

PUBLIC INFORMATION COPY

ELFORD PARISH COUNCIL

COMMUNITY FLOOD PLAN

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Elford Community Flood Plan

Preface

This document has been prepared for Elford Parish Council in consultation with the Environment Agency (EA) and Lichfield District Council. For the purposes of simplicity Lichfield DC will be considered to be an Emergency Service for the purposes of action during flood events.

The plan sets out various issues related to the flooding risks in the village given its proximity to the flood plain of the River Tame. It is intended that this document is dynamic in that it will evolve with time and experience. It includes an Action Plan to be implemented by appointed Flood Wardens (FW) on behalf of the Parish Council for any flood events that occur. Experience of future flooding events will generate additions, adjustments and updates to the plan.

In addition to the Action Plan element there is a section outlining the responsibilities of the Flood Wardens. It is a volunteer role and there are currently two people appointed to the role to improve cover for the village at all times. The FW's are in turn intended to be supported by a network of Auxiliary Flood Wardens (AFW's) who will provide assistance to villagers during any flood event particularly to the more vulnerable members of the community.

A section on some of the factual history of past flooding events has been included to give context to the Action Plan. It should also be acknowledged here that significant physical work has been provided by the Environment Agency to address the flood risks in the village. This includes the designation of the outfall section of Green Brook, which is the cause of some of the major flooding experienced in the past, as 'Main River'. This action has resulted in the provision of significant physical work to the land drainage system the most important being the provision of a state of the art Storm Water Pumping Station that now protects the most densely populated area of the village.

In the appendices to the plan are various documents that contain factual data that is relevant to the history of flooding in the village and whilst relevant as a record may unduly clutter the main document as a result Appendices 4,5,6,7,8 and 10 will only be attached to Parish Council's copy of the plan. Should anyone be interested in reading these appendices they can be made available on request.

The plan also identifies potential future action that can be considered if the predicted worsening of flooding events due to global warming actually occurs and further protective action is necessary.

Introduction

Elford lies in the shallow valley of the River Tame adjacent to its eastern bank between Tamworth and Burton on Trent. The village generally lies above the 100 year flood level although there are localised areas within the village that are at risk to floods below the 100 year river flood levels without protective measures.

The major risk to the central area of the village is the Green Brook, a tributary to the River Tame, which runs through the village from its catchment lying to the north east of the village. The brook is an open water course for the majority of its length but just as it enters the confines of the village it enters a culvert (a large pipe) and formerly becomes a '*culverted watercourse*'. This length of the brook has now been designated '*Main River*' and has become a section of the storm water network the effective operation of which is now overseen by the Environment Agency.

The associated flooding threat to the heart of the village is created by the storm water trapped in the area of The Beck at the times Green Brook free discharge to the river is restricted by high water levels on the River Tame. There is however also a risk of the high river water levels on the River Tame backing up into the Green Brook culvert at times that the River Tame flood plain is seriously surcharged. These threats have now been addressed by the Environment Agency which recently constructed a Storm Water Pumping Station (SWPS) adjacent to The Beck / Church Road which is capable of over-pumping very high volumes of flood water from the Green Brook (see later section for detail). The problem of surcharging storm water from the river has been relieved by the inclusion in the SWPS of a penstock (a sliding gate) that can be closed to seal the brook off and stop all backflow of water from the river. There are still issues related to technical constraints on the pumping station size and configuration but it is a very effective facility that provides the village with better flood protection than it has ever had previously.

Storm flooding issues in the area of The Crown and The Square have been eased by the reconstruction of a collapsed storm water pipe in the central area of the village adjacent to The Forge. A flood flap has been fitted to the pipe outfall to the river to protect back flow of water from the River Tame at times of flood. This has reduced the risk of storm water flooding in that area of the village.

A fundamental point that we have to be clear on from the outset is that storm drainage systems can never be practically designed to cope with **all** flood / storm events; it would be totally uneconomic and largely impractical. Therefore two key principles apply to Elford as with all riverside development:

- There will always be a risk of flooding during periods of exceptionally wet weather.
- All areas adjacent to major rivers and their flood plains are at the highest level of flood risk.

That said the village now has in place a storm drainage system that comfortably meets if not exceeds modern design standards as well as having a state of the art pumping station that provides exceptional protection standards against flooding and undoubtedly the best protection the village has ever had since the very first properties were built here.

There are several village properties that have river frontage that are at flooding risk for severe flood events (over 1 in 100 year return periods) the most at risk being in the area on the fringes of the

village at the Elford Mill site. Again the flooding impact is amplified by the existence of a small brook tributary on the edge of the site which feeds into the river at that point. Various remediation works have been undertaken by the residents here and there has been some mitigation of the flooding for moderate events but extreme floods will always threaten housing adjacent to and on river flood plains.

A further key area of the village and the most critical in terms of housing our most vulnerable residents is Stubby Leas Nursing Home on the west side of the River Tame and sited in the middle of the floodplain. Its threshold levels are generally above the 1 in 100 year flood level and the building does not normally flood. The management of the home have their own secure and robust Flood Plan to protect their particularly vulnerable residents. The existence of this plan and the fact that the home is cut off from the village as soon as the river breaks its banks means that there is little potential for us to help in an emergency and therefore it has little operational impact on our village plan.

Based on the personal experience of some of our Flood Wardens over the last 40 years the flooding events appear to occur on a 6-7 year cycle. The most severe flooding has occurred when flooding events well above the norm have occurred in the River Tame and Green Brook catchments at the same time one involved a 1 in 200 year storm in the catchment for the Green Brook. Experience also seems to indicate that storm events are becoming more frequent and more intense than past storm design parameters would indicate. Consequently the point about needing to keep this document a dynamic and ever changing plan in the light of experience is well made.

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ELFORD PARISH COUNCIL

COMMUNITY FLOOD PLAN

ACTION PLAN

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ACTION PLAN

Many organisations have a role to play in the event of flooding and in order to set a context for this plan a list has been prepared based on an EA document outlining who is responsible for what during a flood event. This is attached as **Appendix 1**.

The Action Plan is based on the template issued by the EA and is structured around the Flood Warning Codes. These codes are based in turn on the severity of the risk at a particular point in time and are as follows:

1. **Flood Alert (B)** - flooding is possible be alert – given two hours to two days before possible event.
2. **Flood Warning (C)** - flooding is expected to occur take immediate action – given half an hour to a day before expected event.
3. **Severe Flood Warning (D)** - severe flooding expected, risk to life – given when flooding is expected to pose a significant threat to life.

The village Flood Wardens are already registered with the EA Floodline 24hr flood notification service and will be notified of any flood risk along with its anticipated severity. Irrespective of the automatic telemetry control of the village position by the EA the FW's can monitor precise flood levels by reference to physical datum points on The Shrubbery Outfall headwall and survey station points on the Osiers access road. The critical level for action to start is when the river is 200mm (8") from the top of the outfall headwall to The Shrubbery storm sewer outfall when the penstock should be automatically closed. When the risk has passed the EA will similarly notify the FW's and then action can be targeted on any clean-up operation necessary and support for people who need help with any insurance claims. The full warning schedule is attached as **Appendix 2** to the plan.

While the principal action plan relates to the management of a flooding event there is significant work carried out by the Flood Wardens who regularly inspect the Green Brook inlet headwall, the general river levels, road gullies and the operational position of the penstock at the SWPS throughout the year. The operational status of this equipment and the ambient river levels are of particular interest and ensuring they are fully operational at all times is good practice for any operational plan to manage a flood event. Keeping mobile phones charged and available and checking the stored equipment are also prime actions for the Flood Wardens.

For the management of any flood event the village has been split down into six areas where flooding risk exists and **Schedule A** identifies six areas at risk (see also **Drawing No. EVFP 1**) and explains the source of the flooding for each. The action plan is then split into three schedules one for each of the three warning conditions and are attached as **Schedules B, C, D**. Finally there is **Schedule E** which shows action triggers, equipment needs and response times.

The schedules B, C, and D assume full operational capability of the Storm Water Pumping Station (SWPS) at the junction of The Beck / The Shrubbery and Church Road. In the event that this is not the case there is an additional Plan B in **Schedule F** that addresses action in that event that the SWPS is not fully operational. Within this schedule there are differing actions dependent on the extent of the problem with the SWPS.

There are two fundamental back-up actions intended to remedy any SWPS failure:

- Loss of power – EA to bring in a stand-by generator.
- Pump breakdown – EA to bring in temporary pumps.

There are facilities fitted within the SWPS that enable both of the above actions to be very simply and effectively put in place and to alert the EA engineers of any malfunction within the SWPS:

- Automatic alarms warn the EA offices in Fradley of any faults in the pumping station;
- a dedicated ancillary power input socket is available for temporary generator power;
- a fixed delivery pipe is available to take temporary pump suction pipes.

This latter facility enables easy and straightforward access to the pump sump and discharge well removing the need for the trailing pipework that has hampered road access during the flood events of the past.

Individual Auxiliary Flood Warden's (AFW) have been identified to take charge in areas 2-6 incl. of the flooding risk areas identified in Schedule A. In the case of The Beck and Croft Close six have been established due to the extent of work involved in the event of a flood in this area. Area 1 Stubby Leas has its own Flood Plan which will be administered by its full time management staff.

The AFW volunteers are listed in the Flood Warden / Auxiliary Flood Warden schedule attached as **Schedule G**. The AFW's for The Beck and Croft Close will only be needed in the event of a major failure of the SWPS or where demands elsewhere are high. **When the SWPS is fully operational there is no flooding risk in this area.** The Osiers and The Mill will need proportional support dependent on the severity of any flood event as they have areas open to the river flood plain. The Shrubbery only has a problem for long duration high river levels but the risk level is very low and remedial action is simple and effective. In the event of a Flood Warning a flyer will be circulated to all at risk properties with a list of contact numbers and a description of how to summon help on one side and a large red letter 'H' on the other. The 'H' side will be displayed in a window by all residents needing the attendance of an AFW who on seeing the signal when circulating the village will call at the house and provide any help required.

The AFW'S will provide the support defined in **Schedule F** along with any other actions necessary to support the local people particularly those who are the most vulnerable through age or disability. **Schedule H** shows the list of vulnerable people within the village area.

Contingency plans are in place to allow for the eventuality that the Village Hall is not available for use as a Report Centre (RC) / Emergency Evacuation Centre (EEC). It is most unlikely that this would occur but plans are in place to use firstly the Elford Working Men's Club premises which despite being on The Beck have threshold levels well above flood levels. Finally in the event that neither of these premises is available then the church will act as the RC/EEC. This is recorded in **Schedule J**. There will be an emergency car park for any displaced cars on the Church Drive (see **Drawing No. EVFP 1**)

In any emergency situation contact phone numbers and email addresses are critical and those relevant to this plan are recorded in **Schedule K**. In an attempt to pre-empt some of the questions that are bound to arise a short series of FAQ's have been generated to provide pre-emptive answers

and contact details and these are listed in **Schedule L**. An Emergency Contact Form for vulnerable householders to use to get help from the Auxiliary Flood Wardens is appended as **Schedule N**.

An added level of protection for all properties at risk would be provided if each householder prepares a personal Flood Plan. Copies of the EA document that gives a framework for a personal plan is attached in **Appendix 12**. Copies have been made available to all properties that have previously flooded and all householders who feel vulnerable to flooding can request a copy from the Flood Wardens or direct from the EA.

Following any flood event there will be a recovery period when the affected areas will be restored to an acceptable environmental condition. The lead in this work will lie with Lichfield DC as the Local Authority for the area however the Flood Wardens and Auxiliary Flood Wardens will assist where necessary to target action and ensure a timely and effective clean up takes place.

Additionally following the whole flood event and clean up exercise the FW's and AFW's will hold a debriefing when the effectiveness of the plan will be assessed and any modifications agreed and put into place. This will be supported by an annual review of the plan particularly to ensure that the contact names and numbers of all included stay current and correct.

LOCATION OF RISK OF FLOODING / SOURCE OF FLOODING

Schedule A

Area Number	Location of Risk (Area)	Source of Flooding	Flow Route
1	Stubby Leas NH	River Tame	Property within floodplain but on raised ground. River flow is south to north around the premises.
2	The Osiers	River Tame	River flows south to north along the road cutting off the access to property. No rear access to property. (Action Point)
3	The Shrubbery	Impounded rainfall / Green Brook overflow	Properties lie in a hollow which fills with standing water when the SW outfall is closed due to high river levels.
4	The Beck / Croft Close	River Tame/ Green Brook	Surcharging river water backs up onto The Beck if not obstructed. Green Brook flows east to west when it overtops flowing down The Beck.
5	The Mill	River Tame	The river flows south to north and floods via an old mill race through the properties which form an old mill complex.
6	Green Brook Culvert	Green Brook	Green Brook surcharges if insufficient pumping / free discharge and it breaks its banks outside 61 The Beck and flows west down The Beck.

FLOOD ALERT SCHEDULE**Schedule B**

Level Of Warning	Location of Risk (Area)	Action	Notes
Flood Alert	Stubby Leas NH (1)	Contact Duty Officer and check that they are aware of warning and assess if help needed	This is all managed through the NH's own Flood Plan. Property cut off from village once river breaches its banks. Support mainly Emergency Services.
	The Osiers (2)	Monitor River Levels and notify relevant AFW. If river breaches banks inform all householders of potential risk.	Property thresholds are above the 1 in 100 year flood level but vehicles are at risk if left on the access road. Rear exit of properties is not available but the facility would be beneficial. (Action point)
	The Shrubbery (3)	Monitor River Levels and if river breaches banks inform all householders of potential risk.	Houses protected by flood flap / large storage pipe for short duration floods. Longer flooding periods may require pumping from SWS onto Beck. Household have a 2" SW Pump for this eventuality. Past problem of backflow resolved by recent work to gullies.
	The Beck / Croft Close (4)	Monitor River Levels and if river breaches banks inform all householders of potential risk. Contact STW to ensure that the foul / combined sewer PS is operating normally.	The whole Beck area is now protected by a large capacity SW Pumping Station. Only threat of flooding is if the SWPS is not operational. In this event Plan B will need to be implemented (see Schedule F). Manual operation of the penstock in the SWPS is available to protect from river flood water but there would be a potential major risk from flows in the Green Brook if operated without local knowledge.
	The Mill (5)	Monitor River Levels and notify relevant AFW. If river breaches banks inform all householders of potential risk.	These properties are adjacent to the flood plain and have suffered significant flooding in the past. Recent work by householders has done much to mitigate flood impact.
	Green Brook Culvert Inlet(6)	Inspect grillage and ensure that it is clear and serviceable.	This inlet is protected by a new inlet structure but it needs to be effectively maintained. EA (Action Point)

FLOOD WARNING SCHEDULE

Schedule C

Level Of Warning	Location of Risk (Area)	Action	Notes
Flood Warning	Stubby Leas NH (1)	Notify Duty Manager that flooding is expected. Ensure that they are aware and enacting their flood plan. Give them the Flood Warden contact details.	We can only help with notification / checking as once the river breaks its banks the village is cut off from the NH. We could provide help prior to flooding if the home was desperate for help.
	The Osiers (2)	Notify AFW for area. Ensure all cars are at high level / removed. Ensure that householders are aware and check potential needs for access / food etc. Give FW contact details.	Property thresholds are above the 1 in 100 year flood level but emergency access via rear is not available. This should be addressed as it could be a great benefit particularly to any vulnerable people in residence. (Action point))
	The Shrubbery (3)	Notify AFW for area. Inform residents of risk. Ensure their pump is serviceable if needed. Give them the FW contact details.	Houses protected by flood flap / large storage pipe for short duration floods. Longer flooding periods may require pumping from SWS onto Beck. Householders have a 2" SW Pump for this eventuality.
	The Beck / Croft Close (4)	Monitor river levels. Liaise with EA on the serviceability of the SWPS and if all clear and operational no further notification required. Contact STW and ensure that the foul / combined sewer PS is definitely operational. If not get them to take immediate remedial action	Any potential failure of the SWPS would require Action Plan B – Schedule F to be enacted. This would be necessary to protect properties on The Beck, Croft Close and The Shrubbery.
	The Mill (5)	Notify the AFW for the area. Contact the householders and ensure they put their own flood plan into action. Give them FW contact details. Notify the Fire Brigade of their potential need for pumping support for extended flooding.	Householders and local AFW to contact the Fire Brigade if there is potentially a need for their help. AFW to keep FW contact centre aware of request.
	Green Brook Culvert Inlet(6)	Notify AFW for the area and ensure the grillage is clean.	Local AFW lives adjacent to the structure and can quickly ensure that the screens are free and operational.

SEVERE FLOOD WARNING

Schedule D

Level of Warning	Location of Risk (Area)	Action	Notes
Severe Flood Warning	Stubby Leas NH (1)	Monitor situation as necessary.	Once a severe event is underway there is no way we could help and any contact may be considered an unnecessary / unwanted distraction to the staff. At this stage only help when asked.
	The Osiers (2)	Notify AFW for area. Ensure all cars are at high level / removed. Ensure that householders are aware and check potential needs for access / food etc. Give FW contact details.	May need to try to gain access to properties if there is a protracted flood event. Monitor via phone from help desk.
	The Shrubbery (3)	Notify AFW for area. Inform residents of increased risk. Ensure their pump is serviceable and if not warn Fire Brigade of potential need for pumping support. Give FW contact details.	
	The Beck / Croft Close (4)	Ensure the SWPS is operational and if all clear and operational no further notification required. Any problem move to Plan B.	Any potential failure of the SWPS would require Action Plan B to be enacted. This would be necessary to protect properties on The Beck, Croft Close and The Shrubbery.
	The Mill (5)	Notify the AFW for the area. Ensure the residents are aware of the increased threat and that their plan is working.	We can raise help if needed and the SWPS is operational as all eleven FW's / AFW's could help.
	Green Brook Culvert Inlet(6)	Notify AFW for the area and ensure the grillage is clean and remains clear.	Local AFW lives adjacent to the structure and can quickly ensure that the screens are free and operational.

LOCAL FLOOD ACTIONS – Action Triggers, Equipment and Response Times

Schedule E

Area	Location	Action Trigger	Local Action	Equipment Required	Time Required
1	Stubby Leas NH	Flood Warning	Monitor with operational staff	None	N/A
2	The Osiers	Flood Warning / river levels reach top of Shrubbery Outfall headwall	Monitor with Householders	None	N/A
3	The Shrubbery	Flood Warning/ river levels reach top of Shrubbery Outfall headwall	Ensure pumping facility serviceable	2" SW Pump	30mins
4	The Beck / Croft Close	Flood Warning / river levels reach top of Shrubbery Outfall headwall	Monitor with EA. If problem with SWPS see Plan B – Appendix F	HD Standby generator, High Output Standby Pumps Sandbags	1hr unless the failure occurs during operation when instant action would be needed.
5	The Mill	Flood Warning	Monitor with householders	Sandbags	3hrs
6	Green Brook Culvert	Flood Warning	Monitor with EA	Rake	6hrs unless blocked during event then instant action required.

PLAN B – FOR USE IN TIMES OF SWPS FAILURE / UNAVAILABILITY

Schedule F

Level of Warning	Location of Risk (Area)	Action	Notes
Plan B – Major Failure of SWPS	The Beck, The Shrubbery and Croft Close (3) (4)	Contact EA to assess the situation / timescale for getting the PS operational. If more than 1hr progress below.	<p>AWF's to operate throughout the areas affected and support residents on a priority basis. Refer to list of vulnerable people. They will also:</p> <ul style="list-style-type: none"> • Help fill sandbags; • help fit door stops and air brick closures; • solicit help from other fit people prepared to help; • attend vulnerable people's houses • distribute food / flyers as necessary • help residents protect property and important documents and secure premises; • Circulate the area to identify needs; • Keep the helpdesk fully informed of action / needs. <p>Any action taken to use the VH as a rest centre will be supported by LDC representatives. The LDC standard documentation / systems will be used for registering attendance at and departure from the centre.</p> <p>If the PS failure is due to loss of power request a standby generator from the EA. If the failure is a pump failure request adequate standby pumping provision from the EA.</p> <p>In past floods the FWS PS in Croft Close has had problems due to the ingress of storm water from flooded sewers. The pumps are not rated nor could they be expected to pump the volumes of water involved. However STW need to ensure as far as possible that flood waters are not contaminated by raw sewage.</p>
		Set up help desk at the Village Hall	
		Provide noticeboard and maintain up to date information posted.	
		Activate relevant AFW's	
		Ensure the support pack is available for use.	
		Monitor river levels to maximise loss of Green Brook water / identify need to evacuate. Watch the river levels on The Shrubbery Outfall / Osiers road.	
		Let Emergency Services (ES) know who we are and what we know – liaise and support ES as required	
		Coordinate sandbag requirements / prioritise	
		Ensure all door protection / airbrick protection is fitted to property where available	
		Help with evacuation if it is necessary	
		Coordinate food for ES's and any people evacuated to the Village Hall, Working Men's Club or the Church in conjunction with LDC reps.	
		Pursue the reinstatement of the SWPS with the EA.	
		Contact STW to ensure that the foul / combined sewer PS remains operational throughout the flooded period.	

AGREEMENT WITH OTHER BODIES

Schedule J

Organisation	Support Provided	Contact No.
Village Hall Committee	Village Hall as a report centre / Emergency Evacuation Centre Main Emergency Centre Key holders contact numbers	01827 383056 (Greg Watkins) Beck Cottage, The Beck 01827 383817 (Anne Kent) 2 The Osiers 01827 383487 (John Rowbottom) The Hawthornes, The Square
Elford Working Men's Club (WMC)	Use of Club as alternative report centre / Emergency Evacuation Centre Back up Emergency Centre Key holders contact numbers	01827 383461 (Maurice Harvey) 2 Croft Close 01827 383807 (Anne Rowley) 8 Tamworth Road
Elford Parochial Church Council	Use of Church as Emergency Evacuation Centre if there are problems with the Village Hall / WMC Alternative location Emergency Centre Key holders contact numbers	01827 383195 (Denise Burgess) 23 Croft Close 01827 383487 (John Rowbottom) The Hawthornes, The Square

EMERGENCY CONTACT PHONE NUMBERS

Schedule K

Organisation	Function / Personal Role	Phone No.	Mobile No.	email
Elford Parish Council	Flood Warden – Dave Hill	01827 383645	07749 024519	dave@scaravay.com
	Flood Warden – Brian Green	01827 383381		
Environment Agency	Floodline	0845 988 1188		
	Quickdial	05212232		
	Incident Hotline	0800 807 060		
	National Customer Services Engineers	08708 506 506		
Staffordshire County Highways	Local Office	01543 404 980		
	Flood Risk Manager – Matt Bulzacchelli	01543 510155	07773 791425	Matt.Bulzacchelli@staffordshire.gov.uk
Lichfield District Council	Resilience Officer – Nigel Walker	01543 308070	07734 850867	Nigel.Walker@lichfielddc.gov.uk
	Tim Matthews – EHO	01543 308755	07710 919252	
	John Roobottom – Land Drainage	01543 687546		
	Emergency Contact	01543 574 480		
	Normal Daytime	01543 308999 / 308000		
Severn Trent Water	Emergency Contact	0800 783 4444		
South Staffs Water	Leakline	0800 585 940		
	24 Hour	01922 622 271		
	Leakline	0800 243 352		
	Clean Water Supply / Emergencies	0800 389 1011		
Fire and Rescue Service	Emergency Contact (24hr)	08451 213 322		
Police	Emergency Contact	0300 123 4455		
Ambulance Service	Emergency Contact	01384 215555		enquiries@wmas.nhs.uk
Electricity Board – Eon	General Enquiries	0800 096 3080		
Central Networks	Emergency loss of supply	0800 328 1111		
Homezone		01543 420 800		
Association of British Insurers (ABI)		020 7600 3333		

FAQ's TO PROVIDE GUIDANCE FOR VILLAGERS DURING FLOOD EVENT

Schedule L

Issue	Response	Notes
Who are the Flood Wardens?	Dave Hill and Brian Green are the Flood Wardens and they have nine other Auxiliary Flood Wardens to help in an emergency.	Ring Dave on : 01827 383645 07749 024519 Email Dave on dave@scaravay.com Ring Brian on 01827 383381
I don't have a phone or computer available?	Ask a Flood Warden who will be circulating your area wearing a yellow fluorescent jacket during any event and ask for updates. You can also ask a neighbour to contact them on your behalf.	We will be provided with A4 notices to vulnerable people who can use them to signal for help by displaying them in their windows to get an AFW's to call.
I want information on the risks / actions when a flood occurs?	The Flood Wardens will record the current position on the noticeboard in the Village Hall based on information from the Emergency Services and feedback from the AFW's. Records will be kept to update the Flood Plan after the event. Also you can ring the FW's on 01827 383645 or 07749 024519	If you can't access the Village Hall just ring the FW's or stop an AFW when they pass.
Will there be any help available?	There will be an Auxiliary Flood Warden (AFW) for each area at risk and they can get additional help if there is a need. The village has six areas susceptible to flooding and each has its own AFW.	If in doubt ring the FW's. We will leaflet drop everyone in at risk areas to provide reminders of relevant contact numbers.
What can I do to help myself?	Prepare your own personal Flood Plan a template is available if you wish to prepare one just ask a Flood Warden.	The template is produced by the Environment Agency and copies can be requested from them too.
Will I have to put my own door baffles in place?	There will be help available but if you can do it yourself it will help as there will be much to do but if you have any problem just ask the FW's. AFW's will be around to offer help with anything needed.	Only Homezone properties have the prefixed door baffle equipment. The Homestead has its own airbrick covers.
Is further flooding very likely?	Whilst it is impossible to rule out future flooding the area of The Beck / Croft Close is now more secure from flooding than it has ever been and it would take a combination of very unlikely failures to create flooding in this area. The Mill and the Osiers will experience flood events each time the river overtops its banks but generally the situation is again better managed than it has been in the past. The Shrubbery area has been protected by recent works and the a private SW pump is available to cope with any problems.	The situation at The Mill is in the hands of the householders. The situation is manageable up to a 1 in 100 year event on the River Tame and we have to trust in statistics and hope that the 100 year event does not happen in the near future.

Schedule M**LIST OF FLOOD BOX CONTENTS**

	QTY
Polypropylene Box 600 x 400 x 300 – Storage Box	1
Expandable Flood Sacks – (Pack of 10)	1
Torch	1
Headlamp	1
Emergency Whistle	1
Reflective Foil Survival Blankets	4
Hand Sanitiser Gel – (large 240ml)	1
Heavy Duty Rubber Gloves (pair)	1
Waterproof Notepad/Pen.....	2
Water Purification Tablets – (Pack of 50)	1
Plastic sheeting for use with Flood Sacks	1
Kit Bag / Ruck Sack (22l Capacity).....	1
Waterproof Pouch A4	1
Disposable Camera	1
Pack of Antiseptic Wipes (100)	1
Roll of 20 Bin Liners	1

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Elford Village Flood Plan

Emergency Support Form - Key Contact Numbers

Flood Warden:

During a flood event the Flood Wardens can give you the latest up to date information on the flooding position in Elford. They can also get someone to come round and help with fitting any flood defences you have available, move any furniture to safe places in your home and notify Lichfield DC that they need to provide sandbags. **Use the MOBILE Number first.**

Dave Hill – Mobile – 07749 024519

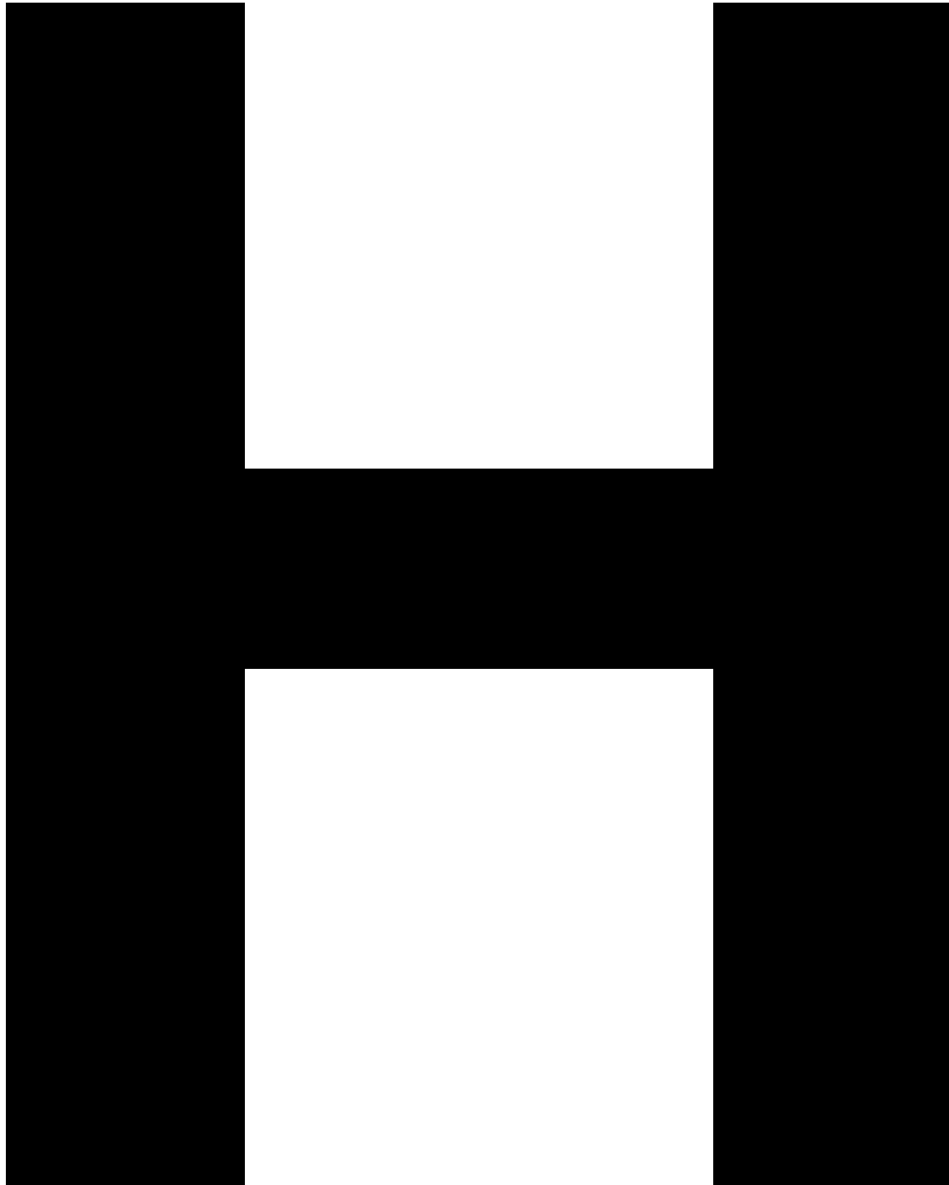
Landline - 01827 383645

Brian Green – Landline – 01827 383381

Major Emergency

If the Flood Wardens are unavailable for any reason you can ring the Environment Agency (0845 988 1188) for flood information or Lichfield District Council (01543 574480) for support. These numbers should only be called as a last resort as during flooding events they have many calls and need to prioritise the most important – **so try the Flood Wardens first to keep Emergency Lines Clear!**

If you are having difficulty contacting the Flood Wardens for any reason just put this sheet up in your window facing the road with the large letter 'H' facing outwards and our Auxilliary Flood Wardens will call when they do their tour of inspection.



Flood Wardens Role – Elford

The basic Flood Warden (FW) role is to ensure that plans are in place within the community to identify key actions and critical pressure points to support and guide people within the community during times of flooding risk. This is a voluntary role undertaken for and on behalf of the Parish Council.

A critical point that should be made clear at the outset is that the role does not directly impact on the actions of emergency services during an actual flood event. The FW role is intended to inform the local community on key issues regarding flooding prior to flood events and, where it is considered helpful, support and provide advice on local issues pertinent to any flood to the Emergency Services. The Environment Agency (EA) staff and the ES will take complete administrative and operational control during any flooding event.

The Flood Wardens will however:

- Monitor Flood Warnings from the Environment Agency;
- be available to provide their local knowledge of key pressure points and critical issues related to the geography, topography and demography of their area;
- will set up a contact point within the village with a known contact phone number at which they provide clear and simple position statements for the community regarding the practical steps taken and planned;
- provide support and feedback to the EA / ES representatives.
- hold a list of contact numbers for all operational and emergency staff and be the community's link to those organisations (this is not intended to preclude any individual from taking their own action regarding their own individual situations but to enhance and support the effectiveness of community action during flooding risk);
- hold copies of the latest guidance from the Environment Agency relating to their Flood Warning Service as well as published advice on action to minimise the impact of flooding on premises;
- be responsible for the Flood Pack held at the Village Hall with vital equipment to provide support during any flood event;
- provide whatever update reports are relevant regarding flood planning to the Parish Council;
- seek support from the community for auxiliary flood wardens to assist during flood events;
- meet periodically to review and update information and report any action necessary to the Parish Council for consideration;
- provide a simple plan setting out what information is available to members of the community and where it can be sourced.

The Auxiliary Flood Wardens Role

This is a voluntary support role provided by nominated people who will assist the Flood Wardens by:

- Monitoring the situation in their designated area
- Supporting vulnerable people in their area.
- Identifying and directing the provision of sandbags.

- Feeding back to the FW's at the control desk any needs of villagers affected by the flooding.

All FW's and AFW's must be issued with high visibility jackets and such equipment as needs dictate for particular events i.e. torches if working in the dark, two way radio's if action becomes critical, protective clothing if walking in water. There needs to be basic training for all people operating in flooded areas to ensure that all risks are understood and mitigated as much as possible.

Designated Flood Areas

1. **Stubby Leas Nursing Home (SLNH)** (Area 1) – this is the only designated site of vulnerable people in the village area and it is covered by a discrete Flood Plan managed and staffed by members of the management of the home.
AFW – Duty Officer for SLNH
2. **The Osiers** (Area 2) – this is a group of 4 houses adjacent to the main river channel and with floor thresholds above the 1 in 100 year flood level. Vehicular access is cut off when the river breaks its banks.
AFW – Roger Kent
3. **The Shrubbery** (Area 3) – this is a group of 3 houses protected from flooding by a flood flap but lying in a hollow making it vulnerable to localised flooding during long term high river levels.
AFW – Dave Warmington
4. **The Beck / Croft Close** (Area 4) – this is the main area flooded in past but now protected by the Storm Water Pumping Station on the Green Brook.
AFW's – John Price, Steve Lewis, Peter Sloan, Steve Poutney, Neil Taylor
5. **The Mill** (Area 5) – this is a group of 3 houses adjacent to the flood plain of the river built before floor levels were protected.
AFW – Mike Arnold
6. **The Green Brook Headwall** (Area 6) – this is the inlet to the Green Brook Culvert and for all flood events must be kept clear at all times.
AFW – Gary Delderfield

Flooding History

The village has a history of flooding and several residents have the experience of six or seven flood events over the last 40yrs. The primary impact of flood water in the village is on the The Beck which besides having the lowest road levels within the village also has a culverted watercourse carrying the Green Brook running beneath it. It is often the result of high intensity rainfall in the relatively small Green Brook catchment at times of high river levels that creates the flooding conditions.

In the early years the surcharging water ran west along The Beck to its junction with Church Road and The Shrubbery before spilling overland through a Trent River Board site into the main river channel. The development of the River Board site saw ground levels change and the construction of a culvert under the new development. The hydraulics of the new system were challenged at the time but the local planning authority LDC accepted the plans and the development went ahead with slab levels for the houses being set above the 1 in 100 year flood level of the River Tame. Practical experience of subsequent flooding events showed flood levels were slightly increased.

Concerns about surcharging river levels backing up the new culvert and the ability to discharge storm water from the Green Brook led to a proposal to provide a Storm Water Pumping Station (SWPS) at the junction of Church Road / The Beck / the Shrubbery. This was achieved by the acceptance of the Green Brook Outfall being designated as 'Main River' and the EA taking the design and construction of the new SWPS. Its construction was started in 2006 but for a variety of reasons, not worth rehearsing here, the completion was delayed. Unfortunately when the flooding events of the summer of 2007 occurred the SWPS was not operational. This was to lead to some unfortunate consequences as the part completed facility was not able to be effectively operated and flood levels were aggravated. This in turn led to properties normally above flooding levels having some degree of ingress of water.

Subsequently the SWPS was commissioned and it has shown in a minor flood event since commissioning that it has the capability to provide protection above those specified in storm drainage design guides. A schedule of the properties that have flooded in the past is attached as **Appendix 3**.

There are several reports that were produced by one of our residents who is a Civil Engineer both on the local flooding of Elford and the wider issues related to flooding and river floodplains. To ensure that there is a complete record of these reports they are attached as addendum appendices for information and future reference including some produced for the visiting Secretary of State for Floods after his visit to Elford in 2007. The reports are:

1. Flooding Event Elford Village - 21st/22nd July 2007 **Appendix 4**
2. Follow Up Issues to Flooding Event Elford - 21/22 July 2007..... **Appendix 5**
3. E. A. Meeting – Review of the Land Drainage Pumping Station Elford **Appendix 6**
4. Local Issues Briefing Note for John Healy - HM Government Minister of State for Communities and Local Government – Paper 1 **Appendix 7**
5. Strategic Briefing Note for John Healy - HM Government Minister of State for Communities and Local Government – Paper 2 **Appendix 8**
6. Insurance Flooding Report for No. 11a Croft Close, Elford – 8th December 2008... **Appendix 10**
7. Tamworth Flood Risk Management Strategy Document – July 2009 **Appendix 11**

These papers contain considerable information on flooding both local to Elford and more strategic matters. They may be useful to anyone with an interest in the background to flooding in Elford and perhaps the wider strategic issues related to property at risk of flooding and their flooding action plans.

There is a very pertinent issue related to insurance of properties that have flooded and the difficulties that householders face when their property has been flooded. In some cases insurance has been outright refused and for others the 'Excess' on the policy has been raised to very significant levels. This may seem a little unfair but insurance companies base their policies on probability and where a property has flooded several times its risk quotient increases and hence both policy cost and the 'Excess' where the policyholder shares a proportion of the risk. For property in any area where remedial measures have been taken after flooding it is essential that the insurance company understand the impact of those works on the probability of re-flooding. One example is a property in Croft Close where the 'Excess' for the renewal after a flooding incident was raised to several thousand pounds. In this instance work was done to raise the floor levels of the room that flooded, circumstances of the management of that flood event were unusual and a high capacity storm pumping station was installed to remedy the cause of the flooding source. A report was written (see **Appendix 10**) and it resulted in a reduction of 80% on the 'Excess' attached to the property. Lichfield DC and the Environment Agency can provide advice on the insurance of houses that have flooded and anyone concerned should contact them to ask for advice.

The Parish Council was consulted on a draft document called 'Tamworth Flood Risk Management Strategy Document' and subsequently a report was produced by one of the villages Flood Wardens suggesting the basis of the PC's comments. It is attached as **Appendix 11** to this report to underpin the wider issues of flooding in the River Tame catchment and its impacts on development.

CONCLUSIONS

It is clear from the content of this report that Elford is in a strong position to deal with any future flood event. Recent action taken by various statutory bodies has made the villages flood defence position far more secure than it has ever been in its history despite significant upstream development and global weather pattern changes. The existence of this Plan in itself is a strengthening of the villages' capability to cope with a future flood. It must however be recognised at this stage that when dealing with flood water generated by storms there can never be an absolute certainty in prediction of flood levels, impacts or frequency nor can we either practically nor financially plan for every eventuality.

With the provision of the following works the storm drainage network in the area is robust enough to deal with well above normal design criteria storm events:

- The high capacity Storm Water Pumping Station on the Green Brook outfall (EA);
- a new inlet structure on the Green Brook Culvert Inlet (EA);
- modifications to The Shrubbery storm outfall on The Osiers (STW);
- an upgrade of FWS PS Croft Close (STW);
- modifications and improvement to the highways storm drainage system and outfall in Church Road and The Square (SCC);
- localised works in the area of The Mill (Householders).

However if future weather patterns and associated conditions do deteriorate and given that the main SWPS does have some inherent shortfall in its sump capacity as well as potential under capacity / operational stresses on its main feeder culvert there is, as described in the Flooding Report in *Appendix 5* attached, an alternative relief route for storm water to the north east of the village. This could be a very cost effective upgrade to the Green Brook discharge by enabling it to bypass The Beck and SWPS and for it to outfall by gravity to the River Tame downstream of the village.

Fundamentally despite being located on the edge of the floodplain of the River Tame the village is well protected for flood events up to 1 in 100yrs on both the River Tame and the Green Brook.

This plan will need to be a living document and it will need to change as we gain experience of future floods and as any climate change impacts manifest themselves over the next few decades. For now it is intended to demonstrate the approach taken by Elford Parish Council in consultation with the EA and LDC for the effective local management of flooding events in the village.

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ELFORD PARISH COUNCIL

COMMUNITY FLOOD PLAN

APPENDICES

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Appendix 1

Who does what during a Flood?

Environment Agency (EA)

- Issue flood warnings;
- Receive and record details of flooding incidents;
- Monitor the situation and advise other organisations;
- Deal with emergency repairs and blockages on main rivers and own structures;
- Respond to pollution incidents;
- Advise on waste disposal issues.

Staffordshire County Council (SCC)

- Co-ordinate emergency arrangements;
- Maintain safe conditions on the roads;
- Put flood warning signs on highways;
- Organise road closures and traffic diversions;
- Clear blockages on highway drainage systems;
- Action to protect property from flooding by water from the highway where there is a failure of the highway drainage system.

Lichfield District Council (LDC)

- Co-ordinating role for their area;
- Flood warning dissemination (by local agreement with EA);
- Emergency assistance i.e. sandbags etc;
- Clear blocked watercourses;
- Pollution issues;
- Clear blocked road channels / gulley gratings;
- Emergency planning support groups.

Elford Parish Council

- Flood warning dissemination (by local agreement with EA);
- Distribute sandbags from LDC stockpile;
- Support Emergency Services where requested to do so;
- Provide local knowledge to all other agencies when needed.

Police

- Take over all co-ordination role during any incident;
- Emergency road closures;
- Public security.

Who does what during a Flood? cont.

Fire and Rescue

- Respond to all emergency incidents as required including rescue;
- Assist residents where their specialist expertise and equipment is required.

Water Companies

- Clear blockages on public sewers;
- Take action to protect property from flooding by water from the public water mains or discharges from the public sewerage systems.

Other Utilities – Electricity, Gas, Telecommunications

- Attend to emergencies relating to their service at properties where life is at risk due to flooding;
- Attend to flooding emergencies in their own service installations.

Businesses

- Protect their own premises and installations;
- Provide potential support services where expertise and equipment exists.

Property Owners

- Move to a safe area if life is at risk;
- Prevent water from entering property if possible;
- Switch off electricity / water at mains if property is likely to flood;
- Move valuable possessions to secure flood risk free areas.
- Move equipment and furniture where possible.

FLOOD WARNING SERVICE

Appendix 2

On-line Flood Risk Forecast	Flood Alert	Flood Warning	Severe Flood Warning	Warning no longer in force
<i>What it means</i> Be aware. Keep an eye on the weather situation	<i>What it means</i> Flooding is possible. Be prepared	<i>What it means</i> Flooding is expected. Immediate action required	<i>What it means</i> Severe flooding. Danger to life	<i>What it means</i> No further flooding is currently expected in your area
<i>When it's used.</i> Forecasts of flooding on our website are updated at least once a day.	<i>When it's used.</i> Two hours to two days in advance of flooding.	<i>When it's used.</i> Half an hour to one day in advance of flooding	<i>When it's used.</i> When flooding poses a significant threat to life.	<i>When it's used.</i> When river or sea levels begin to return to normal.
<i>What to do.</i> <ul style="list-style-type: none"> • Check weather conditions • Check for updated flood forecasts on our website 	<i>What to do.</i> <ul style="list-style-type: none"> • Be prepared to act on your flood plan. • Prepare a flood kit of essential items. • Monitor local water levels and the flood forecast on our website. 	<i>What to do.</i> <ul style="list-style-type: none"> • Move family pets and valuables to a safe place. • Turn off gas, electricity and water supplies if it's safe to do so. • Put flood protection equipment in place 	<i>What to do.</i> <ul style="list-style-type: none"> • Stay in a safe place with means of escape. • Be ready to evacuate your home should it be necessary. • CO-operate with the emergency services. • Call 999 if you are in immediate danger. 	<i>What to do.</i> <ul style="list-style-type: none"> • Be careful. Flood water may be around for several days. • If you've been flooded ring your insurance company as soon as possible.

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Flooding Event Elford Village - 21st/22nd July 2007***Appendix 4*****Introduction**

This report has been written by a Civil Engineer who experienced, first hand, the events of this flood from 4.15 pm on the 21st to 6.00am on the 22nd July.

The flood event was extreme with river levels rising at a rate previously thought to be unlikely if not impossible. The event involved the use of the new pumping station penstock to great beneficial effect. It involved a level of pumping and effort from both the Environment Agency (EA) and the Fire Brigade that was as exemplary as it was effective.

The whole process of river water levels and Green Brook levels were actually measured twice during the flood event to give accurate and real time relative levels on The Beck, part of the Osiers and the river.

The penstock in the Storm Pumping Station was only temporarily fixed at the time of the event but its availability was critical, despite it leaking slightly. The electrically operable penstock was not commissioned and had no power. It was operated using the manual emergency procedure.

The Event

The report of events is made here as statements of facts as I saw them and recalled at 10am the next morning. They are not intended in this section to be judgemental, merely factual, I will go on later to discuss the issues that arose.

The day was overcast but there was no measurable rainfall. This fact turned out to be a huge benefit as the forecast had been for heavy rain.

The first sign of real flooding began at about 4.30pm (21st) when a small patch of water on The Beck appeared outside No.22. This spread across the carriageway in 20minutes and it was clear that the need for pumping was urgent and essential. Two Environment Agency staff were already on site at 4.15pm and had a 6" pump set up at the Storm Pumping Station (SPS). This was extremely good planning and enabled immediate intervention as soon as the likely severity of the event became evident. Initially I did not see the scale of what was to unfold and was not concerned until about 8.00pm when it was clear that despite very significant emergency pumping capacity we were failing to control the rising flood levels on The Beck and in a section of the Osiers.

The flow in the Green Brook Culvert (GBC) was unusually sluggish at the start, which I understand, was due to a partially closed penstock which had been left in that position to control the flow and provide best standby position should it be needed to be closed quickly. At about 5.30pm (21st) Silver Control gave an instruction to close the penstock and to commence pumping. I considered the pumping capacity to be very limited but initially thought that it would cope. After about an hour (6.30pm ish) it was becoming clear that we needed more pumping capacity. Once the penstock is closed fully there is an essential need to be able to pump at least the base flow of the Green Brook if flooding is

to be averted. This was not the case and flood level rose moderately quickly. The decision was then made that a further 8" pump was required and thanks to the intervention of a past EA employee who was on site one was acquired.

The EA responded and the additional pumping capacity was provided and installed. Given events and pressures elsewhere, the decision was made in a timely and effective manner. The instruction process was a problem as the EA did not have an engineer on site. That said, the EA staff that attended were exemplary in their action within their remit to act. The whole process was very effectively supported at every stage by County Cllr Matthew Ellis, who was to play a key on site coordinating role.

It was not long before the need for even more pumping capacity was identified and a second 6" pump was provided by the EA. The decision was made to pump from the surface of The Beck as concerns were that the leaky penstock was circulating a percentage of water and the lowering of water was best served by disposing of it away from the SPS direct to the river.

We were unable to secure an engineer on site, despite strenuous efforts and it was not until about 11.00pm that an engineer arrived on site who was capable and authorized to make instant critical decisions. After his arrival things dramatically improved as he had a detailed understanding of the whole situation and more importantly he could make real time decisions and secure immediate action. He made a thorough check of every aspect of the flood – pumping station operation, flood levels / trends, feedwater levels and rates and a full review of the situation on site. He did much to allay concerns by answering questions from local people in a clear and concise manner. He also actively continued the coordination of all agencies active on site. This role prior to 11.00pm had been effectively discharged by County Cllr Matthew Ellis who fulfilled the coordination role above and beyond the call of duty and his direct responsibility.

Water levels on The Beck continued to rise and more pumping capacity was requested from the Fire Brigade who up to that point had not attended. Estimates of the timescale of events at this point would be pure conjecture on my part as things were happening very fast and the County Councillor was providing the principle, very effective, coordinating role in the absence of an EA engineer. The Fire Brigade then provided their high capacity pump (reputed to pump 9cumecs per minute) this was deployed and was very effective in helping control the rate of flooding on The Beck by surface pumping but water levels on The Beck continued to rise slowly.

An option to remove the 8" and 6" pump discharges from the pumping station to aid potential use of the penstock was not possible due to the lack of availability of adequate lengths of discharge pipes for the pumps.

Three properties on the Osiers were experiencing continued increasing flooding from a storm drainage grill in their locality. This was understood to be on a flood flapped system draining direct to the river. The flood flap either did not work or it does not discharge to the river. In the event and a little late in the day we decided to try to stem the flow from the grillage which was threatening to swamp the three houses. We sandbagged the grill, which was by then submerged, to poor effect. A second manhole lid also spilling water was sandbagged to a slightly better effect. Water continued to spill. An additional Fire

Tender then arrived and it was put to work pumping the flow by the three houses on the Osiers and it successfully controlled the flow albeit unable to reduce the level by more than 1". It did hold the level there to the benefit of the three houses.

A datum level was taken of the river water relative to the level on The Beck in the late twilight. This showed the river to be 190mm lower than the floodwater on The Beck at that time. This was perhaps about 10.00pm but I will stand correction. The river was rising continuously and very rapidly throughout the event with an increase of 14" being recorded over a five and a half hour period pre / post midnight. The forecast of the flood peak on the river continued to slip from an initial prediction of 10pm (21st) at the start to 12 noon (22nd) at the latest. By 4.00am the prediction was between 5am and 7am (22nd). The flood water eventually seemed to begin to recede about 5.00am (22nd) although the evidence was slight.

The battle to control the water levels on The Beck continued and basically despite the flood water continuing to deepen slightly the situation was held steady by the Fire Brigade and the EA staff. Levels were then taken by the EA engineer to ascertain the relative levels of the river at about 4.00am. At that time the river level was recorded as being 245mm (10") above the level of the water on The Beck, which was still rising albeit very slowly. This fact was astounding to most people on site and to me it was a revelation as it showed weaknesses in my own understanding of the flood water levels and their interaction in various areas of the village.

The weather in the local area stayed largely dry for the whole flood event. This was a major benefit in supporting all agencies in their ability to control the flood.

I left the scene at 6.00am with indications that the river had peaked but with water still building slowly on The Beck despite the best efforts of:

- 1no. Fire Tender pumping two discharge pipes in the Osiers
- 1no. 8" and 1no. 6" EA pumps overpumping the SPS wier
- 1no. 6" EA pump surface pumping direct to the river from The Beck
- 1no High Discharge 6" pump surfacing pumping direct to the river.

Efforts of all concerned could not have been better and the help of local people keeping the agency / emergency staff supplied with drinks and food all night was exceptional. The community of Elford knows how to react in a crisis and did much to help sandbag property and provide whatever they had that was needed.

Analysis

The reactions of all involved were good but as with all things there are issues to address.

The things that were effectively done in the face of events:

- The EA have provided a much needed pumping facility which, while not complete, provided an essential service at the peak of the flood event.

- The penstock in the SPS whilst only temporarily fixed provided a critical role in preventing backflow from the river which could have lifted flood levels by up to 10”.
- The EA pump support staff were on site very early and were very effective in preparing for what was to come.
- The EA engineer, once he was in attendance, carried out a comprehensive and very effective review of the circumstances prior to his arrival; he made fast and effective decisions once on site and he played a very safe strategy in a very fluid situation.(please excuse me one pun there was much humour on the night which benefited those who were under duress).
- The decisions made by the EA engineer on the night were wholly appropriate given the situation and his thoroughness when assessing critical potential action under pressure was a credit to him as an engineer.
- The coordinating role of Cllr Mathew Ellis was exceptional in the circumstances and he filled a gap effectively and efficiently keeping agencies coordinated, keeping local people informed, notifying Silver Command and supporting the move to Gold Command at an early stage.
- The effective provision of additional pumping capacity by the EA and Fire Brigade.
- The offer of additional pumping by Highway Authority staff who supported throughout.
- The support from Lichfield District Council staff was again effective and constant throughout the event.
- Homezone again had staff on site throughout the event to provide support.
- All agencies involved had staff on site in a timely manner and they did what they could at the earliest opportunity and were available well into the night.
- The EA and Fire Service were exemplary again.

Now the issues that need to be addressed:

- The attendance of the EA engineer was very late in the event despite early requests for his attendance by County Cllr Ellis. His earlier attendance would have meant that decisions based on his technical knowledge could have been taken earlier.
- The failure to commission the Storm Pumping Station as soon as the wetwell structure was available has caused major disruption during two flooding events.
- It is thought that a flood flap on a storm drainage discharge protecting three houses on the Osiers failed to operate – this needs specific investigation.
- Road closure was considered but for public convenience considerations it remained open – in the event full closure would have been better due to the irresponsibility of some drivers and damage to pump delivery pipes.
- There was no police presence and this was only an issue related to traffic management. I understand that no support was requested.
- The lack of availability of discharge pipe for the pumps reduced their operational scope and adequate lengths of pipe should always be available.
- Adequate information on relative flood water levels was not available.
- The closure of the penstock is not an off site decision as its closure timing is critical.

Conclusions

From the lists above it can be deduced that there is much more that went right than went wrong and even the issues to be addressed can be explained and have positive solutions:

1. The flood event was managed effectively and professionally by all agencies involved.

All agencies should be thanked and complimented on their action and professionalism.

County Councillor Ellis should be thanked for his dedication and commitment in coordinating on site matters prior to the EA engineer's arrival.

2. The decision to close the penstock was made remotely and may, in my own view, have been made too early. It was in fact done before we could test the effect of opening the penstock fully to release Green Brook flows during the first stage of flooding and assess any potential benefits. This point is my speculation based on information that I was previously given about the penstock being held in a half open position. The delay in closing the penstock would only have allowed a relatively small proportion of flood water to have passed to the river while levels were still relatively low. It would also have delayed the onset of pumping.

Any future manual operational decisions on penstock operation should be made by informed operational staff on site supported by adequate manuals.

3. The delay in the arrival of the EA engineer delayed decision making on key technical issues although in the event thanks to the coordination role of the County Councillor the negative impacts were largely mitigated.

An EA engineer should be in early attendance where there is potential for a severe flooding event and be at least available on call during lesser events with an hour's response time.

4. The lack of availability of the Storm Pumping Station meant that Elford suffered significant disruption during the recent two floods. That said, the transfer of the responsibility for the Green Brook to the EA was only just over two years ago and they did inherit a poison chalice. In that time they have secured finance for two major and overdue structures. They have designed, constructed and commissioned a very competent headwall on the inlet to the culvert. They have designed, constructed and are in the process of fitting out and commissioning a £190,000 Storm Pumping Station and they have undertaken some investigatory work on the culvert itself and continue to analyse the Green Brook situation. All in all in my opinion as a Civil Engineer with experience of bureaucratic process is that this represents a rapid very good, if not exceptional, response for a Government funded body.

The Storm Pumping Station must be commissioned and become fully operational at the earliest opportunity.

5. The matter of flows discharging into the low area by the three houses on the Osiers was a major concern. A further major issue created by this flooding is the fact that the backfeeding water surging up in this location, if river water, provides the potential for the river to breach the village defences. The flow was very high and it backfed through the electricity sub-station, round the wetwell structure and onto The Beck adding to the flooding. These flows are significant and in the light of the fact that the river levels are capable of exceeding levels on The Beck this is a critical issue in need of thorough and urgent investigation. The level survey carried out when the river level was above The Beck level, indicated that the water level by these three houses was more related to The Beck flood level than to the river level. This should be a key part of the necessary investigation and EA engineer's survey results need to be input.

A full investigation should be undertaken to establish the outfall location of the storm drain adjacent to these houses and remedial work should be undertaken to remedy any water backfeed problem.

6. The movement of vehicles is critical to the effective operation of work in the carriageway and in future any temporary emergency action should require the road to be closed to all vehicles except emergency vehicles. I apologise for being the voice of reason here when I supported letting vehicles at least leave the village. They disrupted operations, damaged discharge pipework and generally caused disruption to everyone operating in the area. This matter may be a none issue once the full operational capacity of the SPS is available but in the event of a pump failure or the need for additional capacity it should be born in mind and put into any emergency procedures.

The police should be called in to any future emergency situation where pumping is required in the road and all but emergency vehicles excluded from the Shrubbery.

7. The lack of availability of pump discharge pipe was almost inexcusable. To have pumps available and not to be able to use them to their full potential because a few hundred metres of delivery pipe were not available is very poor indeed. The pipes that were available to the EA staff were leaky, mismatched and really becoming unfit for purpose. In mitigation, they have had much use recently and people driving over them without regard to their importance are equally culpable. The fact is they need to be fully operationally effective.

The EA should carry adequate stocks of discharge pipe for all pumps to allow all options for flood water discharge to be used.

8. The manual operation of the penstock is a critical issue and needs to be governed by clear and tight procedures. They need to be informed by good dynamic level information on the river levels and the levels on the Green Brook. The criteria for manual penstock closure should include the following:

- a. The river level has to be known and threatening.
- b. Adequate pumping capacity has to be available to **at least** pump the trapped Green Brook base flow.
- c. Competent river and Green Brook levels need to be available real time and regularly reviewed – this is a critical issue and would have been a major benefit to the live management of the flooding event.
- d. An EA staff member able to make competent informed decisions has to be available on site to manage the process.

The decision on manual operation of the penstock should be made on site by EA staff who understand the operation of the SPS and can make intelligent Informed decisions.

An effective flood level monitoring arrangement should be set up at the earliest opportunity with live real time information being available directly on site.

A larger manual windlass should be fitted to penstock to allow significantly better and speedier emergency operation than was possible this time.

A final point to make is about the weather as had we had the forecast rain we would have been in significant difficulty. In the event we had virtually no rainfall in the Green Brook catchment and Birmingham did not do too badly either. Had there been even moderate rainfall during the flooding time discussed here we would have had a significant problem and significantly higher potential flood levels. The sooner the SPS is in and working the easier we can all rest easier in our beds.

These conclusions and recommendations are all made with the best of intent, I hope they help. I mean no criticism of anyone involved in the management of the event and I add my own thanks and congratulations to all the Agencies' staff involved all of whom were a credit to their organizations; I am a local resident and I and my family have benefited from your professionalism.

P.S. This is an installment as I have written before the flooding event is over. I am now about to enter the second phase of the event and will add anything that may be needed.

DRH EFR/4 – 22/07/2007

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Appendix 5

Follow Up Issues to Flooding Event Elford - 21/22 July 2007

Introduction

These notes supplement the more focused report on the flooding event in Elford following a little more reflection on what happened, why and how we can better manage the situation. I believe there are four key aspects to the way forward:

1. The immediate practical technical considerations that can be evaluated and resolved.
2. The public understanding and perceptions.
3. The likely procedures required to ensure that the all Agency's and their staff understand what is going on and how to deal with it.
4. The wider scope action that will help reduce or avoid future flooding.

1. Immediate Actions

These are covered in detail in the earlier report but for completeness the action list is repeated here:

- Any future manual operational decisions on penstock operation should be made by informed operational staff on site supported by adequate procedure manuals.
- An EA engineer should be in early attendance where there is potential for a severe flooding event and be at least available on call during lesser events with an hour's response time.
- The Storm Pumping Station must be commissioned and become fully operational at the earliest opportunity.
- A full investigation should be undertaken to establish the outfall location of the storm drain adjacent to the three houses on the Shrubbery and remedial work should be undertaken to remedy any water backfeed problem.
- The police should be called in to any future emergency situation where pumping is required in the road and all but emergency vehicles excluded from the Shrubbery.
- The EA should carry adequate stocks of discharge pipe for all pumps to allow all options for flood water discharge to be used.
- The decision on manual operation of the penstock should be made on site by EA staff who understand the operation of the SPS and can make intelligent informed decisions.

- An effective flood level monitoring arrangement should be set up at the earliest opportunity with live real time information being available directly on site.
- A larger manual windlass should be fitted to the penstock to allow significantly better and speedier emergency operation than was possible this time.

2. Public Awareness

Public perception and awareness of the issues related to flooding paramount if we are to get their sympathetic reaction to future events. It is necessary for them to realize:

- the Storm Pumping Station is designed on a 1 in 100 year storm and why;
- how the flooding is created in various parts of the village - levels
- the implications of a storm event that exceeds a 1 in 100 year event;
- the cost of the works already provided;
- the level of work and commitment put in to supporting the village during both flood events – input cost would be impressive plus staff hours; worked, number of sandbags, clean up action, investment by Homezone etc.;
- the work still being done to implement action identified and deliverable from experiences of the events;
- no-one is to blame for the water but certain Agencies are for the reaction to it – within sensible and practical parameters;
- action continues after the flood event itself to - clean up, learn from the event and plan future action and perhaps identify possible action.
- the nature of the work that goes on year in year out to improve and maintain flood defences and the current and proposed investment levels.

3. Future Procedures

There is a need to have clear operating procedures for the new SPS and for them to be available not only to the EA staff directly responsible for their implementation but also the other emergency services attending. The relationship of the river levels at any point in time in relation to the flood water on The Beck is critical.

From levels taken during the last flooding event we know that the river is capable of flooding the main village and that the timing of the closure of the penstock is critical if the maximum quantity of flood water is to be passed by gravity prior to penstock closure.

The procedures at time of flood should be available in the village possibly through an arrangement involving the Parish Council and stored in the Village Hall almost opposite the SPS.

It is accepted that the procedures need to reflect the operation of the new SPS station in a way completely different from the recent two flood events but

ultimately in the event of a failure of the power supply and the potential failure of the back up generator a similar emergency situation will exist. This will require similar action and decisions in terms of pumping locations, penstock closure timing and discharge locations to those just needed.

4. Wider Action Issues

The outcome of the last two flooding events identified some new and previously mis-understood facts:

- the river can flood The Beck (last event by up to an additional 250mm – 10”) if there was no penstock protection.
- The three houses on the south side of the Osiers are vulnerable from back-flowing water from a substantial source causing a backflow of water onto the Beck.
- The river can rise by 14” in 6 hours despite the extent of the floodplain and presence of bridges restricting flows in the floodplain.
- An overland route through the Osiers could potentially expose the village centre to more extreme flooding.

All of these points need detailed investigation to inform future action but they serve to tell us that our historic / anecdotal understanding is flawed.

One issue not previously identified is the issue of houses on the edge of the village that suffer direct flooding from the river. They should have access to the best specialist advice to enable them to protect their own property with bespoke flood defenses should they wish to do so. They should also have direct access to the best flood level information and advice when flooding risk is identified.

Two key potential actions need to be investigated further are:

- The Green Brook Culvert needs to be assessed for lining given the changed hydraulic loading regime on it due to pumping and the limitations of the wetwell capacity of the SPS. (Medium term).
- The potential of a diverting brookcourse to take peak flow off the Green Brook on its approach to The Beck to take it across the fields to the north of the village and away to the river flood plain to the north-west. (Longer term).

Conclusions

The action identified as short term should be actioned as a matter of urgency.

The publicity issue needs to be addressed particularly if the common belief that flood return frequencies are materially changing and flooding will be more intense and regular.

The following wider critical issues should not be forgotten:

- A culvert collapse at time of flood could have particularly disastrous consequences.
- The potential to cap peak flows and divert the remainder around the village would have major benefit to the village for relatively moderate cost.
- The houses directly 'at risk' from the river would benefit greatly from timely access to the best information on impending flood events and their own bespoke flood protection measures.

DRH EFR/5 – 24th July 2007

Appendix 6

Environment Agency Meeting – Review of the Land Drainage Pumping Station Elford

Time and Date of Meeting - 10.00am on the 10th July 2007

Attendance – Gary Tustin – Technical Specialist }
 Martin Hayes - M & Elec Designer } Environment Agency, Fradley Office
 Dave Hill – Local Resident (Civil Engineer)

Purpose – to assess the design criteria for the new Land Drainage Pumping Station recently constructed in Elford and currently being commissioned.

Key Issues –

1. Design storm frequency / peak flows.
2. Station pumping capacity.
3. Control Systems.
4. Power Supply.
5. Water delivery / access to wet well.
6. Overland emergency discharge.
7. Flood plain levels.
8. Future Maintenance systems and management.
9. Additional Work.
10. Timescale.

Background

These notes relate to the above meeting and are intended to clarify and provide an overview of the current position on the pumping station and provide a measure of understanding of the issues and complications of the process of project design and delivery.

It should be borne in mind that the Environment Agency (EA) has only been responsible for the Green Brook culvert which runs under 'The Beck' for two years. The culvert is a piece of drainage infrastructure in the form of an old brick culvert that runs under the northern pavement of 'The Beck', a local road. The culvert has been neglected for many years and has the added problem of flooding periodically at times of extreme rainfall at which time it overflows down the road sometimes flooding houses. The flood water overland discharge has been cut off from the river by a new development. The culvert is a significant liability and had lacked adequate headwall protection until very recently and was without any planned capital or programmed maintenance. These are facts not excuses.

The EA have already built a good headwall structure on the culvert inlet at its upstream end to prevent access into the culvert of weed and debris likely to cause blockages. They have assessed the culvert and its potential programme of maintenance work and have already provided a pumping station structure. Works are in hand to commission a sophisticated pumping arrangement within the structure to help overcome or at least mitigate the extent of the flooding problem.

I believe that we are indeed fortunate to have had the Beck culvert and Green Brook designated Main River enabling the future maintenance of the brook to be organized and undertaken by the EA.

Detailed Discussions –

1. Design storm frequency / peak flows -

- The station has been designed on the standard 100 year design storm meaning that the station should only be unable to cope with rainfall once in 100 years.
- That does not mean that the Beck will not flood it means that the upper flood level will be restricted to a point below the door threshold of all houses on the Beck and on Croft Close.
- This design process is not an exact science but it is based on the current accepted design criteria for schemes of its type.
- Following the meeting I am as convinced as I can be, without detailed evaluation of the design calculations, that the design has been comprehensive and has provided a competent pumping station likely to mitigate the flooding of houses.
- In time the pumping station will demonstrate its practical capability but I can confirm that its conceptual design is robust.

2. Station pumping capacity -

- The pump is a variable speed pump which will adjust its operating speed to meet flow requirements between 0.1 cumecs (one tenth of a tonne of water a second) up to a set maximum of 2.0 cumecs (two tonnes of water a second). This is an impressive operational range.
- Each fire tender used in the last flood were said to be capable of pumping 1.0 cumec per minute (one tonne of water a minute) to give you an idea of the relative power of the new station (120 times more than one fire tender).
- Peak 100 year flood flows (3.5 cumecs) will exceed the ability of the station to pump all the water (max 2.0 cumecs) but storage of the excess flow within the Beck culvert and on the road / pavement areas should be sufficient to balance peak flows without flooding property.
- There is a potential maximum pumping capacity of 3 cumecs for the installed pump but the constraining factor is the ability to get that volume of water to the station at that rate to keep the pump operating satisfactorily.
- A design addition is being investigated to get more flood water into the culvert more quickly and hence to the station, the pump and subsequently to the river (see later note).

3. Control Systems –

- The station is to be controlled by an ‘intelligent’ control panel that will open and close the penstock gate in the station automatically prior to the start of pumping and operate the pump in relation to the river level, the downstream level in the Beck culvert and the inlet level of the pumping station wet well.
- This approach is sophisticated and should ensure that penstock gate does not get closed too early exacerbating the flooding level. This was a major concern of mine prior to the meeting.

- The system will only work automatically and to its optimum when there is electrical power to the station.
- In the event of no power being available it will be necessary for manual operation of the system which will be slow and will need an informed and competent operator to be available to make the station work (see later note).

4. Power Supply –

- There is an electricity sub station adjacent to the pumping station making the base supply very easy to provide and reducing any fault risk to the link.
- The EA are to provide a back-up generator to power the station in the event of a major power outage to the village.
- This stand-by generator will be in position next to the pumping station. Operational systems will need to be in place to ensure that it can be switched on in a timely manner.
- The final design back-up is the provision of two pumping supplementary sumps in the pumping station wet well to take two separate emergency pump suction pipes – either fire engines or trailer pumps will be able to provide simple, effective and additional reserve pumping capacity (see later note).

5. Overland Emergency Discharge –

- The historic overland relief route was lost at the planning stage of the redevelopment of The Osiers and Victoria Meadow when twin culverts (underground pipes) were said to be adequate to take the flow. This statement was refuted as incorrect by several local residents at the time of the planning application but the comments were disregarded.
- In the event the latest flood (June 2007) was higher than previous flood events and many of us are convinced that it was due the obstruction of the old surface relief route by the new housing. This conclusion is widely shared by other local people who live in the flooded area, understand the flooding and have had experience of past flood events.
- The replacement of this route is feasible but it would involve major disruption to new gardens and drives.
- The need for the overland route will have been alleviated to a degree by the new pumping station but that level of alleviation has yet to be proven.
- This matter may need to be re-visited.

6. Flood plain levels –

- The river is not the creator of flooding in the Beck area of the village.
- The flood water comes from the Green Brook catchment lying to the east of the village and when the culvert cannot accommodate the flows it overflows at its inlet headwall creating flooding along The Beck and into Croft Close.
- The river level dictates the rate at which the Green Brook culvert discharges its water into the river, the higher the river water level the slower the rate of flow of the brook. This restraint of flow in turn determines the level of Green Brook flood water on the road. It is not river water on the Beck.
- The flood plain adjacent to and upstream of the village between Elford and Tamworth is a massive 5-6 square miles and it has several restricting structures

(bridges and flood arches) on the river that hold back water in the various sections of the flood plain all helping to reduce river levels in Elford.

- Once the river spills beyond its banks into the flood plain for the water level to rise on the river by the village by an inch would take millions upon millions of gallons of flood water and even at the level of the last flood the river had some 15-18 inches to go before it would be high enough to get back into the main village. Its balancing capacity is enormous.
- That is not to say it could never happen but the event would have to be massively worse than the recent event which in itself may have been bad but was no where near the level to cause Elford a major flooding problem from the river water.

7 Future Maintenance systems and management.

- It is clear that we need simple yet comprehensive management manuals for the Pumping Station and that they need to be available to the station operators, the fire service and possibly the local community (see later note).
- Maintenance needs not only to be undertaken for the pumping station but also for the culvert that feeds the pumping station / river.
- The culvert outfall headwall to the river needs access ladders to make maintenance safe and simple to ensure free flow and the lowest flow invert and highest flow capacities are maintained.
- Maintenance work is already required to the river outfall.
- Drawdown impacts on the brick culvert need to be assessed both for potential precautionary remedial works now and the likely future maintenance needs (see later note).
- Manual operation of the station will be a specialist operation and will need to be timely and precise if flooding is not to be exacerbated by the station failing with the penstock in a closed position.

8 Potential Additional Work –

- Work may be needed to be undertaken in the brick culvert that takes the base flows due to the changed free flow regime to the new pumped situation. A further survey is needed to identify the nature and scale of work required.
- There may be need for additional grating entry points on the culvert to enable flood water a more direct and hydraulically efficient route into the culvert and subsequently the wet well for pumping to the river.
- Additional topographic survey work is required to identify optimum locations for these extra grating ‘sinks’ – target low points (deepest flooding points) on The Beck.
- CCTV Survey to assess maintenance work required; cleaning to remove debris and improve flows and possibly lining of the culvert to reduce coefficients of friction and aid the rate of flow, improve structural integrity and increase capacity.
- Access ladders and maintenance works are required at the river outfall to the Green Brook culvert to allow safe access and allow removal of silt built up and impeding the Green Brook flow path.

9. Timescale –

- Precise timescales for the work were not discussed although the work to the station has been brought forward from the 2008 capital programme thanks to underspends on other schemes.
- Programme delay on the initial work to the station was caused by cuts to the Land Drainage Budgets to support other urgent financial priorities of Central Government.
- Work to complete the station are in hand and perhaps we can get a clearer view on dates at the public meeting to be held on the 11th July 2007 in the Village Hall.

Additional Points Discussed

- All of the above issues were discussed at the meeting and there was general agreement that it had been a useful exercise.
- Additional issues were identified worthy of further consideration.
- It was suggested that a formal opening of the pumping station should take place supported by a presentation of the design principles and intended impacts to inform villagers of both the level of investment and the commitment of the EA to resolve the problem.
- From Section 2 the issue of increasing the flood water access to the station has identified the need to review levels on the Beck and the need for additional grated 'sinks' to allow water to get into the culvert in the areas beneath the deepest flood water. These 'sinks' will allow the maximum practical rate of flood flow into the station and enable the maximum operational pumping capacities to be used in the station.
- From Section 3 the manual operation of windlass to move the penstock will be a very slow process and it will need an expert eye to judge the flow rates in the culvert to determine when the gate can be closed as if this is done too early there is a risk of worsening the flood levels on the Beck. Local knowledge and understanding may help ensure that this eventuality is best managed, particularly if it is emergency services dealing with any event and not Environment Agency staff. Having a simply written manual section for this eventuality in the Village Hall office which is virtually 'on site', may help. A local flood warden role may also be able to help.
- From Section 4 the ability to bring in additional reserve emergency pumping capacity will help if there are problems with power or the pump itself. This position will require a clear procedure with the locations illustrated for emergency pumps adjacent to the pumping station to ensure fast and effective operation. There also need to be clear markings identifying the supplementary wet well draw off pipes to enable fast and effective back up pumping to start at the earliest point in any flood event. This facility will avoid all the road obstruction created by the last event as the discharge will be right next to the suction point within the station (no trailing discharge pipes). It will be an incredibly effective and efficient back up facility if it is operated effectively.
- From Section 7 there arises the issue of the structural integrity of the culvert and the impact of dynamic pumping flows within it. This will create greater draw down of water and pulsing of flows that will result in suction and pressurizing forces being exerted on the culvert. As it is a very old and poorly maintained brick structure it is the

last form of operational 'loading' that it needs. Open joints, loose bricks and tree roots pushing in through the bricks no doubt already take their toll on the structural integrity of the culvert but a sucking and blowing action could lead to collapse at times of flood creating all kinds of risks and flow continuity problems. A proprietary lining system could help strengthen the structure, negate the pumping water effects and increase the flow characteristics of the culvert to increase capacity. This matter needs careful monitoring, if not immediate action.

Conclusion

Firstly I must thank the Environment Agency for access to their hard pressed technical staff for the meeting on site at the pumping station. They were very open and helpful about all aspects of the scheme for the pumping station and very well informed on every aspect of its development and design.

The station design gives us protection for what is rated as a 1 in 100 year storm and that is a key point. If a future event is rated at a higher event return period i.e. a 1 in 500 year event, we will still be at risk of flooding. The reason the EA do not use the worse storm event is purely a function of cost – we could not afford the works necessary to protect us and it will be so infrequent as to fail to justify any action! So if in five years we are faced with a flood that floods houses, listen to the explanation and if the flood return period exceeds the 1 in 100 year event then that will be the answer not that you were told a 'load of rubbish' this time.

The 'proof of the pudding' as they say will be when the next severe flood arrives and we will see if the station under load, having had the maintenance regime employed prior to the event, lives up to today's expectations.

This current pumping station should protect houses on the Beck and Croft Close against anything below a 1 in 100 year event assuming that:

- It is fully operational at the time of the flood.
- There is free and unobstructed flow in the Beck culvert.
- We have uninterrupted electrical power at the pumping station.
- We do not have a catastrophic event in the Tame river catchment upstream of Elford (anticipated once every few [10] thousand years!)

I hope this note has been informative and useful to all who read it. If it has, my name is Dave Hill and I live on the Beck; if not my name is Gordon Brown and its not my fault, Tony Blair made me wait too long and let too much water go under the bridge!

Post Script : At the public meeting held on the 11th July 2007 it was stated that the pumping station would be fully commissioned by September 2007. It was also stated by the LDC Chief Executive Nina Dawes that all of the remaining sand bags would be removed as a matter of urgency. The risk level of a recurrence of the flooding has diminished and the sand bags are contaminated hence the need for fast removal.

*Appendix 7*PAPER 1**Local Issues Briefing Note for John Healy - HM Government Minister of State for Communities and Local Government****Local Issues Paper for Flooding Event in Elford, Staffordshire - 16/17th June 2007**

Elford, which stand on the banks of the River Tame, has a distinct and clear set of conditions that effect flooding in the village:

- The river itself is not the governing cause of flooding in the village.
- Flooding occurs as a result of rainfall in the Green Brook catchment to the east of the village, which is exacerbated by the outfall level of the brook culvert dictated by the level on the river Tame.
- The river level dictates the rate of flow from Green Brook but the brook flow always has precedence in the outfall culvert to the river and the levels are such that the river water itself does not flood the village.
- It would take an extraordinarily high intensity and long duration storm within the Tame catchment for the river to flood the village as the flood plain adjacent and upstream of the village is over 5 square miles in area and therefore provides millions of gallons of water storage.

While there is no direct correlation between the storm flooding and the Sewage Authority (in our case Severn Trent) we had the misfortune to suffer a foul pumping station breakdown several days before the flood leading to problems of foul water flooding before and after the flooding event. This led to huge confusion on the part of villagers and led to a misunderstanding of the true situation and the split of responsibilities.

A misinterpreted message that there would be an 18" surge on the river at midnight increasing flood levels led to much worry and concern but as indicated above the topography of the rivers flood plain at and above the village made this a practical impossibility.

The fire service were excellent after a slow start which was in the main due to a lack of understanding of relative river / flood levels and the failure to identify pumping discharge points early on in the process.

All in all the whole situation was an interesting collision of misfortune, misinformation and misinterpretation washed down with copious amounts of raw sewage and thousands of gallons of flood water.

Background to the Issues Requiring Support

The flood water from the Green Brook historically used to flow at surface level from the western end of The Beck overland to the river to spill into the vast flood plain. Since the development of recent housing across that overland route this high level spill has been prevented.

The position on flooding risk was made clear to the Local Planning Authority at the time of the planning approval but they assured us that twin culverts would solve the problem. The assertion about the culvert was refuted by us at the time of the application yet the request to maintain the overland flow was refused and the site was developed to its current levels.

A pumping station has been designed and constructed to help remove the flooding but it was not commissioned at the time of the last flood, however, this is not the overriding issue. The key issue relates to whether the station will work and there are technical issues that give us cause for concern. We have contacted the Environment Agency at national and local level and despite having had standard letter responses we have had no sight of the detailed criteria which relate to pumping capacities and station control systems. I accept that the request was relatively recent but we have a public meeting arranged on the 11th July and could benefit from an understanding of the technicalities prior to this meeting.

Elford is infamous for the number of power cuts and we need to know what will happen if this coincides with a flood event. This information is critical for both the Environment Agency and any emergency services looking to support.

Current Requirements

We would like:

- access to the Environment Agencies design staff and design details for the station to assure ourselves of the adequacy or otherwise of the storm water pumping station prior to 8th July. We have the necessary expertise available to assess it competently prior to our public meeting on the 11th July;
- Lichfield District Council and the Environment Agency to review the overland flow position subject to the findings of the pumping station design with particular reference to the emergency situation if power fails;
- a clear and stated approach to making adequate sand bags available well prior to the flooding threatening houses.
- an indication of the level of emergency services support in the event of future flooding;
- the crews to have access to procedures to ensure an effective and rapid response to any flooding event – particularly for the new pumping station.

The last element is critical as the pumping station will, prior to pumping, have to cut off the base flow through the station by the use of a penstock. Any mishandling of the timing of such a shut down has the potential to create flooding not alleviate it.

The Local Issues Paper 1 has been made available to both Lichfield District Council and to the local Environment Agency Office at Fradley.

*Appendix 8***PAPER 2****POTENTIAL ACTION TO SUPPORT POSITIVE ACTION AGAINST FLOODING****Strategic Briefing Note for John Healy - HM Government Minister of State for Communities and Local Government****Introduction**

Further to your visit to Elford in Staffordshire on the 3rd July 2007, to get first hand experience of the recent flooding event, I have drafted this note as promised to outline some larger generic issues that relate to the national debate on flooding.

I comment as a retired professional Civil Engineer of 40 years standing and having operated at City Engineer level for several years. I have a particular interest in hydraulics, hydrology and flood engineering.

Strategic Issues

The weather dictates the frequency of flooding and with the apparent worsening of the general situation worldwide we would be ill advised to ignore the needs to manage flooding more effectively whilst accepting its inevitability at times of particularly severe weather.

KEY ISSUES**The public lack of awareness of the fundamental principles of flooding –**

- Confusion over the responsible bodies – Regional Water Authorities / Environment Agency / Highway Authorities
- Design criteria for major hydraulic structures and drainage are set to affordable levels and can never prevent flooding completely – the public purse couldn't afford it.
- It's always someone's fault, usually Government closely followed by the Statutory Agencies and local Councils.
- The historic situation of larger towns and cities being 'traffic jams' for water – built close to sources of water, constrained river channels, inevitable flooding.
- Summer storm peaks and hard ground due to good weather – increased run off.
- Flooding is inevitable at times – no-one's fault just the rainfall intensity exceeds the practical ability to fund the 'ultimate' measures

Potential Mitigating Action – Educate the public through simple easy to understand accessible information; be clear that flooding cannot be prevented in every case; get the economic argument understood.

Public concern over the implication of flooding –

- Obvious damage to property and disruption to community / family life.
- Major impact on affordability of insurance.
- Risk to life and limb.
- Likely increase in events of flooding – worsening weather, higher sea levels, coastal protection.

Potential Mitigating Action – Demonstrate action to manage it but be honest about the limitations; demonstrate effective action in flood events; have effective teams available to act immediately and to report back for improvement; work with the insurance industry; set a prioritised national strategy for flood control / reduction and publicise it.

Causes of unnecessary flooding –

- Poor drainage / hydraulic structures maintenance.
- Lack of local knowledge of where problems occur and how to mitigate them by the people responsible for taking action – Environment Agency / Highway Authorities / Water Authorities / Emergency Services.
- Redevelopments that obstruct historic flooding routes.
- Incompetent drainage design – failure to accept the importance of all drainage infrastructure within the design process.
- Failure of crumbling infrastructure

Potential Mitigating Action – give drainage maintenance the priority it deserves and fund it; get local teams from the local community to manage and maintain the system – there is no substitute for local knowledge of drainage systems; treat drainage as a very important part of the development process and have fully evaluated drainage impact analyses of all development (definitely not adequately done now); review design criteria – use higher standard storm intensities.

Suggestions to better manage flooding risk –

1. Flood farm land upstream of cities in preference to trying to contain increased levels in the cities – berm / dyke the areas for reserved storage and flood barrier the river.
2. Early warning systems based on actual river level responses.
3. Maximise flooding in flood plains through management of waterway structures to attenuate flows – intelligent computer controlled systems.
4. Improve linkage between the Regional Water Authorities and the Environment Agency to make the management of storm water a seamlessly managed process.
5. Manage the whole water cycle more effectively from rainfall to discharge into the sea – management of flows on every major river where flooding is a major risk; storage for times of drought, replenishment of groundwater; movement of water around the country – this will include the British Waterways Board.
6. Recognise the problems of the Water Authorities with crumbling infrastructure and encourage reinvestment in the network.
7. Better development design which recognises the topography of the area and allows flooding events to store in parks, car parks, open space and roads prior to houses.

8. Encourage all authorities with a responsibility for water and potential flooding to give secure jobs to local people who will take ownership of the problems of the area who have an intimate knowledge of the infrastructure allowing them to act quickly and effectively when needed – speed and effective action is the essence in the face of potential flooding.
9. Give maintenance its proper profile and get all responsible bodies to commit the necessary funding support – major new construction gets what it needs for a 1-2 year build it has to operate for 50 – 100 years and needs to be adequately maintained and timely maintenance is very cost effective.
10. Stop building housing in flood sensitive areas.

I accept that much work is done in many of these areas but I contend that reviewing each one will provide opportunities to prevent avoidable flooding and provide a clear and logical basis on which to explain any future flooding events to irate and sometimes unreasonable press and public.

Conclusions

This note is not intended to overlook or demean the excellent work of all bodies managing water resources and reacting at times of flood, it is however intended to identify one or two areas that would benefit from some additional consideration and / or support in order to mitigate flooding by learning a little from the past and by anticipating the future.

1. There is merit in taking action to prevent flooding in cities by slowing river flows and flood peaks by holding water in areas upstream of the city where societal impacts are less.
2. Encouragement of the past practice of having a stable local workforce responsible for drainage maintenance in a relatively local area would both improve the level of service and ensure that action at times of flooding would be rapid and effective.
3. Emergency Services should have access to procedures for all critical areas of flooding and for major pumping storm water pumping stations and understand the relief pumping procedure in the event of power failure.
4. To help minimize the hysteria surrounding most flood events the public should be made more aware of the range of storm events, the inevitability of flooding at some point and the efforts put in by the professionals to mitigate the impact of severe rainfall.

DRH EFR/2 – June 2007

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Appendix 9**Elford Flood Plan****Reference Documents**

All these documents are available from the organisations that produce them which in the main is the Environment Agency (Ring 08708 506506). Copies can be downloaded on-line or if you prefer ask your Parish Councillor or one of the Flood Wardens they can arrange to get copies for you.

1. **Flooding Minimising the Risk** – Environment Agency (EA) – Flood Plan Guidance for Communities and Groups.
2. **Personal Flood Plan** – (EA) – Check list for individual home owners.
3. **Prepare your property for Flooding** – (EA) – A guide for householders and small businesses.
4. **Living on the Edge** – (EA) – Advice for riverside property owners.
5. **What to do before during and after a flood** – (EA) – Practical advice on how to protect yourself and your property.
6. **A guide to resistant and resilient repair after a flood** – Association of British Insurers (ABI) – How to protect your house and what materials to use to reduce damage in future.

Reference Bodies

Anyone can contact these agencies and request information on all aspects of flood management.

1. **Environment Agency** – Provides exhaustive advice on flood action before, during and after flood events. (<http://www.environment-agency.gov.uk>)
2. **The National Flood Forum** - Provides support and advice to communities and individuals that have been flooded or are at risk of flooding. (<http://www.floodforum.org.uk>)

Web Based Reference Information Pages

The following links will provide up to date information on the subject areas listed.

Midland river levels: <http://www.environment-agency.gov.uk/homeandleisure/floods/riverlevels/120502.aspx>

Flood Warnings: <http://www.environment-agency.gov.uk/homeandleisure/floods/31618.aspx>

Personal Flood Plan: <http://www.environment-agency.gov.uk/homeandleisure/floods/31624.aspx>

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*Appendix 11***Parish Council Report (Modified) – 20th July 2009****Report on the ‘Tamworth Flood Risk Management Strategy Document’ – D R Hill Flood Warden****Introduction**

I speak to inform the Parish Council from my perspective as Flood Warden for the village and as a retired Chartered Civil Engineer with over 40 years of experience in the field of river and urban drainage design and construction.

As it is a strategic flooding assessment report the paper is understandably thin on real detail but there are one or two key points to make from my reading of the report.

Report Analysis

The speed of concentration of floodwater in the river is created largely by the urbanisation of the upper lengths of the river where flood plains have all but disappeared. The management of the river channel has led to straight engineered channels that pass water rapidly downstream decreasing the time of concentration of flood water and worsening the whole flood situation. The increasing of flood wall / bank heights in these upper reaches will worsen the situation downstream as previously escaping water will be retained in the river and passed downstream. The provision of additional balancing of the flows i.e. retention in holding areas / lakes will help reduce the impact of increased bund heights but the figures for the relative volumes of removed flooded area and the new area / volume would be useful to see.

There is little that can be done upstream on the main river channel to do more than restrict the river flow and pass it downstream but planners should encourage all developments and properties in the upper reaches (and downstream for that matter) to hold as much water short term as possible on the site being developed to reduce the severity of the peak flows in the river.

As regards the river from Comberford to Alrewas the initial report stated that there are five houses that will flood that do not now as the strategy cannot justify protective works. This reference has been removed but on what basis, Clearly it is the truth or it would not have made the first report so why have they been excluded and has any material action being taken to protect them now? We should pursue this matter and ask which houses were referred to in the original report anyway. We should also ask what can be offered to the householders of these properties to enable them to protect their own homes in any event. This is key for our local situation.

There is much that could be done to help houses like Elford Mill if the correct technical staff resources could be made available to help plan individual defence works. (Pumps, bunds, walls, grout curtains, piling etc)

Local Elford Issue on the Green Brook

The Environment Agency designated a length of the Green Brook as 'Main River' which enabled the agency to provide crucial flood protection to the village in the area around The Beck. This has taken the form of a Flood Water Pumping Station which can both prevent the river from flooding back into the village and overpump the floodwater subsequently trapped in the Green Brook catchment into the river until such time as the river levels fall.

This provision is welcomed by the Parish Council but there are three aspects of the works untested and additionally the station has a peak capacity above which flood events could still flood the village. The untested issues are:

- the structural integrity of the culverted section of Green Brook;
- the hydraulic capacity of the culvert;
- the stability of the power supply to the pump.

There is a proven topographical route for flood water from the Green Brook catchment north of the village around the northern perimeter of the village that could act as an emergency relief to the flows on The Beck. This is clearly demonstrated on your map Drwg No. WN/RTSU/- figure 1j which shows the 100 year flood level projecting arm of the flood extending eastwards across the north of the village. The natural land form lends itself to a ditch across one field to link the Green Brook to this shallow valley and extreme flows could easily be diverted away from the village.

Whilst it is accepted that the additional works required would be beyond the length of the Green Brook formally made 'Main River' they would still relieve the hydraulic position on the Environment Agency Pumping Station and provide an emergency diversion at relatively low cost should the station ever fail or be overwhelmed for whatever reason.

Discussions with the EA Engineer

I was contacted by the EA engineer on the 20th July as promised and had a very helpful and honest discussion with him about the report. They are trying to be very open and clear with their consultations and it is now clear to me that they are in fact doing a sound job. I have had the benefit of listening to the explanations of what they are doing and why.

The issue of the five houses is in my opinion not an issue to be concerned about, things are in hand. The EA are not trying to cover up the impacts of the works upstream and the likely severity of future floods on those five houses they just don't want to unfairly blight them with publicity. They are to contact and discuss the matter directly with each householder and help them along the lines we are asking for in this response by giving direct technical advice and support. I do not believe there is a negative issue here. In fact they had the chance to say that tolerances of analysis are so wide that it could be argued that there is no change but they have not.

That said there is an acknowledgement that things downstream may be marginally worsened by their proposals but as with democracy generally it comes down to the benefit to the majority compared to the disadvantage of the few. Bad luck if you are one of the 'few' but it does ultimately make sense and you have to accept that if you choose to live by water one day it may become a problem. You of course will most of the time have a nice water scene that enhances rather than detracts.

Consequently given that the EA made a major, almost too good to be true, investment in the new SW Pumping Station in the village and are being open and helpful with their consultations I think we should send in a cautionary but positive response along the lines of the points below.

Summary

Consequently I would make the following comments / ask the following questions in any letter sent to the Environment Agency:

Local detail issues:

1. **We acknowledge that upstream works to protect the 'many' but can we be assured that as much balancing will be done to mitigated downstream effects as possible?**
2. **We are pleased to note that the individual householders affected by flooding on the edges of the floodplain are to be consulted on an individual basis and we hope that they will be afforded technical help to plan and provide their own protective works, permanent or temporary?**
3. **We hope that any works developed under 2 above be provided even if the works marginally impinge on the floodplain?**
4. **Can we have the assurance that the potential to divert peak flows in the Green Brook around the village as described above will be considered at a future date should experience demonstrate that the pumping station is failing to cope with the flood flows adequately?**
5. **Given the advertised speed of flood events within the catchment can the houses in the village area critically affected be given their own direct priority notification of impending flood events?**

Strategic Issues:

1. **Can we get better river channel management of maintenance works to ensure that the main channel, its structures and the floodplain are all clear and fit for purpose?**
2. **There is a public lack of awareness of the fundamental principles of flooding** - educate the public through simple easy to understand accessible information; be clear that flooding cannot be prevented in every case; get the economic argument understood.
3. **Public concern over the implication of flooding** - demonstrate action to manage it but be honest about the limitations; demonstrate effective action in flood events; have effective teams available to act immediately and to report back for

improvement; work with the insurance industry; set a prioritised national strategy for flood control / reduction and publicise it.

4. **Causes of unnecessary flooding** - give drainage maintenance the priority it deserves and fund it; get local teams from the local community to manage and maintain the system – there is no substitute for local knowledge of drainage systems; treat drainage as a very important part of the development process and have fully evaluated drainage impact analyses of all development (definitely not adequately done now); review design criteria – use higher standard storm intensities.
5. **Flood farm land upstream of cities** - in preference to trying to contain increased levels in the cities – bank / dyke the areas for reserved storage and flood barrier the river.
6. **Maximise flooding in flood plains** - through management of waterway structures to attenuate flows – supported by intelligent computer controlled systems.
7. **Improve linkage between the Regional Water Authorities and the Environment Agency** - to make the management of storm water a seamlessly managed process.
8. **Manage the whole water cycle more effectively from rainfall to discharge into the sea** – management of flows on every major river where flooding is a major risk; storage for times of drought, replenishment of groundwater; movement of water around the country – this will include the British Waterways Board.
9. **Recognise the problems of the Water Authorities / Highway Authorities** - with crumbling drainage infrastructure and encourage reinvestment in their networks.
10. **Create better development design** - which recognises the topography of the area and allows flood water to flood in non sensitive areas before housing throughout the catchment all intended to delay flow times downstream.
11. **Use local work teams and support local knowledge** - encourage all authorities with a responsibility for water and potential flooding to give secure jobs to local people who will take ownership of the problems of the area who have an intimate knowledge of the infrastructure allowing them to act quickly and effectively when needed – speed and effective action is the essence in the face of potential flooding.
12. **Get all Agencies / Authorities to give maintenance its proper profile in budgets** - timely maintenance is very cost effective and results in improved service levels.
13. **Stop house building in flood sensitive areas.**

I accept that much work is done in many of these areas but I contend that reviewing each one will provide opportunities to prevent avoidable flooding.

Personal flood plan

Name



Are you signed up to receive flood warnings?
If not call Floodline on 0845 988 1188 to see if your area receives free flood warnings.

Let us know when you've completed your flood plan by calling Floodline on 0845 988 1188.
This will help us learn more about how people are preparing for flooding.

General contact list	Company name	Contact name	Telephone
Floodline	Environment Agency		0845 988 1188
Electricity provider			
Gas provider			
Water company			
Telephone provider			
Insurance company and policy number			
Local council			
Local radio station			
Travel/weather info			

Key locations

Service cut-off	Description of location
Electricity	
Gas	
Water	

Who can help/who can you help?

Relationship	Name	Contact details	How can they/you help?
Relative			
Friend or neighbour			

Be prepared for flooding. Act now

Personal flood plan

What can I do NOW?



<input type="checkbox"/> Put important documents out of flood risk and protect in polythene	<input type="checkbox"/> Look at the best way of stopping floodwater entering your property	<input type="checkbox"/> Find out where you can get sandbags	<input type="checkbox"/> Identify what you would need to take with you if you had to leave your home
<input type="checkbox"/> Check your insurance covers you for flooding	<input type="checkbox"/> Make a flood plan and prepare a flood kit	<input type="checkbox"/> Identify who can help you/who you can help	<input type="checkbox"/> Understand the flood warning codes

What can you do if a flood is expected in your area?

Actions	Location
Home	
• Move furniture and electrical items to safety	
• Put flood boards, polythene and sandbags in place	
• Make a list now of what you can move away from the risk	
• Turn off electricity, water and gas supplies	
• Roll up carpets and rugs	
• Unless you have time to remove them hang curtains over rods	
• Move sentimental items to safety	
• Put important documents in polythene bags and move to safety	
Garden and outside	
• Move your car out of the flood risk area	
• Move any large or loose items or weigh them down	
Business	
• Move important documents, computers and stock	
• Alert staff and request their help	
• Farmers move animals and livestock to safety	
Evacuation - Prepare a flood kit in advance	
• Inform your family or friends that you may need to leave your home	
• Get your flood kit together and include a torch, warm and waterproof clothing, water, food, medication, toys for children and pets, rubber gloves and wellingtons	

There are a range of flood protection products on the market to help you protect your property from flood damage. A directory of these is available from the

National Flood Forum at www.bluepages.org.uk

Be prepared for flooding. Act now

ELFORD PARISH COUNCIL

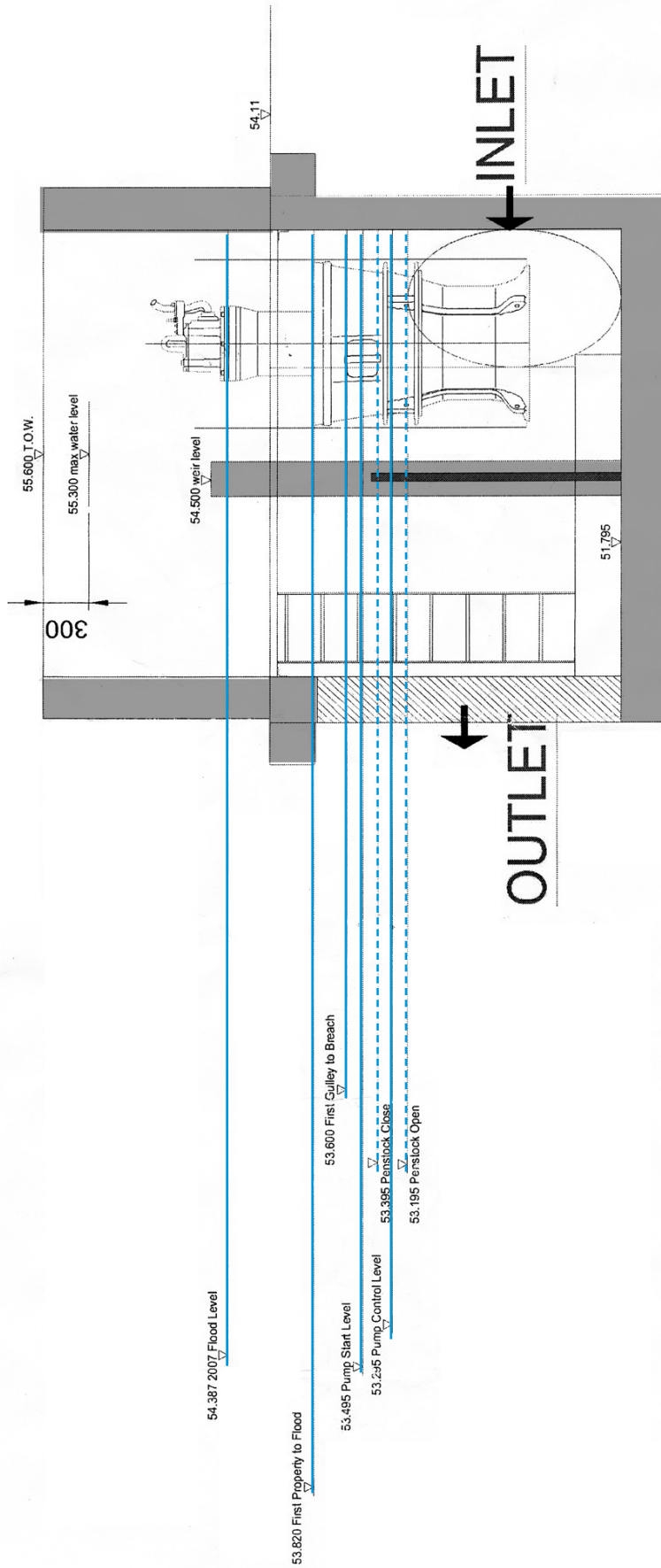
COMMUNITY FLOOD PLAN

REFERENCE PLANS

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Elford Pumping Station

Operational Levels



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ISSUE	REVISION	BY	DATE	FILE	6ELFD/LEVELS/DRAWING

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Central Area

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WS13 8RR.
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Title **ELFORD LEVELS DRAWING**

Drawing No **EVFP2**