



LancelinSouth

PO Box 60

Lancelin WA 6044

Ph: 08 9655 1555

admin@lancelinsouth.com.au

ABN 18 152 331 238

Report to the Department of Health

by

Lancelin South

for the period

1 July 2019 to 30 September 2019

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1.0 Water Provider Information

Table 1: Water Provider Contact Details

Name of Company	Lancelin South		
Company Address	PO Box 60, Lancelin, WA, 6044		
Company Phone	08 9655 1555	Fax	
Company Email	admin@lancelinsouth.com.au		
Chief Executive Officer	Joe Matthews		
CEO Email			
DoH Liaison Officer	Blair Shackleton, GHD		
DoH Liaison Officer Email	Blair.shackleton@ghd.com		

Table 2: Lancelin South System Information

Number of consumers	13
Average water supplied (L/day)	218
Sources of water	100% groundwater
Treatment systems	Media filtration, GAC filtration, RO, chlorination
Length of mains	Approximately 1.6 km
Number of zones	1
Number of sample points	3 (Bore SP, treated water tank SP, consumer SP)

Source Details

Raw water for the Lancelin South residential development is sourced from a single production bore, tapping the Leederville aquifer within the Lancelin South water reserve, approximately 250 m east of the Lancelin South development. The catchment within the water reserve is natural bushland.

Distribution System

The fenced Water Treatment Plant is located at the existing bore site (adjacent to Lancelin Road). Treated and chlorinated water is stored in a single tank adjacent to the water treatment plant. Potable water is supplied via a gravity system through approximately 1,600 m of DN 250 and DN 300 PVC (polyvinyl chloride) pipeline along Lancelin Road Reserve with a distribution network currently of approximately 1,900 m of HDPE (high density polyethylene) pipeline.

2.0 Performance Summary

Table 3: Water Quality Meeting the Drinking Water Guidelines / Minister of Health’s Directions

	Number Assessed (1)	Number of Non-Compliant Analyses (2)	% Compliance
Microbiological Quality			
Thermotolerant Coliforms / <i>E.coli</i>	4	0	100%
Amoeba (Thermophilic Naegleria)	3	0	100%
Chemical Quality(3)			
Chemical – Health related(4)	6	0	100%
Chemical – Aesthetic(5)	6	0	100%
Radiological	0	0	100%

Notes:

- (1) Number of samples taken for the quarter from Consumer Sampling Point
- (2) Number of samples that do not comply with the drinking water guidelines (ADWG).
- (3) Chemical performance is based on the results of the quarter.
- (4) Chemicals with ADWG Health guideline;
- (5) Chemicals with ADWG aesthetic guideline value

3.0 Microbial Performance

3.1 Microbiological - Exception Notifications

Nil incidents (1 July 2019 to the end of the reporting quarter).

3.2 Microbiological - Compliance Summary.

Table 4: Microbiological compliance summary

	Sampling Point	Number of Analyses ⁽¹⁾	Number of Non-Compliant Analyses	% Compliance
<i>E. coli</i>	Treated Water Tank	2	0	100%
	Consumer	2	0	100%
Thermophilic <i>Naegleria</i>	Treated Water Tank	2	0	100%
	Consumer	2	0	100%
<i>Naegleria fowleri</i>	Treated Water Tank	0 ⁽²⁾	0	100%
	Consumer	0 ⁽²⁾	0	100%
Heterotrophic bacteria	Consumer	1	0	100%

Notes:

(1) Microbiological assessment performed on 2 samples taken at Consumer sample point and 2 from Treated Water Tank sample point

(2) No analyses for *N. fowleri* as no detection of thermophilic *Naegleria*

Table 5: Heterotrophic bacteria analyses at Consumer Sampling Point

	Number of analyses	Maximum Value
HPC at 22°C for 3 days	1	<20
HPC at 37°C for 2 days	1	<20

4.0 Chemical - Health Related Performance

4.1 Chemical - Health Related - Exception Notifications

Nil incidents.

4.2 Chemical - Health Related

Consumer Sample Point

One (1) sample was collected for analysis of physical and inorganic parameters and for disinfection by-products in the potable water from the Consumer Sample Point on 29/8/2019. No parameters exceeded the ADWG health related values.

Six (6) routine field measurements of residual chlorine were undertaken; none exceeded ADWG health related values.

Table 6: Summary of health related analyses from consumer sampling point

Health Characteristic (guideline limit)	Number of Analyses	Number of Analyses Non- Compliant	% Compliance	Maximum value (mg/L)
Free Chlorine (<5mg/L)	7	0	100%	1.5
Fluoride, F (1.5 mg/L)	1	0	100%	0.2
Nitrite Nitrogen, NO ₂ as N (0.9 mg/L)	1	0	100%	<0.02
Nitrate Nitrogen, NO ₃ as N (11 mg/L)	1	0	100%	0.2
Total Antimony (0.003 mg/L)	1	0	100%	<0.001
Total Cadmium (0.002 mg/L)	1	0	100%	<0.0001
Total Chromium (0.05 mg/L as Cr ^{VI})	1	0	100%	0.001
Total Copper (2 mg/L)	1	0	100%	0.007
Total Lead (0.01 mg/L)	1	0	100%	<0.001
Total Manganese (0.5 mg/L)	1	0	100%	<0.01
Total Nickel (0.02 mg/L)	1	0	100%	<0.001
Total THM's (0.25 mg/L)	1	0	100%	0.12
Chloroacetic acid (0.1 mg/L)	1	0	100%	0.03
Dichloroacetic acid (0.1 mg/L)	1	0	100%	0.004
Trichloroacetic acid (0.1 mg/L)	1	0	100%	0.011
Chloral Hydrate (0.1 mg/L)	1	0	100%	<0.002

Treated Water Sample Point

No (0) samples were collected for laboratory analysis of the potable water from the Treated Water Sample Point between 1 July and 30 September 2019.

Ten (10) routine field measurements were undertaken. One (1) sample exceeded the ADWG health related value for residual chlorine; a value of 6.2 mg/L was measured from the Treated Water Tank Sampling point. The high chlorine level was caused by a faulty chlorine instrument, resulting in over-dosing of the tank. The fault was rectified within 1 day, the treated water tank was drained and refilled to dilute contents. This incident has not resulted in non-compliant residual chlorine levels at the Consumer SP.

Table 7: Residual chlorine analyses

Sampling Point	No of Analyses	No of Analyses Non-Compliant ⁽¹⁾	% Compliance	Maximum value
Treated Water Tank Sampling Point	10 ⁽²⁾	1	89%	6.2
Consumer Sampling Point	7 ⁽³⁾	0	100%	1.5

Notes:

- (1) Non-complying: <0.1 mg/L or >5.0 mg/L
- (2) All 5 analyses by field instrument.
- (3) One sample at laboratory and 6 analyses by field instrument.

Source Sampling Point

One (1) sample was collected in the reporting period for analysis of physical and inorganic parameters and pesticides in the source water from the Source Sample Point on 29/8/2019. Results are presented in Table 8 below. No parameters exceeded the ADWG health related values.

Table 8: Summary of health related analyses from source sampling point

Health Characteristic (guideline limit)	Number of Analyses	Number of Analyses Non-Compliant	% Compliance	Maximum value (mg/L)
Free Chlorine (0.6mg/L)	1	0	100%	0.04
Arsenic – Total (0.01 mg/L)	1	0	100%	<0.001
Barium – Total (2 mg/L)	1	0	100%	0.16
Beryllium – Total (0.06 mg/L)	1	0	100%	<0.01

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Health Characteristic (guideline limit)	Number of Analyses	Number of Analyses Non- Compliant	% Compliance	Maximum value (mg/L)
Boron – Total (4 mg/L)	1	0	100%	<0.05
Mercury – Total (0.001 mg/L)	1	0	100%	<0.0001
Molybdenum – Total (0.05 mg/L)	1	0	100%	<0.001
Selenium – Total (0.01 mg/L)	1	0	100%	<0.001
Silver – Total (0.1 mg/L)	1	0	100%	<0.001
Uranium – Total (0.017 mg/L)	1	0	100%	<0.001
2-Chlorophenol	1	0	100%	<1
2,4-Dimethylphenol	1	0	100%	<1
2,4,6-Trichlorophenol	1	0	100%	<1
Pentachlorophenol	1	0	100%	<1
Paraquat	1	0	100%	<1
Amitrole	1	0	100%	<1
Aldrin	1	0	100%	<0.001
Bromophos Ethyl	1	0	100%	<0.005
Chlordane	1	0	100%	<0.002
Chlorothalonil	1	0	100%	<0.01
Chlorpyrifos	1	0	100%	<0.005
Diazinon	1	0	100%	<0.01
Dieldrin	1	0	100%	<0.001
Endosulfan I	1	0	100%	<0.001
Endosulfan II	1	0	100%	<0.001
Endosulfan Sulfate	1	0	100%	<0.001
Ethion	1	0	100%	<0.01
Fenitrothion	1	0	100%	<0.01
Fipronil	1	0	100%	<0.02
Heptachlor	1	0	100%	<0.001
Lindane	1	0	100%	<0.001
Malathion	1	0	100%	<0.01

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Health Characteristic (guideline limit)	Number of Analyses	Number of Analyses Non- Compliant	% Compliance	Maximum value (mg/L)
Methoxychlor	1	0	100%	<0.02
o,p-DDT	1	0	100%	<0.001
p,p-DDT	1	0	100%	<0.001
Parathion Ethyl	1	0	100%	<0.02
Parathion Methyl	1	0	100%	<0.02
Trifluralin	1	0	100%	<0.01
Diuron	1	0	100%	<0.5
Molinate	1	0	100%	<0.1
Fluometuron	1	0	100%	<0.1
Trifluralin	1	0	100%	<0.1
Dimethoate	1	0	100%	<0.1
Simazine	1	0	100%	<0.1
Atrazine	1	0	100%	<0.1
Propazine	1	0	100%	<0.1
Terbutryn	1	0	100%	<0.1
Fenitrothion	1	0	100%	<0.1
Chlorpyrifos	1	0	100%	<0.1
Endosulfan I	1	0	100%	<0.1
Fenamiphos	1	0	100%	<1
Endosulfan II	1	0	100%	<0.1
Endosulfan Sulfate	1	0	100%	<0.1
Diclofop Methyl	1	0	100%	<0.1
Amitraz	1	0	100%	<0.1
Metolachlor	1	0	100%	<0.2
Hexazinone	1	0	100%	<0.4
Azinphos Methyl	1	0	100%	<1
Propiconazole	1	0	100%	<0.4
Dicamba	1	0	100%	<0.1

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Health Characteristic (guideline limit)	Number of Analyses	Number of Analyses Non- Compliant	% Compliance	Maximum value (mg/L)
MCPA	1	0	100%	<0.1
2,4-D	1	0	100%	<0.1
2,4,5-T	1	0	100%	<0.1
Picloram	1	0	100%	<0.2
Clopyralid	1	0	100%	<0.4
Metsulfuron Methyl	1	0	100%	<0.5
Triclopyr	1	0	100%	<0.1
Fosamine	1	0	100%	<0.1
Temephos	1	0	100%	<0.5
Chlorfenvinphos	1	0	100%	<0.2

5.0 Chemical - Aesthetic Performance

5.1 Chemical - Aesthetic - Exception Notifications

Four (4) out of seven (7) field analyses for TDS (calculated from conductivity) collected at the Treated Water Tank SP exceeded the ADWG aesthetic guideline of 600 mg/L.

5.2 Chemical – Aesthetic

Consumer Sampling Point

One (1) sample was collected for analysis of physical and inorganic parameters in the potable water from the Consumer Sample Point on 29/8/2019. Results are summarised in Table 9 below. No parameters exceeded ADWG aesthetic related values.

Routine field measurements were undertaken (6). No parameters exceed ADWG aesthetic related values.

Table 9: Summary of aesthetic related analyses from consumer sampling point

Aesthetic Characteristic (guideline limit)	Number of Analyses ⁽¹⁾	Number of Analyses Non- compliant	% Compliance	Maximum value
pH (6.5 – 8.5)	7	0	100%	7.8
Total Dissolved Solids Dried at 175-185°C (600 mg/L)	1	0	100%	500
Turbidity (1	0	100%	0.2
Colour (True) (15 HU)	1	0	100%	<5
Chloride, Cl (250 mg/L)	1	0	100%	240
Sulfate, SO ₄	1	0	100%	12
Ammonia Nitrogen, as N (0.5)	1	0	100%	<0.02
Sodium, Na	1	0	100%	110
Total Hardness by Calculation	1	0	100%	160
Total Aluminium (0.2 mg/L)	1	0	100%	<0.01
Total Copper (1 mg/L)	1	0	100%	0.007
Total Iron, Fe	1	0	100%	<0.01
Total Manganese	1	0	100%	<0.01
Total Zinc	1	0	100%	0.019

Treated Water Tank Sampling Point

No (0) samples were submitted for laboratory analysis of physical or inorganic parameters in the potable water from the Treated Water Tank SP during the period.

Field measurements at the Treated Water SP recorded during routine maintenance visits to the WTP are summarised in Table 10 below. TDS was the only parameter to exceed ADWG aesthetic related values.

Table 10: Summary of aesthetic related analyses from treated water tank sampling point

Aesthetic Characteristic (guideline limit)	Number of Analyses ⁽¹⁾	Number of Analyses Non- compliant	% Compliance	Maximum value
pH (6.5-8.5)	9 ⁽¹⁾	0	100%	7.3-8.0
TDS (600 mg/L)	7	4	42%	802 ⁽²⁾
Turbidity (5 NTU)	7	0	100%	1.16

Notes:

(1) All analyses by field instrument.

(2) Result by field instrument (calculated internally from conductivity measurement).

Source Sampling Point

One (1) sample was collected for analysis of physical parameters and pesticides in the source water from the Source Sample Point on 29/8/2019. The results can be seen in Table 11 below.

Field measurements at the Source SP (7) recorded during routine maintenance visits to the WTP are summarised in Table 11.

Table 11: Summary of aesthetic related analyses from source sampling point

Aesthetic Characteristic (guideline limit)	Number of Analyses	Number of Analyses Non- Compliant	% Compliance	Maximum value (mg/L)
pH (6.5-8.5)	9	0	100%	6.8 – 7.3
TDS (600 mg/L)	8	8	0%	926
Turbidity (5 NTU)	8	0	100%	1.7

6.0 Radiological Performance

No (0) samples were submitted for radiological analysis in this period.

Next sampling from the Source sampling point for radiological analysis due in quarter 4 (October – December) 2019.

7.0 Sampling Programme

7.1 Summary of Achieved Versus Planned Sampling for Q3 2019

The planned sampling and analysis for the period 1 July to 30 September 2019:

- Microbiological testing from:
 - Treated water tank SP for
 - thermotolerant coliforms and *e. coli* – planned = 2, taken = 2;
 - thermotolerant amoeba – planned = 1, taken = 3.
 - Consumer SP for
 - thermotolerant coliforms and *e. coli* – planned = 6, taken = 4;
 - thermotolerant amoeba – planned = 3, taken = 3;
 - heterotrophic bacteria (HPC 37°C 2 days) – planned = 1, taken = 1.
 - heterotrophic bacteria (HPC 21°C 3 days) – planned = 1, taken = 1.
- Chemical testing from:
 - Source SP for Suite 1, 4, 5 and 7 parameters.
 - Source SP for pH, conductivity and calculated TDS (routine field testing) – planned 18, taken 22.
 - Treated Water Tank SP for chlorine, pH, conductivity, calculated TDS and turbidity (routine field testing) – planned 30, taken 40.
 - Consumer SP for chlorine, pH and temperature (routine field testing) – planned 9, taken 16.
 - Consumer SP for Suite 1, 2, 3 and 6 parameters.

Table 12: Summary of achieved versus planned sampling

		Planned	Taken	% Taken
Microbiological	Treated Water SP	3	8	100%
	Consumer SP	10	9	90%
Chemical	Source SP	58	62	100%
	Treated Water SP	30	40	100%
	Consumer SP	46	53	100%
Radiological	Source SP	0	0	0%
	Treated Water SP	0	0	0%
	Consumer SP	0	0	0%

7.2 Planned Sampling Summary for October to December 2019 (Q4)

Table 13: Planned sampling program for Oct - Dec 2019 (Q4)

		Planned sampling	Frequency	Total No. of Analyses
Microbiological	Treated Water SP	Suite M1 (laboratory)	8 weeks	3
	Consumer SP	Suite M1 (laboratory)	4 weeks	10
		Suite M2 (laboratory)	4 weeks	1
Chemical	Source SP	Field testing (pH, Cond'y, TDS)	2 weeks	18
		Suite R (Laboratory)	Once	2
	Treated Water SP	Field testing (Free chlorine, pH, Cond'y, TDS, Turbidity)	2 weeks	30
	Consumer SP	Field testing (Free chlorine, pH, Temp)	2 weeks	18
		Suite 3 (Laboratory)	Once	10
		Suite 6 (Laboratory)	Once	8

Note: Refer to Section 7.3 for details of laboratory analysis suites.

7.3 Routine Sampling Program

Lancelin South has developed a sampling program based primarily upon the Department of Health's published Small Community Sampling Grid (V2). The program identifies 3 sampling points being:

1. Source water (sampled from bore headworks);

2. Treated water (sampled from the outlet of the Potable Water Storage Tank at the water treatment plant); and
3. Consumer water (sampled from the internal tap in the Lancelin South Sales Office within the Lancelin South development).

Water analyses are derived from:

1. Grab samples analysed in the field by hand held instruments; and
2. Samples submitted to a NATA accredited laboratory.

On-line instrumentation is installed within the water treatment plant to indicate correct operation of the plant. However, no instrumentation is currently installed to monitor water specifically at the three designated sampling points.

Table 14: Sampling summary - field checks

	Source SP	Treated Water SP	Consumer SP
Free Chlorine	-	Fortnightly	Fortnightly
pH	Fortnightly	Fortnightly	Fortnightly
Temperature	-	-	Fortnightly
Conductivity	Fortnightly	Fortnightly	
Calculated TDS	Fortnightly	Fortnightly	
Turbidity	-	Fortnightly	

Table 15: Sampling summary - Microbiological

		Source SP	Treated Water SP	Consumer SP
Suite M1	Total Coliforms	-	2 Monthly	Monthly
	E.Coli			
	Amoeba			
Suite M2	Heterotrophic plate count	-	-	3 Monthly

Table 16: Sampling summary - radiological

		Source SP	Treated Water SP	Consumer SP
Suite R	Gross Alpha	2 yearly *		
	Gross beta			

* To be reviewed – may be changed to 5 yearly if little variation or ongoing compliance demonstrated

Table 17: Sampling summary - physical and inorganic

		Source SP	Treated Water SP	Consumer SP
	Free Chlorine			6 monthly
Suite 1	pH	Annually		6 monthly
	TDS			
	Conductivity			
Suite 2	TSS			6 monthly *
	Turbidity			
	Colour			
	Alkalinity			
	Hardness			
	Chloride			
	Sulphate			
	Sodium			
	Potassium			
	Calcium			
	Magnesium			
	Aluminium - total			
	Ammonia - total			
	Iron - total			
Manganese - total				
Suite 3	Nitrite			6 monthly *
	Nitrate			
	Antimony – total			
	Cadmium - total			
	Chromium - total			
	Copper - total			
	Fluoride			
	Lead - total			
	Nickel - total			
	Zinc - total			
	Suite 4			
Barium				
Boron				
Mercury – total				
Molybdenum – total				
Selenium - total				
Suite 5	Beryllium	2 Yearly		
	Silver – total			
	Tin – total			
	Uranium – total			

* To be reviewed – may be changed to annually if little variation or ongoing compliance demonstrated

Table 18: Sampling summary - disinfection byproducts

		Source SP	Treated Water SP	Consumer SP
Suite 6	THMs - total			6 monthly *
	Chloroacetic acid			
	Dichloroacetic acid			
	Trichloroacetic acid			
	2-chlorophenol			
	2,4-dichlorophenol			
	2,4,6-trichlorophenol			
Trichloroacetaldehyde				

* To be reviewed – may be changed to annually if ongoing compliance demonstrated

Table 19: Sampling summary - pesticides

		Source SP	Treated Water SP	Consumer SP
Suite 7	Aldrin (& Dieldrin)	Annually		
	Amitrole			
	Atrazine			
	Chlordane			
	Chlorfenviphos			
	Clopyralid			
	2,4-D			
	DDT			
	Diquat			
	Diuron			
	Endosulfan			
	Fosamine			
	Glyphosate			
	Heptachlor			
	Hexachlorobenzene			
	Hexazinone			
	Lindane			
	Molinate			
	Organophosphates – total			
	Paraquat			
	Pentachlorophenol			
Picloram				
Propiconazole				
Simazine				
Temephos				
Triclopyr				

8.0 General Notes/Other News

Maintenance of the water treatment plant is undertaken by a specialist contractor on a fortnightly basis. The contractor verifies operation of on-line instrumentation and checks basic water quality parameters using hand-held instruments through the plant on each visit. Recording of these checks in the past quarter has been adequate.

Regular fortnightly checking of pH, chlorine and water temperature using hand held instrumentation at the Lancelin South sales office, within the residential area, commenced in mid June 2018. All samples prior to this quarter returned a pH within the ADWG aesthetic guideline range, temperature below 23°C and positive result for chlorine.