Fluoridation Committee
Annual Report
2009-2010
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Introduction

This report was prepared in accordance with section 17(2) of the Fluoridation Act 1968 (the Act).

Water fluoridation is the adjustment of fluoride in drinking water to a concentration that helps prevent dental decay. The National Health and Medical Research Council (NHMRC) affirm that water fluoridation remains the most socially equitable method of achieving community-wide exposure to the health benefits of fluoride. Adjusting fluoride levels to the NHMRC recommended levels in public water supplies has proven a safe and effective measure in the prevention of dental health problems.

Water fluoridation receives endorsement by more than 150 science and health organisations worldwide and fluoridation programs have the strong support of the NHMRC, the World Dental Federation, the International Association for Dental Research and the World Health Organisation.

The Queensland government undertook research which suggested that for each dollar invested in water fluoridation the savings in dental treatment costs range from $12 to $80. Given the improvements in oral health and reductions in associated health costs, State and Territory governments intend to extend their fluoridation programs under the National Oral Health Plan 2004-2013. In Tasmania, 83% of the population receives fluoridated drinking water. In accordance with the National Oral Health Plan 2004-2013, public water supply systems servicing all communities above 1000 in population in Tasmania are fluoridated.

Fluoridation of Tasmanian public drinking water supply systems commenced in 1953 (in Beaconsfield), making Tasmania the earliest jurisdiction to do so. Under the Fluoridation Act 1968, the Minister for Health directs the water corporations (based on recommendations from the Fluoridation Committee) to fluoridate specific public water supplies in a prescribed manner. Included in this Ministerial Direction is the need to monitor the level of fluoride in drinking water on a daily basis.

The Fluoridation Committee’s annual report for 2009-2010 is the first reporting period in which the newly established water corporations are the owners and service providers of fluoridation assets and water fluoridation respectively. The role of the Department of Health and Human Services (DHHS) remained as the regulatory body with strategic oversight being provided by the Fluoridation Committee. This role-change is a result of amendments to the fluoridation legislation in 2008-2009, which was a consequence of the water and sewerage reforms in Tasmania.
The Fluoridation Committee

The Fluoridation Committee consists of five members, each appointed by the Minister for Health. The Deputy Director of Public Health (as a delegate of the Director of Public Health) occupies the position of committee chair. The principal functions of the Fluoridation Committee are to act as an expert advisory committee to interested parties including the Minister, on matters relating to fluoridation of drinking water and to provide strategic oversight of fluoridation works in Tasmania and report on the performance and outcomes of the fluoridation stations throughout the state.

For 2009-10 the Fluoridation Committee members were:

- Dr Chrissie Pickin, Deputy Director of Public Health, Department of Health and Human Services.
- Mr Bill (Kai Chye) Ho, Manager Water and Sewerage, New South Wales Office of Water.
- Dr David Butler, Director Clinical Services, Oral Health Services, Department of Health and Human Services.
- Dr John O’Reilly Section Head – Inorganic Chemistry (Metals), Department of Primary Industries, Parks, Water and the Environment.
- Dr Martin Bicevskis, Senior Medical Officer (Occupational and Public Health), Department of Health and Human Services June 2009 – Dec 2009) and retired registered medical practitioner (Jan 2010 – current).

Meetings of the Fluoridation Committee were held:

- 28 October 2009
- 9 December 2009
- 15 March 2010
- 29 June 2010
Achievements in 2009-10

The following are the key achievements in the implementation of water fluoridation during 2009-2010:

- As water fluoridation was incorporated into the water and sewerage reform, further legislative and administrative activities were undertaken as follows -
  - The passing of the Fluoridation Amendment Bill through both houses of Parliament in October 2009;
  - The re-issuing of the Ministerial Direction to fluoridate public water supplies was given to the three newly established water corporations - Ben Lomond Water, Cradle Mountain Water and Southern Water;
  - The transfer of fluoridation assets from State Government to the new water corporations; and
  - The re-appointment of members to the Fluoridation Committee.

- Completion of Fluoridation Audits by the water corporations as part of their risk review of all newly-acquired infrastructure.

- The submission of a Fluoridation Project Plan (which outlines fluoridation improvements to achieve compliance and other Code of Practice requirements) by the three new water corporations as part of their overall Compliance Implementation licence obligations (to manage and operate water and sewerage infrastructure in the state).

- Finalisation of the plant design and completion of significant building modifications at the National Park fluoridation site as part of the installation of new sodium fluoride dosing equipment.

- Finalisation of electrical design for installation of new switchboard and fluoride dosing equipment (with controls) at Bryn Estyn water treatment plant.

- Continued replacement of corroded pipework at the Gawler and Cam fluoridation plants (which commenced at the end of the 2008-2009 period).

- Re-configuration and instalment of adequate bunding to address OH & S and environmental requirements at the Reatta Rd (Launceston) plant.
Fluoridation Plant Status and Performance

Fluoridation Plant Status

There were 39 operating fluoridation plants in Tasmania for the reporting period of 2009-2010. These plants are designed to provide fluoridated drinking water to approximately 84 per cent of the Tasmanian population. This is a significant proportion as public drinking water supplies provide reticulated water to approximately 88 per cent of the population.

There were 41 fluoridation plants in Tasmania in 2008-2009, of which only 39 were operational. The decrease in fluoridation plants between the two reporting periods relates to the Bell Bay and at Bachelor St, Queenstown fluoridation plants which were made redundant at the start of the 2009-2010.

For more than five years, the Bell Bay fluoridation plant has not operated because the water supply for this plant has not been used for the provision of drinking water for any significant period of time. As a consequence, the fluoridation assets and plant have become quite aged (not been refurbished or upgraded since being installed in 1983) and obsolete. Furthermore the plant design is dated and is unable to meet OH&S requirements. During the transfer of fluoridation assets to the water corporations, it was recognised that the assets at Bell Bay had exceeded their lifespan and were redundant. Should the water supply for this plant be reinstated for a significant period of time and should the Fluoridation Committee recommend fluoridation of this supply in the future, then new fluoridation assets would be required at this plant.

With regard to the Bachelor St, Queenstown fluoridation plant, the water supply for this plant will not be reinstated again in the near future thus rendering the plant redundant.

The site at Illabrook (New Norfolk) was the only plant which was not operational for the full reporting year. At the start of 2010, Southern Water indicated that the Illabrook catchment would no longer be used to supply water for New Norfolk. Fluoridated drinking water for New Norfolk is now provided solely from the Bryn Estyn water treatment plant.

Twenty-one plants use sodium fluoride (NaF), which is a white material available as an odourless powder or in a crystalline form. Fluoridation is accomplished by dissolving the sodium fluoride in water. To minimise occupational health and safety issues the Fluoridation Committee previously approved the use of soluble bags made of Poly Vinyl Alcohol (PVA) for the addition of sodium fluoride to drinking water.

Eighteen plants use Fluorosilicic acid (H₂SiF₆), commonly known as FSA. FSA has advantages with regard to dosing accuracy and economics and is in use in most of the large water treatment plants around the State. The use of automated dosing systems to add FSA to water significantly reduces occupational health and safety issues. FSA is an extremely corrosive and volatile liquid with a pH level of 1.2 that can have an effect on the pH of drinking water if the water does not have sufficient buffering capacity to neutralise the effect of this acidic fluoridating agent.

Fluoridation Plant Performance

Under the Fluoridation (Interim) Regulations 2009, the water corporations must maintain and operate fluoridation plants to ensure compliance with the following performance specifications:

- the fluoridation concentration range required in the drinking water supply is 0.8 to 1.2 mg/L of fluoride
- the maximum level of fluoride allowed in the water is 1.5 mg/L. (This latter maximum level is based on the Australian Drinking Water Guideline health limit)

All three water corporations submitted monthly performance reports during 2009-10.
Table 1 shows that 35 of the 39 fluoridation systems that operated throughout 2009-10 maintained an average fluoride dose within the required fluoride concentration range of 0.8 mg/L to 1.2 mg/L. This compares with 37 of 39 compliant fluoridation systems in 2008-09. Only Cradle Mountain Water achieved 100 per cent compliance of all the fluoridation systems in the north-west region and has been the case for at least the past three reporting periods. The non-compliant fluoridation systems achieved fluoride concentration doses below the optimum range.

**Non-Compliant systems:**

**National Park and Ferntree**

Two of the four non-compliant fluoridation plants were also non-compliant during 2008-2009 - National Park and Ferntree. These systems have had longstanding issues associated with the interaction between the fluoridating agent FSA and the existing water chemistry. Correction of such an issue can be achieved by using an alternative form of fluoride and installing the appropriate equipment needed to store and dose the new fluoridating agent sodium fluoride. This has been planned for the National Park plant with Southern Water completing the design phase and significant building modifications in 2009-10, with installation/commissioning planned in early 2010-11. It is anticipated that the National Park plant will be dosing at the optimal fluoride level in early 2011. With regard to the Ferntree plant (as the effect on water chemistry due to the use of the current fluoridating agent FSA is not as acute and therefore underdosing is not as severe at this plant when compared with the National Park plant), Southern Water is in the process of reviewing and optimising operations at the Ferntree plant. The review will inform a scope and design to address the sub-optimum fluoride dosing. The success of the National Park project will further inform the Ferntree project in 2010-2011.

**Merton and Longford**

There were two additional fluoridation systems that were non-compliant in 2009-10. The Longford plant experienced significant equipment failure during the year. This plant’s failures were corrected by Ben Lomond Water, by the end of the reporting period. The other non-compliant plant was Merton (Glenorchy) which supplies approximately two per cent of Hobart’s fluoridated drinking water supply. This plant has similar but not as severe water chemistry issues as that experienced at the National Park and Ferntree plants. As a result, the average fluoride concentration in the Merton water supply system was 0.77 mg/L, just under the optimum range of 0.8 to 1.2 mg/L.

As a result of the four fluoridation plants failure to not maintain an average fluoride dose within the required fluoride range supply, only 76% of the population receiving fluoridated water at the prescribed range of 0.8 – 1.2 mg/L.
**Plant Reliability**

Fluoridation plant reliability focuses on the level of failure/breakdown of the fluoridation systems. The *Tasmanian Code of Practice for Fluoridation of Public Water Supplies (2007-10)* recommends a reliability level of 95%. This means that the fluoridation system is operational for 95% of the time. The most common causes for low reliability are ageing equipment and/or a major malfunction, which can result in the system being offline for a significant period of time. Fluoridation systems which were not operational for a period of time for the purpose of upgrades and to address non-dosing issues (eg OH&S requirements) are not included in this measure.

Table 1 shows that during 2009-10, 35 of the 39 fluoridation systems had acceptable reliability, which is an improvement from the previous reporting period, when 33 of the 39 fluoridation systems achieved 95% or higher reliability.

In 2009-10 significant effort was undertaken by Ben Lomond Water and Cradle Mountain Water in improving plant reliability. Southern Water maintained the high level of plant reliability achieved by Hobart Water in the previous reporting periods.

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<tr>
<th>Water supplier</th>
<th>Number of fluoridation systems</th>
<th>Number of fluoridation systems that complied with the prescribed fluoride concentration range</th>
<th>Number of fluoridation plants with a reliability of 95 per cent or greater</th>
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<tbody>
<tr>
<td>Ben Lomond Water</td>
<td>12</td>
<td>11</td>
<td>10</td>
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<tr>
<td>Cradle Mountain Water</td>
<td>13</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Southern Water</td>
<td>14</td>
<td>11</td>
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Future Activities

The following issues and activities will be progressed in 2010-2011:

- Completion of the installation and commissioning of the bulk sodium fluoride National Park plant which would allow optimisation of the fluoride dosing at this plant.
- Installation of an additional barrier of fail-safe devices to prevent siphoning and ensuring fluoride dosing equipment cannot occur unless water is flowing through the plant.
- Completion of the installation of a new switchboard and upgrade of the fluoride dosing equipment and associated controls at Bryn Estyn water treatment plant.
- Consultation with Southern Water to address the sub-optimal fluoride dosing at Ferntree.
- Review, consultation and amendments to the Fluoridation (Interim) Regulations 2009.
- Review and revise the Tasmanian Code of Practice for the Fluoridation of Public Drinking Water Supplies.
- Review the options to expand the provision of fluoridated drinking water to numerous communities with populations greater than 500 which currently do not received a fluoridated water supply.
- Preparation of a three year strategic and implementation plan for the Fluoridation Committee.
- Development of a formal emergency plan for fluoride overdose incidents.