

# River Mease SAC Water Quality (Phosphate) Management Plan

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<b>Approved By:</b>			
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Signature:		Signature:	
Date:	1 August 2011	Date:	13 July 2011

## Revision History

Revised version number	Description of Change	Author	Approved by		Date Approved
			Env Agency	Natural England	

## **1.0 INTRODUCTION**

The Environment Agency complies with the EU Birds and Habitats Directives (Council Directives 79/409/EEC on the conservation of wild birds updated in 2009 by Council Directive 2009/147/EC, and 92/43/EEC on the conservation of natural habitats and of wild flora and fauna) in planning and carrying out all of our regulatory and operational activities. As required by our obligations as a competent and relevant authority, we apply the Conservation of Habitats and Species Regulations 2010 (SI No. 2010/490) when considering all applications for authorisations, permissions, permits, consents and environmental licences (referred to as permissions). These 'Habitats Regulations' implement the requirements of EC directives in the UK. We also meet these obligations when carrying out our own projects and apply the general duty in Regulation 9 to all our relevant policy and operational activities.

The aim of the Habitats Directive is to contribute towards ensuring biodiversity through the conservation of natural habitats and of wild fauna and flora. It states that measures taken pursuant to the Directive shall be designed to maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora. Among the measures prescribed by the Directive are the designation, management and protection of a network of sites, known as Natura 2000 and comprising Special Areas of Conservation (SAC's) and Special Protection Areas (SPA's) . It is envisaged that Natura 2000 will enable the natural habitats and species for which the sites are designated to be maintained at or where appropriate restored to, favourable conservation status.

Natural England and the Countryside Council for Wales have overall responsibility for Natura 2000 sites. Those sites, save for some marine areas, are also notified as Sites of Special Scientific Interest (SSSI's) under the Wildlife and Countryside Act 1981, as amended. The condition of SSSIs, including those that coincide with Natura 2000 sites is assessed in view of the conservation objectives for that site and against the various attributes set out in the favourable condition tables that accompany those objectives, in order to make a judgement on whether the component SSSIs are in favourable condition.

The assessment and decision making process provided for by the Habitats Regulations apply to all "plans and projects" that are undertaken, permitted or authorised by a competent authority, including any licensed or approved activity or statutory plan. Some activities are therefore covered by an environmental permit – e.g. the discharge of sewage effluent and must be subject to that assessment and decision-making process, whilst others, e.g. agricultural practices or urban run-off, may not be as there is no competent authority permitting or undertaking them.

The Habitats Regulations (Regulation 63), requires competent authorities to review all decisions to grant consents and permits and to act to remove adverse impacts or the risk of adverse impacts on Natura 2000 sites. The Environment Agency's review of consents for the River Mease SAC was completed in April 2009.

The Review of Consents (RoC) made it clear that excessive levels of phosphate were preventing the achievement of favourable condition in the R Mease SAC and concluded that the SAC would not be able to achieve favourable condition, by making changes to the abstraction licences and discharge consents alone.

The decision to produce this plan was made using regulation 64(3) (previously regulation 51(3)) of the Habitats Regulations. This is the regulation which allows a competent authority to conclude no adverse effect for a permission, if action to be taken by them or another competent authority would remove the adverse effect from that permission.

A number of further actions were required for the Agency to comply with its obligation under the Habitats Regulations, which included the production of a Water Quality (Phosphate) Management Plan. Together with other short, medium and long term actions, this will continue to work towards the R Mease SAC meeting its targets and ensuring the Review of Consents is Habitats Regulations compliant.

This plan draws together all existing knowledge and work being carried out within the catchment, along with new actions and innovations that will work towards the long term goal of the achievement of the Conservation Objectives for the River Mease SAC and bringing the SAC back into favourable condition.

This plan is not expected to be a fixed report, rather it is anticipated to be a working document, regularly updated and amended as progression is made / changes occur within the catchment and will be a partnership document between the main parties concerned; the Environment Agency, Natural England, Local Planning Authorities and Severn Trent Water Ltd.

A formal governance structure for this plan is described in more detail in the Actions Tables section (Section 5.0). Ongoing governance of the plan will allow us to be flexible and re-prioritise the plan in the light of ongoing investigations. It will also enable measurement and tracking of delivery of the actions and environmental improvements within the SAC.

## **1.1 Purpose and Coverage of Plan**

The primary purpose of this Water Quality Management Plan (WQMP) is to reduce the levels of phosphate within the River Mease SAC, to enable the Conservation Objectives for the SAC to be met, and an adverse effect upon the SAC avoided. The primary objective of this plan is that the combined

**MWQ(P)MP FINAL DOCUMENT**

V1.0 27th June 2011

actions will result in a reduction in phosphate in the River Mease to no more than 0.06mg/l, and this will be achieved by 2027 (expected to be derogated from 2015).

The 0.06 mg/l targets will be reviewed. UKTAG is also reviewing nutrient standards, across all regulatory drivers, from March 2011. Proposed new standards will be approved in October 2011, with stakeholder review during January to March 2012. The review will include consideration of JNCC Common Standards for Natura 2000 sites and the Environment Agency and Natural England will be working together to agree a common evidence base and a common decision-making framework for target setting. **New standards resulting from the UKTAG work will be agreed in May 2012.**

The improvements are required through a number of related drivers:

- Article 6(1) of the Habitats Directive
- The Protected Area provisions of the Water Framework Directive (WFD) relating to Water-dependent Natura 2000 sites (see Annex D of the SW River Basin District Management Plan)
- The need to produce and implement a Site Action Plan to conclude the EA's Review of Consents Project under what was then Regulation 50 of the Habitats Regulations

The WQMP incorporates and builds on the Diffuse Water Pollution Plan (DWPP) produced by Natural England and the Environment Agency in December 2010. This plan differs from the DWPP in that it is focused specifically on phosphate, and includes consideration of consented (and unconsented) point sources. It is also intended to provide additional confidence that the necessary actions and investigations required to ensure long term compliance with the Conservation Objectives are secured. This is important if short term increases in phosphate levels in the SAC, caused by plans and projects (for example those associated with housing growth), are to be accommodated within a general downward trend in phosphate concentrations, and to achieve compliance with the requirements of Regulation 61 of the Habitats Regulations 2010.

Implementation of the plan will also help attain Good Ecological Status/Good Ecological Potential on the relevant WFD Water Bodies as well as reduce levels discharging to waterbodies downstream, and will also help restore Favourable Condition on the relevant SSSI units.

Further information on the interest features of the R Mease SAC and its Conservation Objectives are provided in the DWPP (see Appendix 1 to this plan).

## 1.2 Plan contacts

Although this may be subject to change, the current relevant contacts for this plan are listed below.

### Natural England

SSSI Responsible Officer – Sadie Hobson  
HLS Contact – David Jackson  
Planning and Conservation Officer – Rachel Hoskin  
Regional freshwater & pollution specialist – Ian Butterfield  
National lead on Nutrient Management Plans for European Sites – Rob Cooke

### Environment Agency

Senior Environmental Planning Officer (WQ) – Bev Allen  
Technical Specialists – Chris Grzesiok / Dave Ottewell  
Technical Officer (Conservation) – Chris Farmer/Kathryn Edwards/Gill Walters  
Local Environment Officer – Joe Adams  
Team Leader, Planning Liaison – Penny Thorpe

## 2.0 THE RIVER MEASE

The River Mease is designated as a Special Area of Conservation (SAC) under the Habitats Regulations.

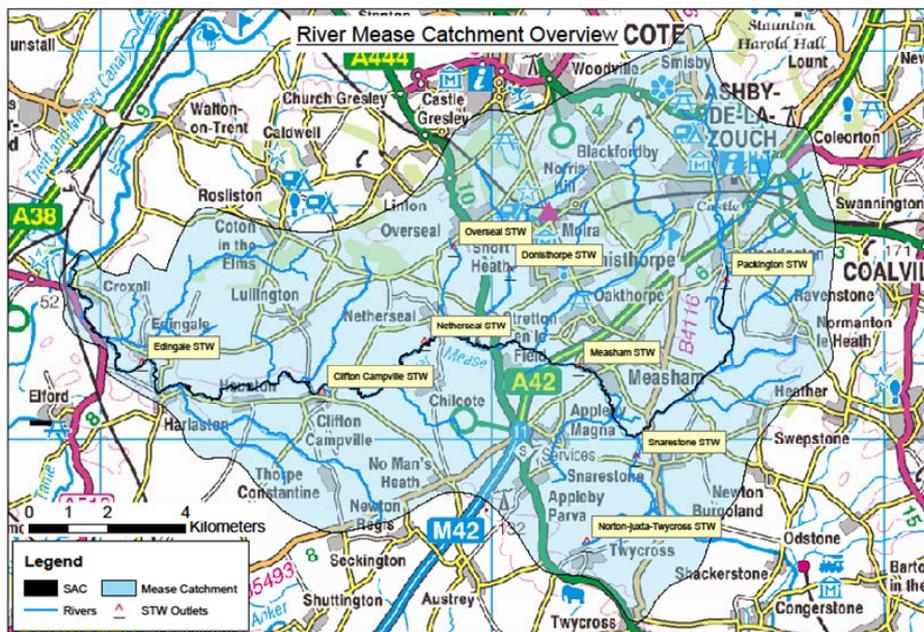
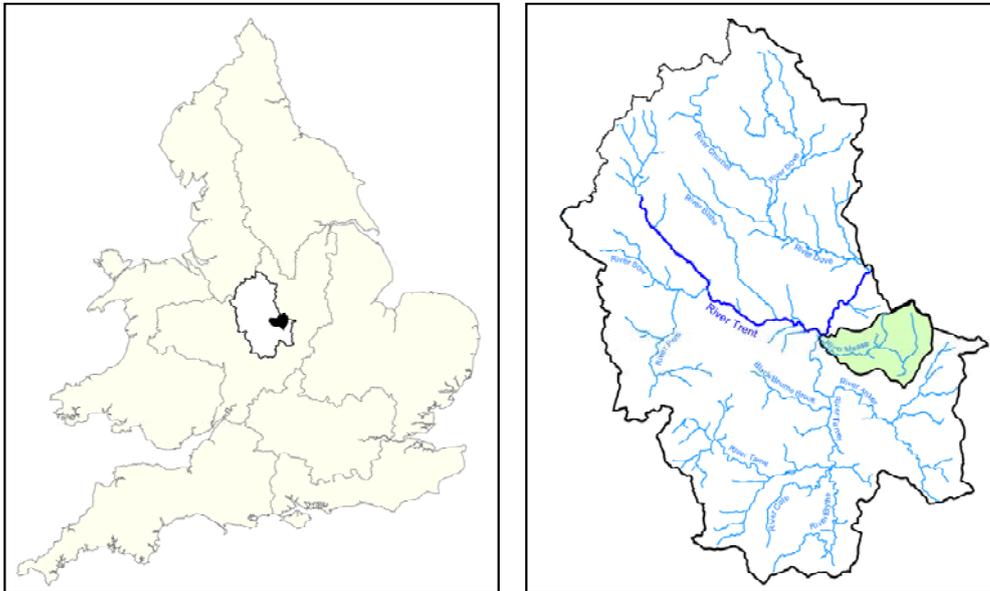
The River Mease rises in north-west Leicestershire and flows westwards for approximately 25 kilometres across a largely rural and agricultural landscape to its confluence with the River Trent at Croxall. It represents a relatively unmodified lowland clay river and contains a diverse range of physical in-channel features, including riffles, pools, slacks, vegetated channel margins and bankside tree cover which provide the conditions necessary to sustain nationally significant fish populations of spined loach *Cobitis taenia* and bullhead *Cottus gobio*. Included in the designation are the lower reaches of the Gilwiskaw Brook which are steep and fast flowing, Following formal adoption by the European Commission, the River Mease was designated by DEFRA as full Special Area of Conservation (SAC) on 1 April 2005.

The SAC incorporates the Gilwiskaw Brook downstream of Packington village and the River Mease from its confluence with the Gilwiskaw Brook to its confluence with the River Trent.

The reason for the designation of the River Mease as a SAC was the presence of Habitats Directive Annex II species Spined loach *Cobitis taenia* and Bullhead *Cottus gobio*. Habitats Directive Annex II species White-clawed crayfish *Austropotamobius pallipes* and Otter *Lutra Lutra* are also

present as qualifying features but not a primary reason for site selection. Water courses of plain to montane levels with the *Ranunculus fluitantis* and *Callitriche-Batrachion* vegetation and Annex I habitat is also present as a qualifying feature.

## 2.1 Location Plans of the R Mease SAC



## 2.2 Current Pressures on the R Mease SAC

The pressures on the River Mease are significant, and in order to have certainty that the SAC will be restored to Favourable Condition, pressures need to be clearly identified and actions put in place to ensure they do not

prevent the SAC from achieving the targets set out in the Conservation Objectives. This is the overall aim of this plan – to work towards attaining the phosphate Conservation Objective through actions in addition to those actions delivered by the Review of Consents. The three main current pressures on the SAC are:-

- Development and Housing

The need to consider what level of growth within the catchment is acceptable with the requirement to meet and maintain the Conservation Objectives for the SAC;

- Wastewater Capacity / Quality

The capacity and quality of effluent from the sewage treatment works throughout the catchment (often known as point sources), will need to be improved and consistently maintained in order to both allow growth within the catchment and achieve the Conservation Objectives and enable an appropriate level of growth;

- Diffuse Sources

The quality of diffuse sources, for example urban (highway and sewer discharges) and agricultural/land run-off will need to be identified and improved alongside improvements to point sources in order to allow the SAC to achieve Favourable Condition.

These will be discussed in more detail further on in this plan.

### 3.0 CURRENT STATUS OF THE RIVER MEASE SAC

A number of surveys and assessments have been carried out by both Natural England and the Environment Agency. Excerpts which relate to the current condition and status of the SAC can be seen below:

A SSSI condition assessment is carried out by Natural England on a 6 year cycle (although remedies are updated as and when required). The latest condition assessment was reported in January 2010.

*“Condition Monitoring of Canal, River and Open Water SSSIs in the East Midlands Area. **Common Standards Monitoring Condition. Assessment of River Mease SSSI. Technical Report. January 2010**”*

A summary of the main points from the report are below:

- Water quality is generally good with possible indications of improvement, (although it can't be ascertained as to whether the improvements are sustainable), however, there remains a need to address excessive phosphate concentrations present throughout the river,

- The GQA biological module is currently unfavourable due to the result for Management Unit 2,
- Macrophyte diversity and abundance are also currently below what would be expected for the river type, possibly due to historic over-deepening. The river bank and riparian zone targets are also generally unfavourable. These are likely to be related to the level of tree cover and historic over-deepening of the channel affecting the species abundance and diversity,
- It is considered that improvements in sewage treatment works effluent and work to address the challenging issue of diffuse sources (agriculture and urban run-off etc) will need to be achieved to see any further significant improvement,
- The River Mease is currently assessed as being in unfavourable condition, however, given that the SSSI was designated as recently as 2000 and given that the problems present seem to be gradually improving (in terms of water quality) or a result of historic actions (over-deepening of the channel), a verdict of unfavourable (no change) could be justified.

More details can be seen in the Appendix 2 - summary of the results of the Condition Assessment – Condition Status of River Mease SAC.

### **3.1 Natural England Fish Survey (February 2010)**

Natural England undertook a fish survey, reported in February 2010.

*'Natural England RIVER MEASE SSSI AND SAC FISH SURVEY Final Report February 2010'*

Both species of fish (Spined loach and Bullhead) fail in at least two of the units in terms of population size and in all units in terms of population structure although this may be partly due to the efficiency of capture. In terms of crayfish the site seems to be without them with the only sign found in an otter spraint.

There is no sign of signal crayfish or of plague so the contractors are postulating that a recent pollution event may have either finished them off or reduced the population to undetectable levels.

Further details can be seen in Appendix 3 - Extracts from the Natural England Fish Survey Report

WB ID	Stretch	Current Overall Ecological Status (2009 baseline)	Individual Element	Current Status in RBMP (2009 baseline)
GB104028046590	Gilwiskaw Bk from Source to R Mease	POOR	Fish	POOR
			Invertebrates	MODERATE
			Phosphate	MODERATE
GB104028046570	R Mease from Gilwiskaw Bk to Hooborough Bk	MODERATE	Fish	HIGH
			Invertebrates	GOOD
			Phosphate	BAD
GB104028046560	R Mease from Hooborough Bk to R Trent	MODERATE	Fish	HIGH
			Invertebrates	MODERATE
			Phosphate	POOR

### 3.2 Environment Agency Assessment of WFD Status

A summary of the overall status and individual element status can be seen in the table above for the three waterbodies that comprise the River Mease SAC.

High orthophosphate concentrations are unlikely to have a direct effect on spined loach or bullhead. The populations of native crayfish have not been determined, but if water quality generally is good, high orthophosphate concentrations should not present a direct problem. The main effect of high orthophosphate would be likely to be seen on Ranunculus stands. Ranunculus would be liable to decrease as algal cover increased.

In terms of the status of Bullhead and Spined loach, they are both at HIGH status in GB104028046570 (River Mease from Gilwiskaw Brook to Hooborough Brook) and GB104028046560 (River Mease from Hooborough Brook to the River Trent). However, in GB104028046590 (Gilwiskaw Brook from source to River Mease) at one site Bullhead is at HIGH status and another site is classified as being at BAD status. Spined loach are missing from both sites and the reasons for this still need to be understood.

Extracts from Water Body Reports for GB104028046570 and GB104028046590 can be found in the appendix 4. These reports are currently being written for each waterbody in the Midlands, Central area. A fuller explanation of the data analysis carried out for WFD fish classification can also be found in the appendix 5 - River Mease Fish FCS2 Data Analysis.

### **3.3 Interpretation of Natural England assessment and Environment Agency assessment (Fish Surveys)**

The methodologies used for fish surveys are not easily comparable. The Joint Nature Conservation Committee (JNCC) methods have been used to actively target minor species, whereas the Environment Agency will have recorded log abundance at best and at worst presence/absence only. There is a major difference in actively searching for minor species and carrying out a full fisheries based survey. Historically, even when log abundance data was available for minor species, it should not be relied upon as the survey would have been biased towards species of greater angling interest.

Environment Agency historic data shows only two records of native crayfish in the R Mease from 1996, one of which was taken from drainage works and not from a biological survey. Information from Natural England survey results for native crayfish populations prior to designation may give a good indication on the historic status of the crayfish in the R Mease and help determine whether a decline in crayfish populations has taken place.

The R Mease has areas of poor and good fish populations. If we are to achieve Good Ecological Status in line with the River Basin Plans and Favourable Condition for the SAC, work needs to be carried out on the catchment as a whole. This includes improved water quality, habitat restoration and better catchment / land management for all of the water bodies associated with the river.

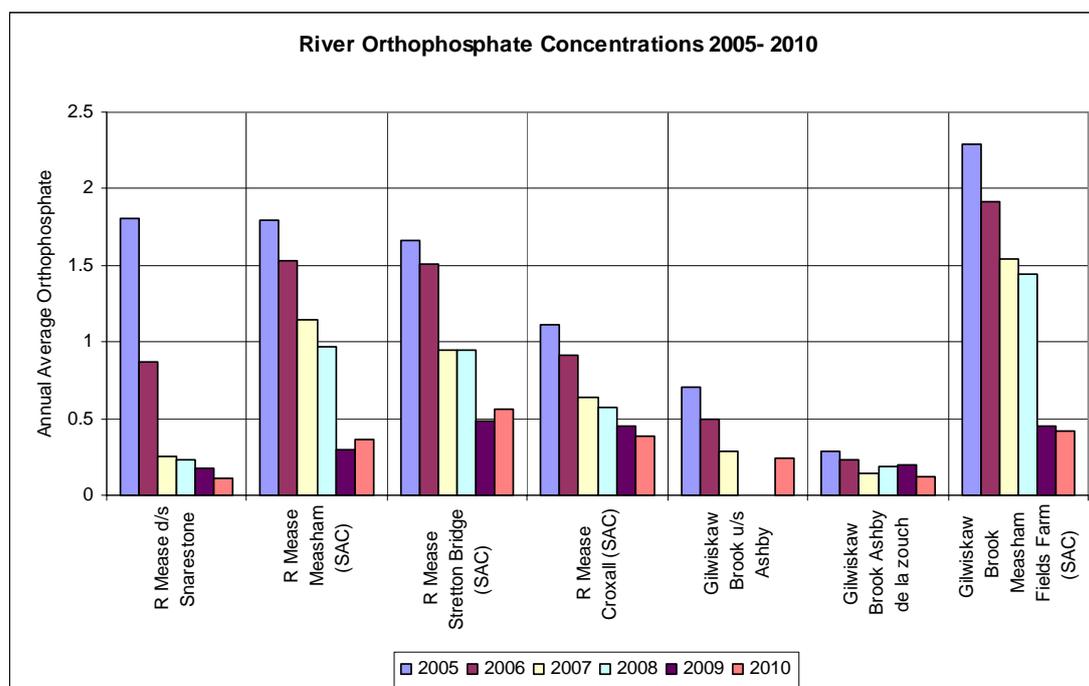
Overall, the findings of the surveys are likely to differ due to highly patchy distribution of fish, their motile nature, seasonality, habitat preference and sensitivity to poor water quality. The two survey sets both indicate areas of concern on the R Mease for fish stocks and areas which appear to reflect more sustainable populations.

### **3.4 Chemical (Phosphate) Status**

The phosphate targets in the Conservation Objectives for the SAC are expressed as annual average concentrations of total reactive phosphorus and throughout the River Mease SAC, this target has been set at 0.06mg/l.

This threshold is based on a family of phosphate targets for different river typologies, developed by Natural England National Specialists, and endorsed by the Joint Nature Conservation Committee. The underpinning science base from which these targets were derived was recently reviewed by Mainstone (2011). Where these values are exceeded, based on annual averages, the underpinning SSSI units are in Unfavourable Condition, in accordance with Natural England's Common Standards Monitoring, and the integrity of the SAC is at risk.

The annual average of sampling results from 2005 – 2010 at sample points throughout the Mease catchment can be seen in the graph below. Although the Conservation Objective still fails throughout the SAC, it can be seen that there has been a significant reduction in levels of phosphate at all sample points in the Mease catchment, including those within the SAC (marked with 'SAC').



Whilst the Conservation Objective for phosphate is still exceeded throughout the SAC, the levels entering the Mease have started to decline over the past 5 years, primarily as a result of AMP4 funded phosphate-stripping of sewage treatment works (STWs).

#### 4.0 CURRENT MAJOR PRESSURES AFFECTING THE RIVER MEASE SAC

##### 4.1 Development and Housing

Foul effluent from the existing built environment has been identified as a major source of phosphate into the River Mease SAC. The appropriate management of foul effluent from both existing and new built development is a key mechanism which will deliver water quality improvements to the River Mease.

The Mease SAC flows through the following Local Planning Authority boundaries;

- Leicestershire County Council
  - North West Leicestershire District Council
- Derbyshire County Council
  - South Derbyshire District Council

MWQ(P)MP FINAL DOCUMENT

V1.0 27th June 2011

- Staffordshire County Council
  - Lichfield District Council

Through South Derbyshire District Council and Lichfield District Council areas the Mease SAC flows through a rural landscape of established farms and small settlements. In Lichfield DC there is currently little developer interest and South Derbyshire District Council receives a number of proposals for small development sites. Within North West Leicestershire District Council (NWLDC) however there is considerable developer interest for residential, retail and industrial schemes especially around the towns of Ashby-de-la-Zouch and Measham.

It is the role of the primary competent authority under the Habitats Regulations to carry out an appropriate assessment of plans, projects and permissions to demonstrate no adverse effect on site integrity. For the purposes of the Town and Country Planning process the primary competent authority is the Local Planning Authority.

North West Leicestershire District Council (NWLDC) are currently working on their programme for the development of their Core Strategy which will identify the level of development expected to take place in the District between 2008 and 2026 whilst fulfilling their obligations under the Habitats Regulations. As part of the evidence base for the Core Strategy NWLDC have completed an outline Water Cycle Study and have recently commissioned a Detailed Water Cycle Study for completion by July 2011.

Ordinarily, the preferred disposal route for foul effluent from any development is via a public sewer (where one exists) and treated at a public sewage treatment works (STW). However advice recently received by NWLDC (Tyldesley, 2010) suggests that there should be no increase in the wastewater entering the public sewer as this would increase the level of phosphate entering the Mease SAC from the STWs. Since the current level of phosphate in the Mease SAC is considerably higher than the Conservation Objective, there is no environmental capacity within the river to accept additional phosphate without other actions for phosphate management being in place.

The Environment Agency is working closely with Severn Trent Water Limited to identify and secure a number of medium to long term solutions to effluent management. As such solutions are likely to require significant funding the availability of public funding and/or developer contributions is being discussed with Severn Trent Water and the LPAs.

In partnership with STW Ltd the occurrence of sewer mis-connections and unconsented discharges will be investigated. Where issues arise, work will be carried out with property owners, landowners and business' to remedy the failure.

In addition the EA will review all pollution incidents in the Mease SAC, undertake targeted investigations and work with STW Ltd, landowners and other sewage treatment operators to find ways of minimising the potential for such incidents to occur in the future.

**MWQ(P)MP FINAL DOCUMENT**

V1.0 27th June 2011

Where existing private treatment plants are in operation they will be reviewed to see if they are contributing phosphate above the conservation target into the Mease SAC. Work will be carried out with the operators to see if treatment can be improved or if connection to a public sewer has become available.

In addition to publicly funded solutions there is the potential for developer led solutions to come forward. The Environment Agency, Natural England and the LPAs are working together to assess these solutions to ensure that they help to deliver the continuous improvement in phosphate levels in the River Mease SAC. As all solutions can pose some environmental risk, this risk needs to be assessed for both individual and cumulative impacts with a key consideration about how the solutions will be owned, maintained and perform over time. Where solutions include discharge to the environment they may also require an Environmental Permit from the Environment Agency.

The action plan identifies the need for developer contributions for new developments connecting to the mains sewer, to ensure that their proportionate effect upon the SAC is offset by funding for projects to improve water quality. The scheme will need to be developed to provide funding for projects over and above the suite of specific improvement actions within the actions tables, and contributions will need to be relevant to the relative phosphate impact on the SAC being made by each new development. Developer contributions schemes to contribute to the mitigation for development impact upon European wildlife sites, and assist with the restoration of deteriorated sites is now an established principle, and has been most successfully implemented for the Thames Basin Heaths SPA, for example.

Further information regarding growth and development, including potential options and flow scenarios can be found in Appendix 6 to this plan.

## 4.2 Wastewater Capacity / Quality

This pressure is tied in with the effluent arising from the existing and new built environment in the catchment. The main mechanism to achieve improvements for water company point source discharges is via the Natural Environment Programme (NEP), which forms part of the Asset Management Plan (AMP). This plan runs in 5-yearly cycles with the current plan (AMP5) running from 2010 – 2015.

Phosphate removal has already been installed at the following STWs in AMP4;

<b>STW</b>	<b>Phosphorus Limit on Consent</b>	<b>Date of Completion</b>
Snarestone	1mg/l	31/03/07
Norton juxta	2mg/l	31/03/07
Twycross		

Donisthorpe                      1mg/l                                      31/03/07

and is due to be installed at the following STWs in AMP5;

<b>STW</b>	<b>Phosphorus Limit on Consent</b>	<b>Delivery Date</b>
Overseal	1mg/l	31/03/2013
Netherseal	2mg/l	31/03/2013
Measham	1mg/l	31/03/2012
Clifton Campville	2mg/l	31/03/2013
Packington	1mg/l	31/03/2012
Edingale	2mg/l	31/03/2013

A series of graphs can be seen in Appendix 7 which show the concentrations in the Mease upstream and downstream of STWs where phosphate-stripping has been installed.

STWs make a significant contribution to P within the catchment. P removal at STWs has been demonstrated to be the most effective mechanism to date in reducing phosphates in the River Mease SAC. Further reductions could be secured by reducing the contribution by either treating to a higher standard or by taking wastewater/treated effluent out of the catchment.

The AMP is reviewed every five years through the periodic review process. The next Periodic Review is in 2014 (PR14) and will drive water industry investment between 2015 and 2020 (AMP6).

The Environment Agency has to make a case to secure water industry funding for its proposals. To be confident of securing additional schemes in the AMP6 period, we need to present a strong case, based on robust evidence and to gain the support of groups such as OFWAT and Consumer Council for Water (CCWater).

Future tightening of phosphate limits will only be achieved by gaining a greater understanding of the process technologies for phosphates removal and effects of reduced phosphates on the environment. The Environment Agency and Natural England will gather a significant evidence base to support further phosphate reduction schemes and will have to make a robust business case to secure investment in future periodic reviews. Within this section, we identify actions that will be required to support this case to PR14.

In the last AMP period (AMP4) water companies were allowed £3.5 billion as part of the NEP to improve sewage treatment works and storm overflow discharges to the water environment. In the latest AMP period (AMP5) £4.4 billion will be invested as part of the NEP and there are 1861 schemes to improve, monitor or investigate water company assets. 121 of these schemes are to specifically improve water quality relating to SSSIs, habitat sites and biodiversity.

When planning our programme of water industry improvement schemes to go into the NEP, we want to ensure that we get the best value for the environment and make the best use of resources. We will target our efforts on areas where we have strong supporting evidence that we need to improve water industry discharges to correct a failure of water quality. One of our top priorities for improvement schemes in the PR09 NEP were schemes that secured compliance with the Habitats Directive (HD).

The Environment Agency ensures that the five year National Environment Programme is implemented by water companies. We report annually to Ofwat on the environmental performance of the water industry and Ofwat uses our assessments to decide if they should impose financial penalties on the companies.

The Agency will advise the Govt and Ofwat on the programme of schemes it requires Companies to deliver to meet agreed and required environmental targets. The Agency, as in PR09, did work on assessment of disproportionate costs for WFD schemes to inform and advise the Govt on this issue. The Govt then decides on the scope and scale of the final programme based on the environmental needs as identified by the Agency, the costs of the programme to deliver those needs as identified by Ofwat and what it considers is affordable for the country.

In the time leading upto a periodic review, the Agency will assess its priorities and gather evidence to support these priorities. Experience of previous periodic reviews has demonstrated that Habitats Directive schemes have gained strong support for inclusion in the AMP NEP. However in proposing further future tightening of P limits on the nine STWs in the catchment to work towards the conservation objective target, we would expect to provide evidence of the degree to which previous investment has delivered the required outcome and to demonstrate the magnitude of any shortfall between the then current and target phosphate concentrations to identify the required further tightening of P limits through AMP.

Further information regarding wastewater capacity and quality can be found in Appendix 8 to this plan

### **4.3 Diffuse Sources**

These sources arise from discharges to the catchment which are usually more difficult to identify and deal with, for example, road run-off, drainage from fields and farmland, unsuitable small septic tank or package treatment plants, misconnections from developments, pollution incidents etc.

Although the source apportionment work carried out to date has determined what is coming from point sources (sewage treatment works etc) and what from diffuse sources, it is currently impossible with present models to further break down the sources of diffuse pollution into their constituent parts, particularly agricultural and non-agricultural.

Instead, the best way to identify diffuse sources coming into a river is often through a catchment walkover and following up any issues identified.

There are also a number of initiatives which can be used to minimise the impact of diffuse sources of pollution (for example Catchment Sensitive Farming, Water Protection Zones, liaison with and influencing road and rail management companies and Nitrate Vulnerable Zones etc).

Under the Water Framework Directive, the River Mease SAC falls within 3 separate waterbodies:-

GB104028046590 – Gilwiskaw Brook from source to River Mease

GB104028046570 – River Mease from Gilwiskaw Brook to Hooborough Brook

GB104028046560 – River Mease from Hooborough Brook to River Trent

There are a number of generic actions which occur across England and Wales which are detailed in the Humber River Basin Management Plan, and more specific actions relating to the individual waterbody. All of these actions and investigations together will work towards meeting Good Ecological Status by 2027. Many of these actions relate to identifying and addressing diffuse sources of pollution throughout the catchment.

Further information with regard to the Water Framework Directive can be found on the Environment Agency's website at [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk). The Diffuse Water Pollution Plan can be found in Appendix 1 of this plan.

The purpose of this plan, is to develop actions with particular regard to diffuse sources of phosphate to the River Mease SAC, for example - actions to identify and investigate sources and actions to prevent sources occurring.

## **5.0 ACTIONS TABLES**

The following tables form a list of actions and investigations relating to all types of sources, some secured and others not, which when carried out, will help reduce the levels of phosphate throughout the catchment and the River Mease SAC.

A programme board will be set up to include key partners to co-ordinate, review and implement the Plan. These will include the Environment Agency, Natural England, Severn Trent Water Ltd and North West Leicestershire District Council. There will also be other partners as the plan proceeds.

A six monthly update of the plan will be produced and will include progress against existing actions, to include new actions and review existing and new information. A meeting of the programme board will also take place at this time, to review the plan and move existing and new actions forward.

Quarterly technical meetings will also take place to support and inform the Programme Board.

Draft Terms of Reference of Project Board – to be agreed by members at the initial meeting:

1. The objective of the programme board is to secure actions to achieve the conservation target within the agreed timescales. The actions shall not affect the integrity of the SAC.
2. Board Members will be responsible and accountable for delivery of identified actions for their respective organisations and for committing the appropriate resources.
3. The Board will review performance and delivery of actions within the plan and take timely corrective action where necessary.
4. The Board will rely on input from the technical group to help inform their decisions and will direct the technical group where additional / different actions are required
5. The Board will agree the frequency of the technical Group meetings
6. Board members will commit to final sign off of the plan by the end of June 2011.
7. The plan will initially be reviewed after 3 months and then at 6 month intervals.

## 5.1 Existing / Secured Measures

Action	Lead Team	Start Date	Target Date	Outcome	Potential to Reduce Phosphate in R Mease
<b>Plan Governance</b>					
Set up and maintain Programme Board	Environment Agency	June 2011	Programme Board will be in place for the lifetime of the Plan (achievement of Conservation Objective for phosphate)	The Programme Board will commit the key partners to the review and implementation of the Plan. The core partners will be the Environment Agency, Natural England, Severn Trent Water Ltd and North West Leicestershire District Council. There will be other partners as the Plan proceeds including other LPA's within the catchment.	Monitor and drive the actions within the Plan to ensure continuous reduction in P throughout the catchment to achieve the Conservation Objective for phosphate
Determine Programme Board Objectives	Environment Agency	June 2011	June 2011	1. To review the delivery of the Plan to ensure the River Mease SAC achieves its Conservation	Monitor and drive the actions within the Plan to ensure continuous reduction in P throughout the catchment to achieve

				<p>Objective for phosphate by December 2027, with a combination of current action and future actions to be added to the Plan;</p> <p>2. Board to determine interim targets with dates for achieving Conservation Objective for phosphate by 2027;</p> <p>3. Programme Board members to commit to the actions for delivery within their respective organisations;</p> <p>4. Ensure the initial Plan is signed-off by end of June 2011;</p>	<p>the Conservation Objective for phosphate</p>
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				<ol style="list-style-type: none"> <li>5. Start up in June 2011, with a follow up meeting in September 2011 and thereafter every six months;</li> <li>6. Measure/Monitor delivery of actions, and agree milestones based upon future projections for improvements;</li> <li>7. Measure/Monitor progress of the environmental response to the actions (reductions in Phosphate towards Conservation Objective);</li> <li>8. Advise/steer the technical group on changing priorities based</li> </ol>	
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				<p>on evidence and commit to new actions where there is a shortfall in a timely manner.</p> <p>9. Facilitate WQ Management Plan partners to engage with LEPs</p>	
Set up Technical Group	Environment Agency	June 2011	Technical Group will be in place for the lifetime of the Plan (achievement of Conservation Objective for phosphate)	Create Technical Group consisting of key partners to coordinate, review and implement the Plan and develop further actions to be added to the Plan. These will include the Environment Agency, Natural England, Severn Trent Water Ltd and North West Leicestershire District Council. There will also be other partners as the Plan proceeds. This group will inform the	Monitor and drive the actions within the Plan to ensure continuous reduction in P throughout the catchment to achieve the Conservation Objective for phosphate

				Programme Board and lead on action delivery within the Plan.	
Monitor delivery of Plan	Programme Board	June 2011	Every six months	Track delivery of actions, re-prioritise, add agreed further actions and monitor environmental response.	Monitor and drive the actions within the Plan to ensure continuous reduction in P throughout the catchment to achieve the Conservation Objective for phosphate
Review and modify Plan as new evidence, issues and opportunities are identified.	Technical Group led by Environment Agency (signed off by Programme Board)	June 2011	Initially 3-monthly meetings to end of 2011, 6-monthly to end 2012, annually post-2012	Plan is flexible and is continually improved with further actions added. The outcomes of the Plan can be refined as we develop a better understanding of the environmental response to the actions. The Plan will be based on up to the minute technology and information for the SAC to enable the Plan to progress.	Monitor and drive the actions within the Plan to ensure continuous reduction in P throughout the catchment to achieve the Conservation Objective for phosphate

<b>Development and Housing</b>						
Produce Core Strategies and subsequent LDF documents with relevant commitments to River Mease SAC partnership work and improvements to meet conservation objectives. Proactive actions such as minimum standards on CODE for sustainable homes for in catchment development added to policy.	All LPAs within River Mease catchment	July 2011	In place as LDF documents emerge	LDF documents to support the achievement of conservation objectives for the SAC, and identify the role that development has in contributing to that achievement. Provide policy commitments to a developer contributions scheme that ensures proportionate contributions linking with the developer contributions scheme action in this plan.	Policy mechanisms in place to enable progression of action plan in LPAs and progression of developer contributions scheme	
Active involvement with both NWLDC and Water Cycle Study (WCS) consultants throughout the development of	Environment Agency / Natural England	February 2011	30 September 2011	Ensure that Water Cycle Studies for NWLDC takes the Mease SAC into account, use appropriate data and information and agree the outcomes	The WCS will seek opportunities to demonstrate a betterment for phosphate for options taken forward to support growth. The	

the WCS				<p>with partners, along with seeking solutions that provide a net benefit to the SAC;</p> <p>The WCS will provide suitable information/direction for development/growth within the catchment and ensure protection of the SAC;</p> <p>The detailed WCS will also act as an evidence base to support the LPA Core Strategy.</p>	WCS will quantify any expected improvement and any actions will be incorporated into the Plan at the earliest opportunity.
Establish a developer contribution framework, in accordance with planning obligations best practice.	Natural England /North West Leics DC/Local Planning Authority/Environment Agency.	June/July 2011 and prior to permissions being given that result in additional wastewater to the sewage treatment works discharging into the SAC.	Agreements in place prior to new permissions being given.	Developer contributions fund a programme of actions to restore and provide new benefits to the river.	All new development with a net increase in wastewater to mains drainage will mitigate and compensate for nutrients entering the river, equivalent to the relative contribution of phosphate as a result of development and which will benefit the river as a whole.

<b>Wastewater Capacity / Quality</b>					
Environment Agency and Severn Trent Water Ltd to manage delivery of AMP 4/5 phosphate removal schemes to ensure delivery is not compromised.	Environment Agency / Severn Trent Water Ltd.	March 2012 / March 2013	March 2012 / March 2013	AMP 4/5 phosphate removal schemes delivered to agreed programme dates.	Phosphate reductions planned for and secured through the AMP process are delivered on time.
Undertake calculations to demonstrate what would be required to meet the Conservation Objective	Environment Agency	Feb 2011	Sept 2011	Know what limits would be required to sewage treatment works consents to meet the Conservation Objective (0.06mg/l). Outcome to be taken to technical group to propose further action to be agreed at programme board who will commit resource to reduce phosphate levels where feasible.	Allow an understanding of what is required by sewage treatment works to meet the Conservation Objective for phosphate.
Outcome of the mass balance calculations to be	Technical Group and Programme Board	September 2011	New actions from findings added to the	Further actions added to the Plan, including an indication of the step by	Part of evidence base for AMP6 bid. Potential for further

taken to the Technical Group. The Group to propose further actions to the Programme Board who will commit resource to further reduce phosphate levels.			Plan by October 2011	step improvements necessary to meet the Conservation Objectives for phosphate.	phosphate reduction, but levels of actions and timing unknown at this stage.
Continued up to date understanding of headroom availability to inform planning decisions	Severn Trent Water, liaising with LPAs and keeping EA and NE informed.	July 2011	Ongoing, but with updated information provided every 3 months	A precautionary approach enabling appropriate growth whilst ensuring headroom capacity is not breached. Timely communication of near capacity situations at Wastewater Treatment Works.	Ensuring backlog of development proposals is appropriately considered in light of available capacity.
Review of options for available headroom within existing consents	EA and NE	July 2011	July 2012	To have an agreed position for dealing with available headroom.	
<b>Environmental Status</b>					
Reassessment of the Condition of the SAC on a regular basis (i.e. more frequently	Natural England	January 2012	To be confirmed	To give an ongoing and relatively up to date condition assessment especially once AMP improvements start	Monitoring to see the level of further actions required.

than the current 6 yearly cycle) – if possible every 1 - 2 years. Frequency of reassessment dependent on funding.				coming on line. Outcome to be taken to technical group to propose further action to be agreed at programme board who will commit resource to reduce phosphate levels where feasible.	
Outcome of the Condition assessment action and monitoring results to be taken to Technical Group to propose further action, with resources agreed at Programme Board to further reduce phosphate levels.	Technical Group and Programme Board	Following January 2012 assessment	To be confirmed	Further actions added to the Plan on the basis of information gathered.	Further phosphate reduction where necessary, but levels of actions and timing unknown at this stage.
<b>Diffuse Sources / Agriculture</b>					
Identify all actions relating to phosphate in the Diffuse Water Pollution Plan (DWPP).	Technical Group to identify actions and present to Programme Board	Action to identify from June 2011	Report to Board - September 2011	Outcome to be taken to the Programme Board to identify owners responsible for the actions and reporting.	Actions carried out under DWPP will reduce phosphate within catchment .

Programme Board to secure commitment for the DWPP Actions.	Programme Board	September 2011	September 2011	The actions in the DWPP have ownership and delivery is linked to and driven through the Programme Board.	Actions carried out under DWPP will reduce phosphate within catchment .
DWPP programme Management Reports progress to Mease WQ (P) Management Plan Programme Board.	Environment Agency /Natural England	DWPP published December 2010. Actions underway by 2011.	Report back at every Plan review	Outcome to be taken to technical group to propose further action to be agreed at programme board who will commit resource to reduce phosphate levels where feasible.	Actions carried out under DWPP will reduce phosphate within catchment in conjunction with additional actions within this Plan. Levels of actions and timing unknown at this stage.
CSF/HLS Review of long term monitoring (25 extra survey sites).	Catchment Sensitive Farming Officer / Natural England	Underway by 2011 CSF.	Report back at every Plan review.	Reduce phosphate inputs from agriculture.	CSF modelling predicts an average reduction of 5% in phosphate in receiving waters.
Identify locations of Combined Storm Overflows (CSO's) within the R Mease catchment.	Severn Trent Water Ltd/Environment Agency	October 2011	December 2011	Understand location of potential CSO sources. Create a GIS layer showing the locations. Outcomes from this action can be fed into other CSO actions in this table.	The expected contribution in phosphate from Combined Storm Overflows is likely to be minimal.

## 5.2 Existing / Secured Investigations

Action	Lead Team	Start Date	Target Date	Outcome	Potential to Reduce Phosphate in R Mease
<b>Diffuse Sources</b>					
Review all water related pollution incidents in the Mease catchment recorded on NIRS (National Incident Recording System) since 1/1/08 to identify type and source of pollution	Environment Agency – Environment Management	June 2011	December 2011	Collated evidence base of pollution incidents in the catchment.	Expect a reduction in number of misconnections, pollution incidents (including agricultural) in catchment and accompanying reduction in phosphate input.
Targeted investigations to assess and identify appropriate prioritised actions to address water related pollution incidents	Environment Agency – Environment Management	December 2011	Report back at every Plan review	Expect a reduction in number of misconnections, pollution incidents (including agricultural) in catchment	Expect a reduction in phosphate input as number of pollution incidents and misconnections decrease.
Upon completion of the sampling in May 2011, analysis undertaken to highlight areas	Environment Agency – SEO (WQ) / Analysis & Reporting / Midlands Environment	Sampling currently underway	End March 2012	To identify areas within the catchment of high or low phosphate so that targeted investigation can locate key sources	Actions carried out following this analysis will reduce phosphate within catchment .

MWQ(P)MP FINAL DOCUMENT

V1.0 27th June 2011

where phosphate concentrations are higher, using existing and new sampling data	Planning			or discount areas of the catchment.	
Create a prioritised list of subcatchments and take to Programme Board to secure commitment for the actions.	Environment Agency – SEO (WQ) / Analysis & Reporting / Midlands Environment Planning	April 2012	June 2012	Identify key areas of concern and a list of areas where further action is required.	Actions carried out following this analysis will reduce phosphate within catchment .
Implementation of actions following sampling analysis.	Environment Agency – SEO (WQ) / Analysis & Reporting / Midlands Environment Planning	September 2012	Report back at every Plan review	Outcome to be taken to technical group to propose further action to be agreed at programme board who will commit resource to reduce phosphate levels where feasible.	Actions carried out will reduce phosphate within catchment in conjunction with additional actions within this Plan. Levels of actions and timing unknown at this stage.
Review of historic invertebrate sampling, macrophyte sampling and fisheries surveys within the catchment	Environment Agency –Analysis & Reporting / Midlands Environment Planning	July 2011	March 2012	Identify existing invertebrate, macrophyte and fisheries monitoring sites and review the data.	Part of evidence base for AMP6 bid. Potential for further phosphate reduction, but levels of actions and timing unknown at this stage.

Report to be produced detailing analysis of 6 extra invertebrate monitoring sites	Environment Agency –Analysis & Reporting / Midlands Environment Planning	Sampling Underway	End Sept 2011	Review the 6 extra invertebrate monitoring sites. Review data for any assemblages that might indicate reaches affected by phosphate	Part of evidence base for AMP6 bid. Potential for further phosphate reduction, but levels of actions and timing unknown at this stage.
Local Environment Management Team and Senior Environment Officer (WQ) will review the NE outfall walkover survey and the Fisheries, Recreation, Biodiversity (FRB) Team catchment walkover	Environment Agency – Environment Management / SEO (WQ)	Underway July 2011	December 2011	Review the NE survey and investigate potential sources of phosphate	Expect reduction in diffuse sources of phosphate where identified, cannot currently be quantified.
Outcome of NE outfall walkover survey and FRB catchment walkover to be taken to Technical Group to propose	Technical Group/Programme Board	January 2012	Report back at every Plan review	Further actions added to Plan to reflect findings of the NE walkover survey.	Expect reduction in diffuse sources of phosphate where identified, cannot currently be quantified.

<p>further action to be agreed at Programme Board who will commit resource to reduce phosphate levels where feasible.</p>					
<p>The Senior Environment Officer (Agriculture) will identify the major land uses within the River Mease catchment</p>	<p>Environment Agency – SEO (AGRI)</p>	<p>In line with CSF designation</p>	<p>End Dec 2011 or in line with CSF designation</p>	<p>Review of landuse information. Identify potential sources of P from any farming/landuse data</p> <p>Feed into CSF and targeted investigations</p> <p>An initial study will be completed by December 2011 or in line with any Catchment Sensitive Farming Initiative secured.</p>	<p>Expect reduction in diffuse sources of phosphate where identified, cannot currently be quantified</p>
<p>Outcome from the initial study above to be taken to Technical Group to propose further action to be agreed at Programme Board who will</p>	<p>Technical Group/Programme Board/CSF Officer</p>	<p>In line with CSF designation</p>	<p>End Dec 2011 or in line with CSF designation</p>	<p>Further actions added to Plan to reflect findings of the above review</p>	<p>Expect reduction in diffuse sources of phosphate where identified, cannot currently be quantified</p>

commit resource to reduce phosphate levels where feasible.					
Review of private sewage treatment works which have historically been issued with a Consent to Discharge and their geographic distribution, followed by on the ground investigations to determine whether the package treatment plant is a major source of phosphate in that location.	Environment Agency – Environment Management / SEO (WQ)	Underway	December 2011	Review consented private sewage treatment plants. Review the geographical distribution of consented private treatment plants to look for potential sources of phosphate.  Report of specific actions and enforcement required with suggested timescales.	Expect reduction in diffuse sources of phosphate where identified, cannot currently be quantified
Outcome of study above to be taken to technical group to propose further action to be agreed at programme board who will	Environment Agency – Environment Management / SEO (WQ)	April 2012	April 2012	Further actions added to Plan to reflect findings of the above review.	Expect reduction in diffuse sources of phosphate where identified, cannot currently be quantified

commit resource to reduce phosphate levels where feasible.					
Sewer Misconnections	Environment Agency – Environment Management/Severn Trent Water Ltd/LPA	Underway	March 2012	Check for any records of sewer misconnections in the River Mease catchment and take actions to ensure Severn Trent Water treat any outstanding problems as high priority. Report provided showing all identified misconnections and the proposed actions to be taken for each to rectify the issue.	Expect reduction in diffuse sources of phosphate where identified, cannot currently be quantified
Severn Trent Water Ltd to treat all misconnections as high priority and present Programme Board with a timetable for action.	Environment Agency – Environment Management/Severn Trent Water Ltd/LPA	April 2012	Report back at every Plan review	Sewer misconnections rectified	Expect reduction in diffuse sources of phosphate where identified, cannot currently be quantified

### 5.3 Additional Analysis / Actions / Recommendations not yet secured

The following table lists further ideas and actions where no timetable has yet been set or funding secured. These actions are recommendations and will be discussed at the first Programme Board to see whether they are feasible.

Action	Lead Team	Start Date	Target Date	Outcome	Potential to Reduce Phosphate in R Mease
<b>Development and Housing</b>					
Understand the contribution CSO's make to phosphate levels in the R Mease SAC. Develop a UPM for the R Mease catchment	Severn Trent Water Ltd/Environment Agency	To be confirmed by Programme Board.	To be confirmed by Programme Board.	Produce a report detailing location and contribution from CSO's in the catchment. A prioritised list will be produced.	Part of the evidence base for PR14
Where identified promotion of capital schemes to reduce phosphate from CSO's in the catchment.	Severn Trent Water Ltd/Environment Agency	To be confirmed by Programme Board.	To be confirmed by Programme Board.	Reduce contribution of phosphate from CSO's to the catchment.	Expect reduction in diffuse sources of phosphate where identified, cannot currently be quantified
<b>Wastewater Capacity / Quality</b>					
Technologies for tighter phosphate removal should be identified and where possible	Environment Agency / Severn Trent Water Ltd	To be confirmed by Programme Board.	To be confirmed by Programme Board.	Wherever appropriate, new technologies should be used to further reduce phosphate	Part of evidence base for PR14.

utilised, in light of a weight of evidence requiring tighter phosphate limits				concentrations within the SAC.	
To gain a better and more detailed understanding of phosphate fractions and the levels at which they have an ecological effect	Severn Trent Water Ltd	To be confirmed by Programme Board.	To be confirmed by Programme Board.	Share information from the 'Balancing Carbon Programme' where relevant to the R Mease SAC P issues (e.g. literature review, innovative technology etc)  Use outcomes of trial (if successful) to identify how the individual fractions of P interact and what the ecological effects are. Upon completion of the trial further actions can be suggested by the Programme Board based on input from the Technical Group.	Part of evidence base for PR14.

Education and awareness programme for the wider public with regard to the phosphate issues within the SAC catchment, and promotion of measures to reduce phosphates in the home/business	All partners, lead by EA/NE	To be confirmed by Programme Board.	To be confirmed by Programme Board.	Greater awareness of River Mease SAC and need for phosphate reduction amongst wider public in catchment.	This action cannot be quantified and therefore cannot be relied upon to contribute to the achievement of the plan objective, but is a positive measure to improve general awareness of the SAC and promote good practice in lowering phosphate.
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Signed on behalf of the Environment Agency

Signed on behalf of Natural England

Paul Hickey  
Head of Land and Water Quality  
Environment Agency

Rob Cooke  
Principal Adviser, Freshwater and Coast  
Natural England

June 2011

June 2011

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