Research Round Up

Title of the project: Analysis of wastewater samples from sewage treatment plants for endocrine disrupting chemicals

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Collaborating organisations: MidCoast Water, NSW

Key issue/s addressed:
- Fate, analysis and removal of endocrine disrupting chemicals (EDCs) in sewage treatment plants

Objectives:
- Determine the levels of oestrogenic and androgenic activities in wastewater samples from sewage treatment plants.
- Identify the chemicals responsible for the activity.
- Gain an understanding of the removal efficiencies of the various treatment processes investigated (activated sludge, UV disinfection and membrane bioreactor).
- Investigate the sludge component for fate and levels of EDCs.
- Investigate a membrane bioreactor for the removal of EDCs as a decentralised system.

Planned Outputs/Outcome (by when):
- Detailed analysis of samples using biological and chemical techniques at different stages of treatment (end 2007).
- Details of levels and fate of EDCs in sewage sludge (end 2008).
- Details on the efficiency of a membrane bioreactor as a decentralised system for EDC removal (end 2008).

Methodological approach:
- Analysis of oestrogenic and androgenic activities using the oestrogenic and androgenic yeast screen bioassays.
- Chemical analysis using Gas Chromatography-Mass Spectrometry with negative ion chemical ionisation.

Key findings so far:
- Biologically significant levels of oestrogenic and androgenic activities observed in all samples studied.
- Androgenic activity was much higher than oestrogenic activity which was attributed to higher levels of androgens in domestic waste from human excretion compared to oestrogens.
- Secondary treatment by activated sludge removed over 90% of oestrogenic and androgenic activities.
- The membrane bioreactor followed by electrochlorination removed >87% of oestrogenic and >98% of androgenic activities from raw sewage samples.

Please tick the relevant theme below:

Monitoring/ Analysis ☑ Exposure assessment ☐ Environmental Fate ☐ Effects ☐

Treatment Technology ☑ Risk Assessment ☐ Other ☐