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Introduction

The vision for the Don and Rother Catchment Abstraction Management Strategy (CAMS) is to contribute towards sustainable development by managing the water resources within the catchment to maximise the availability of resources for abstraction while protecting the flow requirements of the riverine ecology.

Catchment Abstraction Management Strategies (CAMS) are strategies for management of water resources at a local level. They will make more information on water resources and licensing practice publicly available and allow the balance between the needs of abstractors, other water users and the aquatic environment to be considered in consultation with the local community and interested parties.

CAMS are also the mechanism for managing time limited licences by determining whether they should be renewed and, if so, on what terms.

Managing Water Abstraction: The Catchment Abstraction Management Strategy Process is the national document that supports the development of CAMS at a local level. It sets out the national policy and the regulatory framework within which CAMS operate, describes the process of developing CAMS and provides information on the structure and content of CAMS documents. This document should be read in conjunction with Managing Water Abstraction.

The Don and Rother CAMS sets out how much water is available in the catchment and the Environment Agency’s strategy for managing this water now and in the future. The Don and Rother CAMS is the first of three CAMS to be produced in Ridings area. CAMS are a rolling programme and the Don and Rother CAMS will be reviewed in six years time.

A Technical Document supporting the Don and Rother CAMS has been produced which provides the detailed technical information on which the development of the strategy has been based. If you wish to receive this document on CD-ROM, please contact the Environment Agency at the address below. A hard copy of the document is also available for viewing at the same office.

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or by email to: cams.ridings@environment-agency.gov.uk
Consultation on the Don and Rother CAMS

Consultation is an integral part of the CAMS process. It is important because it ensures that the CAMS process is as transparent as possible and gives everyone the opportunity to get involved. For the Environment Agency (hereafter referred to as the Agency) to manage water resources in a catchment effectively and sustainably, it is important that as much information as possible is collated on water needs and uses. Comments and suggestions have been gathered during the early stages of the development of this strategy through various pre-consultation activities. These were:

- an awareness raising leaflet
- a CAMS stakeholder group
- targeted information request

The leaflet was distributed in October 2001. Its aim was to raise awareness of the development of the CAMS in the local area and it also invited anyone with an interest to send in written comments, providing information, views and suggestions.

A Stakeholder Group was set up for the Don and Rother CAMS. The role of the Stakeholder Group was to represent the key interests in the catchment and to help identify issues of local significance, provide views on proposals and to consider the likely implications of different strategy options. The members of the Don and Rother CAMS Stakeholder Group and the interests they represented are as follows:

Geoff Roberts: Chairman
Nigel Barnes: British Waterways representing navigation and associated waterway management issues
John Cooke: Friendship Estates representing farming interests
Dick Kirk: Don Fisheries Consultative Association representing fisheries interests
Ben McCarthy: Ecologist from Rotherham Borough Council representing conservation
John Rockett: Corus Engineering Steels representing industry
Ian Rotherham: Sheffield Hallam University representing conservation and academia
Mark Tinsdall: Yorkshire Water Services Ltd. representing water company interests

There was also a formal consultation on the Don and Rother CAMS through a Consultation Document, distributed in November 2002. The responses received were analysed and taken into account as the strategy was finalised. This CAMS document now sets out the final strategy that has been determined for the Don and Rother CAMS area.
This Section contains background information about the Don and Rother CAMS area. More detailed information can be found in the Technical Document.

The Don and Rother CAMS surface water catchment covers an area of approximately 1360km². This includes all the land, downstream of the public supply reservoirs, from which surface water drains to the River Don and its tributaries down to the tidal limit at Kirk Sandall and the River Went. The topography is very diverse, from the heights and steep sided valleys of the Pennines in the west, down to the low-lying floodplains in the east. To the north are the River Aire and Calder catchments and to the east and south lies the River Trent catchment. Much of the Don and Rother CAMS area is densely populated and industrialised although the Upper Don and River Went catchments are typically agricultural in nature. The five main centres of population are Doncaster, Barnsley, Rotherham, Sheffield and Chesterfield.
3.1 Public water supply network

There is an extensive public water supply and distribution system in the Don and Rother CAMS area. Water is abstracted from reservoirs in the west of this CAMS area for public water supply. There is also a transfer of water from Ladybower Reservoir (Midlands Region) into the network that supplies Sheffield.

The Don and Rother CAMS does not include the influence of public water supply transfers and abstractions upstream of the reservoir dam walls. This water is fully committed for public water supply and reservoir compensation releases. Any surplus water flows into the downstream rivers by overtopping the dam walls. Further information on the boundaries of the Don and Rother CAMS area is given in Section 4.5.

More information on the public water supply network can be found in Water Resources for the Future: A Strategy for North East Region (March 2001).

3.2 Hydrology

The principal rivers in the Don and Rother CAMS area are the Don, Rother, Dearne and Went.

The River Don is the main river in the catchment and flows east from its headwaters in the Pennines. The upper reaches of the River Don and many of its tributaries have been extensively impounded to create a reservoir system used for public water supply. Releases of water are made from these reservoirs that add to the downstream river flows. The River Don continues down through Sheffield and is joined by the River Rother at Rotherham and the River Dearne at Conisborough before joining the River Ouse near Goole which flows into the upper part of the Humber Estuary. Many of the river reaches between Sheffield and Doncaster are wide and deep reflecting their use for navigation.

The River Rother begins in the Peak District National Park and the River Dearne drains the high ground around Huddersfield and Barnsley. In general, the western streams and rivers, Upper Don, Upper Dearne and River Sheaf, respond quickly to rainfall. Downstream of Doncaster, the River Don becomes more lowland in character. There are reaches that, as a consequence of many drainage and flood defence schemes, provide conditions that support the reproductive needs of many species that are now well established in the lower river. The eastern part of the Don and Rother CAMS area falls within the tidal influence of the Humber Estuary. The tidal limit of the River Don is at Kirk Sandall.

Rainfall quantities vary greatly across the catchment with the average annual rainfall in the Pennines being 1580mm and in Doncaster being 580mm.

3.3 Geology and hydrogeology

The geology of the Don and Rother CAMS area is characterised by rocks laid down in the Carboniferous era between 290 and 363 million years ago. The western edge of the Don and Rother CAMS area is underlain by the Millstone Grit formation while further east lies the shallow Coal Measure deposits of the Yorkshire Coalfield. Both the Millstone Grit and Coal Measures are classified as minor aquifers. A ridge of Permian Magnesian Limestone runs north-south through the region. Although
classified as a major aquifer, yields are variable. Groundwater baseflow from the Magnesian Limestone aquifer provides an important contribution to surface water flows in the River Went. To the east of the Don and Rother CAMS area can be found the Sherwood Sandstone aquifer, which forms the low-lying floodplain between Doncaster and Goole. The Sherwood Sandstone aquifer is also a major aquifer, and both the Jurassic Sherwood Sandstone and Magnesian Limestone are extensively used for industrial, agricultural, public and private potable water supply.

### 3.4 Minewater in South Yorkshire

Active pumping and treatment of minewater still occurs at three locations in the Don and Rother CAMS area. Carr House pumping station at Rotherham discharges minewater into the River Don and prevents water from Silverwood and adjoining mines migrating eastwards and flooding the Rossington and Maltby Mines. Woolley pumping station near Bamsley pumps into the River Deame and prevents flooding of Caphouse Mining Museum near Wakefield and polluting discharges to the River Calder. Minewater from this site previously contributed to gross river pollution in the downstream area but a recent remediation programme undertaken at this site has reduced pollution levels dramatically. Hope Shaft pumping station at Caphouse Mining Museum also protects the on-site mining museum.

There are approximately 20 gravitational surface outflows in the Don and Rother CAMS area. These are caused by minewaters gradually filling the available voids and flowing out through surface cracks and fissures into the nearest watercourse. Consented outflows can be found at Blacks, Cresswell, Harlington, Oxcroft and Williamthorpe mines on the River Rother; Silkstone mine on the River Deame and at Fender Colliery on Barlow Brook. Although the flows may not be large, they are likely to continue into the future as underground minewater levels continue to recover in the area and large-scale dewatering operations are discontinued. There is also a risk of new surface outflows occurring over the next few years as available void space becomes filled and pumping is reduced leading to an overall rise in underground minewater levels.

Further information can be found in the Technical Document.

### 3.5 Canal network

There is an extensive canal network in the Don and Rother CAMS area. The Sheffield and South Yorkshire Navigation connects Sheffield to Goole via the Aire and Calder Navigation. The canal basin in Sheffield is presently supplied with water via a pipeline abstracted from the River Don at Tinsley pumping station near Meadowhall. From Rotherham, commercial traffic can navigate along canal cuts and navigable sections of the River Don down to Doncaster Lock where the canal finally separates from the river. The canal then splits again at Kirk Bramwith to form the New Junction Canal, which flows north east to meet up with the Aire and Calder Navigation. The Aire and Calder Navigation then flows east to Goole Docks and into the Stainforth and Keadby Canal flowing east to the River Trent.

The Chesterfield Canal is fed by the River Rother. The Chesterfield Canal Society have plans to connect the Chesterfield Canal, via the River Rother, to the Sheffield and South Yorkshire Navigation. If successful this will occur beyond the six year lifespan of the Don and Rother CAMS.

Abstractions of water from the canal network require an abstraction licence from the Agency. These licences are granted to British Waterways on behalf of any potential abstractor. The Agency, as regulator, retains responsibility for enforcement of these licences.

### 3.6 Hydrometry

River flows are measured using a network of 16 flow gauging stations and river levels are measured primarily for flood warning purposes at another 33 sites. Groundwater levels are monitored at nine boreholes in the Don and Rother CAMS area. Gauging stations in this CAMS area are shown on Map 2.
3.7 Abstractions and discharges

There are 350 current abstraction licences in the Don and Rother catchment of which 286 can be found in the Don and Rother CAMS area. Currently the Agency is aware of 103 abstractions which are exempt from the licensing process under current legislation. The greatest use of abstracted water within the Don and Rother CAMS area is for industry (excluding public water supply abstraction). Figure 1 shows the different uses of surface water and groundwater which is abstracted in this CAMS area.

![Figure 1](image1.png)

Figure 1: Use of abstracted water in the Don and Rother Catchment (excluding Private Water Supply)

There are also large discharges of water into the rivers from wastewater treatment works that service the major conurbations of Sheffield, Rotherham and Barnsley. These greatly increase the flow in the rivers. Map 4 shows the consented discharges in the Don and Rother CAMS area and Figure 2 shows the breakdown of the volume of water as measured at Doncaster gauging station.

![Figure 2](image2.png)

Figure 2: Breakdown of flow as measured at Doncaster gauging station

3.8 Conservation designations

The Don and Rother CAMS area contains a wide diversity of habitats. The area is of high conservation value with a number of designated sites, and these are shown on Map 5.

The Natura 2000 network is a series of sites designated under the European Habitats Directive. These sites are afforded the highest level of protection under European Law. All Natura 2000 sites are Sites of Special Scientific Interest (SSSIs) and either Special Areas of Conservation (SAC) or Special Protection Areas (SPA). The South Pennine Moors, a SPA and a proposed SAC, can be found in the west of the Don and Rother CAMS area. This area is nationally important for its upland habitats (both wet and dry) and upland birds. The River Don also flows into the Humber Estuary, an area of significant ecological importance and a SSSI. Work is currently underway within the Habitats Directive to assess the impact of abstractions upon the freshwater requirements of the Humber Estuary. To the east of the Don and Rother CAMS area lies Thorne and Hatfield Moors which is the largest area of lowland raised mire in England.

The following is a summary of the Habitats Directive sites that are situated within the boundaries of the Don and Rother CAMS area or are potentially influenced by activities within this CAMS area:

- Thorne and Hatfield Moors SPA
- South Pennine Moors SPA and candidate SAC
- Humber Estuary European Marine Site
Preliminary assessments for these sites have been completed under the Habitats Directive and if further investigation of licences is required, contact will be made with the licence holders at the appropriate stage in the process. For further information on the Habitats Directive, refer to Managing Water Abstraction (Annexe 2, page 32).

The impact of the Habitats Directive on existing and new licence applications is outlined in Sections 5.3.3 to 5.3.5 in this document.

There are SSSIs in addition to the Natura 2000 sites and some are related to the wetlands or watercourses in the Don and Rother CAMS area such as: Denaby Ings, Broomhill Ings and Broomhill Flash. Many SSSIs are important habitats for wildlife conservation, although in the Don and Rother CAMS area, only a few are dependent upon water level and none are dependent upon river flows. SSSIs are afforded protection from impacts of abstraction through the licence determination procedure where local impacts of potential abstractions are assessed.

The UK was one of 150 Governments who signed the Biodiversity Convention at the Earth Summit in Rio in 1992. In
In the UK, a national strategy has been developed for the conservation of biological diversity through the UK Biodiversity Action Plan (BAP). There are several BAP species recorded in the Don and Rother CAMS area, which are shown in Table 1.

### 3.9 Water resource investigations

The Restoring Sustainable Abstraction (RSA) programme investigates the impact of potentially unsustainable abstraction on a local scale. At present there are no RSA sites in the Don and Rother CAMS area.

<table>
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<tr>
<th>Species</th>
<th>Common name</th>
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<tr>
<td>Lutra lutra</td>
<td>European otter</td>
</tr>
<tr>
<td>Triturus cristatus</td>
<td>Great crested newt</td>
</tr>
<tr>
<td>Austropotamobius pallipes</td>
<td>White-clawed crayfish</td>
</tr>
</tbody>
</table>
3.10 Water quality

There has been a legacy of industrial pollution in the Don and Rother CAMS area that is now beginning to show an improvement as indicated in the General Quality Assessment national classifications. The biological quality of the rivers is improving but they are still only classified as fair to fairly good (D to C in 2000) and the chemical quality has been assessed as mostly good to fair (B to D in 2000). There was only one River Quality Objective failure in 2000 and this was at the confluence of the River Rother and River Don. The failure was due to high ammonia levels. River quality failures have significantly reduced.
as part of a longer term improvement trend since 1995.

Improvements in the wastewater treatment works discharge quality have resulted in improvements to the status of the ecology and fisheries in this area.

The Agency also monitors the quality of groundwater. The groundwater in the sandstone is of a very high quality and localised pollution issues are rare. The Agency has a groundwater protection policy designed to afford the highest protection to areas of chalk and sandstone feeding water supply abstraction. If public water supply sources are affected by pollution, alternative sources of water have to be found either in the short or long term.

3.11 Status of ecology and fisheries in the Don and Rother CAMS area

The Agency collects and analyses a large amount of ecological information. The data collected can give an indication of problems in the river related to abstraction and water quality. This data has been used to guide the assessment of water resource availability for the Don and Rother CAMS.
3.11.1 Fisheries

Fish populations have changed greatly, on a number of rivers in the Don and Rother CAMS area, over the last ten years in response to improvements in water quality. However some of the rivers still do not support salmonid populations.

Naturally occurring and stocked populations of brown trout primarily dominate the River Don. As the majority of the rivers are regulated by discharges from reservoirs, salmonid spawning areas are restricted to short reaches downstream of the lower dam walls. The extensive brown trout populations provide exceptional angling locations from the Don’s headwaters to Penistone with occasional brown trout also being caught below Doncaster. The stretches of river between Doncaster and Rotherham and from Adwick to the Rivers Don and Deame confluence are important match angling locations for coarse fish species such as barbel and dace.

On the River Rother and Doe Lea water quality prevents resident salmonid populations although on the tributaries, for example Barlow Brook, good populations can be found. The dominant species in the Upper River Rother tributaries is brown trout. Lower down the catchment the population is dominated by coarse fish, predominately rheophilic species, i.e. those species that prefer to spawn in gravel river beds.

The River Dearne has brown trout populations in its upper reaches and coarse fish species in its lower reaches. This reflects the change in habitat from fast flowing to slow moving water.

The industrial heritage of the River Don catchment has left a legacy of numerous weirs. Some of these restrict the passage of fish through the catchment and it is only via fish passes, including those maintained by the Agency, that fish migration is possible past the larger structures. Further fish passes are planned to be introduced on some of these structures; the most recent being at Crimpsall Sluice near Doncaster.

3.11.2 Ecology

Ecological quality is assessed in the Don and Rother CAMS area using procedures agreed nationally within the Agency. Assessment methods focus on the physical character of the river and macro-invertebrate communities that reflect stress related to river flow. In general, the western streams and rivers (Upper Don, Upper Deame and River Sheaf) drain from the Millstone Grit. They are moderately wide and steep, with moderate to fast current flows. The substrate is predominately cobbles and gravels. Invertebrate communities are comprised of taxa that reflect this environment such as riffle beetles, stoneflies, mayflies and caddis flies. Instream vegetation is dominated by bryophytes and algae but is limited by the mobile nature of the substrate. Downstream of Doncaster, in the Middle Don, the main River Don becomes slow flowing, wide and deep with a silt dominated substrate. Reeds and emergent plants rooted in the silt create marginal habitat for water vole, damselflies, dragonflies and a range of aquatic snails.

The River Rother flows south to north, rising to the east of the Pennines at a lower altitude than the River Don. The middle reaches are similar to those of the River Don; moderately steep with moderate current speed and cobbley substrate with biotic communities that prosper in a high energy environment.

The River Went flows west to east with a moderate gradient in its upper reaches. However, the river has tidal gates and its lower reach takes the form of linear ponds when the gates are closed.

Many of the rivers in the Don and Rother CAMS area, although showing signs of improvement, are still degraded in terms of biological quality as assessed using macro-invertebrates. Historical pollution from agriculture, industry and minewaters are the main pressures impacting upon the biological quality of the area. This poor quality has resulted in restricted diversity and the proliferation of pollution tolerant species such as worms and water hoglouse. The River Rother experienced the worst historical pollution and even in the light of recent improvements it still retains severely degraded habitats and invertebrate populations. The Rivers Don, Went, and Deame have sections of good biological quality where the biology has not been significantly impacted. These sections are generally upstream of the major urban areas and support key indicator species such as crayfish. However the majority of stretches are of a fair quality.

3.12 Tourism and recreation

Tourism and recreation are important to the economy of South Yorkshire. Visitors are drawn to the area by a range of varied attractions including the Peak District National Park and extensive navigation and boating facilities. Recreational activities include an extensive network of footpaths and bridle ways, scenic drives and angling on the many coarse fishery sites. More active pastimes are situated around sites such as the
Rother Valley Country Park where water skiing, windsurfing and rowing are available.

Some of the more popular tourist attractions which can be found in this area are the Trans Pennine Trail, Earth Centre and varied archaeological and heritage sites such as Bolsover Castle, Conisborough Castle and Monk Bretton Priory.

The Agency has a duty to promote the use of water and land associated with water for recreation and to take recreation into account in the performance of all its functions.

3.13 Links with other plans

The Agency and other organisations have responsibility for various plans and initiatives, which are linked to the management of water resources. Those most directly linked to CAMS are described below.

The Agency has just finished consulting on its draft corporate strategy ‘Making it Happen’ which is the plan to deliver our environmental vision and the Agency’s contribution to sustainable development over the five years from 2002 to 2007. The CAMS for the Don and Rother area contributes to some of the key targets:

- to put in place 50% of Catchment Abstraction Management Strategies by 2007
- to characterise and quantify pressures and impacts on all surface waters and groundwater sources

In general, the Agency aims to improve river habitats and increase diversity and populations of particular species, for example under the BAP process.

On a larger scale, the Agency’s National and Regional Water Resource Strategies play a major part in targets relating to overall water demand and supply. The detail of how this CAMS updates the strategy is given in Section 4.5.10.

Each water company produces a Water Resources Plan, setting out its view on how it will manage water resources for public supply over the next 25 years. In addition, drought plans are produced by both the Agency and water companies and updated annually. These outline specific measures to be implemented in time of drought, having regard to environmental impacts and in turn water resource availability. The water companies also produce investment plans which balance supply and demand, including planning for new sources and making environmental improvements. This happens through the Periodic Review process.
4 Resource assessment and resource availability status

4.1 Introduction

To manage water resources effectively, the Agency needs to understand how much water is available and where it is located. This is achieved by undertaking a resource assessment, covering both surface water and groundwater.

Water is used for a number of different purposes, the principal categories being general agriculture, spray irrigation, industrial use, power generation and water supply. For each different use, the amount of water that is returned to the water environment close to where the water was abstracted may vary considerably. Where this loss is high, the Agency considers the abstraction to be consumptive. The availability of water may be restricted, unless a significant proportion of the water abstracted is returned to the water source close to the point of abstraction.

To easily provide information on the availability of water resources within a catchment that may be used for consumptive purposes, a classification system has been developed. This ‘resource availability status’ indicates the relative balance between committed and available resources, showing whether licences are likely to be available and highlighting areas where abstraction needs to be reduced. This does not replace the need for the licence determination process which is applied to licence applications. More information on the determination process is given in Managing Water Abstraction (Annexe 2).

There are four categories of resource availability status, as shown in Table 2.

A framework for resource assessment and management has been applied in all CAMS areas so that water resources are assessed consistently across England and Wales.

This framework involves the development of an understanding of the water resources of the CAMS area and assessment of the surface water and groundwater resource. These results are integrated to define the final resource availability status of different units within the CAMS area.

Within and between catchments there are variations in physical, ecological and hydrological characteristics. In order to measure, manage and regulate effectively, the Agency need to break catchments down into smaller areas, recognising similarities in characteristics. Groundwater Management Units (GWMU) are defined in areas where groundwater resources are significant.

For surface water, Assessment Points (APs) are located on the river network. The catchment draining to each AP is a Water Resource Management Unit (WRMU). The WRMUs in the Don and Rother CAMS are shown on Map 6.

Map 7 shows the GWMUs and river APs that have been defined for the Don and Rother CAMS. These river APs and GWMUs are the focus of resource assessment and abstraction licensing.

Further details on how these were defined are provided in the Technical Document.

Table 2 Resource availability status categories

<table>
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<th>Indicative resource availability status</th>
<th>Definition</th>
<th>Colour coding for illustration on maps</th>
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<tbody>
<tr>
<td>Water available</td>
<td>Water likely to be available at all flows including low flows. Restrictions may apply.</td>
<td>Blue</td>
</tr>
<tr>
<td>No water available</td>
<td>No water available for further licensing at low flows although water may be available at higher flows with appropriate restrictions.</td>
<td>Yellow</td>
</tr>
<tr>
<td>Over-licensed</td>
<td>Current actual abstraction is resulting in no water available at low flows. If existing licences were used to their full allocation they would have the potential to cause unacceptable environmental impact at low flows. Water may be available at high flows with appropriate restrictions.</td>
<td>Orange</td>
</tr>
<tr>
<td>Over-abstracted</td>
<td>Existing abstraction is causing unacceptable environmental impact at low flows. Water may still be available at high flows with appropriate restrictions.</td>
<td>Red</td>
</tr>
</tbody>
</table>
4.2 Resource assessment of Groundwater Management Units

For the groundwater resource assessment, five tests are applied to each unit to determine the resource availability status. These tests are:

1. Examining the balance between recharge to the unit and abstraction from it.
2. Investigating the impact of abstraction on summer outflows from the unit.
3. Examining long term groundwater level trends.
4. Investigating historical evidence of abstraction related damage.
5. Applying any local tests that have been developed for the management of the groundwater.
4.3 Resource assessment of river Assessment Points

The surface water resource assessment requires the definition of river flow objectives. These are based on the sensitivity of the local ecology to variations in river flow (i.e. their vulnerability to abstraction impacts). It also takes account of other flow requirements such as amenity or aesthetic needs. These objectives represent the minimum flow that the Agency are aiming to protect. This then affects the amount of water that is available for abstraction.

These river flow objectives are developed by first giving ‘Environmental Weighting’ (EW) scores to the reaches, which represent the sensitivity of the river reach to abstraction. Reaches are banded A to E, A being most sensitive to abstraction and E being the least sensitive.

Map 8 shows the EW bands for each AP in the Don and Rother CAMS area.

These river flow objectives are then compared with a scenario flow which assumes that all licences are being fully utilised (i.e.
the full licensed quantity is being abstracted). This comparison reveals either a surplus, balance or deficit. The size of the surplus or deficit corresponds to a resource availability status for the unit.

The surface water resource availability classification gives an indication of whether new licences will be available from the river or whether some recovery of resources is required. However, there are significant variations in flow throughout the year. A classification of ‘over-licensed’ or ‘over-abstracted’ generally indicates that no new licences will be granted. However, this applies only at times of low flow. During periods when flows are higher, there may be some water available for abstraction. The classification is therefore really a classification of resource availability at low flow. Low flows will occur more frequently during the summer months.

Abstraction licences are sometimes managed in order to ensure this flow variability is maintained by the use of hands-off flow conditions. These are conditions on licences that require abstraction to cease (or reduce) when the flow in the river falls below a specified level. Therefore, when river flows are above this hands-off flow, abstraction can take place but when flows are below this, no abstraction (or reduced abstraction) can occur. In order to maximise abstraction while maintaining the variability of flow (required for many aquatic species) a tiered system of hands-off flows is applied. Licences are generally granted with the lowest hands-off flow possible on a first-come-first-served basis. As more licences are granted, the hands-off flow must be increased to maintain sustainable flows in the river.

For potential applicants for new abstraction licences, it is therefore important to know not only the likelihood of obtaining a licence, but also the reliability of a licence if granted with a hands-off flow condition. Within the CAMS resource assessment, reliability is expressed as a percentage. This percentage indicates the minimum amount of time over the long term that the scenario flow exceeds the river flow objective, therefore allowing abstraction to take place.

The resource assessments for both surface water and groundwater use a scenario which assumes that all licences are being fully utilised; that is, the full authorised volume is being abstracted. However, many licences are not used fully and therefore in reality the resource availability can be different. If

<table>
<thead>
<tr>
<th>Name of river reach or Groundwater Management Unit</th>
<th>Preliminary low flow resource availability status</th>
<th>Final low flow resource availability status in Consultation Document</th>
<th>Final low flow resource availability status for the final CAMS Document</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnesian Limestone North GWMU</td>
<td>Water available</td>
<td>Over-licensed</td>
<td>No water available</td>
</tr>
</tbody>
</table>

the result of a resource assessment is ‘over-licensed’, data of actual abstraction is then used to establish whether the status is ‘over-abstracted’ (actual flows are lower than river flow objectives). ‘Over-abstracted’ represents abstraction that is already unsustainable whereas ‘over-licensed’ represents the potential for damage should the full licensed amount be abstracted.

4.4 Integration of the surface water and groundwater resource assessments

The resource availability results for river reach and GWMU assessments are integrated and iterations made.

The preliminary results for a river reach or a GWMU may be overridden in order to protect a downstream river reach or underlying GWMU that has a worse low flow resource availability status than its own (here the downstream reach or unit is known as the critical reach or unit). Previously these overridden river reaches or GWMUs would have been assigned the same low flow resource availability status as that of the critical reach or unit. This has caused confusion in some cases about where the actual effects of over abstraction are seen within the catchment and as a result the Agency have changed the way in which we override the low flow resource availability status of a river reach or GWMU above a critical reach or unit.

Where the preliminary low flow resource availability status of the river reach or GWMU is ‘water available’ it is overridden to ‘no water available’ in order to indicate that additional abstraction will only be allowed where it does not make the position within the critical unit any worse. Where the river reach or GWMU is ‘no water available’, ‘over-licensed’ or ‘over-abstracted’ it maintains its own status. The strategy that is developed still takes into account the impact that any additional abstraction from these river reaches or GWMUs has on the critical reach or unit.

This means that the low flow resource availability status of one GWMU has changed from the Consultation Document. This was done in order to fit with the new way in which the Agency override the low flow resource availability status of a river reach or GWMU above a critical reach or unit. This has not changed the way in which the Agency propose to manage these reaches and units. The results of this can be seen in Table 3.
4.5 Water Resource Management Units in the Don and Rother CAMS area

The Don and Rother CAMS area has nine surface WRMUs. The WRMUs have been derived according to the level of hydrometric data, distribution of abstractions, discharges, major tributaries and ecological characteristics. All abstractions and discharges have been included in the resource assessment, which applies to the main CAMS rivers. An EW assessment is only carried out on the main CAMS rivers, but the calculation of the available resource includes the impact of all abstractions in a WRMU draining to the AP.
An assessment of resources has not been carried out on Ea Beck, a river where there is little abstraction and no gauging station. Without a flow gauging station a resource assessment could not be undertaken with the required level of confidence for the results to be used by CAMS. The Lower Went WRMU also has no gauging station but an assessment of resources was undertaken by developing a mathematical model using data from Walden Stubbs gauging station situated on the Upper Went. The River Don downstream of Kirk Sandall is also not included in the Don and Rother CAMS due to tidal influence. With current technology a reliable assessment of water resources could not be carried out on these reaches.

The upper limit of this CAMS area on the River Don is the base of the reservoir dam walls. No assessment has been made upstream of the dam wall as all the resource is fully committed to public water supply and reservoir compensation releases. The land upstream of the reservoir dam wall is owned by Yorkshire Water Services Ltd., and there is unlikely to be a demand for new abstractions from third parties, as they would have no riparian rights to abstract. Any surplus water flows into the downstream rivers by overtopping the dam walls.

There are five GWMUs, which have been assessed within the surface WRMs. The Magnesian Limestone aquifer has been split into three individual GWMUs, separated by drainage areas to individual rivers. The Millstone Grit and Coal Measures, both minor aquifers, have been assessed as whole units. The Sherwood Sandstone aquifer, designated a major aquifer for water supply underlies several CAMS areas across Yorkshire. It is not appropriate to assess this aquifer in isolation in each CAMS. A separate investigation will be undertaken on the Sherwood Sandstone groundwater unit, incorporating the development of a new groundwater model, in 2005. The results of the study will be published in the Aire and Calder CAMS in 2007.

The following Sections describe the results of the resource assessment for each WRMU.

4.5.1 Water Resource Management Unit 1 – River Sheaf

The River Sheaf is the smallest WRMU in the Don and Rother CAMS area and covers an area of approximately 49km². The river flows from high in the Pennines and joins the River Don in Sheffield. The land in the upper catchment is predominantly used for grazing in contrast with the urban lower part of the catchment. The WRMU is underlain by the Millstone Grit and Coal Measures aquifers. River flows are measured at Highfields gauging station with records dating back to 1981.

The total licensed volume of water abstraction from the River Sheaf WRMU accounts for 11% of the total licensed volume in the whole Don and Rother CAMS area. The number of licences makes up 3% of the total number of licences in this CAMS area. The rural character of the catchment is reflected in that over 72% of the licensed volume within the River Sheaf WRMU is for agricultural use. Of the total licensed volume of water to be abstracted from the River Sheaf WRMU, 81% is actually abstracted in an average year.

There are no wastewater treatment works discharging into the River Sheaf. Other discharges unassociated with licensed abstractions account for only 15m³/day. This data was used in the resource assessment calculations undertaken using the Resource Assessment and Management framework (RAM). The results for this WRMU are:

- both of the aquifers have been assessed as having a resource availability status category of ‘water available’
- surface water abstraction from the WRMU is at a sustainable rate
- this unit is assessed as ‘no water available’

4.5.2 Water Resource Management Unit 2 – Upper Don

The Upper Don WRMU consists of the River Don and main tributaries from the headwaters and the base of the reservoir dam walls, to Hadfields gauging station in Sheffield. The WRMU covers an area of approximately 193km². The land use of the WRMU is predominantly characterised by grazing and open moorland while the valley floors contrast between farmland and heavily urbanised areas. Heavy industry, attracted to the area for its natural resources, can still be found in many of the valleys. The majority of the mills and dye works have now closed down with the steel industry now dominant. The WRMU is underlain by the Millstone Grit and Coal Measures minor aquifers. Flows are measured at Hadfields gauging station, situated next to Meadowhall in Sheffield, with records dating back to 1966.

The total licensed volume of water abstraction from the Upper Don WRMU accounts for 43% of the total licensed volume in the whole Don and Rother CAMS area. The number of licences makes up 38% of the total number of licences in this CAMS area. Within the WRMU surface water licences represent only 19% of the total number of licences but account for over 93% of the volume of abstracted water. Over 99% of the licensed volume abstracted within the WRMU is for industrial use. Of the total licensed volume of water to be abstracted from the Upper Don WRMU, only 17% is actually abstracted in an average year.

Compensation flow releases are made from the reservoirs. These flows contribute to the baseflow of the river, which is especially important during the summer lower flow months. The ecology of the upper reaches has adapted to these flows.

There are four wastewater treatment works that discharge at a total flow of 5.52Ml/day into the WRMU. This data was used in the resource assessment calculations undertaken using the RAM framework. The results for this WRMU are:

- both of the aquifers have been assessed as having a resource availability status category of ‘water available’
- surface water abstraction from the WRMU is at a sustainable rate
- this unit is assessed as ‘water available’

4.5.3 Water Resource Management Unit 3 – Upper Rother

The upper reaches of the River Rother drain the peat of the high Pennines. The river then flows through Chesterfield, an urban area of high industrial demand for water. The WRMU covers an area of approximately 167km². The WRMU is underlain by the Coal Measures minor aquifer. River flows have been measured at Whittington gauging station, situated downstream of Chesterfield, since 1964.

The total licensed volume of water abstraction from the Upper Rother WRMU accounts for 3% of the total licensed volume in the whole Don and Rother CAMS area. The number of licences makes up 13% of the total number of licences in this CAMS area. Within the WRMU surface water licences account for over 94% of the volume of abstracted water. Of the total licensed
volume of water to be abstracted from the Upper Rother WRMU, 77% is actually abstracted in an average year.

There are five wastewater treatment works that discharge at a total flow of 4.23Ml/day into the WRMU. Minewater discharges at Cresswell and Brimington also supplements river flows.

The river water feed for Chesterfield Canal is situated at Chesterfield. The planned restoration of Chesterfield Canal will increase the demand for water resources in this area but these developments will take place beyond this CAMS cycle.

This data was used in the resource assessment calculations undertaken using the RAM framework. The results for this WRMU are:

- the Coal Measures aquifer has been assessed as having a resource availability status category of ‘water available’
- surface water abstraction from the WRMU is at a sustainable rate
- this unit is assessed as ‘water available’

### 4.5.4 Water Resource Management Unit 4 – Lower Rother

The Lower Rother WRMU includes the River Rother from Whittington gauging station down to Woodhouse Mill gauging station, and the River Doe Lea, which joins the River Rother at Renishaw. The WRMU covers an area of approximately 184km². The industrial past of the River Rother catchment has resulted in the water in the River Rother being of insufficient quality for many abstraction purposes. This is changing as part of a longer term improvement trend since 1995. The WRMU is underlain by the Coal Measures, a minor aquifer. River flows have been measured at Woodhouse Mill gauging station since 1976.

The total licensed volume of water abstraction from the Lower Rother WRMU accounts for 7% of the total licensed volume in the whole Don and Rother CAMS area. The number of licences make up 6% of the total number of licences in this CAMS area. Within the WRMU 98% of the volume of abstracted water. Over 96% of the licensed volume abstracted within the WRMU is for industrial use. Of the total licensed volume of water to be abstracted from the Lower Rother WRMU, only 41% is actually abstracted in an average year.

There are 11 wastewater treatment works which discharge a total flow of 44Ml/day into the WRMU. Minewater discharges at Orgreave and Treeton also supplement flows.

Only small quantities of water are abstracted from or discharged to the River Doe Lea.

This data was used in the resource assessment calculations undertaken using the RAM framework. The results for this WRMU are:

- the Coal Measures aquifer has been assessed as having a resource availability status category of ‘water available’
- surface water abstraction from the WRMU is at a sustainable rate
- this unit is assessed as ‘water available’

### 4.5.5 Water Resource Management Unit 6 – Upper Dearne

The Upper Dearne WRMU extends from the headwaters of the River Dearne to Barnsley gauging station situated in Barnsley. The unit covers an area of approximately 119km². The catchment is predominantly agricultural in nature. The unit is underlain by the extensive Coal Measures minor aquifer. River flows have been measured at Bamsley gauging station since 1960.

The total licensed volume of water abstraction from the Upper Dearne WRMU accounts for less than 1% of the total licensed volume in the whole Don and Rother CAMS area. The number of licences makes up 8% of the total number of licences in this CAMS area. Within the WRMU 70% of all licences are for agriculture, although these licences are for relatively small quantities. Of the total licensed volume of water to be abstracted from the Upper Dearne WRMU, only 75% is actually abstracted in an average year.

There are two wastewater treatment works which discharge a total flow of 2.81Ml/day into the WRMU. Minewater discharge at Woolley also supplements flows.

This data was used in the resource assessment calculations undertaken using the RAM framework. The results for this WRMU are:

- the Coal Measures aquifer has been assessed as having a resource availability status category of ‘water available’
- surface water abstraction from the WRMU is at a sustainable rate
- this unit is assessed as ‘water available’

### 4.5.6 Water Resource Management Unit 6 – Lower Dearne

The Lower Dearne WRMU is situated between Barnsley gauging station and Adwick gauging station which lies on the River Deane just upstream of its confluence with the River Don. The unit covers an area of approximately 192km². The land use in the catchment is a mixture of urban and agricultural. The unit is underlain by the extensive Coal Measures minor aquifer and the middle Magnesian Limestone major aquifer GWMU. River flows have been measured at Adwick gauging station since 1976.
The total licensed volume of water abstraction from the Lower Dearne WRMU accounts for 5% of the total licensed volume in the whole Don and Rother CAMS area. The number of licences makes up 7% of the total number of licences in this CAMS area. Surface water abstraction accounts for 86% of the total licensed volume in the WRMU. Of the total licensed volume of water to be abstracted from the Lower Dearne WRMU, only 14% is actually abstracted in an average year.

There are 17 wastewater treatment works which discharge at a total flow of 57Ml/day into the WRMU.

This data was used in the resource assessment calculations undertaken using the RAM framework. The results for this WRMU are:

- both aquifers have been assessed as having a resource availability status category of ‘water available’
- surface water abstraction from the WRMU is at a sustainable rate
- this unit is assessed as ‘water available’

4.5.7 Water Resource Management Unit 7 - Middle Don

The Middle Don WRMU stretches from the centre of Sheffield down to Kirk Sandall, downstream of Doncaster. It also includes small stretches of the River Rother up to Woodhouse Mill gauging station and the River Deane up to Adwick gauging station. The unit covers an area of approximately 271km². Much of the river is ponded and classified as a navigable watercourse, making up sections of the Sheffield and South Yorkshire Navigation. These ponded reaches are connected by riffle and pool reaches. The River Deane joins the River Don at Conisborough, which significantly increases the river flows. Kirk Sandall is the tidal limit of the River Don, therefore this WRMU is the most downstream unit on the main River Don. The unit is extensively underlain by Coal Measures, with a small section of Magnesian Limestone near Doncaster. River flows have been measured at Doncaster gauging station since 1959.

The total licensed volume of water abstraction from the Middle Don WRMU accounts for 28% of the total licensed volume in the whole Don and Rother CAMS area. The number of licences makes up 14% of the total number of licences in this CAMS area. Surface water abstraction accounts for 82% of the total licensed volume quantities in the WRMU. Within the WRMU 99% of the licensed volume of water to be abstracted is for industrial purposes. Of the total licensed volume of water to be abstracted from the Middle Don WRMU, only 29% is actually abstracted in an average year.

There are six wastewater treatment works which discharge at a total flow of 204Ml/day into the WRMU.

This data was used in the resource assessment calculations undertaken using the RAM framework. The results for this WRMU are:

- both aquifers have been assessed as having a resource availability status category of ‘water available’
- surface water abstraction from the WRMU is at a sustainable rate
- this unit is assessed as ‘water available’

4.5.8 Water Resource Management Unit 8 - Upper Went

The Upper Went WRMU lies between the headwaters of the Went down to Walden Stubbs gauging station. The catchment is agricultural in nature and covers an area of approximately 86km². The unit is underlain by the Coal Measures minor aquifer and the northern Magnesian Limestone major aquifer GWMUs. River flows have been measured at Walden Stubbs gauging station since 1979.
The total licensed volume of water abstraction from the Upper Went WRMU accounts for 3% of the total licensed volume in the whole Don and Rother CAMS area. The number of licences makes up 8% of the total number of licences in this CAMS area. Abstraction from groundwater accounts for 95% of the total licensed volume of water that can be abstracted within the WRMU. Of the total licensed volume of water to be abstracted from the Upper Went WRMU, only 49% is actually abstracted in an average year.

There are four wastewater treatment works which discharge at a total flow of 6.68 Ml/day into the WRMU.

The most northerly Magnesian Limestone GWMU that underlies the Upper Went has been assessed as ‘water available’. The Upper Went CAMS river is assessed as ‘over-licensed’. It is not ‘over-abstracted’. This is because the quantities of water that are actually taken are less than the quantities allocated for abstraction on the licences. The Upper Went is dependent upon flow from the GWMU as the aquifer contributes to the baseflow of the river. The groundwater resource assessment has been overridden to ‘over-licensed’, as any further abstraction from the aquifer would have the potential to affect river flows.

- the unit has been assessed as ‘over-licensed’

**4.5.9 Water Resource Management Unit 9 – Lower Went**

The Lower Went WRMU is from Walden Stubbs gauging station down to the confluence with the River Don at Went Mouth Sluices. The unit is agricultural in nature and covers an area of approximately 99 km². The unit is underlain by the Sherwood Sandstone aquifer which will not be assessed until the Aire and Calder CAMS (see Section 4.5 for further information). There is no gauging station on the Lower Went. The resource estimation has therefore not been based upon measured data but on a mathematical estimation and for this reason there is greater uncertainty about the result.

The total licensed volume of water abstraction from the Lower Went WRMU accounts for less than 1% of the total licensed volume in the whole Don and Rother CAMS area. The number of licences makes up 3% of the total number of licences in this CAMS area. Of the total licensed volume of water to be abstracted from the Lower Went WRMU, only 18% is actually abstracted in an average year.

There is one wastewater treatment works that discharges at a total flow of 0.5 Ml/day into the WRMU.

The Internal Drainage Boards pump water into the river and this impacts on the river flows in this WRMU. The water flowing into the River Don is controlled by sluice gates, which results in ponding of the downstream reaches of the River Went during times of high tide on the River Don.

This data was used in the resource assessment calculations undertaken using the RAM framework. The results for this WRMU are:

- surface water abstraction from the WRMU is at a sustainable rate
- the unit has been assessed as ‘no water available’

**4.5.10 Implications of the CAMS resource availability status on the Regional Water Resource Strategy**

The Agency’s National and Regional Water Resource Strategies define water resources availability. In this the Agency reported that for strategic water resources, the Don and Rother catchments have been assigned as having the classification of ‘water available’.

Within this Don and Rother CAMS, all catchments have been assigned as having the resource availability status of ‘water available’ with the following exceptions:

- the small rural catchment of the River Sheaf is updated to ‘no water available’
- the Water Resource Management Units of the Upper and Lower Went are assigned the classification of ‘over-licensed’ and ‘no water available’ respectively

It is important to note that these updates are limited to the smaller tributaries and do not alter the water availability of the larger strategic rivers.
5.1 Sustainability appraisal

5.1.1 Introduction

A sustainability appraisal process has been developed to enable the Agency to take account of pros and cons in the production of CAMS. The process considers the government’s four objectives of sustainable development, relating to the environment, economics, society and resource use. It uses a largely qualitative, pro forma-based approach to consider what the resource availability status for each WRMU should or could be after each six-year cycle (Tier 1). This is undertaken for all units in all CAMS areas. It also allows the appraisal of options for recovering water resources, by taking into account the implications of different options on all aspects of sustainability (Tier 2). This is undertaken to determine the most sustainable options for the future management of the catchment including, where necessary options for recovery of resources. More information on the sustainability appraisal process is provided in Managing Water Abstraction.

5.2 Catchment overview of licensing strategy

Future abstraction licensing in the Don and Rother CAMS area will be based on the resource assessment carried out for the Don and Rother CAMS. This provides the Agency with an improved understanding of where water resources are available on a catchment scale and a more structured system of managing abstraction, whilst minimising the risks to the environment.

Below is an outline of the Agency’s licensing strategy in the Don and Rother CAMS area as a whole. Sections 5.4 to 5.8 describe in detail the strategy for each WRMU. The strategy provides an indication of whether licences are likely to be available and the conditions which would be expected on new or varied licences.

It is important to note that the strategy relates primarily to licences that have a consumptive use of the abstracted water and therefore have a net impact upon the catchment water resource. The Agency will generally consider non-consumptive licences where the water is discharged back to river, in all WRMUs at all times of the year.

5.2.1 Licence determination

All future licence applications will be considered against the requirements of national legislation: Water Resources Act (1991). The Agency will always assess the local impacts of proposed abstractions on the environment and existing licence holders and this may override the resource availability status of the catchment as defined through the RAM framework of CAMS. Therefore, even if the strategy set out below indicates that water is available, local impacts or other considerations may prevent a licence from being issued. For more information on the licence determination process refer to Managing Water Abstraction (Annexe 2).

5.2.2 Surface water abstractions

The licensing strategy will introduce in each WRMU a set quantity of water that can be abstracted all year round (i.e. higher reliability) and three new levels of hands-off flow. If or when this ‘all year round’ water is allocated, also known as the ‘unconstrained’ quantity, further abstractions will be allocated a hands-off flow. Each hands-off flow will give abstractors different reliabilities of abstraction i.e. the amount of time abstraction can take place within a 12 month period. Licences will be granted on a first-come-first-served basis.

5.2.3 Groundwater abstractions

There is a moratorium in place on abstraction from the Sherwood Sandstone aquifer in Ridings Area for large abstractions. However applications to abstract less than 7300m$^3$/year will be considered on a case-by-case basis. The groundwater level in the Sherwood Sandstone aquifer has been declining since 1971 at an average rate of 14cm a year. In recent years, levels have started to recover. However, the recovery period has not been long enough to give confidence that abstraction from the Sherwood Sandstone is now at a sustainable level. The Agency is developing a new hydrogeological model of the aquifer, which underlies several CAMS areas in Yorkshire. The results from the model and strategy for managing the aquifer will be incorporated into the Aire and Calder CAMS, to be published in 2007.

The available resource in the Magnesian Limestone, Coal Measures and Millstone Grit aquifers is discussed within each WRMU. All abstractions from the remaining aquifers will be determined on a case-by-case, first-come-first-served basis, in accordance with the Water Resources Act (1991).
5.2.4 Licences from tributaries

Applications for abstractions from smaller tributaries (i.e. non CAMS rivers) will be determined against the requirements of the Water Resources Act (1991) on a case-by-case basis and by the effect they have on the main CAMS river. This includes applications to abstract from Ea Beck, which is not a CAMS river.

5.2.5 Exempt abstractions

Managing Water Abstraction (Annexe 2) describes instances, relating to both purpose and quantity, for which a licence is not required.

5.2.6 Discharge of abstracted water

The point to which abstracted water is discharged impacts upon the resource availability in the Don and Rother CAMS area. Conditions may be applied to new licences that specify the point of discharge when an abstraction has the potential to significantly impact the water resource management of the catchment. This will be decided by the Agency on a case-by-case basis. CAMS does not set out an overall policy for this.

5.2.7 Impoundment licences

Licence applications for new impoundments will be considered on a case-by-case basis.

5.2.8 Management of licences

If necessary the Agency may revoke unused and reduce partially used licences throughout the Don and Rother CAMS area where relevant legislation permits. This will be done in consultation with licence holders.

The Agency will continue to operate a rigorous enforcement policy and inspections will continue to be carried out regularly to ensure licence holders are meeting the conditions of their licences.

5.3 Approach to time limiting

5.3.1 New Licence applications and new variations to existing licences

For all new licence applications and variations to existing licences, there is a presumption that they will be issued with a time limit.

For the Don and Rother CAMS area, the normal renewal period for time limited licences is 12 years, and the common end date for the catchment is March 31 2017. Most new licences will be issued to this common end date so that licences within the catchment expire on the same date, linking with the six yearly CAMS cycle. However it should be noted that licences granted up to March 31 2005 will be issued for longer than the normal 12 year period while licences granted after March 31 2005 will be issued for less than the normal 12 year period as the common end date approaches. Any subsequent renewal of a licence in 2017 will normally be for 12 years, i.e. to March 31 2029.

There is a presumption of renewal of time limited licences subject to the following three tests:

- continued justification of the reasonable need for the water
- efficient use of water
- there is no environmental damage caused by the abstraction

Holders of time limited licences will be notified that their licence will expire and that they will be expected to re-apply for their licence.

The Agency also has the discretion to apply shorter time limits to licences justified according to its time limiting policy and in exceptional cases to permit longer duration time limits (please refer to Managing Water Abstraction Sections 5.3 and 5.4). For example, licences to fill winter storage reservoirs may be issued for longer periods.

If a licence is considered to be damaging the environment it may not be renewed with the existing rights and conditions. In this case, the Agency will endeavour to give six years notice if a licence is not to be renewed or is to be renewed but on more restrictive terms, which impact significantly on the use of that licence.

Licences from the Sherwood Sandstone aquifer will be time limited to March 31 2015, in line with the common end date for the Aire and Calder CAMS.

The common end date for the catchments (March 31 2015 for the Aire and Calder CAMS, March 31 2017 for the Don and Rother CAMS) may be overridden by the requirements of the EU Habitats Directive (1992) as outlined in Section 5.3.3 to 5.3.5 of this document.

Further information on time limiting can be found in Managing Water Abstraction (Section 5).

5.3.2 Existing time limited licence holders with hands-off flow conditions

Licence holders with existing hands-off flow conditions which are also time limited and currently give them greater reliability of abstraction than the new three tiered hands-off flow conditions, will NOT have their licences changed without six years notification by the Agency.
Once the six-year notification period has been completed changes to these existing licences will be made following the first-come-first-served principle. Priority will be given to the oldest licences when incorporating them into the new hands-off flow system. This will mean they receive the lowest hands-off flow conditions first. All licences that are formally varied or are re-issued after the time limit expires will be required to show evidence that they meet the three tests, as outlined in Section 5.3.1 in order to be re-granted.

Licences with hands-off flows that do not refer to an Agency flow monitoring site, but a structure local to the point of abstraction, may not be incorporated into the new three tier hands-off flow management system. These will be assessed on a case-by-case basis.

5.3.3 Implications of the Habitats Directive on abstraction licensing

The Agency is currently undertaking a review to assess the impact of all its permissions, including abstraction licences, on Habitats Directive sites. Following the review, any actions such as changes to licences, which may be necessary to prevent damage to the Habitats Directive sites, are planned to be implemented by the dates shown in Table 4.

<table>
<thead>
<tr>
<th>Habitats Directive site</th>
<th>Timetable for changes to licences</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Pennine Moors</td>
<td>2006</td>
</tr>
<tr>
<td>Thorne and Hatfield Moors</td>
<td>2006</td>
</tr>
<tr>
<td>Humber Estuary</td>
<td>2008</td>
</tr>
</tbody>
</table>

The detailed review includes licences within or close to the boundary of these sites, or within the catchment. As the whole Don and Rother CAMS area ultimately drains to the Humber Estuary, in principle any licence in the Don and Rother CAMS area may have an impact on this Habitats Directive site. However, the majority of licences are small relative to flows in the estuary and therefore unlikely to have a significant effect. However, in the event that a licence is found to be damaging, it may be amended or revoked according to the timetable shown in Table 4.

The Agency will write in advance to any licence holders who will be affected by the review. If you are an existing licence holder you do not need to contact the Agency regarding the Habitats Directive.

5.3.4 Implications of the Habitats Directive on existing time limited licences

If an existing licence is due to expire before the dates shown in Table 4 and is likely to have a significant effect then:

- the licence may be renewed to the date shown in Table 4 while the Agency complete the detailed assessment of impacts. This is providing that the potential impact of the abstraction over this period is not considered unacceptable
- the licence may not be renewed or it may be renewed with different conditions

If a licence is due to expire on or after the dates shown in Table 4 then at the end of the review process the Agency will decide whether or with what conditions to renew it.

If an existing time limited licence is not likely to have a significant effect on a Habitat Directive site then it will be managed as outlined in Section 5.3.1.

The Agency will write in advance to any licence holders who will be affected by the review. If you are an existing licence holder you do not need to contact the Agency regarding the Habitats Directive.

5.3.5 Implications of the Habitats Directive on the time limiting of new licences

If the Agency determines that a new licence application is likely to have a significant effect upon a Habitats Directive site, the following rules will be applied to setting a time limit for that licence:

1. If the assessment of the impact on the Habitats Directive site is inconclusive, the licence may be granted with a time limit to the dates shown in Table 4. These are the dates when the Agency will have completed a full assessment of impacts on the site and decided what action, if any, is necessary to prevent damage.

2. If the licence is assessed to have a detrimental impact upon the Habitats Directive site then it might be refused or have special conditions attached.

If a detailed assessment shows that the new licence will have no impact upon the Habitats Directive site then it will be managed as set out in Section 5.3.1.

5.3.6 Introduction to Water Resource Management Units

The following sections set out the licensing strategy for individual WRMUs. It is important to note that this strategy may not apply to non-consumptive licences or licences that are consumptive but are determined by the Agency to result in a net benefit to the water environment. Where appropriate WRMUs that have the same water resource availability status have been combined.
5.4 Water resource management unit: River Sheaf (1)

5.4.1 Resource availability status and results of sustainability appraisal

The River Sheaf WRMU has a resource availability status of 'no water available' at low flows. This CAMS river has the highest Environmental Weighting score (A) of the Don and Rother CAMS area, which means that the ecology and fisheries are sensitive to changes in flow. The sustainability appraisal process has determined the preferred option for this CAMS cycle is to maintain the resource availability status of 'no water available'.

5.4.2 Guidance on the assessment of new applications

Consumptive surface water licences will be issued with hands-off flow conditions attached. The most reliable hands-off flow of 7.5Ml/d, measured at Highfields gauging station, will allow abstraction, on average, for 95% of the time or 347 days per year.

Table 5 Hands-off flow rates and corresponding reliability of abstraction for the River Sheaf WRMU

<table>
<thead>
<tr>
<th>Hands-off flow reliability of abstraction (Based upon long term average days per year)</th>
<th>Hands-off flows (Ml/d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hands-off flow 1 (347 days per year)</td>
<td>7.5</td>
</tr>
<tr>
<td>Hands-off flow 2 (299 days per year)</td>
<td>12</td>
</tr>
<tr>
<td>Hands-off flow 3 (251 days per year)</td>
<td>18</td>
</tr>
</tbody>
</table>

Once this water has been allocated the next hands-off flow condition, offering reduced reliability of abstraction, will be applied to new licences. The reliability of abstraction of each hands-off flow in the WRMU is shown in Table 5.

Increased volumes of water are available for abstraction during the winter months when flows are higher, although these volumes will still be small due to the relatively small size of the catchment.

Groundwater licences will be available subject to the normal licence determination procedure including assessment of local circumstances and issued on a case-by-case basis. Both the reliability of abstraction and the volumes of water available will be low.

All new and varied licences in the unit will be time limited. The common end date for the unit is March 31 2017. When renewed licences will normally be issued with a further 12 year time limit.

5.4.3 Renewals and management of existing licences

There will be a presumption of renewal of time limited licences, subject to the renewal criteria outlined in Section 5.3.1. However, licence conditions may be subject to minor changes.

5.5 Water Resource Management Unit: Upper Don (2)

5.5.1 Resource availability status and results of the sustainability appraisal

The Upper Don WRMU has a resource availability status of 'water available'. The sustainability appraisal process has determined the preferred option for this CAMS cycle is to maintain the resource availability status of 'water available', with the resource being available for abstraction.

5.5.2 Guidance on the assessment of new applications

There is water available for further abstraction throughout the year.

The reliability of abstraction throughout the year is high. Surface water abstraction licences without hands-off flow conditions are available until the unconstrained quantity of available water has been allocated.

Once the unconstrained quantity of available water has been allocated, licences will be granted with the least restrictive (i.e. most reliable in terms of abstraction) hands-off flow conditions. The most reliable hands-off flow of 100Ml/d, measured at Hadfields gauging station, will allow abstraction, on average, 126 days per year.

Table 6 Hands-off flow rates and corresponding reliability of abstraction for the Upper Don WRMU

<table>
<thead>
<tr>
<th>Hands-off flow reliability of abstraction (Based upon long term average days per year)</th>
<th>Hands-off flows (Ml/d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hands-off flow 1 (347 days per year)</td>
<td>100</td>
</tr>
<tr>
<td>Hands-off flow 2 (332 days per year)</td>
<td>133</td>
</tr>
<tr>
<td>Hands-off flow 3 (270 days per year)</td>
<td>183</td>
</tr>
</tbody>
</table>
for 95% of the time or 347 days per year. Once this water has been allocated the next hands-off flow condition, offering reduced reliability of abstraction will be applied to new licences. The reliability of abstraction of each hands-off flow in each WRMU is shown in Table 6.

The river reaches immediately downstream of the reservoir dam walls are fish spawning grounds. These reaches require extra protection with regard to maintaining adequate flows for fish spawning. Further abstraction will be restricted in these reaches with only small volumes of water being able to be abstracted. This will be assessed on a case-by-case basis.

Groundwater licences will be available from the Coal Measures aquifer subject to the normal licence determination procedure including assessment of local circumstances and issued on a case-by-case basis.

All new and varied licences in the WRMU will be time limited. The common end date for the unit is March 31 2017. When renewed, licences will normally be issued with a further 12 year time limit.

5.5.3 Renewals and management of existing licences

There will be a presumption of renewal of time limited licences, subject to the renewal criteria outlined in Section 5.3.1. However, licence conditions may be subject to minor changes.

5.6 Water Resource Management Units: Upper Rother (3), Lower Rother (4), Upper Dearne (5), Lower Dearne (6) and Middle Don (7)

5.6.1 Resource availability status and results of the sustainability appraisal

These WRMUs all have a resource availability status of ‘water available’ at low flows. The sustainability appraisal process has determined the preferred option for this CAMS cycle is to maintain the resource availability status of ‘water available’, with the resource being available for abstraction.

5.6.2 Guidance on the assessment of new applications

There is water available for further abstraction throughout the year.

The reliability of abstraction throughout the year is high. Surface water abstraction licences without hands-off flow conditions are available until the unconstrained quantity of available water has been allocated.

Once the unconstrained quantity of available water has been allocated, licences will be granted with the least restrictive (i.e. most reliable in terms of abstraction) hands-off flow condition. The most reliable hands-off flow condition will allow abstraction, on average, for 95% of the time or 347 days per year. The reliability of abstraction of each hands-off flow in the WRMU is shown in Table 7.

In the Lower Dearne WRMU, on the River Dove, water is released from Worsbrough reservoir for the benefit of downstream ecology. To protect the limited resource of the reservoir further surface water abstraction will be restricted on the river reaches immediately downstream of the reservoir.

Groundwater licences are available from the Coal Measures aquifer. There is a moratorium in place on abstraction from the Sherwood Sandstone aquifer for large abstractions (see Section 5.2.3 for more information). However applications to abstract less than 7300m³/year, based upon 20m³/day for domestic and agricultural use, will be considered on a case-by-case basis. All groundwater applications will be subject to the normal licence determination procedure including assessment of local circumstances.

All new and varied licences in the WRMU will be time limited. The common end date for the unit is March 31 2017. When renewed, licences will normally be issued with a further 12 year time limit.

<table>
<thead>
<tr>
<th>Water Resource Management Units</th>
<th>Hands-off flows in individual WRMU (Ml/d)/ Hands-off flow reliability of abstraction (days per year) (Based upon long term average days per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HOF 1</td>
</tr>
<tr>
<td>Upper Rother</td>
<td>30</td>
</tr>
<tr>
<td>Lower Rother</td>
<td>81</td>
</tr>
<tr>
<td>Upper Dearne</td>
<td>26</td>
</tr>
<tr>
<td>Lower Dearne</td>
<td>72</td>
</tr>
<tr>
<td>Middle Don</td>
<td>410</td>
</tr>
</tbody>
</table>
5.6.3 Renewals and management of existing licences

There will be a presumption of renewal of time limited licences, subject to the renewal criteria outlined in Section 5.3.1. However, licence conditions may be subject to minor changes.

5.7 Water Resource Management Unit: Upper Went (8)

5.7.1 Resource availability status and results of the sustainability appraisal

The Upper Went WRMU has a resource availability status of ‘over-licensed’ at low flows. The actual rate of abstraction is much less than the potential licensed quantities that could be abstracted. The present rate of abstraction, as assessed under the RAM framework, is at an environmentally sustainable level. There are many existing time limited licences in the WRMU that expire in 2006. There is a presumption of renewal of these licences subject to the renewal criteria as outlined in Section 5.3.1. The sustainability appraisal process has determined the preferred option for this CAMS cycle is to maintain the resource availability status of ‘over-licensed’.

The new three tiered hands-off flow licensing system offers, in practice, a reduced reliability of abstraction in comparison with hands-off flow conditions on existing licences.

Table 8 Hands-off flow rates and corresponding reliability of abstraction for the Upper Went WRMU

<table>
<thead>
<tr>
<th>Hands-off flow reliability of abstraction (Based upon long term average days per year)</th>
<th>Hands-off flows (ML/d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hands-off flow 1</td>
<td>Resource fully allocated</td>
</tr>
<tr>
<td>Hands-off flow 2</td>
<td>Resource fully allocated</td>
</tr>
<tr>
<td>Hands-off flow 3 (255 days per year)</td>
<td>19</td>
</tr>
</tbody>
</table>

5.7.2 Guidance on the assessment of new applications

Surface water is available for consumptive abstraction at high flows. A hands-off flow will be applied to all new licences.

The quantities allocated for the two most reliable hands-off flows have already been allocated to existing abstractors. The most reliable hands-off flow that has water available for abstraction (19ML/d, measured at Walden Stubbs gauging station) will allow abstraction, on average, for 70% of the time or 255 days per year. The reliability of abstraction of the hands-off flow is shown in Table 8. Resources are therefore available to meet a reliable winter storage abstraction or an unreliable summer abstraction. Although winter storage is a possible option there is little water available for consumptive uses.

Groundwater abstraction will only be considered from the Magnesian Limestone aquifer when surface water flows are high. This is because of the interaction between groundwater and surface water in the unit. The Magnesian Limestone aquifer contributes to the baseflow of the River Went. Therefore, further abstractions from groundwater in the summer months would reduce the base flow into the River Went and contribute to low flow problems. All applications to abstract groundwater will be assessed on a case-by-case basis.

All new and varied licences in the WRMU will be time limited. The common end date for the unit is March 31 2017. When renewed, licences will normally be issued with a further 12 year time limit.

5.7.3 Renewals and management of existing licences

There will be a presumption of renewal of time limited licences, subject to the renewal criteria outlined in Section 5.3.1. However, licence conditions may be subject to minor changes.

The new hands-off flow conditions that will be implemented under CAMS offers, in practice, a reduced reliability of abstraction compared with existing hands-off flow conditions.

Existing licences will not be incorporated into the new three tier hands-off flow licensing system without six years notice by the Agency and until an investigation has been completed into the environmental and economic cost and benefits of doing so. This notice will be served in 2003. The investigation will be completed by 2009, which will coincide with the publication of the second Don and Rother CAMS.

All licences that expire in 2006, which will have been served six years notice in 2003, will have their licence renewed, with their existing conditions, for three years until 2009.

If the outcome of the investigation is to incorporate these licences into the new three tiered licensing system, this will be undertaken as described in Section 5.3.2. These licences will then be time limited with these new conditions until 2017.

If the outcome of this investigation is not to incorporate these licences into the new three tiered licensing system then the time limits will be extended with their existing conditions until 2017.
5.7.4 Resource recovery strategy and other changes to existing licenses

The outcome of the sustainability appraisal is for the Agency not to actively reduce quantities on licences to change the resource availability status from 'over-licensed' to 'no water available'. The Agency will however require existing licence holders, whose time limits expire in 2006, to prove 'reasonable need' of their existing licensed quantities.

5.8 Water Resource Management Unit: Lower Went (9)

5.8.1 Resource availability status and results of the sustainability appraisal

The Lower Went WRMU has a resource availability status of 'no water available' at low flows. The sustainability appraisal process has determined the preferred option for this CAMS cycle is to maintain the resource availability status of 'no water available'. The resource availability is not based upon measured data but on a mathematical estimation and for this reason there is greater uncertainty about the results.

Table 9  Hands-off flow rates and corresponding reliability of abstraction for the Lower Went WRMU

<table>
<thead>
<tr>
<th>Hands-off flow reliability of abstraction (Based upon long term average days per year)</th>
<th>Hands-off flows (Ml/d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hands-off flow 1 (347 days per year)</td>
<td>17</td>
</tr>
<tr>
<td>Hands-off flow 2 (310 days per year)</td>
<td>22</td>
</tr>
<tr>
<td>Hands-off flow 3 (219 days per year)</td>
<td>35</td>
</tr>
</tbody>
</table>

5.8.2 Guidance on the assessment of new applications

Surface water is available for abstraction. A hands-off flow will be applied to all new licences.

The quantities for unconstrained abstraction have been allocated to existing abstractors. The most reliable hands-off flow of 17Ml/d, will allow abstraction, on average, for 95% of the time or 347 days per year. The reliability of abstraction of each hands-off flow in the WRMU is shown in Table 9. This is subject to normal licensing determination criteria including assessment of local circumstances.

Groundwater licences are available from the Coal Measures aquifer. There is a moratorium in place on abstraction from the Sherwood Sandstone aquifer for large abstractions (see Section 5.2.3 for more information). However applications to abstract less than 7300m³/year, based upon 20m³/day for domestic and agricultural use, will be considered on a case-by-case basis. All groundwater applications will be subject to the normal licence determination procedure including assessment of local circumstances.

All new and varied licences in the WRMU will be time limited. The common end date for the unit is March 31, 2017. When renewed licences will normally be issued with a further 12 year time limit.

5.8.3 Renewals and management of existing licences

There will be a presumption of renewal of time limited licences subject to the other renewal criteria outlined in Section 5.3.1. However, licence conditions may be subject to minor changes.

5.9 Opportunities for water rights trading in the Don and Rother CAMS area

One of the objectives of the CAMS process is to facilitate water rights trading. The term water rights trading refers to the transfer of licensable water rights from one party to another, for benefit. It involves a voluntarily movement of a right to abstract water between abstractors, using the abstraction licensing process. More detailed information is available in Managing Water Abstraction (Section 4).

A guidance leaflet (Water Rights Trading) was published and sent to licence holders towards the end of 2002 explaining the scope for water rights trading within current legislation. Consultation on more detailed proposals took place in July 2003. After considering responses to the consultation exercise, in the winter of 2003, further information will be made available to update licence holders on the Agency's conclusions for a detailed framework within which water rights trading will take place.
5.10 The impact of the Water Bill

The Government, as well as the Agency and other organisations, considers that significant changes to the water abstraction authorisation system are now needed in order to help ensure that we continue to use water resources sustainably. Over the last few years, Government proposals and decisions have been set out in a series of consultation and decision papers, resulting in the publication of a draft Water Bill in November 2000. The proposed Water Bill will complement existing Agency initiatives, such as the review and curtailment of damaging abstractions, the development of a framework for trading in water rights, implementation of the Agency's policy on time limiting licences and the development of CAMS.

The Water Bill is currently with Parliament and new legislation is expected to be passed in November 2004. When enacted, the responsibility for many of its provisions will fall to the Agency and will result in significant changes to the water resources authorisation system over a period of years. In order to support the implementation of the new legislation, the Agency will produce clear guidance both for Agency staff and existing or potential licence holders and other key stakeholders in order to explain and facilitate the introduction of these important changes.
Future developments in the Don and Rother CAMS area

There are no planned resource developments on the River Don system in this CAMS cycle. There is the possibility of a greater demand for the use of direct river abstraction for agricultural irrigation, but this volume should not be large. The development of winter storage reservoirs will be encouraged due to restricted summer abstraction rates.

The proposed restoration of the Chesterfield Canal is likely to result in additional water demand within the Don and Rother CAMS area. However, it is unlikely that the restoration will take place over the period of this CAMS and therefore it will require further consideration in the review of the Don and Rother CAMS in 2007.

There will be some development of the gauging station network during this CAMS cycle. A new gauging station will be built in Rotherham City Centre in the Middle Don WRMU. The Agency will also carry out a scoping study into building two new gauging stations; one at Conisborough by the confluence of the River Dearne with the River Don, and one on the River Don above Sheffield. The addition of new gauging stations would greatly improve the flow data that could be collected for the resource availability assessment.

There is an ongoing programme of remediation and treatment of minewater discharges at a number of sites in this area, for example, at Woolley. The Agency will also be maintaining a watching brief on the water resources impact of minewater breakout in this next six year period.

There will be an investigation into the need for further fish passes to be introduced on some of the weirs in the River Don catchment.

The investigation into the impact and possible changes to the compensation releases from the reservoirs will continue. Ecological monitoring of the current compensation release regime is to continue until 2004 when the regime will be changed and monitored for a further three years to assess the impact on the riverine ecology.

The Agency will continue to apply the Habitats Regulations and monitor the progress of the review of the Humber Estuary, South Pennine Moors and Thorne and Hatfield Moors. All new licence applications will be assessed to see if the abstraction is likely to have a significant impact upon the sites.
The Agency will review the Don and Rother CAMS starting in 2007 and publish the updated version of the CAMS in 2009. The results of the CAMS driven investigations will be considered during this review. The progress and implementation of the CAMS will be assessed using the following measures:

- the resource availability status of each WRMU either remains unchanged or improves
- visits to licence holders to ensure that licence conditions are met and comply with current legislation
- the protected rights of existing abstractors and existing lawful uses are not adversely affected
- routine sampling programmes will continue to monitor fisheries, macrophytes and macroinvertebrate communities
- gauging stations will continue to monitor river flows and levels
- progress in implementation or development of the Regional and National Water Resources Strategies
- successful application for new or significantly varied abstraction licences in each WRMU will be granted with consideration of resource availability status for that WRMU to protect low flows and flow variability
Glossary of terms and abbreviations

Abstraction  Removal of water from a source of supply (surface or groundwater).

Abstraction - actual The volume of water actually abstracted as opposed to the volume of water that may be abstracted under the terms of an abstraction licence. Individual abstraction records are reported to the Environment Agency each year.

Abstraction licence The authorisation granted by the Environment Agency to allow the removal of water from a source.

Aquifer A geological formation, group of formations or part of a formation that can store and transmit water in significant quantities.

Artificial influences Catchment activities such as surface water abstractions, effluent returns and groundwater abstractions which individually and collectively have an influence on natural flows or levels.

Assessment Point (AP) Critical point in catchment at which an assessment of available resources should be made. APs are located at the extremities of identified reaches and Water Resource Management Units.

Asset Management Plan The Asset Management Plan (AMP) is the plan produced by the Water Companies for Ofwat. It sets out the water industry investment programme. These plans are drawn up through consultation with the Environment Agency and other bodies to cover a five year period. AMPs have to be agreed by Defra and Ofwat.

Biodiversity The living component of the natural world. It embraces all plant and animal species and communities associated with terrestrial, aquatic and marine habitats. It also includes genetic variation within species.

Borehole A well sunk into a water bearing rock from which water will be pumped.

Canal An artificial watercourse used for navigation.

Catchment The area from which precipitation and groundwater will collect and contribute to the flow of a specific river.

Compensation flow Water released from reservoirs to maintain a flow in the river downstream.

Confluence The point where two or more streams or rivers meet.

Constrained abstraction impact The influence of an abstraction source which operates within pre-defined flow/level or water quality constraints.

Consumptive use Use of water where a significant proportion of the water is not returned either directly or indirectly to the source of supply after use.

Demand The requirements for water for human use.

Demand management The implementation of policies or measures which serve to control or influence the consumption or waste of water.

Derogation In legal terms, the taking away of protected rights under the Water Resources Act due to the granting of a new licence.

Discharge The release of substances (i.e. water, sewage etc.) into surface waters.

Drought A general term covering prolonged periods of below average rainfall resulting in low river flows and/or low recharge to groundwater, imposing significant strain on water resources and potentially the environment.

EC Directive Issued by the European Commission to member states with the objective of producing common standards in the European Community – member states are then obliged to introduce appropriate legislation to comply with the Directive.

Environmental impact The total effect of any operation on the environment.

Environmental River Flow Objectives The minimum river flows from the area required to protect ecological and other environmental objectives.

Environmental Weighting An assessment of a river’s sensitivity to abstraction based on physical characteristics, fisheries, macrophyte and macro-invertebrates for a catchment/sub-catchment.

EU Water Framework Directive First major review of European water policy. Seeks to improve water quality in rivers and groundwater in an integrated way. This will be transposed into UK law in 2003.

EU Wild Birds Directive Implemented through the Conservation (Natural Habitats etc.) Regulations 1994 along with the Habitats Directive 1992 – collectively known as the Habitats Directive. A network of sites has been established to protect important and threatened species.

Flood plain Land adjacent to a watercourse that is subject to flooding.

Gauging station A site where the flow of a river is measured.

General Quality Assessment A general measure of the water quality of rivers and canals by reference to chemistry, biology, nutrients and aesthetics.
Geomorphology  Scientific study of land forms and of the processes that formed them.

Groundwater  Water occurring below ground in natural formations (typically rocks, gravels and sands).

Groundwater baseflow  That part of the river flow that is derived from groundwater sources rather than surface run-off e.g. soil water, reservoir releases, effluents etc.

Groundwater Management Units  Administrative sub-divisions of aquifers, defined on geological and hydrogeological criteria, which form the basis for groundwater resource management and licensing policy decisions.

Groundwater Protection Policy  Environment Agency policy relating to groundwater recharge areas to control activities having the potential to pollute underground water.

Habitat  Place in which a species or community of species live, with characteristic plants and animals.

Hands-off flow  A condition attached to the abstraction licence so that if the flow in the river falls below the flow specified on the licence then the abstractor may be required to stop or reduce the abstraction.

Humber Estuary European Marine Site  This comprises the Humber Estuary possible Special Area of Conservation, Humber Flats, Marshes and Coast Special Protection Area and potential Special Protection Area, Humber Flats, Marshes and Coast Ramsar site and proposed Ramsar site.

Hydrogeology  Branch of geology concerned with water within the Earth’s crust.

Hydrology  The study of water on and below the Earth’s surface.

Hydrometry  The measurement of water on or below the Earth’s surface.

Impounding reservoir  A reservoir created by damming a natural watercourse.

Impoundment  A dam, weir or other work constructed in an inland water, whereby water may be impounded and any works for diverting flows in an inland water associated with the construction of a dam, weir or other work.

Internal Drainage Board  A local land drainage authority with powers to raise finance and do works.

Licence  Formal permit allowing the holder to engage in an activity (in the context of this report, usually abstraction), subject to conditions specified in the licence itself and the legislation under which it was issued.

Licence application  Formal request by an individual or organisation to the competent authority for a licence. For abstraction licences, the competent authority is the Environment Agency.

Licence determination  A decision by the competent authority on whether and on what terms to grant or refuse a licence application, by reference to the authority’s regulatory powers and duties.

Licence trading  A commercial transaction for the purpose of transferring an abstraction licence between two or more parties.

Low flow  The flow that is exceeded for a given percentage of the time. For example, Q95 is the flow that is exceeded 95% of the time, this means that flow will only fall this low 5% of the time.

Main river  The watercourse shown on the statutory ‘Main River Maps’ held by the Agency and DEFRA. The Agency has permissive powers to carry out works of maintenance and improvements on these rivers.

Managing Water Abstraction  Document produced in May 2001 on the CAMS process.

Natura 2000  The Habitats Directive will establish and protect a network across Europe of the most important areas for Wildlife, to be known as Natura 2000. This will include all SPAs and SACs on sites which are already SSSIs.

Non-consumptive  This is where all abstracted water is returned to source a relatively short distance downstream of the abstraction point.

Pool  A distinct natural feature of deeper water. In dry-weather conditions, there is no perceptible downstream flow. Back currents may be present.

Potable water  Water of a suitable quality for drinking.

Precautionary principle  Where significant environmental damage may occur, but knowledge on the matter is incomplete, decisions made should err on the side of caution.

Public water supply  Term used to describe the supply of water provided by a water undertaker.

RAM framework  Resource Assessment and Management framework – a technical framework for resource assessment (for the definition and reporting of CAMS) and subsequent resource management (including abstraction licensing).


Reach  A length of river.

Recharge  Water which percolates downward from the surface into groundwater.

Río Earth Summit, 1992  This was the United Nations Conference on Environment and Development (UNCED) in Río de Janeiro. It was the largest ever gathering of world leaders (over 150 Heads of Government). At this conference 153 countries signed the
Constitution on Biological Diversity.

River An open channel in which inland, surface water can flow.

River Flow Objectives (RFOs) The minimum river outflows from the area required to protect ecological objectives, effluent dilution requirements, navigation and amenity in-river needs.

River Quality Objective (RQO) A River Quality Objective is an agreed strategic target, expressed in terms of River Ecosystem standards, which is used as the planning base for all activities affecting the water quality of a stretch of watercourse.

River reach Unit of a river between two Assessment Points, delineated for the purposes of abstraction licensing and resource management.

Salmonids Members of the family Salmonidae, includes salmon, trout and char.

Scenario flows The flows, which would leave the Assessment Point in the specified year, based on the assumed scenario abstractions and discharges.

Site of Special Scientific Interest (SSSI) An area given a statutory designation by English Nature or the Countryside Council for Wales because of its nature conservation value.

Special Area of Conservation (SAC) A Special Area of Conservation is one classified under the EC Habitats Directive and agreed with the EC to contribute to biodiversity by maintaining and restoring habitats and species.

Special Protection Area (SPA) A Special Protection Area is one classified as such under the EC Birds Directive to provide protection to birds, their nests, eggs and habitats.

Spray irrigation Abstracted water sprayed onto grassland, fruit, vegetables etc. Can have a high impact on water resources.

Surface water This is a general term used to describe all the water features such as rivers, streams, springs, ponds and lakes.

Surplus or deficit How much more or how much less abstraction impact is acceptable:

= Scenario flows - RFOs.

Sustainable development Development that meets the needs of the present without compromising the ability of future generations to meet their own needs. This involves meeting four objectives simultaneously:

- social progress which recognises the needs of everyone
- effective protection of the environment
- prudent use of natural resources
- maintenance of high and stable levels of economic growth and employment.

Tidal limit The most upstream point within an estuary or river where water levels are subject to tidal variation.

Time limited licence Licence with specified end date.

Topography Physical features of a geographical area.

Wastewater treatment works The place where water is treated.

Water resource The naturally replenished flow or recharge of water in rivers, or aquifers.

Water Resource Management Unit An area that has similar groundwater and or surface water characteristics and is managed in a similar way.

Water Resources Strategies (The) Strategy for Water Resource planning in England and Wales over the next 25 years to ensure sustainable use and sufficient water for all human uses with an improved water environment. The strategies predict demand using different social and economic scenarios.

Watercourse A stream, river, canal or channel along which water flows.

Yield The reliable rate at which water can be drawn from a water resource.

AP Assessment Point.

BAP Biodiversity Action Plan.

CAMS Catchment Abstraction Management Strategy.

Defra Department of the Environment, Food and Rural Affairs (succeeds former DETR).

EW Environmental Weighting of a river reach based on its physical, macrophyte, fisheries and macroinvertebrate scores.

GWMU Groundwater Management Unit.

HOF Hands-off flow.

km² Square kilometres.

Ml, Ml/d Ml = megalitres = 1,000,000 litres = 1,000 cubic metres = 220,000 gallons

Ml/d = Ml per day = thousand cubic metres per day (tcmd).

mm Millimetres.

Ofwat Office of Water Services.

Q95 Flow exceeded during 95% of period over which flow data are being considered.

RFO River Flow Objectives.

RQO River Quality Objective.

SAC Special Area of Conservation.

SPA Special Protection Area.

SSSI A Site of Special Scientific Interest i.e. an area given a UK statutory designation because of its conservation value.

WRMU Water Resource Management Unit.