



# Lithgow Environment Group Inc.

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*Preserving the Balance of Nature*

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Dear Dr Whyte

## **Re: Variation to Delta Electricity's Environment Protection Licence No. 766**

Please find below and attached our members recommendations regarding the proposed variation to Delta Electricity Environment Protection Licence No. 766.

We believe that the findings of Graeme E. Batley in November 2011 are contrary to those of Dr Ian Wright in his supplementary report of October 2011 "Investigation of water quality in the upper Coxs River: focus on the influence of Wallerawang Power Station wastewater discharges" -

*Given the scale of the water quality contamination from Tortuous Watercourse inflow into the Coxs River and the number of contaminants that are elevated beyond ecosystem protection guidelines (ANZECC), I infer that it is very likely that the biological condition of the Coxs River has changed due to this inflow.*

We also note that –

- The Sydney Catchment Audit 2010 found that -
  - *'water pollutants were having a detrimental effect on the aquatic biota',*
  - *'a reduction in the salt and metal loads in the Upper Coxs River sub-catchment is highly desirable and necessary',* and
  - Recommendation 4 states that *'DECCW review licence limits in the Upper Coxs River subcatchment for all licensed discharge points with a view to reducing the heavy metal and salinity concentrations and loads being discharged to the Coxs River catchment.*
- Numerous reports by Cardno Ecology for Delta's "Water Management Licence" annual returns over many years identified that macroinvertebrate fauna in the Coxs River downstream of the Tortuous watercourse were rated as *significantly impaired*;

In any event Delta Electricity have publicly admitted that a problem exists, and have publicly expressed at the most recent Delta Western Community Reference Group meeting that they intend to reduce pollutant loads into the Coxs River above and beyond EPA requirements.

## **1. The proposed limits are totally unacceptable**

The licence limits proposed by Delta are absolutely atrocious, and will lock in the highest pollutant levels that have been experienced to date, and allow 'business as usual' for an unspecified number of years. Such high limits will also set a precedent for other industry.

The proposed 2600  $\mu\text{S}/\text{cm}$  discharge limit for salinity, for example, is 86 times higher than natural background levels in the Coxs River upstream in Ben Bullen State Forest (30  $\mu\text{S}/\text{cm}$ ), more than 4 times higher than what other power stations have to meet under the Hunter Salinity Trading Scheme (600  $\mu\text{S}/\text{cm}$ ) in the upper Hunter Catchment, and almost 3 times higher than some coal mines such as Ulan Mine have to meet (900  $\mu\text{S}/\text{cm}$  limit).

For example today (16/12/2001) salinity levels in the Coxs River were –

- immediately upstream of Wallerawang Power Station - 680  $\mu\text{S}/\text{cm}$
- Lake Wallace - 680  $\mu\text{S}/\text{cm}$
- Tortuous Watercourse - 1690  $\mu\text{S}/\text{cm}$
- Great Western Highway - 950  $\mu\text{S}/\text{cm}$  (note Lake Wallace was spilling)
- Marrangaroo National Park - 660  $\mu\text{S}/\text{cm}$
- Lake Lyell – 520  $\mu\text{S}/\text{cm}$

LEG therefore believes that a 600  $\mu\text{S}/\text{cm}$  limit for salinity, and a similar fourfold reduction in limits for other heavy metals and pollutants, is achievable, realistic and necessary.

### **Recommendation:**

A licence limit of 600  $\mu\text{S}/\text{cm}$  for salinity and a fourfold reduction in proposed limits for all other heavy metals and pollutants to be phased in over a maximum of 4 years, with no difference to water quality parameters up and downstream of Wallerawang PS by 2016.

## **2. Focus on reducing Salinity, Heavy Metal and other pollutant levels in the Coxs River**

The focus of this licence variation appears to be to reduce salinity, heavy metals, and other pollutant levels in the discharge water, but does not consider the volumes of contaminated water being discharged, regardless of whether it is a trickle or the current 6-12 ML/day

LEG contends that the main focus should be on reducing salinity, heavy metal and other pollutant levels in the Coxs River, not in the discharge water. For example LEG believes that salinity in the Coxs River downstream of the tortuous watercourse should be limited to 600  $\mu\text{S}/\text{cm}$ . This will provide Delta with other options to reduce salinity in the Coxs River, such as increasing environmental flows.

### **Recommendation:**

Increased environmental flows should be considered as an option to reduce pollutant levels downstream of Wallerawang power station.

### **3. All Potential Contaminants must be licenced**

This licence variation mentions Metaflex EP corrosion inhibitor and dithiocarbamate products as possible contaminants, but fails to include Copper Corrosion Inhibitor AZ8104 (approved by Licence Variation 1114466 on 18 June 2010), Chlorine Dioxide, Carbohydrazide, Ferrous Sulphate, Sodium Hydroxide, Hydrochloric Acid, and other water treatment chemicals used in large quantities (according to various documents) by Delta Electricity.

#### **Recommendation:**

All corrosion inhibitors and water treatment chemicals used by Delta Electricity and their potential contaminants should be listed, and licence limits imposed.

### **4. The recommended licence limits in the attached document should be considered.**

Thankyou for providing our group with this opportunity to respond to this licence variation. If you would like to discuss this further please call me on 6355 1179 or 0408 315 041.

Yours faithfully

Chris Jonkers

On behalf of Lithgow Environment Group Inc.

## **Case study 2: Upper Coxs River licensed discharges**

Local environment groups and the Environmental Defenders Office have publicly raised concerns about unnaturally high concentrations of heavy metals in the Upper Coxs River and its tributaries. These metals were claimed to be present at elevated concentrations with respect to environmental guidelines and were suggested to be having a negative impact on both the river environment and the quality of Sydney's drinking water. The environment groups claimed that the elevated metals were directly attributable to the coal mining industry and to the two Delta Electricity power stations.

In July 2008 and February 2009 the DECCW and the SCA undertook a joint sampling program of the Upper Coxs River. The samples were analysed for an extensive range of contaminants including heavy metals. The results of this sampling indicated that a number of heavy metals were present in water samples at concentrations greater than ANZECC/ARMCANZ (2000) guideline values. These metals included aluminium, boron, copper, nickel and zinc. Articles in *The Sydney Morning Herald* (SMH, 2 December 2008, p.5; SMH 18 June, 2009, p.1; SMH, 19 June, 2009, p.1) highlighted potentially toxic concentrations of other heavy metals, for example arsenic and fluoride, from the Wallerawang Power Station discharge (often referred to as the 'blowdown'). Follow-up water quality and macroinvertebrate sampling by DECCW in September–October 2009 confirmed a

number of areas where contaminant levels were relatively high.

It is understood that in response to these concerns, Delta Electricity has implemented a number of improvements aimed at reducing salt loads and contaminants in its discharges to the Coxs River catchment. Delta is also currently in the process of constructing a reverse osmosis plant at Wallerawang Power Station and a pipeline to Mt Piper Power Station for treatment (Delta Electricity submission 2010a). DECCW has also been working closely with industry to try and address these issues.

The following sections provide a summary of the results of analyses of water quality and macroinvertebrates in the Upper Coxs River catchment (DECCW 2010b).

## **Water quality in the Upper Coxs River sub-catchment**

### **Heavy metals**

Analysis of total and dissolved metal levels in water samples collected from the Upper Coxs River catchment identified 4 distinct clusters of sites:

1. sites associated with and downstream of Wallerawang blowdown discharge
2. sites associated with Neubecks Creek
3. sites associated with Sawyers Swamp Creek below the ash dam
4. all other sites (with generally lower dissolved metal levels).

The water quality analyses indicated that dissolved metals and total metals were generally higher in waters downstream of the Wallerawang blowdown discharge, in Neubecks Creek and in Sawyers Swamp Creek below the ash dam. Relatively increased metal levels in water samples could be identified for at least 6–7 km downstream from the Wallerawang blowdown source (DECCW 2010b).

### **Salinity**

Salinity is also an important issue in the Upper Coxs River and there are concerns about saline discharges affecting the aquatic ecology above and below Lake Lyell. Salinity has previously been shown to have an impact on species retention rates in the Victorian and South Australian streams (Kefford et al. 2010) with species retention rates often decreasing as salinity levels increased. Wallerawang blowdown discharges are currently around 2500  $\mu\text{S}/\text{cm}$  conductivity, while those of the minewater discharges are typically around 1200  $\mu\text{S}/\text{cm}$ . Streams high up in the Catchment typically have much lower conductivity levels (often between 20 and 100  $\mu\text{S}/\text{cm}$ ). If the major salt ions (sodium, calcium, magnesium and potassium) are considered, then the blowdown discharge and Neubecks Creek sites are identified as having elevated salt ion levels. The salt signature of minewater discharges is also very similar to that of the blowdown discharge. This is not surprising since minewater is currently transferred from Centennial Coal's operations to Delta Electricity and subsequently used for cooling water purposes. Some concentration of salts in the blowdown discharge is expected simply due to evaporation.

Investigation of historic water quality data generally indicated that, since the 1960s–1990s, salinity levels have noticeably increased in the Coxs River at locations upstream of the Wallerawang Power Station, downstream of the Great Western Highway, at Lake Lyell and downstream of Lake Lyell as far as Duddawarra. **Nutrients**

In contrast to the metals and salt data, the nutrient data indicate alternative sources for the

majority of nutrients in the Coxs River catchment. Sites in Farmers Creek downstream of Lithgow township and the Lithgow STP have elevated nutrient levels compared to most other sites in the catchment. Nutrient levels in Lake Lyell are also often elevated as a result of inflows from both Farmers Creek and the Upper Coxs sub-catchment. While recent improvements have been made to the Lithgow STP, this remains an important source of elevated nutrients in the Coxs River catchment. In addition, the urban areas around Lithgow are also potential contributors to elevated nutrients in Farmers Creek and Lithgow Council has recently undertaken an assessment of the environmental impacts of the sewerage collection systems (Aurecon 2009b).

## **Macroinvertebrates in the Upper Coxs River sub-catchment**

Elevated contaminants in water were considered to be having an effect on the aquatic biota, including macroinvertebrates. DECCW sampled a large number of sites for macroinvertebrates in the Coxs River catchment in September–October 2009. The fauna assemblages at most sampled sites in the Coxs River catchment were dominated by pollution-tolerant taxa such as worms and chironomids. This was particularly evident in the Coxs River between the Neubecks Creek confluence and Lake Lyell; Farmers Creek downstream of the STP and Lithgow township; Neubecks Creek; and Sawyers Swamp Creek. The site on Kangaroo Creek downstream of the Angus Place discharge was found to have a depauperate macroinvertebrate community.

Analyses indicated that the invertebrate assemblages were influenced by the elevated salinity levels, with the assemblages of sites with elevated conductivity and salts being more similar to each other than to other sites with lower conductivities. There were two caddisfly genera, three mayfly genera and two dipterans that were collected only from sites of lower conductivity. Dragonflies and damselflies were less common at sites of higher salinity, and the total number of taxa collected from each site was generally lower with increasing conductivity. The invertebrate fauna collected from Farmers Creek downstream of the STP were indicative of nutrient pollution, having low diversity and being dominated by dipterans and oligochaetes.

## **Conclusion**

The major conclusions of the DECCW (2010b) assessment were that:

- salinity and metals were elevated in river reaches of the Upper Coxs River subcatchment as a result of power station and mine water discharges, mine water runoff and re-use
- nutrients were elevated downstream of Lithgow township and STP
- these water pollutants were having a detrimental effect on the aquatic biota.

As a result of the above conclusions the Auditor considers that a reduction in the salt and metal loads in the Upper Coxs River sub-catchment is highly desirable and necessary. While efforts by industries have been made to reduce the level of contaminants in their discharges, at this stage this is not sufficient to protect the ecosystem health of the waterways. The Auditor therefore recommends that the Environmental Protection Licence limits for these discharges be reviewed with a view to reducing the heavy metal and salinity concentrations and loads being discharged to the Coxs River catchment.

**Recommendation 4: DECCW review licence limits in the Upper Coxs sub-catchment for all licensed discharge points with a view to reducing the heavy metal and salinity concentrations and loads being discharged to the Coxs River catchment.**