THIRD ANNUAL REVIEW OF THE WET SLEDDALE WATERBANK (2007 OPERATION)

February 2008
Janet Bromley
United Utilities

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1. Introduction

On the 9 October 2003 the Environment Agency (EA) varied United Utilities (UU) abstraction licence (No. 2776007047) for the River Eden at Cumwhinton to permit increased abstraction to ensure a supply-demand balance for water in the Carlisle resource zone. Condition 10b of the new licence states that: "An annual waterbank of 600 Megalitres at Wet Sleddale Reservoir shall be operated as directed by the Agency, and to the benefit of fisheries. This procedure shall be reviewed annually by the Agency." The procedure is based on the document produced by Jim Walker and Tom Veitch for United Utilities in June 2002 entitled "Wet Sleddale Water Bank". This document was part of the Environmental Report produced in support of the application to vary the above licence.

UU has produced annual review reports for the water bank's operation in 2005 (report dated Jan 2006) and 2006 (report dated Feb 2007). This report is the third annual waterbank review report for 2007.

The details of the waterbank operation were set out by the EA in a letter dated 15 February 2005 (see Appendix 2). The following is a summary of the key features of the agreement:

- Up to 600Ml of the Wet Sleddale waterbank will be released to the River Lowther during the period April to September inclusive to support the river during times of low flow.
- The releases from Wet Sleddale are triggered by river levels recorded at the EA's Bampton Grange gauging site such that as the river level drops, the volume of the release increases to a maximum release rate of 11Ml/d (in addition to the normal compensation flow of 7.5Ml/d). The original trigger levels and release rates included in the June 2002 document "Wet Sleddale Water Bank" were revised in 2005.
- The EA have the discretion to request additional water to be released from the waterbank, for example, to aid spawning or during severe droughts.
- The operating rules are reviewed on the 1 July, 1 August and 1 September of each year and, depending on the cumulative volume of water released to date, the rate of release may be increased.
- Information on the storage in Wet Sleddale reservoir and the waterbank are provided electronically by UU to the EA each week during the April to September period.
- UU and the EA will review the previous year's operation of the waterbank by 31 March each year and the EA will inform relevant third parties of any resulting changes to its operation.

2. Triggers

The original trigger levels reported in the June 2002 document "Wet Sleddale Water Bank" were revised, in conjunction with the EA, for the first year of waterbank operation in 2005, and subsequently were also adopted for the second year of operation in 2006. The "Original Triggers" are detailed in Appendix 1 whilst the "2005 & 2006 Triggers" used for the waterbank operation in 2005 and 2006 are given in Appendix 2.

Due to the absence of measured river flow data the "Original Triggers" were based mostly upon a modelled data set. When additional river flow data became available for Bampton Grange the "Original Triggers" were revised and moved upwards by 7.5Ml/d such that the largest release volume from Wet Sleddale is made if the flow at Bampton Grange is 18Ml/d rather than 10.5Ml/d as was originally the case. Thus the flow does not have to reach such a low level before the maximum Wet Sleddale release is made, resulting in more water being released more often. The "2005 & 2006 Triggers" are more realistic given the measured flows in the river.

In January 2005 the level-flow relationship (rating curve) for the EA's gauging station at Bampton Grange changed mainly due to the large flood event, such that for a given flow the water level on the staff gauge became higher (or vice versa, for a given water level the equivalent flow becomes lower). This meant that the releases would not have been triggered until the flows dropped below the agreed flows. Therefore the trigger levels were revised using the new level-flow relationship and these "2007 Triggers" were adopted for the waterbank operation for 1 April to 30 September 2007. The "2007 Triggers" are set out in Appendix 3.

Following a review of the use of the waterbank in previous years, the EA have requested that the flows at Bampton Grange that trigger a release from Wet Sleddale reservoir be increased by 10% for the 2008 waterbank period. Thus the flow does not have to reach such a low level before the Wet Sleddale releases are made, resulting in more water being released more often. United Utilities has agreed to implement the increased triggers during the 2008 waterbank period but raised concerns to the EA. The Wet Sleddale waterbank is limited to 600 Ml per year and modelling work using the original triggers indicated that this volume would be fully utilised in a severe drought such as in 1995/6. Therefore, as the trigger flows will be increased, there is a risk that in a severe drought the waterbank could be fully used before the 30 September meaning that there is no further water available for release if dry conditions persist.

The reasons the Environment Agency gave for the 10% increase in trigger flows is that the waterbank has not been fully used in any of the first few years of its operation and the river flows drop quite low before the additional water is released, and so they felt it would be good to optimise the waterbank usage. If the waterbank is only targeted at the driest years it is not providing as much benefit as it could do in non-drought years. As with previous years, the changes would be on a trial basis and could be altered in a subsequent year. The 10% increase was based on the degree to which the rating changed at Bampton Grange in 2005 and 2006, and so also offers protection should a similar scale of change occur in future. It is recognised that a change in rating could also occur in the opposite direction to last time.

The increased trigger flows may also compromise the ability to release the fish migration flow of 33 Ml/d in November and December, if reservoir levels are depleted because more water has been released than would have been the case otherwise. United Utilities has agreed to implement the changes to the Bampton Grange triggers for 2008 at the EA's request, but identified that if the consequence is a subsequent detrimental impact on the ability to release the migration flows,

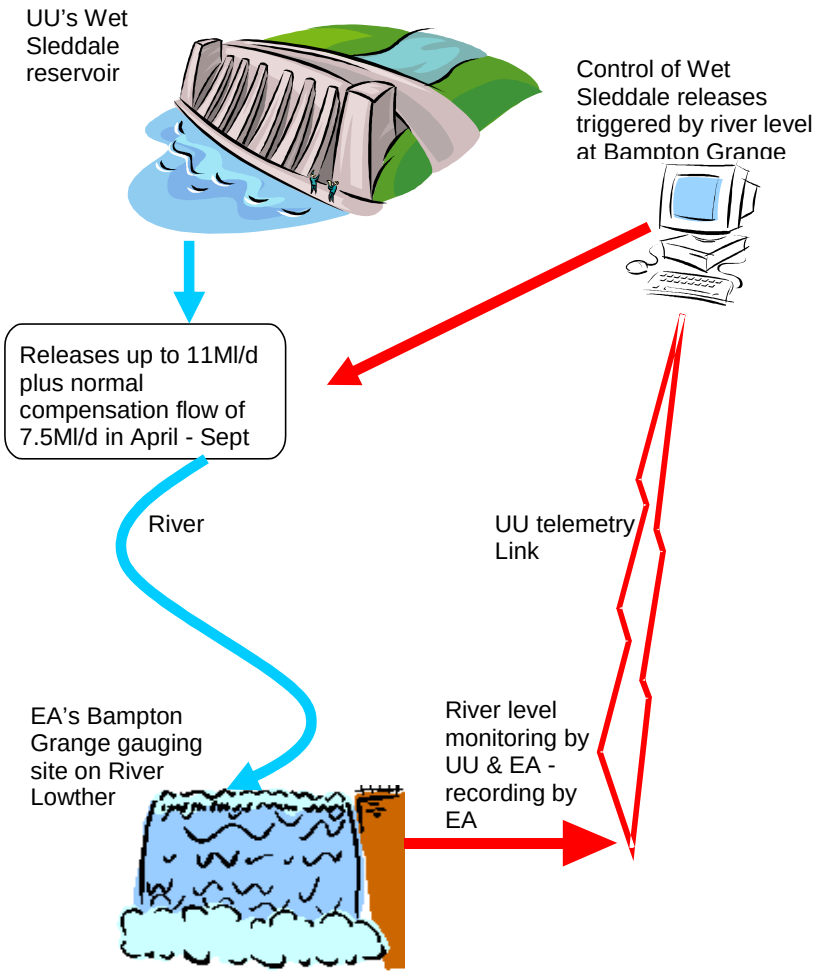
United Utilities can not be held responsible. In such a situation, the approach to managing flow releases would be discussed with the Environment Agency.

3 flow bands at Bampton Grange are to be used to trigger the Wet Sleddale release in 2008 as detailed in Tables 1 and 2 within Appendix 4.

The EA have been monitoring flow at Bampton Grange since 10 Oct 2000 however not all the data is useable due to the lack of calibration during the Foot and Mouth epidemic. The lowest observed flow at Bampton Grange for the record period to 25 January 2008 is 15.55Ml/d on 4 July 2006. This is lower than the previous minimum flow of 18.58Ml/d reported for the same date in the 2006 annual report as the updated level-flow relationship at Bampton Grange (following the January 2005 flood event) has been used to recalculate the flow record, resulting in lower flows for a given water level. It is important to note that because the waterbank is in operation, the lower flows recorded at Bampton Grange will not drop as low as it would have done without the waterbank releases.

Figure 1 shows the nature of the waterbank operation.

Figure 1
Schematic showing the logic of the Wet Sleddale waterbank operation



3. Construction progress

The implementation of the Wet Sleddale waterbank scheme is in two phases. Phase 1 was completed prior to the scheme's initiation on 1 April 2005 and involved the installation of new valves, meters and river flow measurement devices at Wet Sleddale to control the release of the additional water. Phase 2 of the project involves the installation of a stilling well and water level measurement device at the EA's Bampton Grange gauging station, together with an automatic system to control the Wet Sleddale release based on the water level at this site.

In 2006 a kiosk, stilling well and instrument was installed at Bampton Grange gauging station and in 2007 a BT telephone line was constructed between Bampton Grange and Wet Sleddale reservoir which enables information from the Bampton Grange flow gauging station to be sent back to the control valve at Wet Sleddale. Following construction of the BT line the commissioning of the automatic control system commenced in autumn 2007 but was deferred until 2008. This was because the control system could not be commissioned whilst the 33Ml/d fish migration flows were being released from Wet Sleddale reservoir during November and December. The commissioning needs to take place during low river flows and this can only occur when the base compensation flow release of 7.4Ml/d is being made during the months of January to October. The risk of delaying full commissioning until January 2008 onwards is that problems may be encountered such that implementation of the automatic control system cannot be achieved by the 1 April 2008 when the next water bank period commences. These risks were explained to the EA who felt that it was important to continue with the 33Ml/d fish migration flow releases rather than reduce these to allow commissioning to take place. Therefore further works will take place in 2008 to programme the control system and undertake a period of commissioning and testing to ensure the system is working correctly.

Once complete, the system will allow the Wet Sleddale releases to be automatically controlled according to the Bampton Grange river level triggers set within the control system. These trigger points can easily be adjusted if required. In 2005, 2006 and 2007 the releases from Wet Sleddale have been triggered based on manual river level readings at the EA's Bampton Grange gauging station. This manual approach will need to continue until the automatic control system is in place and commissioned.

4. Waterbank volumes released during April – October 2007 period

Figure 2 below shows the releases made from Wet Sleddale reservoir during April to September 2007, the third year of waterbank operation, and Figure 3 shows the raw release data on which Figure 2 is based.

At the end of September UU agreed with the EA to continue to apply the Wet Sleddale release triggers for the month of October 2007 as due to the wet summer, only a small proportion of the 600Ml waterbank volume had been released. UU agreed to this extension but highlighted the risk that continuing the releases in to October 2007 could result in depleted water volumes being stored in Wet Sleddale reservoir which in turn could put the ability to release the 33Ml/d fish migration flows during November and December 2007. As it was, river flows in October 2007 remained above the trigger levels resulting in no releases being required.

Figure 2
Graph of cumulative Wet Sleddale waterbank release for April to October 2007

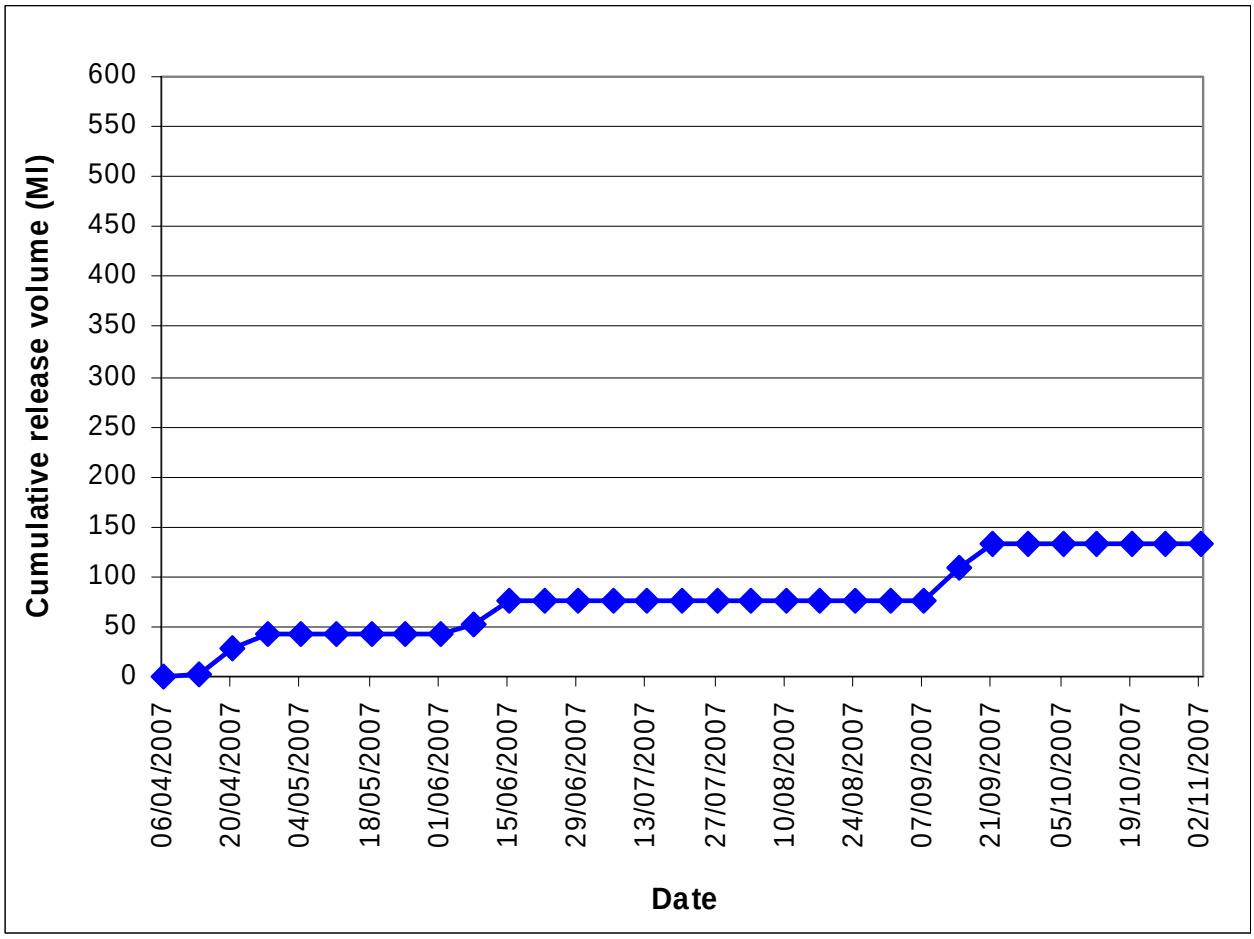


Figure 3
Table of Wet Sleddale waterbank releases during April to October 2007

Week Ending Date	Wet Sleddale reservoir level (m btwl)	Wet Sleddale reservoir volume (Ml)	Volume of water released from waterbank (Ml / wk)	Cumulative total of waterbank release (Ml)
06-Apr-07	0.04	2267	0	0
13-Apr-07	0.11	2246	2	2
20-Apr-07	0.32	2175	26.232	28.232
27-Apr-07	0	2282	15.017	43.249
04-May-07	0.02	2274	0	43.249
11-May-07	0	2282	0	43.249
18-May-07	0	2282	0	43.249
25-May-07	0.03	2267	0	43.249
01-Jun-07	0.11	2246	0	43.249
08-Jun-07	0.3	2181	8.829	52.078
15-Jun-07	0.3	2181	23.754	75.832
22-Jun-07	0	2282	0	75.832
29-Jun-07	0	2282	0	75.832
06-Jul-07	0	2282	0	75.832
13-Jul-07	0.01	2274	0	75.832
20-Jul-07	0	2282	0	75.832
27-Jul-07	0	2282	0	75.832
03-Aug-07	0.01	2274	0	75.832
10-Aug-07	0.01	2274	0	75.832
17-Aug-07	0	2282	0	75.832
24-Aug-07	0.01	2274	0	75.832
31-Aug-07	0.1	2317	0	75.832
07-Sep-07	0.22	2206	0	75.832
14-Sep-07	0.66	2070	33.258	109.09
21-Sep-07	0	2282	24.244	133.334
28-Sep-07	0	2282	0	133.334
05-Oct-07	0	2282	0	133.334
12-Oct-07	0	2282	0	133.334
19-Oct-07	0	2282	0	133.334
26-Oct-07	0.03	2270	0	133.334
02-Nov-07	0.03	2270	0	133.334

Figure 3 shows that the total volume released from the Wet Sleddale waterbank during 2007 was 133Ml. This compares to 287Ml in 2006 and 476Ml in 2005. The low usage in 2007 reflects the high rainfall during this year as explained in more detail below. The maximum possible waterbank release is 600Ml but it is expected that the full allowance would only be released in droughts such as 1995/6. In other years it would be expected that the waterbank allocation would not be so heavily utilised.

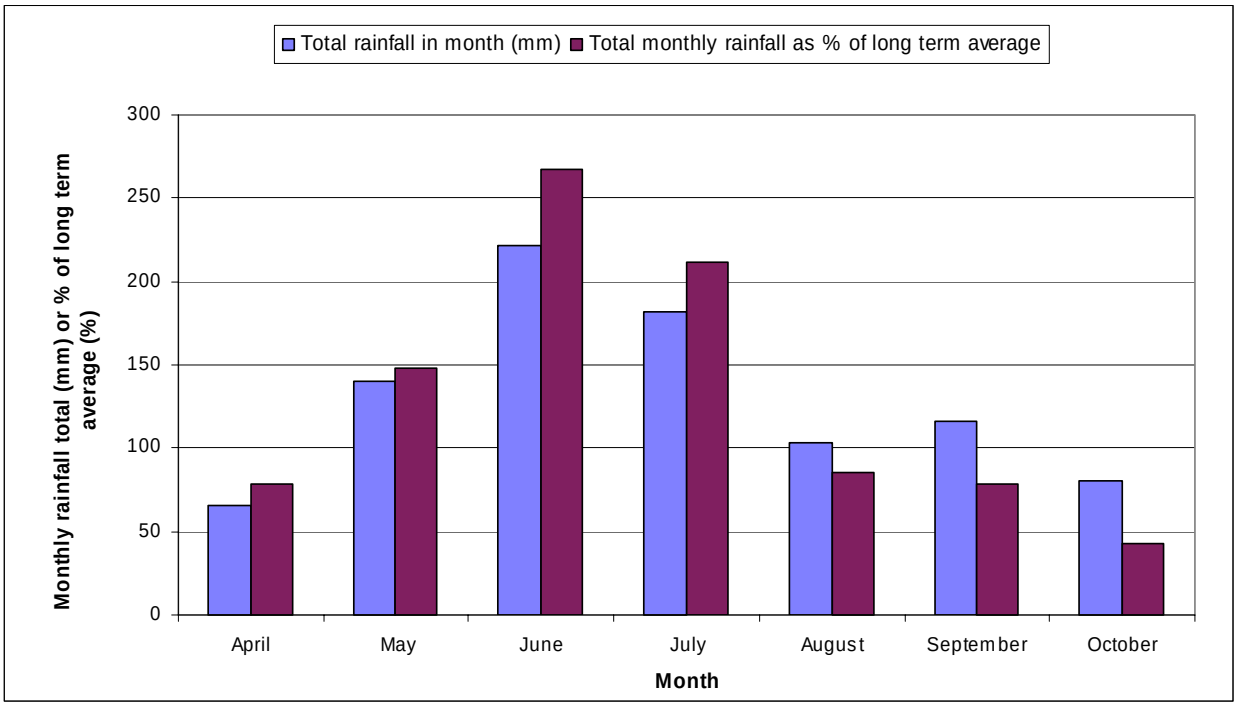
The first release from the waterbank was made in mid April 2007 as river flows dropped to trigger the release. The only other releases made during 2007 were for two 2-week periods in June and September. Apart from these times the river flow at Bampton Grange remained above the trigger level.

At nearby Haweswater reservoir, the total rainfall during the period April to October 2007 was above the expected amount (113% of the long term average for those months), with a total of 908.8mm being recorded compared to the long-term average of 804mm. However there was a seasonal distribution to this rainfall. April was relatively dry with 78% of average rainfall, hence the waterbank releases being needed for a 2-week period in April 2007. May, June and July were all significantly wetter than expected with 148%, 267% and 212% of average rainfall respectively. However within this wet period, late May and early June 2007 was actually very dry with only 8.8mm of rainfall from the 20 May to 10 June inclusive, resulting in the river level at Bampton Grange falling and triggering 2-weeks of releases in mid June 2007. Late June saw the start of the wet summer with 219.6mm falling from the 11 to 30 June 2007 inclusive, resulting in high river levels and cessation of the waterbank releases. August, September and October were all drier than expected with 85%, 79% and 43% of average rainfall respectively

resulting in the need for waterbank releases to be made for a 2-week period in mid-late September 2007.

For comparison with previous years, the total rainfall at Haweswater during the April to September 2007 period (i.e. the normal waterbank period) was 828.8mm, 134.6% of the long term average for these months of 616mm. This compares to 615.2mm for the same months in 2006 and 611mm in 2005. Therefore the rainfall totals seen in 2007 were significantly higher than those in 2006 and 2005, resulting in higher river flows and hence lower usage of the Wet Sleddale waterbank.

Figure 4
Rainfall recorded at Haweswater reservoir (Burnbanks) during April to October 2007



5. Monthly reviews

The 1 July 2007 review showed that only 75.8Ml of the waterbank had been released up to this date. As this was less than the 150Ml review volume specified in the agreement (see Appendix 3), increased rates of release were adopted from the 1 July 2007. The 1 August 2007 review showed that no additional water had been released and so the increased rates of release continued to be adopted from the 1 August 2007. The 1 September 2007 review again showed that no further water had been released and so the increased rates of release continued to be adopted from the 1 September 2007. The total volume of water released during 2007 was 133.3Ml.

6. Flow in the River Lowther

The Environment Agency gauging station at Bampton Grange is located approximately 200m upstream of the confluence of the River Lowther with Haweswater Beck. A shaft encoder measures the river level every 15 minutes and this data is logged. A rating equation, determined through manual flow gaugings of the river, is used to translate river level into river flow. Figure 5 below shows the available flow record for Bampton Grange from the 10 Oct 2000 to the 25 Jan 2008. Data up to the end of November 2001 should be treated with caution as few manual flow gaugings were undertaken prior to this mainly due to the foot and mouth epidemic.

Figure 5
Bampton Grange flow record from 10 Oct 2000 to 25 Jan 2008 inclusive

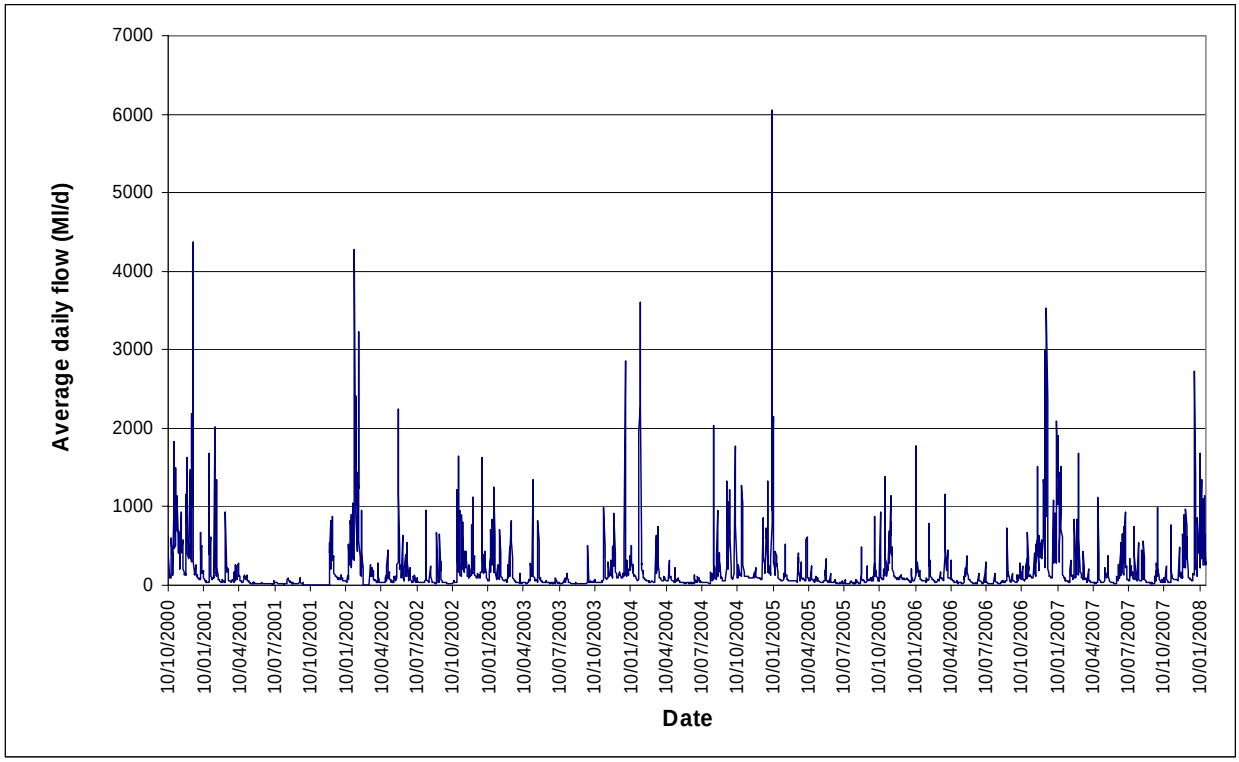
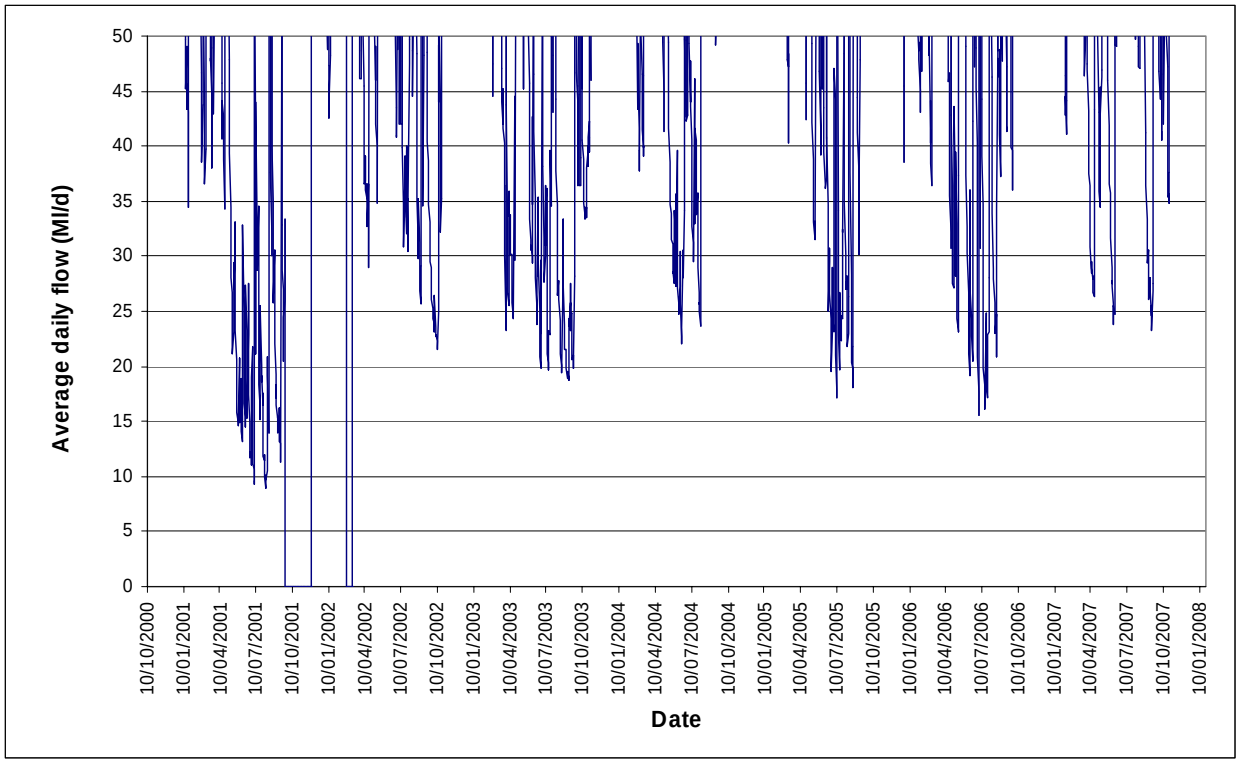


Figure 6 below is identical to Figure 5 except that it concentrates on low flows below 50Ml/d as the principal aim of the waterbank it to enhance low flows by up to 11Ml/d during the months of April to September.

Figure 6
Bampton Grange flow record (flows < 50Ml/d only) from 10 Oct 2000 to 25 Jan 2008 inclusive



If the whole Bampton Grange flow record from 29 Nov 2001 to 25 Jan 2008 inclusive is analysed (excluding the suspect data prior to 29 Nov 2001) then the key flow statistics are:

- Maximum daily average flow = 6056.6Ml/d on 7 Jan 2005
- Minimum daily average flow = 15.55Ml/d on 4 July 2006
- Average daily average flow = 190.8Ml/d
- Q95 flow (low flow statistic = flow that is exceeded 95% of the time) = 24.1Ml/d

Figure 7 below shows the Bampton Grange flow record for the third year of waterbank operation from 1 April to 30 September 2007. The key flow statistics for this period are:

- Maximum daily average flow = 1114.6Ml/d on 23 April 2007 (731.8Ml/d on 2 Sept 2006)
- Minimum daily average flow = 23.24Ml/d on 13 Sept 2007 (15.55Ml/d on 4 July 2006)
- Average daily average flow = 139.5Ml/d (70.2Ml/d)
- Q95 flow (low flow statistic = flow that is exceeded 95% of the time) = 26.0Ml/d (18.7Ml/d)

For comparison the equivalent flow statistics for the 1 April to 30 September 2006 period (using the updated level-flow relationship for Bampton Grange) are shown in red font above. All flow statistics were higher in 2007 compared to 2006 reflecting the differing hydrological conditions (i.e. rainfall) and the variation in the waterbank releases.

Figure 7
Bampton Grange flow record for the third year of waterbank operation from 1 April to 30 September 2007

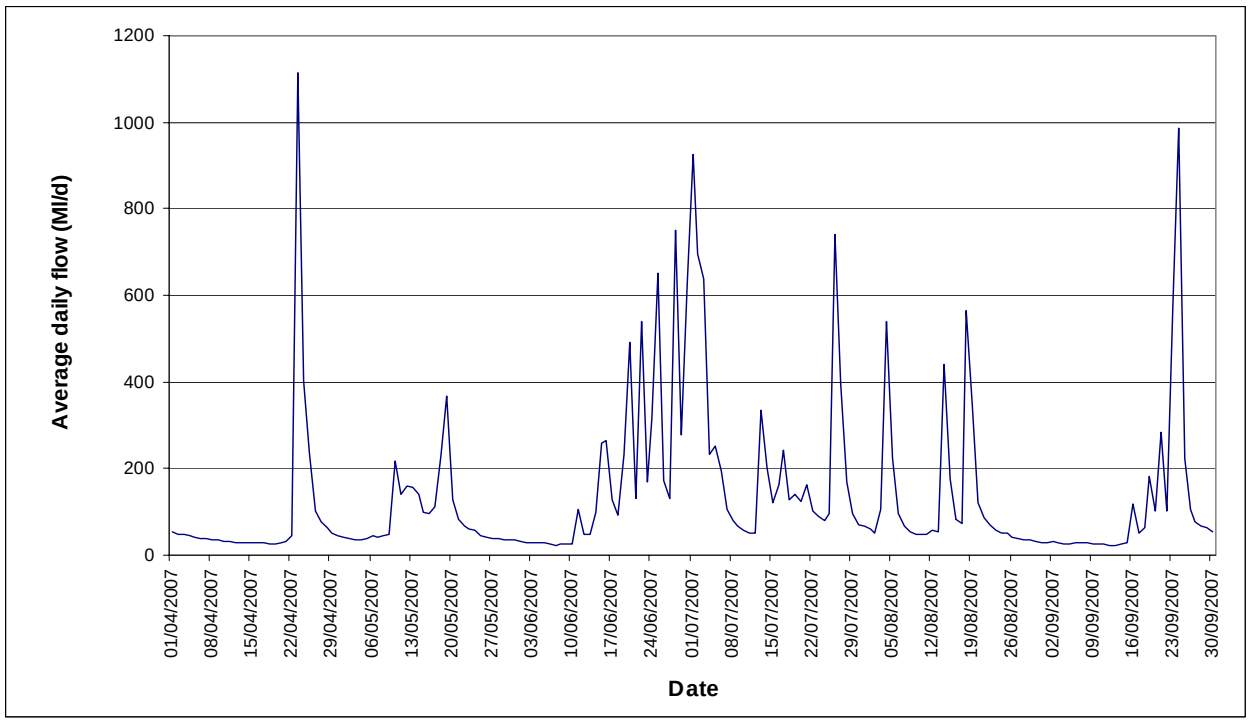
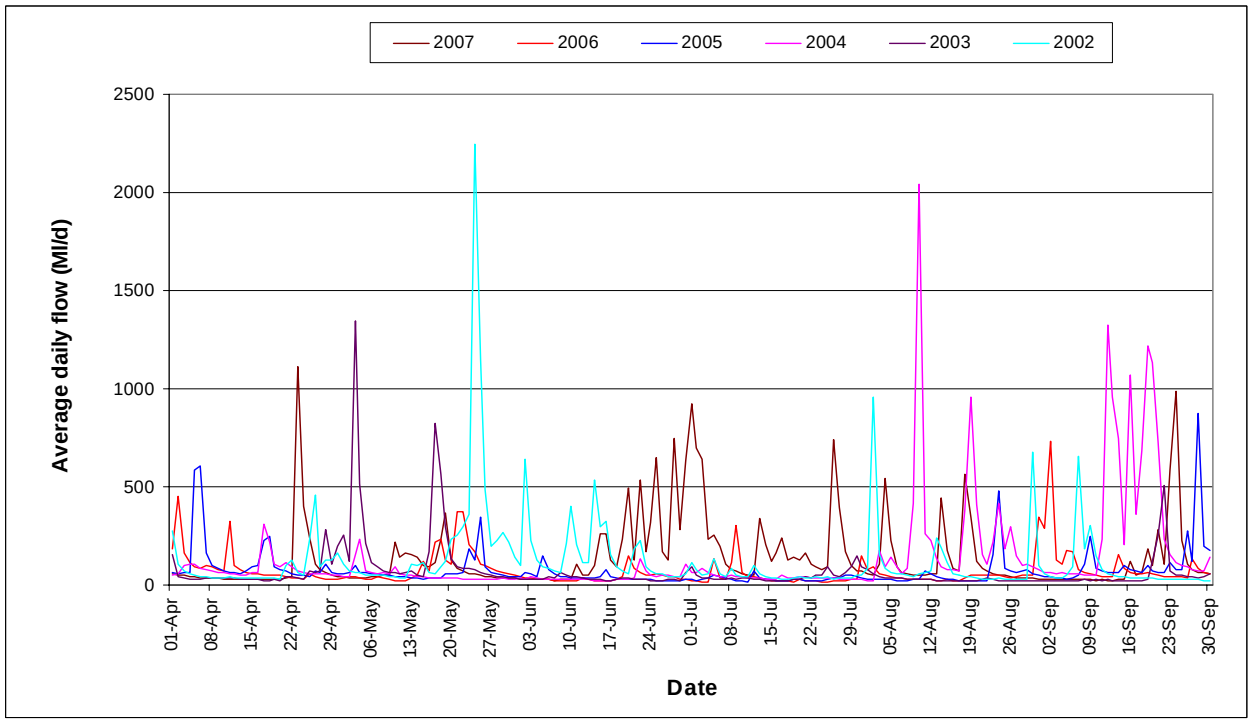


Figure 8 below shows the same data as Figure 7 but concentrating on flows of 50Ml/d and below, and compares the 2007 flow data to the previous 5 years.

Figure 8
Bampton Grange flow record (flows < 50Ml/d only) for the April to September period for 2007, 2006, 2005, 2004, 2003 and 2002



7. Wet Sleddale reservoir levels and abstraction

Figure 9 below shows Wet Sleddale reservoir levels during the waterbank's third year of operation in 2007. The same graph also shows when abstraction occurred during this period and it can be seen that abstraction tends to occur when the water level in the reservoir is relatively high – the abstraction is measured at the Tailbert meter on the Swindale aqueduct and therefore also includes the other river intakes, not just Wet Sleddale. This is because, to ensure we are able to provide the waterbank of 600Ml, we have to carefully control our abstraction from Wet Sleddale and can only abstract water when the reservoir is close to full.

Figure 9
Wet Sleddale reservoir level and abstraction data for 1 April to 30 October 2007

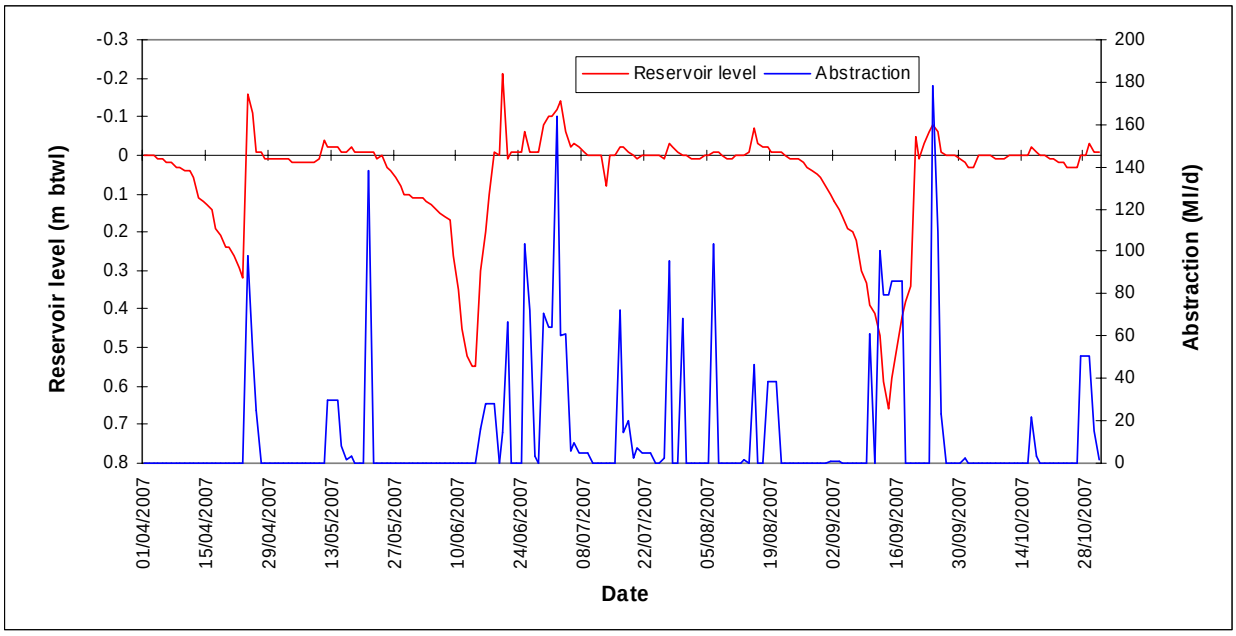


Figure 9 shows that Wet Sleddale reservoir was at its lowest level of 0.66m below top water level on the 14 Sept 2007, equivalent to 2069Ml of water remaining in storage. This compares to a minimum level of 2.71m below top water level on 29 Sept 2006 during the 2006 waterbank period. Therefore during 2007 the volume of water in Wet Sleddale reservoir was always sufficient to maintain the waterbank and normal compensation release.

8. Conclusions and recommendations for the waterbank operation in 2008

The success of the Wet Sleddale waterbank operation in 2005 and 2006 has continued in 2007 with releases being made from the waterbank in accordance with the agreed triggers based on river level at the EA's Bampton Grange gauging station. The normal waterbank period of April to September was extended to include October 2007 at the EA's request.

The storage in Wet Sleddale reservoir remained healthy such that the waterbank of 600Ml was capable of being provided if required. During the 2007 waterbank period, 133Ml of additional water was released to the River Lowther at Wet Sleddale, resulting in increased flow for the entire length of the river. The releases from the waterbank in 2007 were less than in previous years due to the wet summer period.

Following a review of the use of the waterbank in previous years, the EA requested that the flow at Bampton Grange that triggers a release from Wet Sleddale reservoir be increased by 10% for the 2008 waterbank period (see Appendix 4). Thus the flow does not have to reach such a low level before the Wet Sleddale releases are made, resulting in more water being released more often.

The EA will continue to monitor the level-flow relationship at Bampton Grange and the triggers will be kept under review and may need to be altered again. They may also need to be altered in the future if the rating alters.

It is anticipated that the automatic control system to manage the releases from Wet Sleddale reservoir depending on the river level downstream at Bampton Grange will be fully commissioned during 2008.

The flexible working relationship between UU and EA will continue, including the consideration of additional flow releases.

APPENDIX 1 - "ORIGINAL TRIGGERS"

ORIGINAL TRIGGER LEVELS REPORTED IN THE JUNE 2002 DOCUMENT "WET SLEDDALE WATER BANK"

Original Triggers – Normal Releases

Flow at Bampton Grange Ml/d	Corresponding stage range from rating equation (m)	Stage difference	Release from Wet Sleddale Ml/d
< 10.5	0.251		7.25
10.5 to 11.5	0.254	3 mm	6.5
11.5 to 12.5	0.258	4 mm	5.5
12.5 to 13.5	0.261	3 mm	4.5
13.5 to 14.5	0.264	3 mm	3.5
14.5 to 15.5	0.268	4 mm	2.5
15.5 to 16.5	0.271	3 mm	1.5
16.5 to 18.5	0.277	6 mm	0.5
> 18.5			0

Original Triggers – Increased releases

Flow at Bampton Grange Ml/d	Corresponding stage range from rating equation (m)	Stage difference	Release from Wet Sleddale Ml/d
< 11	0.252		11.25
11 to 12.5	0.258	6 mm	10
12.5 to 14	0.263	5 mm	8.5
14 to 15.5	0.268	5 mm	7
15.5 to 17	0.272	4 mm	5.5
17 to 18.5	0.277	5 mm	4
18.5 to 19	0.278	1 mm	2.5
> 19			0

For comparison, the actual triggers used in 2005 and 2006 are given in Appendix 2 and those used in 2007 are given in Appendix 3.

APPENDIX 2 - "2005 & 2006 TRIGGERS"

LETTER FROM EA SETTING OUT WET SLEDDALE WATERBANK OPERATING AGREEMENT FOR PERIOD TO 31 MARCH 2006

Our ref: Lic No 27 76 007 047/BPO
Your ref:

Date: 15 February 2005

Mr J Sanders
United Utilities Water plc
Lingley Mere Business Park
Lingley Green Avenue
Warrington
WA5 3LP

Dear John

LICENCE NO 27 76 007 047 - WET SLEDDALE WATER BANK

The above licence was issued on 9th October 2003 and Condition 10b) states that "An annual waterbank of 600 Megalitres at Wet Sleddale Reservoir shall be operated as directed by the Agency, and to the benefit of fisheries. This procedure shall be reviewed annually by the Agency." The procedure is based on the document produced by Jim Walker and Tom Veitch for United Utilities in June 2002 entitled "Wet Sleddale Water Bank." This document is part of the Environmental Report produced in support of an application to vary the above licence. This letter sets out the details of the management procedure, as directed by the Agency, for the Wet Sleddale Water Bank, until March 31st 2006.

1. The Principle of the Wet Sleddale Water Bank procedure is to provide a water bank of 600 Ml which will be available between April and September each year, to support the fisheries of the River Lowther during periods of low flow.
2. Given that April and May is a potentially sensitive time when spawn are in the river, the Agency may direct that sufficient water is released in order to protect the spawn from the adverse impact of low flows.
3. The remaining volume will be available for release during the proceeding 4 months each year as required by the Agency. For example, should July be a dry month, with resultant low flows, then additional releases may be directed by the Agency, even if the water bank should then be exhausted.
4. During a period of severe drought, should the 600 Ml water bank be exhausted, the Agency may request that United Utilities continue to release water to ensure fish survival, instead of conserving the remaining reservoir storage for winter flow releases. (See the Environmental Report 2002, Page 142) This procedure to be discussed and jointly agreed.
5. The releases from Wet Sleddale shall be triggered by levels recorded at Bampton Grange. The level will be monitored every 6 hours. The releases will be as per the following table:

Table 1

Flow at Bampton Grange Ml/d	Corresponding stage range from rating equation (m)	Stage difference	Release from Wet Sleddale Ml/d
18 to<18	0.275	9 mm	7.25
18 to 22	0.286	11 mm	5.0
22 to 26	0.296	10 mm	2.0

The operating rules will be reviewed on the 1st July each year. If less than 150Ml have been released from the waterbank, then the daily releases in July are increased. Similar reviews are also held on 1st August (less than 300Ml released to date) and 1st September (less than 450Ml released to date) to see if releases should be increased. Table 2 below shows the triggers to be used in these situations.

Table 2 - increased releases

Flow at Bampton Grange Ml/d	Corresponding stage range from rating equation (m)	Stage difference	Release from Wet Sleddale Ml/d
18 to<18	0.275	9 mm	11.0
18 to 22	0.286	11 mm	9.0
22 to 26	0.296	10 mm	4.75

6. Data concerning the storage remaining in Wet Sleddale Reservoir; the water bank, will be provided electronically by United Utilities to the Water Resources section of the Agency at Ghyll Mount, Penrith, each week.
7. There will be an annual review, no later than 31st March each year, of the operation of the water bank, to include volumes released, river flow in the River Lowther, the regime of releases, the sustainability of the releases, flow gaugings, and the perceived benefits to the fisheries of the River Lowther from the operation of the Wet Sleddale Water Bank as well as any other issues identified by the Agency.
8. The operation of the Wet Sleddale water bank will be as directed by the Agency but following discussion with United Utilities.
9. Following the annual review, the Agency will inform the members of the River Eden Interest Representative Group and English Nature, of any changes in the operation of the Wet Sleddale Water Bank.

Yours sincerely

STEPHEN HARDY
Water Resources, Regulatory and Technical Team Leader

APPENDIX 3 - "2007 TRIGGERS"

The following triggers were provided by Dawn Wicks (EA) on 19 February 2007 and were adopted for the 2007 waterbank operation. The 2007 trigger levels have been recalculated based on the updated rating curve following its change in the flood event of January 2005.

Table 1

Flow at Bampton Grange Ml/d	Corresponding stage range from rating equation (m)	Stage difference	Release from Wet Sleddale Ml/d
18 to<18	0.284	?	7.25
18 to 22	0.295	11 mm	5.0
22 to 26	0.305	10 mm	2.0

Table 2 - increased releases

Flow at Bampton Grange Ml/d	Corresponding stage range from rating equation (m)	Stage difference	Release from Wet Sleddale Ml/d
18 to<18	0.284	?	11.0
18 to 22	0.295	11 mm	9.0
22 to 26	0.305	10 mm	4.75

These trigger levels are provided subject to approval of Rating T02 at Bampton Grange by EA North West Region.

APPENDIX 4 - "2008 TRIGGERS"

The following triggers were provided by Dawn Wicks (EA) on 28 January 2008 and are to be adopted for the 2008 waterbank period. The 2008 triggers represent a 10% increase in flow compared to the 2007 triggers (see Appendix 3).

Table 1

Flow at Bampton Grange Ml/d	Corresponding stage range from rating equation (m)	Stage difference	Release from Wet Sleddale Ml/d
<19.8	0.289	-	7.25
19.8 to 24.2	0.300	11 mm	5.0
24.2 to 28.6	0.310	10 mm	2.0

Table 2 - increased releases

Flow at Bampton Grange Ml/d	Corresponding stage range from rating equation (m)	Stage difference	Release from Wet Sleddale Ml/d
<19.8	0.289	-	11.0
19.8 to 24.2	0.300	11 mm	9.0
24.2 to 28.6	0.310	10 mm	4.75