

Crystal Valley
15 Montgomery Rd
PO Box 4337
WANGANUI
4541

Analytical Report

Report Number: 13/6826
Issue: 1
18 March 2013

Attention: Andrew McAuley

| Sample | Site | Map Ref. | Date Sampled | Date Received | Order No. |
|------------|--------------------------|----------|-------------------------------------|--------------------------------------|-----------------------|
| 13/6826-01 | Domestic Water Supply | | 11/03/2013 00:00 | 12/03/2013 08:30 | 0 |
| Notes: | | | | | |
| Test | Result | Units | Comments | Signatory | |
| 0001 | pH | 7.7 | Passes GV of 7.0 to 8.5 | Vinia Buntoro KTP | |
| 0052 | Alkalinity - Total | 180 | g CaCO ₃ /m ³ | Not a NZDWS test | Marylou Cabral KTP |
| 0055 | Conductivity at 25°C | 46.4 | mS/m | Not a NZDWS test | Vinia Buntoro KTP |
| 0055B | Total Dissolved Solids | 255 | g/m ³ | Below GV of 1000 | Vinia Buntoro KTP |
| 0084 | Turbidity | 1.84 | NTU | Below GV of 2.5 | Gordon McArthur KTP |
| 0601 | Fluoride | 0.43 | g/m ³ | See Notes Below | Shanel Kumar KTP |
| 0602 | Chloride | 36.6 | g/m ³ | Below GV of 250 | Shanel Kumar KTP |
| 0605 | Nitrate - Nitrogen | < 0.01 | g/m ³ | Passes MAV Limit of 11.3 | Shanel Kumar KTP |
| 0607 | Sulphate | 2.05 | g/m ³ | Below GV of 250 | Shanel Kumar KTP |
| 1602 | Arsenic - Acid Soluble | < 0.005 | g/m ³ | Passes MAV Limit of 0.01 | Tina James KTP |
| 1606 | Boron - Acid Soluble | 0.04 | g/m ³ | Passes MAV Limit of 1.4 | Tina James KTP |
| 1610 | Calcium - Acid Soluble | 40.1 | g/m ³ | See Total Hardness | Tina James KTP |
| 1615 | Copper - Acid Soluble | < 0.005 | g/m ³ | Below GV of 1 | Tina James KTP |
| 1619 | Iron - Acid Soluble | 0.346 | g/m ³ | Above GV of 0.2 | Tina James KTP |
| 1622 | Magnesium - Acid Soluble | 11.8 | g/m ³ | See Total Hardness | Tina James KTP |
| 1623 | Manganese - Acid Soluble | 0.267 | g/m ³ | Passes MAV Limit of 0.4 | Tina James KTP |
| 1629 | Potassium - Acid Soluble | 4.48 | g/m ³ | Not a NZDWS test | Tina James KTP |
| 1634 | Sodium - Acid Soluble | 30.7 | g/m ³ | Below GV of 200 | Tina James KTP |
| 1641 | Zinc - Acid Soluble | 0.006 | g/m ³ | Below GV of 1.5 | Tina James KTP |
| 1642 | Total Hardness | 149 | g CaCO ₃ /m ³ | Above Moderate Hardness Level of 100 | Tina James KTP |
| 1643 | Silica | 44.5 | g/m ³ | Not a NZDWS test | Tina James KTP |
| Z9602B | Overall Compliance | NZDWS | | See Notes Below | Jacinta Hira-Wilson . |

Comments:

Sampled by customer using ELS approved containers.

Comments on Individual Test Results

pH

pH measures how acidic or basic the water sample is. Waters with low pH can be corrosive and those with a high pH can promote scale formation in pipes and hot water cylinders. The guideline value for pH in the NZ Drinking Water Standards is 7.0 to 8.5 so the pH of this sample complies with this value.

Alkalinity - Total

Alkalinity is a measure of a waters ability to neutralise acid and is not listed in the NZ Drinking Water Standards. It is included here as a general water quality parameter and can be used as part of the Saturation Index calculation.

Conductivity at 25°C

Conductivity is not listed in the NZ Drinking Water Standards and is an indicator of how many ions are dissolved in the water such as chloride, sulphate and iron. The result is used to calculate the Total Dissolved Solids content of a sample.

Total Dissolved Solids

Total Dissolved Solids is calculated from the conductivity result and has a Guideline Value in the NZ Drinking Water Standards of 1,000 g/m³. The result for this sample complies with this limit.

Turbidity

Turbidity in water is caused by the presence of fine suspended matter such as clay, silt, and other particles. The result for this sample passes the NZ Drinking Water Standards limit of 2.5 NTU.

Fluoride

Non-fluoridated supplies can have naturally occurring fluoride levels ranging from zero to 0.5 g/m³. The Ministry of Health recommends that the concentration of fluoride in fluoridated drinking-water supplies be between 0.7 and 1.0 g/m³ and lists a Maximum Allowable Value of 1.5 g/m³. The level of fluoride in this sample complies with this limit.

Chloride

Chloride is usually present in water sources as sodium chloride - or salt. The NZ Drinking Water Standards lists a Guideline Value of 250 g/m³, above which the water can taste salty and cause corrosion. The level of chloride in this sample is below the limit.

Nitrate - Nitrogen

Nitrate-Nitrogen is introduced to water supplies through fertiliser run-off, the breakdown of organic matter, and from septic tanks and effluent ponds. The NZ Drinking Water Standards lists a Maximum Allowable Value of 11.3 g/m³. The level of nitrate-nitrogen in this sample complies with this limit.

Sulphate

Sulphate is present in some New Zealand soils and can cause taste problems at high levels. The NZ Drinking Water Standards lists a Guideline Value of 250 g/m³, above which the water can taste bad and smell of sulphur. The level of sulphate in this sample is below the limit.

Arsenic - Acid Soluble

Arsenic is found in some soils around New Zealand and this can lead to elevated arsenic levels in some bore waters. The NZ Drinking Water Standards lists a Maximum Allowable Value of 0.01 g/m³. The level of arsenic in this sample complies with this limit.

Boron - Acid Soluble

Boron is introduced to water supplies through the weathering of rocks or from geothermal processes. The NZ Drinking Water Standards lists a Maximum Acceptable Value of 1.4 g/m³. The level of boron in this sample complies with this limit.

Copper - Acid Soluble

Copper is introduced to water supplies through the weathering of rocks, from geothermal processes and from copper pipes and can cause a blue stain at elevated levels. The NZ Drinking Water Standards lists a Guideline Value of 1 g/m³ and Maximum Acceptable Value of 2 g/m³. The level of copper in this sample complies with both limits.

Iron - Acid Soluble

Iron is an essential element that is very common in NZ water. The NZ Drinking Water Standards lists a Guideline Value of 0.2 g/m³. The level of iron in this sample is above the limit indicating the water may cause brown staining of laundry and basins. This does not indicate a health risk.

Manganese - Acid Soluble

Manganese is introduced to water supplies through the weathering of rocks and is common in NZ. The NZ Drinking Water Standards lists a Guideline Value of 0.04 g/m³ and a Maximum Allowable Value of 0.4 g/m³. The level of manganese in this sample passes the MAV limit of 0.4 g/m³ but may cause staining of laundry and basins.

Potassium - Acid Soluble

Potassium is not listed in the NZ Drinking Water Standards and is included here as a likely indicator of dairy farm contamination.

Sodium - Acid Soluble

Sodium is usually present in water sources as sodium chloride - or salt. The NZ Drinking Water Standards lists a Guideline Value of 200 g/m³, above which the water can taste salty and cause corrosion. The level of sodium in this sample is below the limit.

Zinc - Acid Soluble

Zinc is introduced to water supplies through the weathering of rocks and from galvanised pipes. The NZ Drinking Water Standards lists a Guideline Value of 1.5 g/m³. The level of zinc in this sample is below this limit.

Total Hardness

Hardness is derived from the calcium and magnesium content of the water and indicates the likelihood of scale formation inside pipes and kettles. The level of hardness in this sample indicates a moderate to hard water.

Silica

Silica is a hard, glassy mineral substance and is one of the most abundant elements on earth. It is released during the weathering of rocks and is only slightly soluble in water. Because of this, water with high levels of silica can form scale in water heaters and kettles. Silica is not listed in the NZ Drinking Water Standards.

Overall Compliance

All results are measured against the NZ Drinking Water Standards (NZDWS) Guideline Value (GV) and/or Maximum Allowable Value (MAV). Results flagged as above or below a GV do not indicate a health risk, but may require treatment to remedy. Results that exceed a MAV are highlighted in the 'Comments on Individual Test Results' section in red text indicating the water may not be safe to drink. If all comments are shown in black text then the water can be considered to pass the NZ Drinking Water Standards - limited to the tests we have performed - and can be considered safe to drink. E.coli must be included in this report as a passed result in order to claim that the water is safe to drink.

Test Methodology:

| Test | Methodology | Detection Limit |
|--------------------------|--|---------------------------------------|
| pH | Dedicated pH meter following APHA 21st Edition Method 4500 H. | 0.1 |
| Alkalinity - Total | APHA 21st Edition Method 2320 B | 1 g CaCO ₃ /m ³ |
| Conductivity at 25°C | APHA 21st Edition Method 2510 B. | 0.1 mS/m |
| Total Dissolved Solids | Conductivity reading in mS/m x 5.5. The result by this method should be considered approximate only. | 1 g/m ³ |
| Turbidity | Turbidity Meter following APHA 21st Edition Method 2130 B. | 0.01 NTU |
| Fluoride | Ion Chromatography following USEPA 300.0 (modified). | 0.02 g/m ³ |
| Chloride | Ion Chromatography following USEPA 300.0 (modified). | 0.02 g/m ³ |
| Nitrate - Nitrogen | Ion Chromatography following USEPA 300.0 (modified). | 0.01 g/m ³ |
| Sulphate | Ion Chromatography following USEPA 300.0 (modified). | 0.02 g/m ³ |
| Arsenic - Acid Soluble | ICP-OES following APHA 21st Edition Method 3120 B (modified) | 0.005 g/m ³ |
| Boron - Acid Soluble | ICP-OES following APHA 21st Edition Method 3120 B (modified) | 0.01 g/m ³ |
| Calcium - Acid Soluble | ICP-OES following APHA 21st Edition Method 3120 B (modified). | 0.05 g/m ³ |
| Copper - Acid Soluble | ICP-OES following APHA 21st Edition Method 3120 B (modified) | 0.005 g/m ³ |
| Iron - Acid Soluble | ICP-OES following APHA 21st Edition Method 3120 B (modified). | 0.005 g/m ³ |
| Magnesium - Acid Soluble | ICP-OES following APHA 21st Edition Method 3120 B (modified). | 0.01 g/m ³ |
| Manganese - Acid Soluble | ICP-OES following APHA 21st Edition Method 3120 B (modified). | 0.005 g/m ³ |
| Potassium - Acid Soluble | ICP-OES following APHA 21st Edition Method 3120 B (modified). | 0.05 g/m ³ |
| Sodium - Acid Soluble | ICP-OES following APHA 21st Edition Method 3120 B (modified). | 0.05 g/m ³ |
| Zinc - Acid Soluble | ICP-OES following APHA 21st Edition Method 3120 B (modified) | 0.005 g/m ³ |
| Total Hardness | ICP-OES following APHA 21st Edition Method 3120 B (modified). | 1 g CaCO ₃ /m ³ |
| Silica | ICP-OES following APHA 21st Edition Method 3120 B (modified) | 0.02 g/m ³ |
| Overall Compliance | Compliance is measured against the New Zealand Drinking Water Standards for New Zealand 2005 (Revised 2008). | n/a |

"<" means that no analyte was found in the sample at the level of detection shown. Detection limits are based on a clean matrix and may vary according to individual sample.

g/m³ is the equivalent to mg/L and ppm.

Samples will be retained for a period of time, in suitable conditions appropriate to the analyses requested.

All test methods and confidence limits are available on request. This report must not be reproduced except in full, without the written consent of the laboratory.



Report Released By
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