



Stonehaven Flood Protection Scheme

Flood Protection Order - Summary
Environmental Report
June 2015

Aberdeenshire Council



Stonehaven Flood Protection Scheme

Flood Protection Order - Summary
Environmental Report

June 2015

Aberdeenshire Council

Issue and revision record

Revision	Date	Originator	Checker	Approver	Description
0	23/06/2015	R MacKenzie M Sterling	L Mair L Cload	S Robertson	Supporting document for FPO submission June 2015

Information Class: Standard

This document is issued for the party which commissioned it and for specific purposes connected with the above-captioned project only. It should not be relied upon by any other party or used for any other purpose.

We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties.

This document contains confidential information and proprietary intellectual property. It should not be shown to other parties without consent from us and from the party which commissioned it.

Contents

Chapter	Title	Page
1	Introduction	1
	1.1 Introduction _____	1
	1.2 Background _____	1
	1.3 Purpose of Document _____	2
2	Non-Technical Description	3
	2.1 Location _____	3
	2.2 Environment _____	3
	2.3 Flood Risk _____	3
	2.4 Description of the Proposed Scheme _____	4
	2.5 Operation and Maintenance _____	6
3	Legislative Context	7
	3.1 Environmental Impact Assessment (EIA) _____	7
	3.2 Key policy considerations _____	7
4	Project Summary	8
	4.1 Screening _____	8
	4.2 Scoping _____	8
	4.3 Environmental Assessment _____	9
5	Stakeholder Consultation	11
	5.1 Stakeholder Workshop _____	11
6	Environmental Assessment	14
	6.1 Air Quality _____	14
	6.2 Ecology _____	14
	6.3 Historic Environment _____	15
	6.4 Landscape and Visual _____	15
	6.5 Noise and Vibration _____	16
	6.6 Soils, Geology and Land Quality _____	16
	6.7 Water Environment _____	17
7	Next Steps	19

1 Introduction

1.1 Introduction

- 1.1.1 Aberdeenshire Council are proposing a Flood Protection Scheme in the town of Stonehaven to prevent damage caused by flooding from the Carron Water, Burn of Glaslaw, and overland flow. The proposed scheme along with other minor work seeks to modify the flow regime of the lower watercourse of the river to reduce out of bank flooding.
- 1.1.2 The Scheme is being delivered under the Flood Risk Management (Scotland) Act 2009. Under this Act the requirement for an Environmental Impact Assessment (EIA) is set out in the Flood Risk Management (Scotland) (Flood Protection Schemes, Potentially Vulnerable Areas and Local Plan Districts) Regulations 2010.
- 1.1.3 An EIA Screening Opinion was submitted to Aberdeenshire Council in January 2015 to gain their opinion on whether an EIA was required for the scheme. The Screening outcome confirmed that an EIA would not be required. However, the Council recommended that an Environmental Assessment be undertaken to address potential environmental effects associated with the scheme.
- 1.1.4 This Environmental Summary Report outlines the proposed scope and methodology for the Environmental Assessment (EA) for the proposed Flood Protection Scheme. It identifies all relevant topics that are considered appropriate for inclusion within an EA, as well as identifying those topics which, based on sound reasoning and judgement, can be scoped out.

1.2 Background

- 1.2.1 A request for a screening opinion was previously submitted in April 2013, under the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011 (Ref: ENQ/2013/0727). However, the Stonehaven Flood Protection Scheme is being delivered under the Flood Risk Management (Scotland) Act 2009 and the scheme design has been amended. Therefore, a new Environmental Impact Assessment (EIA) screening opinion was submitted to Aberdeenshire Council in January 2015 under the Flood Risk Management (Scotland) (Flood Protection Schemes, Potentially Vulnerable Areas and Local Plan Districts) Regulations 2010.
- 1.2.2 A number of previous studies have been undertaken for the preliminary Stonehaven Flood Protection Scheme design, primarily by JBA Consulting. These reports have been referenced in the relevant topic section of this report. Existing baseline data from these reports has been reviewed and updated for this Scoping Report. Due to the time lapse since the reports were produced and the updated scheme design the surveys and assessments will need to be redone to inform the Environmental Assessment.

1.3 Purpose of Document

- 1.3.1 This Summary Environmental Report will support the Flood Protection Order (FPO) application of June 2015 as required under the Flood Risk Management (Scotland) (Flood Protection Schemes, Potentially Vulnerable Areas and Local Plan Districts) Regulations 2010 and summarises the extent of environmental survey work and assessment carried out to date as well as outlining the proposed approach going forward.

2 Non-Technical Description

2.1 Location

- 2.1.1 Carron Water and Glaslaw Burn flow through the south of the town of Stonehaven. Where visible the presence of the Carron Water offers a dynamic, natural feature within the settled, urban character of the town. The small but valued open spaces next to White Bridge and Green Bridge act as green buffers from which it is possible to appreciate the context of the river within the overall setting and provide visual links with the semi-rural, wooded hinterland.

2.2 Environment

- 2.2.1 Ecology - The Carron Water and its tributaries are important for aquatic wildlife including trout, salmon, European Eel, Lamprey, and otters. The watercourse, banks, and surrounding trees, park, and woodland are important habitats for a variety of species including bats and breeding birds. Loch of Lumgair Site of Special Scientific Interest (SSSI) is the only statutory protected nature conservation site within the catchment, located along a tributary of the Burn of Glaslaw 4km upstream from the works. Fowlsheugh Special Protection Area (SPA) lies approx. 4km south along the coast and Garron Point SSSI lies approx. 2km north along the coast.
- 2.2.2 Historic Environment - The sections of the proposed scheme from Green Bridge to Beach Bridge are within the Stonehaven Conservation Area. White Bridge, 19 Bridgefield, and some river walls are Category C listed structures affected by the scheme. There are a number of other Category A, B, and C Listed Buildings within 150m of the proposed works. Of particular note is the Category A listed St James the Great Episcopal Church on Arbuthnott Street approx. 20m south of the works at White Bridge.

2.3 Flood Risk

- 2.3.1 Fluvial flooding risk from the Carron Water results from heavy or prolonged rainfall and/or snowmelt in the Carron catchment causing river levels to rise, with the potential for the river banks to be overtopped and flooding to land and properties to occur. Stonehaven is also at risk from surface water flooding. The topography of Stonehaven means that surface water will be shed from the higher areas in the central, west, and north-west parts of the town towards the lower areas at the coast and the Carron and Cowie valleys.
- 2.3.2 The proposed Stonehaven Flood Protection Scheme covers an area from the Red Bridge to Beach Bridge, Figure 2.1.

Figure 2.1: Bridge Locations of Stonehaven Flood Prevention Scheme



Source: Insert source text here

2.4 Description of the Proposed Scheme

2.4.1 The proposed works and their footprint are shown on Figure 2.2. The work is anticipated to last approximately two to three years and is likely to involve the following:

Burn of Glaslaw

- Replacement of culverts at Woodview Court and Low Wood Road;
- Construction of walls along both banks adjacent to Woodview Court;
- Slope stabilisation on the right hand bank adjacent to Woodview Court
- Waterproofing and strengthening works to basement level of properties adjacent to the river, i.e. 58 Carron Gardens
- Works in channel to construct walls
- Construction of an embankment at the upstream end

Red Bridge to Green Bridge

- Replacement of Red Bridge and installation of new abutments
- New walls along the Low Wood Road and Carron Terrace
- Works in channel to construct walls
- Demolition and replacement of garages

Green Bridge to White Bridge

- New self-closing barrier walls on Cameron Street near White Bridge
- Construction of new walls along Carron Terrace

- Lowering of island downstream of Green Bridge
- Removal of Green Bridge
- New replacement crossing downstream of Green Bridge
- Replacement of boundary wall of Abbeyfield House;
- Works in channel to construct walls

White Bridge to Bridgefield Bridge

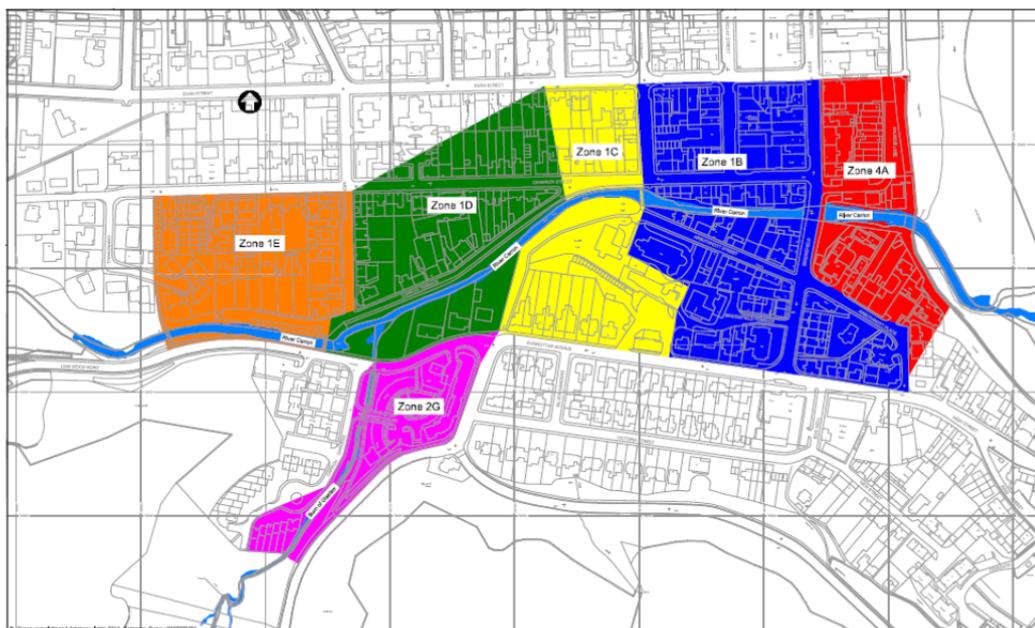
- New self-closing barrier walls and culvert at the rear of 1-37 Cameron Street
- Works in channel for replacement of existing channel walls and works construction
- Raising of White Bridge
- Lowering of bed of the river.
- Construction of a pumping station outfalling to the river

Bridgefield Bridge to Beach Bridge

- Modification to Bridgefield Bridge parapets to increase freeboard
- Modifications to Beach Bridge and abutments
- Works in channel to construct walls and lower bed.
- Raising or replacement of existing boundary walls of properties on Arbutnott Place and Salmon Lane

2.4.2 The scheme can be divided into six zones (see Figure 2.2):

Figure 2.2: Scheme zones



Source:

- 2.4.3 Burn of Glaslaw (Zone 2G) - runs south-north along the Burn of Glaslaw from the Woods of Dunottar, alongside modern housing;
- 2.4.4 Red Bridge to Green Bridge (Zone 1E) - lies west of the Green Bridge to White Bridge section, with pedestrian crossings to the west (the Red Bridge) and east (the Green Bridge). South of this area is the main road and modern housing, with a continuation of Carron Terrace to the north;
- 2.4.5 Green Bridge to White Bridge (Zone 1D and Zone 1C) - this section extends eastwards from the Green Bridge to White Bridge. Carron Terrace with its avenue of trees lies to the north, and a public footpath follows a grassed area for a distance along the south bank, also flanked by an avenue of trees;
- 2.4.6 White Bridge to Bridgefield Bridge (Zone 1B) - lies between White Bridge and Bridgefield; private properties extend to the water on both north and south banks; and
- 2.4.7 Bridgefield Bridge to Beach Bridge (Zone 4A) - lies between Bridgefield and the beach where Carron Water flows into the sea.

2.5 Operation and Maintenance

- 2.5.1 Aberdeenshire Council will be responsible for the operation and maintenance requirements of the scheme, and how these will be enacted and improved. The scheme will be operated and maintained to provide and maintain the flood defence standard for its 100 year design life.
- 2.5.2 An Operation and Maintenance Manual will be used to inform the planning process and provide a reference to Aberdeenshire Council for the future management of the flood protection scheme.
- 2.5.3 The key operational requirements are to close the flood gates and ensure the operation of the self-closing flood barriers and pumping stations, as necessary.
- 2.5.4 The key maintenance activities will be to maintain the integrity of the wall, repointing stonework, maintaining tree integrity and maintaining operational systems.

3 Legislative Context

3.1 Environmental Impact Assessment (EIA)

- 3.1.1 As identified in Section 1, an EIA is not required for the proposed Scheme. However, an Environmental Assessment (EA) is being undertaken to address potential environmental effects and consider environmental issues during the design of the Scheme. Throughout the detailed design stage of the project the EA will identify the significant environmental effects (both adverse and beneficial) of the proposed scheme and identify opportunities for reducing any adverse effects and to inform the design of the scheme. Consultation with Regulatory and key Stakeholders has been undertaken and will continue throughout the assessment process.

3.2 Key policy considerations

3.2.1 National Planning and Legislative Context

- Flood Risk Management (Scotland) Act 2009;
- Flood Risk Management (Scotland) (Flood Protection Schemes, Potentially Vulnerable Areas and Local Plan Districts) Regulations 2010;
- The National Flood Risk Assessment (SEPA, December 2011);
- National Planning Framework 3 (2014);
- Scottish Planning Policy (2014); and
- Planning Advice Notes.

3.2.2 Regional and Local Planning and Legislative Context

- North East Draft Flood Risk Management Plans (SEPA and Aberdeenshire Council, 2015)
- Aberdeen City and Shire Strategic Development Plan 2014;
- Aberdeenshire Local Development Plan 2012; and
- Proposed Aberdeenshire Local Development Plan 2016.
- Baseline

- 3.2.3 The Scheme is being delivered under the Flood Risk Management (Scotland) Act 2009. Under this Act the requirement for an Environmental Impact Assessment (EIA) is set out in the Flood Risk Management (Scotland) (Flood Protection Schemes, Potentially Vulnerable Areas and Local Plan Districts) Regulations 2010.

- 3.2.4 The baseline conditions of the site and its surroundings form the basis of the assessment for the EA. The likely significant environmental effects will be identified through a comparison of the proposed works with the baseline that comprises both the current and future situations.

- 3.2.5 The exact current and future baseline will be defined on an environmental topic basis for the purposes of the EA.

4 Project Summary

4.1 Screening

- 4.1.1 A request for a screening opinion was previously submitted in April 2013, under the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011 (Ref: ENQ/2013/0727). However, the Stonehaven Flood Protection Scheme is now being delivered under the Flood Risk Management (Scotland) Act 2009
- 4.1.2 An EIA Screening Opinion was submitted to Aberdeenshire Council in January 2015 to gain their opinion on whether an EIA was required for the scheme. The Screening outcome confirmed that an EIA would not be required. However, the Council requested that an Environmental Assessment should be undertaken to address potential environmental effects associated with the scheme.

4.2 Scoping

- 4.2.1 A number of previous studies have been undertaken for the preliminary Stonehaven Flood Protection Scheme design, primarily by JBA Consulting. Existing baseline data from these reports was reviewed and updated as part of the scoping process. Due to the time lapse since the reports were produced and the updated scheme design the surveys and assessments are being repeated, as necessary, to inform the Environmental Assessment.
- 4.2.2 Subsequently, an Environmental Assessment - Scoping and Consultation Summary has been produced by Mott MacDonald, May 2015. The summary comprises the initial stage of the EA process. Information on the EA process along with details of each technical chapter provides high level information on the assessment methodology to be implemented at the EA stage. High level baseline information for the site and an identification of the potential environmental effects to be assessed at the EA stage are also included.
- 4.2.3 Following the scoping exercise carried out in May 2015, topics which were 'scoped in' (i.e. considered further in the EA) and 'scoped out' (i.e. not considered further in the EA) are summarised in Table 4.1.

Table 4.1: Summary table of topics scoped in and out

Environmental Topic	Scoped in / out of EA Process		Brief justification for topics scoped-out
	Construction	Operation	
Air Quality	Scoped In	Scoped Out	Operational activities will include inspection and maintenance. These are likely to be low frequency and consist of one or two small vans at a time.
Ecology (Flora & Fauna)	Scoped In	Scoped In	-
Historic Environment	Scoped In	Scoped In	-

Environmental Topic	Scoped in / out of EA Process		Brief justification for topics scoped-out
	Construction	Operation	
Landscape and Visual	Scoped In	Scoped In	-
Material Assets (such as property, infrastructure, and utilities)	Scoped Out	Scoped Out	Effects on property and infrastructure such as roads are addressed under the Socio-Economic; Historic Environment; and Transport, Access, and Traffic sections of this report. Sewer and power cables will need to be diverted. However, it is likely that this will be possible without disruption to normal services.
Noise (& Vibration)	Scoped In	Scoped Out	Operational activities will include maintenance and repair. These are likely to be low occurrence and temporary in nature
Socio-Economic	Scoped Out	Scoped Out	Issues covered in this topic are addressed elsewhere in the report including construction dust and noise nuisance, access issues, and effects on views. The scheme itself will provide flood protection for properties and businesses.
Soils, Geology, and Land Quality	Scoped In	Scoped In	-
Transport, Access and Traffic	Scoped In	Scoped Out	Operational activities will include inspection and maintenance. These are likely to be low frequency and consist of one or two small vans at a time
Water Environment	Scoped In	Scoped In	-

4.3 Environmental Assessment

4.3.1 An Environmental Assessment will be undertaken in accordance with the topics scoped in the scoping document.

4.3.2 The effects of the scheme during construction and operation will be assessed as detailed in Table 4.1, and:

- Air Quality (Construction only);
- Ecology;
- Historic Environment;
- Landscape and Visual;
- Noise (& Vibration) (Construction only);
- Soils, Geology, and Land Quality;
- Transport, Access and Traffic (Construction only); and
- Water Environment

4.3.3 During the Environmental Assessment the effects of each topic area will be considered along with the cumulative effects on the local environment. Prior to carrying out the assessment it is not possible to confirm these effects.

- 4.3.4 The report will provide suggested mitigation measures that should be followed during the construction and operational phase. This will follow best practice and current legislation and should be followed by the appointed contractor. The objective being that the environment would not be overly adversely impacted upon during the construction and operational phase with any possible detrimental effects being temporary in nature.

5 Stakeholder Consultation

5.1 Stakeholder Workshop

- 5.1.1 Comments on the proposed scheme were initially sought during a Consultation Workshop held by JBA on 2 June 2014 and during a workshop held on 22 April 2015. Where appropriate, the views and information provided by statutory and non-statutory consultees will help to form the basis of the EA for the scheme. Table 5.1 shows the list of consultees consulted and indicates those organisations who attended the Consultation Workshop:

Table 5.1: Consultees consulted during 2015

List of Statutory and Non-Statutory Consultees	Attended workshop
Aberdeenshire Council	Yes
Castle Hill Housing Association	Yes
Emergency Services	Yes
Forestry Commission	Yes
Scottish Environment Protection Agency (SEPA)	Yes
Stonehaven Flood Action Group	Yes
Stonehaven Town Partnership	Yes
Scottish Natural Heritage (SNH)	No
Historic Scotland	No
Stonehaven and District Angling Association	No
Dee District Salmon Fishery Board	No

It should be noted that consultation with Historic Scotland, Scottish Natural Heritage (SNH), the Stonehaven and District Angling Association and the Dee District Salmon Fishery Board who did not attend the Consultation Workshop has commenced following the Stakeholder Workshop and is ongoing.

A site visit with representatives from the Dee District Fishery Board and Mott MacDonald's design and environment teams took place on 03 June 2015. See Section 6.2.5.

The main discussion points from this meeting were around the proposed culvert in zone 1B and how to accommodate the engineering works in the watercourse whilst also allowing for the safe passage of fish. Proposals include making the culver 'fish friendly' by incorporating baffles to allow the fish migrating upstream to rest as well as the potential for including light wells in the design was discussed.

An alternative option of 'fish rescue' was discussed and would allow the Fishery Board to gather valuable data on the variety and health of the Carron Water fish populations. Discussions to establish the best option are ongoing.

Feedback has been received from Scottish Natural Heritage (SNH) who have stated that; in terms of impacts on designated sites, the closest site about 700 metres away is Garron Point SSSI. Based on the current proposals, i.e. the type of proposed scheme and its distance from the scheme, we don't consider that the proposed flood prevention scheme will have a significant impact on the interests of this site. We don't consider there will be any other designated sites impacted by this proposal.

Table 5.2 shows a summary of the comments received from the Consultation Workshop.

Table 5.2: Consultation workshop summary

Topic	Summary of Comments
Ecology	<p>The importance of maintaining visual amenity offered by trees in the area was stressed. Particularly in relation to tree removal and removal of the island.</p> <p>Suggestions to remove more trees than necessary in order to promote the growth of younger trees were made. Additionally the lifting of the crowns of trees to provide more light along paths and the river was suggested.</p> <p>Considerations required in relation to management/maintenance or potential removal of trees.</p> <p>Concerns were raised over tree root protection during construction and potential for bat roosts/breeding birds in mature trees.</p> <p>Threats to ecosystems during construction and as a result of changing water levels were highlighted. It will be necessary to demonstrate how the council are meeting their biodiversity duty.</p> <p>Concerns over culverts/fish barriers and the effects during spawning. Also noise and vibration caused by construction above culverts.</p> <p>The importance of pollution control was raised as vehicles will be working in the river.</p> <p>Queries were raised over the responsibility for maintenance of the scheme and dredging of the river due to silt or debris build up should it be required.</p> <p>There may be potential for enhancing the amenity value of the area by identifying desire lines/pathways and areas where people may wish to sit.</p>
Visual/Historic Environment	<p>Concerns were raised over a number of visual/historic features including;</p> <ul style="list-style-type: none"> ■ Listed Buildings – Directly Affected <ul style="list-style-type: none"> – 19 Bridgefield – Cameron Street Properties ■ Listed Buildings – Visual Impact <ul style="list-style-type: none"> – St. James Church – Carron Restaurant – Cameron Street – Carron Terrace ■ Listed Structures <ul style="list-style-type: none"> – White Bridge – Stone Boundary Walls ■ Open Spaces ■ Trees ■ Bridges <ul style="list-style-type: none"> – Beach Bridge – Bridgefield Bridge – Green Bridge – Red Bridge – Woodview Court (new culvert)

Topic	Summary of Comments
<p>Hazards in Operation (HAZOP)</p>	<p style="text-align: center;">– Low Wood Road Culvert(new culvert)</p> <p>Concerns were raised over increased pedestrian and vehicle traffic during construction.</p> <p>Concerns over access and parking arrangements. Details of the Contractors site compound would be welcomed</p> <p>Concerns over potential for children to use culverts it as play sites. As such, a safety grill was proposed. However this may cause issues i.e blockages etc.</p> <p>It was suggested that any accidents involving the river may become a Coast Guard issue due to the flow sweeping the person out to sea / beach.</p> <p>It was suggested that bathing water quality should be considered, in addition to concerns that if migratory fish are present, then the culvert would be a problem during construction.</p> <p>Concerns were raised about the potential for maintenance needed to be carried out from within the river</p> <p>It was highlighted that many near flood events in the past may cause issues for the Contractor.</p>
<p>Social</p>	<p>Concerns raised over increased noise during construction, in particular from generators.</p> <p>Visual impact of walls is a concern in terms of height and materials. Also, consideration of upstream flood water storage requested. However, there would still be a requirement for the walls despite the upstream storage. Visualisations would prove helpful during further consultation.</p> <p>Queries raised over construction schedule. Displays on local information board would be welcomed.</p> <p>Beach Bridge is locally considered to be a choke point.</p> <p>Walkways between the beach and the Bridgefield street to provide amenity value were well received. An extension of paths between the sea and woodland were suggested.</p> <p>Development within private gardens was of concern and will require careful consultation with the local community.</p> <p>Access ramps for bridges were discussed but no comment.</p> <p>Concerns raised over potential reductions in sought after car parking in town centre.</p> <p>Local tourist office suggested as consultee with reference to preferred walking route to Dunotter Castle.</p> <p>Maintaining access across the river near White Bridge is thought to be important. However, restricting access during flood events was not perceived to be a problem.</p> <p>The suggestion of providing additional seating was understood to be a good idea.</p>

6 Environmental Assessment

6.1 Air Quality

- 6.1.1 During 2012, Aberdeenshire Council monitored baseline conditions of NO₂ concentrations in Stonehaven. The baseline levels were found to be compliant with annual mean NO₂ air quality objective, as set out by the Council.
- 6.1.2 There is expected to be an impact on air quality during the construction phase, normal with construction works. The air pollutants at this stage are assumed to be dust, NO₂ and fine particles.
- 6.1.3 Emissions associated with the construction phase are likely to be temporary in nature and are not expected to give rise to significant environmental effects.
- 6.1.4 The receptors are most likely areas of parkland, residential areas and areas of aquatic and terrestrial wildlife and within 350m from the construction site boundary.
- 6.1.5 An assessment will be made during the detailed design phase of the project with emissions modelled against the baseline and assumptions made with regards to the construction.

6.2 Ecology

- 6.2.1 Ecological baseline information has been compiled through previous studies and the documents listed below:
- River Carron Ecological Survey (2011) JBA Consulting;
 - River Carron, Stonehaven – further ecological surveys (2013) JBA Consulting;
 - Carron Water Survey: Habitat and Electrofishing Data for the Proposed Flood alleviation Scheme. (2014) The River Dee Trust; and,
 - Tree survey & Arboricultural Report for Trees at Carron Terrace Stonehaven (2013) Langton Tree Specialists
- 6.2.2 This existing baseline will be updated with further survey and monitoring where required to allow a thorough assessment of the potential significant effects on ecological receptor to be completed.
- 6.2.3 Otters (*Lutra lutra*) remain to be active around the mouth of the watercourse, confirmed following a survey conducted in relation to planned ground investigations near to Beach Bridge. An application for a license to disturb otters at two protected resting sites which lie within the Zone of Influence of the Ground Investigation works is currently being prepared by MML for submission to SNH for their consideration
- 6.2.4 Following initial early consultation, a site meeting was arranged (for 03 June 2015) with a representative from the Dee District Salmon Fishery Board and Mott MacDonald's design and environment teams. Topics discussed included construction and mitigation measures for

impacts on the river, including the design of the culverts. Discussions are ongoing and MML intend to consult with the Board throughout the life of the project.

6.3 Historic Environment

6.3.1 The scheme between Green Bridge and Beach Bridge lies within a Conservation Area.

6.3.2 A Heritage Assessment was carried out with a previous design, going forward this exercise will be updated with the latest design iteration. If any actions are identified these will be addressed as the project develops.

6.3.3 Following a recent meeting with Aberdeenshire Council the following was discussed and agreed and Listed Building Consents will be required for:

- White Bridge the pillars of the bridge would need to be numbered and removed and reconstructed. The bridge could potentially be removed for a year.
- 19 Bridgefield. The means of intervention have been discussed and drawings will be provided with the proposed finish, to be discussed further.

6.3.4 The only above ground works that would directly affect the historic structures is the work at White Bridge.

6.3.5 At 19 Bridgefield, the intended works involve external works only to the riverside façade of the building. Interventions are to be agreed in discussion with the Planning Authority and the property owner.

6.3.6 The setting is required to be considered for

- St James Church (included within the application for White Bridge)

6.3.7 For historic structures there maybe requirements for underpinning works to the following properties:

- 29-37 Cameron Street and
- 19 Cameron Street
- 19 Bridgefield

6.3.8 The scheme requires the removal of some stone walling in the rear gardens of the properties along Arbuthnott Street.

6.4 Landscape and Visual

6.4.1 Previously a baseline study was carried out by JBA with the initial feasibility design. The report will form part of the baseline study associated with the appraisal for the Landscape and Visual assessment of the proposed scheme.

6.4.2 A landscape study report will be prepared as part of the EA. This will contain a study of the existing built form in Stonehaven and recommendations for wall finishes along each stage of the flood defence scheme.

6.4.3 Photomontages showing our recommendations have been prepared to inform the public consultation these will be refined and updated as required to include in the EA.

6.4.4 Where trees are removed these are proposed to be replaced by planting within the scheme.

6.5 Noise and Vibration

6.5.1 The urban location of the river is subject to typical noise levels associated with an urban environment. It is proposed that only the Construction phase would be considered during the assessment.

6.5.2 Sensitive areas include parks, residential areas, historic structures and parkland.

6.5.3 Construction levels are considered to be significant if they are 5dB above the baseline. These are proposed to be minimised around residential areas.

6.5.4 Vibration is generally tolerated, if prior notification has been issued, unless it is higher in magnitude. It is recognised that there are some sensitive structures to vibration. The selection of pile will be undertaken during detail design to minimise vibration near sensitive structures. Vibration levels will be monitored during construction and plant selected to minimise vibration and potential damage to sensitive structures, as necessary.

6.5.5 Construction noise and vibration will be assessed within the EA however operationally this is expected to be minimal and will not be assessed.

6.6 Soils, Geology and Land Quality

6.6.1 Baseline conditions in relation to ground conditions at the site have been compiled through previous studies and the documents listed below;

- Costain Environmental Services, 'Factual Report on Ground Investigation, Volume 1 of 2', (January 2015);
- Jeremy Benn Associates Ltd (JBA), 'Ground Investigation Interpretive Report', (September 2014); and
- Mott MacDonald, 'Phase 1 Preliminary Contaminated Land Risk Assessment', (January 2015).

6.6.2 Mott MacDonald undertook a Phase 1 Preliminary Contaminated Land Risk Assessment in January 2015. The assessment identified pollutant linkages which could potentially exist at the

site following the planned development and included a preliminary Contaminated Land Risk Assessment.

- 6.6.3 A Phase 2 Intrusive Ground Investigation is to be undertaken as recommended on the Phase 1 Preliminary Contaminated Land Risk Assessment in order to further inform the contaminated land risks and identify sensitive receptors.
- 6.6.4 A number of assessments have been carried out to date in relation to;
- Geology and ground conditions
 - Geological maps
 - Superficial geology of the site
 - Solid geology beneath the site
 - Hydrogeology and hydrology
 - British Geographical Society Hydrogeology maps
 - Mining and quarrying
 - Land Contamination
- 6.6.5 The potential environmental effects are being assessed with reference to various receptors including; human health (construction workers and future site users), the water environment, flora and fauna.
- 6.6.6 The proposed works also have the potential to effect the existing built environment and therefore the potential risk to a number of adjacent buildings is being assessed.
- 6.6.7 Both construction and operation effects on soils, geology and land quality are being assessed through the EA. Aspects of the proposed works which may cause such effects are outlined in Table 6.1 below.

Table 6.1: Likely Construction and Operational Effects for Soils, Geology and Land Quality

Construction	Operation
Earthworks and excavations	New planting and landscaping
Disposal of soils	Sheet pile / secant pile walls
In-channel works	Change in land use
General construction works	

6.7 Water Environment

- 6.7.1 Baseline conditions relating to the water environment have been formed through review of various sources and assessments, including the Scottish Environment Protection Agency (SEPA) River Basin Management Plan (RBMP) interactive mapping.
- 6.7.2 Bathing water quality is an important local issue and is being considered within the EA in relation to the proposed construction works.

- 6.7.3 Data in relation to the Stonehaven bedrock and localised sand and gravel aquifer groundwater body and drinking water protection zone has been analysed as part of the EA.
- 6.7.4 A review of a previous geomorphological audit of the Carron Water, undertaken by JBA in 2010 has also informed the EA and baseline compilation.
- 6.7.5 Flood risk in the study area comprises of both fluvial flooding risk from Carron Water and surface water flooding as a result of the topography of Stonehaven.
- 6.7.6 The potential environmental effects are being assessed with reference to water receptors, namely the Carron Water and Glaslaw Burn.
- 6.7.7 Both construction and operation effects on the water environment are being assessed through the EA. Aspects of the proposed works which may cause such effects are outlined in Table 6.2 below.

Table 6.2: Likely Construction and Operational Effects for Water Environment

Construction	Operation
In-channel works	Works to river channel
Work on bridges crossing the river, river banks, and new walls	Lowering the river bed
General construction works	

- 6.7.8 Operational flood risk impacts have already been carried out. Subsequently the proposed scheme has been developed taking account of the risks highlighted.

7 Next Steps

7.1.1 The next phase of the project will be to complete the Environmental Assessment and produce an overarching Environmental Report documenting the potential effects and the significance of these potential effects on the proposed scheme on each considered receptor.

7.1.2 The project Environmental Team will continue to liaise with the relevant consultees to provide the most informed, favourable and agreed design layout.

7.1.3 The studies proposed to be incorporated within the Environmental Assessment are as follows:

Table 7.1: Topics to be covered within the Environmental Assessment

Topic	Assessment during Construction Phase included	Assessment during Operational Phase included
Air Quality	Yes	No
Ecology	Yes	Yes
Landscape and Visual	Yes	Yes
Noise and Vibration	Yes	No
Soils, Geology and Land Quality	Yes	Yes
Transport, Access and Traffic	Yes	No
Water Environment	Yes	Yes

7.1.4 The Environmental Assessment and subsequent Environmental Report will be used to form the basis of the Environmental Management Plan and Schedule of Mitigation for the construction phase of the project to translate the required mitigation into required actions for the Contractor.