Perth and Kinross Council Environment Service
Comrie Flood Protection Scheme - Community Drop-in Sessions
Summary of Questions & Answers

Introduction

Perth and Kinross Council held community drop-in sessions in Comrie Community Centre from 2-8pm on 1 and 8 September 2016. The aim of the drop-in sessions was to consult with the local community on:

- The risk of flooding in Comrie.
- The Council's proposals for a flood scheme.
- Work to raise awareness of flooding and to help the local community to become more prepared and resilient to deal with flooding in the future.
- Other action being taken on flood risk.

This report collates the questions received during the drop-in sessions and provides the Council's response to those questions.

The event was well attended and the Council would like to thank those residents who took the time to attend and provide comment.

Flood Scheme Proposals

The Council has engaged consulting engineers, Mouchel, to develop proposals to manage the risk of flooding from the Water of Ruchill, the River Earn and the River Lednock. Mouchel have considered a wide range of potential options for managing the risk of flooding at Comrie and have recommended a preferred option to the Council. However before taking this forward, the Council was keen to consult with the community.

The following main options have been considered as part of the flood scheme investigations:

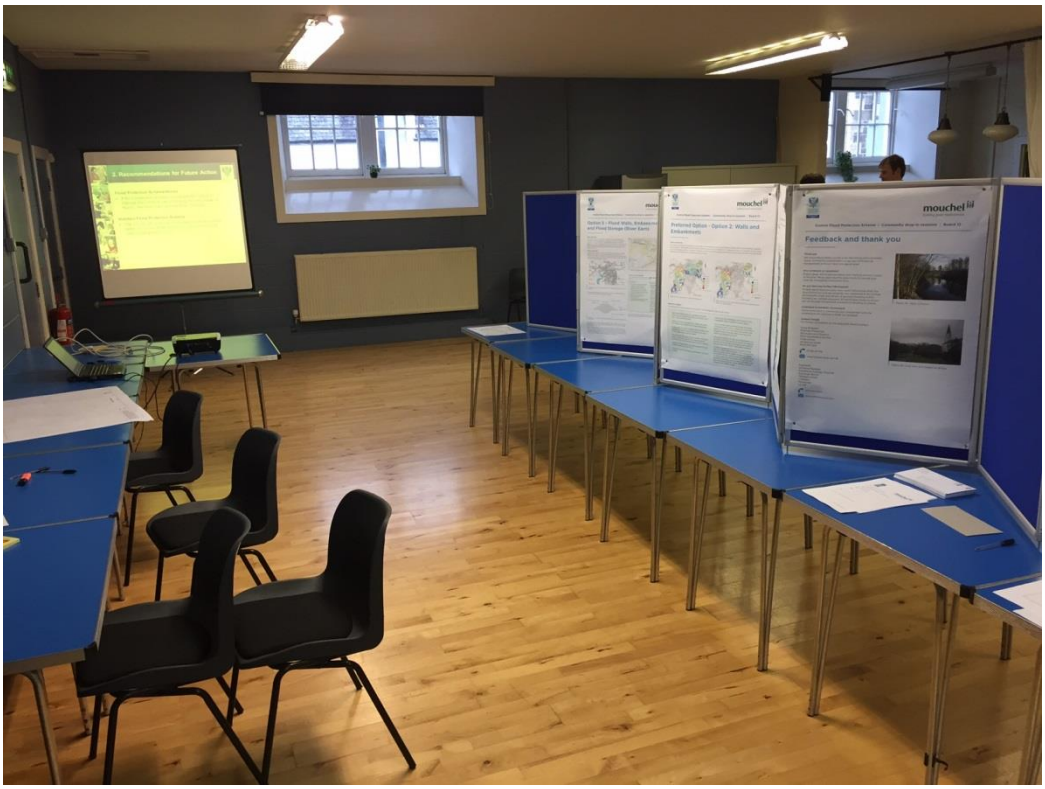
Option 1 – Dredging
Option 2 – Walls and Embankments
Option 3 – Upstream Flood Storage
Option 4 – Flood Walls, Embankments and Flood Storage (Water of Ruchill)
Option 5 – Flood Walls, Embankments and Flood Storage (River Earn)

Option 2 – Walls and Embankments – was put forward at the drop in sessions as the preferred option.

Drop In Sessions

The drop in sessions involved a central display, a slide show on a projector and a series of plans of the scheme options located on tables around the room. A letter had been distributed to the community in advance outlining the options considered and inviting residents to attend the drop in sessions.

The event was very well attended by the local community demonstrating a high level of interest in the flood scheme proposals. An estimated 120-150 people attended the drop in sessions over the two days. Representatives from the Council and Mouchel attended to provide information and answer questions.



Displays at Drop in Sessions

All members of the community who attended where encouraged to complete a comment form to express their views and opinions or to ask any questions on the Council's proposals. These forms were either completed on the day and handed to the Council or Mouchel, or were completed after the event and returned to the Council. Blank maps were also made available to allow consultees to make comments and mark on any information they had on flood extents, etc.

The public consultation materials can still be viewed on the Council's web site at http://www.pkc.gov.uk/comriefloodscheme and also on the Comrie Community Council website at http://www.comrie.org.uk/.

Community Response

In general, the impression received from the drop-in sessions was that the local community where in favour of the preferred option (Option 2 – Walls and Embankments).

24 comment forms were returned to the Council. The majority of the responses also indicate general approval for the preferred option.

The attendees raised a number of questions on their completed forms and these are listed in the Annex below along with the Council's response. The questions have been grouped into the following three general themes: -

(A) Flood scheme development and timescales;
(B) Maintenance;
(C) Resilience and self-help.

Those submitting forms have not been named for confidentiality reasons.

This report will be distributed to members of the community.

Conclusion

Perth & Kinross Council was satisfied with the outcome of the drop-in sessions. The sessions confirmed that the local community are generally in favour of the preferred option put forward by the Council's consulting engineers, Mouchel.

The Council has therefore instructed Mouchel to finalise their report on this phase of the flood scheme investigations and will move forward to develop the preferred option in more detail.

The Council will carry out further consultation with the community as the scheme proposals are developed.

For further information on the proposals please contact:

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Engineer (Flooding)
Structures and Flooding
Perth and Kinross Council
Pullar House
35 Kinnoull Street
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Paul Swift
Divisional Manager
Flooding & Drainage
Mouchel
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Tel 0151 600 5500
Email paul.swift@mouchel .com

Website: www.pkc.gov.uk/comriefloodscheme

Annex - Questions & Answers

(A) Flood Scheme Development and Timescales

Question 1 – Can anything be done to reduce the estimated timescale for implementation of the flood defences?

The flood scheme has a high priority within the national priority list of flood schemes and the Council's local flood risk management plan. Although funding is provisionally secured, it is also important to note that the implementation of a scheme is still likely to be some time away and is not yet certain, due to the need to secure statutory consents and other approvals.

The development of such a large civil engineering project takes a good deal of time, as indicated on the displays at the drop-in sessions. A lot of work remains to be done on the planning and design of the scheme; securing statutory approval; tendering and the construction works. In the first instance the design of the preferred option put forward at the drop in sessions needs to be developed further as described below:

- **Develop outline design** – the flood defence heights, extents and the construction methodology for the Scheme will be developed further;
- **Environmental work** – environmental surveys (bats, badgers, trees, etc) and an environmental assessment will be undertaken;
- **Further hydraulic modelling** - further detailed hydraulic modelling will be undertaken to confirm flood defence levels and the impact the scheme may have on flood risk in other locations. If flood risk is found to increase in other locations then mitigation measures will be proposed to address this.
- **Drainage** – analysis of the drainage network will be undertaken to determine the impact of a potential scheme on surface water drainage;
- **Services** – liaison with utility companies will be undertaken to determine how and where we will divert their services (electricity, mains water, etc.), if required;
- **Bridges** – the impact the scheme may have on the relevant bridges will be assessed in order to determine if any work is needed to strengthen or alter these structures;
- **River behaviour assessment** – the hydraulic modelling, together with further river surveys, will be used to assess the nature of sediment movement and the potential for erosion within the rivers. Further works to mitigate these issues may still be required as part of the proposed scheme.
- **Further consultation** – the community and all relevant stakeholders will be consulted and their views will inform the development of the proposals.

Following further consultation and refinement, the Council will formally publish the flood scheme under the Flood Risk Management (Scotland) Act. At this stage any person who may have an interest (including local residents and landowners) will have the opportunity to object to the scheme. Such objections can take time to resolve, but the Council will seek to minimise these through early consultation.

Once the Scheme is approved (or 'confirmed') the Council will have the legal power to build it and will be able to proceed with securing the remaining consents, the detailed design, tendering and construction.

It is essential that the final scheme will be safe, functional and readily buildable by the selected civil engineering contractor.

In summary, due to the large number of issues to be considered; the extensive consultation required; the complexity of the engineering work and the statutory requirements, it is unlikely that the estimated programme for delivery can be reduced significantly.

Question 2 - How high will the proposed defences be?

The walls and embankments will vary in height from 0.25 metres to 1.5 metres and up to a maximum of 2.2 metres in some localised sections. The defence heights are determined by predicted flood levels, local ground levels and calculated freeboard (an allowance for uncertainty/safety factor).

The required height of the flood defences will be reviewed and refined during the design of the scheme and we will provide greater detail on this thereafter. The flood defences heights will be subject to further consultation with the community.

Question 3 – Will consideration be given to measures in the upper catchment that may reduce the risk of flooding at Comrie (these measures are generally termed "Natural Flood Management")?

Natural flood management (NFM) typically involves slowing or storing flood water in the upper catchment to reduce peak flows in areas downstream. These techniques can include measures as diverse as increasing tree planting, introducing contour ploughing, reducing livestock densities, provision of in-stream barriers, creating pond and wetland areas etc. The works are therefore normally of a small scale and low cost however a large number of separate sites and actions are often required to see any perceptible difference in flood flows in the lower catchment. This is true even in small catchments and the effect of NFM on the scale of large catchments during extreme events is still untested.

As part of the initial option assessment for the flood scheme, the potential impact that the application of these techniques could make was estimated from the hydraulic model. They were found not to reduce flood levels sufficiently for large flood events. As the Council is aiming to manage flood risk from 3 large rivers up to the 1 in 200 year flood event event NFM measures have been screened out and are not considered to be a viable option as part of the proposed flood scheme.

Question 4 – Will the location and appearance of any finished work be sympathetic to its surrounding environment?

The Council will seek to minimise the impact of the scheme on the surrounding environment. Further consultation with the community, SEPA, SNH, Historic Scotland and other relevant stakeholders will be carried out to inform the development of the scheme. This issue will be considered as part of the environmental assessment for the flood scheme.

Having decided that flood walls and embankments form part of the preferred option, the Council and our consultants will investigate the alignment and visual appearance and of these proposed structures in more detail. Often it is appropriate to clad or treat a wall surface in some way to integrate it into the local surroundings. The use of sympathetic landscaping will also be considered.

More detail will become available as the scheme progresses and more information will be made available to the community throughout the design process.

In the meantime please be assured any selected finishes will be required to be in keeping with the local area, and that the defences will be incorporated into the local landscape as much as possible.

Question 5 – Could the final proposals address measures to 'sweep' the outlet of the River Lednock into the flow of the River Earn at the junction of the two rivers?

The preferred proposal for flood walls and embankments allows for the flow regime at the confluence of the River Earn and the River Lednock. The flood defences at the Comrie Holiday Park are set back from the River Earn to allow more space for the rivers in higher flow conditions.

The preferred proposal is designed to work with the natural alignment of the River Lednock. Permanently re-directing the channel of the River Lednock at its confluence with the Earn would require major engineering works which would effectively work against the river and would therefore have to be maintained at considerable cost in the future. It is also unclear what additional benefits such work would deliver when compared to the proposed arrangements.

There are therefore no current plans to introduce a 'sweep' at the outlet of the River Lednock. .

Question 6 – Will the scheme address the required upgrade to drainage in the Monument Road area?

There is a short watercourse system which flows down the edges of Monument Road before entering into a pipe at the Car Park for Deil's Cauldron. The watercourse is culverted from here towards the River Earn via Dundas Street.

Flooding has occurred from this watercourse on Monument Road due to the limited capacity of the pipe inlets at the car park. The Council has carried out works to alleviate this situation by providing an alternative overflow route, with an improved

headwall and a new screen arrangement. This overflow will reduce the amount of water which flows down Monument Road towards the road junction and adjacent property in times of heavy rain.

The route, form of construction and current condition of the culvert are not fully known south of the entrance to the drive of Comrie House. The culvert passes through various sections of private ground before it outfalls to the River Earn. The relevant landowners in this area have a responsibility for the culvert where it passes through their property and may have more information on their title deeds.

It is considered that the preferred option for the flood scheme will have a negligible impact on the culvert or the watercourse. The bulk of the flood defence works will be remote from the assumed line of the drain and therefore there are no plans to upgrade or replace the drain as part of the flood scheme. However, where the proposed flood defences cross the culvert then measures may be required to maintain the integrity of the outfall to the River Earn and even to prevent backflow in times of flood.

Question 7 – Will the scheme take in to account the risk of water being passed downstream and/or backing up in Comrie and possibly causing damage to downstream and/or upstream properties? Will the risk of flooding be transferred to downstream or upstream locations?

A number of residents noted their concern that a flood scheme will either cause a constriction on the river channels causing flood water to back up or will pass more flood water downstream, thereby increasing flood risk to property in these areas.

The Council acknowledges these concerns and has engaged experienced consulting engineers to carry out detailed river modelling to examine these impacts in detail.

The proposed flood defences will reduce the available floodplain area available to the rivers. This will ensure that flood water that would previously have entered the town and flooded property will in future be contained by the flood defences. However the new flood walls and embankments will be raised to a sufficient level and create additional storage within the restricted river channel to allow for this containment localised raising of water levels through the reaches of the Scheme.

Based on the hydraulic modelling undertaken so far, the potential impacts out with the proposed defences and Scheme bounds are as below:

(i) just upstream of the proposed flood defences along the River Earn - flood levels would increase by up to 200mm in the 1 in 200 year flood event;
(ii) just downstream of the proposed flood defences along the River Earn - at Invermilton, flood levels would increase by 115mm in the 1 in 200 year flood event.

The impacts in other locations for the 1 in 200 year flood event are considered to be negligible.

At the upstream end of the scheme, the main constriction on the River Earn is the Bridge of Ross and the extent of the flood defences required in this area is limited. The total loss of floodplain in this area is therefore relatively small. The hydraulic modelling has been used to consider if any significant change in predicted flood levels will occur to properties in this location outwith the Scheme extents as a result of the proposed defences. This has not been found to be the case currently as any of the houses in this location are set well back from the bank and/or are elevated above the predicted flood levels. However, this will be looked at further and in more detail in the next stages of design.

It would not be acceptable for the Council to increase flood risk to neighbouring property without suitable mitigation. Where a change in predicted flood levels has the potential to impact on property, then the need for mitigation will be assessed and measures included within the flood scheme to ensure that their current standards of flood protection are maintained. The Council will consult with any landowners or residents who may potentially be affected if required though the next stages of the Scheme development.

Question 8 – Will communication continue with the local community to update us on the progress of the scheme and decisions being made?

We are committed to continuing the community involvement in the development of the flood scheme proposals and will continue to keep you updated on progress.

A dedicated webpage for the flood scheme has been set up on the Councils' web site at http://www.pkc.gov.uk/comriefloodscheme. The display materials used at the recent drop-in sessions can be viewed at this web page.

The Council will continue to update Comrie Community Council with information as and when it becomes available. The next full consultation with the community will be carried out before the outline design of the flood scheme is completed. Discussions with individual landowners and residents will continue in the meantime

In the meantime any questions you may have can be directed to Craig McQueen Engineer (Flooding), Perth and Kinross Council, Pullar House, 35 Kinnoull Street, Perth, PH1 5GD or craigmcqueen@pkc.gov.uk

Question 9 – Will the Scheme construction start upstream first?

The programme and phasing for the construction phase of the project will be confirmed once a contractor has been appointed.

The management of flood risk during construction will be considered as part of the detailed planning for the construction works.

Question 10 - Which river contributed most to the 2012 flooding? The Water of Ruchill, the River Earn or the River Lednock?

The Dalginross area of Comrie was severely affected by flooding on 27 August and 19 November 2012. During both of these events the Water of Ruchill was the main source of flooding and the highest contributor to the recorded river flows.

(B) Maintenance

Question 11 – Will regular review of the watercourse and subsequent protection be taken into account within the scheme's maintenance?

Under the Flood Risk Management (Scotland) Act, the Council has a duty to assess bodies of water and to carry out clearance and repair works where this will substantially reduce flood risk. The Council currently undertakes routine inspections of the bodies of water and flood defences in Comrie as follows:

- The Water of Ruchill, River Earn, River Lednock and Fey Burn are inspected every 3 months. Once per year a more detailed inspection is carried out on the Water of Ruchill to monitor any change in the river channel.

- The rock armour at Ruchilside and the Field of Refuge is also inspected every three months. The flood protection works along the western edge of Dalginross are inspected every year, with a structural inspection every five years.

The Council will also respond if any issues are reported in the intervening period between routine inspections. The Council has and will continue to carry out clearance and repair works as required.

The primary responsibility for avoiding or managing flooding risk remains with riparian landowners who are expected to maintain watercourses which pass over their land.

Once the new flood scheme is complete, the frequency of watercourse inspections will be reviewed. In most areas across Perth and Kinross, watercourses are inspected every 6 months or every year where a flood scheme has been constructed. At present, Comrie is currently monitored more frequently than this as there is a high risk of flooding but no flood scheme that protects the whole town.

The Council will inspect and maintain any new flood defences that are constructed as part of a flood scheme. This will be carried out in accordance with the recommendations of the scheme designers.

Question 12 - Are there actions, (e.g. tree planting, stabilizing banks, periodic dredging, other) to minimize / manage / validate the control of natural river fill as a key part of the final recommended flood protection scheme? What analysis / modelling has been included and validated regarding the source / timing and impact of aggregate / sediment / river debris build-up / movement over time and the wall and embankment recommendation?

Rivers change over time due to the natural processes of erosion and accretion. In particular the Water of Ruchill has changed its alignment over the years.

Natural flood management actions - such as tree planting - have been considered by Mouchel – please see our response to Question 3.

Where necessary, the Council has carried out works to raise and stabilise the river bank at Ruchilside (which was heavily eroded during the flooding of 2012) and at the Field of Refuge (in order to protect the existing flood defences).

With regard to dredging, the work done by Mouchel and put forward at the drop-in sessions confirms that a significant amount of material would also have to be removed from the Water of Ruchill to contain a flood event and deliver any significant reduction in flood risk. This is not considered to be a feasible or sustainable option; hence other options have also been considered to manage flood risk.

The modern approach to river management aims to minimise disturbance to the natural characteristics of rivers and to work with nature to reduce the risk of flooding.

The preferred option for a flood scheme involves the construction of flood walls and embankments. These flood defences will be set back from the river where possible and will therefore minimise any impact on the rivers.

Mouchel have already investigated flood risk and changes in river behaviour. Hydraulic modelling of the three watercourses in Comrie has been carried out based on survey data and river cross sections which have been re-surveyed in recent years. Work has also been carried out to study the river behaviour in the area (in particular river stability and likely future channel change). Much of this work will be based on a photographic record of the main watercourses in Comrie and the recorded changes over time. Further study, survey and modelling work will be carried out and this will continue to inform the development of the flood scheme

One of the key aims of this assessment will be to ensure that future changes in the river channel will not affect the integrity of the flood defences. Where this is likely to be an issue then the scheme proposals may include works to address this risk, e.g. mitigation/stabilisation works and/or enhanced monitoring. This work will inform the design of the flood scheme and its future maintenance.

Question 13 – Will consideration be taken for regular review of the pumping stations and will upgrading of the pumps be taken when necessary? How will they be maintained?

There are currently 5 pumping stations in Comrie which help the local sewer system operate effectively. Scottish Water is responsible for operating and maintaining the sewer system, including these pumping stations. The new flood scheme will be carefully designed and planned so as to ensure that there is no impact on this system.

Now that the preferred scheme option has been identified, further analysis of the drainage network will be undertaken to determine the impact of the potential scheme on surface water drainage. Suitable mitigation may be required such as new drainage pipes, storage, pumping stations etc.

Arrangements will be put in place by the Council to ensure that any new pumping stations are regularly inspected, serviced and maintained so as to remain operational during a flood event. The council already has similar arrangements in place for the pumping stations which form part of flood schemes in other areas.

Question 14 – Will dredging be used as an ongoing measure to manage flood risk on the Ruchill along with the management of fallen trees?

A river is contained entirely within its banks under normal flow conditions. Any flow in excess of the channel capacity will result in overtopping of the banks. The sight of water out of a river channel and on floodplains is therefore actually quite commonplace. However, this can be a concern if it impacts upon people or property located on the floodplain.

During a large flood event, the peak river flow is usually many times the bank full channel capacity and large volumes of water will spill out onto the floodplain. It is therefore not practical to dredge the river to the extent that it would confine such large flood flows within the channel only and to exclude flow from the wider floodplain.

For example, try to visualise the size of river channel which would have been required to contain the Water of Ruchill during the 2012 flood events. The channel would need to be enlarged to many times its natural size to prevent it spilling onto the floodplain.

Overall, the volumes of flood water are just too large for dredging to work effectively to manage flooding on rivers as large as those in Comrie. In addition, regular dredging would be required to maintain the enlarged channel and this would not be sustainable.

The results of the hydraulic modelling work carried out by Mouchel and put forward at the drop-in sessions confirms that a significant amount of material would have to be removed from the Water of Ruchill to contain a flood event and deliver any significant reduction in flood risk. Dredging has therefore been discounted and will not form part of the proposed flood scheme or the Council's approach to managing flood risk in the area.

Landowners are however free to apply for the appropriate permissions from SEPA should they wish to continue to extract river bed gravel on a commercial basis.

With regards to fallen trees, please see our response to Question 11. In reality the rivers at Comrie are large and fallen trees present little risk in terms of flooding. Only a significant build-up of trees would create an obstruction to river flow. The Dalginross Bridge is the only structure which could potentially trap timber and collect

debris in a manner to increase flood risk. However, there are no reports of any substantial build-ups of timber ever occurring on this bridge. The central span of the bridge (between the masonry piers) is approximately 26 m and this allows the predominant river flow to pass largely unimpeded. Fallen timber carried down by the river tends to continue past the bridge. However despite the nominal risk, the Council will continue to monitor the rivers and this bridge and will remove any large trees which become trapped on the bridge piers.

With regards to fallen timber in the river generally landowners are free to remove fallen trees from their sections of river channel should they wish. They do not need any relevant permissions to carry out this type of work.

Question 15 – Can you if confirm that the flap valves/outfalls from the roads drainage system which discharge into the River Earn are operating correctly?

The Council has checked these systems on several occasions and no issues were observed regarding the operation of the flap valves. The connected pipe networks are also in good condition.

As part of our on-going inspection regime in Comrie we will continue to check these flap valves on a regular basis and we will also undertake additional checks after any high-water events.

There are potential issues with these drainage outfalls as they are set low into the river bank and so the flap valves will close at an early stage when river levels are high. The roads drainage system will only discharge water to the river provided there is sufficient head of water within the pipe. If not then the flap valve will seal to prevent the flow of river water back-up up the pipe until the river level drops. This means that there is a limit to how much water can enter the drainage system from upstream before it begins to surcharge at the lowest road drains. This has occurred on several occasions now and does cause issues along the roads closest (and lowest) to the River Earn (Lochay Drive and Garry Place).

The Council intends to investigate this issue further as part of the flood scheme design. Further analysis of these outfalls and drainage systems will be undertaken to determine the impact of the proposed scheme on them. The Council will consult further with the community on this.

Question 16 – Is any maintenance planned for the existing defences along the western edge of Comrie prior to any Scheme being constructed?

A visual inspection of these flood defences is carried out annually and a structural survey is also undertaken every 5 years. Based on the findings and recommendations from these inspections, the Council will take action to maintain the defences as and when required. No maintenance works are currently planned for these flood defences.

Residents or landowners can report any issues in the intervening period.

It is likely that the existing flood defences in this area will require to be raised and/or refurbished as part of the proposed flood scheme. This part of the proposals will be developed further during the outline design of the scheme.

(C) Resilience and Self-Help

Question 17 – We are interested in protecting our own property in the meantime before the scheme is complete and are interested in flood defences for our home however they are expensive; can the council help with this?

As a householder or a business, you can install products to help protect your property from flooding. Flood products, such as flood gates for doors and air brick covers, are widely available and are designed to suit a variety of homes. A number of residents in Comrie have already installed such devices on their homes.

The Council would encourage you to look into the suitability of these products for your home and can provide advice on this; however we cannot provide financial assistance to residents for the purchase of these products.

The Scottish Flood Forum (Tel 01698 839021) can provide you with further independent advice on the selection of suitable products, and also on any related flood insurance matters.

Further information on property level flood protection products and flood insurance can also be found at the following:

www.pkc.gov.uk/plp
www.scottishfloodforum.org
www.floodre.co.uk

Question 18 - I asked for sandbags during the last high flow event but I never received them or they are always too late in arriving. Can you not just give me sandbags now?

Although the primary responsibility to protect property from flooding lies with the owner, the Council still endeavours to assist during flood events by supplying traditional sandbags to affected properties where possible, even though this is not a statutory responsibility. Sandbags are only provided if property is being flooded or is in imminent danger of being flooded. At the same time as endeavouring to supply sandbags, the Council may assist by attempting to divert the flow of water and by pumping flood water away from properties. However, the resources for these activities are limited and therefore assistance has to be prioritised.

As part of this prioritisation process, where flooding is imminent the Council will sometimes deliver a pallet (or several) of sandbags to a community and leave them for local residents to help themselves The Council has previously left pallets of

sandbags at the Fire Station on Strowan Road. Unfortunately the Council is not able to deliver sandbags to individual properties in a large town like Comrie.

The Scottish Fire and Resuce Service also holds floodsax (a modern lightweight version of traditional sandbags) at the Fire Station on Strowan Road.

If you know you are at flood risk, then the Council would suggest that you take steps in advance of any future flooding to ensure that you are as prepared as possible. Part of this may include purchasing your own sandbags and/or other suitable flood protection products for your home. Flood protection products can play an important role in improving the resilience of individual properties against flooding.

However, if you are in imminent danger of flooding and require sandbags urgently then please call 01738 625411 to request assistance.

Further information is available at www.pkc.gov.uk.

Question 19 – Will the 'early warning' system continue to be in place within Comrie?

SEPA are the national flood forecasting authority in Scotland. As part of this role they provide targeted local Flood Warnings for Comrie. This warning system will continue to be maintained and SEPA would advise all local residents who are at risk of flooding to sign up for the Floodline service to ensure they receive the appropriate warnings. The service is free and ensures that anyone who is registered within a target area will be sent a message by phone or text, advising when a Flood Warning or Flood Alert for their local area has been issued.

You can get more information, or sign up for the Floodline service, at http://www.floodlinescotland.org.uk/ or by phoning 0345 988 1188.