



REPORT TO: MORAY COUNCIL ON 30 NOVEMBER 2021

SUBJECT: RIVER SPEY FLOOD MITIGATION PROPOSALS

BY: DEPUTE CHIEF EXECUTIVE (ECONOMY, ENVIRONMENT AND FINANCE)

1. REASON FOR REPORT

1.1 To inform the Council of issues related to flood risk from the River Spey at Garmouth, as set out in the Notice of Motion agreed at the meeting of Moray Council on 15 September 2021 (paragraph 5 of the minute refers).

2. RECOMMENDATION

2.1 It is recommended that the Council:

- i) consider the history of the investigations since 2007 and Moray Council Policy on Flood Risk Management, outlined in paragraph 3.8, including the reasons why this Policy was agreed in 2016;**
- ii) if minded to instruct works, progress the best value solution, Local Land Raising at a cost of £25,000 to £45,000, excluding staff costs, as outlined in paragraph 3.12; and**
- iii) agree that if the proposal put forward by the community is to be progressed, it should be progressed by the community, as outlined in paragraph 3.23.**

3. BACKGROUND

3.1 At a meeting of Moray Council on 15 September 2021 (para 5 of the minute refers), it was agreed that Officers would bring a report to this meeting of the Council with details of the potential solutions identified by Officers with indicative costs and a high level review of the proposals put forward by the community, based on the report drafted by Hamish Moir of cbec eco-engineering UK Ltd (cbec).

Flood History

3.2 Garmouth consists of approximately 220 households and 500 people. The village is surrounded by agricultural land, except to the east where Garmouth Golf Course separates the village from the River Spey. The dismantled railway line runs in an east - west direction and spans the River Spey. Ross

House, at Queenshaugh, is a single isolated property located south of the dismantled railway line.

- 3.3 The vast majority of Garmouth is elevated above the River Spey's natural floodplain. However, a small number of properties located at the north east end of the village are located at a lower elevation on the edge of the River Spey's floodplain. There are approximately 10 properties currently at risk of flooding in Garmouth.
- 3.4 There are two flood mechanisms at Garmouth, which are dependent on water level within the River Spey.
1. Mechanism one – occurs at lower return periods, where the River Spey floods the land to the south of the rail embankment. Water flows across the fields through the two openings in the embankment into the golf course and towards low lying properties at Garmouth.
 2. Mechanism two - occurs when levels are high enough to overtop the left hand bank of the river to the north of the railway embankment. At this point both mechanisms will be working as one, causing significant and wide scale flooding of the low lying land around the Garmouth and Kingston area.

Haskoning Study 2007

- 3.5 In October 2007 Moray Council commissioned Royal Haskoning to undertake a Pre-Feasibility Study for a Flood Alleviation Scheme (FAS) at Garmouth, to identify the potential for further investment in a grant eligible Flood Alleviation Scheme for Garmouth. The report looked at a number of different factors, including flood history, existing flood risk, environment and geomorphology. These areas informed the options, which could be available to protect Garmouth including the cost of constructing them and the benefits they would provide. The report concluded that the indicative baseline flood damages in Garmouth are estimated to be £350,000. These damages are based on 2007 figures, which are now out of date, however, the economic feasibility would be broadly the same, as construction costs have also increased since 2007. The report identified a number of flood protection measures that could be implemented at Garmouth. These options were assessed against technical feasibility, economic feasibility and sustainability. The report concluded that while it was technically feasible to construct a flood protection scheme for Garmouth it was not economically feasible to do so, as the cost of protection works are significantly higher than the damages. Based on the recommendations in this report a full feasibility study, which would include a detailed benefit cost analysis, was not progressed. Further detail on this study can be found in **Appendix 1**.
- 3.6 Since 2007 the frequency of flooding at Garmouth has increased and in the last 3 years this has been more significant. The increase in the frequency has not changed the number of properties affected by flooding but has changed how often they flood. The increase in flood frequency occurs when water levels are lower than in 2007. As the depth of flooding is low the increase in damages is not significant and will not have a significant impact on the economic feasibility of providing a flood protection scheme for Garmouth.
- 3.7 The change in frequency is due to the current position of the River Spey, compared to its position in 2007. As the bank has been eroded, lower ground

behind the bank is now exposed and is subject to overtopping at lower water levels than was the case in 2007, increasing the frequency of flooding at Garmouth.

Moray Council Flood Risk Management Policy

- 3.8 At a meeting of Moray Council on 25 May 2016, members agreed the current [policy](#) with regard to delivering Flood Protection Schemes (paragraph 11 of the minute refers). The current policy is “To deliver schemes that are approved in the Flood Risk Management Plans”. As part of the Council’s commitment to achieving a financial sustainable position, the Council agreed to review its policies and priorities to reduce capital expenditure and avoid abortive work. The current Flood Risk Management Policy was agreed as part of this review. This Policy means that flood protection works will not be progressed for some communities within Moray that are affected by flooding because they are not included in the Flood Risk Management Plans. These communities include Portgordon, Arradoul and Garmouth.
- 3.9 There are no actions identified for the development of a Flood Protection Scheme at Garmouth in the Flood Risk Management Plans for Cycle 1 (2016 – 2022) or Cycle 2 (2022 – 2028). When developing the Flood Risk Management Plans, actions to implement Flood Protection Schemes are only identified where it is economically feasible to do so. For a scheme to be considered feasible the benefits from reduced damages must exceed the cost of the works. The study undertaken in 2007 demonstrated that it is not economically feasible to construct a flood scheme at Garmouth. The number of properties at risk of flooding from the River Spey has not changed since this study was undertaken, therefore, the economic feasibility has not changed, which is why a scheme has not been identified for Garmouth. The frequency of flooding has increased but as outlined in paragraph 3.6, this will not significantly impact on the economic feasibility of providing a flood protection scheme for Garmouth. If a scheme is not included in the Flood Risk Management Plans, it will not be considered for grant funding from Scottish Government.

Moray Council Investigation 2020

- 3.10 In October 2020 Garmouth and Kingston Amenities Association raised concerns with regard to the increase in flooding at Garmouth. The Association claimed that flooding is now occurring when water level readings at the SEPA Boat O’Brig level gauge are lower than had occurred previously. In response to these concerns, Moray Council committed to:
1. review existing topographical survey information between the River Spey and Garmouth Village, so that the flow mechanism can be understood for different flood levels;
 2. review options to reduce the interaction of the Black Burn and the River Spey until normal floodplains are active; and
 3. review operational Flood Warning Level.
- 3.11 Local Councillors wrote to community representatives on 4 February 2021, advising the study was in progress and on completion a meeting would be arranged with the community and other interested parties to discuss its findings.

3.12 The study was completed in July 2021 and the report on its findings was shared with community representatives in August 2021. The study identified seven potential solutions to reduce the frequency of flooding. Since completing the original report two of the solutions have been modified, these have been detailed in the revised report, which is provided in **Appendix 2**. A short description of each solution is provided below, along with indicative costs. The costs identified for each solution do not include staff costs which would come from the Council's revenue budget and would range from £9,000 to £20,000 depending on the complexity of the solution. The level of protection provided, in terms of return period, cannot be quantified without undertaking complex river modelling, which would cost in the region of £100k. However, these options will provide a barrier between the river and properties in Garmouth, to a level that is equal to or exceeds the bank levels in 2007. Therefore, each of the solutions identified below will mitigate against the recent increase in frequency of flooding at Garmouth. To undertake these mitigation works would not comply with Council Policy, as only works that are economically feasible would be included in the Flood Risk Management Plans. Additional detail on the advantages and disadvantages of each solution is provided in **Appendix 2**.

1. **Offset Flood Bund (£300,000 to £400,000)** - This solution is to install an offset flood bund. The bund would follow the line of the Ross House access track before heading behind Ross House and back to the railway embankment. The bund would be made up of a rock core and earth face.
2. **Low Level Bunds at Railway Embankment: (£100,000 to £125,000)** - This solution is to place low level rock armour bund within the bridge openings on the railway embankment.
3. **High Level Bund at Railway Embankment (£400,000 to £500,000)** - This solution is to install a larger bund/wall within the bridge holes with an approx. height of 2m. The wall would be constructed of concrete and independent of the railway bridge.
4. **Low Level Wall at Spey Street Burn (£75,000 to £125,000)** - This solution is to install a low level wall along the burn and parallel to the village hall, with a small rise at the footpath bridge over the burn. The wall could be constructed of brick.
5. **Adaption Plan (£30,000)** - An Adaptation Plan would be developed in conjunction with Community Engagement. The Plan would consider the current and future flood risk to receptors and assets and consider how they can be modified to manage the flood risk.
6. **Natural Flood Management (£100,000 to £150,000)** - This solution is to plant the field in certain locations with Willow obtained from the east bank of the River Spey. In addition to planting Willow, fallen trees will be buried in the field with the root balls exposed. The placement of Willow and root balls should cause the river to deposit sediment in low lying areas and raise the land locally creating a natural barrier to flooding.

7. **Local Land Raising (£25,000 to £45,000)** - This solution would raise the land in and around Ross House and Black Burn to fill the depressions which are highlighted in the ground elevation model (LIDAR data). Fill would be protected and planted.

- 3.13 During the investigation officers spoke to and met with community representatives and a number of affected people, to understand what the issues were and what had changed over the last year. A number of site visits were undertaken to better understand the change in flood mechanism in this area. Since completing the investigation, officers have met with local landowners to discuss the proposals.
- 3.14 On 14 October 2021 a meeting was held with community representatives, landowners and other interested parties to discuss the findings of the investigation. At this meeting community representatives advised that they would like to progress the work identified in the report by cbec outlined in paragraph 3.18, which the community commissioned. The Kingston and Garmouth Amenities Association advised that a combination of the solutions identified by officers and the proposal identified in the cbec report would provide the most sustainable solution to flooding issues at Garmouth.
- 3.15 As stated in Section 3.9 of this report, there is no statutory funding available to undertake flood protection works at Garmouth. In Policy terms there would also be no funding available from Moray Council to undertake these works. However, alternative funding sources to undertake these works, such as the Scottish Land Fund and The Peoples Postcode Lottery, are available for the community to bid for.

Community Proposal - CBEC

- 3.16 Cbec was commissioned by Innes Community Council to undertake development of sustainable options for the management of the lower River Spey. A review of this work has been undertaken by officers, based on the information provided in the report drafted by Hamish Moir of cbec. A copy of this report is provided in **Appendix 3**.
- 3.17 The report states that “The highly dynamic nature of the Lower Spey in the vicinity of the Spey Viaduct means that if left unchecked, continuing erosion of the left bank at Ross House poses a potential risk of destabilising adjacent infrastructure, properties, local amenities and land use.”
- 3.18 The proposal put forward by cbec is to encourage the dominant flow of the river to migrate towards a more easterly orientation that approaches the main span of the Spey Viaduct. This would be achieved by installing a large wooden structure approximately 300m upstream of Ross House and undertaking sediment management in the river to encourage flow down a previously active channel.
- 3.19 Officers have reviewed the proposal outlined in cbec’s report and have identified a number of issues, which are listed below.
1. The proposed design is indicative and the report recommends that a member of the cbec design team be present on site to identify modifications required to the design during construction (refer **Appendix 3** page 21).

2. The proposal is based on engineering judgement and no modelling or detailed design calculations have been provided to demonstrate the integrity of the proposal.
 3. The report focuses on channel management and does not identify any benefits the proposal would have with regard to flood mitigation. As such, the economic feasibility of this proposal cannot be assessed.
 4. The report does not specify a design life for the proposal or what the future maintenance requirements might be.
 5. The proposal has been designed to withstand a moderate size of flood event, which has not been quantified in the report.
 6. The cost information provided for the proposal is very high level and does not include an allowance for risk. The estimated cost without risk is £82,350.
 7. The proposed method of construction is to undertake "field fitting", which could result in significant changes being made during construction, which could increase costs.
- 3.20 The main driver for the proposal put forward by cbec is to stabilise the situation by reducing the risk of bank erosion. However, the report does not provide any evidence to demonstrate that this proposal will provide mitigation with regard to the recent increase in flood frequency at Garmouth.
- 3.21 Based on the information in the report, there is uncertainty with regard to how robust this proposal would be and what the ongoing maintenance requirements might be for the party responsible for the finished works. There is also insufficient design information to allow anyone other than the cbec designer to progress this proposal. As such, Moray Council should not participate in the delivery of this proposal.

Conclusion

- 3.22 The proposals identified by Moray Council at para 3.12 above will address the increase in flood frequency at Garmouth, which has been caused by erosion of the left hand bank of the River Spey at Queenshaugh. These proposals will not stabilise the river and reduce the risk of further erosion. As such, over time the banks of the river will continue to erode and could, at some point in the future, undermine the flood mitigation measures identified by Officers. To progress any of the solutions identified in Section 3.12 of this report would contravene current Council Policy with regard to Flood Risk Management. Should members choose to contravene this Policy it may create a precedent with regard to undertaking flood mitigation works that are not economically feasible. This work would also have to be funded by Moray Council, or community accessed funding, as it would not be eligible for grant funding from Scottish Government. Should members choose to progress one of the solutions identified in Section 3.12, then the lowest cost solution of raising land locally at a cost of £25,000 - £45,000 would provide best value. This is because the level of protection that each of the proposed solutions will provide cannot be quantified beyond reducing the flood frequency to 2007 levels. .
- 3.23 The cbec proposals put forward by the community, if successful, would stabilise the river and reduce the risk of further erosion. However, the report drafted by cbec does not indicate what flood protection this proposal would provide. As Moray Council has had no involvement in the development of this proposal, it should not progress this work, as it could not take responsibility for the integrity of the design or the potential ongoing maintenance implications

associated with it. The work required to develop this proposal was commissioned by the community and should be progressed by the community, should it choose to do so.

4. SUMMARY OF IMPLICATIONS

(a) Corporate Plan and 10 Year Plan (Local Outcomes Improvement Plan (LOIP))

Empowering and connecting communities

(b) Policy and Legal

To undertake flood mitigation works at Garmouth would contravene Council Policy with regard to Flood Risk Management. Council Policy is "To deliver schemes that are approved in the Flood Risk Management Plans".

(c) Financial implications

When the Council approved the budget for 2021/22 on 3 March 2021 (paragraph 3 of the Minute refers) it balanced only by using one-off financial flexibilities. The indicative 3 year budget showed a likely requirement to continue to make significant savings in future years. All financial decisions must be made in this context and only essential additional expenditure should be agreed in the course of the year. In making this determination the committee should consider whether the financial risk to the Council of incurring additional expenditure outweighs the risk to the Council of not incurring that expenditure.

Should members agree to fund flood mitigation and / or bank stabilisation works at Garmouth, this funding would need to come from the Council's revenue budget, or community raised funding, as it would not be eligible for grant funding from Scottish Government.

(d) Risk Implications

The method of construction indicated in the proposal put forward by the community indicates that there is some uncertainty with regard to the proposed design. Any changes made during the construction process are likely to increase costs.

There is uncertainty with regard to the design life of the proposal put forward by the community.

To progress any of the solutions identified in Section 3.12 of this report would contravene current Council Policy with regard to Flood Risk Management. Should members choose to contravene this Policy it may create a precedent with regard to undertaking flood mitigation works that are not economically feasible.

(e) Staffing Implications

There are currently no staff resources within the Consultancy Section available to undertake the work identified in this report. If any of the solutions identified in 3.12 are progressed the design and site supervision work would need to be outsourced at a cost of approximately £9,000.

(f) Property

Low lying properties in Garmouth will continue to flood with increased frequency if no mitigation works are undertaken.

(g) Equalities/Socio Economic Impact

There are no equalities / socio economic implications associated with the recommendations in this report.

(h) Consultations

Depute Chief Executive (Economy Environment & Finance), Head of Economic Growth and Development, Chief Financial Officer, Legal Services Manager and Tracey Sutherland, Committee Services Officer have been consulted and their comments incorporated into the report.

5. CONCLUSIONS

5.1 The flood frequency at Garmouth has increased recently due to erosion of the left hand bank of the River Spey.

5.2 Council officers have identified seven potential solutions to reduce the frequency of flooding back to 2007 levels. The option that provides best value is the lowest cost option, which is to raise land locally at a cost of £25,000 to £45,000.

5.3 A proposal has been put forward by the Garmouth community that indicates it would stabilise the river banks by reducing erosion. It is uncertain to what level this proposal would reduce the increased frequency of flooding at Garmouth.

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Background Papers:
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