Orana Water Utilities Alliance

ORANA WATER UTILITIES ALLIANCE FLUORIDATION GUIDELINES

Document Register

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August 2014	Daryl McGregor Pty Ltd, Consulting Engineers	Original – Adopted
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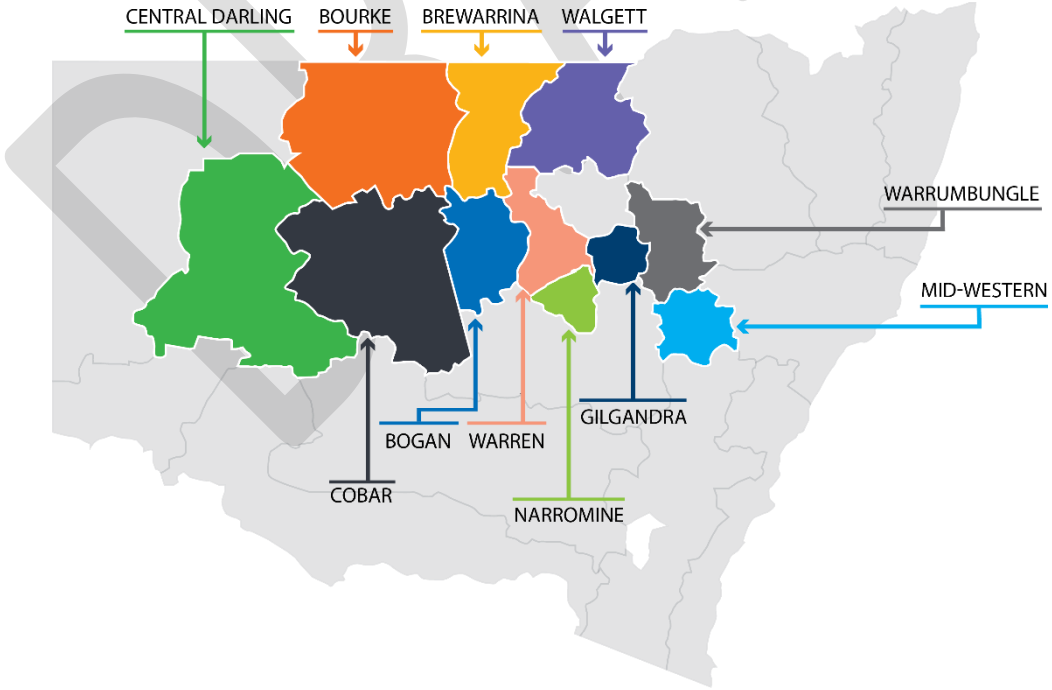
Background

This document is the Water Supply Fluoridation Guidelines which has been adopted by the 11 Councils of the Orana Water Utilities Alliance (OWUA).

These guidelines takes account of and is based on the Code of Practice for Fluoridation of Public Water Supplies, as published by NSW Health, March 2010.

The 11 member Councils of the OWUA are:

- Bogan Shire Council
- Bourke Shire Council
- Brewarrina Shire Council
- Central Darling Shire Council
- Cobar Shire Council
- Gilgandra Shire Council
- Mid-Western Shire Council
- Narromine Shire Council
- Walgett Shire Council
- Warren Shire Council
- Warrumbungle Shire Council



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Introduction

Water fluoridation is the upward adjustment of fluoride in water to optimal levels to help prevent tooth decay. The optimal level of fluoridation is the level of fluoride in the community water supply that is associated with the maximum reduction of dental decay in the population and the minimal occurrence of any adverse dental effects. Fluoridation of drinking water at optimal levels remains the most significant dental public health program in Australia. Water fluoridation delivers the most effective, efficient and socially equitable means of achieving community wide exposure to the dental decay preventive effects of fluoride.

In the 1950's, prior to fluoridation, the level of dental caries amongst children in New South Wales (NSW) was one of the highest in the world with 12 year olds having a mean of 9 to 10 decayed, missing and filled teeth (DMFT). In NSW, water fluoridation was first introduced in the town of Yass in 1956, followed by Tamworth (in 1963) and Sydney (in 1968). By the late 1970's approximately 90 per cent of the population in NSW had access to fluoridated water. Currently approximately 94 per cent of the NSW population has access to fluoridated water.

In NSW, children living in unfluoridated areas have significantly higher dental decay rates than those living in fluoridated areas despite the availability of fluoride toothpaste.

The advantage of water fluoridation is that the entire community benefits from the preventive measure, regardless of age, socioeconomic level, educational achievement, individual motivation or the availability of a dental workforce.

The principal objectives of these guidelines are to encourage the Councils of the Orana Water Utilities Alliance to introduce fluoridation of their water supplies (where this is not currently practiced) and to implement a level of uniformity of approach in fluoridating water supplies across the eight Councils of the Alliance.

Relevant Legislation

Fluoridation of water supplies in NSW is not mandatory. The legislation providing for water fluoridation is described as permissive or enabling legislation.

The NSW Department of Health recognizes that water fluoridation, when implemented, must be effectively managed to achieve maximum oral health benefits and to minimise any risks associated with excessive exposure to fluoride. Best practice in the establishment and operation of fluoridation plants in NSW, in order to meet the technical, occupational health and safety and environmental requirements of the relevant legislation, are contained within the *NSW Code of Practice for Fluoridation of Public Water Utilities, March 2011.* The Code applies to all new and existing plants in NSW and it is the responsibility of all fluoridating water utilities to ensure that they comply with this Code.

There are potential aesthetic, health and environmental risks associated with the use of fluoridation chemicals. These risks need to be effectively managed. The application of risk control measures should be applied systematically to all identified risks based on a hierarchy of control.

Other relevant legislation and regulations which apply to fluoridation of water supplies are:

- Fluoridation of Public Water Supplies Act, 1957.
- Fluoridation of Public Water Supplies Regulation, 2002.

General Requirements for Fluoridation

3.1 Approvals and General Considerations

- A Water Supply Authority must obtain approval from NSW Health prior to fluoridating any water supply.
- A Water Supply Authority shall not commence fluoridating until a formal instrument of approval is received from NSW Health and all NSW Health requirements are in place and operational.
- A Water Supply Authority will not commence fluoridation of a water supply prior to all consumers within the supply area being given adequate warning / notice of the commencement date.
- The community must receive water that is fluoridated to the optimal level of fluoride concentration, so that oral health is not compromised. (The optimum concentration is between 0.9mg/L and 1.05 mg/L of fluoride ion).

3.2 Design Elements

- The design of the fluoridation plant shall ensure it can consistently achieve an overall accuracy of within ±5% of the required fluoride target dose rate over the full water flow rate range approved by NSW Health.
- The design of the fluoridation plant shall ensure reliable automatic operation. That is, it must reliably stop and start with the water flow being dosed.
- The design of the fluoridation plant shall minimise the risk of overdosing due to human error wherever possible.
- The design of the fluoridation plant shall provide a safe working environment and facilitate safe working practices to protect both plant operations staff and the public.
- The design of the plant shall minimise the risk of fluoridating agents escaping to the environment.
- The fluoridation plant shall comply with all legislative requirements.

Typically four generic types of fluoride dosing systems are used. The choice of which to use includes issues such as size, availability of fluoridating agent, costs, staffing availability / limitations, ease of operation, management limitations etc.

The four dosing systems are:

- Dry fluoridating agent feed systems;
- Fluoride solution feed systems
- Fluoride activated systems
- Hydrofluosilicic acid dosing systems.

Sodium silicofluoride (hexafluorosilicate) is the most common chemical used in NSW.

The Code of Practice describes specific requirements for each of the four generic systems.

3.3 Occupational Health & Safety

The water utility shall provide a safe working environment and safe working practices for both plant operators and untrained staff/public

3.4 Environmental Safety

The environment must be protected from adverse impact due to the fluoridation plant.

3.5 Control of fluoridating agent

- Procurement of Fluoridating Agent
  - Any impurities in the fluoridating agent shall not cause health problems for consumers or result in non-compliance with the Australian Drinking Water Guidelines. Physical characteristics and variations in strength should not significantly increase the risk of reliably maintaining the required fluoride concentration in the treated water.

- Storage of Fluoridating Agent
  - Fluoridation plants shall not run out of fluoridating agent.
  - Fluoridating agents must be appropriately stored to minimise deterioration.

3.6 Measurement of fluoride in the treated water

- Sample requirements
  - A representative sample of treated water that directly reflects the real time dosing performance of the fluoridation plant shall be available at all times.
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- Analytical requirements
  - A reliable method for determining fluoride concentration in the treated water shall be provided onsite at all times.
  - The calibration standards must be accurate, the quality of the total ionic strength adjuster and electrode filling solutions and the operation of the fluoride meter must be reliable.
  - All operating staff at a fluoride plant shall follow the same procedures when calibrating the fluoride meter and analysing fluoride samples.
  - The potential for incorrect fluoride results due to temperature differences between the calibration standards and the treated water samples is to be minimised.

3.7 Plant operation and process control

- Fluoridation plant operating targets
  - The fluoridation plant is to be operated to maintain a consistent fluoride concentration throughout the distribution system.
- Routine operational requirements
  - The fluoridation plant shall reliably achieve the required fluoride concentration in the treated water on a continuous basis with no over or under dosing.
  - Fluoride concentrations reaching consumers in the distribution system are to match the treatment plant operating target.
  - All operating staff at a fluoride plant shall follow the same procedures when carrying out routine operational duties.
  - The fluoridation plant and equipment shall not be operated by unqualified persons.

[The water utility shall ensure that it has a sufficient number of qualified people available to enable operation of the fluoridation plant at all times. A minimum of two qualified people is required].

- Emergency response requirements
  - Consumers should not receive fluoride concentrations over 1.5mg/L. Any over or under dosing incidents are to be quickly identified and effectively managed to minimise any impact on consumers.

3.8 Reporting and Communication Requirements

Effective routine communication must be maintained between NSW Health and Water Supply Authorities.

Fluoride Protocol – Roles and Communication

Organisation	Contact details	Roles and Responsibilities
Water utility		▪ Report monitoring results to NSW Health Water Unit (reported electronically or in hard copy: Form 4) and send monthly sample to the laboratory ▪ Report any incidents to the Water Unit (Form 5) ▪ Fluoride overdose response (Form 6)

Organisation	Contact details	Roles and Responsibilities
NSW Office of Water (NOW)	Ph: 02-8281 7326 Fax: 02-8281 7353 Email: Bill.Ho@water.nsw.gov.au	▪ Provide technical advice to water utility and other agencies ▪ Approval Form 1 ▪ Approval of tender specification ▪ Approval of tender acceptance ▪ Inspection of plants for approval to operate ▪ Plant operation support
Public Health Unit (PHU) NSW Health		▪ Assist water utility with compliance with reporting and monitoring and response to incidents ▪ Follow up any non-compliance with water utility
Water Unit, NSW Health	Ph: 02-9819 0589 Fax: 02-9816 0377 Email: waterqual@doh.health.nsw.gov.au	▪ Confirm monitoring results and frequency ▪ Follow up any non-compliance ▪ Provide technical support ▪ Report on monitoring to FPWSAC
NSW Centre for Oral Health Strategy	Ph: 02-8821 4300 Fax: 02-8821 4302 Email: cohs@swahs.nsw.gov.au	▪ Provide advice on health questions related to fluoridation ▪ Provide advice on funding for new plants
Fluoridation of Public Water Supplies Advisory Committee (FPWSAC)	C/- Centre for Oral Health Strategy (As above)	Improve and regulate fluoridation by Water Utility Provide advice to the Minister for Health

3.9 Operator Training and Qualifications

Fluoridation plant operators must be trained and competent to operate a fluoridation plant.

3.10 Record keeping and availability

- Appropriate records must be maintained, documenting the fluoridation plant performance.
- Records of the fluoridation plant performance must be made available to NSW Health upon request.

3.11 Quality Assurance and Auditing

The Water Utility must comply with the requirements of the Fluoridation Act, Regulations, and the requirements of the Code of Practice on an ongoing basis.

NOTE:

- Quite apart from the General Requirements listed above, the NSW Code of Practice for Fluoridation of Public Water Supplies contains a number of specific requirements which must be complied with.
- The NSW Office of Water provides Operator Training for Water Treatment Plant Operators, including training in Fluoridation.

Commitment

Where the raw water supply source has insufficient naturally occurring levels of fluoride concentration (less than 1.0mg/L), Councils of the OWUA commit to the development of fluoridation facilities for their potable supplies, as and when funds are available. Such fluoridation facilities shall be developed in accordance with the NSW Code of Practice for Fluoridation of Public Water Supplies, 2011 and these guidelines.

For those Councils currently operating fluoridation facilities, the plant will be maintained, operated and updated, as required, in accordance with the Code of Practice.

For those Councils seeking to implement fluoridation, a process of public awareness and consultation will be undertaken prior to seeking approval for such facilities.

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