-RP-Z-0001
Status: S0/P01.01
Date: 07 June 2021

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Enhancing Society Together

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Internal use only

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Table of Contents

Table of Tables

Table of Figures

Appendices

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Acronyms and Abbreviations

Acronym / Abbreviation	Description
CANMORE	The National Record of the Historic Environment and Historic Environment Scotland
CAR	Controlled Activities Regulation
CCTV	Closed Circuit Television
CD	Chart Datum
CSO	Combined Sewer Overflow
DOA	Drainage Operating Area
FPS	Flood Protectin Scheme
INNS	Invasive Non-Native Species
mCD	Chart Datum
mOD	Ordnance Datum
MS-LOT	Marine Scotland Licensing Operations Team
NSA	National Scenic Area
OD	Ordnance Datum
PAC	Pre-Application Consultation
PMF	Priority Marine Feature
PS	Pumping Station
RP	Recommended Practice
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SEPA	Scottish Environment Protection Agency
SPA	Special Protection Area
SSSSI	Site of Special Scientific Interest
WFD	Water Framework Directive
WwPS	Wastewater Pumping Station

1 Introduction

1.1 Project Background

The existing Caol No1 Wastewater Pumping Station (WwPS) (Caol No1) and Caol Transfer WwPS (Caol Transfer) outfalls are a part of the Fort William Drainage Operating Area (DOA) located in Lochaber, Scottish Highlands. The existing outfalls are used to discharge screened storm sewage overflow. Caol No1 and Caol Transfer outfalls make up two of the three outfalls located in the catchment (Figure 1.1).

Due to the current condition of the existing outfall pipes (i.e. damaged and dilapidated), Catchment Ltd requires a solution to repair or replace both outfalls. Royal HaskoningDHV were commissioned by Catchment Ltd to carry out a review and optioneering study for the repair and/or replacement of the existing Caol No1 & Caol Transfer outfalls. The following three options were considered:

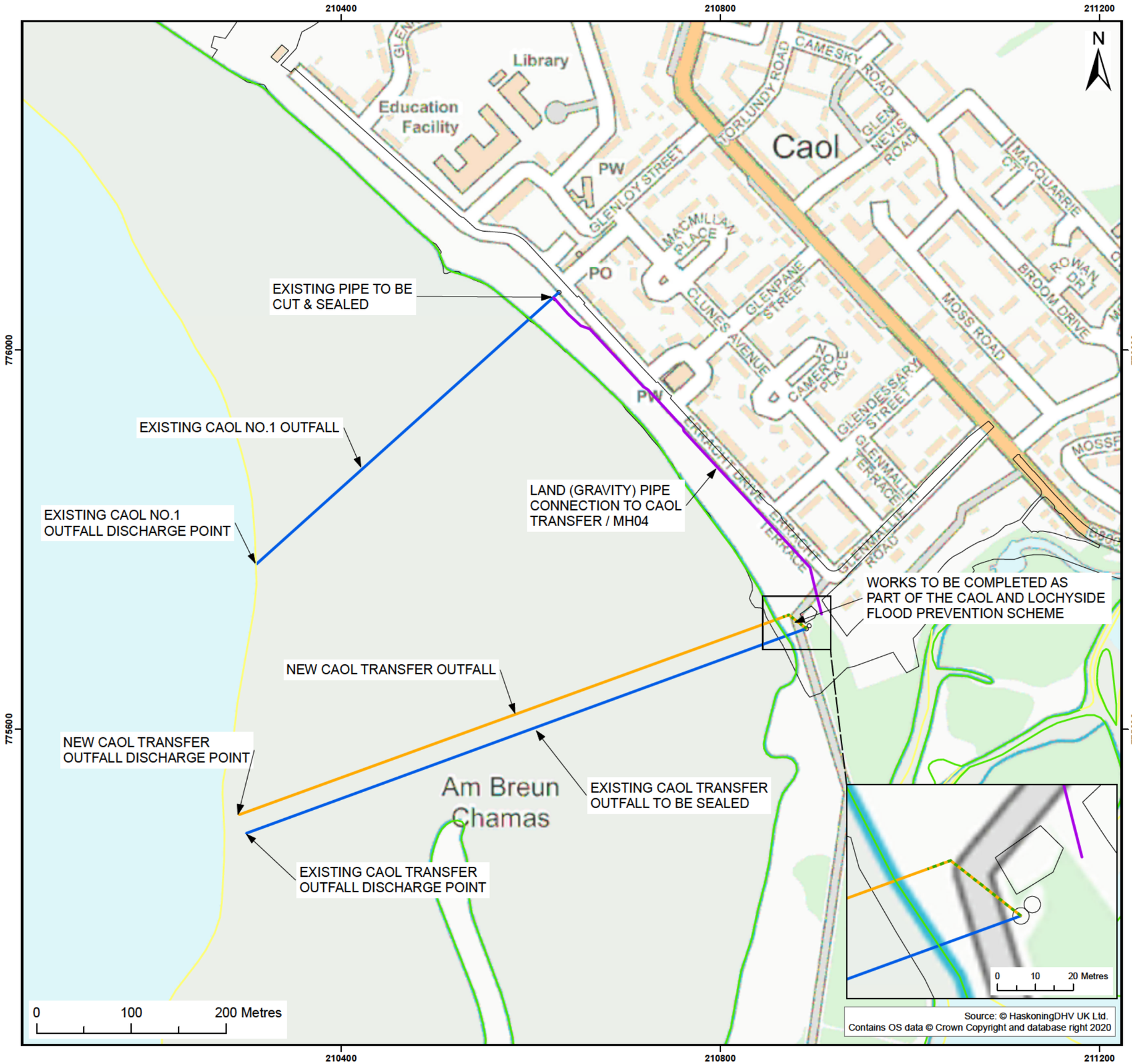
- Option 1 – New Land Pipe connecting to Existing Caol Transfer Outfall
    - Divert the flows (by gravity) from Caol No1 WwPS to Caol Transfer WwPS/MH05 and remove Caol No1 outfall. Retain and repair Caol Transfer outfall.
- Option 2 – New 'Like for Like' Replacement of both Caol No1 and Caol Transfer outfalls.
- Option 3 – New Land Pipe connecting to New Caol Transfer Outfall
    - Divert the flows (by gravity) from Caol No1 WwPS to Caol Transfer WwPS/MH05 and remove Caol No1 outfall. Replace Caol Transfer outfall with a new outfall with suitable capacity.

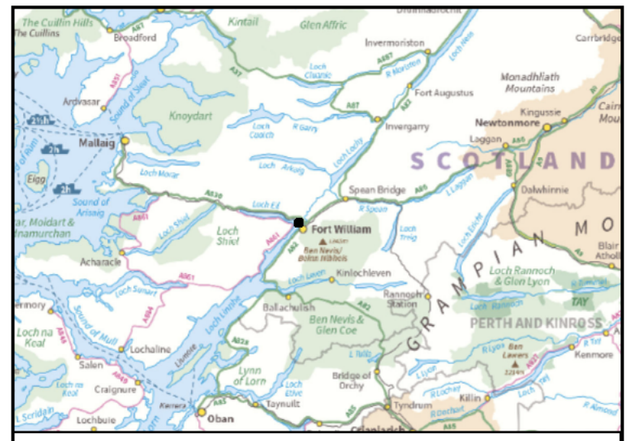
The option chosen to be taken forward is: Option 3 (Abandon Caol No 1, Divert Flow to Caol Transfer/MH05 and Replace Existing Caol Transfer) as a replacement solution and the design of the land (gravity) pipeline to the Caol Transfer WwPS/ Chamber. Diversion works associated with the Existing Caol No 1 Flows will be undertaken by the Highland Council and are not part of this application. **Catchment Ltd/Scottish Water will undertake the replacement works for the Existing Caol Transfer and it is for these works that this Marine Licence application and Environmental Report relate to.** The replacement works are here-in referred to as the Proposed Scheme.

1.2 Purpose of the Marine Licence Environmental Report

Catchment Ltd are seeking to apply for a Marine Licence from Marine Scotland Licensing Operations Team (MS-LOT) for the replacement of the existing Caol Transfer under the Marine (Scotland) Act 2010 (hereafter referred to as 'the Marine Act').

This Environmental Report is submitted in support of the Marine Licence application to provide an overview of the baseline environment and any potential impacts from the outfall works construction and operation. Consent for the onshore aspects of the works has been granted by The Highland Council under the Town and Country Planning (Scotland) Act 1997.





Legend:

- Existing Caol Outfall
- Land (gravity) pipe connection to Caol transfer / MH04
- New Caol transfer outfall
- Works to be completed as part of the Caol and Lochyside Flood Prevention Scheme
- Mean High Water Spring
- Mean Low Water Spring

Client:	Project:
Catchment Ltd	Caol No1 & Caol Transfer Outfalls

Title: Existing and proposed outfall pipes

Figure:	Drawing No:
1.1	PC1651-001-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	06/05/2021	JT	JM	A3	1:4,000
01	22/04/2021	JT	JM	A3	1:4,000

Co-ordinate system: British National Grid

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2 Project Description

2.1 Existing structures

The Caol No1 and Caol Transfer outfalls are located at the northern extent of Loch Linnhe, a sea loch at Caol, Fort William; grid coordinates 56° 50.0928' N, 5° 6.1476' W (Figure 1.1**)**. The Caol Transfer WwPS is the main pumping station transferring flows from the Caol catchment to the Fort William Wastewater Treatment Works. The effluent to be discharged is screened storm sewage, which will be the same effluent in terms of quality and quantity as what is being currently discharged at the existing Caol Transfer outfall.

A visual, non-intrusive inspection of the Caol No1 and Caol Transfer outfalls was carried out during low water spring tides on 28 August 2020 to assess the current condition of the outfalls. A brief summary and description of the existing outfalls are provided in the following sections.

2.1.1 Caol No1 Outfall

The existing Caol No1 outfall is approximately 413 m in length and has an external diameter of approximately 220 mm. It is assumed that the outfall pipe material is steel. The outfall is constructed with timber supports (as observed during the technical site visit) and it is partially buried on the foreshore as shown in Figure 2.1. It was not possible to determine the depth of penetration of the timber supports. The outfall discharges beyond the low tide level via a flap valve arrangement, the presence of which was not confirmed during a site visit as it was not visible.

The outfall discharges screened storm sewage water from Caol No1 WwPS, located at Erracht Drive, Caol, Fort William. It operates as a Combined Sewer Overflow (CSO) and as an Emergency Overflow should high levels occur in the network due to extreme rainfall events or pump failure at the pumping station (PS).

The existing Caol No1 outfall is damaged beyond repair and the middle length of the pipe was observed on the foreshore in multiple sections. A proposed scheme which includes the diversion of flows from the existing Caol No1 outfall via a New Land (Gravity) Pipe connecting to New/Replacement Caol Transfer Outfall is commencing shortly.

The existing Caol No1 outfall will be decommissioned and capped close to the new connection point at its upstream end once the construction of the Proposed Scheme is complete and the flow is successfully diverted. The existing pipe will be left in situ.

Figure 2.1: Existing Caol No1 Outfall Pipeline

2.1.2 Caol Transfer Outfall

The existing Caol Transfer outfall is estimated to be approximately 635 m in length with an internal diameter of approximately 450 mm. It has been in operation since the 1970s. Unlike Caol No1, the Caol Transfer outfall does not appear to have any piles or timber supports.

The site visit confirmed that there is no flap valve arrangement present at the end of the outfall, as shown in Figure 2.4. The outfall is partially buried as observed during the site visit and shown in Figure 2.2 to Figure 2.6. It is assumed that the Caol Transfer Pipe material is reinforced concrete. Externally, it was observed that the outfall was covered with marine growth and internally the Lanes Group plc Closed Circuit Television (CCTV) survey identified some internal debris and a small hole adjacent to the pumping station.

The outfall discharges storm sewage from the Caol Transfer WwPS, located at Caol Spit, Fort William. It operates as a CSO and an emergency overflow should high levels occur in the network due to extreme events or pump failure at the PS.

The existing Caol Transfer outfall will remain in operation during the construction of the new outfall and will be decommissioned and capped (discharge end of outfall) once the construction of the Proposed Scheme is complete and the flow is successfully diverted. The pipe will be left in situ.

Figure 2.2: Close Up View Of The Existing Caol Transfer Outfall

Figure 2.3: Existing Caol Transfer Outfall

Figure 2.4: Existing Caol Transfer Outfall Discharge End

Figure 2.5: Existing Scour Protection On Beach

Figure 2.6: Landward End Of The Existing Caol No1 Outfall

2.2 Construction of the New Caol Transfer Outfall

The works required to replace the existing Caol Transfer will be to construct a new pipe next to the existing pipe and connect it to the new land-based gravity flow diversion pipe. This replacement outfall will be offset 20 m to the north of the existing Caol Transfer outfall and will extend 639 m offshore to the new Caol Transfer outfall discharge point at co-ordinates 56° 49.94436' N, 5° 6.58914' W. The end point of the outfall pipe will be located at seabed depth of approximately -0.397 m below Ordnance Datum (mOD) and fitted with non-return duckbill valves. The new outfall is based on the provision of a design life of 50 years. The extend of works will be limited to working footprint 50 m either side of the new pipe.

Placing the outfall pipeline directly on the seabed surface is likely to cause an obstruction which will be at risk from anchor damage and boat collision and subjected to higher wave/current loads. To mitigate this, the pipeline will be installed within a buried trench. The seabed area around the new diffuser discharge location shall be protected from scour with rock armour, level with the sea bed. The diffuser pipe section and protection units are to be founded on suitable granular bedding and surround material. All imported rock is to be in accordance with CIRIA Report 169 'Manual on the use of rock in Hydraulic Engineering' and concrete mattresses are to be stable in all environmental conditions.

Operationally the existing license would continue until the new pipe was ready to make connection and then that would be done in a suitable weather window with an Environmental Pollution Incident notification procedures and Construction and Compliance Risk Assessment in place with SEPA (from Scottish Water). The existing pipe will be capped once the replacement outfall is commissioned

2.2.1 Works associated with the Caol and Lochyside Flood Protection Scheme

The Highland Council have designed a Flood Protection Scheme (FPS) which overlaps with the highest section of the Proposed Scheme. Construction works for The Highland Council's Caol and Lochyside FPS are programmed to commence prior to the construction of the Proposed Scheme; therefore, to minimise future disturbance of the FPS, disruption and cumulative effects, The Highland Council will install the upper 30 m of the outfall pipe (i.e. part of the Proposed Scheme) as part of their own FPS works and under their

own licence(s). As this work will be undertaken prior to the construction of the Proposed Scheme, there will be some changes to the baseline environment following the construction of the FPS. All works (including capping) of the Caol No1 Outfall will also be carried as as part of The Highland Council's FPS works.

At a later stage, the Proposed Scheme will then commence construction, extending further from this initial 30 m of pipe down the shore to the low water. It is this work that will be undertaken under the Marine Licence being applied for by this report.

2.3 SEPA Discharge Consent

In 1997, the North of Scotland Water Authority[1] had gained the required discharge consents under the Control of Pollution Act 1974 from the Scottish Environment Protection Agency (SEPA) for both the Caol No1 and Caol Transfer outfalls for a discharge of screened sewerage under section 34 of the Act from Caol No. 1 Pumping Station and the Caol Transfer Pumping Station respectively.

The Caol No1 consent states that “Discharges shall be made to the Loch Linnhe below low water mark Ordinary Spring Tides by means of an outlet at a point corresponding to National Grid Reference NGR NN 1032 7577”. The consent also states that the discharge of storm sewage to the outfall shall occur only when the rate of flow in the sewer at the storm sewage separating weir exceeds 34 l/s due to rainfall and snow melt. The discharge of storm sewage shall be screened to 6 mm mesh or equivalent.

The Caol Transfer consent states that “Discharges shall be made to the Loch Linnhe below low water mark Ordinary Spring Tides by means of an outlet at a point corresponding to National Grid Reference NGR NN 1030 7549”. The consent also states that the discharge of storm sewage to the outfall shall occur only when the rate of flow in the sewer at the storm sewage separating weir exceeds 108 l/s due to rainfall and snow melt. The discharge of storm sewage shall be screened to 6 mm mesh or equivalent.

It is anticipated that a new Controlled Activities Regulation (CAR)[2] licence is not required and a variation to the existing licence will be sought. This is because the type of effluent and volume being discharged will not change and it is only the location of the discharge point and associated drawings that will change.

[1] In 2002 the Scottish Parliament passed the Water Industry (Scotland) Act 2002 merging the three water providers into one, Scottish Waters.
[2] Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended).

3 Construction Method and Materials

The following section outlines the anticipated construction method and materials which will be used for the construction, operation and maintenance and decommissioning activities of the Proposed Scheme. There is no confirmed contractor for the construction of the Proposed Scheme; therefore, some specifics in the construction methods may change, in which case further consultation with relevant stakeholders will be undertaken as appropriate.

3.1 Geotechnical Risks and Investigations

A geotechnical desk study and further investigations will be undertaken during the next design stage (Quarter 4, 2021), the geotechnical risks associated with the proposed site for the proposed construction:

- Unknown ground conditions: There are no ground investigation (GI) data available. Formation of the marine trench for pipeline will require excavation of soil which is close to the seabed surface. Additional ground investigations to cover the uncertainties associated with the ground conditions is required along the proposed route of the new outfall pipeline.

- Subsea infrastructures/ obstructions: Survey of existing infrastructures and services along the outfall routes, on land and offshore will need to be undertaken.

GI works will be carried out by the chosen Contractor just prior to the construction phase in 2023, as part of this Marine Licence application. The detailed design phase will therefore assume geotechnical parameters which will be updated (if required) when the GI works are completed and confirmed by the chosen contractor. The GI works are anticipated to be carried out on the foreshore by land based equipment in separate phases as follows:

Foreshore Ground Investigation

- Cable Percussion Boreholes (150mm diameter shafts up to 5m depth) and trial pits (2m x 2m, up to 5m depths) every 200m carried out by window sampling located on the inter-tidal foreshore. (The frequency and type of sampling may change depending on the nature of the ground encountered)
- Geotechnical laboratory testing of soil samples.
- Production of factual report.

Foreshore Surveys Investigation (Non-Intrusive) Phase 1: Topographic and Bathymetric Survey

- Topographic and Bathymetric survey.
- Production of factual report.

Benthic Ecology and Sediment Quality Survey

The scope of the survey for the Benthic ecology and sediment quality survey work package comprises of the following:

- Sediment quality survey.
- Marine ecology survey.

3.2 Construction

The replacement Caol Transfer outfall route starts at the Caol Transfer connection point at MH05 at an invert level of +1.40 mOD. As discussed in Section 2.2, the upper 30 m will be constructed by The Highland Council during works associated for the Caol and Lochyside FPS.

3.2.1 Trench works

The excavation and backfill operations of the trench will be prepared using the side-casting method. This involves digging a trench using heavy equipment during low water and placing the excavated material to the side for subsequent re-use as backfill.

It is currently anticipated that all construction will be done from the intertidal zone at low water, working around low tides, rather than using vessels, although a diver support vessel or floating pontoon may be required. The new pipe will be placed in the trench with a minimum of 1.5 m cover to the pipe crown and will be secured with concrete weights to ensure pipe stability. Backfilling of the trench will be performed in a controlled manner to ensure even placement of material around the pipeline and ground level will be restored to existing levels.

3.2.2 Duration of works

Nearshore/intertidal preparation works are typically carried out in daylight hours and around times of low tide. Works will be undertaken over 10 – 14 weeks. No night time, weekends / bank holidays working is envisaged unless necessary. Works are anticipated to start in May 2023 and end August 2023, within the 3 year limit of consent.

3.2.3 Vehicles and Materials

The works will require the following vehicles:

- Long-reach hydraulic excavator(s)
- Delivery lorries (pipes, fixings, fittings, rock, pre cast concrete collars)
- Transport vehicles (personnel)
- Dumpers.

The pipe will be constructed using a Solid Wall Polyethylene (PE) Class 100 Standard Diameter Ratio (SDR) 26 pipe for the offshore section of the Proposed Scheme.

A duckbill (‘Tideflex’ or similar) non-return valve will be used on the discharge end of the new/ replacement Caol Transfer outfall. These valves will prevent tidal and sediment inflow and improve the hydraulic characteristics of the discharge. The valves will also help reduce the potential for marine growth build up within the pipes during their operational life. Figure 3.1 shows examples of a duckbill non-return valve.

Figure 3.1: Examples of a duckbill non-return valve

3.2.4 Compounds

The Contractor will set-up the land-based compound in the vicinity of the working area. This may also be used to store land-based equipment and support the works on the beach. The Contractor will ensure all plant is secure, fenced off, well-lit and not posing a hazard to the public and minimise any disturbance to grassland as this will be located on hard standing.

3.2.5 Safety of the local public

The general public will be excluded from working areas. A combination of signage, fencing, safety patrols and flags to guide the public to clearly marked alternative access routes and keep them at a safe distance from onshore works. During construction, banksmen will be present on site (as required) to engage with the public to advise them of the temporary new routes (as necessary). The contractor will keep to the published schedule to minimise disruption to local residents and businesses.

3.3 Operation

For the new Caol Transfer outfall, the flange joint on the top of the diffuser will be removable to allow for jetting and cleaning access. The detailed requirement for maintenance access and frequency will be developed during detailed design stage (Quarter 4, 2021). Inspection and maintenance will be undertaken during periods of low tides or with the aids of divers as considered necessary.

The effluent to be discharged is screened storm sewage, and is the same discharge as what is being currently discharged at the existing Caol Transfer outfall. A variation to the existing discharge consent will be sought instead of a new CAR licence.

3.4 Decommissioning

The design is based on the provision of a design life of 50 years for the new land (gravity) pipeline, outfall and associated works. Upon decommissioning, it is most likely the diffuser protection dome will be removed and the diffuser riser removed to below seabed level and main outfall pipe shall be sealed or removed at the end of its operating life as necessary. The detailed approach for decommissioning of the pipeline will be confirmed at the time of decommissioning, and will be based on relevant guidance and legislation at the time. It is assumed that an outfall pipe will still be required to service the surrounding residential area in 50 years; therefore, it is most likely that the pipe will be repaired or replaced following surveys and consultation with relevant stakeholders.

4 Scotland's National Marine Plan

Scotland's National Marine Plan covers both Scottish inshore waters (out to 12 nautical miles (nm)) and offshore waters (12 to 200 nm). It also applies to the exercise of both reserved and devolved functions. Marine planning matters in Scotland's inshore waters are governed by the Marine Act.

The National Marine Plan sets out strategic policies for the sustainable development of Scotland's marine resources. Regional Marine Plans will be implemented at a local level within Scottish Marine Regions, to take into account local circumstances and smaller ecosystem units.

The following policies are relevant to this Marine Licence application:

- GEN 1 General planning principle: There is a presumption in favour of sustainable development and use of the marine environment when consistent with the policies and objectives of this Plan.
- GEN 3 Social benefit: Sustainable development and use which provides social benefits is encouraged when consistent with the objectives and policies of this Plan.
- Gen 7: Landscape/seascape: Marine planners and decision makers should ensure that development and use of the marine environment take seascape, landscape and visual impacts into account.
- GEN 9 Natural heritage: Development and use of the marine environment must:
  (a) Comply with legal requirements for protected areas and protected species.
  (b) Not result in significant impact on the national status of Priority Marine Features.
  (c) Protect and, where appropriate, enhance the health of the marine area.
- GEN 10 Invasive non-native species: Opportunities to reduce the introduction of invasive non-native species to a minimum or proactively improve the practice of existing activity should be taken when decisions are being made.
- GEN 12 Water quality and resource: Developments and activities should not result in a deterioration of the quality of waters to which the Water Framework Directive, Marine Strategy Framework Directive or other related Directives apply.
- Gen 13: Noise: Development and use in the marine environment should avoid significant adverse effects of man-made noise and vibration, especially on species sensitive to such effects.
- GEN 15 Planning alignment: Marine and terrestrial plans should align to support marine and land-based components required by development and seek to facilitate appropriate access to the shore and sea.
- GEN 18 Engagement: Early and effective engagement should be undertaken with the general public and all interested stakeholders to facilitate planning and consenting processes.

GEN 1 is relevant to all marine activities**.** This principle seeks to ensure that the development and use of the marine area is consistent with the National Marine Plan, ensuring activities are undertaken in a sustainable manner that protects and enhances Scotland's natural and historic marine environment. The Proposed Scheme is to enable the discharge of waste water in an environmentally sound and sustainable manner and, therefore, is relevant to this policy.

GEN 7 considers the importance of landscape and seascape elements to people's enjoyment of the coastal and marine environment. There will be some temporary short term visual disturbance during construction from vehicles and plant on the shore but as the pipe will be buried, impacts during operation will be minimal.

GEN 3 is of relevance to social benefit. Caol, Fort William and Corpach require local waste water services and the construction of this infrastructure is of relevance to maintaining the health and wellbeing of these coastal communities.

GEN 9 requires compliance with protecting and enhancing the natural environment. The purpose of the Proposed Scheme is to replace an existing pipe system which is in need of repair and no long fit for purpose, and by doing so prevents deterioration of the marine environment

GEN10 considers introduction and spread of invasive non-native species. All works in the marine environment have the potential to cause spread or introduction of such species and measures should be embedded into the design of the Proposed Scheme and construction methodology to manage any risks.

GEN 12 requires that, with regards to the Water Framework Directive (WFD), reference should be made to the 'ecological status of the water environment' which includes water quality and quantity and changes to water level as well as biological aspects such as the impact of non-native species. The Proposed Scheme will discharge to the marine environment and, therefore, this policy is relevant for construction and operation activities.

GEN 13 states that the any man-made noise and vibration does not adversely affect those species sensitive to underwater noise. Works are anticipated to be undertaken in the intertidal in the dry, via construction vehicles on the beach. Apart from placing rock and backfill, no noise pollution is expected.

GEN 15 requires planning alliance between the onshore (gravity pipe) and offshore (new transfer pipe) components of the Proposed Scheme. Consultation with both the Highlands Council and MS-LOT has been undertaken to ensure compliance with this policy.

GEN 18 requires appropriate consultation with all relevant parties. As well as engaging with statutory consultees, the Pre-Application Consultation (PAC) process was carried out and appropriate notices given to provide opportunities for engagement with the local community and other relevant parties.

5 Consultation

Consultation has been undertaken with statutory stakeholders. In addition, the local community and other relevant stakeholders have been given the opportunity to comment through the formal PAC process. Due to restrictions imposed by Covid-19, consultation has been held virtually or through email correspondence. Details of the consultation undertaken, and responses received are presented below.

5.1 Pre-Application Consultation

A virtual PAC event was organised and scheduled to be held on the 1 April 2021 in accordance with Regulation 4(d) of The Marine Licensing (Pre-Application Consultation) (Scotland) Regulations 2013.

In order to comply with Section 23 of the Marine (Scotland) Act 2010, statutory consultees must be notified 12 weeks in advance of any proposed development which requires PAC. Part (3) states that the notification must contain:

- a description in general terms of the activity to be carried out;
- a plan or chart showing the outline of the location at which the activity is to be carried out (including, as appropriate, the route to be taken in order to carry out the activity), which is sufficient to identify the location;
- details as to how the prospective applicant is to be contacted; and
- such other information as may be prescribed by regulations made by the Scottish Ministers.

The event was duly advertised in The Oban Times and the statutory consultees, as well as other identified consultees, were informed 12 weeks in advance on 15 February 2021 (see Section 5.2). The PAC notifications are presented in **Appendix 1**. All declined to attend the event, responding by email with any comments they wished to raise, and no members of the local community chose to register for attendance either. A summary of consultation is included within the Pre-Application Consultation Report.

5.2 Stakeholder Consultation

Statutory stakeholders were consulted via email. A summary of the stakeholder consultation carried out is presented in Table 5.1.

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Table 5.1 Consultation

Consultee	Date / Document	Comment	Response / where addressed in the report
MS-LOT	Email to Alexia Chapman dated 26th January 2021	MS-LOT is of the opinion that the marine activity is of a class or description prescribed in Regulation 4(d) of The Marine Licensing (Pre-Application Consultation) (Scotland) Regulations 2013 ("the Regulations") and as such will require pre-application consultation. MS-LOT has reached this opinion as you have provided information to show that the total area in which the construction works are to be located exceeds 1000 square metres in extent. Regulation 4 (d) of the Regulations states "the construction of any works (with the exception of a renewable energy structure) within the Scottish marine area either in or over the sea or on or under the seabed, but only where the total area in which such works are to be located exceeds 1000 square metre	Consultation with other statutory consultees documented within this table. PAC consultation detailed in Section 5.1
Maritime and Coastguard Agency	Email to Alexia Chapman (2 March 2021)	Based on the information provided, I would suggest that the risk to the safety of navigation is relatively low on this occasion and that the risk can be mitigated through suitably worded conditions of consent, including local notifications and notifying the UK Hydrographic Office for the update of nautical charts and publications. It would also be useful if you could confirm in your formal application the following information to assist our assessment at that time: 1) whether the works fall within the jurisdiction of a responsible navigation authority; 2) It appears the pipe will be buried, and extend the same distance offshore as the existing outfall. Please can you confirm? 3) Details of consultation taken place with interested parties; and 4) Any expected impact on vessels and safe navigation in the area.	The works do not fall within the jurisdiction of a responsible navigation authority. It was confirmed that the new pipe will extend to approximately the same distance as the existing outfall. Consultation is discussed in Section 5 Section 7.9 discusses impacts to Navigation and mitigation that will be taken regarding local notification and notification to the UK Hydrographic Office.
NatureScot	Email to Alexia Chapman (14 & 16 April 2021)	NatureScot were consulted upon the need for undertaking surveys and whilst they agreed with our conclusions on impacts and agreed that the mitigation proposed was appropriate, with regards to marine habitats they informed us that they have an old record (1989) for blue mussel beds (*Mytilus edulis* beds on littoral habitats) in the proximity of Caol no.1 outfall near the sea end of the pipe. Therefore, NatureScot advised that we carried out a drop down survey in this area to check for the presence of this Priority Marine Feature (PMF) and include a mitigation plan as appropriate. On response that the construction of the pipeline will not extend further than the intertidal zone (with the diffuser jutting into the shallow subtidal), an intertidal walkover survey was proposed to check for the presence of blue mussel beds on the intertidal zone. NatureScot's response was positive, stating that the	An intertidal walkover survey was carried out at low water spring tides on 29 April 2021. No evidence of blue mussel was found. Results of the survey can be found in Appendix 1.

Consultee	Date / Document	Comment	Response / where addressed in the report
		reason for the drop down video was to check for any mussel growth on the original Caol outfall, if the outfall was to be removed. NatureScot stated that an intertidal survey carried out on a spring low tide is sufficient to determine the presence of blue mussel beds.	
SEPA	Online form on SEPA website Phone call to Alexia Chapman 2 March 2021	Due to the ongoing cyberattack issues SEPA are facing, it was not possible to contact SEPA by email. Instead, SEPA have asked that all correspondence is via filling in their online form. The 12- week notification and PAC invitation were both submitted via the online form. Note that it was not possible to attach files using this method; therefore, not possible to send SEPA and drawings/figures of the development. SEPA acknowledged receipt of the information submitted via their online form by phone on 2 March 2021. No comments were raised. SEPA acknowledged that a separate CAR licence was being sought.	Impacts to water Quality are discussed in Section 7.3
Northern Lighthouse Board	Letter to Alexia Chapman dated 22nd February 2021	Northern Lighthouse Board have no objection to the proposed works and advise the following; • Catchment Ltd liaise with local stakeholders with regard to the operations, and issue a local Notice to Mariners informing of the scope and timeframe of the works. • Upon completion of the works, 'as-built' plans should be provided to the UK Hydrographic Office to enable the update of navigational publications.	Section 7.9 discusses impacts to Navigation and mitigation that will be taken regarding local notification and notification to the UK Hydrographic Office.
Lochaber District Salmon Fisheries Board	12-week notification email 15 February and PAC Event invite	The 12-week notification was sent to the Lochaber District Salmon Fisheries Board, as well as the PAC event invite. No response was provided from the consultee.	N/A
Lochaber Fisheries Trust	12-week notification email 15 February and PAC Event invite	The 12-week notification was sent to the Lochaber Fisheries Trust, as well as the PAC event invite. No response was provided from the consultee.	N/A
The Highland Council	12-week notification email 15 February and PAC Event invite	The 12-week notification was sent to The Highland Council, as well as the PAC event invite. No response was provided from the consultee.	N/A

6 Embedded Mitigation

Embedding mitigation into the proposed project design is a type of primary mitigation and takes account of activities that will be undertaken as standard best practice. Table 6.1 and Table 6.2 outline the embedded mitigation which has been incorporated into the Proposed Scheme.

Table 6.1 Embedded mitigation measures through scheme design

Parameter	Mitigation measures embedded into the scheme design
Footprint	Localised reduction of the width of the proposed working area, where practical, and adherence to strict footprint of works to minimise temporary construction impacts on neighbouring habitats (50 m either side of the new pipe).
Navigation	To mitigate risk of collision or entanglement the new pipeline will be installed within a trench.
Consultation	Ongoing consultation with local community and other relevant stakeholders.

Table 6.2 Embedded mitigation through Best Practice and Policy

Parameter	Mitigation measures through Best Practice and Policy
Pollution prevention	Guidance for Pollution Prevention GPP 5: Works and maintenance in or near water (Netregs, undated). Environmental Pollution Incident notification procedures and Construction and Compliance Risk Assessment (SEPA 2020)
Pollution prevention	SEPA (2016) standing Advice for Marine Scotland on Small Scale Marine Licence Consultations Supporting Guidance WAT-SG-53 on Environmental Quality Standards and Standards for Discharges to Surface Waters (SEPA, 2019); GPP1 Understanding your environmental responsibilities – good environmental practices (Northern Ireland Environment Agency (NIEA), Department for Agriculture the Environment and Rural Affairs (DAERA, SEPA and Natural Resources Wales (NRW) 2020), GPP5: Works and maintenance in or near water (NIEA, SEPA and NRW 2018a); GPP21: Pollution incident response planning (NIEA, SEPA and NRW, 2017) GPP22: Dealing with spills (NIEA, DAERA, SEPA and NRW, 2018b).
Construction good practice	CIRIA Coastal and marine environmental site guide (2nd edition) (C744)
Construction good practice	CIRIA Guidance note C692 Environmental Good Practice on Site Guide (3rd Edition).
Pollution prevention	SEPA Pollution Prevention Guidelines.
Invasive non-native species	SEPA guidance: Biosecurity and management of invasive non-native (INNS) species for construction sites and controlled activities

As part of this best practice, several mitigation measures will be implemented as part of the project embedded mitigation to manage and minimise the risk of a pollution event occurring during construction activities:

- Development of an Emergency Response Cooperation Plan (ERCoP) using relevant guidance including GPP21, GPP22, set out by Maritime and Coastguard Agency (MCA) in Marine Guidance Note (MGN) 543 issued and approved by MCA;
- Notice to Mariners to be issued to reduce collision risks; and
- Should vessels be required:
    - Vessels associated with all Project operations will comply with IMO/MCA codes for prevention of oil pollution and any vessels over 400 GT will have on board SOPEPs;
    - Vessels associated with all Project operations will carry on-board oil and chemical spill mop up kits; and
    - Where possible, vessels will avoid working in poor weather conditions.

7 Assessment of Potential Impacts

7.1 Overview

The Caol Outfalls are located to the North of Fort William, at the village of Caol. The nearest postcode is PH33 7AZ.

The beach is known to be used at low tide by the public for leisure purposes, especially during the summer months. Access to the site by car is gained from the B8006 (Kilmallie Road), with parking facilities available overlooking the outfall at Erracht Drive.

The following sections provide an overview of the key receptors that have the potential to be affected by the activities at the outfalls. Data sources that have informed the baseline are as follows:

- Ecology walk over / site visit;
- Consultation undertaken with MS-LOT, NatureScot, SEPA, Maritime and Coastguard Agency, Northern Lighthouse Board;
- Data from Highland Biological Recording Group;
- Data from the Caol and Lochyside FPS application; and
- Other, publicly available information including websites and data searches.

An assessment of the impacts from the construction, operation & maintenance, and decommissioning for the Proposed Scheme (abandonment, diversion and replacement) was carried out on the following receptors: physical processes, water quality, marine habitats, birds, otter, terrestrial ecology, archaeology, other marine users and navigation.

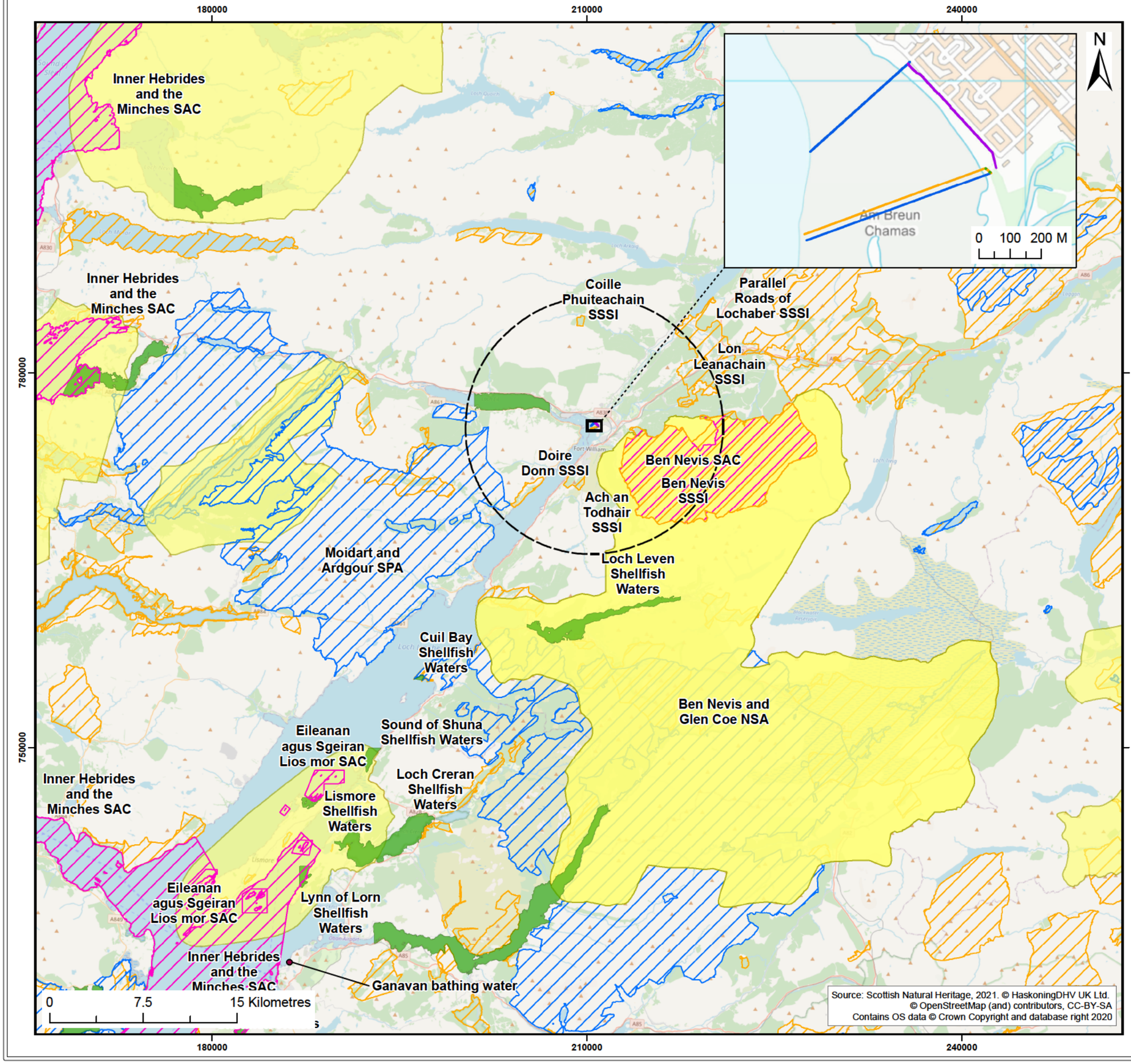
The following receptors were ‘scoped out’ as no pathway of effect was determined: nature conservation designated sites, and marine mammals. The following paragraphs provide further justification for the scoping out of these receptors.

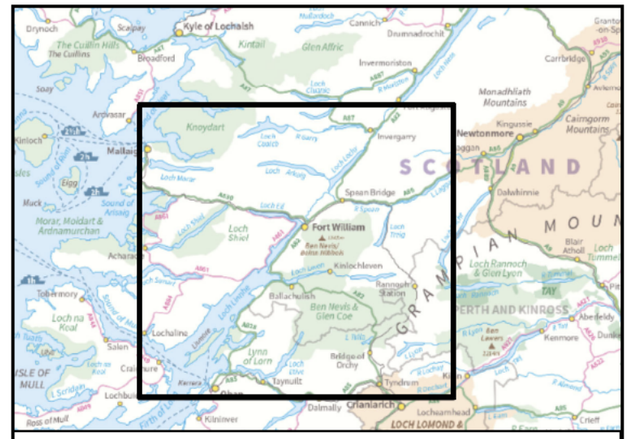
An environmental designations check was carried out using the Magic and NatureScot websites and showed no impact on Biosphere Reserves, National Nature Reserves, Ramsar Sites, Special Protection Areas (SPAs), Royal Society for the Protection of Birds (RSPB) Reserves, nor National Parks. There are no nature conservation designated sites immediately within the vicinity of the proposed scheme. One Special Area of Conservation (SAC), one Special Protection Area (SPA), five Sites of Special Scientific Interest (SSSI) and one National Scenic Area are located within 10 km and are presented in Table 7.1 and shown on Figure 7.1[3]. An assessment has determined that there is no pathway for interaction of potential effects between the proposed scheme and the sites or their designated features; therefore, all designated sites are scoped.

[3] *https://sitelink.nature.scot/map*

Table 7.1: Nature Conservation Designated Sites within 10km of the Proposed Scheme

Designation	Approximate Distance (km) From Proposed Scheme	Reasons for Designations	Scoped In/Out
Ben Nevis SAC	3	Siliceous alpine and boreal grasslands, alpine and subalpine calcareous grasslands, siliceous scree of the montane to snow levels, calcareous rocky slopes with chasmophytic vegetation and siliceous rocky slopes with chasmophytic vegetation	Scoped out – no pathway for interaction with this site or its designated features
Ben Nevis SSSI	3	Geological (Caledonian Igneous) and Biological (upland assemblage, native pinewood, upland oak woodland, vascular plant assemblage, bryophyte assemblage, breeding bird assemblage, small mountain ringlet butterfly *Erebia epiphron* and fly assemblage)	Scoped out – no pathway for interaction with this site or its designated features
Ach an Todhair SSSI	3.5	Upland mixed ash woodland and upland assemblage	Scoped out – no pathway for interaction with this site or its designated features
Lon Leanachain SSSI	7	Blanket bog	Scoped out – no pathway for interaction with this site or its designated features
Doire Don SSSI	6	Upland oak woodland, chequered skipper *Carterocephalus palaemon* and beetles	Scoped out – no pathway for interaction with this site or its designated features
Parallel Roads of Lochaber SSSI	7	Fluvial geomorphology and quaternary geology	Scoped out – no pathway for interaction with this site or its designated features
Coille Phuiteachain SSSI	8	Beetles and native pinewood	Scoped out – no pathway for interaction with this site or its designated features
Moidart and Ardgour SPA	8	Golden eagle *Aquila chrysaetos*	Scoped out – no pathway for interaction with this site or its designated features
Ben Nevis and Glen Coe National Scenic Area	2.5	Mountain and highland vistas, settlements and lochs	Scoped out – no pathway for interaction with this site or its designated features





Legend:

- Existing Caol Outfall
- Land (gravity) pipe connection to Caol transfer / MH04
- New Caol transfer outfall
- works to be completed as part of the Caol and Lochyside Flood Prevention Scheme
- Outfalls 10km Buffer

Designated sites

- Sites of Special Scientific Interest (SSSI)
- Specia Protection Areas
- Special Areas of Conservation
- National Scenic Areas
- Shellfish waters
- Bathing water points

Client:	Project:
Catchment Ltd	Caol No1 & Caol Transfer Outfalls

Title: Nature conservation designated sites and Water Framework Directive Waters

Figure: 7.1 | Drawing No: PC1651-001-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	06/05/2021	JT	JM	A3	1:300,000
01	22/04/2021	JT	JM	A3	1:300,000

Co-ordinate system: British National Grid

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Marine mammals have not been considered further as there is no discernible pathway of effect from the construction and operation of the new pipe to the receptor. Marine mammals are primarily impacted through the generation of underwater noise. Works are anticipated to be undertaken in the intertidal in the dry, via construction vehicles on the beach. Apart from placing rock and backfill, no noise pollution is expected. As there is no generation of underwater noise, this receptor has been scoped out and, by default, any adjacent Special Areas of Conservation (SACs) and SSSIs for which marine mammals are a qualifying feature are also scoped out. This applies to Eileanan agus Sgeiran Lios mor SAC (common seal *Phoca vitulina*) and Inner Hebrides and Minches SAC (harbour porpoise *Phocoena phocoena*) which are located approximately 34 km and 40 km away from the Caol respectively.

For all receptors assessed, if the Proposed Scheme was decommissioned, impacts from the removal process will be at worst the same as those for installation.

7.2 Physical Processes

7.2.1 Bathymetric/Topographic Survey Data

In-depth knowledge of the bathymetry at the Caol site was not necessary due to the fact that the new and existing outfalls discharge near to the lowest tidal mark. A bathymetry survey will be required and will be carried out for future design stages of the new/replacement Caol Transfer outfall. Topographic data from a survey of the site location carried out by Scottish Remote Sensing Portal has been used to develop the design for the new/replacement outfall.

7.2.2 Geotechnical Conditions

There is no geotechnical data available at this stage specific to the existing outfalls.

British Geological Survey data classifies the foreshore as sand and the backshore as gravel in the location of the proposed scheme, leading to gravel substrate deeper into the sea loch.

A geotechnical desk study will also be undertaken at future design stages of the new/replacement Caol Transfer outfall to identify and scope the level of detail and type of further GI works required prior to construction works in 2023.

7.2.3 Tidal Conditions

Tidal water levels at the project site based on Standard port (based on 19 years of tide gauge data), Corpach from Admiralty Tide Tables 2020, are provided in Table 7.2. Chart Datum (mCD) is 1.98m below mOD.

Table 7.2: Caol Project Site Tidal Levels to Chart Datum and Ordnance Datum

Tidal Level	Chart Datum (mCD)	Ordnance Datum (mOD)
Highest Astronomical Tide (HAT)	+4.79	+2.81
Mean High Water Springs	+4.05	+2.07
Mean High Water Neaps	+3.05	+1.07
Mean Low Water Neaps (MLWN)	+1.70	-0.28
Mean Low Water Springs	+0.70	-1.28
Lowest Astronomical Tide (LAT)	-0.05	-2.03

7.2.4 Waves and Currents

There are no wave or tidal current data available for the site location at present. In accordance with the DNV[4] Recommended Practice F109 Stability Design Code[5], the new/replacement Caol Transfer outfall has been designed to provide stability against a wave with 100 year return period and a current speed of 1 in 10 years or a wave with 10 year return period and a current speed with a 100 year return period, whichever is the worst case.

The design of the new pipe has considered a tidal current speed of 0.3 m/s along the site, obtained from an online source - Scottish Shelf Model. Part 5: Wider Loch Linnhe System Sub-Domain - Part 5 of the hydrodynamic model developed for Scottish waters.

Varying wave heights were employed for various chainages along the length of the new/replacement Caol Transfer outfall. The wave heights employed along the length of the marine section of the outfall are depth limited and based on the tidal water levels outlined in Table 7.2. It should be noted that in the absence of measured or precise modelled data the values utilised may under or over-estimate the requirements for pipeline stability and scour protection. Wave heights adopted for the concept design of the outfall are provided in Table 7.3.

Table 7.3: Concept Design Wave Heights along length of the new/replacement Caol Transfer outfall

Chainage (m)	Water Depth at HAT (m)	Wave Height, H_s (m)	Wave Period, T_p (s)
100	2.3	1.3	4.2
300	2.6	1.5	4.5
500	3.3	2.0	5.1
620	3.5	2.1	5.2

7.3 Water Quality

7.3.1 Baseline

Loch Linnhe North is designated as a transitional water body (ID: 200089) in the Scotland River Basin District under the Water Framework Directive (WFD). The proposed scheme is located at the northern reaches of this water body. It is 25.3 km^2 in area and its condition and future objectives are classed by SEPA[6] as 'Good' both currently and in the long term, with 'High' physical condition and freedom from invasive species.

The nearest designated bathing waters are located 50 km to the south at Ganavan. The nearest designated shellfish water protected area is at Loch Eil, approximately 3.5 km to the west of the Proposed Scheme. Loch Linnhe and surrounding water bodies are not classed as a sensitive area under the Urban Waste Water Treatment Directive.

[4] DNV (Det Norske Veritas) is the certification body for the stability design
[5] The main objective of this recommended practice (RP) is to provide rational design criteria and guidance for assessment of pipeline on-bottom stability subjected to wave and current loading
[6] *https://www.sepa.org.uk/data-visualisation/water-environment-hub/*

7.3.2 Potential Impacts

As the guidance notes set out in the embedded mitigation (Table 6.1 and Table 6.2) will be followed throughout the construction and operation of the proposed scheme the risk of an accidental spill occurring is considered to be adequately mitigated and will not be considered further

The construction and operation of the Proposed Scheme may affect the water quality of the Loch Linnhe North transitional water body including the excavation of the trench for the new outfall pipe to be laid in both intertidal and subtidal regions. In total approximately 11,000m^3 of sediment will be excavated. Any excess material will be replaced on site. Works will be undertaken in the dry, within the intertidal area and the opportunity for the creation of sediment plumes will therefore be limited. The foreshore is classed as sand and gravel, and as such will not contain significant concentrations of contaminants as they do not adsorb easily to coarser sediments compared to fine sediments (National Research Council (NRC), 1997). In addition, coarse sediments have a reduced risk of causing sediment plumes compared with finer siltier sediments. The low silt levels are also unlikely to affect other water quality parameters such as dissolved oxygen and the proposed works are short term and of a small footprint. Adherence to the standard best practice measures described in Table 6.2 are not considered to have an impact on the Loch Linnhe North transitional water body or Loch Eil Shellfish Waters.

The new Caol Transfer pipe will be a like for like replacement and will discharge similar flows to the existing pipe, consistent and in line with the discharge consents. During operation, the maximum design flow for Caol transfer WwPS outfall will be 114l/s which includes the pass forward flows from Caol No1 WwPS of 34l/s. The minimum design flow for Caol Transfer WwPS outfall is to be 80l/s on the assumption that Caol No1 WwPS is not passing flow forward.

The existing pipes are due for repair/replacement due to recurring holes and damaged sections along their lengths and are not functioning correctly. The construction of the new pipe system will ensure the water is discharged effectively in the low shore and will not leak out across the intertidal area. The Proposed Scheme will, therefore, have a small positive impact on the existing water quality by allowing proper flushing of the water into the loch.

During decommissioning, impacts will at worst the same as those from during construction.

Overall, there are no significant adverse impacts anticipated to the water quality in the water body and no secondary impacts to important or designated features, including bathing waters, shellfish waters, marine habitats or wildlife.

7.4 Marine Habitats

7.4.1 Baseline

A walk over of the site was undertaken by an experienced marine biologist during a spring low tide on 29th April 2021 (see Appendix 1 for surveys results). In addition, photographs taken during an engineering site visit (2020) show were reviewed by a marine biologist. A review was also undertaken of the National Biodiversity Network Atlas[7]online.

The intertidal area is characterised by muddy/sandy gravel littoral sediment with common gravel / pebbles and cobbles distributed. The hard surfaces of the cobbles and artificial substrata of the existing pipes are colonised by fucoids and gutweed *Ulva intestinalis* (Figure 2.3 to Figure 2.6).

[7] *www.NBNAtlas.org.*

NBN Atlas contains records made by Joint Nature Conservation Committee (JNCC) for Lochy Flats – the beach at the location of the outfalls, within a 500 m buffer of the pipes. Records were made in 1989 and are, therefore, considered to be out of date. These species recorded were the algae Horned wrack *Fucus ceranoides*, bladder wrack *Fucus vesiculosis* toothed wrack *Fucus serratus* gutweed, red seaweed *Porphyra indet and brown seaweed Ectocarpaceae*. Blow lugworm *Arenicola marina*, and estuary ragworm *Hedeste diversicolor* were recorded in the sediments. Flat periwinkle *Littorina fabalis,* common periwinkle *Littorina littorea,* rough periwinkle *Littorina saxatilis/arcana,* sand gaper *Mya arenaria* blue mussel *Mytilus edulis*, , acorn barnacles *Balanus crenatus* and *Semibalanus balanoides*, and amphipods *Echinogammarus* and isopods *Idotea granulosa* were also recorded on the shore.

The 2021 intertidal walk over survey covered the full extent of both existing pipes and the surrounding area. Saline grasses and common scurvy grass *Cochlearia officinalis* were recorded above MHWS. Caol Transfer WwPS was recorded to be mainly lightly buried in the upper and mid shore with some exposed sections, and exposed towards the lower shore and Caol No1 pipe was buried in places, and fully exposed / in broken unconnected sections in the mid shore. Sediments were generally recorded to be silty sandy or coarse sand with gravel and pebble and boulders. Algae cover was densest along the line of the pipes (even in buried sections) but also present attached to detached or buried pebbles and cobbles on the shore. The pipes and surrounding area supported *F. ceranoides, F. spiralis, F. vesiculosis, Chondrus crispus, Ulva intestinalis and Hildenbrandia rubra. Porphyra indet. Ceranium* spp., *Dumontia cortorta were present in the low shore.* The barnacle *Chthamalus montagui,* amphipods *Echinogammarus* and green shore crab *Carcinus maenas, A. marina and L. littorea* were also recorded.

These species are all common for the area, and typical of a sea loch environment with freshwater and / or waste water influence. Although blue mussel beds on littoral sediments are a Priority Marine Feature in Scotland's seas there is no indication from the surveys that the mussels recorded on the shore in 1989 were part of a mussel bed.

No records of INNS have been identified to date. Vessels are not anticipated to be required for the works, which will be undertaken in the dry via construction vehicles on the shore.

7.4.2 Potential impacts

The installation of the pipe has the potential to adversely affect the intertidal marine habitats at Caol through disturbance and removal of habitats. The installation of the pipe would involve construction vehicles on the shore; however, the construction activities will be undertaken within a strict footprint of works with sediments replaced following completion of the works. The littoral habitat supports limited species of limited conservation value, with most species associated with the hard substrata (natural and artificial) present on the shore.

The footprint of the works is a narrow stretch of shore and full recovery of fucoids takes between one to three years (Holt *et al*, 1997). The works are not anticipated to cause significant disturbance or any habitat fragmentation to the habitats and species on the shore.

There is a low potential for the introduction of both new INNS and an increased range for those which are established within the marine environment within Scotland to be brought to the site on construction vehicles / materials. Embedded mitigation for INNS, including a commitment to standard best practice measures, is discussed in Section 6. Duckbill non-return valves will be used at the end of the pipe. The valves will help reduce the potential for marine growth build up within the pipes during their operational life.

Therefore, there is no significant impact anticipated from installation of the pipes on marine habitats.

There will be no direct impacts to marine habitats during operation. Considering the existing pipe is in need of repair (holes and broken sections) and will therefore not be functioning effectively, the operation phase of the new pipe will ensure the outflow reaches below MLWS and is properly flushed into the marine environment in a safe manner. No significant impacts are anticipated during the operation of the new pipe.

During decommissioning, impacts will at worst the same as those from during construction.

7.5 Birds

7.5.1 Baseline

The sediment shores of intertidal habitat would provide foraging ground for coastal birds, and is part of a wider network of sea lochs, coast and countryside. Some potential ground bird nesting habitat is present above the tide line however due to the close proximity of the site to the village of Caol there will be regular disturbance of the area by dog walkers and other recreational activities and therefore nesting within the immediate area of the pipes is unlikely. Birds are more likely to use the comparatively undisturbed scrub and woodland habitat surrounding the sewage works.

Species recorded on NBN Atlas by British Trust for Ornithology (BTO) in 2017 and 2019 within a 500m buffer of the pipes include glaucous gull *Larus hyperboreus*, ringed plover *Charadrius hiaticula*, oystercatcher *Haematopus ostralegus*, common sandpiper *Actitis hypoleucos*, Canada goose *Branta canadensis*, Goosander *Megus merganser*, wigeon *Maraca penelope*, curlew *Numenius arquata*, mallad *Anas platyrhynchos*, redshank *Tringa tetanus*, cormorant *Phalacrocorax carbo*, common gull *Larus canus*, Teal *Anas crecca*, black headed gull *Chroicephalus ridibundus*, grey heron *Ardea cinerea*, great black backed gull *Larus marinus* and little grebe *Tachybaptus ruficollis.* Records for a number of terrestrial bird species were also made, including woodcock *Scolopax rusticoa,* song thrush *Turdus philomelos,* pied wagtail *Motacilla alba yarrellii,* goldfinch *Carduelis carduelis,* hooded crow *Corvus cornix,* robin *Erithacus rubecula,* chaffinch *Fringilla coelebs,* buzzard *Buteo buteo,* blackbird *Turdus merula* and sparrowhawk *Accipter nisus.*

During the ecology walkover survey (April 29th, 2021) the following species were recorded: goldfinch, house sparrow *Passer domesticus*, oystercatcher, mallards *Anas platyrhynchos*, nuthatch *Sitta europaea*, and common gull.

Ringed plover, woodcock, curlew, song thrush and house sparrow are currently on the BTO's Birds of Conservation Concern (BOCC) red list, indicating the highest level of conservation concern. Amber list species include teal, mallard, oystercatcher, common sandpiper, wigeon, redshank, black headed gull, common gull, glaucous gull and great black backed gull and are of medium conservation concern. It should be noted that all breeding bird species are protected under the Wildlife and Countryside Act 1981 (as amended).

7.5.2 Potential Impacts

As discussed in Section 2.4, the installation of the upper 30 m of outfall pipe will be undertaken by The Highland Council when constructing the Caol and Lochyside FPS, and breeding birds will be considered in these works and mitigated for by The Highland Council accordingly, including pre construction surveys. The works associated with the construction of the FPS will change the baseline environment from that which is currently present.

For the Proposed Scheme, approximately 11,000 m^2 littoral habitat will be disturbed during the construction works and associated trenching activities for the Proposed Scheme. The amount of the shore disturbed is small when compared to the size of the beach and surrounding habitat, works are considered to be short term and temporary, with reinstatement following completion of the construction phase. This is not anticipated to cause a significant impact to bird food resource.

The works are likely to take place between March and September to take benefit of longer daylight hours to coincide with low tides, and better weather for the works; therefore, access for the construction works for the installation of the pipe as part of the Proposed Scheme has the potential to disturb any nesting birds, if present, during the breeding months between March and August, inclusive. A pre-construction survey to assess for nesting birds present at the time of construction would be carried out, with appropriate mitigation applied based on current good practice guidance. Limited suitable nesting habitat and there is a commitment to undertake a pre-construction survey for the presence of nesting birds. Depending on the results of the survey, additional mitigation will be discussed with NatureScot as required. As such, no significant impact is predicted from the installation of the pipes on breeding birds.

Impacts to birds are not anticipated to occur during operational phase. If any significant maintenance is required during the breeding bird season a pre-maintenance breeding bird survey will be conducted and if necessary additional consultation will be undertaken with NatureScot to agree any mitigation required to ensure no disturbance occurs.

During decommissioning, impacts will at worst the same as those from during construction.

7.6 Otter

7.6.1 Baseline

Otter are European Protected Species and are fully protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). Otter is also a Priority Marine Feature in Scotland. No signs of European or UK legally-protected mammal species were found as part of the Mammal Survey undertaken for the Caol and Lochyside Flood Protection Scheme mammal surveys in 2015; [redacted] A walkover survey undertaken for the Caol and Lochyside FPS in 2015 did not record any otter signs in the vicinity of the FPS (JBA Consulting, 2017) and no signs were recorded during the ecology walk over (29th April 2021).

The outfalls are located on the edge of the village, and will be regularly disturbed by dog walkers, walkers, cyclists, residential traffic, children playing etc. It is unlikely that otter holts will be present in the areas surrounding the existing outfalls due to this regular disturbance but there is potential for otters to commute the beach between the river and the canal.

7.6.2 Potential Impacts

Otter are a highly mobile species with a potential home range of up to 5 km on the West Coast of Scotland. As discussed in Section 2.4, the installation of the upper 30 m of pipe will be undertaken by The Highland Council when constructing the Flood Protection Scheme, and otters will be considered in these works and

mitigated for accordingly. The construction of the Flood Prevention Scheme will also alter the baseline environment.

With regards to the Proposed Scheme, there are no SACs designated for otter which have connectivity with the footprint of works. The connectivity of the footprint of the Proposed Scheme to the wider habitat provides suitable foraging and commuting habitat for otter, although the human and dog activity associated with the village and beach may dissuade otter from regularly using the area. There is a potential for otters along the shore to be disturbed by loud or sudden noise during construction activity. The close proximity of the footprint of the Proposed Scheme to the village is likely to dissuade otters from using the area for resting sites or natal holts.

Risks to otter will be reduced by following best practice and guidance, including NatureScot Standing Advice for Planning Consultations (otter)SNH, undated) including:

- where artificial light is required, lights will be directed away from the coastal area and watercourses to allow otters to migrate through the area undisturbed. Any lighting required at these areas will be low-intensity;
- a temporary ramp will be placed in trenches over 0.5 m deep in order to allow a potentially trapped animal to exit the trench;
- any open pipes will be capped to prevent animals gaining access;
- all excavations and pipe systems will be checked at the start of each working day;
- construction vehicles and equipment should not be active on, or stored by, the coastline for longer than is essential; and
- existing vegetation will be retained wherever possible.

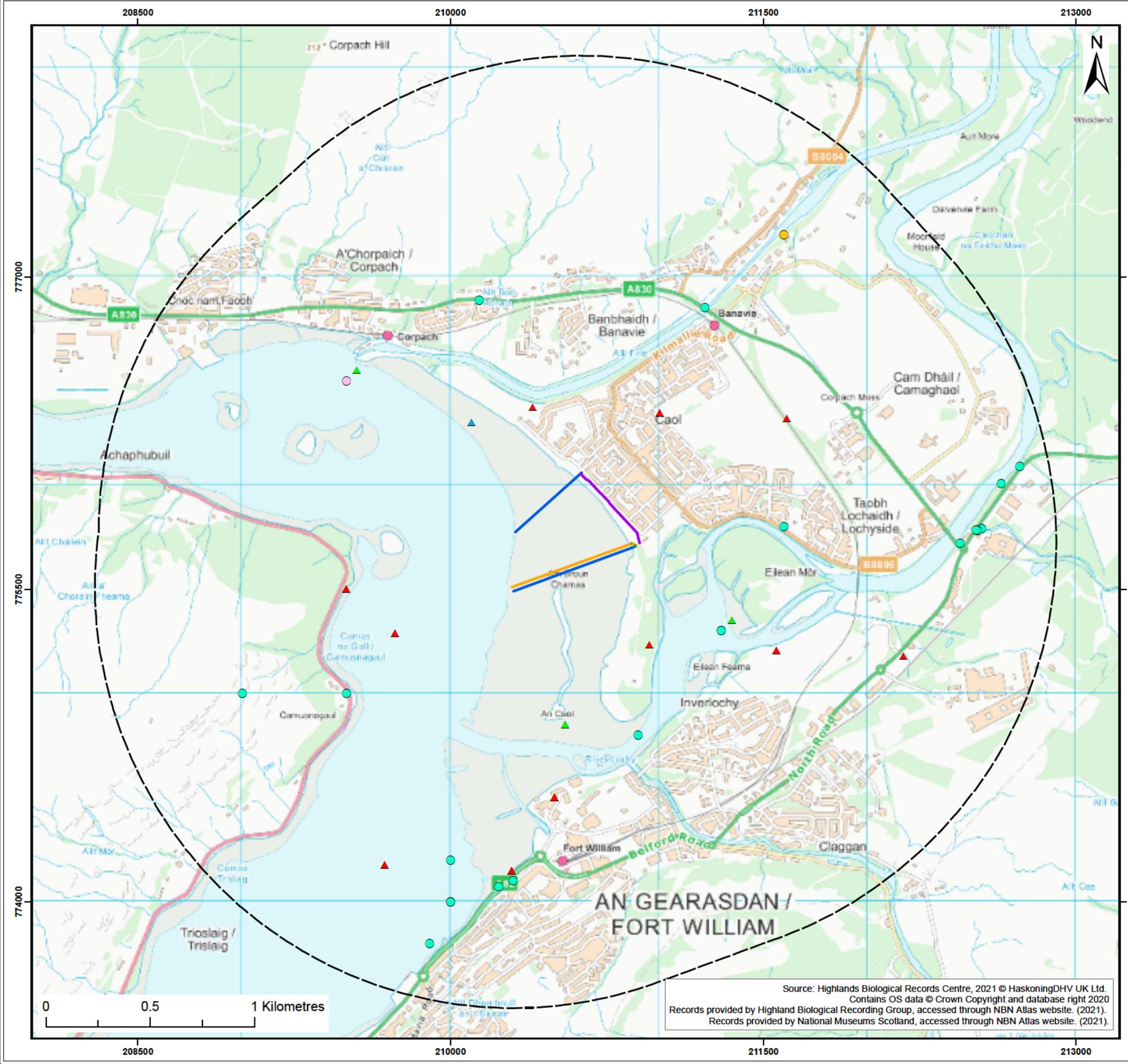
A pre-construction survey will be conducted (to a 250 m buffer) to confirm the absence of otter resting sites. The surveys should be undertaken in appropriate weather condition and following guidance in the ‘New Rivers and Wildlife Handbook’ (Holmes et al, 1994), Chanin (2003) and Strachan & Jefferies (1996), and NatureScot Standing Advise for Planning Consultations, Otter (SNH, undated). If evidence is found at the time additional consultation will be conducted with NatureScot to ensure appropriate mitigation is in place, including application for a licence to disturb an EPS if necessary. Consultation will be undertaken with NatureScot to discuss the additional mitigation required under this licence. This may include the following:

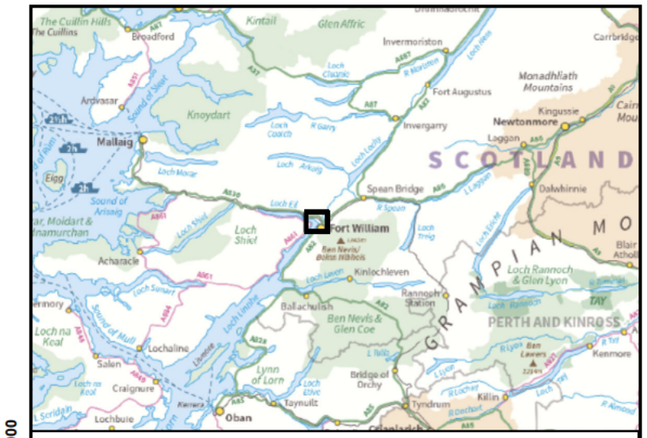
- If any otter fatalities occur during construction, carcases should be retained and NatureScot should be notified, if non-fatal injuries occur as a result of construction then NatureScot should be notified immediately;
- Work should stop should an otter holt or resting place be found within 250m (SNH 2007), and NatureScot consulted, as a licence may be necessary before works can continue;
- Site construction fencing should not interfere with the passage of animals through coastal corridors.

Following these best practice measures, there will be no impacts to otter during the construction phase on the outflow pipe.

If any significant maintenance is required a pre-maintenance otter presence survey will be conducted and if necessary additional consultation will be undertaken with NatureScot to agree any mitigation required to ensure no disturbance occurs.

During decommissioning, impacts will at worst the same as those from during construction.





Legend:

- Existing Caol Outfall
- Land (gravity) pipe connection to Caol transfer / MH04
- New Caol transfer outfall
- Works to be completed as part of the Caol and Lochyside Flood Prevention Scheme
- Outfalls 2km Buffer

Recommended Common Name/Taxon Group - Highlands Biological Records Centre

- Common Pipistrelle
- Common Seal
- European Otter

Common name - NBN Atlas

- Eurasian Otter
- Grey Seal
- Harbour Seal

Client:	Project:
Catchment Ltd	Caol No1 & Caol Transfer Outfalls

Title: Ecology

Figure: 7.2 | Drawing No: PC1651-001-003

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid

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7.7 Terrestrial Ecology

7.7.1 Baseline

Access will be required for the construction vehicles to access the foreshore. The installation of the upper 30m of pipe will be undertaken by The Highland Council when constructing the Flood Protection Scheme, and access for to the shore for the construction of the pipe will be considered in these works. The construction of the Flood Prevention Scheme will also alter the baseline environment.

Surveys undertaken for the Caol and Lochyside Flood Prevention Scheme in 2015 identified no habitats with possible European or Biodiversity Action Plan rankings and Groundwater-Dependant Terrestrial Ecosystems to be present and the habitats surveyed were deemed to have low or negligible nature conservation sensitivities. Invasive species are known to be present along the FPS footprint at Caol and include Japanese knotweed *Reynoutria japonica*, giant hogweed *Heracleum mantegazzianum* and Himalayan balsam *Impatiens glandulifera* . The Highland Council have committed to a treatment programme would be contracted to reduce or eradicate the knotweed prior to any construction of the Flood Prevention Scheme. This is likely to be undertaken prior to construction of the Proposed Scheme.

There is a limited foraging potential for bats in in the wooded area surrounding the access round to the waste water works but these trees are small and offer no roosting habitat. No records for bats are shown on data from the NBN Atlas or the Highland Biological Recording Group (Figure 7.2).

Extensive vegetated shingle has recorded along the shores of Loch Linnhe, including at Caol (Murdock et al., 2014) however it was noted that at Caol Beach the vegetation has been degraded by mechanical beach-cleaning, dumping of the material and regrading of the landward slope. Species include curled dock *Rumex crispus,* sea mayweed *Tripleurospermum maritimum,* Scotland orache *Atriplex glabriuscula,* red sorrel *Rumex acetosella* and chickweed *Stellaria media* all frequent with silverweed *Potentilla anserina* locally abundant.

The ecology walkover (April 29th 2021) recorded the vegetation at the top of the Caol Transfer Pipe to consist of a grassy managed embankment between the road and beach, with rock revetment, supporting common gorse *Ulex europaeus*, common nettle *Urtica dioica*, dandelion *Taraxacum officinale agg*, silverweed *Potentilla anserina*, tormentil *Potentilla erecta*, ribwort plantain *Plantago lanceolata*, vetch indet. *Vica spp*. and curled dock *Rumex crispus* along with several small saplings (goat willow *Salix caprea*, sycamore *Acer pseudoplatanus*, ash *Fraxinus excelsior*).Terrestrial vegetation at the top of the shore between the two pipes also included saline grasses, curled dock, common scurvy grass *Cochlearia officinalis* leading to buttercup *Ranunculus, spp*, wild raspberry *Rubus idaeus*, alder *Alnus glutinosa*, dandelion, silverweed, rosebay willowherb *Chamaenerion angustifolium* and goat willow.

A single stand of Japanese knotweed in grassy embankment at top of shore at grid reference NN 10683 75982. This is not within the access route for the new Caol Transfer Pipeline works, and it is anticipated this will be eradicated as part of the FPS pre construction works, nevertheless it indicates the species to be present in the nearby area.

7.7.2 Potential Impacts

As discussed in Section 2.4, the installation of the upper 30m of pipe will be undertaken by The Highland Council when constructing the Flood Protection Scheme, and otters will be considered in these works and mitigated for accordingly. The construction of the Flood Prevention Scheme will also alter the baseline environment.

With regards to the Proposed Scheme, there are no anticipated impacts to protected or sensitive habitats or species during access to the beach. Existing scour protection will have already degraded the value of the vegetated shingle.

The access to the beach will be undertaken within a strict footprint of works to minimise disturbance and there is no anticipated disturbance of scrub or woodland habitat. The Contractor will set-up the land-based compound in the vicinity of the working area. This may also be used to store land-based equipment and support the works on the beach. The Contractor will ensure plant is secure, fenced off, well-lit and not posing a hazard to the public and minimise any disturbance to grassland as this will be located on hard standing. Any disturbed habitats will be replaced to as good as quality or better upon completion of the works.

A pre-construction walk over survey will be undertaken prior to works starting to ensure no further invasive species have established within the access footprint. Should any invasive species be identified within the footprint of the Proposed Scheme, an Invasive Species Management Plan will be drawn up and plants will be managed in line with SEPA's Biosecurity and management of invasive non-native species for construction sites and controlled activities guidance. Additional consultation may be conducted with NatureScot and SEPA as to appropriate treatment (eradication or 10m buffer fencing to prevent cross contamination of plant material or contaminated soil).

No trees will be removed in creating access to the beach for the construction activities and any potential impacts on bats will be considered and if necessary mitigated for by The Highland Council prior to construction of the Flood Prevention Scheme. As such impacts to bats are not anticipated during construction of the proposed Scheme.

As such, no significant impacts are anticipated to terrestrial habitats during construction or operation of the Proposed Scheme.

During decommissioning, impacts will at worst the same as those from during construction.

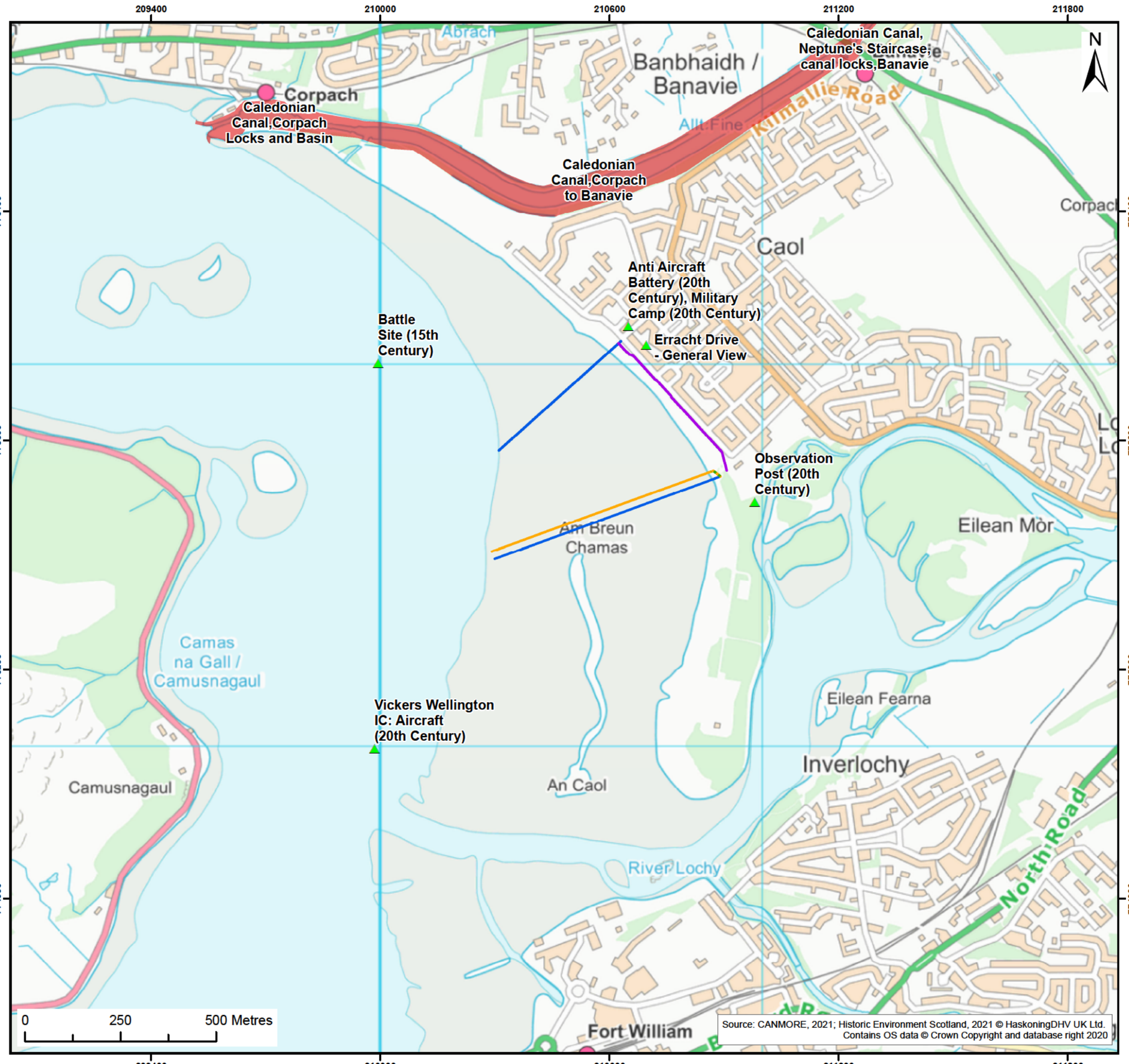
7.8 Archaeology

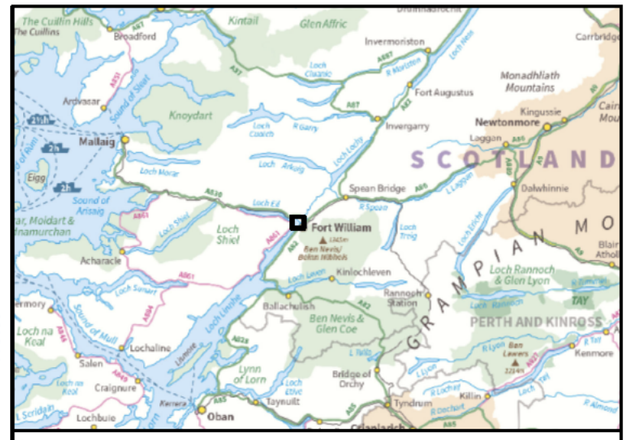
7.8.1 Baseline

The CANMORE (The National Record of the Historic Environment and Historic Environment Scotland) map viewers, have been used as the primary data sources initial Report. Other historic sources such as historic OS mapping, historic aerial photography and grey literature has been used in conjunction with these.

Loch Linnhe follows the Great Glen Fault, and the village of Caol is located at a section where the sea loch narrows, immediately north of Fort William. The earliest recorded settlement at nearby Fort William is of a wooden fort by British troops in 1654. The Caledonian Canal, located approximately 1.1 km to the north of the Proposed Scheme and connecting with Loch Linnhe at nearby Corpach, was constructed by Thomas Telford and completed in 1822, and is listed as a Scheduled Monument (reference SM6491).

There are no Historic Marine Protected Areas in the vicinity of the Proposed Scheme. The nearest are at Duart Point and Dartmouth, both approximately 54km south of the Proposed Scheme where Loch Linnhe meets the Sound of Mull. There are no reported wrecks off the coast of Caol. There are no historic records within the footprint of the Proposed Scheme, and Table 7.4 and Figure 7.3 identifies the historic records close by.





Legend:

- Existing Caol Outfall
- Land (gravity) pipe connection to Caol transfer / MH04
- New Caol transfer outfall
- works to be completed as part of the Caol and Lochyside Flood Prevention Scheme
- Scheduled Monuments
- Archaeology features

Client: Catchment Ltd	Project: Caol No1 & Caol Transfer Outfalls
Title: Archaeology	
Figure: 7.3	Drawing No: PC1651-001-004

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Table 7.4 historic records[8]

CANMORE ID	Type of Site	Lat (Decimal Degrees minutes WGS84)	Long (Decimal Degrees minutes WGS84)	Distance from Proposed Scheme (m)
23710	Battle Site (15th Century)	56 50.189794398	-5 6.9760570398	575
119927	Anti Aircraft Battery (20th Century), Military Camp (20th Century)	56 50.258042046	-5 6.337237587	432
297413	Erracht Drive - General View	56 50.232280182	-5 6.2888565168	369
318097	Observation Post (20th Century)	56 50.018008698	-5 5.9916873282	112
293528	Vickers Wellington IC: Aircraft (20th Century)	56 49.645980876	-5 6.9396928668	602

Based on the above, the potential for further archaeological remains to be present within the site is considered to be low. Geoarchaeological remains may be present buried within the intertidal sediments, however, the new outfall pipe will be constructed immediately adjacent to the existing outfall pipe, and it is likely that any remains present were disturbed during the original installation process.

7.8.2 Potential Impacts

As has been discussed, there are no known designated or non-designated heritage assets located within the footprint of the proposed works. The proposed works will be undertaken within a limited footprint and there will be no impact to the Historic Marine Protected Areas or the Caledonian Canal scheduled monument.

The construction activities and presence of the pipe during operation have the potential to impact the general view of Erracht Drive (Canmore ref 297413) but the viewpoints on record are taken from the north-west, north and west, i.e. onshore with mountain backdrop, not offshore towards the sea and the footprint of the proposed works. Therefore, although the construction works and pipe will be visible from Erracht Drive, they will not interfere with the mountain backdrop of the buildings. In addition, the pipe will be constructed next to the existing pipe structure, will be partially buried.

In conclusion, as no impacts will occur to any heritage assets during the instillation or operation of the new pipe, it is considered unlikely that further archaeological mitigation measures will be required for the installation of the new outfall pipe.

During decommissioning, impacts will at worst the same as those from during construction.

[8] *ref https://canmore.org.uk/site/search/result?SITECOUNTRY=0&view=map*

7.9 Navigation

7.9.1 Baseline

The area is frequently used by recreational and commercial vessels traversing the sea loch and accessing the Caledonian Canal to the north of Caol, which connects the Atlantic coast to the North Sea via Loch Lochy. The nearest ferry route is 1.5 km south of the site, and will not be impacted by the proposed works.

Corpach Harbour is located further north. Loch Linnhe is popular with yachts travelling between the Atlantic and the North Sea, and a number of sailing clubs and water sports centres are located in the area. There are no pier or harbour facilities at Caol. Due to the presence of the nearby sewage works, the area where the outfalls are is not of value to the fishing community.

The proposed works to the outfalls are in the intertidal region, and extend offshore by 610m, beyond the low water mark. To minimise the risk of the vessels colliding or getting entangled with the new pipe, the Proposed Scheme has been designed so that the pipeline is installed within a buried trench. The pipe will be buried within a trench and backfilled with suitable as dredged or imported engineering material. This is to avoid the potential for damage to the pipeline in the future from seabed erosion, anchor drag and collision.

7.9.2 Potential Impacts

Although the area is frequently used by recreational and commercial vessels, the proposed works to the outfalls are in the intertidal region, relatively close to shore and will be undertaken at low tide. Neither the outfall nor associated scour protection will not be significantly raised off the seabed compared to the existing structures. Therefore it is anticipated that there will be no impacts from the construction and operation of the outfalls on the other marine based users of the sea loch or navigation.

The risks to Navigation are considered to be low, and the UK Hydrographic Office will be notified for the update of nautical charts and publications.

General best practice methods will be followed, and works are expected to be undertaken in the dry within the intertidal habitat, with materials delivered by lorry. Should vessels be required, additional mitigation will be put in place, including the following:

- Proposed activities will be limited to agreed transit routes for materials deliveries, proposed dredge area.
- A notice to Mariners will be issued no less than five working days prior to the commencement of the works and at regular intervals during the works.
- All navigation activities will be undertaken by qualified mariners in a competent manner (e.g. with due care and attention, not under the influence of alcohol or drugs, etc.).
- All navigation activities will be undertaken using suitable and appropriately maintained vessels and equipment.
- All other navigation activities will be undertaken in accordance with applicable navigation regulations, guidance, Notice to Mariners (NtMs) etc.;
- Care will be taken to ensure there are no foreign objects lost overboard and left on the sea floor. Any lost materials will be reported to the MMO immediately.

Therefore, it is anticipated that there will be no impacts from the construction and operation of the outfalls on the other marine based users of the sea loch or navigation.

During decommissioning, impacts will at worst the same as those from during construction.

7.10 Landscape, seascape and visual impacts

7.10.1 Baseline

The proposed scheme is located at the northern extent of Loch Linnhe, a tidal sea loch on the west coast of Scotland. The Village of Caol borders the coastline, with sea-view residential housing separated from the beach by a strip of amenity grassland and Erracht Drive (small residential B road). The village and beach have a mountain backdrop with Ben Nevis located to the east.

The Proposed Scheme is located approximately 2.5 km from the Ben Nevis and Glen Coe National Scenic Area (NSA), designated for its maintain and highland vistas, settlements and lochs. This designated site has been scoped out as the works will be undertaken in the short term, at an existing settlement, and the new pipe will be buried, minimising any cause of long term impacts from the NSA.

7.10.2 Impact Assessment

During construction the intertidal works may cause visual disturbance to people accessing the beach for recreation and local residents. Works will be undertaken over 10 – 14 weeks, in daylight hours around times of low tide. Nearshore/intertidal preparation works are typically carried out in daylight hours and around times of low tide. No night time, weekends / bank holidays working is envisaged unless necessary. Works will be limited to a small area of the shore.

Upon completion of the works, the pipe will be buried and therefore there will be minimal visual change from the baseline. The existing algae vegetation is expected to recover in 1-3 years to blend the works into the beach scene.

During operation, if significant maintenance is needed that requires vehicles and plan to access the beach, a similar approach will be used as during construction. No significant impacts are anticipated during operation.

7.11 Other Users

7.11.1 Baseline

The beach at Caol is known to be used at low tide by the public for leisure purposes, especially during the summer months. Access to the footprint of the Proposed Scheme by car is gained from the B8006 (Kilmallie Road), with parking facilities available overlooking the outfall at Erracht Drive. The beach, coastal habitat and green space is of recreational value to the local residents of Caol for walking, cycling, dog walking, fishing and other outdoor activities. The Great Glen Way Long Distance Path passes the shoreline between the outfall locations.

The road entrance to the Fort William Waste Water Treatment Works are located at the existing Caol Transfer pipe, surrounded by scrub and deciduous woodland habitat which leads to the sewage works plant. The mouth of the River Lochy is located south of the sewage works, north of the larger highland town of Fort William.

A small children's play park is present just northern of the Caol Transfer, between the coast and Erracht Drive, along with a café and church . The play park is being relocated as part of Flood Prevention Scheme. Caol Primary School and a small parade of local shops, including post office, pharmacy, supermarket and takeaways is located of the seafront north-west of the Caol No1 pipe.

7.11.2 Potential Impacts

The intertidal works may cause noise, visual and air quality disturbance to people accessing the beach for recreation. Works will be undertaken over 10 – 14 weeks, in daylight hours around times of low tide. Nearshore/intertidal preparation works are typically carried out in daylight hours and around times of low tide. No night time, weekends / bank holidays working is envisaged unless necessary.

The general public will be excluded from working areas for safety. A combination of signage, fencing, safety patrols and flags to guide the public to clearly marked alternative access routes and keep them at a safe distance from on shore works. During construction, banksmen will be present on site (as required) to engage with the public to advise them of the temporary new routes (as necessary). The contractor will keep to the published schedule to minimise disruption to local residents and businesses.

Any diversions around works on the foreshore (i.e. for recreational walkers on the beach / walkers on the Great Glen Way) would be minimal, as access at the beach would be diverted at worst case along the pavement by Erracht Drive for a short period of time (10 - 14 weeks) and then access will be reinstated. Impacts to other users are anticipated to be not significant and short term temporary.

During operation, if significant maintenance is needed that requires vehicles and plan to access the beach, a similar approach will be used as during construction (i.e. signage, fencing, safety patrols and flags to guide the public to clearly marked alternative access routes and keep them at a safe distance from on shore works). No significant impacts are anticipated during operation.

During decommissioning, impacts will at worst the same as those from during construction.

8 Summary

Catchment Ltd is seeking to obtain a Marine Licence from MS-LOT for the construction and installation of a new outfall pipe for the replacement of the existing Coal Transfer outfall at Caol.

This Environmental Report is submitted in support of the Marine Licence application submitted by Catchment Ltd for the installation of the pipe. Consultation has been undertaken with statutory stakeholders and a virtual PAC event was organised, however it was not held as no parties signed up to attend. Scotland's National Marine Plan has been considered and an assessment of the potential impacts of the installation, operation and decommissioning of the pipe has been carried out in relation to the following receptors:

- Water quality;
- Marine habitats;
- Birds;
- Otter;
- Terrestrial ecology;
- Archaeology;
- Navigation;
- Landscape;
- Seascape and visual impacts; and
- Other users of the beach.

The following receptors were scoped out of the assessment as there is no pathway of effect from the installation, operation and decommissioning of the pipe:

- Marine mammals; and
- Designated sites.

The following mitigation will be implemented:

- Construction activities will take place within a strict footprint of works.
- The new pipe will be installed in a trench to mitigate impacts to vessels.
- Ongoing consultation will be conducted with the local community and other relevant stakeholders;
- The works will adhere to standard best practice guidance for construction works and pollution prevention.
- Development of an Emergency Response Cooperation Plan (ERCoP) using relevant guidance including GPP21, GPP22, set out by Maritime and Coastguard Agency (MCA) in Marine Guidance Note (MGN) 543 issued and approved by MCA.
- UK Hydrographic Office will be notified for the update of nautical charts and publications.
- Notice to Mariners will be issued to reduce collision risks will be issued no less than five working days prior to the commencement of the works and at regular intervals during the works.
- A pre-construction walk-over survey will be undertaken to confirm absence of breeding birds, otter and INNS. Should evidence be found of these species, appropriate mitigation will be applied in consultation with NatureScot.
- Any disturbed habits will be replaced to as good as quality or better upon completion of the works.
- The general public will be excluded from working areas for safety. A combination of signage, fencing, safety patrols and flags to guide the public to clearly marked alternative access routes and keep them at a safe distance from on shore works.

- During construction, banksmen will be present on site (as required) to engage with the public to advise them of the temporary new routes (as necessary).
- The contractor will keep to the published schedule to minimise disruption to local residents and businesses.
- Should vessels be required:
    - Vessels associated with all Project operations will comply with IMO/MCA codes for prevention of oil pollution and any vessels over 400 GT will have on board SOPEPs;
    - Vessels associated with all Project operations will carry on-board oil and chemical spill mop up kits;
    - Where possible, vessels will avoid working in poor weather conditions;
    - Proposed activities will be limited to agreed transit routes for materials deliveries, proposed dredge area.
    - All navigation activities will be undertaken by qualified mariners in a competent manner (e.g. with due care and attention, not under the influence of alcohol or drugs, etc.).
    - All navigation activities will be undertaken using suitable and appropriately maintained vessels and equipment.
    - All other navigation activities will be undertaken in accordance with applicable navigation regulations, guidance, Notice to Mariners etc.; and
    - Care will be taken to ensure there are no foreign objects lost overboard and left on the sea floor. Any lost materials will be reported to the MMO immediately.

Following the above mitigation, no significant impacts are predicted from the installation, operation and decommissioning of the pipe to any of the assessed receptors.

9 References

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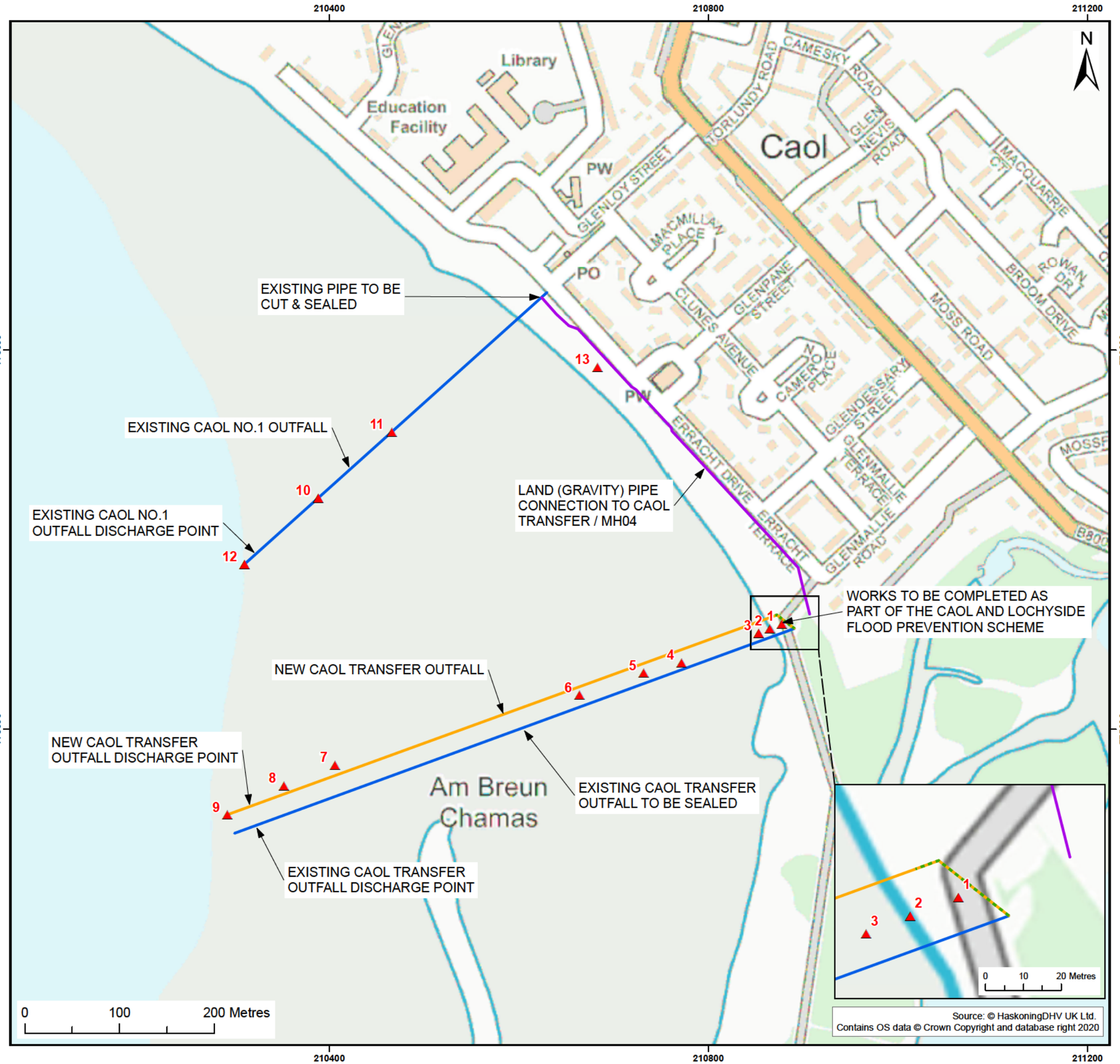
Appendix 1: Results of ecology walkover

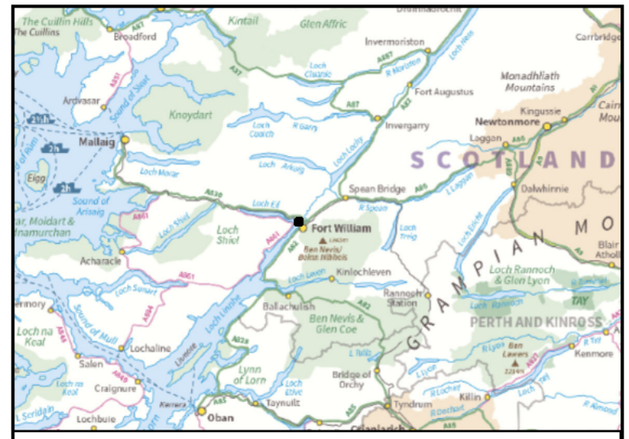
A walkover survey was undertaken by an experienced marine biologist and an experienced ecologist on 29th April 2021. Weather conditions were fair and the survey was undertaken at low water springs when the full length of pipes were accessible. The survey was requested by NatureScot (see Table 5.1 of main document) to determine the presence/absence (and condition) of blue mussel *Mytilus edulis*, which had been recorded at the site in 1989. No evidence of blue mussel was recorded from the current survey and the species is concluded to be absent from the intertidal area surrounding the pipes.

A search was undertaken for evidence of protected species. No signs of otter or other protected species were recorded during the survey and the scrub and woodland habitat at the top of the Transfer Outfall was considered to be of limited foraging value for bats.

The following birds were recorded during the survey: goldfinch *Carduelis carduelis*, house sparrow *Passer domesticus*, oystercatcher *Haematopus ostralegus*, mallards *Anas platyrhynchos*, nuthatch *Sitta europaea*, common gull *Larus canus.*

A series of target notes and photographs were taken at notable locations and are presented in Table A1.





Legend:

- Existing Caol Outfall
- Land (gravity) pipe connection to Caol transfer / MH04
- New Caol transfer outfall
- Works to be completed as part of the Caol and Lochyside Flood Prevention Scheme
- Target note

Client: Catchment Ltd	Project: Caol No1 & Caol Transfer Outfalls

Title: Results of ecology walkover, 29th April 2021

Figure: A1.1 | Drawing No: PC1651-001-006

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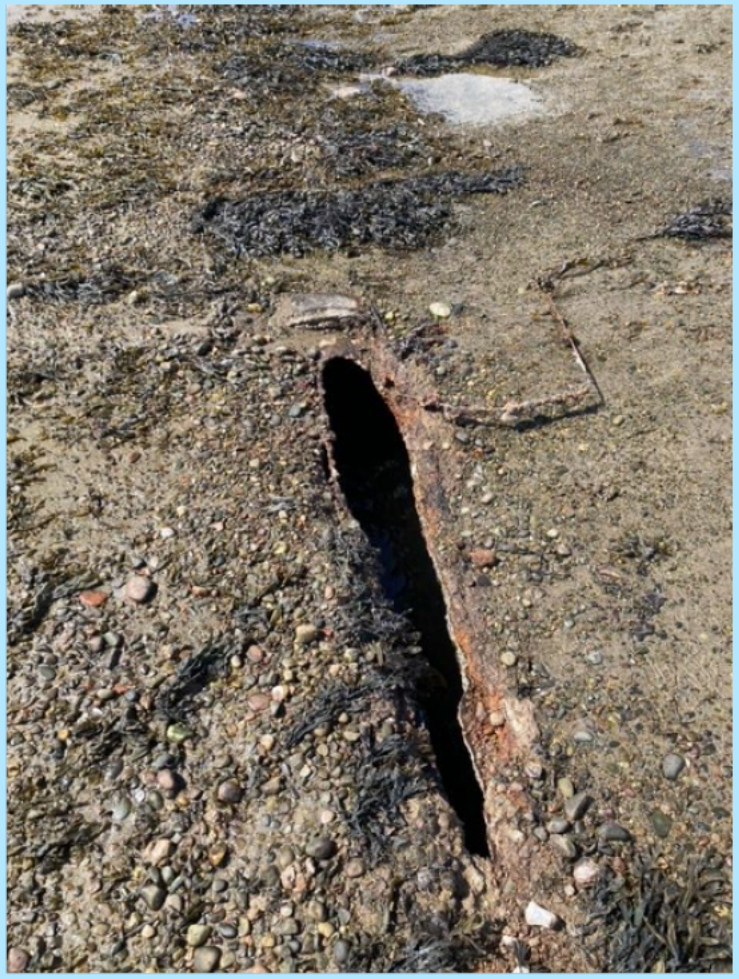
Table A1 Target notes of ecology walkover survey

Target Note	Lat (WGS84)	Long (WGS84)	Description	Photograph of target note
Caol Transfer WwPS and surrounding area				
1	56° 50.0547636	-5° 6.0954748	Directly above pipe on embankment Grassy managed embankment between road and beach, with rock revetment, supporting common gorse *Ulex europaeus*, common nettle *Urtica dioica*, dandelion *Taraxacum officinale agg*, silverweed *Potentilla anserina*, tormentil *Potentilla erecta*, ribwort plantain *Plantago lanceolata*, vetch indet. *Vica spp.* and curled dock *Rumex crispus* along with several small saplings (goat willow *Salix caprea*, sycamore *Acer pseudoplatanus*, ash *Fraxinus excelsior*). A significant amount of drift material was noted immediately below the revetment.	

Target Note	Lat (WGS84)	Long (WGS84)	Description	Photograph of target note
2	56° 50.0517478	-5° 6.1077203	Curled dock, silverweed and saline grasses (indet.) above Mean High Water Springs (MHWS). Outfall from drain present.	

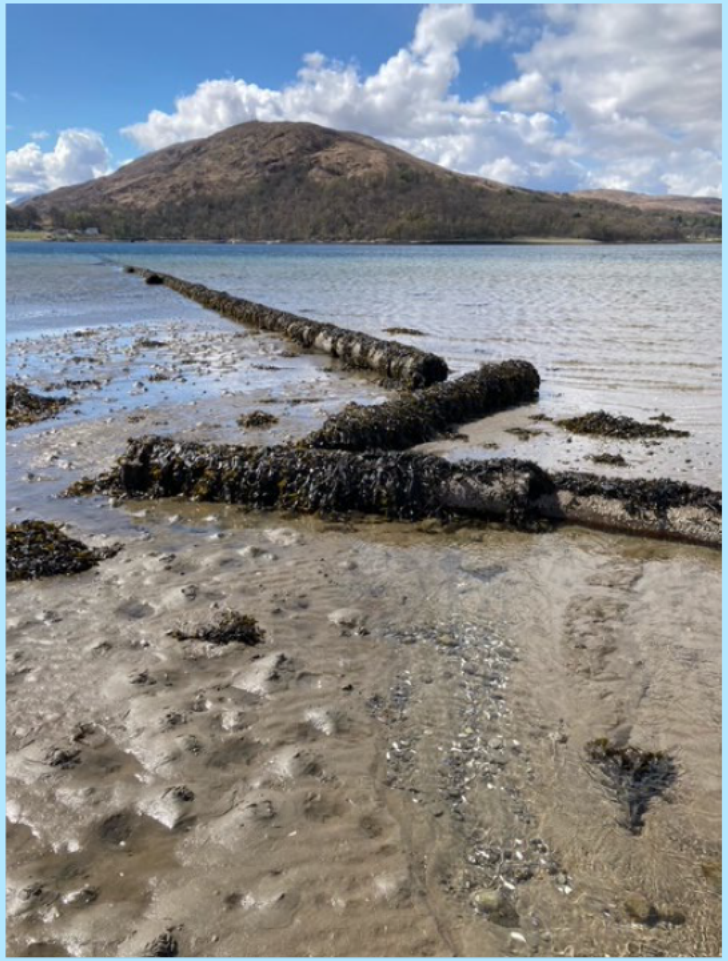
Target Note	Lat (WGS84)	Long (WGS84)	Description	Photograph of target note
3	56° 50.0489715	-5° 6.1189444	*Fucus ceranoides* attached to pebbles buried within sandy sediment and grave, leading to matrix of *F. ceranoides* and *Fucus spiralis* down shore, amphipods *Echinogammarus*.	

Target Note	Lat (WGS84)	Long (WGS84)	Description	Photograph of target note
4	56° 50.0301532	-5° 6.1973348	Hole in pipe. *F. spiralis and Fucus vesiculosis* present on the pipe. Down shore of the hole the pipe is slightly raised and densely covered in fucoids. *Chondrus crispus*, and *Chthamalus montagui* also present, and amphipods *Echinogammarus* .	

Target Note	Lat (WGS84)	Long (WGS84)	Description	Photograph of target note
5	56° 50.0232556	-5° 6.2361179	Access hatch with *Ulva intestinalis*. Patches of *F. ceranoides* suggests fresh water leaking. Green shore crab *Carcinus maenas*.	

Target Note	Lat (WGS84)	Long (WGS84)	Description	Photograph of target note
6	56° 50.0092148	-5° 6.3018567	*Fucus vesiculosis, C. crispus, F. ceranoides* and *Hildenbrandia rubra* in saltwater channel. Down shore of the channel the pipe is more buried and seaweeds sparse l ke the surrounding area, characterised by coarse sands with occasional pebble. Filamentous brown seaweeds (indet.), *C. crispus, U. intestinalis* and *F. vesiculosis* present on detached pebbles..	
7	56° 49.9630765	-5° 6.5518625	*Arenicola marina* 3/m² on sand and gravel	

Target Note	Lat (WGS84)	Long (WGS84)	Description	Photograph of target note
8	56° 49.9499139	-5° 6.6038971	Abundant pebbles on fine silty sediment. Redox level very close to surface at this location.	
9	56° 49.9320986	-5° 6.6609763	End of (raised) pipe on sand, gravel and small pebble. Pipe densely covered in fucoids, with occasional algae present on surrounding sediments. *Fucus serratus* and *C. montagui, C. crispus, Littorina littorea, Porphyra indet. Ceranium* spp., *Dumontia cortorta*, green shore crab.	

Target Note	Lat (WGS84)	Long (WGS84)	Description	Photograph of target note
CAOL No 1 WWPS and surrounding area				
10	56° 50.1142141	-5° 6.5818899	Pipe lying on foreshore in multiple sections on silty sand, with remains of wooden brackets. *A. marina* 9/m². *F. serratus, C. montagui, L. littorea, F. vesiculosis*	

Target Note	Lat (WGS84)	Long (WGS84)	Description	Photograph of target note
11	56° 50.1536357	-5° 6.5087993	Pipe buried within the shore, wooden brackets intact. Saline grasses and common scurvy grass *Cochlearia officinalis*.	

Target Note	Lat (WGS84)	Long (WGS84)	Description	Photograph of target note
12	56° 50.0747847	-5° 6.6549914	*A. marina* 1/m² in silty sandy sediment. *F. serratus* and *Ceranium spp.* on pipe. Green shore crab.	
13	56° 50.1959019	-5° 6.2986330	Single stand of Japanese knotweed R*eynoutria japonica* in grassy embankment at top of shore. *Ranunculus, spp*, wild raspberry *Rubus idaeus*, alder *Alnus glutinosa*, dandelion, silverweed, rosebay willowherb *Chamaenerion angustifolium* and goat willow also present