Chester-le-Street
District Council

Leisure & Neighbourhood Overview and Scrutiny Panel

Review of Local Watercourses

May 2008 **FIRST DRAFT**

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Foreword of the Chair

Following discussions with panel members the Leisure and Neighbourhood Overview and Scrutiny Panel decided to undertake a review into the water quality of local watercourses. This was identified from topics highlighted in the panels work programme for 2006/07 and had been raised by local residents.

The review conducted by the panel was a piece of work that looked into the quality of local watercourses and associated environmental issues. As a panel we visited Lumley Park Burn and the mine water treatment reedbeds at Lamesley to investigate this issue in more depth. A number of focus groups were also held with a variety of stakeholders including the Coal Authority, Environment Agency and experts from Newcastle University. A variety of desktop research was also undertaken during the course of the review.

On behalf of the review panel I would like to take this opportunity to thank all the individuals and organisations involved in this review for their contributions. The panel found, in particular, the site visits most helpful during the review process. It is hoped that the recommendations within this report will be accepted and developed to ensure that Chester-le-Street continues to promote and encourage residents, visitors, businesses and communities to care for their environments. One of the four main principles of good scrutiny is to enable the voice and concerns of the public and through this review we have attempted to do so.

The review was carried out between July 2007 and March 2008.

Cllr Geoff Armstrong

Chair of Leisure and Neighbourhood Overview and Scrutiny Panel

MEMBERSHIP OF THE PANEL

Councillor Geoff Armstrong	**Chairman of the Panel**
Councillor Bill Barrett	**Vice-Chairman of the Panel**
Councillor Keith Davidson	**Panel Member**
Councillor Alan Holden	**Panel Member**
Councillor Bill Laverick	**Panel Member**
Councillor Maureen May	**Panel Member**
Councillor Mike Sekowski	**Panel Member**
Councillor David Thompson	**Panel Member**
Councillor Frank Wilkinson	**Panel Member**

REPORT OF LEISURE & NEIGHBOURHOOD OVERVIEW AND SCRUTINY PANEL
REVIEW OF LOCAL WATERCOURSES

1 Introduction

1.1 At the Leisure and Neighbourhood Overview and Scrutiny Panel meeting held on Wednesday 13 June 2007 Members discussed potential topics for scrutiny review. Local residents, the parish council and the local conservation group in Bournmoor had raised issues with Members over the quality of the local waterway, Lumley Park Burn, concerning environmental problems.

1.2 Members of the panel highlighted other issues concerning water quality in local waterways and it was decided that this would be an interesting issue for review and would provide benefit to local communities. It would also afford the opportunity for the scrutiny panel to undertake some work in external scrutiny as well as fulfilling part of the panels remit in managing the built and natural environment.

2 Purpose of the Review

2.1 The purpose of the review was to look at the quality of local watercourses and the environmental issues surrounding them. The desired outcome of the review would be to engage and work with partner organisations, local communities and groups. The review would aim to promote biodiversity within the Chester-le-Street area and particularly in relation to local watercourses.

3 Scrutiny Review Process

3.1 Scrutiny reviews are in-depth studies into issues which have been identified by scrutiny members as important to the community and Council of Chester-le-Street.

3.2 Scrutiny reviews investigate issues by a process of gathering evidence through speaking to individuals and groups that are involved or affected. The review panel then formulates realistic evidence based recommendations which are presented to the Council's Executive.

3.3 Scrutiny reviews will carry out a number of stages in undertaking and completing a review. The stages broadly are:

Stage 1 Scope — The initial stage of the review identifies the background, issues, potential outcomes and timetable for the review.

Stage 2 Investigate	The panel gathers evidence using a variety of tools and techniques and arranges site visits where appropriate.
Stage 3 Analyse	The key trends and issues are highlighted from the evidence gathered by the panel.
Stage 4 Clarify	The panel discusses and identifies the principal messages of the review from the work undertaken.
Stage 5 Recommend	The panel formulates and agrees realistic recommendations.
Stage 6 Report	Draft and final reports are prepared based on the evidence, findings and recommendations.
Stage 7 Monitor	The panel undertakes to monitor agreed recommendations on a regularly agreed basis.

4 Background

4.1 Many human activities and their by-products have the potential to pollute local waterways. Large and small industrial enterprises, the water industry, the urban infrastructure, agriculture, horticulture, transport, discharges from abandoned mines and deliberate or accidental pollution incidents all affect water quality.

4.2 Pollution is often described as *point source* or *diffuse* pollution. Point source pollution enters a water body at a specific site and is generally readily identified. This includes effluent discharges from sewage treatment works, power stations, landfill sites etc. Diffuse pollution arises where substances are widely used and dispersed over an area as a result of land-use activities such as urban development, amenity, farming and forestry.

4.3 A number of known discharges into the Lumley Park Burn and its tributaries have been recorded by individualist environmental group, igreens and this is attached at Appendix 1 of this report.

5 Terms of Reference

5.1 To build an impression of the biological, physical and chemical water quality of local waterways in and around the Chester-le-Street area.

5.2 To gain an understanding of the nature and causes of pollutants to local watercourses and the effects of such pollutants on the natural environment.

5.3 To investigate the role of the various agencies and environmental groups in the protection of local waterways and how the local authority assists or can assist in this process.

5.4 To look at the various methods either being planned or already employed to prevent contamination of local watercourses.

6 Methodology

6.1 The review panel was working to a clearly agreed timetable. The timetable was a useful tool by which progress could be monitored and also provided a basis for progress reports to the main panel meetings.

6.2 A list of publications, papers and documents was assembled by the Scrutiny Officer and a bibliography can be found in **Section 11** of this report.

6.3 Interviews were conducted with:

Alex Norton (Development Manager – The Coal Authority)
Jamie Fletcher (Environment Manager Team Leader – Environment Agency)
Rob Carr (Environment Agency)
G Hoddy (Regulatory Officer – Environment Agency)
P Alebed (Mine Water Project – Environment Agency)
J McPake (Environment Manager – Environment Agency)
Paul Griffin (Bournmoor Parish Clerk)
R McFarlane (Biodiversity Officer – Environment Agency)
C Courage (Natural England)
M Garrett (Local Conservationist Group)
K Clark (Bournmoor Parish Council)
Dr Adam Jarvis (Hydrogeochemical Engineering Research and Outreach – Newcastle University)
David Wilkinson (Business Manager, Environmental Management and Laboratory – Durham County Council)

6.4 A field trip was arranged to follow the course of the Lumley Park Burn to allow members of the panel to gain an insight into the environmental issues affecting the burn along its course. A visit was also arranged, in conjunction with the Coal Authority, to the reedbed treatment area at Lamesley to illustrate one of the measures currently employed to successfully treat mine water.

6.5 A variety of desktop research was conducted to gain an insight into current developments in the treatment of mine water, environmental issues, current legislation and examples of innovative and successful initiatives.

7 Legislative & Strategic Context

The Water Framework Directive

7.1 The Water Framework Directive (WFD) is a key piece of European legislation that provides an overarching programme to deliver long-term protection to water environments, improving the quality of all water including groundwater and surface waters.

7.2 The WFD covers all water bodies including rivers, coasts, estuaries, man-made structures and groundwater sources and will enable the setting of new objectives to promote the sustainable use of water. The implementation of the directive takes place in planning cycles with a target completion date of 2015 for the first cycle.

7.3 Negative impacts on water environments e.g. factories and road networks will be identified under the WFD and a 'Programme of Measures' established to address all types of impact. River Basin Management Plans will bring together all these aspects to achieve a 'good status' in the UK's river basins by 2015. A core requirement within the WFD will be that of public participation.

The Groundwater Directive

7.4 The Groundwater Directive aims to protect groundwater from pollution by controlling discharges and disposals of certain dangerous substances. In the UK, the directive is implemented through the Groundwater Regulations 1998. The regulations deal with substances that can have an adverse impact on groundwater. Substances controlled under the regulations fall into lists:

List 1 substances are the most toxic and must be prevented from entering groundwater. Substances in this list may be disposed of to the ground, under permit, but must not reach groundwater. This includes pesticides, sheep dip, solvents, hydrocarbons, mercury, cadmium and cyanide.

List 2 substances are less dangerous, and can be discharged to groundwater under permit, but must not cause pollution. Examples include sewage, trade effluent and most wastes. Substances in this list include some heavy metals and ammonia, phosphorus and its compounds.

7.5 The Environment Agency (EA) is the primary organisation for groundwater protection in England and Wales. The regulations require the EA to consider monitoring in the area of authorised disposal sites to ensure groundwater protection; strategic groundwater monitoring may provide this.

7.6 The EA acts as a statutory consultee to the development/planning regime at both the strategic and development control levels. The Groundwater Directive must be repealed by December 2013. The WFD (2000/60/EC) and Groundwater Daughter Directive (2006/116/EC) will continue the regime of groundwater protection.

8 Findings of the Review

Field Trip – Lumley Park Burn

8.1 Members of the scrutiny panel along with officers from the Environment Agency, District Council and Members of Bournmoor Parish Council undertook a field trip along the course of the Lumley Park Burn to gain an understanding of some of the environmental issues that impact on watercourses across the district. Lumley Park Burn was chosen for the trip as it had been highlighted as an issue by the local conservation group and due to the stream exhibiting most of the issues that can be seen in other watercourses across the district.

8.2 Rain falling onto semi-permeable rocks at Houghton Cut feeds the Herrington and Moor Burns in effect creating these watercourses. Houghton Quarry, an active landfill site, was bunded with a water proof lining to prevent contamination of the land and watercourses. The Herrington and Moor Burns courses could be traced to the River Wear in Chester-le-Street. There were issues with spillages from adjacent industrial sites into the natural drainage and ultimately the watercourses.

8.3 During the field trip stretches of the Lumley Park Burn were seen contaminated with a fridge, garage door and various other detritus which was clearly visible in the water. The importance of keeping an up-to-date portfolio of pollutants to ensure effective analysis of watercourses was highlighted.

8.4 The Lumley Park Burn was a designated Grade 4 stream able to support fish yet there were no signs of fish in the particular stretch visited. The plant life survived due to rainwater washing pollutants from the vegetation. The Environment Agency reported that a network of monitoring points for streams and rivers was used to sample water quality with the number and frequency of sampling dependent on the importance of the stream or river.

8.5 Problems of unauthorised access to sewerage treatment works had the potential to create problems of an environmental nature and these were ongoing problems not isolated incidents.

8.6 Members were taken to a spot of the burn where mine water was being discharged into the watercourse. The oxide deposits were clearly visible in the river as well as erosion of the riverbank. Mine water pumping is permissible due to historical consents and currently is not prohibited by the law.

The Coal Authority

8.7 The Coal Authority (CA) was established by Parliament in 1994 to undertake specific statutory responsibilities. A Non-Departmental Public Body it is primarily funded by grant-in-aid amounting to £27 million per year. The CA employs 140 staff and its main responsibilities are as follows:

- Licensing coal mining operations in Britain

- Handling subsidence damage claims which are not the responsibility of licensed coal mine operators
- Dealing with property and historic liability issues, such as treatment of mine water discharges
- Providing public access to information on past and present coal mining operations
- Provision of a 24-hour call-out service for reported surface hazards.

8.8 When the CA became operational on 31 October 1994 certain property rights and obligations were transferred to the CA including ownership of coalmines previously vested in the British Coal Corporation. Despite being no statutory obligation on the CA in relation to mine water pollution it was a key issue given the scale of the coalmine closure programme during the 1980's and 1990's.

8.9 The CA inherited a number of existing operations from British Coal where mine water pumping took place to control rising mine water and prevent future uncontrolled discharges. These consisted of nine pumping stations in County Durham (none of which had treatment systems due to the relatively good quality of the pumped waters), one in Yorkshire and one in Staffordshire. The mine water pumping stations inherited from British Coal by the CA had originally operated to prevent water from migrating to deeper operational mines which had been closed in the run-down of the industry.

8.10 In the Durham coalfield (North East of England), British Coal had proposed to switch off the pumps at the 9 pumping stations in the region and allow the mine water to recover, predicting that the waters would eventually discharge, without problem, to the North Sea through a number of 'beach adits'. Concerns were raised by a number of parties including the National Rivers Authority (predecessor of the Environment Agency), District and County Councils that British Coal's predictions were erroneous which resulted in the pumping operation continuing.

8.11 Since 1994 legislation has changed in relation to mine water pollution from abandoned mines but this relates only to mines abandoned after 31st December 1999. In addition new regulations were brought in requiring operators to give at least 6 months notice of any proposed 'abandonment' to the Environment Agency in order to allow time to consider likely impacts and appropriate measures to deal with anticipated issues.

8.12 The CA Representative, Alex Norton, explained how mine water is oxidised through the process of mining and when mine water reaches the surface it comes into contact with the air and a chemical reaction takes place changing the iron in the water from a ferrous to a ferric state. This causes small particles of iron (ferric hydroxide) to form a solution, more commonly known as ochre.

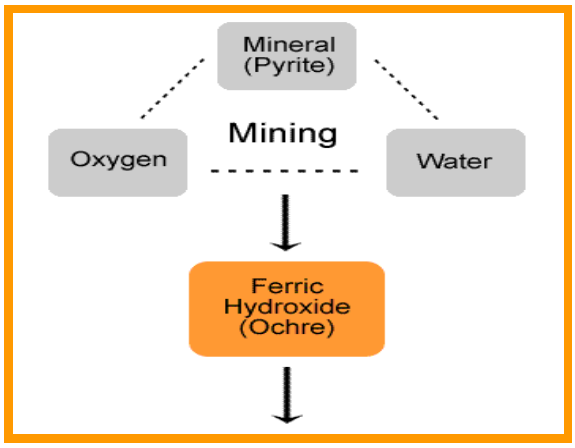


Figure 1: Mine Water Process

8.13 There are 4 pumping stations in the Chester-le-Street locale – Kibblesworth, Kimblesworth, Woodstone Village and Chester Moor. Mine water at Kibblesworth passes through 9 reedbeds and is currently taking out approximately 50 tonnes of ochre a month. The restarting of the pumps at Lumley 6th site was in order to control and prevent mine water discharges in the area.

8.14 The CA is currently exploring potential uses for the Ferric Hydroxide including as a flocculent in sewerage treatment and also as a slow release fertiliser. However to develop these ideas further the CA required the backing of the Environment Agency who currently class the ochre as a waste material rather than a by-product.

8.15 The reedbeds have a 25 year life span before replacement is required. The CA has completed 47 mine water schemes, over 100km of river improvement, over 100km of river protection and 132 tonnes of ferric hydroxide removed from water per month. The cost of each individual scheme is approximately £1 million. The CA is currently looking at alternative options to pumping into Lumley Park Burn including the installation of a mine water treatment scheme or a gravity system at Chatershaugh. However one of the major problems/issues for the CA is the acquisition of suitable land on which to install green treatment schemes. Also funding has been reduced from £8 million per year to £2.5 million.

The Environment Agency

8.16 The EA was established under the Environment Act 1995 and afforded certain powers and duties. The EA has approximately 12,000 staff with a budget of £900 million and, although independent of, works closely with Central Government which provides around 60% of their funding.

8.17 The EA undertakes work to protect the environment and principle responsibilities including:

- Working with industry to protect the environment and human health;
- Concentrating efforts on high risk businesses;

- Helping businesses to use resources more effectively;
- Take action against those who do not take their environmental responsibilities seriously;
- Looking after local wildlife;
- Working with farmers;
- Restoring rivers and lakes;
- Helping people get the most out of their environment including boaters and anglers;
- Influencing and working with the Government, industry and local authorities.

8.18 There are 4 Environment Management (EM) Teams in the North East Area with the EM South Team covering Sunderland, Easington, Durham, Chester-le-Street and part of Sedgefield. The EM Teams main responsibilities are to regulate the compliance of consented discharges, manage pollution incidents, promote pollution prevention measures and conduct watercourse monitoring.

8.19 Sometimes there can be difficulties in pinpointing the actual source of pollution and the EA are often reliant on information from members of the public. The current Go Green Campaign aims to raise awareness of the work of the EA and how the public can get involved in supporting their own environment and/or report incidents through the dedicated EA hotline.

8.20 Between 1 January 2006 and 1 January 2007 there were 326 waste related incidents with the majority due to illegal disposal of waste. The maximum penalty awarded in relation to environmental crimes is £20,000 in summary proceedings or an unlimited fine and/or imprisonment can be awarded by a Crown Court. The EA will also, as part of their prevention/education strategy, name and shame offenders.

Dr Adam Jarvis – Newcastle University

8.21 Dr Adam Jarvis, Senior Lecturer at Newcastle University on Hydrogeochemical Engineering Research and Outreach (HERO) provided useful information to the scrutiny review team on watercourse pollution. The mineral iron pyrite (Fools Gold) is the primary cause of mine water pollution and creates the red coloured deposits associated with mine water pumping/ pollution when in contact with the air creating ferric hydroxide or ochre.

8.22 The issue with the Lumley Park Burn is that if the pumping was to cease the nature of the water discharge would become unpredictable and the water quality would suffer from deterioration. The pumping process essentially controls the discharge to the Lumley Park Burn.

8.23 Upon emergence at the surface the iron pyrite rapidly forms into a solid precipitate which is deposited on stream beds as ochre. The limestone strata that mine water travels through on its way to the surface generally neutralises the acid in the mine water to a near neutral pH level. Where discharges are acidic there is a tendency for other metals to also be present including aluminium which leaches out of clay due to being more soluble at a low pH.

8.24 The most common problems with mine water concern the visual intrusion, ecological degradation, destruction of bed dwelling fauna and the impact on water resources. The CA has done a lot of work since 1994 to remedy many of the issues and problems of mine water discharge.

8.25 The treatment of mine water pollution can be either active or passive. Active treatment is a more conventional water treatment method using chemicals whereas a passive treatment harnesses a naturally occurring process to remediate pollution. There are advantages and disadvantages to both forms of treatment and the two approaches should be used to compliment each other dependent on the severity of pollution and the range of resources available.

8.26 The active treatment site located at Horden was designed to rapidly remove acidity and iron from the mud by elevating the pH level and encourage very rapid oxidation, precipitation and settlement of the iron. The passive treatment sites at Kibblesworth and Lamesley were good examples of this type of process in action. These passive treatment sites have a typical lifespan of between 10 & 30 years before the need for reed replacement.

8.27 The major drivers for change in this area are the European Water Framework Directive legislation and the public's interest in local watercourses, their management and the environment in general.

Reedbed Treatment Process – Lamesley

8.28 The pioneering Lamesley Wetlands Scheme was created when Northumberland Water and the Coal Authority worked in partnership to provide a sustainable solution to treating mine water and sewage effluent at the same time to clean up the River Team and provide wider landscape and bio-diversity benefits for the local community to enjoy.

8.29 Reedbeds are the most ecologically friendly way of treating mine water. The constructed wetlands form a concentrated habitat for insects and birds which can also be used as a public amenity with some schemes incorporating picnic areas, paths, benches and viewing points. Lamesley Wetlands Scheme has attracted over 100 species of birds to the area including owls, lapwings, ringed plovers and mute swans.

8.30 The main purpose of reedbeds in relation to mine water treatment is two-fold:

Filtration – as the mine water journeys through the reedbed the particles of ferric hydroxide become caught and remain within the natural filter leaving the rest of the mixture to progress. Successful treatment schemes are where the reedbeds are of a sufficient size to remove all the particles before the water re-enters the watercourse.

Settlement – this occurs once filtration has taken place. Most reedbeds have a design life (storage capacity) of in excess of 15 years. Settlement is the

process by which the particles formed during filtration collect together and fall to the base of the reedbed.

Durham County Council

8.31 The Business Manager for Environmental Management and Laboratory from Durham County Council, David Wilkinson, provided evidence to the scrutiny panel review from a county council perspective.

8.32 The difficulty in predicting when and exactly where mine water will rise is a constant issue and increases in complexity due to the level of interconnection between underground water sources. The inland pits (Lumley 6th, Kibblesworth, Chester Moor South & Kimblesworth) have also reduced the volume of water going to coastal pits creating further inland environmental issues.

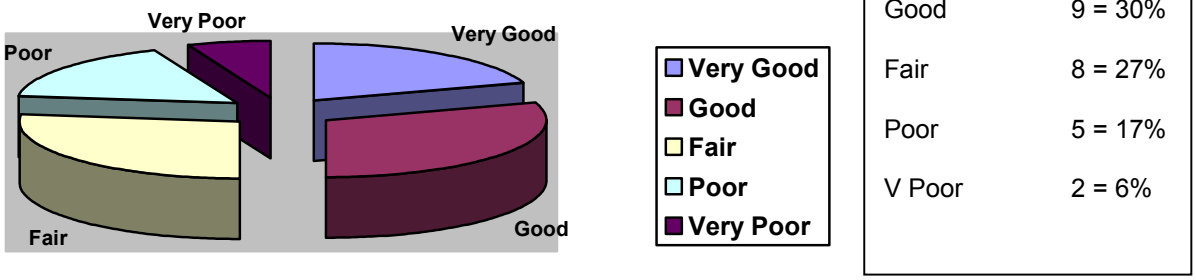
8.33 Lumley 6th (Floaters Mill) currently discharges into the Lumley Park burn via pumping. The Coal Authority is investigating a gravity discharge at Chatershough which would allow for Lumley 6th pumps to be switched off.

8.34 The Edmondsley Reedbed scheme saw the County Council and the CA working closely during the planning phase which cleaned up a stretch of the Cong Burn.

Website Poll Results

8.35 As part of the review process Chester-le-Street District Council hosted a poll through their website site on watercourses. The aim was to gauge public perception of the general quality of local watercourses in the area. The poll had 30 responses and the results are as follows:

Generally what do you think of the water quality of local streams and watercourses in the Chester-le-Street area?



Very Good	6 = 20%
Good	9 = 30%
Fair	8 = 27%
Poor	5 = 17%
V Poor	2 = 6%

Figure 2: Poll Results – Website Survey

Natural England

8.36 Natural England, the integrated countryside and land management agency was formally established on Sunday 1 October 2006 taking on their full statutory responsibilities. Natural England brings together English Nature, the

Countryside Agency and the Rural Development Service. Its role is to ensure that the natural environment is conserved, enhanced and managed for the benefit of present and future generations.

8.37 The scrutiny panel met with Natural England representatives on 20 May 2008 to discuss their remit and responsibilities in relation to the environment and particularly that relating to local streams and watercourses.

8.38 Natural England's statutory role is to provide advice and permission on proposals likely to impact upon SSSIs (Sites of Specific Scientific Interest) and European SPAs (Special Protection Areas) and SACs (Special Areas of Conservation) or protected species. Natural England is also the enforcement authority for protected species crime and damage to SSSIs, SPAs and SACs.

8.39 Natural England is principally funded through the Central Government Department for Environment, Food and Rural Affairs (Defra). Due to the nature of Natural England's work it is inevitable that some of their area of responsibilities overlaps with that of the EA and therefore both organisations work closely with each other.

8.40 Natural England also are involved in issues related to:

- Green infrastructure - in developing new housing estates promote the consideration of green spaces and trees in urban developments.

- Footpaths to Fitness – Natural England works with PCTs in encouraging people to walk in the local countryside as part of a healthier regime. This also helps to promote the natural environment and social cohesion.

- Landscape Projects – working in partnership to deliver environmental gains. In West County Durham the Mineral Valleys Project covers an area of 89,000 hectares and aims to use environment-led regeneration to help local communities celebrate their heritage whilst enhancing the environment around them.

9 Conclusions

9.1 Watercourses are important to the natural environment in sustaining local flora and fauna and stretch the length and breadth of the district both over and underground. Watercourses like many other aspects of the natural environment suffer from pollution and contamination from a variety of sources including mine water discharges, urban developments, amenities, farming and forestry activities. The importance of agency work in controlling, regulating and policing local watercourses was evident throughout the review process.

9.2 The Water Framework Directive is a key driver for improving local watercourses and provides the mandate for long term protection of water environments as well as promoting the sustainable use of water. The Coal Authority, Environment Agency and Natural England all work closely together with other partner organisations including local councils to improve, protect and maintain water quality in streams and rivers across England.

9.3 Coal mining was an important industry to the regions economy and livelihood for many years and its legacy of potential pollution will be an issue for years to come. Tackling polluted water left over by mining and heavy industry has become a major environmental concern. Certainly there are challenges for dealing with mine water pollution and experts such as Dr Adam Jarvis working closely with the Coal Authority and other agencies are developing new and innovative ways of doing just this.

9.4 The Lamesley Wetland Scheme is one such innovative approach to treating mine water and sewage effluent. The scheme was developed by the Coal Authority and Northumbrian Water and is a 5-hectare man-made reedbed. As this scheme has evolved it is estimated that over 100 species of bird have been sighted in the area, with many attracted to the site purely due to the reedbed planting. So as well as providing an environmentally friendly solution to water pollution this scheme has also greatly enhanced the natural environment and created a habitat suitable for sustaining wildlife.

9.5 However this type of scheme is not feasible or suitable for every mine water treatment issue. A reedbed treatment scheme is very much dependent on size, cost and the extent of the water pollution. To have an effective reedbed scheme a large area of land is required to provide the basis for the installation and this may not always be readily available or may have financial implications attached to any land acquisition. Also if the water is heavily polluted or space is limited a reedbed scheme may be ineffective and a more intensive chemical based approach required.

9.6 Pollution of watercourses is not just confined to the legacy of coalmining or output from factories, farms and industry. A less obvious source is that of expanding urban developments and incorrect plumbing leading to waste water from washing machines, dishwashers, baths and even toilets feeding directly into local watercourses.

9.7 It is important to educate and raise awareness of local watercourses within communities and the reporting mechanisms available to the general public if an environmental incident occurs. Much of the preventative and enhancement work that is conducted by enforcement agencies relies on the support of the public in providing local intelligence.

9.7 It is important that all agencies, organisations and interested groups work together to deliver on the Water Framework Directive legislation and provide the best solutions and preventative measures available for the natural environment, communities and future generations.

10 Recommendations

10.1 That the Council seeks to work in partnership with other agencies to increase understanding and appreciation of the value of streams and watercourses to the wider public.

10.2 Through promotion increase public access and awareness of local watercourses and streams.

10.3 That the Council promotes the work of the Environment Agency and the reporting mechanisms available to the public for environmental issues.

10.4 Promote, where possible, the adoption of sustainable urban drainage techniques for development e.g. reedbeds.

10.5 That the Council seeks the inclusion of effective measures for the protection and enhancement of watercourses in the preparation of unitary development plans (UDPs) and other relevant policy documents.

10.6 That procedures are established when liaising with developers to maximise opportunities for riverside enhancement work where applicable.

11 Background Papers

- The Environment – Coal Authority Magazine
- The Coal Authority Website
- Go Green Supplement – Journal Newspaper
- Environment Agency Website
- Natural England Website
- Paul Griffin – Bournmoor Parish Council
- Water Framework Directive
- Discharges to Lumley Park Burn – Alan Vickers
- Sources of Pollution – Foundation for Water Research
- Sewerage Systems of the Future? – BBC Website
- Your Waste – Your Responsibility – Environment Agency

Chester-le-Street District Council

Leisure & Neighbourhood Overview and Scrutiny Panel

Review of Local Watercourses

APPENDICES

APPENDIX 1

Discharges to the Lumley Park Burn and its tributaries

The following are the discharges that are known to have been made into the Lumley Park Burn or its tributaries. The information is supplied from the 'igreens – individualist environmentalist' website and is as complete as possible:

Discharge	Body of Water
Mine water from Elemore Colliery (closed 1974)	Hetton Burn
Mine water from Hetton Colliery (closed 1949)	Hetton Burn
Mine water from Houghton Colliery (closed c1981)	Houghton Burn
Mine water from Nicholson's Pit (ceased pumping c1996)	Moors Burn
Mine water from Annabella Pit (closed c1980's)	Moors Burn
Mine water from North Pit (closed c1830's)	Moors Burn
Mine water from Hutton's Moor Pit (listed as working as part of Newbottle Colliery in 1762)	Moors Burn
Mine water from Ellison's Shaft (listed as working as part of Newbottle Colliery in 1762)	Moors Burn
Effluent from Sedgeletch Sewage Treatment Works	Moors Burn
Mine water from Morton Engine Pit (records indicate pumping from c1728)	Moors Burn
Mine water from Lambton D Pit (closed 1965)	Moors Burn
Mine water from Herrington Colliery (closed 1985)	Herrington Burn
Mine water from Dorothea Colliery	Herrington Burn

(closed 1985) Mine water from William Henry Pit (sunk c1799 when a Boulton & Watt steam pumping engine was erected)	Lumley Park Burn
Mine water from New Lambton Shaft (currently called Lumley 6th and ceased pumping c1996. There was a salt industry established here in 1815 to extract salt from the water pumped from the shaft)	Lumley Park Burn
Mine water from Morton Hill Pit (there was a Newcomen steam pumping engine working here from c1760's)	Lumley Park Burn (possibly)
Mine water from Lumley 6th Pit (closed 1966)	Lumley Park Burn
Mine water from a series of staple shafts In Lumley Park (recorded as being pumped from c1676 a Newcomen steam pumping engine is known to have been working here from 1729)	Lumley Park Burn

ADDITIONAL NOTES (update May 2006)

Lumley Park Burn was probably at its worst when sewage, cokeworks and collieries were discharging into it. However things gradually improved and herons, kingfishers and fish were observed in the burn. Since winter 2005 Lumley 6th Pit has discharged mine water at an unprecedented rate into the burn turning the bed orange. DEFRA and the 'Residents Against Toxic Sites' (RATS) were contacted resulting in pumping taking place only during the hours of darkness. The pollution issue remains unresolved.