

Final Report on Implementation of a Drinking Water Supply's Water Safety Plan

Water Supply

Palmerston North City (PAL001)

Central North Island Drinking Water Assessment Unit
Palmerston North Branch
MidCentral Health
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Report Identifier

PAL001_PalmerstonNorthCity_WSPImplementation_FinalReport_180517_v1

Executive Summary

On 11/1/2017 an on-site assessment of the implementation of the Palmerston North City Water Safety Plan (WSP) was undertaken. The implementation assessment was carried out by Peter Wood, Drinking Water Assessor (DWA), Reynold Ball (DWA) and Louise Allen (DWA) were both present for part or all of the implementation as observers. Palmerston North City Council (PNCC) was represented by Dora Luo; Water Asset Engineer, Mike Monaghan; Treatment Plants Manager, and Joshua McIndoe; Senior Water Treatment Technician. Additional information was requested subsequent to the on-site assessment and was provided promptly. The on-site assessment was undertaken in three parts. The first part was completed at the PNCC Offices. The second part was undertaken at the Papaoiea Park bores and treatment plant considered the most representative of the bore sites. The third part was undertaken at the Turitea Water Treatment Plant.

The outcome of the implementation assessment was that PNCC was implementing the WSP. The WSP could be updated more actively as a number of additional projects were underway that were not captured. Time frames for improvements can be updated if any delays are experienced.

One non-conformance and five recommendations have been made as a result of the assessment.

A summary of the identified non-conformance and recommendations can be found in the 'Agreement Sheet' included below.

Non-conformances relate to DWA findings where requirements of the approved WSP were not met or where the on-site visit has identified critical inadequacies in the approved WSP

Recommendations are suggestions where the DWA believes improvement could be made relating to good practice.

This final report updates the provisional report released 9/3/2017 (Report Identifier: PAL001_PalmerstonNorthCity_WSPImplementation_ProvisionalReport_300117_v1) based on the agreement sheet received 10/5/2017. PNCC provided comments on all five recommendations, and agreement has been reached regarding action and time frames regarding the non-conformance.

Outline of Palmerston North Water Supply

The WSP reports that the primary source for the water supply to the main urban area of Palmerston North is the Turitea Stream. There are two storage dams in the Turitea Valley that provide approximately 60 days of storage at average demand. Supplementary sources are located at four bore sites at Papaoiea Park, Takaro Park, Keith Street and Roberts Line. The original scope of the WSP implementation covered the Turitea Dam sources and the Papaoiea Park bores. Omissions from the original scope are summarised on the final page of this report.

The WSP describes an overview of the treatment of the Turitea Stream/Dam source at the Turitea Water Treatment Plant (WTP). The treatment processes described are coagulation, flocculation, clarification, rapid sand filtration, disinfection using chlorine and fluoridation as a dental health measure. However further detail within the WSP also describes pre-pH correction using soda ash, dosing with potassium permanganate as required for manganese removal, and Powdered Activated Carbon (PAC) dosing as required for taste/odour. The implementation included an on-site assessment of selected aspects at the Turitea water treatment plant.

The WSP also describes how the groundwater is from a secure aquifer and of good quality. Bore water security has been granted for these sources. Treatment at the bore sites consists of disinfection with chlorine to remove small amounts of ammonia and manganese followed by fluoridation. The implementation included an on-site assessment of selected aspects at the Papaoia park bore site and water treatment plant. Other bore sites and related treatment plants were not included.

The WSP also describes how treated water from the Turitea WTP is stored in three reservoirs, a small reservoir located at the Turitea WTP and two larger reservoirs at Ngahere Park. The water supply reticulation servicing the main urban area is described as comprising approximately 481km of pipelines (with approximately 27,700 service connections), three pressure booster pumping stations and a pressure management station with booster facilities. Aspects of management of the reticulation were assessed during the implementation by checking records and requesting information at Palmerston North City Council offices.

WSP Implementation

PNCC divides responsibility for the water supply between two teams, City Networks and City Enterprises. The WSP implementation was carried out with Dora Luo (City Networks), Mike Monaghan and Joshua McIndoe (City Enterprises).

Staff Training

PNCC advised that Council has a system for identifying staff training requirements through an annual Personal Performance Evaluation. This process is a one-on-one with staff members to prioritise necessary training needs. Routine training requirements (e.g. Training for Confined Space Entry) are addressed through this system. Training is funded through the City Enterprise budget. Records are maintained by Human Resources at PNCC.

PNCC has one trainee working towards the National Certificate in water treatment. All other staff members have the National Certificate in Water Treatment or better.

Specific records were not reviewed.

Cyanobacteria Protocol

PNCC have a long-standing cyanobacteria protocol. The protocol was based on the Guidelines for Drinking-water Quality Management and was approved some years ago. The protocol requires a review and updated narrative to ensure it will be consistently applied should current staff leave PNCC.

RECOMMENDATION 1: Include a narrative with the cyanobacteria protocol describing how this is to be applied and re-submit for approval.

PNCC offered to review and update the protocol by 30 June 2017.

Monitoring Records Review

As part of the implementation assessment we asked PNCC staff what was the process for checking monitoring results when they arrive. The Palmerston North City water supply generally runs without incident, and the DWA wanted to check that there was a system for checking results and identifying if there were issues or transgressions.

Sample results are received and checked by Council. Preliminary results are sent to Dora Luo by Email. If the results show low chlorine or low monochloramine then the SCADA system is checked. PNCC advised that they are trialling an online monochloramine residual monitor. This is additional work not captured by the WSP. The WSP should be considered a living document, and where PNCC are doing additional work that is a further improvement or investigation in the supply, this additional work can be added to the WSP.

RECOMMENDATION 2: Update WSP with additional work that is being carried out during the life of the WSP.

PNCC offered to address this recommendation in conjunction with the agreement to clear Non-Conformance 1.

The DWA asked what would happen in the event PNCC received a report of *E. coli* in a sample of drinking water. The DWA was advised that the process would be to implement a boil water notice, begin resampling, and speak with a DWA. There is a contingency plan in the WSP for the event. An exercise could be run so Council tests their contingency plans and ensures these are fit for purpose.

RECOMMENDATION 3: Run a practice exercise to test contingency plans in the WSP and update as necessary.

PNCC offered to schedule an exercise by 22 December 2017.

Backflow

PNCC have a policy regarding backflow prevention and backflow prevention information in the Palmerston North Water Supply Bylaw 2015 Administration Manual. New connections and change of use are covered under the policy. PNCC has identified a gap in the processes around home-operated businesses where no permission is required. A survey of the city is underway to address this.

PNCC owns the boundary backflow prevention devices. These are all tested by an IQP. A copy of recent test reports was forwarded as part of the information requested subsequent to the on-site assessment.

Improvement Schedule Review

The review of the improvement schedule focussed on those improvements that should have been completed or where significant progress would be expected to ensure the improvement will be completed on time. Improvements 2, 3 and 7 were considered individually, and improvements 4 and 12 were considered together.

Improvement 2: Turitea Upper Dam installation of destratification/aeration facility. This improvement is under way. A compressor has been purchased and is in transit. Max Tarr electrical

has been engaged to install the equipment. We determined that this was behind the time frame indicated in the WSP – the improvement was to be completed in 2016.

Improvement 3: Mitigation strategies for a major earthquake event. This improvement is underway, and the Ngahere Circular Reservoir Seismic Assessment was provided as evidence that the improvement was on track.

Improvement 4 and 12: Future planning for water supply infrastructure and new bore for Kelvin Grove zone. This improvement is underway. A new bore has been drilled at Papaoiea Park and another new bore has been drilled at Railway Road. Bore logs were provided, the Papaoiea Park treatment plant was visited, and the new bore was observed (it is not yet supplying water).

Improvement 7: installation of Security Fencing for bore sites. This has been completed, and auto-controlled gates have been installed on two sites. The security fencing was observed at the Papaoiea Park bore site. This site has an auto-controlled gate to control access.

Of the items checked on the Improvement Schedule, improvement 2 was behind schedule, and a non-conformance has been issued.

NON-CONFORMANCE 1: Palmerston North City Council has not met the time frame for completion of all improvements.

PNCC has agreed to revise the WSP with the actual completion dates. The agreed date for the WSP revision is 30 June 2017.

Items Observed On-Site at Papaoiea Park Bore Site

The Papaoiea Park bore site was chosen because a full range of city bores were available at the one site. It is also the location of a failed bore (the casing was broken during drilling and the bore has now been capped).

Papaoiea Park Bore #1 is in a bore chamber/sump. The sump is connected to storm water. The bore is contained in a small shed, it was difficult to observe all aspects of the bore from outside the shed, and entering the shed would have initiated confined space health and safety requirements. A single check valve was observed on the bore. Papaoiea Park Bore #2 is artesian with surface pumps. Papaoiea Park Bore (new) could not be fully observed as pallets were arranged around the bore head. This bore is not yet connected. The location of the failed bore was observed – a concrete pad capped the bore.

The requirements for maintenance of the bores were discussed. The preventative maintenance programme includes a mechanical and electrical programme.

Items Observed On-Site at Turitea Water Treatment Plant

The management of continuous monitoring data for Turitea Water Treatment Plant was assessed. Continuous monitoring data is recorded on SCADA. All data is sent to H₂Ope for reporting, PNCC reported that they undertake no data manipulation before the data is sent through. Two reported non-compliances were followed through, 18/8/2016 and 19/8/2016. These were linked to issues with the lime dosing and were confirmed as low FACe due to elevated pH.

Maintenance records were available through wall planner, the maintenance duties folder, and plant diaries. PNCC reported a move to integrate the maintenance program in Hansen (an asset management system). This improvement should be captured in the Improvement Schedule (refer recommendation 2 above).

The plant has a large number of alarms that alert the operator if any parameter is outside the normal range. FACe, pH (high level at 7.7), filters out of specification, filters off-line, valve positions and final turbidity are all alarmed. The operator receives at least one or two alarms per day. The latest was a series of alarms as a result of a shorted cable.

The monitoring of aluminium residual was checked in accordance with the WSP. This is being undertaken weekly using grab samples.

Continuous fluoride monitoring was discussed. The system uses an ion-selective electrode. This is the reference method under the DWSNZ and can be reported through Infrastructure Data.

RECOMMENDATION 4: Add continuous fluoride monitoring to Infrastructure Data.

PNCC provided useful comment in the completed agreement sheet.

Disinfection by-products are analysed via checks for colour and Total Organic Carbon (TOC). These are currently carried out six-monthly.

Assessment of Health Act Duties

Health Act Section 69S

PNCC provides a spreadsheet to the Central North Island Drinking Water Assessment Unit reporting shutdowns. Council advised this spreadsheet was populated by City Enterprises – the Depot populates the spreadsheet. Unscheduled shutdowns can be compared with Council’s K-base system.

For scheduled shutdowns Council aims to complete a letter drop to affected properties at least 24 hours before the shutdown occurs, Council policy is to aim for 48 hours. Council reports advising those people affected by unscheduled shutdowns through door-knocking and informing customer services. A sample letter was reviewed for Highbury Avenue, Somerset Crescent, Drayton Place, Lancaster Street, and part of Havelock Avenue 10/10/2016.

A copy of the 2016 spreadsheet was requested and compared with shutdown notifications received from Council over the 2016 year. Council advised on one shutdown affecting Turitea Road (a rural area) on 11/11/2016. On this occasion Council fulfilled their duty to notify of an interruption that exceeded 8 hours. The spreadsheet showing shutdowns from 2016 was requested as supplementary information to support the assessment. This spreadsheet was received 11/1/2017. The shutdown Council contacted us about on 11/11/2016 does not appear on the spreadsheet. Although no legislative breach was identified, it is in PNCCs best interest to ensure all shutdowns or interruptions are recorded.

RECOMMENDATION 5: PNCC ensure that all shutdowns are recorded in one location to demonstrate full compliance with the Act.

PNCC agreed to address this.

Health Act Section 69U

PNCC has several bores that are sources for the Palmerston North City water supply, these have achieved secure bore water status. Council also has two dams in the Turitea Reserve. The Upper Dam provides water to the Lower Dam, and the Lower Dam serves the Turitea Water Treatment Plant. The dams are located in the Turitea Reserve. The assessment of the Section 69U duty covered the management of the Turitea Reserve. Council reported that the Turitea Reserve is routinely managed through a restricted entry system, including guided tours, hunter permissions are granted (during this process freedom from disease is assessed), Pest and weed control is undertaken, and annual monitoring for feral animals is completed.

Council was asked about how weed control, a specific action in the WSP, protects the catchment. Council advised that abundant food in the area increased feral animals. Weed control reduces the amount of food available for feral animals. All chemicals used in the reserve must be approved.

Requests were made for reports demonstrating the management of the Turitea reserve and the list of chemicals approved for use in the reserve. Two reports were received 17/1/2017, a weed control report (October 2016) and a Rodent Monitoring Report (Autumn 2016). No additional information is required. The list of chemicals approved for use in the Turitea Reserve was received 24/1/2017.

Health Act Section 69ZE

PNCC receives and investigates complaints regarding the Palmerston North water supply. People phone Council and speak with customer services. If a response is necessary customer services will lodge a request in the Council K-base system. The system was checked for complaints that had been entered during the month of October 2016. Fourteen complaints were recorded.

K-base records the start time, the time lodged, that the complaint was assigned to a person, time frames for the response, and the actual resolution. Where the complainant requests a call back for a complaint resolution this is recorded. Council advised that key performance Indicators for complaint response are published in the PNCC Annual Plan. The Annual Plan was reviewed and the KPIs were found on page 112. The KPIs included response times and resolution times for urgent and non-urgent issues.

Conclusion

During the on-site assessment sufficient evidence was available to determine that the Palmerston North City WSP is being implemented. One non-conformance was identified around time frames in the improvement schedule. PNCC should update the WSP as necessary during the life of the document. This includes adding information about additional work that is being undertaken, and updating time frames to take account of unforeseen delays.

Changes made to the WSP can be discussed with a Drinking Water Assessor as required. Upon agreement that the changes are significant the WSP can be re-submitted for approval.

Under the Health Act, this supply falls into the category of a large drinking water supply. The Health Act 1956 (as amended) required that the WSP be implemented by 1 July 2013.

These results relate only to the Palmerston North City water supply (PAL001).

Information in this report may be provided to the Ministry of Health at their request. With the exception of the Ministry of Health, this report shall not be reproduced without the approval of the Central North Island Drinking Water Assessment Unit and Palmerston North City Council.

Attachments

Provisional Report Completed 8/3/2017.

Final Report Completed 17/5/2017.




Peter Wood
Drinking Water Assessor
Central North Island Drinking Water Assessment Unit (Palmerston North Branch)

Definitions:

Non-conformances relate to DWA findings where requirements of the approved WSP were not met or where the on-site visit has identified critical inadequacies in the approved WSP

Recommendations are suggestions where the DWA believes improvement could be made relating to good practice.

Assessment Report Information

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| Report identifier | PAL001_PalmerstonNorthCity_WSPImplementation_FinalReport_180517_v1 |
| Drinking Water Assessment Unit (Inspection Body) | Central North Island Drinking Water Assessment Unit Public Health Unit MidCentral Health Private Bag 11-036 Palmerston North 06 350 9110 |
| Drinking Water Assessor | Peter Wood |
| Assessment Date | 11/1/2017 |
| Description of assessment work | Assessment of implementation of Water Safety Plan for Palmerston North City PAL001 Sources – Turitea Dam - S00082; Keith Street Bore - G01208; Papaioea Park Bore - G00104; Papaioea Park Bore #2 - G01412; Roberts Line Bore - G00106; Roberts Line Bore #2 - G01736; Takaro Bore - G00105; Treatment Plants – Turitea Water Treatment Plant - TP00147; Keith St - TP02023; Papaioea Park - TP00148; Roberts Line - TP00150; Takaro - TP00149; Distribution Zones – Palmerston North City - PAL001PC; Aokautere - PAL001AO; Fitzherbert West - PAL001FW; Kelvin Grove - PAL001KG) |
| Equipment Used | Nil |
| Water Supply Owner / Person Responsible | Palmerston North City Council Dora Luo; Water Asset Engineer Mike Monaghan; Treatment Plants Manager Joshua McIndoe; Senior Water Treatment Technician |
| Assessment method | Standard assessment as per Scope Procedure 4 Standard specified in Part 2A of Health Act 1956 |
| Documents and Information | Health Act 1956 Drinking Water Standards for New Zealand 2005 (Revised 2008) Water Safety Plan for the Palmerston North Water Supply 9 September 2015 |
| Site of Assessment | Palmerston North City Council Offices Papaioea Park Bores and Water Treatment Plant Turitea Water Treatment Plant Palmerston North Public Health Unit |
| Omissions from proposed assessment | The implementation assessment did not visit the Turitea Dam as the destratification/aeration system was not in place. The following bore sites/treatment plants were omitted from the assessment – Keith St, Roberts Line, and Takaro. |
| Sub-contracted work | Nil |
| Document checked by: | Reynold Ball Drinking Water Assessor 18/5/2017 |
| Release of report authorised by: | Peter Wood IANZ Accredited Drinking Water Assessor  Signature: Date: 17/5/2017 |

If you do not agree with the findings of this report a written appeal must be lodged with the *Peter Wood, Technical Manager, Central North Island Drinking-water Assessment Unit, MidCentral District Health Board, PO Box 11036, Palmerston North 4440*, within 2 months of receipt of this report. The Technical Manager will arrange for a review to be undertaken using the Ministry of Health appeals procedure.