

## **Tywi liming progress report, January – March 2011**

### **Summary**

This report presents the work undertaken and the progress made on the Tywi liming project in the period from January to March 2011 and also summarises lime doser performance in the 2010 – 2011 financial year. Approximately 105 tonnes of lime was dosed in the period from January to March 2011. The rainfall adjusted target for the period was 136 tonnes.

In the period April 2010 to March 2011, approximately 316 tonnes of lime has been dosed, which is 68% of the annual rainfall-adjusted target of 463 tonnes.

The water quality remains on target to achieve the objectives for Good Ecological Potential in the Afon Tywi, as required by the Water Framework Directive.

The priorities for the next quarter will be establishing and utilising the telemetry information system, and progressing the procurement of a new lime delivery system at the Camddwr doser.

### **2. Lime doser operation, maintenance & safety**

The majority of lime was dosed in the later part of the quarter. Approximately 85 Tonnes has been delivered and dosed from the Tywi doser during the period, and 20 Tonnes has been delivered and discharged to the Camddwr. On the three delivery occasions at the Tywi doser, it has been necessary to input a small proportion of the lime delivered directly to the river due to there being insufficient space within the hopper to receive the full delivery amount.

A large shoal which has built up upstream of the Tywi doser is diverting flow away from the hydrogenerator and therefore limiting the amount of power the generator is able to provide the doser. The shoal is also restricting the mixing of the lime as it is input to the river, because the flow is diverted to the opposite river bank. Operations Delivery are intending to remove the shoal once a suitable access route to the river can be established. An issue with the hydro-generator at the Camddwr has been identified by MEICA, and a modification to rectify it will occur once suitable flows allow access to the unit. As an interim measure, the power at both dosers has been supplemented by use of a petrol generator during this quarter.

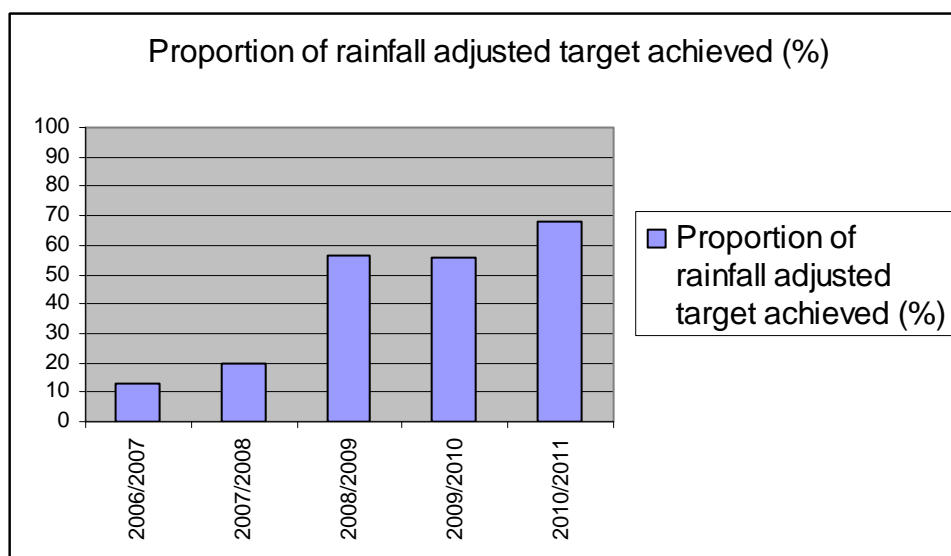
The pipeline extension at the Camddwr is scheduled for this quarter. Sufficient length of pipe has been sourced to conduct a trial initially to ensure that the lime can be delivered over the distance intended. Pending the outcome of this trial, a fixed pipe will then be installed to the top of the track by the Operations Delivery team.

Telemetry arrangements at both sites is scheduled for this quarter.

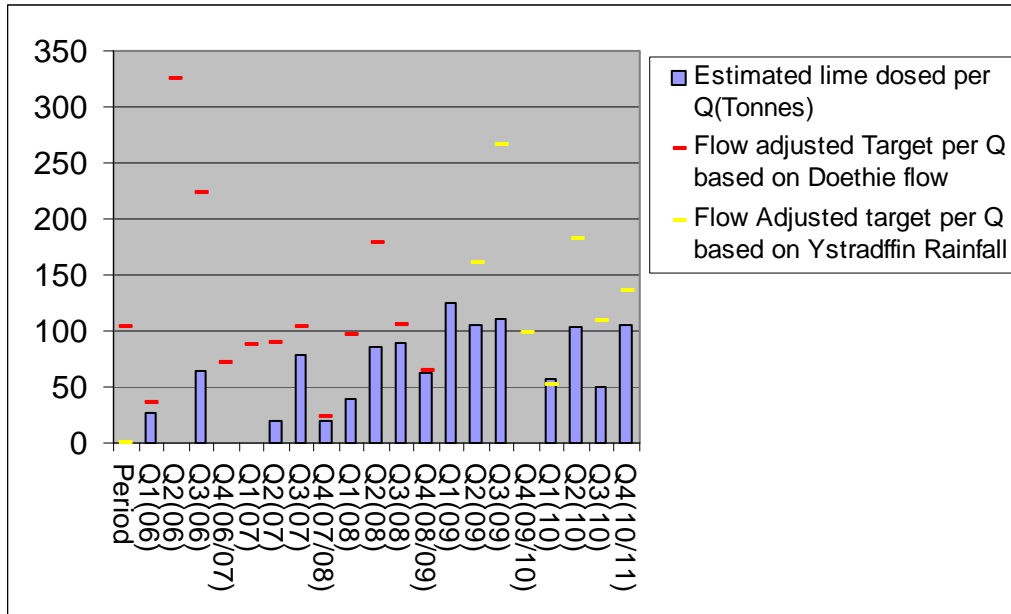
Table 1 and Fig 1 show the overall increase in lime dosed in recent financial years. The rainfall-adjusted liming target for this quarter was 136 tonnes. The January – March 2011 (Q4) total rainfall at Ystradffin was 91% of the quarterly total rainfall average (January 06 – December 2010). The rainfall adjusted target is calculated as 91% of the nominal quarterly target of 150 tonnes (*Fig. 2*).

**Table 1. Summary of lime dosed in financial years.**

Financial year	Estimated amount of lime dosed (Tonnes)	Annual Rainfall Adjusted liming target (Tonnes)	Proportion of rainfall adjusted target achieved (%)	Proportion of 600T target achieved (%)
2006/2007	91	696	13	15
2007/2008	119	601	20	20
2008/2009	275	487	57	46
2009/2010	342	616	56	57
2010/2011	316	463	68	53



**Fig. 1: Bar chart of % of annual rainfall adjusted target achieved.**

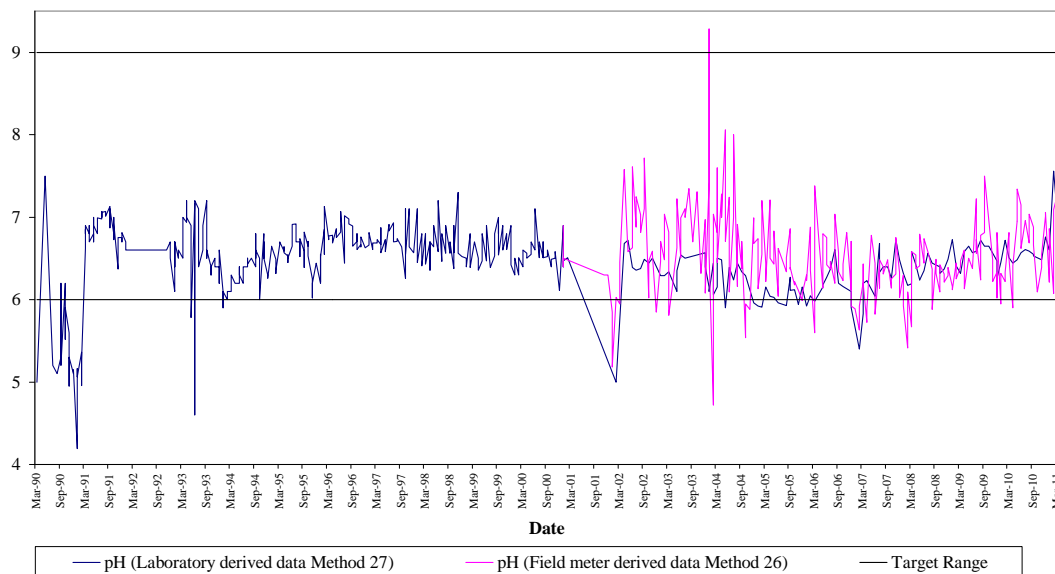


**Fig. 2: Lime dosed per Quarter 2006 – March 2011.**

### 3. Water quality

pH values recorded in the Tywi at Ystradffin, 1.5 km downstream of Llyn Brienne Reservoir, ranged from 6.6 to 7.56 for laboratory-derived data and from 6.07 to 7.28 for field meter data during this quarter\* (Fig 3 and Table 2). The gradual increase in calcium concentrations appears to have continued (Fig 4). The values remain within the target range to achieve the objectives for Good Ecological Potential in the Afon Tywi, as required by the Water Framework Directive.

\* Note that minimum field result and maximum laboratory result were both recorded on 17/02/11 indicating that one of these results is erroneous.

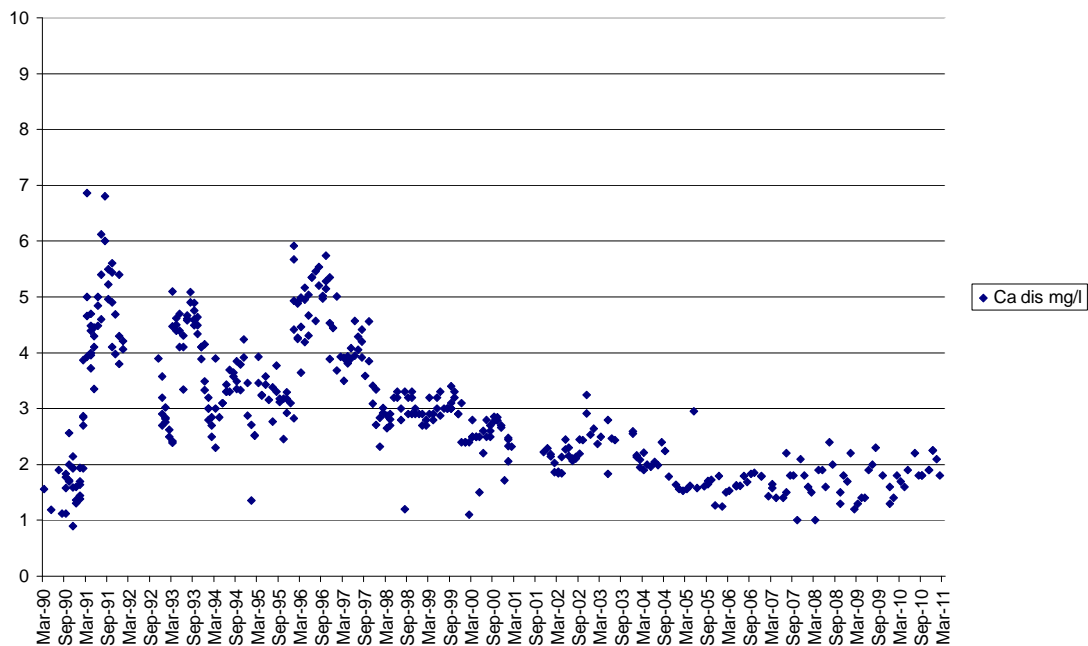


**Fig. 3: pH of the Afon Tywi at Ystradffin, 1.5km downstream of Llyn Brienne Reservoir from March 1990 to March 2011.**

**Table 2. pH and dissolved Ca in the Afon Tywi at Ystradffin, 1.5km downstream of Llyn Brianne Reservoir for period April 2010– April 2011.**

<b>Q1(10/11)</b>	<b>27/04/10</b>	<b>6.44</b>	<b>5.9</b>	<b>1.6</b>
	<b>30/04/10</b>		<b>6.41</b>	
	<b>26/05/10</b>		<b>6.95</b>	
	<b>27/05/10</b>	<b>6.48</b>	<b>7.34</b>	<b>1.9</b>
	<b>24/06/10</b>	<b>6.57</b>	<b>7.15</b>	
	<b>30/06/10</b>		<b>6.62</b>	
<b>Q2(10/11)</b>	<b>22/07/10</b>	<b>6.61</b>	<b>6.96</b>	<b>2.2</b>
	<b>02/08/10</b>	<b>6.59</b>		<b>1.8</b>
	<b>03/08/10</b>		<b>6.69</b>	
	<b>25/08/10</b>		<b>7.04</b>	
	<b>21/09/10</b>	<b>6.55</b>	<b>6.88</b>	<b>1.8</b>
	<b>22/09/10</b>		<b>6.74</b>	
	<b>30/09/10</b>	<b>6.53</b>	<b>6.66</b>	<b>1.8</b>
<b>Q3(10/11)</b>	<b>06/10/10</b>		<b>6.09</b>	
	<b>02/11/10</b>	<b>6.48</b>	<b>6.39</b>	<b>1.9</b>
	<b>19/11/10</b>		<b>6.55</b>	
	<b>06/12/10</b>	<b>6.76</b>	<b>7.01</b>	<b>2.25</b>
	<b>10/12/10</b>		<b>7.06</b>	
<b>Q4(10/11)</b>	<b>11/01/11</b>	<b>6.6</b>	<b>6.21</b>	<b>2.1</b>
	<b>19/01/11</b>		<b>6.86</b>	
	<b>17/02/11</b>	<b>7.56*</b>	<b>6.07*</b>	<b>1.8</b>
	<b>24/02/11</b>		<b>7.09</b>	
	<b>16/03/11</b>		<b>7.28</b>	
	<b>24/03/11</b>	<b>6.99</b>	<b>6.85</b>	

\* Large Difference in values between laboratory and field pH results indicates that one of these results may be erroneous.



**Fig. 4: Dissolved calcium in the Afon Tywi at Ystradffin, 1.5km downstream of Llyn Brienne Reservoir from March 1990 to March 2011.**

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