

## ABERDEEN CITY COUNCIL

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| COMMITTEE        | Communities Housing and Infrastructure |
| DATE             | 29 <sup>th</sup> August 2017           |
| REPORT TITLE     | Inchgarth Road Flood Study             |
| REPORT NUMBER    | CHI/17/193                             |
| INTERIM DIRECTOR | Bernadette Marjoram                    |
| REPORT AUTHOR    | Will Burnish                           |

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### **1. PURPOSE OF REPORT**

The purpose of this report is to ask the Committee to consider the following recommendations resulting from the Inchgarth Flood Study.

### **2. RECOMMENDATION(S)**

That the Committee note the contents of the attached Inchgarth Road Flood Study.

That the Committee approve the following recommendations:

- a) Works to upgrade the existing trash screen
- b) That civil engineering works are not justified (options 1 & 2 below) at this location
- c) Community awareness raising to promote Flood Watch and the PLP (Property Level Protection) Grant Scheme

### **3. BACKGROUND/MAIN ISSUES**

Inchgarth Road is located in close proximity to the River Dee and is separated from the river by an area of vegetated grassland and a riverside bund. Scottish Water's Inchgarth reservoir is located immediately downstream of the bund.

The Inchgarth Road area has a history of flooding, most recently in Winter 2015/16 when the river bund was breached resulting in the flooding of the grassland, Inchgarth Road and neighbouring properties. Given the area's flood history, Aberdeen City Council decided to carry out further flood study and investigate potential solutions to address the flooding issues.

Two principal flood mechanisms were defined through analysis of data and through a site visit carried out on Thursday 6th April 2017.

Namely:

- Mechanism 1 – Fluvial flooding of the River Dee and Burn of Cults during high flood events can cause both watercourses to come out of the bank. This leads to the flooding of the Den of Cults and Inchgarth Road, affecting properties in the vicinity. The fluvial flooding at the River Dee also leads to flow backing up the Burn of Cults culvert at the confluence with the River Dee.
- Mechanism 2 – The 1200mm diameter culvert for the Burn of Cults underneath Inchgarth Road could become blocked. There has been a history of blockage in this culvert, causing the water to back up the Burn of Cults and overtop its banks, affecting properties in close proximity. Higher flow in the watercourse will, as expected, exacerbate the flooding issue should a blockage occur and the culvert could be of insufficient capacity. It is noted that the existing roadside wall, until its collapse, had the potential to trap water overtopping the culvert, further exacerbating flood risk.

Outline mitigation options were selected. From carrying out the site visit these options were further developed and three options were selected for detailed assessment. Some of the mitigation measures were combined in order to form an option that would address and alleviate both flooding mechanisms aforementioned.

These are:

- Option 0 – Do Nothing
- Option 1 – Bund improvement and culvert extension
- Option 2 – Reinforced concrete sheet piled flood wall
- Option 3 – Property Level Protection

Following a detail costing exercise, the following Cost Benefit Ratios were derived.

| <b>Cost Analysis Results for Inchgarth Road area – blocked culvert</b>  |          |             |             |             |
|---|----------|-------------|-------------|-------------|
|   | Option 0 | Option 1    | Option 2    | Option 3    |
| Annual Average Damage   | £4,573   | £927        | £927        | £927        |
| Present Value Benefits (PVb)  | £0       | £108,874    | £108,874    | £108,874    |
| Present Value Cost (PVC)  |          | £995,484    | £1,141,907  | £48,190     |
| <b>Average benefit/cost ratio</b>   |          | <b>0.11</b> | <b>0.10</b> | <b>2.26</b> |
| Note: It is assumed that the existing defences will not require cost to maintain. Option 0 refers to Do Nothing |          |             |             |             |

Option 3 of the blocked culvert scenario has the highest benefit/cost ratio of 2.26 and is the only one with a ratio above 1. The other options have the benefit/cost ratio significantly lower, i.e. ranging from 0.01 to 0.32.

Regardless of options chosen moving forward, the existing trash screen is to be improved to reduce the risk of blockage and facilitate safe access for clearing. It is also advised that the culvert outlet is regularly cleared, including at the downstream end, to prevent blockage.

#### 4. FINANCIAL IMPLICATIONS

The table below details the costs of implementing the above recommendations:

| Item   | Cost           | Funding Source   | Year    |
|--|----------------|--|---------|
| <b>Updated Trash Screen</b>                  | £28,800        | Flooding Revenue Spend. To be added to budget                      | 2018-19 |
| <b>Property Level Protection Flood Grant</b> | £30,000        | PLP Flood Grant Scheme for 5 properties at risk. Already in budget | 2017-20 |
| <b>Awareness Raising</b>                     | £2,000         | Flooding Capital Spend. Already in budget                          | 2016-17 |
| <b>Scheme Cost</b>                           | <b>£60,800</b> |  |         |

Funding for the above is included within the existing flooding capital budgets.

#### 5. LEGAL IMPLICATIONS

By accepting the above report, Aberdeen City Council will continue to meet its obligations under the Flood Risk Management Act. It will also meet part of action 601801005 Flood Protection Study in the North East Local Flood Risk Management Plan.

The committee must also recognise that the proposal for Property Level Protection will not stop flooding around the property or on the public road.

If the occupants do not wish to take up the Grant Scheme or undertake any property level protection their property will remain at significant flood risk.

## **6. MANAGEMENT OF RISK**

### **6.1 Financial**

Uptake of PLP grant scheme is greater than expected, meaning no finance for affected resident to apply. Risk mitigated by ensuring monies are reserved for 5 properties applying for the grant between 2017-2019

### **6.2 Employee**

There is no change to the current risk profile with regard to employees on this scheme

### **6.3 Customer / Citizen**

There may be a situation in times of high rainfall that the area may be subject to flooding. Early warning system to warn residents when to erect PLP will be devised as part of the SCORE Open Data Project

### **6.4 Environmental**

In times of high rainfall the area may be subject to flooding. Provision of Property Level Protection (PLP) will ensure that the property is protected against future flooding

### **6.5 Technological**

Currently there are no technological risks which could affect the delivery of the these works

### **6.6 Legal**

There are no legal risks associated with the proposed report, as we are meeting our objectives as laid out in the North East Local Flood Risk Management Plan

### **6.7 Reputational**

A number of local residents may be unhappy that the report does not provide a scheme of civil engineering works to protect Inchgarth Road from flood water. We aim to undertake community engagement and develop information sheet as to why works are not being done

## **7. IMPACT**

### **Economy**

The study and acceptance will reduce the current ACC capital spend, allowing schemes elsewhere within the city to be undertaken

### **Place**

The proposal in this report will improve customer experience with reduced risk of blockages on the Cults Burn and an early warning system for Inchgarth Road

### **People**

The Public will be better informed about the flood risk within this area now that the report has been completed. It also allows us to raise awareness, giving clear guidance on what to do with regard to the flood risk within this area

The flood study has improved the resources that are available to the flood team with regard to understanding the flood risk within the area of Inchgarth Road. It allows us to better answer questions we receive with regard to flood risk in the area. It will also form part of the wider City Surface Water Management Plans

### **Technology**

This project will not be using any technology.

## **8. BACKGROUND PAPERS**

North East Local Flood Risk Management Plan.

<https://www.aberdeenshire.gov.uk/media/17174/north-east-local-flood-risk-management-plan-2016-2022-web-version.pdf>

## **9. APPENDICES**

Inchgarth Road Flood Study. May C017 Revision B Appendix A

## **10. REPORT AUTHOR DETAILS**

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