

WINDY HARBOUR DRINKING WATER SUPPLY

ANNUAL WATER QUALITY REPORT

2020/21

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1.0 Administration

1.1 Water Provider Information

| Water Provider Contact Details | | | | | | | |
|--------------------------------------|------------------------------------|--|--|--|--|--|--|
| Name of Company | SHIRE OF MANJIMUP | | | | | | |
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| Company Phone | 97717777 Fax 97717771 | | | | | | |
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| Email | | | | | | | |

1.2 Settlement Information

Windy Harbour is a small coastal settlement in an 'A' Class reserve on the southern coast of Western Australia, located in the D'entrecasteaux National Park 60 kilometres south of Pemberton.

The drinking water supply to the settlement is managed by the Shire of Manjimup. The settlement consists of 240 leases, with further room for expansion up to a maximum of 400 leases. A licensed nature based caravan park is also located at Windy Harbour and has a maximum capacity of 140 patrons and water supply to the communal kitchen and toilet amenities servicing the caravan park is drawn from the settlement's reticulated water supply.

The settlement's primary use is a seasonal holiday destination and has a peak period from November to April. There is no permanent population and leaseholder agreements stipulate that lease holders can occupy the lease for a maximum aggregate of 90 days per annum. During peak periods the settlement supports a population of 2500 which includes both the settlement homes and a nature based caravan park.

1.3 Drinking Water Quality Management and Commitment

The Shire of Manjimup is committed to the effective management of the water reticulation system and providing safe, high quality drinking water to consumers at Windy Harbour.

The Shire of Manjimup was granted an exemption in 2005 pursuant to the *Water Services Licencing Act 1995* for a licence to provide a water service. This exemption was granted due to its not for profit service and lease holder arrangements at Windy Harbour. Notwithstanding the exemption, approvals and reporting mechanisms must satisfy the Department of Health. This includes providing a safe water service and provision of a drinking water quality management plan.

In accordance with the 'Shire of Manjimup Windy Harbour Drinking Water Quality Management Plan 2016' (DWQMP), the Shire is committed to-

- Managing water quality at all points along the delivery chain from source water to the consumer;
- Using a risk based approach for identifying and managing potential threats to water quality;
- Integrating the needs and expectations of our consumers, stakeholders, regulator and employees into any future planning;
- Establishing regular monitoring of the drinking water quality and effective reporting mechanisms to ensure relevant and timely information is provided which will promote confidence in the water supply and its management;
- Developing appropriate contingency planning and incident response capability;
- Continually improve our practices by assessing performance against corporate commitments and stakeholder expectations;
- Ensuring that all products used or contractors engaged in servicing the drinking water system are required to deliver on these management plan commitments.

The Shire of Manjimup is also committed to implementing the recommendations contained within Department of Water and Environmental Regulation's <u>drinking water</u> <u>source protection assessment</u> that are within the Shire's area of responsibility.

A number of recommendations are being addressed as follows-

- Include the Windy Harbour Water Reserve as a special control area in its local planning scheme. This will be an inclusion in the Shire of Manjimup's Local Planning Strategy and Scheme which are currently under review.
- Erect signs along the boundary of the Windy Harbour Water Reserve to alert people of its location and purpose, including an emergency contact phone number. Guidance on the format can be provided by Department of Water and Environmental Regulation. The purchase of signage and sign placement was due to be addressed during this reporting period however as a result of the COVID-19 pandemic, non-essential expenditure was restricted. This matter will be addressed in the 2021/2022 budget.

In addition to the Windy Harbour Drinking Water Supply, a signed non-potable camp rainwater tank is situated at the Nature Based Caravan Park, which is not monitored through the DWQMP. The water in this tank is not intended for drinking.

1.4 Catchment Details and System Information

The catchment for the Windy Harbour Drinking Water Supply groundwater supply is north-west of the settlement and extends approximately 5 kilometres inland from the coast and is 3 kilometres wide. The reserve set aside for the settlement is 190 hectares in area. The settlement and the catchment is entirely contained within the D'entrecasteaux National Park.

Land use in the catchment is predominantly natural vegetation, other than the water production infrastructure itself. Given the catchment land use is almost entirely national park, the level of catchment protection is high and the potential for threats to water quality is low.

A limestone quarry partially falls within the western boundary of the Windy Harbour Water Reserve. The quarry has Department of Water and Environmental Regulation (DWER) approval which stipulates best management practices are applied by the quarry proprietor to protect water quality.

The water demand is highly seasonal and directly proportional to occupation of the individual leaseholders' properties (dwellings) and visitors staying at the nature based Caravan Park.

The water scheme comprises of two bores and a Smartaflow chlorinating disinfection system which uses sodium hypochlorite. The chlorination system is the only disinfection system within the drinking water system and is the single most important barrier in protecting consumers against waterborne pathogens. The infrastructure for the bore and the chlorinator are fenced and locked up in secure bore compounds.

The treated water is pumped approximately one kilometre up hill to a secure tank compound. The water is then gravity fed on demand to the reticulated water supply servicing the settlement, including the kitchen, toilets and amenities servicing the nature based caravan park.

Management of the drinking water quality includes monthly sampling at the nominated points as per the DWQMP for microbiological, chemical health and chemical aesthetic characteristics. Shire staff monitor chlorine, microbial, chemical and radiological properties as per the DWQMP.

The Windy Harbour water supply is monitored by the Shire's Environmental Health Officers and day to day maintenance and supervision of the disinfection system is undertaken by the Shire's operational staff at Windy Harbour. Water is pumped daily during peak season and twice weekly or as required during low seasons.

Sampling and in house monitoring procedures are carried out in accordance with best industry practice and undertaken by Shire staff competent in aseptic technique. The sampling schedule includes 5 nominated sampling points located throughout the reticulated distribution system allowing for the fair representation of the water supply in Windy Harbour. Water samples are analysed by approved NATA laboratories in Perth in accordance with the requirements of the Department of Health (DoH).

1.5 Water Quality Parameters

The Water Quality analysis undertaken is categorised into three main performance areas being microbiological, chemical - health related values and chemical – aesthetic related values. The results are assessed for compliance in accordance with the Australian Drinking Water Guidelines 2011 (ADWG).

Table 1: Water quality parameters adopted from the Australian Drinking Water Guidelines (ADWG).

| Turbidity | Turbidity is the cloudy appearance of water caused by the presence of suspended matter. | The Australian Drinking Water Guidelines specify an aesthetic guideline of 5 NTU. If disinfection is required, the turbidity of less than 1 NTU is desirable at the point of disinfection. |
|------------------------|--|--|
| Colour | Colour in water originates mainly from natural drainage through soil and vegetation in a catchment. | The Australian Drinking Water Guidelines value for colour is based on the colour that is noticeable in a glass. This is generally accepted as 15 HU. |
| Iron | Iron occurs naturally in water as a result of contact with soil or rock in the catchment. Iron in the water does not present a health hazard. | The Australian Drinking Water Guidelines recommend that based on aesthetic consideration, the concentration of iron should not exceed 0.3 mg/L. |
| Hydrogen Sulfide | Hydrogen sulfide is formed in drinking water by the hydrolysis of soluble sulfides, or through the reduction of sulfate by the action of microorganisms. Hydrogen sulfide has an obnoxious 'rotten egg' odour. | Based on aesthetic considerations, the concentration of hydrogen sulfide in drinking water should not exceed 0.05 mg/L. No health based guideline has been set. |
| Total dissolved solids | Total dissolved solids (TDS) consist of inorganic (natural) salts and small amounts of organic matter dissolved in water. Total dissolved solids comprise sodium, potassium, calcium, magnesium, chloride, sulphate, bicarbonate, carbonate, silicon, organic matter, fluoride, iron, manganese, nitrate and phosphate. | Treated water quality containing TDS levels of below 500 mg/L is classified as good. |
| Microbial Pathogens | Thermophilic <i>Naegleria</i> refers to a group of amoeba which includes <i>Naegleria fowleri</i> , the organism that causes the waterborne disease primary amoebic meningoencephalitis. <i>Naegleria fowleri</i> is an environmental pathogen which naturally lives in fresh warm water. | The Department of Health WA has notification protocols in place regarding <i>Naegleria</i> . |
| | The most common and widespread health risk associated with drinking water is contamination by microorganisms. Organisms associated with the gut of humans and mammals cause the usual waterborne diseases. Tests are undertaken for <i>Escherichia coli (E. coli)</i> . | The Australian Drinking Water Guidelines state that the thermotolerant coliform E. <i>coli</i> should not be present in a 100 mL sample. |
| рН | pH is a measure of how acidic/basic water is. The range goes from 0 – 14, with 7 being neutral. pH is the measure of free hydrogen ion concentrations in the water. | The suggested aesthetic pH target from the Australian Drinking Water Guidelines is 6.5 to 8.5. |
| (THMs)Trihalomethanes | Refers to the total sum of a group of chemicals predominantly, chloroform, bromodichloromethane and bromoform along with other disinfection by-products. | The Australian Drinking Water Guidelines recommended maximum value is 0.25 mg/L |

The ADWG are produced by the National Health and Medical Research Council (NHMRC) and are available from the NHMRC website at

http://nhmrc.gov.au/about-us/publications/australian-drinking-water-guidelines

1.6 Units

The following is an explanation of the units presented in this report

| <u>Units</u> : | mg/L | Milligrams per Litre |
|----------------|-----------------|--|
| | CFU/100mL HU | Colony Forming Units per 100 millilitres Hazen Units (a unit of colour) |
| | | |
| | NTU | Nephelometric Turbidity Units (a unit of turbidity) |

1.7 Performance Summary

The Shire of Manjimup obtained 438 samples from the reticulation water supply between July 2020 to June 2021. All samples were assessed pursuant to the ADWG.

There have been no public complaints received concerning the quality of the water during this reporting period. Results of any anomalies or exceedances with the recommended guideline values in microbiological or chemical parameters are forwarded to the DoH as they occur.

| Table 2: Summary of total samples during the 2020/21 reporting period |
|---|
|---|

| | No Assessed | No Within Guidelines | Variance |
|---------------------------|-------------|-------------------------|----------|
| Microbial Quality | | | |
| E. coli | 87 | 87 | 0 |
| Thermophilic Naegleria | 59 | 59 | 0 |
| Chemical Quality | | | |
| Chemical – Health Related | 137 | 136 | 1 |
| Chemical – Aesthetic | 153 | 127 | 26 |
| Radiological | 2 | 2 | 0 |

2.0 Microbial Performance

2.1 Microbial – Exception Notifications

The Shire of Manjimup collected 146 samples at nominated points in accordance with the DWQMP. Included in this total were an additional 15 samples for *Escherichia coli* (*E. coli*) which were obtained over a three week period in July 2020. This was in response to issues with the solar power supply to the chlorinator which required operational staff to hand dose chlorine. The raw water supply (bore) was also resampled for *E. coli* in September 2020 due to an exceedance in turbidity. There were no detections or reportable exceptions of either *E. coli* or Thermophilic *Naegleria* species during the reporting period.

2.2 Microbiological – Compliance

| No. of Bacteria | E. (| coli | No. of Amoeba | Thermophilic <i>Naegleria</i> | | |
|--------------------|---------------|-------------|------------------|----------------------------------|-------------|--|
| Samples | Non Comply | % Comply | Samples | Non Comply | % Comply | |
| 87 | 0 | 100 | 59 | 0 | 100 | |

Table 3: Summary of microbiological samples obtained during 2020/21

2.3 Microbiological - Performance

Microbiological results from the nominated sampling points were compliant pursuant to the ADWG Guidelines for the 2020/21 reporting period.

2.4 Microbial Incident Specific Information

There were no recorded microbial non-conforming results for *E. coli*, Thermotolerant Coliforms or Thermophilic *Naegleria* at the nominated sample points during 2020/21. There have also been no significant or reportable microbiological incidents in this reporting period.

3.0 Chemical – Health Related Performance

3.1 Chemical – Exception Notifications

There were a total of 5 exception notifications (Level 2) submitted to the DoH during the reporting period as follows:

- Monthly sampling undertaken in August and September 2020 revealed that turbidity levels exceeded the maximum aesthetic guideline value at the source (bore) sample point. A contributing factor may have been inadequate flushing of the sample point prior to collection. In addition, raw water quality monitoring undertaken during development of the Drinking Water Quality Management Plan for the Windy Harbour Drinking Water Supply indicated that water extracted from the bore(s) has naturally elevated levels of turbidity. Re-sampling undertaken on 14 September 2020 revealed that turbidity values had returned to a compliant level. Furthermore, all *E. coli* samples collected during this time were compliant with the ADWG.
- Monthly sampling undertaken in November 2020 showed the THM level of 0.26 milligrams per Litre exceeded the maximum health-related guideline value at the consumer sample point. THMs are disinfection by-products and are indicative of the natural organic matter in the water prior to disinfection. The Shire will continue to monitor individual and trending results via its monthly sampling program.
- Monthly sampling undertaken in May and June 2021 revealed that turbidity levels exceeded the maximum aesthetic guideline value at the distribution sample point. Water passing through a distribution system can sometimes lead to an increase in turbidity, generally as a result of the resuspension of fine sediments settled over a long period of time, or from the breakdown of pipe materials or biofilms lining the walls of the pipes. The associated health risk is generally minimal however some biofilms can harbour pathogens (ADWG 2011).

In the Windy Harbour drinking water system, free chlorine residuals provide the main barrier to pathogens that may enter the system. The control of free chlorine residuals throughout the distribution system will continue to be maintained via routine monitoring and the Shire's flushing program which draws chlorinated water through the system displacing stagnant water. All *E. coli* samples collected during this period were compliant with the ADWG.

In July 2020 the chlorine value at the treated water storage tanks was 9.6 mg/L which exceeds the health guideline value of 5 mg/L. The probable cause for this anomaly was deemed to be as a result of operational staff hand dosing chlorine due to issues with the solar power supply to the chlorinator. Chlorine values recorded throughout the distribution system and at the consumer sample point at the same time and thereafter were within both aesthetic and health parameters determined by the ADWG.

3.2 Chemical - Health – Compliance

There are many chemical parameters that have a health related guideline value pursuant to the ADWG as shown in the following tables.

| Category | Chemical | Unit | Health Guideline Value | Max Value of Samples | No Assessed | No Within Guidelines | Compliance |
|--|--|------|------------------------------|----------------------------|----------------|-------------------------|------------|
| | Chloroacetic Acid | mg/L | 0.15 | <0.05 | 11 | 11 | 100% |
| | Dichloroacetic Acid | mg/L | 0.1 | <0.02 | 11 | 11 | 100% |
| Organic Chemicals | Trichloroacetic Acid | mg/L | 0.1 | 0.03 | 11 | 11 | 100% |
| Disinfection by- | 2-Chlorophenol | mg/L | 0.3 | <0.00005 | 2 | 2 | 100% |
| products | 2,4-dichlorophenol | mg/L | 0.2 | <0.0001 | 2 | 2 | 100% |
| | 2,4,6-trichlorophenol | mg/L | 0.02 | <0.001 | 2 | 2 | 100% |
| | Trichloroacetaldehyde | mg/L | 0.1 | <0.02 | 11 | 11 | 100% |
| | Antimony | mg/L | 0.003 | <0.001 | 1 | 1 | 100% |
| | Arsenic | mg/L | 0.01 | <0.001 | 1 | 1 | 100% |
| | Barium | mg/L | 2 | 0.049 | 1 | 1 | 100% |
| | Beryllium | mg/L | 0.06 | < 0.0005 | 1 | 1 | 100% |
| | Boron | mg/L | 4 | 0.04 | 1 | 1 | 100% |
| | Cadmium | mg/L | 0.002 | <0.0001 | 2 | 2 | 100% |
| | Chromium (as Cr(VI)) | mg/L | 0.05 | <0.005 | 1 | 1 | 100% |
| | Copper | mg/L | 2 | 0.20 | 1 | 1 | 100% |
| | Cyanide | mg/L | 0.08 | < 0.004 | 1 | 1 | 100% |
| | Fluoride | mg/L | 1.5 | <0.1 | 1 | 1 | 100% |
| Other Inorganic | lodide | mg/L | 0.5 | <0.1 | 1 | 1 | 100% |
| Chemicals | Lead | mg/L | 0.01 | <0.001 | 1 | 1 | 100% |
| | Lithium | mg/L | - | 0.0039 | 1 | 1 | - |
| | Manganese | mg/L | 0.5 | 0.012 | 1 | 1 | 100% |
| | Mercury | mg/L | 0.001 | < 0.00005 | 1 | 1 | 100% |
| | Molybdenum | mg/L | 0.05 | <0.001 | 1 | 1 | 100% |
| | Nickel | mg/L | 0.02 | <0.001 | 2 | 2 | 100% |
| | Nitrate | mg/L | 50 | <0.5 | 1 | 1 | 100% |
| | Nitrite | mg/L | 3 | <0.5 | 1 | 1 | 100% |
| | Selenium | mg/L | 0.01 | <0.001 | 1 | 1 | 100% |
| | Silver | mg/L | 0.1 | <0.001 | 1 | 1 | 100% |
| | Strontium | mg/L | 4 | 0.57 | 1 | 1 | 100% |
| Inorganic Chemicals Disinfection Agents & inorganics by-products | Trihalomethanes | mg/L | 0.25 | 0.26 | 12 | 11 | 92% |
| of disinfection | Chlorine (Free) | mg/L | 5 | 9.6 | 69 | 68 | 98.5% |
| Treatment organics (other than disinfection by-products) | Carbon tetrachloride | mg/L | 0.003 | <0.0005 | 1 | 1 | 100% |
| Organic Compounds: | Benzene | mg/L | 0.001 | <0.0002 | 1 | 1 | 100% |
| industrial | Chlorobenzene | mg/L | 0.3 | <0.001 | 1 | 1 | 100% |
| hydrocarbons (other than disinfection by- products) | 1,2-dichlorobenzene (1,2-DCB) | mg/L | 1.5 | <0.0005 | 1 | 1 | 100% |
| products) | 1,4-dichlorobenzene (1,4-DCB) | mg/L | 0.04 | <0.0002 | 1 | 1 | 100% |
| | 1,1-dichloroethane | mg/L | 0.005 | <0.0005 | 1 | 1 | 100% |
| | 1,2-dichloroethane | mg/L | 0.003 | <0.002 | 1 | 1 | 100% |
| | 1,1-dichloroethene (1,1-DCE) | mg/L | 0.03 | <0.001 | 1 | 1 | 100% |
| | 1,2-dichloroethene (1,2-DCE) | mg/L | 0.06 | <0.0005 | 1 | 1 | 100% |
| | Dichloromethane (methylene chloride) | mg/L | 0.004 | < 0.004 | 1 | 1 | 100% |
| | Epichlorohydrin | mg/L | 0.0005 | <0.00025 | 1 | 1 | 100% |
| | Ethylbenzene | mg/L | 0.3 | <0.001 | 1 | 1 | 100% |
| | Ethylenediamine tetraacetic acid (EDTA) | mg/L | 0.25 | <0.02 | 1 | 1 | 100% |

Table 4: Summary of heath related values for monthly and annual samples relative to chemical parameters

| Category | Chemical | Unit | Health Guideline Value | Max Value of Samples | No Assessed | No Within Guidelines | Compliance |
|----------|--|------|------------------------------|----------------------------|----------------|-------------------------|------------|
| | Hexachlorobutadiene | mg/L | 0.0007 | < 0.0003 | 1 | 1 | 100% |
| | Nitrilotriacetic acid (NTA) | mg/L | 0.2 | <0.02 | 1 | 1 | 100% |
| | Styrene (vinylbenzene) | mg/L | 0.03 | <0.001 | 1 | 1 | 100% |
| | Trichlorobenzenes (total) | mg/L | 0.03 | <0.001 | 1 | 1 | 100% |
| | Vinyl chloride | mg/L | 0.0003 | <0.00015 | 1 | 1 | 100% |
| | Plasticisers di(2- ethylhexyl) phthalate (DEHP) | mg/L | 0.01 | <0.01 | 1 | 1 | 100% |
| | Polycyclic aromatic hydrocarbons (PAHs) Benzo-(a)-pyrene | mg/L | 0.00001 | <0.00000 5 | 1 | 1 | 100% |
| | Toluene | mg/L | 0.8 | <0.001 | 1 | 1 | 100% |
| | Xylene | mg/L | 0.6 | < 0.003 | 1 | 1 | 100% |

The Shire achieved compliance with guideline values for all health-related chemical parameters with the exception of one exceedance in chlorine and THM values respectively. Figure 1 shows THM values for monthly samples obtained during the reporting period.

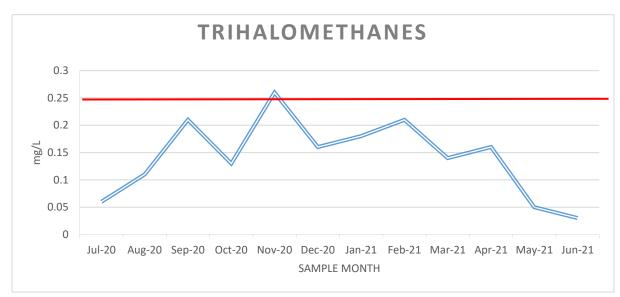


Figure 1:Total Trihalomethane values for monthly samples obtained during 2020/21 (mg/L).

The health guideline value for chlorine is 5 mg/L however during sampling undertaken in July 2020 the chlorine value at the water storage tanks was 9.6 mg/L. The probable cause for this anomaly was deemed to be as a result of operational staff hand dosing chlorine in response to issues with the solar power supply to the chlorinator. It should be noted that all chlorine values recorded throughout the distribution system and at the consumer sample point at the same time were within both aesthetic and health parameters determined by the ADWG.

4.0 Chemical – Aesthetic Related Performance

4.1 Chemical – Aesthetic - Results

The following table summarises the results for the aesthetic characteristics during the reporting period. Whilst exceedances of aesthetic guidelines can affect consumer experience, it is important to note that exceedances to aesthetic guidelines do not pose a health risk to consumers.

| Category | Characteristic | Unit | Aesthetic Guideline Value | Maximum Value of Samples | No Assessed | No Within Guideline s | Compliance |
|---|---------------------------|------|---------------------------------|--------------------------------|----------------|-----------------------------|------------|
| | Hardness | mg/L | 200 | 120 | 1 | 1 | 100% |
| | рН | pН | 6.5-8.5 | 7.10 | 92 | 92 | 100% |
| | Total Dissolved Solids | mg/L | 600 | 830 | 13 | 12 | 92% |
| | True Colour | HU | 15 | 62 | 12 | 0 | 0% |
| | Turbidity | NTU | 5 | 32 | 24 | 20 | 83% |
| Inorganic chemicals, disinfection agents and inorganic by- products of disinfection | Chlorine (Free) | mg/L | 0.6 | 9.6 | 69 | 65 | 94% |
| Inorganic Chemicals Disinfection by- products A | 2-Chlorophenol | mg/L | 0.0001 | <0.00005 | 2 | 2 | 100% |
| | 2,4-dichlorophenol | mg/L | 0.0003 | <0.0001 | 2 | 2 | 100% |
| | 2,4,6-trichlorophenol | mg/L | 0.002 | <0.001 | 2 | 2 | 100% |
| | Aluminium | mg/L | 0.2 | 0.02 | 1 | 1 | 100% |
| | Ammonia (as NH4) | mg/L | 0.5 | <0.005 | 1 | 1 | 100% |
| | Chloride | mg/L | 250 | 170 | 1 | 1 | 100% |
| | Copper | mg/L | 1 | 0.20 | 1 | 1 | 100% |
| | Hydrogen Sulphide | mg/L | 0.05 | <0.01 | 1 | 1 | 100% |
| Other inorganic Chemicals | Iron | mg/L | 0.3 | 7.5 | 12 | 0 | 0% |
| | Magnesium Dissolved | mg/L | No Value | 11 | 1 | 1 | 100% |
| | Manganese | mg/L | 0.1 | 0.012 | 1 | 1 | 100% |
| | Sodium | mg/L | 180 | 90 | 1 | 1 | 100% |
| | Sulphate | mg/L | 250 | 3 | 1 | 1 | 100% |
| | Zinc | mg/L | 3 | 0.058 | 1 | 1 | 100% |

Table 5: Summary of aesthetic values for monthly and annual samples (chemical) obtained during 2020/21

4.2 Chemical - Aesthetic – Incident Specific Information

Iron levels exceeded the maximum aesthetic guideline value in each month during the reporting period. This guideline value is based on a taste threshold and there have been no public complaints received concerning the aesthetic quality of water during this period. The Shire's Environmental Health Officers will continue to monitor iron levels in the future.

The following table shows results for true colour values which were above the aesthetic guideline value in each month during 2020/21.

| True Colour | Guideline Aesthetic Value (HU) | Sample Aesthetic Value (HU) |
|----------------|--------------------------------------|--------------------------------|
| July 2020 | 15 | 37 |
| August 2020 | 15 | 37 |
| September 2020 | 15 | 28 |
| October 2020 | 15 | 31 |
| November 2020 | 15 | 22 |
| December 2020 | 15 | 19 |
| January 2021 | 15 | 36 |
| February 2021 | 15 | 27 |
| March 2021 | 15 | 30 |
| April 2021 | 15 | 32 |
| May 2021 | 15 | 62 |
| June 2021 | 15 | 60 |

Table 6: Summary of True Colour values for monthly samples obtained during 2020/21

True colour represents the colour that remains after any suspended particles have been removed. Colour can influence the appearance of water and, although not necessarily harmful to human health, the water will not be as appealing to consumers.

Raw water extracted from the bore(s) at Windy Harbour is also characterised by naturally elevated levels of colour (greater than 15 HU) and iron (greater than 0.3 milligrams per Litre), and there is no pre-treatment process (filtration) in place to minimise these characteristics prior to chlorination.

Chlorine levels also exceeded the aesthetic guideline value on four occasions however the ADWG state that for some drinking water supplies it may be necessary to exceed guideline values to ensure an effective disinfectant residual is maintained throughout the system.

5.0 Radiological Performance

Radiological testing for Gross Alpha and Gross Beta levels in the Windy Harbour Drinking Water Supply is scheduled on a 5 yearly basis. Samples were obtained in July 2020 and the results from the nominated sampling point were compliant with the screening values in ADWG.

| Characteristic (& Sample Point) | Unit | Screening Value | Sample Value | No Assessed | No Within Guidelines |
|---------------------------------------|-------|--------------------|-----------------|----------------|-------------------------|
| Gross Alpha (Source) | Bq/L* | 0.5 | 0.040 | 1 | 1 |
| Gross Beta (Source) | Bq/L* | 0.5 | <0.076 | 1 | 1 |

Table 7 Summary of Radiological Analysis undertaken during 2020/21.

*Note: Becquerels per litre

6.0 Summary

This Annual Report describes the Windy Harbour drinking water quality performance for the period July 2020 to June 2021. Sampling and in house monitoring procedures are carried out in accordance with best industry practice and undertaken by Shire staff competent in aseptic technique.

The sampling program comprises of 6 compliance monitoring points which includes the source water (bore), treated water tanks and various locations at the extremities of the distribution system, allowing for the fair representation of the water supply in Windy Harbour. Water samples in the sampling schedule are analysed by approved NATA laboratories in Perth in accordance with the requirements of the DoH.

The report demonstrates that all samples obtained for microbiological analysis were within the parameters determined by the ADWG. The majority of the samples acquired for chemical and physical characteristics were also compliant, with the exception of individual results for trihalomethanes and chlorine. Whilst impacts to aesthetic quality of drinking water may occur due to greater concentrations of chlorine, it is important to note that adequate disinfection is paramount for the provision of safe drinking water. The Shire's Environmental Health Officers will continue to monitor chemical analysis results going forward.

The Shire of Manjimup is also committed to being transparent on its performance by providing the public with accurate and representative information in this report. This report aims to demonstrate to Windy Harbour residents, visitors, guests and visitors alike, the ongoing commitment to the sustainable production and supply of high quality drinking water at Windy Harbour.

Any further enquiries or information regarding this report or any other matter pertaining to the Windy Harbour Drinking Water Supply can be obtained by emailing the Shire's Environmental Health Services Team at info@manjimup.wa.gov.au or by telephoning (08) 9771 7777.