

CANTERBURY CITY COUNCIL

FLOODING SCRUTINY PANEL

ACTION PLAN

UPDATE ON SITUATION AS AT NOVEMBER 2007

Update 2 Revision 1

16/11/2007

PREFACE

This is the second update on the present situation with respect to the work of the City Council's Flooding Scrutiny Panel ("the Panel"). It comes six years after the completion of the Panel's investigations and the issue of the original report. The first update reported on the progress with respect to the Actions that were proposed in the short term. This second update aims to cover the medium and long term Actions to see how much has actually been accomplished and where we have so far failed or made little improvement. It is particularly relevant coming after the recent 21st August 2007 severe rainfall flooding in Whitstable and the coastal storm of 9 November 2007.

As for the first update this latest report expands upon the original Action Plan by adding another paragraph "Current Situation" to each of the 50 ACTIONS. These additions summarise what has happened in the intervening period, the improvements made and, where relevant, problems still to be overcome. **In order to easily find these additions the current situation at this second update for each Action point is in coloured typeface. Where it is considered that good progress has been made the situation is in purple. Where progress is considered to be poor or it has not really been possible to do much the situation is in orange.**

Assessing the situation with respect to the Actions it is noted that progress on "things" has been very good. Nearly all the flood alleviation projects have been carried out and are working well. This includes minor to major works by all the agencies, improvements in maintenance regimes and flood reduction measures in development control conditions.

However, progress on "people issues" has not been so good and in one or two cases the situation is actually worse than at the time the Panel sat. There is still confusion by the public as to responsibilities, who to call and what flood warnings mean. For various reasons the very good coordination/cooperation between the agencies, that had built up towards the end of the 2001 flooding, has deteriorated.

The final draft of the Action Plan outlining the work of the Panel was produced on 13 September 2001. It contained the main findings and recommendations of the Panel. The recommendations were submitted to the Council's Development and Planning Committee on 25 September 2001 and were fully approved. Where actions by other agencies are mentioned the information is based on what is understood to be the present position but cannot obviously commit those agencies to what is stated.

The original Action Plan formed a part of the main report of the Panel, which was issued at the same time – 13/09/2001. It was intended to be a "stand alone document" that summarised the main conclusions, recommendations and actions required as a result of the Panel's investigations. It was derived from the evidence given by the public and all involved agencies. Full information on and background to the various Actions proposed, together with more detail on the measures planned to be put into practice, are contained in the various sections of the main report. The original Action Plan was discussed at all the four Area Members Panels and their comments were included.

It should be noted that the numbering of the Actions in no way signifies order of importance or priority. The numbering is based on the sequence of the sections of the report. In order to keep this update as concise as possible the Introduction (Section 1) of the original Action Plan has been omitted but copies are available separately if required. Brief summaries of what the other sections of the main report contained were also included in the original Action Plan. These have also been omitted here but can be made available.

ACTION 1 (future weather conditions)

Conclusion The period April 2000 to March 2001 was the wettest on record with nearly double the average amount of rain falling. It was inevitable that such prolonged and intense rainfall would lead to significant flooding in the district. However, the experts predict that there is a likelihood of increased storminess in future and that rainfall in the winter could significantly increase thus making the events of last year a more regular occurrence.

Recommendation Notwithstanding that the rainfall over the last year was exceptionally high, this Council should investigate and put in hand all practicable measures to reduce the extent and frequency of flooding in the future. The situation at the Nailbourne/Little Stour requires particular attention.

Action The various actions set out elsewhere in this report, many of which have already commenced, are aimed at carrying out this recommendation. Close contact is being maintained with the Little Stour and Nailbourne River Management Group to try to progress action.

Current Situation The continuation of the work to reduce flooding was again proved necessary by the abnormal rainfall on 21 October 2001. For the fourth time in eighteen months two inches of rain fell in less than a day. The intensity of rain on that day was actually the worst we had encountered in recent years and was equivalent to a 1 in 15 year event. Since that time rainfall has generally been just below average for the period 2002 to 2006, with the exception of Christmas to New Year 2002 when there was a prolonged wet period and there were signs in early 2003 of the Nailbourne flowing again. There have, however, been isolated short periods of very heavy rain particularly in summer 2004 and summer 2006. There were a small number of individual locations of flooding but no houses were flooded at any of the main trouble spots. It was noticeable that the number of calls for assistance was considerably down on what we had previously experienced thus showing that the measures put in place had had some real effect.

This was the situation until summer 2007. In May, June and July 2007 the monthly rainfall was twice the average with a number of high intensity storms of 10-15mm of rain falling in a short period, often quite localised. This continued into August with the worst on the evening of 2 August 2007 at Sturry, when there was some internal flooding to five houses, and on the morning of 21 August 2007 when there was severe flooding at Whitstable. On that day 50mm of rain fell in two hours, which is above the average for the whole of August, and a total of 60mm fell in under five hours. The previous four serious flood events in the district (4 April 2000, 12 October 2000, 8 February 2001, 21 October 2001) all had rainfall of just under 50mm but over at least a 12 hour period. This clearly indicates the intensity of rain on 21 August, which was equivalent to a 1 in 50 to 1 in 100 year return period rainfall event.

ACTION 2 (investigate tide locked outfalls)

Conclusion As well as the long-term rainfall there were three days over the last year when very large amounts of rain fell during one day and it would be expected that some localised flooding would result. On two occasions this was coincidental with North Sea surge tides resulting in the outlets to coastal watercourses becoming tide locked. This caused significant flooding along the coastal strip.

Recommendation Along the coast, where tide locking of outfalls can happen and there have been a number of incidents of flooding in recent times, there is a special need to investigate and implement all reasonable measures to alleviate flooding in the future. Particular attention should be paid to the Gorrell Stream, Swalecliffe Brook, Westbrook and Plenty Brook catchments.

Action The various actions set out elsewhere in this report, particularly with respect to operations at sea outfalls, are aimed at carrying out this recommendation. An inter-agency working group has been specifically set up to try to progress solutions.

Current Situation There are five main outfalls that can become tide locked – Gorrell Stream, Swalecliffe Brook, Kite Farm Ditch, Westbrook and Plenty Brook. A more regular checking and maintenance regime has been set up by the City Council for both the mechanics and electrics for the four latter, which are under our control. More regular maintenance at the Gorrell Tank for the pumps and non-return valves has also been put in place by Southern Water for the Gorrell Stream outfall. Some basic modelling has been

carried out to determine the effects of tide locking and this information has helped in setting out new procedures in the Council's "Flood Emergency Handbook" for the best time to open or close the sluice gates. Major improvements have been made at some of the outfalls as described in the various Actions elsewhere in this report. There is little else that can be done when high sea levels (storm surges) coincide with heavy rainfall but such events should normally have a reasonable amount of advance warning.

ACTION 3 (continue with coastal defence works)

Conclusion This report concentrates on the causes and possible solutions regarding the inland flooding that happened over the last year. It is essential that we also continue to be very active in dealing with the risk of sea flooding which could affect a large part of the urban area along the coast.

Recommendation This Council should continue with its proactive approach to coastal defence, both maintenance and improvement works, to ensure that the risk of sea flooding and coastal erosion is kept to the very minimum.

Action Coastal defence work, both revenue and capital, is continuing with the aim of ensuring that we retain a high standard of protection against the sea. The service is funded mainly through central government grant aid for capital works and through a special allowance for the Standard Spending Assessment for revenue expenditure, which means that the vast majority of the cost is covered by central government.

Current Situation Significant capital improvements have been undertaken to coastal defences including the final stage of works at Tankerton and comprehensive sea defence works from Seasalter to Whitstable. Works to the value of about £10 million have been carried out all of which has been grant aided by Defra. As well as this the important, and Defra funded, coastal monitoring and Shoreline Management Plan are well under way. Coastal maintenance has continued and generally the defences throughout are in good condition. This was proved on 9th November with a sea surge of over one metre and gale force northerly winds. There was no flooding to any properties and damage was minimal.

ACTION 4 (blocked gullies and road drains)

Conclusion The capacity of and blockages in highway gullies, drains and culverts was a possible contributing factor to flooding at a number of locations. Backing up of highway drains near their outfalls to watercourses also caused problems. There is a need to ensure that gullies are regularly cleaned out particularly at trouble spots. Highway drains that regularly overflow need to be remedied.

Recommendation The frequency of clearance of gullies and highway drains should be improved by targeting known flood prone locations for more regular action. A programme of improvements to highway drainage should be compiled with particular reference to areas that flooded over the last year. Locations for the fitting of non return valves should be investigated and flap valves properly maintained to reduce backing up of flood water. Additional funding needs to be made available by Kent County Council to facilitate these improvements.

Action The Kent Highways sub-contractor responsible for gully and drain clearance has been changed resulting in improvements to efficiency. All known flood locations are now targeted by Kent Highways for more regular clearance and a system of priorities has been drawn up. Non return valves and flap valves will be fitted to gully outfall pipes where considered beneficial, subject to funding. A programme of highway drainage improvements has been submitted to the County Council. Kent County Council are aware of the financial implications that the necessary improvements to the maintenance regime would mean.

Current Situation Kent Highways considers that the efficiency of gully and highway drain clearance has improved under the new sub-contractor and overall the situation throughout the district is better than it was in 2000/2001. However, nearly all the properties flooded in October 2001 were from surface water off the highway and Littlebourne was particularly badly hit. Two sets of drainage improvement works were brought forward by KCC there and have been completed. Major drainage improvement works at Ickham, Bridge and A291 Busheyfields plus a number of smaller improvement works have been carried out. At sixteen

problematic locations non return valves have now been fitted to highway drains to prevent river water backing up and flooding roads. All road gullies should be cleaned out at least once every year on main roads and every two years on side roads. Known trouble spots are more regularly cleared.

However, there is still a perception that many gullies are not regularly cleaned out, particularly in the older urban areas, and that the overall highway drainage system is poor and it does not take much rainfall for minor flooding of roads to occur. It would appear that in many locations the highway drainage system cannot cope with heavy rain and this is now one of the major causes of flooding. Kent Highways should be requested to carry out a total re-examination of their highway drainage performance, including frequency of gully clearing, and report on their findings and proposed improvements.

ACTION 5 (roadside ditch maintenance)

Conclusion Roadside ditches, including piped lengths at road/drive crossings are an important part of the highway drainage system and it appears that over the years many have been filled in, fallen into disuse or become totally blocked. It is realised that a lot of these ditches could be the responsibility of the adjacent riparian owner and not necessarily Kent Highways. However, lack of maintenance of the ditches clearly contributed to localised flooding and action needs to be taken to remedy the situation to prevent regular flooding. The sizing of many pipes at private drive crossings appears to be too small.

Recommendation Kent Highways should ascertain ownership of the roadside ditches wherever possible and liaise with the landowner about getting them cleared and maintaining them. Particular emphasis should be placed on ditches at known flood locations. Where the owner is not known or where the ditch is within the highway land, Kent Highways should carry out the work. All critical ditch clearances should be completed before next winter. The effect of undersized pipes at drive crossings should be investigated and action taken if required.

Action Clearance of the most critical roadside ditches has been carried out in conjunction with the City Council's own work on watercourse maintenance. A programme of clearance of other ditches is being drawn up but there is only minimal funding by the County Council for this. The situation with piped crossings will be investigated by Kent Highways and CCC Engineering.

Current Situation Minor improvements have been made at a number of locations, including the particular problem areas at Broad Oak, Chestfield, South Street and Blean, by both Kent Highways and the City Council. Regular clearance of the known problem roadside ditches continues by the City Council and Kent Highways and they are now in a better condition than in 2000/2001 - but a number of roadside ditches remain in poor condition. Overall there is still room for improvement and better funding by Kent County Council for this important but somewhat neglected part of the whole drainage system.

ACTION 6 (repair of flood damaged roads)

Conclusion Many roads in the rural area have been badly damaged by heavy rain and flooding. This is particularly so in the southern part of the district. In some places the roads are now barely fit for the purpose and the temporary patching carried out is unlikely to last next winter.

Recommendation Action is needed by Kent Highways to ensure that all roads are repaired to an adequate and safe standard. The work must be completed before the advent of the winter rain and frost. Additional funding needs to be made available by Kent County Council to facilitate this work.

Action Work on the structural repairs to the roads is well under way by Kent Highways and the worst affected are being targeted. All roads will, at the minimum, be patched to meet safety requirements but there is insufficient funding available to carry out the required major repairs to all of the damaged roads. Central government has made available some additional funding for this type of work as a result of the flooding nationally and Kent County Council has lodged its bid of £8.5 million. In advance of any funding from central government KCC have deferred £1.5 million of road schemes to start the repair to affected roads. Canterbury's share of this is £118,000 with a further £192,000 likely to be made available shortly.

Current Situation Kent Highways confirm that all roads damaged in the 2000/2001 floods have been fully repaired. Any damage to roads from later flooding has been relatively minor

and repairs carried out quickly. Repair to highway and footway damage as a result of the flooding at Sturry and Whitstable in 2007 is in hand and Kent Highways aim to complete all necessary work shortly.

ACTION 7 (maintenance of ordinary watercourses)

Conclusion Ordinary watercourses in the form of land drainage ditches, streams and dykes were considered to be one of the major causes of flooding in the district. There is a need to ensure that all forms of watercourses, including piped lengths, are kept clear and free flowing at all times. Maintenance in the form of ditch clearance, desilting, cutting of excessive vegetation, removal of obstructions etc must be regularly carried out.

Recommendation All persons and bodies responsible for keeping watercourses clear must ensure that they carry out their maintenance preferably with a preventative rather than reactive regime. This would include landowners, City Council, Kent Highways, Internal Drainage Boards plus Southern Water and Environment Agency where relevant. Watercourses that are known to have flooded should be prioritised. The City Council should investigate ownership of all watercourses that cause problems to ensure that the riparian owners are aware of the situation and do carry out their maintenance. Where owners cannot readily be traced or when they refuse to carry out maintenance, the City Council should consider doing the work and recharging the cost. For its own watercourses or when action is for its tenants or clearly beneficial to the public at large, the City Council should set up a preventative maintenance regime for critical watercourses.

Action City Council engineers have traced most of the owners of critical watercourses that need maintenance. A database of these is being set up. Many critical watercourses have been substantially cleared over the last year by the City Council. City Council engineers have drawn up a preventative maintenance schedule for all watercourses known to flood regularly and this is now operational with clearances being carried out in September once vegetation dies down. Where necessary City Council engineers have contacted other agencies reminding them of the need to keep watercourses in good condition. Publicity is being carried out to alert riparian owners to their responsibilities by both the City Council and the Environment Agency. Local community associations and parish councils are assisting with this.

Current Situation Many riparian owners have been traced and some have cleared their own ditches and watercourses – generally parish councils have been helpful with this. A City Council programme of maintenance is now running for the regular clearing of all the major watercourses known to flood in the urban area. In the rural area some maintenance works have been carried out but this is prioritised to those watercourses close to houses. The City Council has also carried out minor improvement projects at problematic locations. Persuading riparian owners to do their duty is still difficult and time consuming and some formal notices under the Land Drainage Act have been served. Publicity about how the public can assist and what the duties of riparian owners are has been effected through District Life and via some parish councils.

However, over the last couple of years there has been a gradual reduction in maintenance by riparian owners and a risk that the situation is gradually reverting to the conditions prior to the 2000 flooding. The City Council has had to maintain some obviously private watercourses where ownership cannot easily be found/is disputed. Another high profile publicity campaign is needed.

ACTION 8 (railway culverts)

Conclusion There are a large number of culverts beneath railways in the district and there are also watercourses on railway land. Some of these have been noted to be in need of maintenance and partial blockages have been recorded. This situation has possibly exacerbated flooding of both main rivers and ordinary watercourses. It should be noted that, because of safety and strict railway operating regulations, it is not possible for the City Council or its contractor to enter railway land to carry out even emergency work.

Recommendation Railtrack must inspect all culverts and watercourses on their land and ensure that they are clear and free flowing. Because they alone can do the work, even in an emergency, Railtrack should put into operation a planned system of maintenance and make sure all blockages

are cleared before the coming winter.

Action City Council engineers are aware of those railway culverts and watercourses that have caused problems during recent flood events. They have been in contact with Railtrack and pointed out the problem. Railtrack has carried out inspections of a number of its culverts and has carried out some clearance works. It will be commencing remaining clearance and repair works shortly.

Current Situation Railtrack (now Network Rail) carried out clearance of all the main problem locations as notified to them by the City Council. They have been prepared to action any new problems when requested reasonably quickly as they did recently for a site at Sturry.

However, Network Rail's inspection regime is not known and they should be asked to confirm that they do inspect and maintain regularly.

ACTION 9 (springs and high ground water levels)

Conclusion Some properties have been flooded from springs or exceptionally high ground water levels. Sources have been both in surrounding land and under houses themselves. Residents have asked the City Council for assistance to try to solve the problem.

Recommendation Where the source is in adjacent land the City Council should offer advice regarding possible works that could be done by the householder to divert the water away from the house. If this is not possible then sandbags or similar should be provided to try to prevent the water entering the property. For sources under the building itself it should be recognised that there is nothing the City Council can do to help and it is suggested that householders should engage specialist consultants for advice, possibly through their insurance company.

Action Where requested, City Council engineers have and will continue to visit the site and offer advice to householders. Some sandbags have also been provided for semi-permanent protection.

Current Situation Nothing more has been done on this subject except to try to give guidance to any residents requesting advice. The drier winters since 2001 have meant that springs have not been much of a problem but it must be admitted that should wet weather, and the springs, reappear there is virtually nothing that the Council can do to alleviate the situation apart from supplying sandbags if these will do any good. There were no reported major problems with springs during the wet summer 2007 but should the wet weather continue into winter the springs are likely to reappear.

ACTION 10 (surface water flooding from higher land)

Conclusion Many properties have been flooded by surface water flowing directly off adjacent higher land, often farmland or open space. It should be noted that, unless there is a ditch that has not been maintained or significant change to the upper land causing the problem, under law this is counted as a natural phenomenon. In some cases the City Council could be involved as landowner. The City Council has been approached by many residents asking for assistance.

Recommendation The City Council should offer advice and try to mediate between land owners to try to solve the flooding problem. If the upper land is City Council owned, village green or of unknown ownership then the City Council should investigate a permanent solution such as installing a land drain. If the lower land has City Council property on it or if it would benefit the public at large, a permanent solution such as a new land drain should also be investigated.

Action City Council engineers have responded to numerous requests for help by the public on this and similar land drainage issues. There is still a long backlog of site visits to be carried out as priority has been given to locations where houses have actually been flooded. Staffing availability means that not all problems will have been addressed before next winter. Minor land drainage improvement works have been implemented and some further works are planned but there are insufficient funds available to tackle the bigger problems.

Current Situation Minor land drainage improvements by the City Council to try to alleviate the worst of the problems have been gradually carried out over the last few years and this continues under the Council's land drainage budget. There still remains a number of minor works to be carried out but the worst of the known ones have been completed. Priority has

been given to where a number of houses may be affected. A lot of staff time has been spent in trying to mediate between neighbours and get them to agree to positive action. See also Action 14 regarding agricultural land.

ACTION 11 (weedscreens, sluices and floodgates)

Conclusion Blocked weedscreens and sluice gates not fully open or jammed with debris were the cause of a number of flooding incidents on all types of watercourses. Despite efforts by the relevant agencies these were often cleared too late or it was impossible to clear them because of danger to operatives. The public were unclear as to whom they should contact if they noted a problem. Despite the fact that this had not happened, the public were concerned that floodgates at outfalls had been left closed thus making flooding worse.

Recommendation Improvements to procedures are required to ensure that weedscreens and sluices are visited at an early stage of a potential flood event and cleared where necessary. Some weedscreens need to be redesigned and rebuilt to improve their performance and to allow safe access for operatives to clear them at the peak of the flood. The public need to be better informed of who to contact and agencies should be prepared to coordinate action. Better publicity is required to inform the public of working practices and it is suggested that notices are set beside all these structures to notify the public who to contact.

Action Environment Agency, Southern Water, Inland Drainage Board, Kent Highways and the City Council itself are all involved. These agencies have been asked to re-examine their procedures as recommended. City Council engineers confirm that their procedures do call for inspections of their sluice gates on issue of a Flood Watch. Most of the major weedscreens have been significantly improved recently and there are proposals to improve the others shortly. Publicity and better response to the public needs is being discussed with the Environment Agency and others.

Current Situation Improved procedures for ensuring that weedscreens, sluice gates etc are checked and cleared regularly and at times of heavy rainfall have been brought into operation by all the agencies involved. No known flooding to property has occurred due to weedscreens being blocked. City Council staff continue to inspect all sluice gates when there is a Flood Watch and the procedure is written into the "Flood Emergency Handbook". All but one of the major weedscreens that previously gave problems have now been improved (Valley Road Barham, Plenty Brook Eddington, Swalecliffe Brook outfall). The weedscreen on the Gorrell at Millstrood Road will be renewed towards the end of this year as part of other works there. Many of the weedscreens on smaller watercourses have also been improved/renewed.

ACTION 12 (dredging of main rivers and bank repairs)

Conclusion Improvements need to be made to main rivers to bring them back to the capacity that they once had. Many long time residents complained that the maintenance of rivers, such as dredging and bank repair, has reduced considerably over the last ten years and this could have been the cause of much flooding. A further point that had been made by many of the public and other bodies was that too much emphasis was now being placed on environmental reasons for not doing work and too little on the repercussions and resulting flooding.

Recommendation The Environment Agency should revert to earlier practices in that all critical sections of main rivers should be dredged regularly and the banks should be maintained in a stable state. The rivers should be widened and deepened where necessary to bring them back to their original channel size. Locations where banks have settled or been penetrated should be reinstated. Whilst environmental aspects of the work should always be considered this should not necessarily over-rule the need to prevent flooding.

Action The Environment Agency has reported that some dredging and desilting of a number of lengths of main rivers has now been carried out including the Westbrook, Swalecliffe Brook and parts of the Nailbourne/Little Stour. The work on the Great Stour and remainder of the Nailbourne and Little Stour is programmed for October/November. Critical bank repairs are also programmed for that time. There are no proposals for any extensive re-cutting of existing channels. Maintenance regimes are being re-examined but there are significant funding problems. The Environment Agency has to abide by the strict environmental protection legislation in doing its work.

Current Situation The Environment Agency now has an annual dredging/desilting contract for the Stour and the majority of the length downstream of Fordwich has been dredged at least once. Occasional dredging/desilting at the Little Stour, Swalecliffe Brook and Westbrook has also been carried out on an as and when needed basis by EA. The critical bank repairs noted after the 2000/2001 have mainly been carried out although it is considered some action is still needed on parts of the Stour embankment near Grove. Bank improvements have been carried out at Fordwich.

However, no extensive re-cutting of existing channels has been carried out and the EA considered that action and funding for such work would need to await completion of the Stour Catchment Flood Management Plan (CFMP) and possibly an Environmental Impact Assessment. The CFMP has been completed and policies set for the various sections of the Stour and for the other main rivers. These policies, however, cannot be instigated without more detailed strategy plans and instigation of capital projects, which will not be ready for some time. It is considered that many of the main restriction in the channel could be removed at relatively low expense under maintenance and therefore could go ahead now. See also Action 13 below.

ACTION 13 (weedcutting and removal of debris at main rivers)

Conclusion Debris in main rivers needs to be removed quickly to prevent a build up of material behind it and consequential flooding. Some parts of rivers at or just downstream of flood prone locations had been observed to be clogged with weeds for a long time. The debris, arising from dredging and cut vegetation is usually left on the river bank and quite often it quickly finds its way back into the river due to vandalism or after heavy rain.

Recommendation The Environment Agency should ensure that they have practices in place for rapid response and removal off site when there are reports of debris in rivers. Weedcutting must be regularly carried out and actual removal of roots should be considered at particularly densely weeded locations. Particularly in residential areas, material should be taken away. At other critical areas it should be placed well away from the river banks.

Action The Environment Agency confirms that weedcutting is carried out annually and can be done more regularly if required. At certain locations reed pulling will take place this year to clear very congested areas. There are no proposals to take dredgings and weedcuttings off site except in exceptional circumstances because of the very high tipping charge costs. Weedcutting and reed pulling has now been carried out on the Swalecliffe Brook, Westbrook and parts of the Nailbourne and Little Stour. Work on the Stour and second cut along the Nailbourne/Little Stour will take place in October/November.

Current Situation Weedcutting, reed pulling and removal of general debris is carried out along all the main rivers by the Environment Agency. On the Stour this is understood to be at least once a year but at other rivers it appears to be much less frequent. There is significant concern that environmental reasons have meant that this operation is both less frequent and less extensive than it should be to maintain an adequate flow channel. This is particularly relevant on the Little Stour and on the Great Stour downstream of Fordwich. There is a narrowing of the channel on both these rivers due to vegetation and trees growing in what was once the river channel causing silt and mud to build up behind. The gradual reduction of flow capacity at these locations is considered to be a serious problem. The Environment Agency is aware of this and should be requested to action the situation which has built up over many years and is slowly reducing the capacity of the rivers. See also Action 12 above.

ACTION 14 (agricultural practices and land drainage)

Conclusion Many people considered that changes to farming practices had exacerbated the flooding problems in rural areas and on the outskirts of urban areas. Two particular potential causes were the grubbing up of many of the orchards traditional to Kent and removal of hedgerows and ditches. It was acknowledged that orchards would significantly hold up surface water naturally and their removal had increased the rate of run off from fields. The reduction in hedgerows and ditches had meant that water was not so well channelled, flow downhill was increased and often this was

very silt laden thus quickly blocking gullies and drains. A further perceived cause of problems was the ploughing of land downhill rather than across the slope.

Recommendation The relevant ministry should be contacted to see whether there is any possibility of grant being made available to return fields to orchards or any other way to improve the situation. The NFU should be involved in these proceedings. It was understood from the NFU that there is some form of grant for replanting hedgerows and it is essential that this is well publicised. The reinstatement of ancient evaporation ditches should be considered. City Council and Kent Highways should liaise with farmers to try to reinstate or improve ditches to reduce flow at critical locations and remove the silt and mud flowing onto highways. The NFU has advised that there can be practical difficulties with ploughing across the slope but that it would ensure that farmers are made aware of the comments.

Action The City Council with the help of parish councils has had discussions with some farmers and minor improvements agreed but widespread contact via NFU has not yet been carried out. The City Council and Kent Highways have carried out minor works at some critical locations to construct or improve catchpits to reduce the silt getting into highway drains.

Current Situation **Some further meetings and discussions with individual farmers have taken place and minor improvements to reduce extreme run off have been undertaken by them. However, the problem as a whole remains for the most part and very little has been done. The very important issue of agricultural land and its relationship to flooding is a national issue that Defra are aware of but have not seriously actioned. There is increasing concern about the large number of polytunnels that have been erected in the last few years and the significant rainfall run off that they cause compared with traditional arable land. Some farmers have been considerate in installing additional land drainage and keeping the polytunnels away from houses. It is considered that parish councils could use their influence and knowledge to help with this subject.**

ACTION 15 (sewage pumping station failures)

Conclusion A large number of houses throughout the district had been flooded with sewage either directly or mixed with other flood water. Reports had been received of many failures of sewage pumping stations, which Southern Water state was mainly due to inundations by flood water. Numerous incidences of surcharging of the foul sewers also occurred. Many pumping stations had apparently failed due to inundation on a number of occasions resulting in the system becoming surcharged with surface water and backing up into houses. These problems were quite widespread and not just limited to the severely flooded areas. Particular problem locations reported over the last year had been at: Herne, Blean, Howfield Lane Canterbury, Fordwich, Eddington, Sturry, Marshside, Seasalter, Hoath, South Street Whitstable, St Stephens Canterbury, Waltham, Petham, Chartham, Thanington, Shalmsford Street, Pean Hill and all villages beside the Nailbourne/Little Stour. The public had also complained that systems often broke down after any spell of heavy rain and not just during the flooding recently experienced.

Recommendation Southern Water should carry out an investigation of all the reported problem areas with a view to preventing future reoccurrence. More preventative rather than reactive maintenance to pumping stations should be carried out and possibly flood boards should be considered at doorways to pumping stations in problem areas. Sources of infiltration should be found and stopped. There should be a better system of stand by pumps and emergency generators at critical pumping stations to reduce downtime and resulting sewage flooding. There appeared to be a need for a comprehensive review of the sewerage infrastructure and major improvements to reduce both the extent of flooding from sewers and the regular failures reported at some positions.

Action Southern Water has confirmed that it is currently carrying out investigations at all known sewage flooding locations and will make improvements if these are considered to be essential and within their current financial programme. Some improvements at regular problem locations such as Howfield Lane and Seasalter were already under way. Other minor works have now been carried out as a result of the investigations. Southern Water consider that their current maintenance system is adequate and there are no plans for extensive changes. There are not sufficient funds for major infrastructure improvements in the Canterbury district in response to flooding at the present time.

Current Situation **Southern Water has investigated all the reported pumping stations that**

had problems. Where there were any faults these have now been corrected and at some pumping stations significant improvements have been carried out or are in the current five year capital programme. Southern Water still maintains that many of the problems were not failures of pumping stations, as they were still working to design capacity during the floods, but that the pumping stations were overwhelmed by surface water ingress. This is a further outcome of the poor overall state of the infrastructure – see Action 17.

ACTION 16 (pumping effluent into watercourses)

Conclusion Sewage, both effluent and solids, had been pumped into watercourses at a number of locations, the worst and most continuous being along the Nailbourne and Little Stour but discharging into the Petham Bourne and Plenty Brook is also known to have occurred. This had been carried out by Southern Water as the foul sewerage system had become inundated by flood water from the rivers or it was incapable of handling the combined system during storms. Checks by the Environment Agency had revealed that the concentration of effluent in the rivers was actually quite low being 95% clean water. The Panel expressed its disquiet that in the 21st century raw sewage, including all the detritus, was allowed to be pumped into watercourses passing by people's homes and it appeared that nothing could be done about it.

Recommendation There appears to be the need for stricter enforcement by the Environment Agency to prevent the pumping of sewage into watercourses. OFWAT should also consider using any of their powers to stop this. At the very minimum Southern Water should take measures to ensure that, if this situation is unavoidable because of very high surface water flows, all solids should first be properly screened off so that only the liquid effluent enters the watercourse.

Action Southern Water has stated that it was the exceptional rainfall and the swollen rivers that caused this problem and major improvements are not under consideration at this time. They would be carrying out any required repairs to damaged or blocked pipelines as a matter of urgency but no additional action is proposed as the company considers the sewer system is adequate for normal operation.

Current Situation The Southern Water response on this item in general remains as previously in that the company considers that the sewer system is adequate for normal operation and should not be expected to cope with abnormal rainfall. Repairs to damaged and leaking pipework have been carried out and at some particular problem locations further work was done including increasing pumping capacity and relining of sewers – details in the relevant Actions elsewhere in this report. Apart from one problem at Eddington in 2003, no known reoccurrence of this has happened.

ACTION 17 (public surface water sewers)

Conclusion Flooding of houses at a number of locations had been reported by the public as being due to backing up or overflowing of main surface water sewers under the responsibility of Southern Water. Reports by the public of gullies being blocked and causing flooding sometimes turned out to be that the public surface water sewer was full. It would appear that some surface water sewers did not have the capacity to take heavy rainfall or were at least partially blocked.

Recommendation All surface water sewers at known trouble spots should be surveyed by Southern Water and any debris within them removed. A system of preventative checks of the critical sewers should be carried out before each winter to ensure that they are clear and free flowing. Capacity checks should be carried out on those sewers known to flood regularly. There appeared to be a need for a comprehensive review of the public surface water sewer infrastructure and major improvements to reduce both the extent and frequency of flooding.

Action Southern Water has carried out cctv surveys of some of the critical sewers and some others are proposed. Any debris found has been removed. They are also carrying out high pressure jetting to cleanse the pipelines. As for the foul water sewers there are no major infrastructure improvements planned at this time and the company states that the surface water sewers are generally adequate.

Current Situation There has been a marked improvement in action by Southern Water on inspection and clearance of potentially blocked surface water sewers. All known major trouble spots have now been dealt with by the company – details in the relevant Actions

elsewhere in this report.

However, there are clearly locations where the surface water sewers, including highway drains, have a capacity significantly under what is required during very heavy rain and flooding results from this. No action has been taken to carry out any major improvement works to the infrastructure. The situation is ably demonstrated by the flooding in Whitstable on 21 August where the infrastructure was clearly unable to cope – similar situations would be likely to occur in the older parts of Herne Bay and Canterbury if very heavy rain occurred.

5. SPECIFIC PROBLEM AREAS AND PROPOSED IMPROVEMENTS

There are a number of specific problem areas where significant flooding occurred. Particular or site specific courses of action may be needed over and above the general problems and recommendations set out in the previous section. Details for these locations are included in this section. Absence of a reference to a particular area or problem does not mean that it will be ignored or not actioned but clearly the amount of properties at the following locations that were flooded means that they should be prioritised.

ACTION 18 (Plenty Brook)

Conclusion There is a very serious flooding problem from the Plenty Brook both sides of the railway at Eddington and Cherry Gardens, Herne Bay. 45 houses were badly flooded in February 2001 and of those at Eddington were also flooded in April 2000. Many other houses in the area only just escaped flooding. In October 2000 the same houses in the area were again close to being flooded. The situation is complex involving the Southern Water main culvert under Herne Bay and the reservoir south of the old Thanet Way, the new A299 balancing lagoons and the watercourse itself. The public also see recent large housing developments in the area as being a contributory factor to the flooding.

Recommendation Urgent action is required to alleviate the situation. It is noted that the recent installation of an improved weedscreen and the removal of the tidal flap valve, both of which were previously prone to jamming, should ease matters. However, further measures are considered necessary to reduce possible flooding. In the long term the whole catchment should be investigated, together with possible major infrastructure improvements, particularly regarding future development.

Action The coastal inter-agency working group is treating this as a top priority. An independent consultant has been appointed and has examined all factors, particularly the inter-relationship between the KCC A299 lagoons and the Southern Water attenuation reservoir. The consultant's findings have been considered by the agencies involved to determine the best course of action. An extension to the reservoir and some improvements to the KCC lagoons are being evaluated and, subject to the approval of the Southern Water board, should go ahead shortly. The culvert itself has been fully inspected by Southern Water and no obstructions have been found. The vegetation growth and silt, that is reducing the capacity of the existing reservoir, is currently being removed by Southern Water. The City Council has and will continue to clear growth and debris from the brook at Eddington and a further clearance will take place at the end of September. The City Council will formally approach central government in October for funding to carry out the detailed catchment study. The drainage attenuation ponds and tanks at the recently built developments in the vicinity have been inspected and it is confirmed that they are working properly. The new planning guidance note requiring a drainage impact study will result in strict regulation of surface water flow from any further new developments.

Current Situation A number of short and medium term improvements have been made to the Plenty Brook over the last few years. These have included - complete inspection and removal of any obstructions in the main culvert under Herne Bay by Southern Water, including the removal of a faulty flap valve; the construction by Southern Water of a new overflow holding reservoir, to improve the capacity of the existing by 30%, beside the old Thanet Way; Kent Highways has improved the holding capacity and the overflow arrangements of the A299 drainage lagoons; the City Council has totally cleared through the brook and constructed an improved weedscreen at the culvert to the railway embankment.

As well as these improvements there is now regular maintenance and removal of growth/debris in the brook by the City Council (on behalf of the Environment Agency) and Southern Water has completely cleared its reservoir of silt and vegetation – although it is now becoming overgrown and further action is needed. The major project that will bring significant improvements is the construction by the Mill Lane developer (as part of the development requirements) of a 35,000 m³ holding lagoon on the Plenty Brook between the A299 and the Herne Bay Golf Course. This has just been completed. There is also a 10,000 m³ lagoon on the Herne Drain watercourse that feeds into the Plenty Brook at the Herne Bay Golf Course. This has also just been finished.

ACTION 19 (Eddington Sewerage)

Conclusion Widespread problems with the foul sewerage system throughout the district have been noted in this report. Inundation of the system by flood water and failure of pumping stations has been of great concern in many areas. However, the circumstances at Eddington are considered to be particularly critical. Whenever there is heavy rainfall there is backing up of sewers, people cannot use their lavatories, often sewage in gardens and some reports of flooding in houses. As a result of these sewerage failures there is often detritus littering the Plenty Brook. The main problem is adjacent to the Eddington Pumping Station but other areas of Herne Bay and at Herne village are also affected.

Recommendation Even though the over flow from the combined sewer has been consented by the Environment Agency, Southern Water need to fully investigate the situation and carry out works to improve the infrastructure. It is suggested that major improvements to the pumping capacity are needed to cope with the surface water inflow during heavy rain. Other options that should be considered would be methods to separate out some of the surface water that gets in. An immediate measure must be improvements to screening at the Eddington Pumping Station to stop detritus getting into the Plenty Brook.

Action Southern Water has reported that a consultant has been appointed to look into the total question. Ways to improve the situation in the immediate vicinity to the pumping station are a priority. Some improvements to the operational methods at the pumping station are currently being tested.

Current Situation The Southern Water consultant proposed a number of local improvements and these were all undertaken by the company. In order to prevent solids being deposit along the brook the screen within the pumping station has been modified and its operation and clearing system improved. All pumps have been fully overhauled and systems put in place to reduce possibilities of breakdown. An additional standby pump has also been installed. The operation of the storm pumps has been changed so that in wet weather they come on stream earlier to make use of the full capacity of the pumping main. These changes were completed in late 2001. There was a minor problem during very wet weather in 2003 and the pumping electronics modified as a result but since that time no known problems have occurred. Southern Water has no plans to make major improvements to the system at this time. See also Action 15.

ACTION 20 (Swalecliffe and Chestfield)

Conclusion At Swalecliffe and Chestfield there is an ongoing flooding problem that was particularly bad during the April 2000, October 2000 and February 2001 storms. Flooding is from a number of sources - mainly the Swalecliffe Brook, Kite Farm Ditch and watercourses that feed into them. Flooding to some degree has been a regular occurrence since December 1999. A total of 40 houses have been flooded, some more than once, and major roads in the area have been impassable. It is perceived by many long time residents that the new A299 has had a major impact on the land drainage pattern.

Recommendation Improvements are required at a number of locations to ease the situation. The effects of the A299 need to be investigated and corrected where necessary. The regular flooding at Molehill Road and Radfall Road, which cuts off the community, must be solved. A solution to the tide locking problems is needed and the possibility of a new outfall should be

considered. The whole catchment and longer term options should be studied especially with reference to any future development.

Action A number of minor improvements have already been carried out and more significant works are now under way or programmed for the near future. These are detailed in the main report and can be summarised as: works completed or under way - City Council removed shingle and debris at Kite Farm Ditch outfall and large amounts at Swalecliffe Brook outfall, cleared and improved watercourses at Chestfield particularly along Molehill Road, on behalf of KCC carried out drainage works at Radfall Road and new culverts at Molehill Road; Kent Highways cleared blockages in A299 drainage and at the outfall lagoon; Environment Agency completed weedcutting, removal of debris and some dredging in the Swalecliffe Brook; Southern Water commenced inspection and removal of any debris in the public sewer part of the Kite Farm Ditch and paid for new improved weedscreen at the Kite Farm outfall (work done by CCC). Works planned for the near future are - City Council construct additional outfall works at Swalecliffe plus new weedscreen (contract about to go out to tender), minor improvements to the Kite Farm Ditch at Maydowns Road (work to be done by end September); KCC construct new balancing lagoon at Molehill Road to attenuate the flow from land drainage in that area (planning approval just received subject to landscaping being agreed). Along with land drainage works to the Chestfield Golf course the Club are currently constructing two balancing lagoons on the course which should further help the drainage situation adjacent to the new A299. The City Council and Environment Agency are proposing to carry out a joint catchment study of the area subject to central government funding approval.

Current Situation The following major works that were promised have all been completed and are working well: A new balancing lagoon at Molehill Road has been built by Kent Highways to restrict the flow of water from the A299 drainage into the Molehill Road ditch and the rest of the Chestfield watercourse system; other drainage improvements were also carried out by Kent Highways in the area; the Golf Club has improved their land drainage and built a small balancing lagoon on the golf course; the City Council constructed a second outfall for the Swalecliffe Brook at Long Rock together with improved weedscreen – this almost doubled the flow capacity there; the Kite Farm ditch has been improved and regraded by the City Council and the culverts under the old Thanet Way have been completely cleared; Southern Water carried out jetting through and clearance of the sewer system at Colewood Road; the ditch system near the Kite Farm sea outfall together with the weedscreen have been improved by the City Council; most of the smaller watercourses through Chestfield have been fully cleared and minor improvements made by both the riparian owners and the City Council. The City Council continues to regularly clear the Molehill Road and other problematic ditch systems in the area. The Environment Agency completed weedcutting and minor desilting works in the Swalecliffe Brook and have returned to remove other debris on occasions. Improved drainage at the Radfall Road flyover has been completed but the proposed new outfall works continue to be held up as permission is still withheld by the landowner. It should be noted that there was no known flooding to property at Chestfield despite the heavy rain of 21 August 2007 although there were flooding problems under the Radfall Road flyover.

ACTION 21 (Greenhill and Hampton)

Conclusion There was significant flooding in February 2001 at both Hampton and Greenhill, Herne Bay from the Westbrook and the Greenhill Ditch which runs into it. In total 25 properties were flooded plus a school and a number of business premises. The coastal road at Sea Street was impassable for some time. The main locations were Aldridge Road and Fife Road at Greenhill and Studd Cottages at Herne Bay. These locations all have a history of flooding. Causes of flooding at Hampton are related to the tide locking of the river but the various restrictions by bridges and the condition of the river itself are considered significant. At Greenhill there are a number of possible factors contributing to flooding.

Recommendation The Westbrook has a number of places where the width is restricted or banks have partially fallen in and is in need of dredging. Environment Agency should carry out maintenance works before the winter. Possible improvements to flow at culverts and bridges should

be investigated. An off stream attenuation lake to hold back some of the flow should be considered in the long term. Improvements to the downstream end of the Westbrook will also assist the Greenhill Ditch. The various agencies involved with the Greenhill Ditch, much of which is piped, need to get together to resolve the problems and make improvements.

Action Environment Agency has completed weedcutting and desilting of the Westbrook together with removal of accumulated debris. Repairs to the banks are also under way. For the piped section of the Greenhill Ditch, Southern Water has jetted the system at the problem area and removed some obstructions but recent road flooding shows there still to be a problem with the pipework. Southern Water are being pressed to carry out a full cctv survey and a capacity check on the public sewer network. Railtrack have cleared debris from the culvert under the railway. The City Council has cleared the large amount of debris in the private section of the watercourse and has contacted the owner pointing out his maintenance duties. The City Council has, at the cost of the landowner, removed the disused private bridge that caused a restriction to the flow. The Environment Agency will carry out a catchment study but this is not programmed for some time.

Current Situation The Environment Agency completed all the planned works to the Westbrook - comprising weedcutting, desilting, bank repairs, removal of debris and cutting back of trees encroaching on the river. Southern Water carried out a detailed cctv survey of the surface water drainage system at Greenhill and found major blockages by tree roots in the pipeline. These blockages were removed and the pipeline fully jetted. The City Council has quite regularly removed debris thrown into the Greenhill Ditch open watercourse and carried out general maintenance. Regular maintenance of the Rowland Drive watercourse is carried out. There is still difficulty in getting action from riparian owners and the problem of discarding debris, particularly garden rubbish, in this area continues.

ACTION 22 (Whitstable)

Conclusion Flooding was not so widespread in Whitstable as in other urban areas but still at least 20 houses were flooded. The worst hit areas were all along the Gorrel Stream which is the main watercourse draining the town. Part of the City Council estate at St Andrews Close was badly flooded in February 2001 by both surface and foul water. The main reason was probably that the adjacent watercourse was blocked by illegal dumping of rubbish. In October 2000 there was flooding to many properties in the Westgate Terrace area when the pumps at the outfall at Gorrel Tank failed. This part of the Gorrel Stream is designated as a public surface water sewer maintained by Southern Water.

Recommendation At St Andrews Close the City Council should contact the riparian owner of the watercourse to ensure that he keeps it clear and free flowing. Until a satisfactory maintenance regime is set up by the owner the City Council should protect its tenants by carrying out preventative maintenance to try to ensure the stream remains clear. A publicity campaign is needed to advise tenants not to dump rubbish. At the Gorrel Tank Southern Water should investigate and carry out improvements to the pumping system to try to ensure that this major pumping station does not break down again.

Action City Council engineers have contacted the riparian owner at St Andrews Close and are awaiting a response. In the meantime regular maintenance of the watercourse is taking place and it will be cleared again at end September. Southern Water have advised that improvements have been made to the pumps and the control systems at Gorrel Tank. A secondary back up system has also been installed.

Current Situation A new weedscreen by the City Council and extra maintenance has significantly improved the situation at St Andrews Close and there was no flooding there even during the 21 August 2007 event. The occasional major clearance and more regular general maintenance visits to the Gorrell at Millstrood Road has improved the situation but fly tipping remains a serious problem. Works to the outfall there plus new weedscreen and regrading of the stream are about to commence. At the Gorrell Tank Southern Water increased to three the number of pumps that would be operational during heavy rain.

Despite the above and other general improvements there was flooding to about 50 houses at Whitstable as a result of the very heavy rain on 21 August 2007. It is considered that the intensity of rainfall over a very short period caused the flooding but the low capacity of the

highway drainage system and that of the public sewers may well have exacerbated the problem. The amount of silt within the Gorrell tank structure and the lack of urgency by Southern Water to remove it remains a matter that needs to be resolved.

ACTION 23 (Stour Canterbury to Fordwich)

Conclusion In the urban area there was no major overtopping or bursting of its banks by the Stour. There were some localised problems where flooding directly and indirectly came from the river. These were at Thanington, St Peters Canterbury, Broad Oak Road/St Stephens Canterbury, Sturry and Fordwich. In total 20 houses were flooded. At Fordwich there is a related land drainage problem which also caused some flooding. Backing up of surface water drains that outfall into the river at a number of these locations may well have made the situation worse.

Recommendation The Environment Agency should ascertain the various possible reasons for flooding and carry out improvement works. Non return valves should be fitted to outfall pipes. The banks of the river should be surveyed to find any low spots where attention would reduce the possibility of flooding. Dredging of the river should be carried out where necessary to improve the flow. Canterbury City Council should examine the land drainage problems at Fordwich.

Action The Environment Agency has agreed to remove the shoals in the river at St Stephens and the work will be carried out in October. The situation with the river banks there will also be checked at that time. The City Council will survey the banks in the St Peters area to see if any raising can be carried out - survey planned for September. Southern Water has agreed to fit flap valves to outfalls - work to be carried out shortly. At Fordwich the Environment Agency will carry out works in October/November to ensure that the river walls and banks are continuous and at the correct level. The damaged expansion joints will also be renewed. The City Council, with the landowner, is looking into the land drainage problems there and the situation will be advised to residents shortly. An action group, Floodlinks, has been set up by affected residents and parish councils at Fordwich/Sturry and the City Council is liaising with that group in order to try to solve some of the issues.

Current Situation The removal of shoals in the river and the minor raising of banks at locations downstream of Kingsmead has been carried out by the Environment Agency. Non return valves have been fitted at some but not all the outfall locations by Southern Water. At St Peters the fitting of non return valves to highway drains has been completed by Kent Highways. The City Council has installed/raised some floodboards at St Peters. At Fordwich the Environment Agency has completed maintenance works to river walls and banks to restore them back to their original level. Clearance and minor improvements to ditch systems has been carried out by the riparian owners and the City Council at Fordwich and Whitehall Road. The City Council has completely refurbished all river sluice gates through Canterbury to ensure easy operation during high river flows. The private sluice gates at Barton Mill, which have caused some backing up of the river, are now being removed in conjunction with the development there. Concerns have been raised about the general condition of the Stour through Canterbury and EA have recently carried out cutting back of vegetation and debris clearance.

ACTION 24 (Herne Bay & District)

Conclusion In the centre of Herne Bay and the surrounding communities of Herne, Broomfield and Beltinge there were quite a large number of flooding incidents from a variety of sources. It is estimated that at least 15 houses were flooded internally, at about ten different places, over the April 2000, October 2000 and February 2001 storms in this area. The probable causes were foul sewers backing up, minor streams being blocked, problems with highway and public surface water sewers, possible land drainage changes due to the new A299 and water flowing off fields.

Recommendation City Council engineers should investigate all these problem areas and ensure that the responsible agency is aware and is looking into possible solutions. Where no other agency is involved the City Council should consider what action it can take to assist.

Action Some of the issues have been followed up and other agencies are also investigating but most of the problems have yet been looked into in detail. Sewage flooding at Herne has happened again recently and Southern Water are being pressed to solve this problem.

Current Situation A number of the flooding and land drainage problems have been resolved but there remain some still to be fully dealt with – but these have no solution without very expensive capital works (Southern Water). The sewage flooding problem at Herne appears to have been solved by Southern Water by the installation of non return valves. Some minor improvements to surface water flooding at Reculver Road and Beltinge have been made by Southern Water. The City Council has carried out land drainage improvements at Canterbury Road, Lower Herne and Eddington as well as a continuing maintenance programme for other problematic minor watercourses. See also Action 15 with respect to sewage pumping stations.

ACTION 25 (North Canterbury)

Conclusion There has been a land drainage problem in existence for a long time at north Canterbury from Harbledown right through to Broad Oak. This is allied to the catchment of the Sarre Penn watercourse. Many land drains and watercourses are not functioning properly and water flows unchecked from the hillsides above into residential areas. In the past there have been minor landslides and failures of retaining walls. Although there was considerable flooding of a large area a number of times over the last year the number of houses reported flooded internally was 5. Except for at the Cherry Gardens locality where the condition or capacity of the Southern Water foul and surface water sewers have added to the problem, there are no other agencies involved.

Recommendation The City Council should carry out an in depth study to ascertain the problems and options for improvement. All incidents reported should be followed up to try to instigate short term measures that may help. Landowners should be contacted and made aware of the problems and their responsibilities where relevant.

Action The City Council will shortly be applying to central government for funding of a detailed study here. Some problems have been investigated but because of priorities there are many still to be checked up on.

Current Situation Defra grant aid was received for a land drainage study here and at some other locations within the district. The study has been completed and the consultants made a number of recommendations. The short term recommendations, which included a number of minor improvements to watercourses, have been completed. Some improvements have been made by Southern Water to the foul and surface water sewer systems at Cherry Gardens. The City Council has recently carried out minor improvements to the watercourses at Hillside Avenue and Longmeadow Way.

However, the more comprehensive land drainage improvements suggested in the study still need to be carried out. This work is dependent upon funding from the land drainage revenue account and the call on that money from higher priority items elsewhere in the district.

ACTION 26 (Great Stour)

Conclusion Considering the large developed floodplain of the Great Stour and its massive catchment, there was not widespread flooding from it. Houses at Shalmsford Street and Chartham were very close to being flooded in November 2000 and February 2001. Some houses were flooded at Canterbury and Fordwich directly or indirectly (see elsewhere in this report) from the Stour. However, the main problems were at its confluence with the Little Stour where large tracts of land at Grove were under water for many weeks around February 2001. It is concluded that the holding reservoirs at Aldington and Ashford worked well and the Environment Agency are praised in this respect.

Recommendation Improvements and raising of the banks of the Stour need to be made in the vicinity of Grove to prevent overflow and flooding of the low lying land. Significant dredging of the river bed is urgently needed at Plucks Gutter and further downstream and more frequent maintenance should be planned in future. The pumping capacity at Stourmouth, where the Little Stour is pumped into the main river, should be investigated with a view to increasing flow rate. The whole catchment including the Little Stour and Nailbourne should be studied and the resulting long term improvements put into Environment Agency's capital programme for action as soon as possible.

Action The Environment Agency has confirmed a programme for dredging 3 km of the Stour downstream of Plucks Gutter commencing in October. Due to insufficient funds the next stage of dredging will not start until autumn 2002. The environmental problems in repairing the banks at Grove Ferry have been solved and the work will be carried out in October. Other major improvements to the Stour including possible increased pumping at Stourmouth will be examined as part of the in depth catchment strategy study which is about to commence. The Agency has been requested to urgently repair and bring into use the two (out of six) damaged gates at Stonar Cut and to look into reinstating the original width of the river in the Grove area.

Current Situation The Environment Agency now has in place, and funds available, a programme for capital dredging of the Stour from Sandwich back to Fordwich with an annual rate of about 3 km per year. The first length from Sandwich towards Plucks Gutter was completed in 2001. Since that time the dredging has been fairly regular although perceived environmental impacts have caused delays. The gates at Stonar that all needed repair and partial refurbishment have all been repaired/renewed.

Repair/raising of the banks and some reinstatement of river width at Grove Ferry did not go ahead because of the need for a full environmental impact study and much of the work is even now still outstanding. The question of the possibility of additional pumps at Stourmouth (to pump up the Little Stour) was to be examined as part of the Stour Catchment Flood Management Plan, but the plan did not examine matters in that sort of detail. The CFMP has now been completed but there is no detailed action plan with it and further studies will be needed before any significant capital work on the Stour will be allowed to go ahead.

ACTION 27 (Little Stour & Lower Nailbourne)

Conclusion Serious flooding occurred in the parishes of Bridge, Patixbourne & Bekesbourne, Littlebourne, Ickham and Wickhambreux due to the Little Stour and Lower Nailbourne main river bursting its banks. A total of 60 houses were flooded. Some of these properties were affected continually from November 2000 to April 2001 with the flooding peaking in February 2001. Not all houses were flooded directly from the river as a number of these were flooded as a result of run off from fields and roads where the outfalls to the river also backed up. In February 2001, particularly at Bridge, some houses were flooded due to foul sewers backing up. Restrictions in the river that reduced its flow at highway culverts, water mills, numerous obstructions constructed both privately and as a result of nature all contributed to the problem. The outfall with the Great Stour (see Action 26) was also a major factor.

Recommendation The whole of the Nailbourne and Little Stour should be investigated as one entity as the problems and potential solutions affect the full length. This includes Elham and Lyminge which, although outside the City Council's area, are equally affected. A survey of the river should be undertaken to determine all restrictions and to be the basis of action to remove them where practicable. Care must be taken to ensure that any works do not make the situation worse downstream. The Environment Agency should increase the scope of annual maintenance to the river to ensure that it is in its optimum condition. The work of weedcutting and removal, dredging and bank remedials must be carried out before this winter. Other sources of flooding in the area should be investigated and actioned where possible. Means of keeping the source aquifer at a lower level before winter should be assessed. A detailed study of the entire catchment should be carried out to determine long term solutions.

Action The parishes affected along the entire length of the river have set up the Little Stour and Nailbourne River Management Group to co-ordinate action and are working with the Environment Agency and City Council. This has proved to be a very beneficial partnership which has been instrumental in getting many projects under way. The City Council has completed a survey of the Nailbourne and issued a report detailing maintenance work required. The Environment Agency has surveyed the Little Stour and has begun to action some of the issues. The Environment Agency will carry out some limited dredging of shoals and bank repairs (including at Scoutlands) in September. Some weedcutting and reed pulling has been completed and a further programme of work for the full length of the river will commence in October. The Environment Agency is looking into possible flow improvement works at the water mills. The City Council has completed the high

flow by-pass channel at Patricbourne. The proposed by-pass channel from Littlebourne through to Seaton has been drawn up and set out on site. Subject to satisfactory agreements with landowners and some other legal requirements, Environment Agency considers the channel could be completed (excluding road crossings) by December. The Environment Agency has been asked to check on the feasibility of pumping at the source of the Nailbourne during the summer - no response on this has yet been received. The City Council and Kent Highways have carried out minor local drainage improvements at Bridge and Littlebourne. Kent Highways will carry out drainage improvement works at Ickham in September to provide an outfall for the pond.

Current Situation The Little Stour and Nailbourne River Management Group continued to meet regularly and close liaison was being maintained with the City Council. In the last two years meetings have been very few and possibly a meeting should be arranged shortly to discuss any potential problems. The Group has, on the whole, been a great success. At various locations along the length of the river the Environment Agency had carried out dredging, mainly at the location of shoals. EA has carried out weedcutting and reed pulling at intervals. The major improvement to the river, comprising a new high flow diversion channel from Littlebourne to Seaton, was completed some time ago together with fords/drainage culverts at road crossings carried out by Kent Highways and the City Council. This should noticeably reduce flooding to the villages along this length. A number of local highway drainage improvements at Bridge, Littlebourne and Ickham by Kent Highways have been carried out. The joint project for improvements at Patricbourne has been completed. This comprised a high flow diversion channel, clearance of material under bridges, dredging and some widening of the river and lowering of the ford. The City Council has also carried out a number of land drainage improvements, particularly at Littlebourne.

However, it is considered that both the Lower Nailbourne and Little Stour are now again in a poor state with narrowing of the channel due to vegetation growth, various obstructions to flow, shoals of silt reappearing and still the need for an entire dredge of the river as originally requested. At Littlebourne there has been near flooding recently due to the poor drainage along Nargate Street – Kent Highways are looking into this.

ACTION 28 (Upper Nailbourne)

Conclusion The Upper Nailbourne from its source to Bridge is not a designated main river and does not come under the auspices of the Environment Agency. The villages of Barham, Kingston and Bishopsbourne suffered from flooding just as badly as down river and a total of 40 houses were flooded from the river overtopping its banks and other related causes. Flooding due to run off from fields and from natural springs was particularly bad in this area. The main problems are identical to those for the main river (see Action 27) with respect to restrictions and lack of maintenance reducing the flow.

Recommendation The main recommendations are as for the rest of the river (see Action 27) and must be carried out in conjunction with them. The City Council should co-ordinate action and organise an inspection and detailed survey of the Nailbourne to assess restrictions and possible improvements in conjunction with the parish councils, riparian owners and Kent Highways and Bridges. Possible local drainage improvements should be investigated by the City Council to try to reduce flooding from other sources. After the surveys the riparian owners should be requested to undertake urgent maintenance to the river in the form of removal of vegetation, trimming of tree branches, removal of debris, repair of fallen in banks and dismantling of any unapproved structures restricting the flow .

Action The main actions follow those of Action 27 for the lower part of the river. Both the inspection and detailed survey/analysis of the river has been completed by City Council engineers and the report issued. The new culvert at Black Robin Kingston, currently being installed by Kent County Council, will have some four times the capacity of the original structure. The actual maintenance by the riparian owners is now well under way and considerable improvements have been made along a number of lengths of the river through the villages. All bridges and culverts have been cleaned out by Kent County Council. KCC Bridges have surveyed and reported on all the structures and, together with the City Council, will shortly issue a report on the short and long term

works proposed. It is likely that improvements to the culvert at Frog Lane Bishopsbourne will be the first priority and that the culvert at Valley Road Barham will also be proposed for improvement in the future. Other improvement works by the City Council, either under way or soon to commence, are channel deepening and improvements downstream of Bishopsbourne, flood wall at Barham plus a number of local drainage improvements in conjunction with Kent Highways.

Current Information Considerable improvements have been made to the river by the riparian owners and the City Council in clearing the river and improving the channel. Regular inspections are made by the City Council and minor works and clearance carried out to maintain an effective channel. All bridges and culverts, both KCC and private, have been cleared out and are now regularly checked by Kent Highways. Kent Highways has enlarged the problematic Frog Lane culvert at Bishopsbourne. The Black Robin culvert and the adjacent river improvements have been completed. The City Council has carried out a number of small and medium sized improvements to the river at Barham, Kingston and Bishopsbourne. For some of these the Parish Council and Kent Highways have contributed to the cost.

ACTION 29 (Nailbourne Sewerage)

Conclusion Inundation of the foul sewerage system by flood water causing failure of pumping stations and pumping raw sewage into the river has been a major concern to residents as it continued over such a long period at nearly all the villages along the Nailbourne and Little Stour. Particularly in February 2001 there were a number of houses that had previously escaped problems that were flooded from the sewers. Residents advised that even prior to last year there had been indications of infiltration of ground water into the pipelines and that they considered the system was becoming worn and running at over capacity.

Recommendation Southern Water need to fully investigate the situation and carry out works to improve the infrastructure. A cctv survey of the whole system should be carried out and leaking pipelines replaced or relined. A review of the system's capacity is needed to ascertain any upgrading works to both pumping stations and sewerage.

Action Southern Water has carried out some localised inspections and repairs to damaged pipework and is considering carrying out cctv surveys in all villages to check for cracks and significant displacement of pipes. Since the flooding ceased there have been further reports of failures of the system and a list of known problems is being compiled by the River Management Group for Southern Water's action. There are no proposals at this time by Southern Water for major improvements to the system as the company considers the system has the capacity for normal operation.

Current Situation Southern Water completed all their investigations into known and reported leaking and damaged pipe locations in 2003. A full cctv survey of the pipeline was also carried out to determine overall condition. Where any problems had been found, repairs were carried out. Southern Water has reiterated that it considers the Nailbourne and Little Stour sewerage system is in adequate condition and no major improvements are proposed. The company states it will continue to react as quickly as possible to any pumping station problems and that it has an action plan, based on the lessons learnt from earlier years, to quickly bring into operation additional pumps and equipment should there be future significant flooding of the Nailbourne.

ACTION 30 (Rural Area)

Conclusion The rest of the rural area also suffered from some severe flooding. Conditions in the villages along the Petham Bourne were particularly bad although it was noticeable that people coped very well with little assistance being asked for. It is estimated that about 20 houses were flooded in but the number could quite well be many more. The flow in the Petham Bourne was the worst in living memory and was the cause of half of the incidents of flooded homes in the general rural area. The others were at isolated locations due mainly to water flooding off fields and natural springs but blocked watercourses were also to blame. Failure and inundation of sewage pumping stations was another factor in the flooding.

Recommendations City Council engineers should investigate all these problem areas and

consider what action can be taken to assist. Where relevant Southern Water should carry out their own investigations.

Action Some of the issues have been followed up and other agencies are also investigating but most of the problems have not yet been looked into in detail due to other priorities. The City Council accepts that further investigations should be commenced as early as possible.

Current Situation Further individual land drainage and flooding problem locations in the general rural area have been followed up and some action taken and/or advice given. Whenever a problem is notified a follow up site visit is made and if possible, and within budget, improvements are made.

However, many residents expect the Council to be able to solve everything, often when it is a different agency who may be responsible. In many cases the work to completely solve the problem is not economically viable and often the more urban areas have to take priority because of the number of properties that are affected there.

6. EFFECTIVENESS OF FLOOD WARNINGS

This section of the report covers a description of the general situation with respect to Flood Warnings, the Flood Warnings that were issued last year and some suggestions as to how Flood Warnings could be improved.

ACTION 31 (dissemination of flood warnings)

Conclusion There is a need for better dissemination of flood warnings to ensure that all residents living in the flood plains of rivers are able to receive and are aware of flood warnings as quickly as possible after they come into force. There is a particular problem in this district with respect to locations prone to flooding from watercourses near main rivers but outside the main river flood plain. These residents should also be able to receive flood warnings as experience has shown that flooding there is coincident with flooding at nearby main rivers.

Recommendation The Environment Agency should extend the AVM system to include all locations known to be prone to flooding regardless of whether or not they are within the main river flood plain. Improvements in dissemination of flood warnings to all known potential flooding locations should be made by setting up flood warden systems via parish councils and residents associations. City Council engineers should liaise with Environment Agency to assist with these improvements.

Action Discussions have been held with Environment Agency, who agree in principle to the proposals, but the AVM system for this area is already overfull and EA's procedures state that priority must be given to those in the sea and main river flood plains. The City Council is compiling a list of streets that should be included with the relevant main river flood warning and the information compiled to date has been passed to the Agency. Parish councils and residents associations should approach the Environment Agency who will advise on the best method for setting up flood wardens. The City Council will assist in bringing together the various parties involved.

Current Situation The Environment Agency has made a number of improvements to the flood warning system over the last few years and it is now much wider than in 2000. Particular attention has been made to the dissemination of warnings by various means including via radio, television, internet and "Floodline". The newer "Flood Watch" warning is catchment based and should alert people to potential problems even though they are not within the river floodplain. The AVM (now called "floodline warnings direct") has been considerably extended. Along the Nailbourne, Little Stour and at Fordwich there are systems of flood wardens and flood contact persons.

ACTION 32 (Nailbourne and Plenty Brook flood warnings)

Conclusion There is significant concern that two of the most seriously flooded locations, Plenty Brook and Nailbourne/Little Stour, do not receive flood warnings.

Recommendation For the Plenty Brook it is proposed that Environment Agency include this watercourse on the warning issued for the Westbrook as both tend to react similarly after heavy rainfall. Residents along the Plenty Brook should also be included on the AVM system. For the

Nailbourne/Little Stour the Environment Agency are requested to examine methods to provide a flood warning system and it is suggested that this is based on the level of the aquifer at the source of the watercourse.

Action The Environment Agency states that the flood warning rules do not allow them to include the Plenty Brook with the Westbrook flood warnings but will look into possible changes. The City Council has provided a list of potential flooding locations along the Plenty Brook for the AVM and the EA will contact these addresses to see whether they wish to be included. The Environment Agency will set up by the end of September an advance warning system for the Nailbourne/Little Stour. This will be direct to the City Council and parish council representatives, who will disseminate the warning. A more formal flood warning system is planned for autumn 2002.

Current Situation There is now a full flood warning system introduced by the Environment Agency for the Nailbourne and Little Stour in the same format as for all other main rivers. The Plenty Brook has now been added to the alert for the Westbrook and flood warning information can be found under "The Plenty, Swalecliffe and West Brooks". All these areas can receive automatic telephone warnings from the Environment Agency through the AVM system and it is understood that the take up by the public is higher than the national average.

However, the Gorrell Stream, although now a designated main river, is not covered under the flood warning system and it is suggested that the Environment Agency should add it to the above list of coastal brooks for warnings.

ACTION 33 (improvements to flood warnings)

Conclusion During some of the last year's flooding events the coastal river flood warnings arrived too late to allow effective action. It is considered that some warnings contain inappropriate statements or give the wrong impression as to what may happen.

Recommendation The Environment Agency is asked to re-examine its processes to try to improve the lead time on flood warnings for coastal rivers and particularly the situation when they are tide locked. The Environment Agency should reassess the wording contained in the flood warnings so that it reflects a more likely scenario based on the experience of events over the last year.

Action The Environment Agency is currently setting up a number of extra telemetry stations which will aid more accurate forecasting. The City Council has provided information on actual rainfall and tides during recent flood events to assist. The Environment Agency is currently reviewing the text of flood warning messages with a view to making the wording more consistent with what does happen.

Current Situation Some additional telemetry stations have been set up by the Environment Agency on the Swalecliffe Brook and Nailbourne. These should result in improved lead times on some flood warnings. There has been little or no change in the wording of flood warnings to more accurately describe the likely flooding scenario. City Council engineers have been in contact with EA about this but the national procedures (and type of wording) on the warnings do not allow for local changes to wording. This tends to mean that the coastal warnings for our area can be overly severe whilst the river warnings may not be severe enough and come when a flood is already taking place. The flood warnings are still very much centred on sea and the larger main rivers (The Stour) and do not cater for overland and flash flooding events – such as at Whitstable on 21 August 2007. This needs to be discussed with EA to see whether improvements can be made but national protocol on flood warnings makes any changes very unlikely. It is possible that Defra may now require EA to be more involved with flood warnings for heavy rainfall/flash flooding events but this will take some time before it could be set up.

7. FLOOD EMERGENCY PLANNING AND RESPONSE

Under this section the various emergency plans are described, particularly the City Council's "Major Emergency Plan" and "Flood Emergency Plan". The roles during flooding of the other agencies, including the Police and Fire Services, are summarised. The actual action and response during

emergencies and the resources available, such as sandbags, is included. A number of improvements to the systems are proposed.

ACTION 34 (major emergency plan)

Conclusion The City Council has a Major Emergency Plan which is generic and set up for all the types of emergencies that a local authority is likely to be called upon to deal with. Whilst the plan obviously covers flood emergencies its aim is the overall management of emergencies, ensuring close liaison with the emergency services and other agencies, evacuation and the setting up of temporary shelter. Reports have been received, particularly on the events of February 2001, that there have been breakdowns in communication between agencies. There also appeared to be problems between the site of the emergency and the control centre. With respect to evacuation of flooded homes (specially occupied by the elderly), transportation and setting up the emergency rest centres was clearly a problem at times and it took much longer than it should have done.

Recommendation The City Council together with the KCC Emergency Planning Officer should reassess systems of communication and make refinements wherever necessary. The City Council should send experienced officers to major sites to act as coordinators on the ground and with the control centre. Arrangements for evacuation and transport, bearing in mind the needs of the elderly, need to be improved. Methods must be in place to ensure that regional control centres are fully aware of local problems and will take action to draft in additional resources from elsewhere when necessary.

Action The City Council has just redrafted its Major Emergency Plan which takes account of many of the lessons learnt during the last year's flooding. The system of evacuation and transport has been further re-examined to ensure that the Plan is clear on how this should take place. The draft Plan is now being worked to pending formal issue. A system of "Forward Control Officers" has been included and they will be responsible for ensuring that full situation reports are regularly sent to the control room from the site of flooding. The KCC Emergency Planning Officer has reviewed all downward and upward systems of communication to ensure that all levels have sufficient information to make informed decisions on resource allocations.

Current Situation The City Council's new Major Emergency Plan was issued in 2002 and regularly updated since then. It includes improvements based on the lessons learnt from the 2000/2001 flooding. Inter departmental discussions have also taken place to try to ensure that there is improved communication, especially at the site of the incident, with respect to evacuation and the setting up of emergency rest centres. Actual events such as Tenterden Drive have proved that on the whole the system now works much better. Some problems were encountered during the flash flooding at Whitstable on 21 August 2007, mainly due to poor communication with the contact centre. These problems have been examined and proposals made to rectify them. The sea flood emergency of 9 November 2007 took the proposed amendments into account and the system ran well.

ACTION 35 (flood emergency plan)

Conclusion The actions, responsibilities and work required to deal with and try to alleviate the effects of flooding are set out in the "Flood Emergency Plan". This document is updated annually in September. It is basically a handbook of actions to be taken by the City Council's engineering staff from when the lowest level of Flood Warning is issued up to dealing with actual flooding. The plan was originally set up for sea flooding response but in recent years has been extended to include some guidelines for action on river and other types of flooding. The plan lacks detail on the complex issues of inland flooding and the actions to be taken are very much left to the individual engineer. This can lead to confusion, especially in the minds of the public, as to what will and will not be done. It is considered that, particularly with the Nailbourne flooding, the plan could possibly have gone into action quicker. There were also complaints that at times resources to back up the plan were scarce although attendance by an engineer to a problem area was usually quite rapid.

Recommendation Lessons should have been learnt from the events over the last year and it is considered that improvements could be made to the Flood Emergency Plan to include further operational activities and knowledge that could lead to improved efficiency and possibly a quicker response. These improvements should be brought in before next winter subject to any necessary

City Council financial and policy approvals.

Action The following improvements to the Flood Emergency Plan are being investigated:

- 1) List all known serious flood locations and indicate known actions that can be taken to reduce the impact of flooding;
- 2) Utilise the experience of engineers at certain locations and include this in the plan so that they are sent, whenever possible, to that location;
- 3) List approximate number of sandbags that will probably be required at each site particularly with respect to large numbers used at strategic locations;
- 4) Include a list of local representatives names and telephone numbers, such as parish councils, who are able to assist at short notice;
- 5) Ensure that policies relating to flooding, such as the sandbag policy, are clearly set down so that all who are involved in the emergency are fully aware of the agreed approach;
- 6) Include a brief summary of what Environment Agency and other agencies do to ensure there is no duplication of effort;
- 7) List roads that are known to flood, actions that might be needed and possible diversion routes so that time is not wasted getting to other flooded sites;
- 8) Ensure that the plan is fully integrated with the Kent Highways emergency plan for flood events.

Some of these have already been included in the September 2001 issue and others will be included in an October revision once all details have been received/agreed.

Current Situation The current version of the City Council's Flood Emergency Plan includes details of the Action items listed under this heading. This information is included in the document itself or relevant details/maps/lists are held in the Emergency Room. In view of the local Kent Highways now being a separate organisation there is a need to check the compatibility of the two emergency plans to ensure they work together. This is being done as part of the actions agreed after the Whitstable flooding. Further work is needed with respect to diversion routes for roads known to flood. This will be done in conjunction with Kent Highways.

ACTION 36 (public awareness and contact)

Conclusion There were a number of comments made by the public that there was a lack of co-ordination between agencies and a "not our responsibility" reaction. The public also considered that they were not kept informed of events, were not aware of what the procedures were and did not know who to contact. There were problems at times getting through to the City Council particularly after normal working hours. Difficulties were also experienced in contacting the Environment Agency and the Southern Water's system for answering calls from the public meant that sometimes people had to wait a long time to get through.

Recommendation Communications between the agencies need to improve to ensure that a problem is being properly investigated. If it turns out that the problem is the responsibility of another agency or can better be dealt with by them then systems must be in place so that the person on site knows who to contact and that the action is followed up. The agencies involved should consider setting up a "one stop shop" so that the public are dealt with at their first contact point. Inter agency lines of communications should be set up so that the problem can quickly be passed from the receiving agency to the one who will deal with it. Improved procedures should be set up for keeping the public informed and so they know who normally deals with what. The City Council needs to review its out of office hours call system to be able to cope with and action large amounts of calls. Use should be made of parish councils and community associations to get messages quickly to local residents.

Actions The City Council, Environment Agency and Southern Water have jointly reviewing communication procedures and better direct contact routes have been set up. In emergencies the City Council will try to adopt the "one stop shop" approach but this may require additional staff resources. Other agencies are being asked to do similar in which case there should be little overall increase in workload. During an emergency, when the emergency centre is set up, there are now considered to be sufficient phone lines, and experienced personnel to answer them, at the City Council. The system for calls when the emergency centre is not set up is being reviewed. Direct lines of contact between City Council engineers and appointed representatives of parish council and

community associations in flood prone areas are beginning to be set up.

Current Situation As far as is practicable the City Council is now using a “one stop shop” approach when answering calls from the public about “flooding” by making use of the contact centre facilities. There were problems with this during the Whitstable flooding but these are being resolved and a system set up to ensure there is good two way contact between the emergency room staff and the contact centre. The other agencies have also improved their call centres and response mechanisms to the public.

Despite these improvements the public still have difficulty at times in knowing who to contact and do get passed from one agency to another. There is also the strong perception that the Environment Agency “Floodline” will solve all the problems. Floodline is merely an information service on the levels and extent of flood warnings in force and does not take any action. Further discussion between agencies and better public information is needed to ease this problem.

ACTION 37 (sandbags)

Conclusion Sandbags were a major source of “dispute” between the public and the City Council during the flooding. The City Council’s current policy is that sandbags will not normally be delivered to individual properties and they will only be deployed in strategic areas after an engineer has assessed the situation. In the event the City Council delivered about 35,000 sandbags, virtually on demand in the end. This relaxation of the policy probably saved a very large number of homes from flooding. It is known that some houses did not get sandbags or more often they arrived too late but the widespread nature and scale of the flooding made this almost inevitable. The later retrieval of sandbags also, surprisingly, led to some complaints and it is noted that the cost of retrieval is almost as much as the supply. The situation at other local authorities in Kent has been looked into and the policies vary from nil supply to supply on demand with some limitations.

Recommendation A total review of the sandbag policy should be made by the City Council and it should allow supply to all reasonable requests subject to availability, priority and the engineer’s knowledge of the location. Unlimited supply without question to all who ask for sandbags should not be agreed. The supply of sandbags to individuals should be on the understanding that they then keep them for possible future use. The setting up of local area sandbag stores at critical points, with possible distribution by appointed people, should also be investigated.

Action City Council engineers have drawn up a revised sandbag policy in line with the recommendations of the Panel. Local area stores have already been set up at a most locations and the remainder will be completed in September. A list of local representatives to assist in distribution from these stores is being drawn up. The new policy, which is subject to Committee approval, will make it clear that sandbags when delivered will become the property of the householder and advice on storage will be given.

Current Situation The new sandbag policy has been agreed by Council and has been in operation since October 2001. It has been quite well advertised so that the public should know what to expect, although there is still some opposition when people are told that the sandbags have become their property and often we have ended up taking them away. There also seems to be an impression now that sandbags will be delivered to all the public who call for them and they will get there on time – clearly this is not possible and the wording of the advertised policy may need to make this clearer. Coastal sandbag stores have been set up at Whitstable, Swalecliffe and Herne Bay. Along the Nailbourne/Little Stour every parish now has its own local sandbag store for immediate use by residents. Serco have set up a system by which their larger lorries transport the sandbags from stores to the general area and local distribution is by a fleet of smaller trucks. The Council has advertised empty sandbags for sale to residents at cost price and the take up has been high.

ACTION 38 (the emergency services)

Conclusion The City Council and the public were appreciative of the work of the Police and Fire Brigade during the flooding. On the whole they had responded quickly and done their best to alleviate the situation. The Fire Brigade confirmed that, subject to other emergencies, they would assist householders in the pumping of flood water from their property but their pumps are not large

enough to move any appreciable amount of flood water. Some improvements in communication with the Fire Brigade were suggested to exchange information on properties being flooded. The Police confirmed that their main duties during flooding are to warn residents, assist with their evacuation and protect empty property.

Recommendation There was some concern by the Panel that other, higher profile parts of the county, might have had call on reserves within the emergency services that should have better been deployed in this district. The emergency services and the KCC Emergency Planning Officer were requested to therefore examine procedures to ensure that this would not be the case in future.

Action The KCC Emergency Planning Officer has checked on the position with respect to strategic control of emergencies affecting the whole county and he confirms that resource allocation will be based on "the greatest need".

Current Situation **The flooding in Whitstable on 21 August 2007 and the sea flood emergency of 9 November 2007 tested the response of the emergency services, which was generally seen to be very good. There were a number of lessons learnt from Whitstable that were put into practice for the sea flood emergency. The main difference was that for the sea flood emergency the police and fire services attended at the Council emergency room and ran their operations from there. This worked very well and will be the system for future similar emergencies.**

ACTION 39 (road closures during flooding)

Conclusion There were perceived problems during flood events with the time it took to close flooded roads and sometimes that the signing was inadequate. Roads that were closed were still used by large vehicles which often exacerbated flooding and little action was taken by the Police or the highway authority to prevent this. On partially flooded roads that did remain open speeding vehicles caused bow waves that flooded some properties.

Recommendation Kent Highways and the Police should liaise to ensure that there are sufficient "Road Closed" and "Flood" signs held at suitable locations to allow speedy road closures when necessary. Manpower resources should be checked to ensure there are sufficient persons available in an emergency to effect road closures. The possibility of other responsible persons being allowed to close roads, e.g. parish councils, should be checked. For closures that are likely to last some time, heavy barriers should be installed to physically stop vehicles entering. Ways to ensure vehicles drive slowly along partially flooded roads should be examined.

Action The number of signs readily available for road closures during flooding has been significantly increased since early flooding events and is now considered to be adequate. Joint Police and Kent Highways systems have been re-examined to try to ensure that, within operational limits, sufficient manpower will be available for road closures to be carried out within a reasonable time. Subject to certain provisos it is confirmed that parish councils can carry out road closures in an emergency and City Council staff will liaise on this. The means for physically closing roads when necessary will be examined by Kent Highways. The Environment Agency is nationally looking into the "bow-wave" problem and its report is awaited.

Current Situation **It has been confirmed with Kent Highways that parish councils can be allowed to close roads that are badly flooded. This is with the prior permission of the Highway Manager's staff. Road closure signs were made available in 2002 to the parishes for storage in their sandbag stores.**

However, the flooding in Whitstable in 2007 showed that there is still a problem in getting roads closed quickly and that even when signage is in place there is a tendency for the public to ignore it. Flooding of houses as a result of "bow waves" from vehicles is still happening. Kent Highways and the Police should be requested to re-examine the emergency road closure procedures to see whether the closures can be put into operation more quickly and effectively. As far as can be ascertained there has been nothing published by EA about the problem of vehicles driving through flooded roads.

8. LEGAL SITUATION AND ROLES & FUNDING OF THE AGENCIES

This section deals with the legal situation with respect to the powers and duties of the various

agencies involved together with the requirements placed on riparian owners of watercourses. It also includes an explanation of the roles and responsibilities of these agencies and an indication of their basis of funding.

ACTION 40 (riparian owners)

Conclusion It was found that many property owners living beside watercourses were unaware that they had riparian responsibilities to keep the watercourse clear and free flowing and that it is a legal duty. The requirements are set out in the Land Drainage Act. A considerable amount of the riparian watercourses from rivers such as the Upper Nailbourne to minor ditches were found to be in a very poor state of maintenance. There is clearly a need to ensure that riparian owners are made aware of their responsibilities and do carry them out. The filling in, piping or obstructing of watercourses is theoretically an offence unless the relevant authority has given consent.

Recommendation A publicity campaign is needed before next winter to ensure that all riparian owners are aware of their responsibilities. The relevant authority should check all critical watercourses and those known to flood in order to make sure maintenance work by the owner, where necessary, is carried out. An owners guide to the legal requirements should be made available. The legal powers of the agencies to force the work should only be used as a last resort.

Action There are so many ordinary watercourses in the district that City Council engineers do not have the resources to check them all and have to rely on the public to advise of a problem. A programme has been drawn up to inspect the critical watercourses and those known to flood regularly and a list of known owners is being compiled. The Environment Agency has produced a booklet on this subject and this can be made available free to the public. Publicity about this problem will be put into the next issue of the Council Newspaper.

Current Situation **All watercourses known to cause problems in the past, whether private or public, are inspected by Council engineers at least annually and whenever there is a flood warning in place. Other watercourses are inspected should a problem be notified and where relevant the riparian owner advised what to do.**

However, many riparian owners still do not accept what they need to do and appear unaware of their responsibilities. There has been little further progress to advertise riparian owner responsibility apart from an article some time back in District Life. Ways to improve publicity/action by riparian owners need to be considered.

ACTION 41 (responsibilities of the various agencies)

Conclusion The situation with regard to watercourses and sewers in this country is complex and the public clearly finds it difficult to know who does what and who to contact. In broad terms main (known as public) foul and surface water sewers are the responsibility of Southern Water, road gullies and drains come under Kent Highways and the City Council acts as agent, main rivers are the responsibility of Environment Agency, watercourses in the rural area in the basin of the Stour are looked after by the Internal Drainage Board and the riparian owners should look after all other watercourses with assistance from the City Council. The powers of the Environment Agency, IDB and City Council are permissive which means that they can carry out works if they choose but they do not have to. These powers do not take away the duties of the riparian owners (see Action 40) to act.

Recommendation Publicity, as to who does what, is required so that the public know who to contact if they have a problem and in an emergency. The agencies need to get together to formulate the best approach to this. The “one stop shop” approach should be considered.

Action The inter-agency working group will look into possible ways of improving the situation. An item about this has been included in the next issue of the Council Newspaper.

Current Situation **Of all the actions in this report this one has made the least progress and the situation could actually be considered to be worse than it was after the 2000/2001 floods. There has been little progress to better inform the public on which of the agencies does what, although the Environment Agency has included some information in its “flooding” leaflets and on its website. Clearly the public do not know who best to contact and they are often told that “it’s not us try them”. The public are confused about the EA “Floodline” and it’s purpose – actually only to give out information on flood warnings with respect to the sea**

and main rivers. All agencies (including the City Council) now deal through call centres – EA in Northern Ireland, Southern Water at Worthing, Kent Highways at Maidstone. This results in sometimes a total lack of knowledge of the area and at best little knowledge of specific problems. Co-operation and contact between the agencies has worsened due to a number of staffing reorganisations in EA and loss of knowledgeable local staff. Similarly most of Southern Water work is now carried out by consultants and local staff have been moved elsewhere. The termination of the Kent Highways agency has particularly caused problems reducing by two thirds the number of engineering staff available to deal with an emergency at Canterbury and considerably slowing response.

ACTION 42 (Plenty Brook & Upper Nailbourne)

Conclusion The Plenty Brook and Upper Nailbourne (upstream of Bridge) are classified as ordinary watercourses even though their flows are greater than some main rivers in the district. They are major surface water routes and have comparatively large catchments. They should be main rivers maintained by the Environment Agency who has the funding, staffing and expertise to look after them. The fact that they are not main rivers is only because they were not so designated in the past and included on the main river maps.

Recommendation The Environment Agency should take over these two rivers and carry out the necessary formalities with the relevant government department to “enmain” them.

Action The City Council has written to the Environment Agency on this matter and the Agency is considering it. It is understood though that the Environment Agency will expect quite a considerable sum of money to take over the two rivers.

Current Situation These two watercourses plus the Gorrell Stream and the Kite Farm Ditch were enmained on 1 April 2006 and from that date come under the management of the Environment Agency. However, under an agency arrangement the City Council continues to maintain the rivers and the Environment Agency reimburses the cost. This is considered to be best practice as the rivers come under the overall supervisory powers of EA but the local knowledge of City Council staff is used to best maintain them. There is a possibility that this arrangement may have to cease from 1 April 2008 due to EU procurement rules and City Council involvement would then cease – this is considered to be a backward step.

ACTION 43 (Environment Agency and IDB financing)

Conclusion Funding for the Environment Agency’s flood defence works comes from a levy to the county council plus central government grant for capital works. The levy is fixed by the Kent Flood Defence Committee and becomes part of the community charge that goes to Kent County Council. It is understood that the Environment Agency also received additional funding from central government this year to deal with the effects of last year’s flooding. It is estimated that this Council’s charge payers contributed about £800,000 to the Environment Agency for flood defence this year. From information available the Panel were of the opinion that well under that amount was actually spent in this district. Funding for the River Stour Internal Drainage Board comes from various levies of which the City Council paid about £70,000 this year. There was no reported serious flooding to property from IDB watercourses which are all in the rural area.

Recommendation If the Environment Agency is to make significant improvements to reduce the impact of flooding from main rivers and is to take over responsibility for the Plenty Brook and Upper Nailbourne, it will need to considerably increase its expenditure in this district. More of the current budget should be spent here in line with what is actually paid in. The total budget itself should also be increased to allow for improved flood defence measures. The IDB should prioritise its expenditure to those watercourses that will help to alleviate flooding to peoples homes.

Action The Environment Agency and IDB are aware of these recommendations as is the Kent Flood Defence Committee.

Current Situation Since 2000 there have been a number of reviews of flooding and flood defence expenditure by central government. The Making Space for Water initiative has set out the government view for the next decade on how and where the money should best be spent by the Environment Agency. However, there have been a number of cut backs to spending, including in 2007. This has meant that maintenance has not been increased and

there has been a slow down in capital expenditure. As a result of the summer 2007 flooding at a number of locations in England there has been a promise of a further £200 million but there are doubts that much of this may not go to new flood defence schemes. There is also the concern that the Environment Agency is overly reliant on consultants and their fees appear to take an overly large proportion of the available money.

ACTION 44 (City Council financing)

Conclusion The City Council revenue budget for land drainage works and for flood relief was increased from £10,000 to £50,000 for this financial year. Most of the minor remedial and maintenance works under the various Actions this year can be financed from this budget provided that there are no further significant flood events. The staffing budget will, however, be vastly overspent because of the time being taken to follow up all the problems. This will have to be at the expense of other Council services. If improvements to maintenance and systems are to continue as for this year then at least the current level of revenue funding will be required in the future. There are insufficient funds to carry out any major improvement works although there are a number of locations that would clearly benefit.

Recommendation The City Council has to weigh up the need to improve the service with respect to land drainage, flood alleviation and flood emergency response against the requirements of its other services regarding financing. It is considered that the public clearly expect an improved service. Means of obtaining external funding should be examined in order to progress major improvements. Possible partnerships with the other agencies should also be investigated.

Action Some partnership arrangements have been formed for a number of the works currently in hand. These have been with Southern Water, the Environment Agency and KCC. An application will shortly be made to the Department of the Environment, Food and Rural Affairs for funding for studies at Plenty Brook, Upper Nailbourne, Kite Farm Ditch, North Canterbury and Fordwich. These studies may lead to major improvement works which would then also be eligible for central government funding.

Current Situation The Council has been very successful in obtaining finance from government (Defra) for major capital schemes at the coast, as well as for study work on the inland watercourses. The revenue budget for general maintenance work and minor improvements has been reduced but only by the amount that was previously spent on the critical ordinary watercourses (Plenty Brook, Nailbourne etc) and is now directly financed by the Environment Agency. It is considered that, bearing in mind the financial need of all the other council services, this revenue sum is adequate provided that there is not a repetition of the 2000/2001 conditions. Financing of medium size land drainage and watercourse improvements by the private sector using Section 106 agreements under PPG25 has been very successful.

9. PLANNING POLICIES AND DEVELOPMENT CONTROL

The City Council's policies relating to planning and development control are outlined in this section with particular reference to flooding. It also includes recent initiatives to improve the situation such as the City Council's new drainage guidelines and central government's PPG 25 (development and flood risk).

ACTION 45 (current developments)

Conclusion There has been considerable publicity about the effect of new developments and their possible contribution to the flooding. Particular comment has been made about the large developments along the route of the old Thanet Way. Many members of the public are also blaming these developments for the flooding. There has also been comment that these developments have gone ahead despite Environment Agency advice to the contrary. It is noted that some of the recent developments were approved on appeal against the wishes of the City Council. It is also noted that the Environment Agency has confirmed that the City Council has always abided by its requirements. All the recent developments have had strict drainage restrictions applied such that the outflow of surface water from them is no more than the original agricultural land on which they stand. This is

normally done by large attenuation lakes or underground tanks.

Recommendation The public needs assurance that the new developments are not making things worse in their area. New residents need to be sure that there will not be flooding to their new homes. Public perception is not helped by the poor state of some sites during building and the actions of some of the contractors in dealing with water before permanent works are built. Tighter control during construction is considered necessary.

Action The new guidance note with respect to the requirement for a drainage impact assessment and other drainage measures is now being used for all relevant new development applications. It includes means of ensuring stricter enforcement of requirements during construction.

Current Situation **The new “Drainage Impact Assessment for Development – Guidance Note” has been approved by Council and further improvements have been made to it over time. It is working well and developers are prepared to abide by its conditions although it can be difficult to get all the information from them at an early stage. The drainage requirements, particularly with respect to attenuation of storm water, are made a condition of planning consent. It is considered that its implementation should go a long way to reduce any possible increase in flooding as a result of new developments. In some cases the drainage requirements have actually reduced local flooding. One problem that has arisen is that Southern Water is not prepared to adopt some of the attenuation structures that now become necessary and there could therefore be long term maintenance problems.**

ACTION 46 (sewerage to new developments)

Conclusion Some press reports and many members of the public have called for an embargo on new development until the sewerage system is upgraded by Southern Water. Advice from Southern Water is that everyone has a legal right to a connection to the public sewerage system but to minimise the risk of problems the company can require attenuation or connection at a point where there is sufficient capacity. One of the problems is that during very heavy rain, surface water gets into the system and inundates it thus causing flooding. It is understood that the volume of this surface water is so great compared with the normal foul water flow that additional connections make little difference.

Recommendation As stated elsewhere in this report Southern Water need to improve the infrastructure to ensure that it can cope with the surface water infiltration or take measures to separate out the surface water.

Action Southern Water are fully aware of the problem and have appointed consultants to investigate the major problem areas.

Current Situation **As stated elsewhere, Southern Water are not in a position to make major improvements to the infrastructure which would generally solve this problem. Their consultants have reported on the situation and some improvements, as set out under the individual actions in this report, have been made. Where there are foul sewer capacity problems for new developments various individual solutions have been made including: site storage of sewage with disposal at off peak times; removal of surface water from the system thus allowing new foul flow without increasing the current load; restricting numbers of houses to that which the system can take. Development control committee insist that no new development can be approved without confirmation from Southern Water that there is sufficient capacity in the public sewers.**

ACTION 47 (new developments)

Conclusion There are a number of new developments that are proposed and have already received outline planning permission. Most of these are under way on site or will start shortly. There are great concerns about the impact of these and the effects they may have on flooding. A number of the developments are along the coastal strip where significant flooding occurred over the last year.

Recommendation It is essential that strict requirements are placed on these developments to ensure that they do not make flooding any worse and that they do not flood themselves. Where possible the development should include proposals that aim to improve the overall situation. The new PPG 25 (development and flood risk) guidance should be used wherever possible to

encourage developers to reduce flood risk. The requirements of the Environment Agency and Southern Water must be fully complied with.

Action The City Council's drainage guidance notes, that are now being applied to the majority of new planning applications, contain very strict requirements with respect to the need for a drainage impact assessment, on site storage of surface water for a 1 in 100 year storm, use of more sustainable drainage systems, independent certification of proposals and supervision during construction. There are also proposals that the developer may be required to take measures to reduce flooding outside the site.

Current Situation All new developments have been required to abide by the requirements of the Drainage Impact Guidance Note. Very close liaison is now being maintained between planners and engineers to try to ensure that no development will exacerbate any current flooding problems. Both the Environment Agency and Southern Water are also, within the limits of their powers, assisting. At some locations specific methods of surface water disposal are being made a requirement on the development proceeding. At most developments surface water attenuation equal to or to less than the greenfield run off is a requirement. The attenuation figure we require (4 l/sec/ha) is stricter than the government guidelines and most other authorities in Kent. Area flood reduction measures, or provision of funding towards them, have also been a requirement of a number of major developments to the benefit of the local community. Examples are the Plenty Brook storage lagoons, contribution to new drainage at South Street and for work to the Gorrell Stream.

ACTION 48 (future developments)

Conclusion When considering the allocation of land for future developments the City Council should pay particular heed to what has happened over the past year. New development must not be at risk itself from flooding and it must not exacerbate flooding elsewhere. The impact of the development area on its surroundings and possibly the whole catchment should be assessed.

Recommendation New development should not be in the river or sea flood plains and a drainage impact assessment should be carried out for all large sites and those in or adjacent to flood prone areas. Infill development and redevelopment, especially within a flood plain, should be carefully considered using a risk based approach. The possibility should be considered of major infrastructure improvements or flood defences being constructed as part of large developments.

Action The new Local Plan is currently being compiled and flooding is one of the major factors under consideration in its review. Policies in line with these recommendations are being considered for inclusion.

Current Situation All the requirements following on from the Panel's work, with respect to flooding and new development, have been included in the Canterbury District Local Plan First Review (July 2006). Policies C31, C32, C33, C34 & C37 refer.

10. ASSISTANCE AND ADVICE TO THE PUBLIC

ACTION 49 (self help)

Conclusion The public need to be better informed of what measures they can take to help themselves during flooding and what precautions they should take if they are in a high risk area. There is a health risk when sewers have overflowed and information on this is needed. Many homes were flooded through air bricks and this could have been avoided. Sometimes sandbags were late in arriving but other measures could have been put in place to ease the situation.

Recommendation The City Council and the Environment Agency should produce advice leaflets on the various self help topics with respect to flooding. This should be well publicised particularly targeting vulnerable areas. The availability of prefabricated products to prevent water coming in through doorways and air bricks should be investigated. Public health advice is particularly important. Parish councils and community associations should involve themselves and help to disseminate information. Temporary "sandbags", that are quite effective, can easily be made from various materials such as strong polythene bags and soil. People should be made more aware of this. Procedures should be in place to ensure that vulnerable people such as the elderly are not forgotten.

Action The Environment Agency produces a leaflet on things to be done to prepare for possible flooding, how to reduce the effects of flooding and actions to be taken when flooding is occurring. This can be obtained free from the Agency. The City Council has produced a leaflet on health advice for flooded homes which can be made available on request. City Council engineers have information on a number of proprietary products, and their suppliers, that can be fitted quite quickly in advance of flooding to doors and air bricks. It is understood that the Environment Agency has examined these products in some detail and can advise on the most effective ones. The Environment Agency has arranged a publicity week on all flooding issues including self help towards the end of September. The City Council has a full page item on flooding and self help in the October issue of the Council's newspaper. The Council website will shortly contain much of this information.

Current Situation The Environment Agency has continued to be very proactive with respect to information to the public regarding self help and various measures that can be taken to protect one's own property. This is usually reinforced every year during autumn but does tend to concentrate on action in sea and main river flood plains and when a flood warning has been issued. It is suggested that information leaflets on dealing with flash flooding would be helpful.

The Council did have useful information on its website about self-help and various proprietary products up to about a year ago. However, this seems to have disappeared with the change to the website format. Clearly this needs to be reintroduced in a place that can easily be found together with information in the next Council newspaper similar to what was issued in October 2001. On the whole there is a clearly need for improvement in getting the message across to the public.

ACTION 50 (assistance after flooding)

Conclusion There were complaints from many people that they were given no help by the authorities after the flooding to clear up and put their homes back in order. There also appeared to be lack of advice on what to do and who to contact. Many residents felt that their plight had been totally ignored.

Recommendation For homes flooded from sewers, Southern Water do have a free basic clean up service but this needs to be better advertised. The City Council should decide what level of assistance it is prepared to give to flooded householders and this should also be advertised. It is suggested that as soon as possible after flooding an officer should call at each property with a leaflet containing advice on what to do and letting the occupier know of any help that the Council can give.

Action A decision needs to be made on the level of City Council assistance and how to carry this out and no action has yet been taken on this.

Current Situation There is still no formal agreement as to the degree of assistance that will be given to the public after a flood event. After the 21 August 2007 floods at Whitstable a flyer was drawn up and hand delivered within two days to all who might need assistance setting down what the Council would do. This appears to have been well received by the public.

However, this was an officer decision made at that time and there is a need for the Council to formally decide what if any assistance will be given.