

FLOODING IN BOURNEMOUTH

Report by the Task & Finish group on Flooding in Bournemouth

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EXECUTIVE SUMMARY

PANEL TASK “To investigate and report on the situation regarding “Pluvial Flooding” within the Bournemouth area and to respond to residents’ concerns over the frequency of flooding.”

Flooding is a natural phenomenon. During a storm, when the ground cannot absorb any more rain, the excess will run off naturally; it would run into streams and rivers and end up in the sea. However, human activity alters this natural process. Houses, factories, roads, etc. increase the amount of impermeable surface, which means we get more run off during a storm, but also, there is less land available to absorb the rain.

Flooding falls broadly into five categories:-

- 1 Flooding from rivers and water courses where a river or stream bursts its banks, referred to as fluvial flooding.
- 2 Flooding from the sea caused by tides and storms.
- 3 Flooding from heavy rain running over the surface of the land, often referred to as surface water or pluvial flooding.
- 4 Flooding from sewers / drains when they are overloaded by heavy rain.
- 5 Ground water flooding, where the ground water rises to above the surface of the ground or into basements.

Flooding is a complex issue to deal with as a number of organisations are responsible for different bits of the problem. They often have separate and different legal powers and duties and work to different standards.

- **The Environment Agency** deals with main river and coastal flooding.
- **Wessex Water** is responsible for the main sewers and public drains.
- **The Council** is responsible for the highways and highway drains. It is also the land drainage and planning authority.
- **Land owners** are responsible for ditches and water courses on their land.
- **Property owners** are responsible for their own private drains.
- **Legislation** The new Flood and Water Management Act 2010 <http://www.defra.gov.uk/environment/flooding/policy/fwmb/> has given additional responsibilities to the Council who is now the Lead local flood authority (Llfa) with duties to manage the risks from surface water and

groundwater flooding in accordance with National Strategies that are yet to be published. There is also a duty (under the “The Flood Risk Regulations 2009”) to publish Preliminary Flood Risk Assessments (PFRA) by 22nd December 2011 which have to be in draft format with the Environment Agency by 22nd June 2011

The drainage system is made up of different parts which are the responsibility of various people, organisations and companies. This infrastructure includes gutters, gullies, drains, sewers, highways, ditches, watercourses, rivers and finally the sea. These all interact but many have different standards and capacities, some can cope better than others with extreme intense rain. The Law recognises that it would be impossible to cater for every storm, no matter how severe. As climate change occurs the situation is probably going to get worse. See “How well prepared is the UK for climate change?” at <http://www.theccc.org.uk/reports/adaptation>.

MAIN FINDINGS

The group is convinced that there is far more flooding occurring than we are actually aware of. This is blighting the lives of some residents and affecting businesses but they often do not know who to report it to or whether they should just put up with it. There also appears to be reluctance to report flooding because of the perception that this will lead to “property blight” Residents appear to be wary of having their properties included on any “at risk” register.

The situation has not been helped by complex legislation and often vague or overlapping areas of responsibility even within this Authority. We found that there is a lack of reliable information on drainage assets and maintenance is sometimes minimal. We need to be far smarter in our use of the limited available land in the borough to take account of flooding issues and the implementation of Sustainable urban Drainage systems (SuDs) must be endorsed. This will build on the findings of the “[Making Space for Water](#)” report.

We found that the lack of reliable information on flooding, our own drainage assets, the asset condition and risks involved is affecting this authority’s ability to manage the situation effectively.

A step change is required in how we manage and plan all issues associated with drainage and flooding to solve existing problems before considering the possible effects of climate change. However, it must be realised that this may raise expectations that will be challenging to satisfy

The Council accepts and recognises that continued development (urbanisation or Urban Creep) has made the overall flooding situation worse and it will not improve without committed positive action from all partners to minimise risk. Sustainable Urban Drainage systems must be promoted as a longer term solution - although funding and maintenance will always be an issue. Short - term cost or convenience should not be a factor. We noted that many of the ideas and techniques have been used extensively elsewhere and are not new.

The public sewerage system is the responsibility of the Water Company but we can all help in limiting the risk to the environment.

Recommendations

1. Annual reporting to the Portfolio Holder and relevant Scrutiny panel of flooding issues and major storm events to ensure progress is being made and the subject remains topical.
2. Residents and businesses should be encouraged to report flooding accurately and promptly from any source and this information to be recorded and assessed.
3. The Council to operate a “one stop shop” for any reported flooding rather than passing people on, but in turn should not be expected to solve every problem.
4. Improved collation of gully cleaning information and review performance annually (see 2.6 page 7). Information to be available “electronically” and map based.
5. Undertake a review of all Council owned and maintained drainage infrastructure and prepare an asset data base and plan (See 5.3 & 6.4).
6. Continued collection of accurate local rainfall data. (See (6) page 5)
7. Progress as a matter of urgency “Surface Water Management Plans” to inform the relevant bodies and public of the situation. This will require collaborative working with other partners (principally other Local Authorities, Wessex Water and Environment Agency).
8. SuDs systems must be enforced on all new (re) development and opportunities explored to see where the techniques can be used to resolve existing problems. This must be reinforced through the planning system.
9. “Fat traps” and the like on food preparation premises must be regularly inspected to minimise the blocking of sewers.
10. Provide information to the public about not disposing fat down drains and to encourage alternative disposal means.
11. Enforcement action should be taken against anybody depositing dangerous / hazardous materials down any surface water drains or gullies.

The full report will be available on our website under Minutes and agendas in due course. If you need any further information please contact Paul Ambrose.

My thanks to all those Councillors, Officers, partners and members of the public without whose help this report would not have been possible.

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Notes on RECOMMENDATIONS

(1) **Active regular scrutiny is recommended** for all flooding and flooding related issues with possibly an annual update report or reports on significant events in line with the Pitt Review Final Report (Recommendation 91). http://archive.cabinetoffice.gov.uk/pittreview/thepittreview/final_report.html The Pitt review was a major Government report looking at the widespread flooding of 2007. Further, to comply with the current guidance from the Environment Agency on Preliminary Flood Risk Assessment (PFRA) <http://publications.environment-agency.gov.uk/pdf/GEHO0410BSLS-E-E.pdf> recommends PFRA reports should be subjected to the Council's Overview and Scrutiny process prior to submission to the EA by 22nd June 2011 ready for publication on 22nd December 2011 (see Flood Regulations 2009) <http://www.legislation.gov.uk/ukxi/2009/3042/contents/made>

(2a) **Reporting Flooding.** A comprehensive record of all flooding from any source is kept and is funded, maintained and updated. Further that everybody is encouraged to report all flooding incidents and contribute as much information as possible. (n.b. Any such records may contain "personal information" like addresses so this data cannot be released under freedom of information. Publication would be likely to discourage residents reporting flooding in the future anyway for fear of blighting their properties.) Any reported flooding is to be investigated (**recommendation 3 "one stop shop"**) as per the requirements of the new Floods and Water Management Act 2010 (Clause 19).

http://www.legislation.gov.uk/ukpga/2010/29/pdfs/ukpga_20100029_en.pdf

It should be possible to fund this within existing budgets but it must be a management priority. Such information is also vital to verify existing models and

identify problem areas. The data is likely to be very important to help justify or substantiate any bids for possible future funds to carry out schemes

(2b) Reporting Flooding (continued). Any resident flooded from the “public” sewerage system is encouraged to report it to the Water Company and to be entered on their Register of Flooding (DG5). Wessex Water is a regulated private company. Unless properties are on the official DG5 register OFWAT will not normally permit Wessex Water to fund works to resolve the problem. Residents flooded may also be entitled to a rebate on their water bills.

<http://www.wessexwater.co.uk/water-and-sewerage/threecol.aspx?id=726&linkidentifier=id&itemid=726>.

The Council should seek regular updates from Wessex Water to determine what action is being taken to resolve sewer related flooding what ever the cause. (Blockages, collapses, inadequate capacity etc) and such information is reported to the panel (as recommendation 1).

(4) Better information regarding gully cleaning is collected, maintained, analysed and reviewed on a regular basis (See recommendation 1) (all gullies, not just highway gullies) to identify problem areas and possible “hot spots”. It may also identify where savings could be made on frequency of cleaning. This will require investment in appropriate technology and staff resources. Currently records are largely “paper” based and there is simply not the time or resources to manage this data. Actual costs need to be investigated but until this is done it cannot easily be determined even if there is a problem.

(5) Accurate records of all Council owned and maintained drainage infrastructure needs to be collected, recorded and assessed. This is to include all below ground (pipes, soakaways, tanks etc.) and above ground (ditches, water course, detention ponds, etc) systems. Again this will require resources not currently allocated but should be part of a corporate approach to asset management. This information is to be used to plan regular inspections and maintenance. Further work will be required to identify if this is best kept centrally or within different departments but it is suggested that a single database should be created that can possibly “communicate” with the Wessex Water Asset register so anomalies / gaps / errors can be identified. The drainage system works as a whole even if different people are legally responsible for different bits of it.

(6) The existing weather station currently situated on the Town Hall roof has failed and is too costly to replace. As far as the panel is aware this was the only accurate local source of rainfall information which could be used to determine storm severity / rainfall quantities. This information is important. There is a rainfall intensity gauge at Hurn this is too far away as rainfall can be very localised. Indeed it would be useful to have several gauges around the borough but this is likely to be too expensive. The cost of a single gauge, data logger and installation is of the order of £1,800.00

(7) The Council needs to progress as a matter of urgency “Surface Water Management Plans” to identify flooding Risk Areas and Flooding Hazard maps in accordance with the “The Flood Risk Regulations 2009” (this work is currently underway). <http://www.legislation.gov.uk/uksi/2009/3042/contents/made>

This information will then be placed in the public realm to assist residents in identifying appropriate measures in accordance with the Environmental Information Regulations 2004. <https://opsi.gov.uk/si/si2004/20043391.htm>. (This information is currently only available for inspection at the Council).

(8a) Sustainable Urban Drainage systems (SuDs). The Council must accept and recognises that “Urban Creep” has occurred over many generations. This is where an area has become increasingly impermeable over many years leaving a “legacy” problem which will not be easy to resolve without very high capital investment. It may be that the only feasible solution is that, as areas are redeveloped, SuDS must be used and maintained. Suds are not just soakaways. Wherever possible space should be made available for water with “green routes” identified, which could act as “parks” but also routes for surface water to safely discharge in major storm events. This will build on the findings of Making Space for Water report. In the mean time this will leave existing problem areas that must be resolved as best as possible in a partnership approach with all concerned.

See “Future Water The Government’s Water Strategy for England” at <http://www.defra.gov.uk/environment/quality/water/strategy/index.htm>

(8b) (Suds continued). All Council departments must use and promote SuDs robustly in the broadest sense as well as water recycling and water conservation unless it is totally unfeasible to do so. This would comply with the procedure in Planning Policy Guidance 25 and the Council’s own Suds Policy

<http://www.communities.gov.uk/publications/planningandbuilding/pps25floodrisk>
http://www.bournemouth.gov.uk/Library/PDF/Living/Planning/Planning_Policy/Local/SPG_PGN/Suds2_Adopted.pdf

The presumption must be that this is the expected standard and the costs are a secondary issue. In fact there is no reason why SuDs etc may not actually result in long term savings but often require “up front” investment. The “planning process” must also enforce SuDs and action should be taken for any contravention of planning permissions related to non compliance.

(8c) (Suds continued) The difficulty Bournemouth has is that most SuDs solutions require space which is limited in this conurbation. Further demand for housing is putting increasing pressure on what “green” space is left. To satisfy this contradiction; developers, designers, planners engineers etc will have to be far more innovative. The techniques are there but all need to be persuaded to use them.

http://www.ciria.org/service/AM/ContentManagerNet/TemplateRedirect.aspx?template=/ContentManagerNet/ContentDisplay.aspx&Section=content_by_themes&ContentID=12341

(9 & 10) Fat The build up of fat “illegally” discharged even if only through negligence or carelessness into the sewers is a major cause of blockages which can be prevented by fitting and maintaining “fat traps”. Commercial properties are required to have and maintain such units. Unfortunately the drains are often seen as a convenient dumping ground and people try to flush all sorts of things away which the system was never designed to cope with. These can form blockages.

(10 & 11) Enforcement action should be taken against anybody depositing dangerous / hazardous materials down surface water or road gullies wherever there is any chance of a successful prosecution. This should include dirty water from any commercial activity including washing floors, bins etc which often have high bacteria concentrations but all of which can end up in the sea or watercourses. One of the biggest problems is old engine oil but this can be disposed of at many of the Council’s recycling centres. The Council should also issue periodic reminders in the media about the hazards to the wider public and environment of depositing any material in road gullies. It puts the Council at considerable cost to dispose of these materials and is often a safety hazard.

Final (updated 15-12-10) PA
Postscript added 04-01-11 PA

Commented [t1]: The recommendations need to be more concise with the secondary issues covered within the main report.

1.0 INTRODUCTION

(1.1) This report looks at the various areas of responsibility with regard to pluvial flooding, and how they interlink, along with best practice examples and how their responsibilities affect the Council.

2.0 DESCRIPTION OF EXISTING SITUATION

(2.1) The Borough of Bournemouth developed from about the 1870's based on the original development around the Lower Bourne Stream valley and adjacent to the coast. By 1931 it was established within its current boundaries having "swallowed" up several small hamlets and absorbing the Northbourne / Kinson Areas. The whole Borough has undergone rapid phases of expansion and urbanisation with the development of housing, industrial and retail areas along with their transport links. Almost the entire Borough is now developed apart from isolated pockets of public open space, green belt or flood plain.

(2.2) Early maps show a significant number of natural water courses but as development has occurred these have almost all been culverted over to form public sewers. These would originally have been the responsibility of the Council but are largely now in the ownership of the water company (Wessex Water).

(2.3) There are now only a limited number of watercourses, with the River Stour, Bourne Stream and Kinson Stream being the primary watercourses. The River Stour is a "Main River" and is the responsibility of the Environment Agency. Maintenance of other water courses is the responsibility of the riparian owners (adjacent land owners). The Council has various powers (as opposed to duties) to control ordinary water courses under a number of Land Drainage Acts.

(2.4) Nearly all highway drains (road gullies) in this borough, which are the responsibility of the Council as Highway Authority, drain via the surface water sewers (which are the responsibility of Wessex Water) to the water courses or the sea. There is no significant highway drainage within the Borough. Generally surface water sewers discharge into the sea or water courses, with no form of treatment although a small number have grit and / or fuel interceptors. These are the responsibility of Wessex Water and have to be regularly checked and emptied to be effective.

Commented [t2]: Confusing – do you mean there are few highway sewers that are the responsibility of the Council as Highway Authority?

(2.5) Many of the surface water sewers are still the original pipes installed as the area was developed although there was a major investment in significant parts of the sewerage network between about 1985 to 1993.

(2.6) Surface water is not clean; it contains grit, silt, spilt fuel, detergent (from fuel), rubber (from tyres), brake pad dust, dog and bird faeces, rubbish, litter etc. During low flows and dry periods these contaminants accumulate in gullies and pipes and then can be flushed out during a major storm. This "first flush" is a well known problem. It also occurs in foul / combined sewerage systems many of which have overflows to act as a "safety valve". It is normal practice to design any such overflow to try and capture this "first flush" and pass it on for proper treatment. It is far easier and cheaper to remove accumulated detritus from a gully pot than an underground pipe.

3.0 WESSEX WATER

(3.1) Representatives from Wessex Water attended one of the meetings, and explained that their sewer system is currently designed to cope with a 1 in 30 year event. This figure is specified by OFWAT (see item 3.2) as a realistic, affordable, standard. However there are still large areas of the network that (if they were designed at all) were only designed for a 1 in 20 year event. Many of these original sewers would have been designed using empirical methods or “rule of thumb” which have actually worked surprisingly well in most instances. If however a storm is significantly greater than a design event then the system will be overloaded and “flooding” will inevitably occur.

(3.2) As a regulated private company, their expenditure is tightly controlled by the regulator OFWAT (now called The Water Regulation Services Authority but previously the Office of Water Services). OFWAT carries out major reviews of all Water Companies’ expenditure and determines levels of investment on a 5 year cycle. This applies to both capital expenditure for new sewers and revenue expenditure for ongoing maintenance and repairs of existing sewers. OFWAT only permits investment in increased capacity to solve existing flooding and not in anticipation of future development, which should be funded by developers. Existing flooding is recorded on what is known as the DG5 register.

(3.3) The DG5 Register is a record of any property flooding caused by deficiencies in the sewerage system. It is split into 3 sections depending on the nature and frequency of the flooding. This is not publicly available, although many residents still have a fear that registering an incident of flooding and subsequently appearing on this register may blight their properties and so do not “sign up”. Because of this it is suspected that there is considerable under reporting of incidents. However, this then prevents Wessex Water from being able to seek funding for solutions to any problems that lead to flooding. Wessex Water has a comprehensive complaints recording and processing function.

(3.4) Capital works are investigated and justified using computer models of the sewerage system, with Wessex Water currently proposing the creation of new models for Bournemouth as the original models were developed in the mid 1980’s and are now out of date (also they originally focused on the foul / combined sewerage system). Detailed analysis of this can then lead to future works to improve and upgrade the drainage where substantiated by existing flooding records.

(3.5) Flooding can also be caused by problems such as collapses and blockages. The money available for routine maintenance is determined by OFWAT, with 10% of Wessex Waters budget dedicated to Bournemouth. It is not standard practice and should not be necessary to clean every sewer; however there are know areas where silt or fat does build up requiring more regular cleaning. Routine sewer cleaning is determined using a “hot spot” analysis, which enables them to target their resources effectively, and ensuring that these problem areas are cleaned on at least a 6 monthly basis. This data is regularly reviewed to ensure standards are being met. There is no general method of checking what is happening in the sewerage system (unlike water supply pipes which have pressure sensors at various points in the network). As such WW rely heavily on the public or other organisations informing them of problems. There is telemetry at all WW sewage pumping stations.

(3.6) The Council has formed a good working relationship with Wessex Water, which has provided an electronic copy of their pipe network database to further the Surface Water Management Plans that the Council is preparing. Operational level meetings are held to exchange data and identify / resolve problem areas.

(3.7) Until recently any new development had a statutory right to connect both foul and surface water discharges to the sewerage system. This has now been amended in the Floods and Water Management Bill 2010 to limit the automatic right to connect surface water to the sewers. It is also likely that Wessex Water will be required to take over a large number of private drains in the near future (date to be confirmed). The condition of these is not known but not likely to be good, possibly requiring future repairs upgrading.

(3.8) Wessex Water is not a statutory consultee for planning issues. However, they are now notified regarding the development of a new dwelling / building or any other (re) development that involves a connection to the sewer.

(4.0) TECHNICAL SERVICES

(4.1) Technical Services is responsible for highway maintenance including the highway drainage and cleaning gullies. They are also involved in an emergency response situation. Highway drainage assets consist of gullies, lateral connections to the “public sewer”, highway ditches, soakaways and a small amount of highway main drainage system. They do not become responsible for new highway works until those works are formally adopted. They do clean out gullies for other departments like Leisure but only on an ad-hoc basis.

Commented [t3]: ?

(4.2) Gully cleaning is currently carried out by one directly employed “in house” team and one external contractor. At present funding is a challenge but we are achieving the cleaning cycle of all gullies in less than 1 year. The “in-house” gully cleaning team are multi skilled operatives and in certain times (like the urgent winter gritting) are moved to other duties. This is continually kept under review.

(4.3) Access to gullies for cleaning is a big problem with the large number of parked vehicles in many residential roads. If it cannot be accessed, the team will move to the next gully and record on an inspection sheet that it has been missed. The intention is to go back but this could require many visits and is simply not cost effective. Community Services are now organising Enviro-clean days in conjunction with the police and completely clearing a road of all parked cars. If this is done Technical Services takes advantage to clean all the gullies. Legislation has also considerably increased costs for cleaning gullies in major roads because of traffic management / safety requirements. For example the Wessex Way A338 is now cleaned at night during lane closures while grass cutting and other operations are underway.

(4.4) After cleaning out the gully, the pot is recharged with water. The lateral drain is not routinely cleaned unless there appears to be a problem when the pot is “charged”. This seems to be fairly standard national practice. If there is a problem then a note is made and the pipe is subsequently inspected by CCTV and any repairs or cleaning carried out. A “paper based” record is made that the gully has been cleaned or not. There is no electronic collection of this data for any further analysis. Further there is no electronic record of “hot spots” other than the operative’s local knowledge (especially in relation to autumn leaf fall).

(4.5) Historically, highway drainage was generally not designed to any prescribed standard but just based on "rule of thumb". There are approximately 21,700 gullies throughout the borough and on average each gully drains some 315m² of highway. This figure does not include the considerable quantities of run off from paved forecourts / drives etc. Modern design standards are much closer to 200m² per gully.

(4.6) All arisings from gully cleaning are classified as "active waste" and have to be sent to special licensed facilities for disposal. These are becoming increasingly expensive. Gullies occasionally contain or are blocked with illegally tipped debris including engine oil. This can find its way into local water courses or the sea. Enforcement is rarely taken because of the difficulty in catching culprits and staff simply do not have time for detailed inquiries or collecting the necessary evidence due to restricted budgets.

(4.7) Technical Services still supplies sand bags in emergency situations but in a major pluvial event they simply do not have time or the resources to satisfy demand. Records also need to be available of who requests and is supplied with sandbags. The whole issue of sand bags needs to be re-examined as there are now better alternatives available.

(4.8) There is no record of highway drainage assets and no central recording of new liabilities being taken on when roads are adopted. Commuted sums are taken for future maintenance of things like soakaways but it is not clear where this funding goes.

5.0 CAR PARKING

(5.1) Car parks are normally paved especially those in the town centre. This means they generate significant volumes of run off and potentially could have a major impact on flooding.

Commented [t4]: We have hardly got any that are not paved?

(5.2) There is some limited information available on car park drainage but this is in paper format and there is very little information on its condition. It is simply not known where the majority of car parks drain to but it is believed that the majority go to soakaways. There is little information available on its condition.

(5.3) Gully cleaning is only carried out when required and in response to complaints. There is no planned or routine maintenance. "Parking" employs whoever can carry out the work most efficiently. Local failures are repaired as required. Revenue is lost when the public cannot access pay machines due to flooding. Losses are not thought to be significant except occasionally in Kings Park.

6.0 LEISURE SERVICES

(6.1) The vast majority of watercourses in Bournemouth are in areas of land owned or leased by Leisure Services. Significant areas of this land have now various environmental designations such as SSSI's, which severely restrict how and when things like ditch maintenance can be carried out leading to considerable increases in costs. This, combined with declining funding, is putting severe restrictions on watercourse maintenance. There may be some opportunities for community involvement in this work but even this requires considerable input to organise / manage. However, it should be appreciated that management of some areas may actually involve returning some areas to their original condition to promote wild life.

(6.2) Much of the land administered by Leisure is unpaved but during short intense storms there is simply not time for a lot of this water to soak into the ground meaning that much of it runs off as surface water run off. This is actually worse in the summer when prolonged periods of dry weather can bake the surface of the ground making it very difficult to soak up rainfall.

(6.3) There are some major paved areas within Leisure areas including access roads and parking areas that are not public highway. For example Meyrick Park where in times of heavy rainfall generates significant run off which contributes to the flooding in Braidley Road which in turn results in major traffic disruption.

(6.4) There is some limited information available on Parks drainage but this is currently in paper format and there is very little information on its condition. It is simply not known where the majority of hard surfacing drains to but it is believed that the majority go to soakaways. There is little information available on its condition.

(6.5) Leisure Services has applied for funding to promote rainwater capture and reuse which not only reduces the risk of flooding but also saves on water bills. These have not been successful in gaining approval.

7.0 PLANNING

(7.1) Until recently there has been no information other than anecdotal evidence on which areas are vulnerable to surface water flooding. There has been information on the likely risk area from fluvial (river) flooding and this has allowed the planning process to control / restrict developments in the "flood plain". Further the Environment Agency is a statutory consultee for planning issues.

(7.2) Wessex Water is not a statutory consultee but the Council, as Planning Authority, now does consult them over any development that may involve connections to the public sewerage system.

(7.3). Planning policy is enforced through Planning Policy Statement 25 (PPS25), which lays out a series of tests any development has to pass. However, until recently it has not been possible to include surface water flooding or indeed ground water flooding in this process.

(7.4) Any new development has to comply with the Bournemouth Sustainable Urban Drainage (SUDS) Policy. There is some evidence that planning permission has been given in the past requiring SUDS but, when the developer has started on site, they have found reasons to not proceed with SUDS (for example poorly draining ground or lack of space). Further most soakaway systems (which are the predominantly used technique in Bournemouth) require a lot of space and thus restrict the extent of the development potential of the site. However, there is also a need to maximise the density of development to minimise the impact on green field sites, which creates a conflict. Presently there is little incentive for a developer to use SUDS techniques. This has not been helped by the legal "grey area" of responsibility for future ownership / maintenance and on going costs of SUDS. This will be resolved when the provisions in the Floods and Water Management Bill 2010 - Schedule 3 are enacted when the responsibility will be put on the Council to take ownership and maintain them (except individual properties).

(7.5) It is accepted that in many older properties, when a soakaway fails, the owners often (illegally) connect rainwater down pipes to the domestic drainage system thus increasing the load on the sewers. While this often is a breach of the original planning permission, the chances of anything being done about it are almost nil.

(7.6) Recent changes in legislation and the removal of permitted development rights now require any new paved areas in excess of 5m² to have planning permission. This will become even more extreme under the requirements of the Floods and Water Management Act 2010 which will require any new paved areas to have SUDS approval as well. At present it has not been decided how this will be administered within BBC.

(7.7) We now have three cases (as at 7th July 2010) where developers have been asked to pass the test laid down in PPS25 for sites we have recently become aware of as being at risk of surface water flooding. There has caused some surprise as to why we have been asking for this and in future we need to better inform developers and indeed the public at large as to the extent of risk. This is a requirement under the Flood Regulations 2009. The first case has gone to appeal and the Inspector has made his decision known. While he acknowledged the risk of flooding he felt the developer had addressed the issues. Bournemouth Council is still of the view that while the developer has addressed the issues of rain falling on the site he has not addressed the issue of surface water running onto the site from other areas. However we now have better information from our initial surface water modelling and in future will be more robust in presenting our concerns

APPENDIX A

METHODOLOGY

The panel considered all sources of information currently available and interviewed/questioned various organisations that have a role to play in managing flooding to gather evidence. Organisations included:-

BBC Planning and Transport
Wessex Water
BBC Technical Services (Highway Maintenance)
BBC Car Parks
BBC Parks
BBC Planning

Full details of findings are included in Appendix A

The panel also considered other written information including:-

1. Previous Reports

Environment & Economy Scrutiny Panel report “**Pluvial Urban Flooding**” 22 October 2007

http://www.bournemouth.gov.uk/Library/Committee_Meetings/Scrutiny_Panels/Environment_&_Economy/Reports/22_october_2007/Pluvial%20Urban%20Flooding.pdf

Environment & Economy Scrutiny Panel report “**Pluvial Flooding**” 12 January 2009

http://www.bournemouth.gov.uk/Library/Committee_Meetings/Scrutiny_Panels/Environment_&_Economy/Reports/12_January_2009/Pluvial%20Flooding%20Report.pdf

Report by Councillor West “**Pluvial Flooding**” June 2007 - Paper Copy only

2. Minutes of Meetings

Environment and Economy Scrutiny Panel - 22 October 2007 Item 34. PLUVIAL FLOODING

http://www.bournemouth.gov.uk/Library/Committee_Meetings/Scrutiny_Panels/Environment_&_Economy/Minutes/071022.pdf

Environment and Economy Scrutiny Panel - 12 January and 12 February 2009 Item 6. PLUVIAL FLOODING

http://www.bournemouth.gov.uk/Library/Committee_Meetings/Scrutiny_Panels/Environment_&_Economy/Minutes/090112%20%20090212.pdf

3. Other Information

Bournemouth, Christchurch, East Dorset, North Dorset and Salisbury SFRA Level 1 Strategic Flood Risk Assessment Volume I (Final Report) February 2008 by Halcrow Group Limited

http://www.bournemouth.gov.uk/Library/PDF/Living/Planning/Planning_Policy/Local/Specialist/Flood/SFRA_Final_Report_WEB.pdf

Environment Agency **Dorset Stour Catchment Flood Management Plan Report** -
December 2009

<http://www.environment->

[agency.gov.uk/static/documents/Research/final_stour_pt1_1829196.pdf](http://www.environment-agency.gov.uk/static/documents/Research/final_stour_pt1_1829196.pdf)

BBC Sustainable Urban Drainage Systems (SUDS) Adopted Planning Guidance Note
November 2003

The **Pitt Review** of 2007 and the Subsequent Final Report of June 2008

http://archive.cabinetoffice.gov.uk/pittreview/thepittreview/final_report.html

Appendix B

Pluvial Flooding Task and Finish Group Interim Note: 22nd October 2009

Present: Councillors Roger West (Chair), Morgan, Wakefield, P. Ambrose, S. Hills (note taker)

	Discussion	Progress to be taken
1.0	A review of the work undertaken since the Environment and Economy Scrutiny Panel in January was given by P. Ambrose. This includes a new map based database, linking past flood events with other useful information and records. Past flood events had not previously been recorded, and gathering data has been laborious, especially with a need for specific information (e.g. dates, weather and sources). An advert in the 'Bournemouth Life' magazine had disappointingly resulted in only four responses. An e-mail account has also been set up at flooding@bournemouth.gov.uk . It was agreed that the information collected must be treated confidentially.	It was noted that there is a significant under-reporting of flood events. A standard questionnaire is to be developed allowing councillors to report flooding in their constituency. The councillors are to be encouraged to report incidents of flooding in their wards.
2.0	Bournemouth Borough Council have received £75,000 to help produce the Surface Water Management Plans for the area. This needs to be a continually evolving document that links into planning, with the planners committed to the work being undertaken and its results. Any work given to consultants must ask the right questions to gain value for money.	Continue to relay information to planners for future use.
3.0	The Environment Agency are supporting the Surface Water Management Plans and have provided a map highlighting areas vulnerable to flooding. This was produced using a computer model to simulate heavy rainfall over all of Bournemouth at the same time and seeing where it runs to (This has a number of basic assumptions which limit its usefulness, for example, no buildings or sewer systems are included). It has however provided some clear links to past flooding events, giving a starting place.	Continue contact and relations with the Environment Agency.
4.0	<p>It was noted that although helpful, Wessex Water have not provided an electronic copy of their sewer system so far, which has hindered progress, as paper copies are being used instead. This enables catchments to be set up showing where the water heads to in the drainage network, and highlights issues with specific networks.</p> <p>The combined sewer system was discussed, including the locations of outfalls and the frequency of their discharges. This highlighted that the issues often lie within the system at pinch points and from inadequate capacity.</p> <p>It was agreed that for Wessex Water to action a problem, flooded houses must be on Wessex Water's DG5 Register, although property owners fear that this will blight their property, and therefore do not always agree to this.</p>	<p>It was agreed that Wessex Water should be invited to attend future meetings. It would be beneficial to be able to provide them with any questions in advance to aid their preparation.</p> <p>Specific issues are to be brought up in the regular maintenance meetings.</p>
6.0	<p>The town has very few watercourses (primarily the Bourne Stream and the Kinson Stream), with many historical ones being culverted over, and now listed as sewers. Taking these back is undesirable due to the increased maintenance liabilities and costs.</p> <p>This lack of streams for Highways drains to discharge into means that traditionally the drains discharge into Wessex Waters sewers. This will soon require permission, for any new gullies which will not automatically be granted. The alternative is soakaways which are not desirable due to maintenance issues.</p>	

	Gully cleaning was discussed, and it was noted that what is not cleaned goes into the surface water system and then discharges. Blocked gullies are a part of the problem, although only one part of the larger issues with system capacities.	Gully cleaning needs to continue on a regular basis and further information to be produced regarding frequency
7.0	Maintenance of council land to aid drainage is vital. It has been suggested that Community Service Orders could be used to clear drainage ditches owned by the council and that Community Groups could also help. It was noted that consideration should be given to issues on the edge of the Borough, such as at Frizzell Roundabout and the University, which may impact on the Borough.	It was agreed that this would be very useful at Stour Valley Local Nature Reserve due to environmental constraints requiring hand-digging of ditches.
8.0	It was commented that groundwater is the legal responsibility of the land owner, but the Council should gain an overview on it and where problems exist.	Further information on groundwater should be gathered, primarily through past flood records being collected.
9.0	A number of specific issues were highlighted as part of the discussion, although it was thought that these were best left until the next meeting. These included: <ul style="list-style-type: none"> • Sheepwash: Lagoon is dirty and smelling • Wharncliffe Road: Sewer is collapsing • East Avenue: Flooded but not on DG5 Register • Sevenoaks Drive: Previously unknown sewer flooding • Braidley Road: Historic stream now non-existent • Pinecliffe Avenue: Previously unknown sewer flooding 	It may be that pollution at Sheepwash is considered at another time as it does not directly relate to flooding.
10.0	The next meeting should be at the end of November, preferably at lunchtime, avoiding Tuesday or Thursday.	P. Ambrose to organise

Pluvial Flooding Task and Finish Group

Interim Note: 7th December 2009

Present: Councillors Roger West (Chair), Morgan, Wakefield,
C. Plenty, D. Martin, M. Tidman (Wessex Water)
P. Ambrose, S. Hills (note taker)

	Discussion	Progress to be taken
1.0	<p>It was noted that Wessex Water's design standard is for a: 1 in 30 year event for internal flooding and 1 in 20 year event for external flooding.</p> <p>This is likely to remain the same in the new Floods and Water Management Bill. The Council's Highway drainage is designed to a 1 in 1 (or 5 at a maximum) year event standard. This then often links into Wessex Water's system since Bournemouth only has a small number of watercourses for the flows to discharge into. The Environment Agency chiefly designs flood defences to a 1 in 100 year standard.</p>	
2.0	<p>Wessex Water hold a DG5 register for properties flooded from their systems, which is split into A, B and C sections. A is for properties that have flooded at least once in the last 5 years, B for those that have flooded once in the last 10 years, and C for properties that have flooded once in the last 20 years.</p> <p>Historically approximately 35 new properties go on the register each year, although the overall number is reducing as Wessex Water implement schemes and solutions. Wessex Water will investigate internal flooding reports within 1 week of receiving the report.</p> <p>It was noted by the councillors that many persons do not want to register for this for fear of blighting their property, although the DG5 register is not in the public realm. It was noted that in Bournemouth there are currently 5 records of internal flooding and 38 records of external flooding.</p>	
3.0	<p>Wessex Water is constrained by OFWAT as to price increases and design standards, which are reviewed on a 5 yearly cycle. They also check how the money is spent.</p> <p>Wessex Water noted that 10% of their allocated flooding budget is to be spent in Bournemouth. This includes building a new computer model of the whole sewage system in Bournemouth, and also resolving issues in Poole Road, Columbia Road, Charwood Avenue, Kinson Road, Exeter Park Road, and Wood Lane. The new computer model will not only show areas requiring further investigations, but also provide justification for doing further works in other areas.</p>	
4.0	<p>The Councillors suggested making the writing and telephone numbers larger on the back of the bills so that people know where to call if they are flooded from Wessex Water's system.</p> <p>It was noted that Wessex Water's Planning Liaison is now more involved in the planning process, and they now receive any application which involves more than 4 properties, although they are still not a statutory consultee.</p>	
5.0	<p>It was noted that the foul flows in the sewer are quite small and that it is the rainfall which adds a significant volume to the flow. The September 2008 event which caused a lot of these issues was a 1 in 100 year rainfall event.</p>	
6.0	<p>It was observed that the Pitt Review called for greater sharing of information between organisations. Where problems are shared, Wessex Water expects the Local Authority to take the lead.</p>	

7.0	Recent maintenance works by Wessex Water in Bournemouth included removing 28 tonnes of foreign material from the Redhill siphon (Wimborne Road) which including tarmac, concrete and builder's debris. Wessex Water use a "hot spot" analysis to target resources and ensure that these areas are cleaned on a 6 monthly basis.	
8.0	The meeting noted that it was likely that planning permission for a new development in Colombia Road was likely to be turned down due to surface water issues. This was through	
9.0	For a number of these issues associated with surface water systems, it was noted that there is a Sustainable Urban Drainage System (SUDS) option, but it is often cheaper to implement a piped system. The council could aid the implementation of the SUDS option by volunteering land or maintenance of the scheme (with WW paying a commuted sum) to ensure that it becomes the preferred option.	
10.0	Following this meeting, discussions on specific sites including East Avenue, Colombia Road, Wallisdown, Kinson Common, Leybourne Avenue, Fletcher Road (Howeth Close), Wimborne Road (Kinson), Charnwood Avenue, Wimborne Road (Winton), and St. Luke's Road were held. Most of these will be subject to model verification and a detailed study.	
11.0	The next meeting should be at the end of January, preferably at lunchtime, avoiding Tuesday or Thursday.	P. Ambrose to organise

Pluvial Flooding Task and Finish Group
Interim Note: 20th January 2010

Present: Councillors Roger West (Chair), Morgan, Wakefield,
P. Ambrose, S. Best, L. Austin, S. Hills (note taker)

	Discussion	Progress to be taken
1.0	Cllr. West recorded his thanks to Stuart Best and Larry Austin of Technical Services for attending.	
2.0	Currently Technical Services have one in-house gully cleaning machine, and used the additional £80,000 procured last year to employ an additional external gully clearing machine through the Leisure Services Contract. This has reduced the time between a gully being cleared from 14 months to under a year in line with Government guidance, although 'hot spots' are cleaned more regularly. Any additional blockages are dealt with by the in-house team. One issue is that since the in-house team are multi-skilled, they are often called to other duties, such as gritting, with road gullies not cleaned whilst this occurs.	
3.0	It was noted that all records are in a paper format only (daily logs of rounds and missed gullies), meaning that it is not known when a specific gully was last cleaned without looking back through the paperwork. Operator knowledge of 'hot-spots' is relied on, with jobs raised to clear blockages when back at the depot. The idea of a tracking and in-cab system was discussed, and thought to be a good idea, particularly if the refuse fleet is being changed in 18 months time. This would allow for electronic records to be kept, making the gully cleaning more effective. Before this, the 'hot spots' should be mapped as a minimum.	SB and LA to obtain cost of purchase and installation of tracking device for 1 machine.
4.0	The overall budget for Highways maintenance is £1.2m, although there has been a historical reduction of this, with further cutbacks now needed. This includes all repairs and extras such as gritting. It is not possible to split this figure down to the cost of cleaning highway drains without going back through all the daily records. Having a flexible work force and money is good, but it means that if one is prioritised (e.g. high rainfall, winter weather, green waste collections) then the other services all suffer. Despite budget reductions, real term costs have increased despite the Council's budget reductions. This includes the cost of disposing of waste gully arisings to landfill since they are now classed as contaminated waste, and the cost of shutting roads (e.g. Wessex Way) in order to clean the gullies. Joint working with enviroclean and grass cutting teams is used, although costs are still increasing. It was also noted that reduced cleaning services have led to increased gully blockages.
5.0	One gully issue is building work and the associated grit, sands and gravels that make their way into them. Another issue is trees, which have a double effect of the roots infiltrating and collapsing drains, and leaf drop covering gully grates. It was noted that East Avenue had received significant investment, and is noted as a 'hot-spot'.	
6.0	The Councillors observed that gully cleaning services is split between Car Parks, Leisure Services and Technical Services. This often results in Technical Services doing the work for Car-Parks and recharging them afterwards.	PA to set up a meeting with Car Parks and Leisure Services.
7.0	Gullies are often contaminated or blocked with illegal discharges. These include oil (cooking and engine), parts of engines and wood. Enforcement action is rarely taken due to restricted budgets.	AB and LA to quantify cost of cleaning contaminated gullies.

8.0	<p>The official emergency responder to events is Technical Services, although if there is a major storm, they do not have enough people on the ground to get everywhere. It was noted that Columbia Road needs a better system for closing the road, especially in a flood.</p> <p>The use of sandbags was questioned due to their weight and ineffectiveness. The website currently says that Bournemouth Council will provide them, although do not have the resources to do so. PA suggested flood-sacks, which are lighter, but were dismissed as too expensive.</p>	
9.0	<p>Sustainable Urban Drainage (SUD's) were discussed, and noted that they are not always the solution due to the topography or geology of the land. This then means an increasing reliance on the piped surface water system.</p> <p>It was queried what happened with the commuted sums paid by developers to maintain SUD's. It was agreed that there should be a general pot of money kept from developers payments from which to maintain SUD's.</p>	
10.0	<p>PA noted that the recent Walker Review, which looked at Private Water Companies charging highways for treating the discharged surface water is complete. Although not recommended at the time, this may be a future cost.</p>	
11.0	<p>The Council owned Pumping Stations maintenance arose, and it was noted that no regular maintenance is done, with only reactive works being undertaken.</p>	
12.0	<p>As a benchmark, a Mori LA satisfaction survey of all the Unitary Authorities showed Bournemouth (56%) features in the top 5 for gully cleaning, with most at a similar level between 50 and 60% satisfaction. It was noted that this still means 44% are unsatisfied.</p>	
13.0	<p>The next meeting should be at the end of February, preferably at lunchtime, avoiding Tuesday or Thursday.</p>	PA to organise

Pluvial Flooding Task and Finish Group

Interim Note: 17th February 2010

Present: Councillor Roger West (Chair)

P. Ambrose, M.Sexton, A.McDonald, M.Leslie, S. Hills (note taker)

Apologies received from Councillors Morgan and Wakefield.

	Discussion	Progress to be taken
1.0	Cllr. West recorded his thanks to Martyn Sexton and Andy McDonald of Parks and Open Spaces, and Margaret Leslie of Parking Management and Enforcement for attending.	
2.0	Parking and Enforcement noted that they have compiled a folder containing all recorded information on their 49 car parks, including drainage maps where available. They have no computer based system however, so all data is purely in the operators head, and lost when the operator moves on.	
3.0	<p>The car parks are regularly monitored by parking attendants, who perform a cursory check on the condition (their primary role is to check cars have paid), and record any faults on the back of the job sheet. The supervisor will then raise a job when this is returned, but no further electronic record is kept. Parking and Enforcement will also respond to complaints by the public.</p> <p>It was noted that pot holes are repaired quickly, due to the risk of people tripping, whilst full bins are reported to the Radio Room, but little is done about drain and gully maintenance. It was suggested that a regular condition survey of car parks that is recorded electronically would be useful.</p>	
4.0	There is no regular planned maintenance of car parks with works done on a reactive basis. These works are carried out by Technical Services, although due to their availability, it is often quicker to bypass Technical Services and go directly to Rescue Rod. It was noted that there are no standard charges agreed with Technical Services, and that Parking and Enforcement will have to pay, whatever the cost.	
5.0	Parking and Enforcement noted that they have enough personnel to perform their duties, but little funding for repairs.	
6.0	<p>The drainage at Kings Park is poor, with many people unable to reach the machine, and charges often suspended due to this, losing a lot of revenue. It was also noted that Kings Park is listed in emergency resilience plans, with the poor drainage potentially proving an issue to this.</p> <p>Other issues noted included:</p> <ul style="list-style-type: none">• At Horseshoe Common water flows down the car park steps which can also then freeze, posing a slip hazard.• Cotlands Road has flooding issues.	
7.0	The Borough's parks are drained mainly by soakaway systems, of which the majority are not linked together to provide any resilience to the system. Although soakaways are sustainable, they do not cope with summer deluges, especially if they follow a dry period which has hardened the ground. Parks also noted that very little maintenance of soakaways is done, with no allowance to dig them out or replace them once they silt up.	
8.0	<p>Parks have bought an Asset Inspection Package called PLAYS SAFE, primarily designed for the inspection and management of play area repairs. The software does have capacity to include other inspections of hard landscape features (e.g. paths/fences etc.) and even buildings. This could have future potential for gullies and soakaways etc. Currently there is limited and mainly unusable asset condition data available for existing Parks Infrastructure. An Asset Inspection system for Parks drainage would offer some cost savings, although repair work would still be subject to available funding.</p> <p>It was noted that most asset condition software packages are very tailored, and that a single package for all Council departments would be unlikely to provide many benefits.</p>	

9.0	<p>At present, Parks hold no records of their drainage systems or of any maintenance completed, with current maintenance of ditches irregular. Some are cleaned regularly, but others have not had any works for 50 years. Parks noted that it is cheaper for them to work reactively, and that there is often less of a public issue if a footpath floods (as opposed to property). Surfaces are regularly cleaned, with gratings cleaned by the sweeper once a week.</p> <p>Complaints and ground staff defect reports are factored into the annual revenue budget for small works, although this budget is very tight, with resources also very tight. It was noted that projects above £30,000 should be identified and brought to the attention of the officers for potential funding.</p>	
10.0	Parks noted that they would be happy for Sustainable Urban Drainage Systems to be implemented in the parks, although most of the parks are at higher ground, limiting what can be done.	
11.0	The Walker report was discussed, where water discharged into drains may be charged for in line with the polluter pays principal. Parks noted the large impact this would have since many watercourses flow into Wessex Water's surface water sewers.	
12.0	Water saving measures such as recycling grey water at Kings Park Nurseries, and using water from the Queens Park pond to water the golf course were discussed. It was noted that a fear of new technology has hindered some similar schemes progressing.	
13.0	<p>With respect to the Bourne Stream, it was noted that the larger culvert under the Square had reduced flooding problems. One remaining issue is newly built properties with poor drainage in the Upper Gardens (notably Surrey Road) leading to water spilling over into the gardens. Similarly, sewage surcharging into the Lower Gardens is an issue and occurs approximately twice a year. This may be attributable to pump failure, although the reasons are not fully understood.</p> <p>The Bourne Stream itself has had little maintenance carried out recently, with much of the upper sections beginning to meander again, which is preferable, as it slows down and holds up flows.</p>	
14.0	The next meeting should be in March, at lunchtime with the Planning department.	PA to organise

Pluvial Flooding Task and Finish Group

Interim Note: 19th March 2010

Present: Councillors R. West (Chair), A. Morgan, C. Wakefield
 P. Ambrose, A. Cheesman, M.Hodges, S. Hills (note taker)
 K. Male (Consumer Council for Water) arrived later.

	Discussion	Progress to be taken
1.0	Cllr. West recorded his thanks to Alan Cheesman and Malcolm Hodges of Planning for attending, and noted that he had invited Ken Male of the Consumer Council for Water, who was expected to arrive later.	
2.0	AC explained the planning process. Central government issue Planning Acts, Circulars and Planning Policy Statements (PPS) which are topic based. In particular PPS 25 relates to flooding. At a Regional level there are the Regional Spatial Strategies, and at a Local level there is the Local Development Framework. The Local Development Framework covers the Core Strategy for the town, which includes flooding issues, and must also be in line with PPS 25. It was felt that the Task and Finish Groups work would be able to feed into this Core Strategy.	
3.0	Under PPS 25, there is a sequential test for developers to ensure the most suitable site is chosen. However, many of the sites vulnerable to fluvial flooding are also green belt sites in Bournemouth, so are excluded on both grounds.	
4.0	Wessex Water consulted on every major planning application for 10 or more units, and on every new build where surface water is planned to enter the main sewer. However, due to the volume of requests, an answer is not always received. (N.B. on reading the Draft report Wessex Water has stated that at no time are they aware of not responding fully to all requests)	
5.0	The Surface Water Management Plan (SWMP) will help to inform the Core Strategy as to where the pluvial issues are. It was noted that new development may not be at risk, but it can still exacerbate existing flooding problems. PA introduced the initial mapping work that Mouchel have undertaken, and explained that more results were to follow. This improves on the Environment Agency model results produced so far by using more detailed information. Used as a GIS layer, this could highlight the issue of surface water flooding in prospective developments to allow resilience measures to be introduced. It was also noted that objections to a proposal could make the Council aware of a localised flooding problem.	
6.0	Sustainable Urban Drainage Systems (SUDS) are included in planning, legislation, with the Government and Planning Inspectorate very supportive of them. However, they only deal with what falls on the site, and not what comes onto the site, which can be a bigger issue. The issue arose of developers ticking the SUDS box on the outline planning application before then claiming that it could not be done and using their automatic right to connect to the sewers. It was noted that enforcement should be used if this is being done, and that the Planning Inspectorate would be likely to uphold any decision. However, a number of test cases may be required to stop the practice occurring in the first place. PA to obtain more details from Development Control. The Group decided to recommend that the Core Strategy should make it clear that SUDS are expected for new developments wherever possible, with the onus on the developer. By including them in the Core Strategy, it will allow Development Control to be more robust with their powers.	PA to contact Development Control
7.0	It was noted that when a SUDS condition is imposed on new planning applications, it can be worded in such a way that it must be maintained. Then, if not maintained, the Council could carry out the work and recharge the owner.	
8.0	Soakaways were discussed, and although they should be encouraged, it was noted that the water all goes into the ground in one point (such as with the West Cliff Hotel landslip), and new springs can also form from the increase in groundwater.	
9.0	It was noted that with climate change, the winters are likely to be wetter, and summers drier but with heavier downpours. This will lead to an increased risk of both winter	

	flooding and summer flash flooding. PA noted that the CIRIA (Construction Industry Research and Information Association) design manual allows for a 10% increase in rainfall in the design of soakaways to account for climate change. The Group thought it appropriate to record that even though the science is not exact, there are changing pattern of rainfall that must be accounted for.	
10.0	The Strategic Flood Risk Assessment (SFRA) for Bournemouth (combined with 4 other authorities) does distinguish between different forms of flooding, but is very light on pluvial flooding, since little previous work has been done in this area and there are few records available. The SFRA is periodically updated, and when it is, this section can be updated with any findings of the Group and the SWMP.	
11.0	KM explained that the Consumer Council for Water (CCW) represents the interests of consumers. Issues faced at present include the fact that sewerage is only really an issue when combined sewers overflow. Splitting the drainage system prevents Council tax payers paying to treat highways water. Also, increasing developer contributions towards new connections would help to cover the real cost of connecting new houses.	
12.0	It was noted that the paving of driveways is an issue. Although new driveways require planning permission if constructed of non-porous materials or where water is not directed to lawns or borders to drain naturally, it is hard to know when unauthorised development has taken place. The Group welcomed the fact that there had been some enforcement on this issue.	
13.0	PA noted that the rainfall gauge on the Argus weather station on the roof had stopped working for a number of months, and had not been fixed due to health and safety issues accessing it.	
14.0	Specific issues noted in the meeting include: <ul style="list-style-type: none"> • At Columbia Road an appeal meeting is due on Monday to discuss the refusal of planning permission on pluvial flooding grounds. • Bear Cross Roundabout where water flows onto the road, and possibly caused a crash in the icy period. PA noted that they have powers under the Highway Act to prevent water being discharged onto the highway. • In Boscombe, development has reduced surface water capacity. 	
15.0	The next meeting should be at lunchtime to discuss the format of the final report.	PA to organise

Appendix C

Rainfall

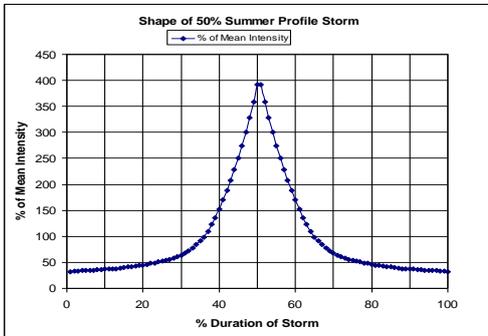
As engineers we often talk about design storms and probabilities and may refer to an Annual Excedence Probability. This can be expressed as a percentage or a decimal or more commonly a return period i.e. 10%, 0.1 or 1 in 10 year. These all refer to the rainfall but it is important to understand what these mean. For example a 1 in 10 year event refers to a rainfall event that on average, over an infinitely long time, would only be exceeded once in 10 years. It does not mean that this will only happen once every 10 years or that if it happened last year it will not happen again for another 10 years. It could happen two years in succession and then you not get a similar event for many years. It also does not tell you when it will happen.

Further it does not tell you anything about the storm duration. Natural drainage and Sewerage systems respond very differently depending on the storm duration. For example 12.5mm of rainfall in 60 minutes or 28.5mm in 12 hours are both 1 in 1 year storms but the short storm would have far more impact on the sewerage system than the longer duration storm despite having less rain overall. You will only get on average, one 1 in 1 year storm in any year, but statistically you are just as likely to get one duration as another. Thus the return period of any flooding is not the same as the return period of the rainfall as each system actually responds differently to that rainfall event. However, there is a lot of design information about rainfall so it is what is normally used to describe the flooding although technically this is wrong but is a convenient "short hand". Many river systems take days to respond so are vulnerable to longer duration storms. Because of the topography of Bournemouth and the size of the catchments they respond most to shorter storm durations typically of 1 - 2hrs which are generally associated with summer thunderstorms

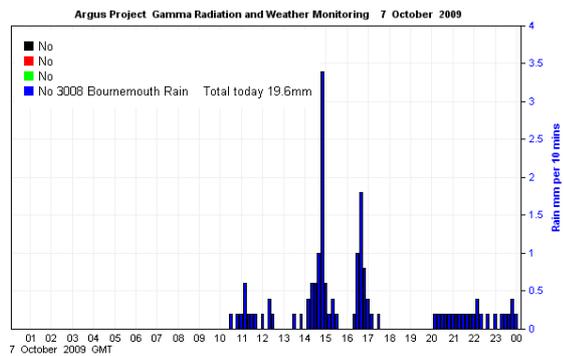
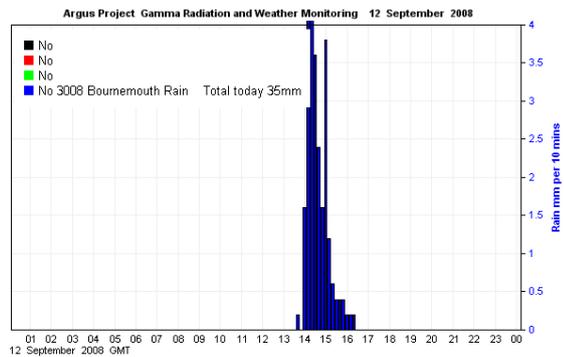
Design Storms

Design Rainfall Total (mm) -Wallingford Procedure localised for Bournemouth										
Duration	RETURN PERIOD (yrs)									
	Total Rainfall in mm									
	1	2	5	10	20	25	50	100	1000	max
15 min	7.3	9.4	11.8	13.9	16.2	17.1	19.8	23.1	37.8	71.0
30 min	9.7	12.5	15.5	18.4	21.6	22.7	26.5	31.0	51.8	98.2
60 min	12.5	15.9	19.6	23.3	27.4	28.9	33.9	39.7	67.1	125.4
2 hrs	16.0	19.9	24.3	28.8	34.0	35.8	41.9	49.1	82.9	151.0
3 hrs	18.4	22.6	27.4	32.4	38.1	40.0	46.9	54.8	91.7	174.0
4 hrs	20.2	24.7	29.8	35.1	41.1	43.2	50.4	58.7	97.3	190.2
6 hrs	23.0	27.9	33.4	39.2	45.8	48.0	55.8	64.8	106.2	213.2
12 hrs	28.5	34.1	40.6	47.3	54.8	57.4	66.2	76.4	122.2	252.4
24 hrs	35.4	41.8	49.2	56.8	65.3	68.2	78.1	89.3	139.2	291.6
36 hrs	40.2	47.1	55.0	63.2	72.2	75.3	85.8	97.6	149.5	309.1
48 hrs	43.9	51.2	59.6	68.2	77.5	80.8	91.6	103.8	156.9	320.7
72 hrs	49.6	57.3	66.3	75.3	85.2	88.6	99.9	112.5	166.9	332.4
96 hrs	55.8	64.0	73.6	83.1	93.4	96.9	108.6	121.7	176.9	344.1
8 days	83.0	93.7	106.4	117.8	129.7	133.8	147.1	161.6	220.5	373.2
25 days	152.3	171.8	195.2	212.3	230.1	236.1	255.4	276.2	357.6	453.1

An idealised Summer Profile Design Storm



The problem is real rainfall does not come in “neat” design storm profiles and often data is missing. See examples of Actual Rainfall from the TH Rain Gauge.

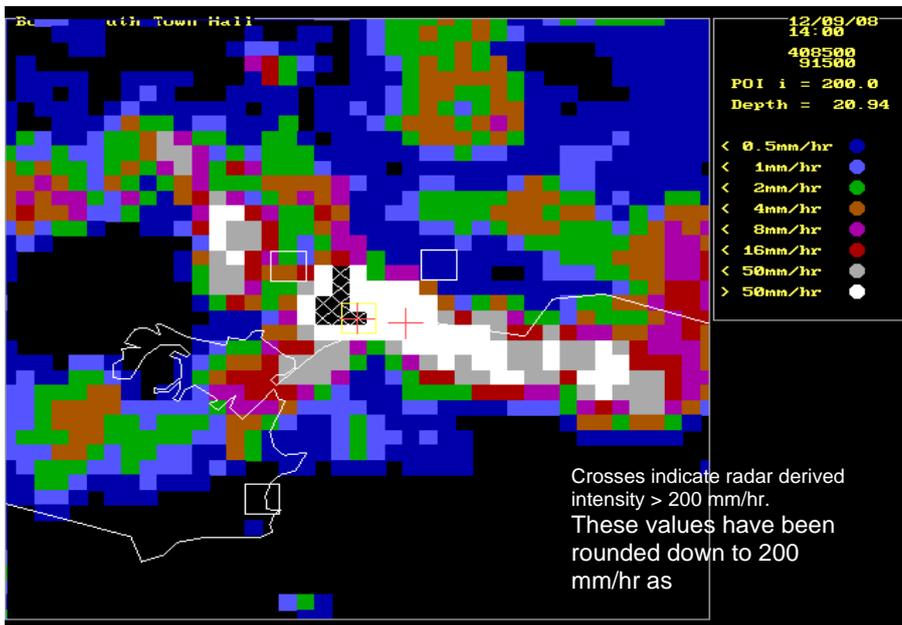


It is often difficult to decide on exactly what the duration of any single event is which in turn makes it difficult to decide on the actual return frequency. That is why all return periods need to be very carefully considered before making “pronouncements”. By just focusing on the most intense part of the storm this often gives a false sense of the storm return period. This is partly why we apparently seem to get 1 in 20 year storms every year!

The situation is further complicated by the fact that rainfall can be very localised . For example in September 2008 a major storm hit the central part of the Bournemouth conurbation. Parts of the storm were assessed to be approximately a 1% Annual Exceedence Probability event (1 in 100 year event). However the storm was relatively localised with the epicentre being only some 3km wide and roughly “tracked down” the Bourne Stream catchment, leading to flooding in various locations around the centre of Bournemouth but other parts of the borough were almost unaffected.

Commented [t5]: Which is it?

Picture from WW report to the Environment and Economy Scrutiny Panel 12 January 2009



Climate Change

With the very limited data currently available to Bournemouth Council there is no evidence of any long term change in Rainfall patterns over the last 30 years. Rainfall has always been very variable and the previous British Record for Rainfall in 24 hours is 279mm from Martinstown (Dorset) 18 July 1955 which caused considerable damage. However, the flooding in Seathwaite in Cumbria provisionally set a new UK record of 314.4mm (12.38 inches) of rain in a 24-hour period on 19-20 Nov 2009. It recorded 372mm over 30 hours

Daily rainfall totals for 18 July 1955

Martinstown (Dorset): 279.4 mm (11.00 in)
Dorchester (Dorset): 190.5 mm (7.50 in)
Weymouth (Dorset): 181.6 mm (7.15 in)

Other British Short duration rainfall records (from Met Office Web Site)

Highest 5-minute total	*32 mm	10 August 1893	Preston (Lancashire)
Highest 30-minute total	80 mm	26 June 1953	Eskdalemuir (Dumfries & Galloway)
Highest 60-minute total	92 mm	12 July 1901	Maidenhead (Berkshire)
Highest 90-minute total	117 mm	8 August 1967	Dunsop Valley (Lancashire)
Highest 120-minute total	#193 mm	19 May 1989	Walshaw Dean Lodge (West Yorkshire)
Highest 120-minute total	#155 mm	11 June 1956	Hewenden Reservoir (West Yorkshire)
Highest 155-minute total	169 mm	14 August 1975	Hampstead (Greater London)
Highest 180-minute total	178 mm	7 October 1960	Horncastle (Lincolnshire)

* Approximate value

#Reservations about Walshaw value, Hewenden value is next highest accepted value.

As can be seen from the above most of these records were set many years ago.

UK Climate Projections 2009 (UKCP09)

Extract from Met Office Web site by **Dr Vicky Pope** *Head of Climate Change Advice*
Dated 15th June 2010

Average European rainfall

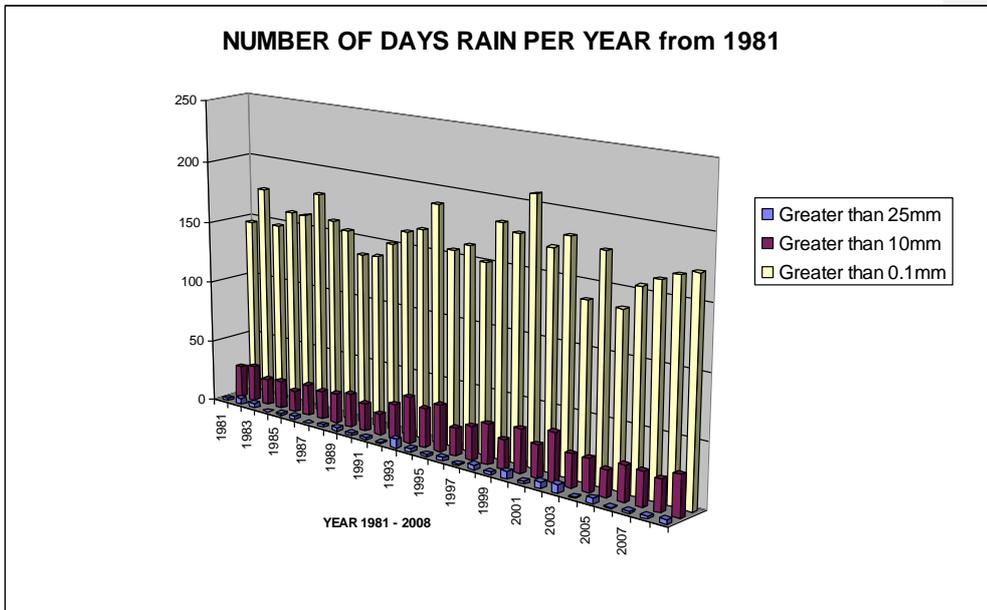
In northern Europe (including UK) average summer rainfall for 2070-2100 is likely to decrease by between 5 and 20%. Average winter rainfall is very likely to increase. The number and intensity of extreme rainfall events will increase in winter.

Summer floods in the UK

For the UK as a whole, 55,000 homes and 6,000 businesses were flooded and related insurance claims were approaching £3bn by the end of 2007. In line with Europe as a whole, UK summer rainfall is very likely to decrease on average. However, it is likely that summer showers will become heavier. This is because warmer air can hold more moisture.

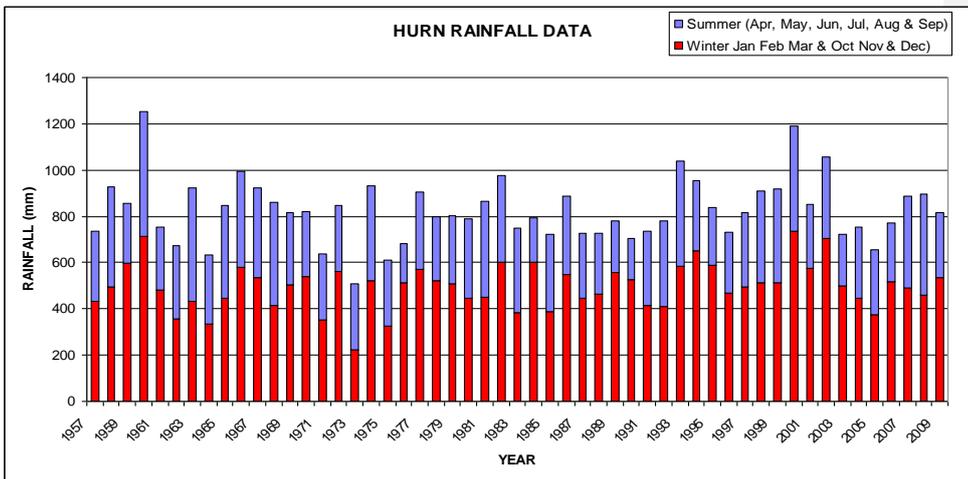
The conclusion must be that flooding is likely to get worse in Bournemouth but to date the local rainfall evidence does not confirm (or deny) this.

No of Days Rain exceeding 25mm and 10mm based on Kings Park Rain Gauge (Daily totals only) since 1981



On average we get 163 days a year when we get some rainfall but typically less than 3 days a year when we get more than 25mm (1 inch).

SUMMER and WINTER Rainfall Totals since 1957 (Hurn)



ADDENDUM

Flooding in Leybourne Av- Excerpt from Echo dated 30th August 2010



‘End our sewage flooding misery’

6:30am Monday 30th August 2010

By Melanie Vass

FED-up residents whose gardens are regularly flooded with sewage have made an impassioned plea for action.

A section of **Leybourne Avenue** in Northbourne has been routinely flooded twice a year for decades.

Wessex Water has investigated the situation and promised to start making improvements next year. But after Wednesday’s flash flood once again left their gardens swimming in sewage, residents say they are no longer willing to wait.

Annie Christopher, who saw her award-winning garden and vegetable plot ruined by the flood, said: “We get two to three foot of water. Our back gardens are the lowest point and they flood incredibly quickly.

“We are powerless to do anything about it and it causes such huge problems. All my vegetable crops are now wasted, everything in our outbuildings is contaminated, it’s awful.

“Last year Wessex Water did an exploratory operation and found various blockages and weaknesses in the system.

“They plan on starting to remedy the problem next year but I don’t want to wait any longer. It’s been too long as it is.

“If you go out for an evening and you know heavy rain is predicted you don’t know what you will find when you come back. We’re all just fed up with it.”

[Kinson](#) North Cllr Pat Lewis is also calling on Wessex Water to make **Leybourne Avenue** a top priority.

“I went out there on Wednesday evening and it was just awful,” she said. “There was sewage and toilet paper everywhere. This has been going on for donkeys’ years and it’s got to be sorted out. Next year won’t do. The quality of life for these residents is awful.”

Clare-Marie Dobing, Wessex Water spokeswoman, said: “Wessex Water is aware that occasionally flooding problems occur in **Leybourne Avenue** following exceptional weather conditions. We believe this has been caused by restrictions in the sewerage network.

“Last year Wessex Water spent £100,000 unblocking a nearby sewer which helped resolve some localised flooding and removed around 30 tonnes of Tarmac and concrete that was wrongly disposed of in the sewer.

“Within the next few months we will be investing around £200,000 on a scheme to remove restrictions in sewers in the area which will hopefully alleviate flooding problems.

“Residents who suffered sewage flooding in their gardens have been compensated and we have assisted with the clean-up following each reported incident.”

Flooding in Leybourne Av- Excerpt from Echo dated 20th July 2007

Deluge as heavy rain hits region

7:00pm Friday 20th July 2007

BRITAIN'S erratic summer continued on Friday, July 20, as a torrential deluge caused floods across Bournemouth and Poole.

Though the conurbation managed to escape the more severe conditions experienced further north, roads became blocked and gardens were also swamped.

"It's never been as bad as this since I've lived here."

Gladys Bateman

An inch of rain fell in the space of a few hours, causing localised flooding in West Howe, Kinson, Bourne Valley and on the Wessex Way.

Among the worst affected were residents of **Leybourne Avenue**, Kinson, who awoke to find their gardens knee-deep in water contaminated with sewage.

An area of council-owned open space directly behind their properties was also awash.

Teacher Annie Christopher, 58, who lives in an upstairs flat, said: "It's been raining all night - then it really teemed down. We've got sewage coming out of the drains."

Another resident, Charles Bird, 78, told the Echo that up to £8,000 worth of woodwork tools stored in his shed had been destroyed by the flooding.

He said: "I feel gutted. The shed is a write-off because the floor will be rotten.

"I've been saying for years this was going to happen. They are going to have to do something."

Gladys Bateman, 82, said she was in tears when she saw the state of her garden.

She said: "It's never been as bad as this since I've lived here. When I looked out I thought: Oh my God! It's going to come in through my back door soon'.

"The whole back garden is flooded. All my plants have gone for a burton. I couldn't get out of my front or back doors."

10th October 2010 Garden Flooding in Leybourne Avenue
J.E.Bird
185 Leybourne Avenue, Kinson, Bournemouth. BH10 5NP

Dear Sir,

Having lived at this address for over fifty three years I believe that little has been done to resolve the problems of foul sewage and surface water sewage which overflows from an inadequate drainage system (Surface water and foul sewage) which fails to cope when there is some heavy rain.

This flooding has occurred on a regular basis from the first part of the 1970's when a new sewer was laid in the Long Road open Space; this was connected to the drainage system at the junction of Long road and Leybourne Avenue.

I am deeply concerned about this problem that the level and intensity of the flooding is increasing. It is now also affecting more properties including 164 East Howe Lane and the bungalows near Leybourne Close

The history of this flooding that has affected the properties is as follows

- New sewer laid in open space Long road in early 1970's
- Rear gardens flooded in 1977 (outbuildings affected) photograph
- Rear gardens flooded in 1981 (outbuildings affected) photograph
- Rear gardens twice flooded on 5th and 24th June 1983
- Letter received from Borough Engineer and Surveyor 5th August 1983 regarding flood relief scheme to be approved by Wessex Water Authority and Bournemouth Borough Council
- Rear gardens flooded again 1993 4th and 10th October (outbuildings)
- 1995 September 24th manhole cover lifted (during heavy rain)
- 1997 August 6th Shed flooded
- 2001 October 7th Shed flooded (again)
- 2002 February 28th Drains Blocked
- 2002 March 1st Drains Blocked
- On May 8th 2004 problems with Communal sewer. Drains blocked
- September 10th 2004 Drains Blocked
- September 21st 2004 Drains Blocked
- September 23rd 2004 Drains Blocked
- October 9th 2004 Drains Blocked
- October 17th 2004 Drains Blocked
- October 18th 2004 Drains Blocked
- CCTV work and high pressure jetting carried out by Drain-Wise on behalf of Bournemouth Borough Council. It was only at this time that it was found out that the communal sewer was the responsibility of Wessex Water.
- Bournemouth Borough Council informs Wessex Water October 2004 to address the problem

- Wessex Water attended in October 2004, investigating with CCTV camera and finding large quantity of grease again, this was removed using High Pressure Jetting.
- Blockages to the main Sewer :
February 28th 2006
July 27th 2006
October 2nd 2006
May 14th 2007
- Letter from Mr B.C.Bird to Wessex Water 23rd May 2007 with enclosed drain plan from Mr Groves Bournemouth Borough Council Surveyor indicating problem area of the drain
- Wessex Water repaired drain between 2nd July 2007 and 9th July 2007 and jetted drain on 12th July 2007
- 20th July 2007 flooding to the rear and front gardens stretching as far as Leybourne close.
The highest level yet. (Outbuildings affected)
- 19th November 2007 flooding in gardens due to heavy rain and drains not coping
- Letter dated 21st November 2007 from Wessex Water regarding an assessment of the network which is part of a programme to identify a long term solution to the flooding
- Letter from Wessex Water informs me that this latest flooding was due to root ingress (the same problem area as mentioned in letter dated 23rd May 2007, there was also heavy rain)
- Letter from Wessex Water dated 19th March regarding updates on assessment of the sewerage work
- Flooding on 12th Sept 2008 due to heavy rain
- Letter from Wessex Water informing me the sewer was unable to cope and that the "provisional rainfall data indicated that this was a 1 in 100 year event"
- Letter to Wessex Water(dated 26th October 2008) about an article in the Autumn/Winter issue of the Wessex Water magazine "reducing the risk of flooding from a 1:20 year storm and providing future protection against a 1:75 year storm"
- Letter received (12th November 2008) from Mr Colin Skellett indicating that a detailed investigation almost complete and that Wessex Water were undertaking modelling work to find the right solution. Wessex Water were undertaking some immediate improvements which was being done now as part of major work which would have to be programmed as soon as they were clear of the scope of work required. We would be updated on the progress by Mr Tommy Stranack Sewage Controller by the end of November 2008
- Letter received(11th December2008) from Ruth Steinhausen Customer Relations Wessex Water, that a high level assessment had been carried out for a scheme to alleviate the flooding problem and that Wessex Water had included this in a bid for funding from OFWAT for the period 2010-2015 subject to funding levels.
- Gardens flooded June 2009
- Letter dated 24th June 2009 from Mr Colin Skellett Chairman indicating that the two types of sewer, Surface and foul, were two separate issues, and that the foul sewer scheme would hoped to be able to implement next year (2010). The surface water

flooding would be prioritised against other flooding problems across the Wessex Region and work should be completed during the period of 2010-2015 subject to sufficient funding being approved by the regulator, Ofwat.

- Flooding 24th November 2009 and 28th November 2009
- Flooding 23rd August 2010 and 29th August 2010 (Shed flooded Twice)
- Residents Meeting in the garden of 187a Leybourne Avenue 2010 with Mr Chris Plenty of Wessex Water and Councillor Mrs Pat Lewis.
- Letter (dated 16th September 2010) from Wessex Water indicating that work to start cleaning Siphons (also to make access point in the Siphons at various points)
- Letter (dated 23rd September 2010) from Wessex Water informing residents of sewer renovation to start 11th October 2010.
- Letter from Wessex Water (dated 1st October 2010) informing the residents that the Surface Water Plan being carried out by Bournemouth Borough Council is not fully complete. Mitigation work was discussed to form a bunded area within the recreation area at the rear of the affected properties in Leybourne Avenue. If favourable would then apply to DEFRA for funding for this work.
- I have had regular updates from Wessex Water during the work to renovate the two Siphons and this work is nearing completion.
- There is no indication as yet when the surface water sewer renovation will start (The sewer which causes the most problem)

Excerpt from Echo dated 7th October 2010

Relief at last for Northbourne sewage victims

7:00pm Thursday 7th October 2010

By Melanie Vass

A £250,000 sewer improvement scheme will get under way on Monday to help residents whose gardens get flooded with sewage.

Wessex Water is investing the cash to remove restrictions in sewers that transport waste from homes in **Leybourne Avenue**, Northbourne.

The scheme involves creating access points to the sewer running below **Leybourne Avenue** and [Wimborne Road](#) so it can be surveyed and cleaned.

Barry Burtenshaw, Wessex Water's engineer for the scheme, said the company hoped the work would prevent occasional flooding in gardens in **Leybourne Avenue** and bring peace of mind to residents.

He said: "We believe issues in **Leybourne Avenue** are the result of restrictions to a sewer which had become overwhelmed following exceptional weather conditions.

"Once this essential work is complete the sewer should operate to a high standard and efficiently remove waste from homes."

Last year Wessex Water spent £100,000 unblocking another sewer in the area, which helped resolve some localised flooding and removed around 30 tonnes of asphalt and concrete that was wrongly disposed of in the sewer.

The latest work will require some roadworks on Wimborne Road and motorists are being advised to allow extra time for their journeys during the scheme.

From Monday October 11, four-way temporary traffic lights will be in place in Wimborne Road for approximately one week at the crossroads with East Howe Lane while manholes are constructed.

Once this work is complete engineers will move eastwards along Wimborne Road to construct further manholes. During this time two-way lights will be in place from Pinewood Avenue to Avebury Avenue for approximately one week.

Following the construction of the manholes the sewer will be cleaned and surveyed. This should take around two weeks and will involve temporary traffic lights on Wimborne Road between 9.30am and 3.30pm.

Works are now nearing completion (see video link). These works should reduce the frequency of flooding in this area from the foul / combined sewer. However this area is still at risk from flooding from the Surface water Sewer and has also been recently identified as being at risk from surface water flooding. This shows the difficulty of resolving these issues and the time scale involved. This has been going on since 1977!

For further information on the current works see
http://www.youtube.com/watch?v=cxjj4bmY_9w

Postscript

Bus-loads of rubbish in sewers

3:30pm Friday 31st December 2010

RUBBISH weighing the equivalent of three double-decker buses has been pulled from sewers in a flood-prone area of Bournemouth.

Wessex Water removed almost 50 tonnes of illegally deposited materials from sewers in Leybourne Avenue and Wimbone Road during its £250,000 improvement scheme.

Engineers working on the project discovered bricks, Tarmac and even toys in the sewers.

Julian Britton, Wessex Water's project manager for the scheme, said: "Work to clear the sewers was considerable, but thankfully it has now been completed and it should help ensure residents in Leybourne Avenue do not experience the flooding problems that have occurred in the past."

Wessex Water also stripped fats, oil and grease from the sewers.

Cllr Pat Lewis, who represents the Kinson North area, said: "Following flooding of gardens in Leybourne Avenue, the residents are pleased with the prompt action Wessex Water has now taken to try to solve it."

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