



#### Purpose of the Task Group

"To serve as a task group on all biosolids related issues, including (but not limited to) working with government on the development and implementation of biosolids related management frameworks, providing advice to industry on current practices and purposed initiatives, and co-ordinating comments from the water industry."

The Latest from the Australian and New Zealand Biosolids Partnership –Stephen Lansdell (EPA), Michael Naughton (Barwon Water), Greg Priest (ANZBP), Karen Campisano (Melbourne Water)

#### ANZBP Update

[www.biosolids.com.au](http://www.biosolids.com.au)

For more information on the ANZBP, any of the projects described below, or to *join as an ANZBP Subscriber* please contact Greg Priest at the Australian Water Association on (02) 9467 8432. Alternatively you can contact any one of our Victorian colleagues on the ANZBP Advisory Board - Michael Naughton (Barwon Water), Karen Campisano (Melbourne Water), Stephen Lansdell (EPA Victoria).

- **Launch of the Legal Register!**

The ANZBP *Legal Register* was launched by DLA Phillips Fox Solicitor Alice Skipper at the Biosolids V Specialty Conference held in Sydney in early June. The presentation outlined the purpose of the Legal Register, its method of use and provided examples of when an Organisation would find it suitable to search the register.

The Register can be found on the ANZBP Subscribers website under the "Technical Resources" tab.

- **Community Attitudinal Survey - Draft Report**

The ANZBP Project Team has received a draft of the *Community Attitudinal Survey (Stage 2 Report)*. Stage 2 builds upon the work completed in the first phase, which was to identify key biosolids issues through dialogue with primary stakeholders. This report analyses the outcomes of a community survey process, which identified general community attitudes towards biosolids/biosolids use. Surveyed persons were grouped into two categories, 'affected' (living in proximity to biosolids management facilities) and 'unaffected' communities. Interesting facts from the survey include the following insights:

1. Members of the affected group are more positively disposed toward biosolids use than the unaffected community.
2. Farmers are notably more likely to buy products grown on land on which biosolids are applied than the rest of the community.

- **Literature Compendium - Draft Report**

The ANZBP Project Team has received a draft of the *Literature Compendium*. The Literature Compendium documents progress in biosolids management practices and research developments in Australia and New Zealand from the past 5 years and planned research. Consisting of a discussion paper which reviews the literature, and a searchable database which categorises the publications the Compendium will be a valuable asset for researchers with technical matters to address, as well as policy and communications officers.

Both the Community Attitudinal Survey and Literature Compendium will be completed and made available on the Subscribers website in August.

## AWA Biosolids Specialty Conference V

Michael Naughton - Barwon Water

The biennial AWA Biosolids Specialty Conference V was held on the 2 - 4 June 2010 in Sydney. Whilst the weather did no favors, the conference once again proved to enlighten and stimulate all those that attended.

The conference was opened with a keynote address from Professor Ian Pepper, a highly respected environmental microbiologist from the Arizona Water Institute. Professor Pepper's explanation of how soils work with biosolids, and his assessment of whether biosolids are a public health threat or saviour, presented an interesting summary of some of the issues confronting the industry.

Of course the dinner after the first day of the conference allowed for some networking, and a chance to get to know each other in a more relaxed atmosphere.

The second day keynote address was presented by Dr. John Novak from Virginia Tech. John has spent more than 40 years studying wastewater sludge dewatering and odours. His address on anaerobic digestion and solids reduction allowed the audience an insight into the latest digestion technologies being developed in USA, and added an international perspective to problems faced by the industry world-wide.

All told there were 40 papers presented by practitioners, researchers, consultants and regulators. Each of the papers provided the attendees with valuable information from people that have obviously taken a great deal of time and care to pass on their learning's through dealing with biosolids issues, both in Australia and around the world.

On the morning of the final day, a workshop on odours was held by Dr. Novak. His experience in this field provided those attending with a number of answers to long asked questions about why some biosolids are more odorous than others, and what might be done to minimise their impact.

Finally the Australian New Zealand Biosolids Partnership held a Road Show Presentation to inform the audience of the benefits of subscribing to the partnership, and a briefing on some of the projects currently being undertaken through the ANZBP.

Summing up, the conference was a great success, and all of us in the water industry have gained a great deal from attending. The next one is to be held in 2012. Keep a space free in your diary.

### Task Group Members

Member	Organisation
Michelle Carsen	South East Water
Karen Campisano	Melbourne Water
Luke Richards	DSE Office of Water
Hieu Dang	Yarra Valley Water
Doug Gardner	Wannon Water
Bruce Hammond	Goulburn Valley Water
Stephen Lansdell	EPA Victoria
Michael Naughton	Barwon Water
Steve Shinnors (Chair)	Gippsland Water
Sarah Johnston	VicWater

### The 5 Key Issues – Current Status

- 1) **Sustainability Template** – Members are encouraged to utilise the Water Environment Research Foundation (WERF) tool, *An Economic Framework for Evaluating the Benefits and Costs of Biosolids Management Options* as a template to determine the sustainability of biosolids management options under consideration. The electronic version of the tool was recently made freely available under WERF's open access policy. It can be downloaded at: <http://tinyurl.com/yj2sumy> .  
  
The task group would welcome any feedback on experiences with the use of this tool, or other similar tools, in the identification of options to manage biosolids.
- 2) **Regulations & Reporting** – the aim is to establish consistent reporting requirements and measures across regulators. The task group has developed a reporting template, and is in the process of consulting with regulators about reporting needs and current KPI's to establish the base from which to develop improvements. Discussions have

been held with the ESC regarding the definition of “biosolids” in the National Water Initiative (NWI) performance indicators. The task group will work with the ANZBP and WSAA to develop a consistent definition of biosolids reuse, to submit to a future review of NWI indicators. It is anticipated that this will ensure consistent national reporting of volumes of stockpiled and reused biosolids.

3) **Strategies/Policies** – the aim is to raise the need for clear directions for biosolids management with government. The EPA has commenced its review of the biosolids reuse guidelines. The guidelines will be informed by the outcomes of the CSIRO National Biosolids Research Program and the ANZBP review of biosolids guidelines. The EPA will continue to inform the task group of the development of the reuse guidelines.

4) **Quality of Product/Risk** – the aim is to establish the risks with biosolids management, and the appropriate quality required to ensure satisfactory management of these risks. The Task Group has received details of sludge bed surveying and monitoring techniques from a number of members, to develop guidance on appropriate techniques to adopt.

Definition of the required quality of stabilised biosolids is dependent on the proposed reuse of the final product. The Task Group has commenced discussions on the processes required to ensure that stabilised biosolids are fit-for-purpose, whilst still mitigating risks to public and environmental health.

5) **Communications** – the aim is to develop communications guidelines to assist the biosolids management industry in Victoria to establish protocols that facilitate the beneficial reuse of biosolids in a safe and sustainable manner. The ANZBP has commenced a Community Attitudinal Survey, with the Biosolids Task Group contributing information and contact

details relating to biosolids management in Victoria. The next stage of the survey will involve direct interviews with key community stakeholders identified throughout the survey.

### Key Tasks for BTG

The key tasks for the BTG are:

- ◆ development and implementation of strategic advice on biosolids management for the Victorian water industry;
- ◆ identification and co-ordination of biosolids research activity in Victoria and input to national biosolids research programs;
- ◆ provision of links to the Australasian Biosolids Partnership;
- ◆ provision of links with regulators; and
- ◆ consider the implications of the findings of the National Biosolids Research Project and implications on EPA’s Guidelines for Environmental Management-Biosolids Land Applications (Publication 943).

## Melbourne Water’s Clay Enriched Biosolids Road Fill Trial

In May 2010, Melbourne Water undertook a novel trial of the beneficial use of clay-enriched biosolids as a geotechnical road fill material at its Eastern Treatment Plant (ETP) in Bangholme, Victoria.

### Introduction

Melbourne Water produces approximately 50,000 tonnes of biosolids annually at its ETP and Western Treatment Plant (WTP) and has almost 3 million tonnes of biosolids stockpiled at both sites.

ETP’s biosolids are unique in nature as approximately 400,000 tonnes of the stockpiled biosolids are clay enriched and nutrient poor.

Clay-enriched biosolids were produced during historical sludge harvesting operations at ETP, where clay-floored sludge drying pans were used,

and biosolids were routinely inadvertently mixed with the clay liner.

Finding a solution for using Melbourne Water's biosolids, including the clay-enriched biosolids, has been a significant challenge due to their atypical composition.

### Biosolids Characterisation

An extensive program of sampling, laboratory testing and analysis of the biosolids was undertaken, which indicated that the clay-enriched biosolids had suitable structural properties for use in geotechnical fill applications. Plate load testing was also undertaken to monitor compaction and settling over time.

### Guidelines

In 2007 VicRoads released Technical Note 90 "Use of clay-rich biosolids as fill material for road embankment construction" to provide guidance on the use of Melbourne Water's clay-rich biosolids for this application.

In June 2009, EPA Victoria released Guidelines for Environmental Management, Publication 1288 "Use of Biosolids as a Geotechnical Fill".

These guidelines have been a significant advance for the beneficial use of biosolids as a geotechnical fill in Victoria by streamlining the previous rigorous and lengthy approval requirements.



Figure 1: Blending of lime with biosolids

### Evolution of Trial Concept

The concept of undertaking a trial of the blending of and use of biosolids in end-use applications at

ETP was proposed and subsequently undertaken to demonstrate:

- that Melbourne Water is able to supply amended clay-enriched biosolids at the required rates, scale and quality required for freeway construction;
- the suitability of amended clay-enriched biosolids in road applications on-site at ETP to provide confidence in this beneficial use of biosolids.

It was proposed to produce two different blends of clay-enriched biosolids for use as a geotechnical fill in two separate roads at ETP:

- One blend would contain cement for enhanced geotechnical properties, and lime for management of moisture content.
- The second blend would contain fly-ash, to extend the setting time and beneficially use another waste material.

This would enable a comparison of the two blends to be made with respect to blending, application and performance over time.

### Biosolids Geotechnical Use Trial

Stockpiled clay-enriched biosolids were transported to a sludge drying pan where blending operations occurred. Fly ash was mixed with biosolids in one blend. Lime was mixed in, followed by cement, for the second biosolids blend.

The two sections of trial road were excavated to the required depths. The existing liners of the roads were constructed of clay, which would provide an impermeable layer.

The fly-ash amended biosolids were placed in one road and compacted, whilst cement/lime amended biosolids were placed in the second road and compacted. A clay cap was applied directly above the amended biosolids for both roads and compacted to provide an impermeable layer. Finally, a layer of crushed rock was applied for sealing.





Figure 2: Cement/lime amended biosolids placed in road

### Stakeholder engagement

It was identified that engagement with all relevant stakeholders was critical to generate support of the concept and encourage the use of clay-enriched biosolids in freeway projects.



Figure 3: Visit to the Trial Site

EPA Victoria, VicRoads, South East Water, Yarra Valley Water and various Freeway Construction Alliances visited the Trial to gain an understanding of how such road projects would be undertaken and ensure the risks would be appropriately managed. This was essential to provide confidence to external parties and to the industry. The visit generated much interest and has assisted in gaining acceptance of the concept.

### Summary

Melbourne Water successfully undertook a small-scale trial of the beneficial use of clay-enriched biosolids as a geotechnical fill material in road applications. It is hoped that the trial will promote the sustainable use of clay-enriched biosolids in road construction applications and encourage biosolids being viewed as a resource rather than a waste material.

### How do you survey your sludge beds?

Readers may recall a request in a previous newsletter for examples of techniques for profiling sludge beds in lagoons. A summary of three of the methods received follows:

#### Sludge Survey Method 1:

- A polycarbonate tube is used to sample and obtain a visual assessment of the demarcation of sludge and water. Previously the objective weight system was used but it was found that it will often sink in active sludge that is around the 0.5% solids range.
- The clear water depth and lagoon depth are then identified from graduations on the tube.
- Sampling is done through a separate vacuum tube that will take a sub sample at several depths of sludge depending on the total depth available, usually 5 sample depths. This is more critical than the sludge depth that can be + or - 100mm.
- With this system of sub sampling any clay slurry or accumulated grit can be identified and discarded. The inclusion of this solids content of grit will have a far greater impact on the total sludge volume than a small error in the depth of sludge.
- A custom sampling tube is used to achieve the sub-sample. This has a far greater repeatability than the old system of a composite of the sludge, which took no account of the solids gradation and clay or grit.
- This method is not 100% accurate there is a lot that depends on the raw water and the lagoon effectiveness (i.e. aeration).

- Surveys carried out on an as forecasted basis.

### Sludge Survey Method 2:

- A calibrated probe is used to locate the floor of the lagoon.
- The total lagoon depth is recorded directly from the calibration probe.
- At the same survey point, the depth of clear water is measured by removing a core sample from the lagoon that contains a portion of sludge in the bottom. This indicates the sludge – water interface and therefore the clear water level.
- Sludge density is determined using an Infra Red Sludge level detector. Depth and density figures are then used to determine the equivalent ‘dry tonnes’ of biosolids.
- The surface area of the lagoon is divided into a grid pattern of 10 square metres and a survey sample point is performed at each grid point node over the entire surface area of the lagoon.
- The annual biosolids accumulation rate (provided the lagoon has not been desludged) is the dry tonnes difference from the most recent survey minus the previous survey result divided by the number of years since the last survey.
- This is not an exact measure and significant variations in sludge volume accumulation rates between measurement intervals have been experienced. There is however a general consistency of inflows to the treatment plants, which are mostly lagoon based, the variations are therefore considered to relate to measurement issues.
- This method of surveying the lagoons is adequate for developing future desludging programs and budgetary requirements.
- Surveys are completed every 3 years.

### Sludge Survey Method 3:

- The depth of sludge is calculated by accurately measuring the total water level depth of the lagoon and the depth of clear water
- The water level depth of the lagoon is measured by inserting a calibrated probe and feeling for the lagoon floor.

- The total lagoon depth is read and recorded directly from the calibrations on the probe.
- At the same survey point, the depth of clear water is measured by removing a core sample from the lagoon that contains a small proportion of sludge in the bottom of the tube.
- The clear water depth is measured as the depth of clear water in the Perspex tube above the sludge layer in the core.
- The small amount of sludge in the bottom indicates the sludge-water interface and the depth of clear water above is a direct indication of the depth of clear water in the lagoon at that location.
- A large number of survey points are used to increase the survey accuracy. As the number of measurements taken increases, it becomes less important to exactly pinpoint the survey location within the lagoon.
- Surveyed every 5 years.
- This is also not an exact measure and significant variations (up to 20%) have occurred in the past.

If you would like to send in examples from your organisation to canvass anonymously in the next edition, particularly if they differ significantly from these examples, please email to: [sarah.johnston@vicwater.org.au](mailto:sarah.johnston@vicwater.org.au)

## Interview- Biosolids in Action

Sarah Johnston interviewing **Gavin Lester Smith**

The biosolids task group are committed to sharing and educating people with the industry. Every second issue we will now have a short interview with someone connected to biosolids, whether they be a farmer, consultant or critic. The idea being to showcase some of the attitudes, both good and bad, that exist on biosolids application.

This issue’s interviewee is **Gavin Lester-Smith**, a crop and prime lamb farmer from the Central Highlands District.

Gavin farms 400 acres at Woodend in Victoria; he is an advocate for the use of biosolids for farming and has been applying biosolids to his land for over 9 years. When Gavin began, the Victorian

EPA Publication 943 *Guidelines for Environmental Management: Biosolids Land Application* did not exist. In taking the decision to use biosolids, he read the NSW guidelines which were to be used, and was impressed by the conservative nature of the protocols underlying land application.

To quote Gavin, in the beginning one of the paddocks he applied the biosolids to would “bog a duck in winter and crack open in summer”, with a history of stubble retention. After the first year’s application of biosolids, the change was dramatic, especially when compared to the paddock next door! It was like comparing chalk and cheese. Gavin can see that the benefits of biosolids go far beyond the pure soil chemistry, in years ahead he believes generations will be aghast at the time taken to get full uptake on the use of biosolids, the concept of nutrient cycling just makes sense.



*Laying the Biosolids*

Some of the challenges Gavin has faced revolve mainly around timing issues, i.e. from treatment plant to paddock. As is to be expected there are a number of protocols that need to be checked off prior to transporting the biosolids. Increasingly erratic weather patterns can sometimes cause havoc for transporting, leaving Gavin on one occasion with no choice but to pull the pin on that particular application. However this is quite rare and more often than not the application is seamless. This is particularly true now, as with increased experience, all parties involved are becoming more aware of each other’s requirements in the treatment and transport of the biosolids.

Gavin is still experimenting with how much to spread, and will admit to a few Jack and the Beanstalk moments where the crops literally

looked like they would touch the sky! His answer in the past has been simply to graze the crop early. He now is growing lupins, which cannot be grazed, and thus is still perfecting the optimum application rate.

Gavin has had no issues with odour and only one anxious moment with dust. As he says if you were spreading lime the dust is less of an issue, however with biosolids the protocols are quite firm. Also the treatment processes to get the biosolids to an appropriate moisture level have improved, reducing the dust threat. Gavin believes that with further education and explanation of the rigour of the guidelines, and the desirability of nutrient reuse, biosolids use will become a better understood, and more accepted practice.

Overall, Gavin’s experience has been an extremely positive and rewarding one. As an advocate for biosolids application and use we welcome and thank Gavin for his insights. Every layer of caution is used when applying biosolids to land for protection of the environment and people alike, but as Gavin has demonstrated the benefits are considerable to the farming sector. We would also like to acknowledge that Gavin sources his biosolids from Western Water and thank them for their support of this article.



*Laying the Biosolids*

## VicWater Biosolids Webpage

The Biosolids Task Group webpage on the VicWater website ([www.vicwater.org.au](http://www.vicwater.org.au)) has recently been upgraded to better serve the biosolids working community. The purpose of the new webpage is to provide information regarding the Biosolids Task Group and its members, provide a list of biosolids contacts across water

businesses and to serve as central reference repository for key biosolids documents.

To access the Biosolids Task Group, select 'Biosolids Working Group' under the 'Task and Working Groups' drop down menu on the VicWater homepage. Alternatively, click on the following link:

[VicWater Biosolids Task Group Webpage](#)

## Do you have any biosolids news to share?

If you have articles for inclusions in future editions of the VicWater Biosolids Newsletter please contact VicWater at [vicwater@vicwater.org.au](mailto:vicwater@vicwater.org.au)

## Key Contacts

The following are key biosolids contacts for utilities and regulators across the Victorian water industry. If you have a query regarding biosolids these people should be your first point of contact.

Organisation	Contact	Organisation	Contact
Barwon Water	Michael Naughton	Lower Murray Water	Keith Neaves
Central Highlands Water	Jason McGregor	Melbourne Water	Karen Campisano
City West Water	Martin Thurlow	North East Water	Tim Clune
Coliban Water	Ross Johnson	South East Water	Terry Anderson
Dept Primary Industries	David Nash	South East Water	Pam Kerry
DSE	Luke Richards	South Gippsland Water	Lale Rogeon
East Gippsland Water	Lara Caplygin	VicWater	Sarah Johnston
EPA Victoria	Stephen Lansdell	Wannon Water	Doug Gardner
Gippsland Water	Steve Shinnars	Western Water	William Rajendran
Goulburn Valley Water	Bruce Hammond	Westernport Water	Geoff Harris
Goulburn Valley Water	Stuart Harris	Yarra Valley Water	Chris Brace
GMMWater	Debra Watson		