UKWIR NEWS

Issue 49, December 2008

DIFFUSE POLLUTION

Co-operating with agriculture

The three year project, *Water Resources Management in Cooperation with Agriculture* (WAgriCo) with a financial contribution from the LIFE Programme of the European Commission, was completed at the end of September. The project was undertaken in the both Lower Saxony and the UK.

It demonstrated the practical water protection measures that farmers can adopt to contribute to EC Water Framework Directive requirements. It also showed that such measures can obviate the use of expensive water treatment where water supply quality is at risk of exceeding the drinking water standard.

This UK project was supported and funded by ADAS UK Ltd, the Environment Agency, the National Farmers' Union, UKWIR and Wessex Water and co-financed by Defra.

At the project dissemination workshop UKWIR Project Manager, **Roger Trengove**, described how the project centred on eight pilot studies within the catchments of the rivers Frome, Piddle and Wey near Dorchester in Dorset, within Wessex Water's supply area.

There were many aims of the project, the prime one being the development and dissemination of best practice approaches to ensure farmer and stakeholder engagement and involvement.

Defra's **Patrice Mongelard** said that we need to use technical knowledge but we also need to change behaviour by overcoming farmers' scepticism. This is best done by working with others and in this we require a community approach, both nationally and locally.

He added that "*water company interventions in the interaction between agriculture and water quality are necessary and important but the companies are unable to do all that is necessary on their own*".

The greatest concern is the steady rise in the level of nitrates in groundwater and to illustrate this UKWIR Client Manager, Wessex Water's **Luke DeVial**, presented figure 1.

As a consequence, a further 43 Ml/d of water resources, across Wessex Water's water supply area could be exceeding the drinking water standard of 50 mg/litre (11.3 mg/l Nitrate as N) by 2015. He added that his company wished to avoid having to build water treatment plants to solve the problem and this means "*there is a need to be focused and concentrate on where the real problems are - we don't need to look everywhere*".

Radical

Luke De Vial warned that we should be willing to be radical in applying solutions. For example it may be better to pay the farmer not to grow traditional crops but plant a '*cover*' crop to reduce nitrate leaching into the groundwater.

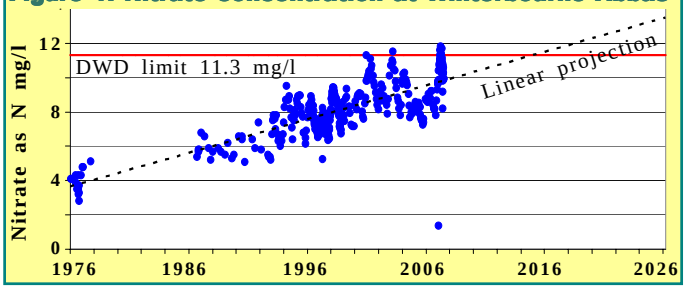
ADAS's **Dr Jodie Whitehead** described how 52 farms cooperated in the project to show the costs and benefits of six mitigation measures:

- fertiliser recommendations
- manure management
- cover crops to reduce leaching
- fertiliser spreader calibration
- moving from autumn to spring application of slurries and poultry manures
- the use of N balances and efficiencies as an in-farm management tool.

ADAS's **Tony Lloyd** saw monitoring as a key element to success. Indeed, depending on the local geology, nitrates can take days, months or even years to leach out into the groundwater. This was supported by modelling evidence presented by **Dr Nick Rukin** of Entec.

Tony Lloyd insisted that historical knowledge of the catchment should not be ignored as it can often provide an explanation when the problems are not easy to deduce from recent data.

Figure 1. Nitrate concentration at Winterbourne Abbas



He emphasised that working with farmers is essential and should be carried out with a spirit of trust and openness.

The collaborative project wouldn't be complete without the input of a farmer's perspective. **Frank Van Nes** farms 4,000 acres and put forward the case for sustainable water management where good water management and good soil leads to good profits.

Perhaps the best vindication of the project is the quotes from farmers who took part:

"*WAgriCo has made us think and take a careful look at what we are doing and why*".

"*WAgriCo has created an awareness that will remain in place for the future*".

Full details of the project can be found at www.wagrico.org and www.wagrico.org.uk

Value for Money

On page 2 of this edition Anglian Water's **Chris Royce** enthuses over the benefits of collaboration and declares his "*aversion to duplicating research when there are opportunities to achieve more through collaboration*".

The 2009 UKWIR programme will provide funds for 18 new projects from the hundred proposals that members put forward.

This imbalance between the demand for research projects and UKWIR's ability to fund them has been a consistent theme throughout this decade.

This underlines the need to avoid duplication and to collaborate with other like-minded organisations.

Fund of knowledge

Chris also added that, in the case of the *Benefit and Cost* project with WERF, a relatively small contribution from each stakeholder has given access not only to a range of software and case studies but to a fund of knowledge from many utilities around the world.

This information can be freely used by UKWIR members to support their business cases, currently being prepared for OFWAT.

UKWIR shares sponsorship with many stakeholders in the UK such as Government departments and regulators. There are also European collaborations such as the *WAgriCo* project that is described on this page.

On a global scale there are international collaborations such as those with members of the Global Water Research Coalition, with whom we are currently developing a number of projects on energy and water.

Costing the benefits of odour control

Cost Benefit Analysis (CBA) is one of the pillars of the PR09 process and an UKWIR project has recently been completed to see how it can be applied to the customer sensitive issue of odour control.

At an UKWIR dissemination workshop, **Gordon Wheale**, Project Manager for *Cost Benefit Analysis of Odour Control Measures* said that "*it has been a difficult project, but the industry now had a better handle on how to make decisions on odour control investment*".

Julian Wells, from the contractor ARUP, confirmed that obtaining the cost information about odour control was relatively straightforward, but that valuing the benefits from such schemes is fraught with difficulties, and that "*the devil is in the detail*".

The research project started out by piloting two separate approaches to valuing benefits. The first of these was based on an analysis of house price movements, to assess the impact of abatement measures to remove odour problems.

Three sites were chosen and odour dispersion modelling used to identify the properties affected.

The results turned out to be inconclusive. There was some association between house prices and odour control but little consistency and it frequently contradicted anecdotal evidence and common-sense reasoning. Hence this method was not recommended as an approach for valuing benefits.

The next line of investigation was to look at '*willingness to pay*' (WTP) and '*willingness to accept*' (WTA) approaches with questions to customers as shown in table 1.

These approaches attempt to elicit the monetary value that people place on odour control measures, by asking affected customers how much they would be willing to pay towards the cost of odour problems, or alternatively, how much they would be willing to accept in compensation if the problems were not to be dealt with.

Unreliable

The results of the WTA research did not provide statistically reliable results, ruling out that approach to establishing a measure of benefit. The WTP approach yielded statistically reliable results at one site, which indicated that affected households would be willing to pay around £70 per year per household towards the cost of odour improvements that completely removed the problem. However, it is not considered that this single result is suitable for use in a benefits transfer exercise. A number of further valuations would need to be obtained and compared to assess common patterns before benefits transfer can be carried out with the confidence that results are relevant and applicable to the transfer site.

Table 1. WTP & WTA questions

WTP

"*would your household be willing to pay an additional £____ on its water bill, in order to completely remove the smell coming from the local sewage plant?*"

WTA

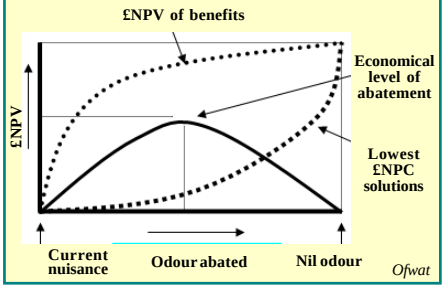
"*if the smell from the sewage treatment plant was kept at exactly the same level and frequency as last year, for the foreseeable future, would you be willing to accept a reduction of £____ in your water and sewage bills in compensation*"?

The recommendations of the project were that:

- water companies should consider undertaking individual benefit valuation surveys at sites where abatement is considered using a WTP approach
- the findings of such studies should be shared across the industry, as it is quite possible that common patterns will emerge in the results. If this happens, it may be possible in future to construct '*ready reckoners*' for valuing the benefits of odour abatement works. Such ready reckoners would allow benefits transfer exercises to be carried out, thereby removing the need for expensive site-level studies.

Client Manager, Severn Trent's **Frank Grimshaw**, summed up progress by saying "*we do not have all the answers, but know more about how to get the answers*".

Figure 2. Economic level of odour abatement



Cost benefits of knowledge transfer

In October UKWIR hosted the European Knowledge Transfer Workshop of the *Cost Benefit Valuation Tool*. In American parlance it is known as the *Benefit Cost Tool* (BCT), gaining greater political credibility by putting the word benefit first.

Under the aegis of the Global Water Research Coalition the project follows an earlier related project on *Tool for Risk Management*.

UKWIR are the lead agent on GWRC asset management research with WERF leading on the BCT project with collaboration from AwaaRF and WSAA of Australia as well as UKWIR.

Anglian Water's **Chris Royce,** UKWIR Client Manager for the project, enthused over the benefits of such a collaboration, especially given his "*aversion to duplicating research when there are opportunities to achieve more through collaboration*".

Chris then added that, for a relatively small contribution from each player, there is not only access to a range of software and case studies but to a fund of knowledge that can be applied to individual circumstances in each participating organisation.

Duncan Rose of GHD presented the background to the BCT project. He acknowledged that UKWIR's project *The role and Application of Cost-benefit Analysis* supplied the '*core logic*' in shaping the tool.

He emphasised that the project is about researching how cost benefit should be done. There is already a huge volume of work on the body of knowledge and decision making processes so the project is concentrating on "*taking this to the practitioners*".

Hands on

This was realised in the afternoon session when workshop participants worked on 'hands-on' examples of a hospital collection pipe failures and a sea outfall upgrade.

The knowledge transfer workshop gave the opportunity for **Linda Blankenship**, of EMA, to outline WERF's extensive *Strategic Asset Management* (SAM) programme that is spread over the next three years. It is funded by WERF, GWRC and AwwaRF and it encompasses the *Cost Benefit Tool* as well as the *Risk Management Tool*.

Chris Royce ended the workshop by reminding delegates that "*this research is an opportunity for companies to enhance their business plans*".

Practitioners get advice from Linda Blankenship and Duncan Rose (both standing)

Integrating drinking water planning

DOMS and DWSPs are two important water industry processes that protect human health and ensure improvements in drinking water quality are made in the most efficient manner. A third related process, CMPCF, is needed when companies consider and plan their requirements for future capital maintenance.

Each of these processes has developed by a different route.

Distribution Operation and Maintenance Strategies (DOMS) were introduced by DWI as a means of ensuring that improvements in drinking water quality following the Section 19 quality improvement programme of the last ten years are maintained.

Drinking Water Safety Plans (DWSP) , introduced by the WHO in 2004, apply the principles of risk assessment to the whole of the water supply system in order to promote and protect public health.

These principles were included in Regulations in 2007 and are a Drinking Water Inspectorate requirement from this October.

The *Capital Maintenance Planning Common Framework* (CMPCF) was developed following criticisms after the 1999 Periodic Review with the aim of achieving an improved framework for the justification of capital maintenance at future Price Reviews.

Now an UKWIR project, managed for UKWIR by **Richard Kirby** with Thames Water's **Mike Shepherd** as Client Manager, is examining the possible benefits and mechanisms for integrating these three processes.

Figure 3, below, illustrates how the three processes overlap, each process having its own definitions and calculation of risk.

The emphasis of DWSPs is more towards qualitative risk assessment from source to tap in contrast to DOMS that tends towards a more quantitative approach, covering water distribution.

Common understanding

Tynemarch's **George Heywood** described how the project set out to identify and review current practice and similarities and differences in approach to DOMS and DWSPs among small, medium and large companies.

It also set out to achieve a common understanding between companies and regulators on how common elements of DOMS and DWSPs may be integrated and used by companies in their normal business and, where appropriate, for PR09.

MWH's **Lisa Barrett** related how six water companies were selected to give a cross section of size and approaches and the results of interviews carried out with representatives from asset, distribution and quality teams in each.

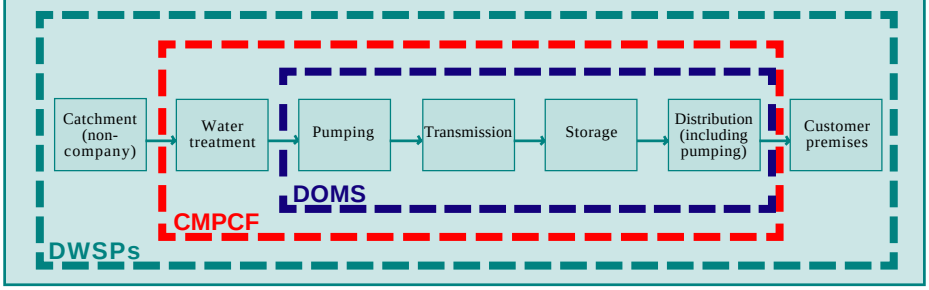
In the event two companies were nearing full integration, one was '*half way*', one '*work in progress*' and two not considering integration.

In general the benefits of integration were seen as:

- improved efficiency and co-ordination of business practices
- improved communication between company departments
- greater consistency in the approach to risk assessment within water companies
- identification of gaps in data or knowledge.

The final project report (08/DW/02/52) puts forward recommendations for individual companies to consider as potential steps towards integration.

Figure 3. Physical scope of DOMS, DWSP and CMPCF



A drinking water future

Following the initial stakeholder workshop in Sutton Coldfield (summarised in the previous UKWIR NEWS) the second workshop of the *Water Supply for the 21st Century* project was held in London in October.

The project is assessing the pressures on the water distribution system over the next seventy years and the potential responses.

The contractor, Mouchel, with support from Imperial College, have set out a '*project concept model*' as shown in figure 4, to help provide a more scientific framework to what **Martin Hall** referred to as '*bringing science into an artistic view of the future*'.

They had carried out further interviews with a number of organisations including Defra, the Environment Agency and BRE that had given a different perspective to the earlier interviews with water companies.

Brendan McAndrew then explained how identifying the '*pressures*' presented the challenge of balancing narratives with quantitative information and that they had decided on a '*hybrid*' solution.

The workshop gathered experts from a wide range of stakeholders with an interest in the future of the water distribution system.

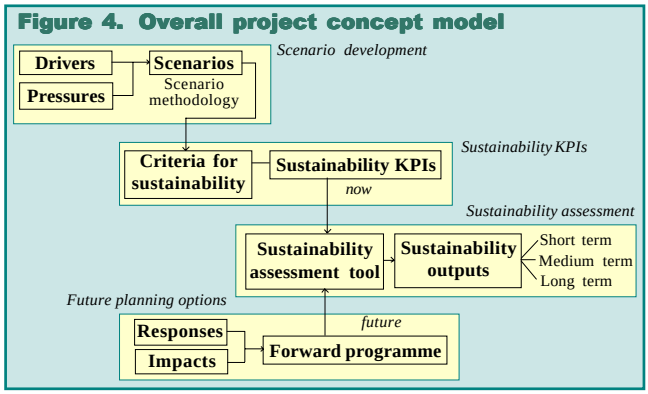
Through a series of structured tasks delegates concentrated on confirming the '*drivers*', identified primarily as climate change, energy (and other commodities) and economic, social and demographic change.

Delegates then assessed the relative importance of a set of twenty sustainable key performance indicators (KPIs) that can be used to test the sustainability of the possible responses to future planning options.

A project website, **www21stcenturywater supply.com** has now been established and UKWIR Client Manager, Thames Water's **Mike Shepherd**, reminded the audience that it is open to all interested parties to contribute their knowledge and expertise.

Project Manager, **Jo Parker** confirmed that the final report, due next Spring, will not only provide future planning options, it will also help in shaping future R&D.

Figure 4. Overall project concept model



Guidance on water use restrictions

The 2004-06 drought affected 13 million people in south east England. Following this Defra reviewed the existing legislation on restricting water supplies plus customer and media concerns over water company inconsistencies, the outcome of public hearings on drought orders and documents such as the public UKWIR *Drought and Demand* project series of outputs.

As a result DEFRA recognised improvements could be made in several areas but proposed that any legislative changes should be made in conjunction with an industry led '*code of practice*' for water use restrictions.

Such a partnership would facilitate more flexibility, moving away from the current system of hosepipe bans followed by bans on non-essential use to a system incorporating '*discretionary*' restrictions.

UKWIR agreed to undertake preparation of a code of practice on behalf of the industry. Recognising the complexity of the task Client Manager Wessex Water's **Luke de Vial** explained at an UKWIR workshop that it had been decided that the project, carried out by Atkins, would combine a code of practice with a guidance document.

Dialogue

Throughout the project contacts were made with trade associations representing water using businesses. Atkins' **Ben Piper** reported that such contacts were most beneficial in opening up a dialogue.

This allows feedback on such items as the calculation of water savings during water restrictions as well as raising the idea of trade associations producing guidance to their own members.

Information, such as the fact that when turf is newly laid it needs water for the first 28 days, but after that watering is much less crucial, can be relevant in considering priorities when managing a drought.

The results of the *Code of Practice and Guidance on Water Use Restrictions* project will feed into and also be affected by the anticipated updates to the *Drought Direction 1991* and forthcoming changes to the *Floods and Water Bill*.

There will also be the need to set out what is proposed in the next round of water company *Drought Plans*.

UKWIR Project Manager, **Nick Humphrey**, summed this up by saying '*this is a stepping stone in a long-term process*'.

This edition features UKWIR publications issued since the last newsletter.

CLIMATE CHANGE

08/CL/01/7	Climate Change - A Programme of Research for the UK Water Industry Volume 1 - Summary Report *(1 84057 513 1)*	£100
08/CL/01/8	Volume II - Technical Report *(1 84057 514 X)* [sold with above]	

DRINKING WATER QUALITY & HEALTH

08/DW/02/51	Real Time On-line Monitoring of Contaminants in Water - Developing a Research Strategy from Utility Experience and needs *(1 84057 511 5)*	£200
08/DW/02/52	Integrating DOMS & Drinking Water Safety Plans *(1 84057 515 8)*	£250
08/DW/06/21	International Collaborative Cell Culture & UV Studies *(1 84057 504 2)*	£100

REGULATION

08/RG/05/23	Capital Maintenance Planning: Asset Deterioration Database (WIDER) Volume I: Project Report *(1 84057 505 0)*	£300
08/RG/05/24	Capital Maintenance Planning: Asset Deterioration Database (WIDER) Volume II: Protocol for the Collection and Submission of Data for Water Treatment Works and Sewage Treatment Works *(1 84057 506 9)* [sold with above]	
08/RG/05/25	Tool for Risk Management of Water Utility Assets *(1 84057 502 6)*	£250
08/RG/07/16	Consequences of Controls on Organic Chemicals in Sludge *(1 84057 508 5)*	£250

WATER MAINS & SEWERS

08/WM/08/38	Leakage in Trunk Mains and Service Reservoirs *(1 84057 512 3)*	£100
08/WM/12/23	National Underground Assets Group: Defining the Technological Capability Necessary for Sharing and Displaying Asset Information - User Requirements *(1 84057 507 7)*	£25
08/WM/18/5	Tools for the DOMS Forward-Looking Approach *(1 84057 509 3)*	£500

WASTEWATER TREATMENT & SEWERAGE

07/WW/17/7	Dangerous Substances & Priority Hazardous Substances/Priority Substances under the Water Framework Directive *(1 84057 464 X)*	£500
07/WW/17/8	Basis for a Programme of (Chemical) Investigations to be Carried out by the Water Industry During the AMP5 Period *(1 84057 510 7)*[sold with above]	
08/WW/20/3	Water Framework Directive: Sustainable Treatment Solutions for Achieving Good Ecological Status *(1 84057 501 8)*	£250
08/WW/23/6	Methodologies for Catchment Based Consents *(1 84057 516 6)*	£200

UKWIR research reports are available for purchase via the internet on www.ukwir.org

SAM seminar

19 May 2009 is the date of the SAM (System-based Analysis and Management of Urban Flood Risks) dissemination seminar at the Church House Conference Centre in Westminster.

This three year project is promoted by BERR with HR Wallingford as lead researcher and supported by a number of research and industrial partners, including UKWIR. SAM aims to develop a new procedure and the tools needed for carrying out risk-based performance assessments of drainage systems. Attendance is free so please book the date in your dairy.

Call for papers

The *Tenth International Conference on Computing and Control for the Water Industry* (CCWI 2009) is being held between 1 and 3 September 2009 at the University of Sheffield.

Submission of abstracts must be by 16 January 2009 with final papers completed by 1 May.

In the past UKWIR projects and collaborations have featured strongly in this event and next year should be no exception. **Visit www.shef.ac.uk/ccwi for details.**

Chris Royce has been UKWIR Client Manager for asset management related projects since 2005, including the Cost Benefit Valuation Tool described on page 2.

Chris is also chairman of Water UK's Capital Maintenance Network that has a regular dialogue between water companies, consultants and Ofwat.

Chris is currently Head of Asset Management Strategy at Anglian Water.

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