

***FERNRIDGE WATER  
SUPPLY ASSOCIATION INC***

***STANDARD OPERATING PROCEDURES***

***Compiled:  
December 2002***

# **FERNRIDGE WATER SUPPLY ASSOCIATION INC**

## **STANDARD OPERATING PROCEDURES**

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# FERNRIDGE WATER SUPPLY ASSOCIATION INC

## Standard Operating Procedure No 1

### MONITORING OF WELL, PUMP HOUSE AND RESERVOIR

#### Once Weekly

#### Check and Record details on Pump House Record Sheet

- 1        If the Duty Pump is not running turn the key to test mode.  
          Then wait until the pump comes on.  
          Proceed as below.
- 2        **Pumps –**  
          Check that the following lights on the Panel are on:
  - The Ripple Control Indicator light
  - The Tank Demand Light,
  - The Duty Pump Running light  
          Record the hour meter readings for both pumps.
3.        **UV Light –**  
          While running, the Green indicator light is on.  
          Record the hour meter reading and the UV efficiency percentage reading.
4.        **Caustic Soda -        Refer to Caustic Soda Procedure (SOP No 9)**  
          Ensure caustic is injecting.  
          Check the weight of the caustic drum.  
          Check the screw plug at top of the drum is loose to allow air to get in.  
          Notify the Treasurer when the level is low.
5.        **Filters –**  
          Record PSI from Primary and Secondary Filters, and before the UV lamp – test while the pump is both on and off.  
          (The maximum differential is 150 kPa (22 PSI) between the primary and Surge Tank pressure gauge indicating a need to replace filters)
6.        **Flow Meter -**  
          Record flow meter reading weekly and whenever pumps are swapped over.
7.        Ensure the Test Mode Key has been turned back to the original position.

#### **Fault Detection:**

If a fault is detected on any of the above, follow the procedures set out in the Flow Charts (*Appendix I & ii*) or the relevant Standard Operating Procedure.

## **Once a Month**

### **1. Pumps –**

Test that the pumps are operating.  
Follow the Pump Testing Procedure Flow Chart. *Appendix i*  
Change the Duty Pump over and record the flow-meter reading.

### **2. Maintenance and Repairs –**

Check that the electric fence is operating  
Check grounds around the pump house and the paddock beyond.  
Advise Committee when the pump house grass needs cutting.  
Note any repairs, or painting that may be required.

### **3. Well Water Level –**

Chairman or delegated Committee Member to check well water level (from the top of the liner) monthly in summer and three (3) monthly at other times, before and after pumping for five (5) minutes.  
Results to be recorded on the Pump House Record Sheet. *Appendix v*  
Secretary to advise Wellington Regional Council annually.

## **Reporting**

Duty Committee Member should complete the details required on the Pump House Record Sheet kept in the pump house at the time of each visit.

Pump House Record Sheet should be handed to the Secretary for filing.

At the Management Committee Meeting following his/her month of duty the Duty Committee Member will advise of any operating problems during his/her month and of remedial steps taken, also any maintenance and repairs that are required.

The next Committee Member on duty should be notified and the Pager handed over at end of each month.

## **MONITORING OF THE RESERVOIR/STOREAGE TANK**

The Reservoir should be checked each time a sample is taken from the Reservoir Sampling Point.

Any non-urgent necessary repairs and maintenance to the tank or surrounding area should be reported to the next Management Committee Meeting.

Contact Mrs Pat Chapman F/N 260 Upper Plain Road – Telephone No: 378 6317 beforehand to access the Reservoir on her property.

ATV may be required in wet ground conditions, therefore contact Chairman.

The key for pump house fits reservoir tank lid.

# FERNRIDGE WATER SUPPLY ASSOCIATION INC

## Standard Operating Procedure No. 2

### PAGER OPERATION AND MAINTENANCE

1. The Pager will be held and maintained by the Committee Member rostered for duty for that particular month. On receipt check that the Pager is working and repeat the checks at regular intervals.
2. The Pager will signal and display a message when one of three possible failure modes occurs  
As follows:

Failure Mode	Display
Low Water Level in the Reservoir	Misc 1
UV Lamp Failure	Misc 2
Power Off (Power Outage)	Charge On

3. The Pager is programmed with a delay so that short power outages are not signalled.
4. Operation of the pager is detailed in the relevant sections of the pager manual, a copy of which is attached. *Appendix iv*

*Note that the pager has a limited function and much of the manual is not relevant to its operational role as a failure warning system.*

5. Remove any messages before handing the pager to the next Committee Member on duty
6. Maintenance of the pager is included in the manual. Additional AA batteries will be made available by the Treasurer as required.
7. Repairs and servicing of the pager will be carried out through:

**Harvest Electronics  
Pragnell Street  
Masterton**

**Ph: 370 1991**

Contact the Secretary before having the pager repaired or serviced.

# FERNRIDGE WATER SUPPLY ASSOCIATION INC

## Standard Operating Procedure No. 3

### WATER QUALITY TESTING BY FERNRIDGE WATER SUPPLY ASSOCIATION AND MASTERTON DISTRICT COUNCIL

#### A. Microbiological Monitoring Requirements:

The microbiological monitoring requirements and rationale are set out in the Drinking Water Standard for New Zealand 2000. The indicator organism chosen in the Standard to indicate possible faecal contamination of drinking water with animal or human waste is *E.coli*

The Clark Report of 2001 recommended that FWSA should carry out monthly monitor testing of the water leaving the treatment plant (pump house) and also in the reticulation, a total of twenty-four (24) monitoring tests per year at a frequency of two per month. The Management Committee adopted this recommendation. Sampling points are shown on the attached plan (*Appendix vi*) and are located at the pump house, the outlet of the storage tank, Upper Plain Road, Tararua Drive, and Evans Road.

In addition, monitoring tests are carried out by the Masterton District Council (MDC) at a frequency of one per month from test points within the reticulation. The Secretary receives the results of these tests. Each year the MDC produce a schedule of testing dates and sampling sites and FWSA testing is programmed accordingly with the pump house tests coinciding with the MDC tests and the reticulation sampling in between the MDC testing dates. DWSfNZ 2000, page 30, requires that sampling ‘.. must not always be on the same day of the week.’ For the FWSA supply it is suggested that Monday, Wednesday or Friday could be chosen.

Additional monitoring tests are required following *E.coli*. contamination of the supply as shown on Figs 3.2 and 3.3 from the Standard *Appendix ix*. If tests are clear for three (3) consecutive tests then testing is reduced to normal. Additional monitor testing is also required by the Standard after installation of new mains or following connection or repair in the reticulation. The monitoring is to be carried out within twelve (12) hours of completion of the work.

#### B Sampling and Testing Procedure.

1. Record the time, date and client name on the bottle label before sampling. These sterile bottles are obtainable from the Masterton Hospital Laboratory.
2. Flush the main line for ten (10) minutes.

3. Flow water from the sampling point for at least two (2) minutes to clear the line between the line and the tap.
4. 'Flame' the sampling point with a gas burner or cigarette lighter. If neither is available or the tap is plastic, wipe with a 70% solution of methylated spirits.  
Prepare by adding 30 ml of water to 70 ml of methylated spirits.
5. Flow water from the sampling point for one (1) minute.
6. Open and fill sterile sample container, taking care not to touch the inside, mouth and neck of the container, or the inside of the container lid. Take care that the tap does not touch the inside of the lid, as this may contaminate the sample. It is also important that there is sufficient headspace in the bottle i.e. water is only filled to the line on the neck of the bottle. This allows the sample to be mixed properly when the bottle is shaken. If you over fill the bottle pour a little out of the bottle immediately. Do not pour out the whole sample and refill the bottle.
7. The sample must be held at below 4C. Place the sample in a chilly bin cooled with a frozen slika pad or similar (i.e. ice in a plastic bag). Make sure the sample is upright. If ice is used, seal the sample bottle in a clean plastic bag as the ice once melted may contaminate the water sample.
8. It is essential that the laboratory has the sample as soon as possible as organisms will die off within a few hours. The sample should be delivered to the laboratory within six (6) hours if possible or at the very outside it must be delivered within twenty-four (24) hours.
9. Masterton Hospital Laboratory hours are from 7.30 am – 4.30 pm Monday to Friday.

Contact at Laboratory:

**Bruce Tooley**  
**C/- Masterton Hospital**  
**Masterton**

**Ph: 06 946 9800**

**Results:**

The laboratory written Reports are sent to David Brown (P O Box 176 Masterton).  
David is telephoned by the laboratory if there is contamination.

The Secretary receives written confirmation of the results from MDC.

Should there be contamination the results are emailed by MDC to:

G Butcher     [fernleigh@xtra.co.nz](mailto:fernleigh@xtra.co.nz)  
Secretary:     [highden@wise.net.nz](mailto:highden@wise.net.nz)



# **FERNRIDGE WATER SUPPLY ASSOCIATION INC**

## **Standard Operating Procedure No. 4**

### **POWER FAILURE**

1. Power failure or power outage will usually be by pager message but may occur during a regular inspection or during maintenance.
2. In the event follow the procedure set out in the flow chart “Fault Diagnostic Procedure in the case of empty Reservoir” a copy of which is kept in the pump house. *Appendix ii*
3. Where the box requires ‘Check with Supply Authority’ contact:

**Powerco**

**Ph: 0800 272 727**

4. Where the box requires ‘Call for Service’ contact:

**Callister Electrical**

**Ph: 377 0973**

**Pager: 026 369 2595**

5. If in doubt contact the Chairman.

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# **FERNRIDGE WATER SUPPLY ASSOCIATION INC**

## **Standard Operating Procedure No. 5**

### **FAILURE OF A PUMP OR BOTH PUMPS**

1. Follow the procedures set out on the flow chart, Regular Pump Testing Procedure.  
*Appendix (i)*
2. Where the box requires 'Call for Service' contact:

**Callister Electrical**  
**Tel. 377 0973**  
**Pager No. 026 369 2595**

3. If it is not an electrical problem and the pump or pumps are faulty, contact the Chairman in the first instance.
4. In an emergency, involving a mechanical fault in a pump or for the replacement of a pump, contact

**ORDISH & STEVENS LTD**  
**Tel. 378 2873**  
**Pager No. 026 102 773**

5. Pump Details:

2No. Davies Red Jacket Submersible Multi Stage Centrifugal  
Model 5 hp 15 EC. Capacity 175 l/min each.

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# **FERNRIDGE WATER SUPPLY ASSOCIATION INC**

## **Standard Operating Procedure No. 6**

### **FAILURE OF THE ULTRA VIOLET LAMP**

1. Check if UV Lamp Alarm is on.  
The alarm will be activated when the lamp fails or needs calibrating, or due to the foot valve or pump failure.  
The sensor will not reflect on the lamp with no water present in the outer chamber.  
The absence of water will not affect the lamp.

Turn main switch off and call electrical contractor:

**Murray Callister**  
**P O Box 743 Masterton**  
**Ph: 06 377 0973**  
**Pager No: 026 36 925 95**  
**Fax: 06 377 0931**  
**Email: [cer@wise.co.nz](mailto:cer@wise.co.nz)**

2. Complete Pump House Record Sheet on problem and action you have taken.  
Inform Chairman
3. Replacement UV Lamp is available at the Pump House for the electrician to install.  
If this is used, advise Treasurer to re-order a UV Lamp.

The UV Lamp specifications are: UV Lamp SF1000 or GPH 840 N2/S

4. The Treasurer to re-order UV Lamp from:

**Contamination Control Limited**  
**P O Box 14-161,**  
**Panmure**  
**AUCKLAND 6**  
  
**46 Lunn Avenue,**  
**Mt Wellington**  
**AUCKLAND**  
**Ph: 09 570 9135**  
**Fax: 09 527 7654**

**FWSA Account Number is - 8377**

# **FERNRIDGE WATER SUPPLY ASSOCIATION INC**

## **Standard Operating Procedure No: 7**

### **PAGER ALARM INDICATES LOW WATER LEVEL IN THE RESERVOIR**

1. Follow the procedures set out on the flow chart 'Fault Diagnostic Procedure in Case of Empty Reservoir' a copy of which is kept in the pump house. *Appendix ii*
2. Where the box requires 'Check with Supply Authority' contact:

**Powerco Ltd**  
**Ph: 0800 272 727**

3. Where the box requires 'Call for Service' contact:

**Callister Electrical**  
**Ph: 377 0973**  
**Pager No. 026369 2595**

4. If in doubt contact the Chairman.

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# FERNRIDGE WATER SUPPLY ASSOCIATION INC

## Standard Operating Procedure No: 8

### CONTAMINATION OF THE RESERVOIR AND/OR RETICULATION

1. If **ANY** test returns a **faecal** count greater than ten (10) a boil water notice must be issued, and members informed by the 'phone tree', unless a boil water notice is already in place.

#### COUNT NOT GREATER THAN TEN (10)

- 1, Take a confirmatory test. If clear take tests over the next two (2) days from the other sampling points.  
If both clear no further action needs to be taken.
- 2, If confirmatory test is **not** clear advise Secretary to inform members and issue a 'boil water' notice.
3. Test the main reservoir, if clear, flush the sampling points and test on a daily basis until clear.
- 4 If the Reservoir sample is **NOT** clear, instigate chlorination of the system by super chlorinating the Reservoir. On the basis of 90,000 litres this requires 11.25 litres of 4% non scented janola.  
This takes one (1) week, and a further week for chlorine to clear from the system.  
Take a sample to the Masterton District Council to check for chlorine residue, if clear than testing can recommence until three (3) consecutive tests are clear.

#### COUNT GREATER THAN TEN (10)

1. Advise Secretary to inform members by telephone and issue 'boil water notice'
- 2 If the Secretary is unavailable to activate the 'phone tree' *Appendix xiv* this task goes to the Duty Committee Member.
- 3 Take confirmatory test, if clear, test over the next two (2) days from other sampling points.  
If both clear advise Secretary that 'boil water' notice can be revoked.
3. If confirmatory sample is **not** clear repeat Steps 3 and 4 above, as well as investigating possible causes of contamination.

# **FERNRIDGE WATER SUPPLY ASSOCIATION INC**

## **Standard Operating Procedure No 9**

### **CAUSTIC SODA CHECK AND REPLACEMENT**

#### **CHECK:**

1. Check to see if caustic pump is injecting at each stroke.  
(Can be seen by movement of liquid at each stroke)
2. Check the drum. When getting low the drum needs propping up at back end so the drum will empty completely.  
When empty turn off the injection pump at wall switch.
3. Notify Chairman and Treasurer to order new drum

#### **REPLACEMENT OF DRUM:**

**NOTE: Don heavy gloves before doing any disconnecting of fittings.**

#### **General Medical First Aid:**

**In all cases of accident seek medical attention:**

**SKIN:** Flush immediately with large quantities of cold water, remove contaminated clothing immediately.

**INTERNAL:** **DO NOT** induce vomiting, immediately rinse mouth with water, give water to drink.

**EYES:** Flush immediately with cold water for 15 minutes.

**NB:** *Above is only a very general first aid guide.*

1. Switch off the injection pump at wall switch.
2. Release the drum restraint strap.  
Remove the drum from mobile stand.
3. Stand the drum upright.  
Turn off tap on fitting screwed into the drum.
4. Unscrew ferrule holding the PVC tube on the fitting, to prevent the PVC fitting from turning and breaking R.T.V. sealant.

5. Remove plastic tube and keep upright to prevent any leakage.
6. Remove main fitting from bunghole in drum with stilson wrench, again being careful not to break R.T.V. seals on joints.
7. Replace bung into the drum.
8. Quality Freighters deliver drum to pump shed. Arrange time to meet them at Shed. It requires two people to put drum on moveable trolley stand and strap to same. Ensure one bung hole is at lowest level of trolley.
9. With the help of the driver, push the trolley and drum back into the shed and stand the drum back up.
10. Carefully remove bung from the drum and proceed to replace fitting in reverse order as above.
11. When fitting is in place pull trolley back down onto wheels and return to corner.
12. Reconnect plastic tube and turn on tap. Raise drum at front and place board under front of trolley.
13. Replace the drum restraint and secure.
14. Loosen top bung in the drum to allow air in.  
Turn injection pump on at wall.  
Check to see if caustic is moving in tube. If there is no movement of caustic in the tube refer to Manual in bag in the pump house. The information is in the last three pages.

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# FERNRIDGE WATER SUPPLY ASSOCIATION INC

## Standard Operating Procedure No. 10

### REPLACEMENT OF THE FILTER CARTRIDGES

#### Note:

1. The cartridges are normally replaced when the difference in pressure between adjacent pressure gauges or between the outermost pressure gauges across both filter housings reaches 150 kPi (22 psi). Only the cartridges with the major pressure drop need to be replaced. Alternatively, cartridges may require replacing when the flow rate drops below an acceptable value and pumping hours increase significantly.
2. Do not attempt the replacement operation on your own, at least **two** people are required to carry out the operation.

#### Cartridge Removal

1. Close the inlet and outlet valves.
2. Open vent to relieve pressure, open the body drain of the unit and drain.
3. When the liquid has been drained, remove housing cover.
4. Remove the compression plate and compression springs. Inspect the inside of the housing for debris – rinse with the cartridges still in place to avoid forward passage of foreign matter.
5. Remove spacers and cartridges. Handle the cartridges with care as they may contain cysts **Disposable Gloves** should be worn.
6. Discard expended cartridges. Wash hands after handling used cartridges. Clean parts before re-assembly. Inspect, clean, and replace housing O-ring, if necessary.
7. Follow the Hygiene Code of Practice set out in **SOP 12** at all times.

#### Cartridge Replacement:

1. Insert tube guides into the bottom seat plates with tube guide locating prong down and push until stopped by cutouts. **Disposable Gloves** should be worn.
2. Slide filter cartridges over the tube guides.



3. Install compression seat plate assemblies on top layer of cartridges, with the open end of spring **upwards**. Place the compression plate over the compression seat plate assemblies making sure the **IN** on the compression plate is positioned over the inlet baffle.
4. Apply and tighten hex nuts, keeping springs lined up with holes in plates. Make sure the vessel O-ring is properly seated, and then replace the cover. Tighten the clamp knob until the lip of the clamp flange comes into contact with the vessel head and shell wall at several points. This fully closed condition is also indicated by a sharp increase in the torque required to continue tightening the clamp knob. Do not pressurise the housing until both the contact and the torque increase are observed.
5. Follow the Hygiene Code of Practice set out in **SOP 12** at all times. The Claris and Nexis cartridges tolerate hypochlorite either for **CIP** or sanitiser baths.

### **Commencing Operation**

1. Loosen the cover vent plug to bleed air from the housing while filling.
2. With the outlet valve fully open, partially open the inlet valve to the filter housing slowly. Check for leakage at the housing connections, drain, and cover. Fill the housing until liquid appears around the vent plug.
3. Tighten the cover vent plug and fully open the inlet valve.

### **Cartridge Specifications.**

1. Primary Filter. Claris CLR-40 cartridges 7 No.
2. Secondary or Polishing Filter. Nexis NXT1-40UPE cartridges 7 No.

Supplied by: **Contamination Control Ltd**  
**P O Box 14-641**  
**Panmure**  
**AUCKLAND 6 or**  
**46 Lunn Ave**  
**Mt Wellington**  
**AUCKLAND.**  
**Ph: 09 570 9135**  
**Fax: 09 527 7654**

To be ordered through the Treasurer. FWSA Account Number 8377.

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# FERNRIDGE WATER SUPPLY ASSOCIATION INC

## Standard Operating Procedure No: 11

### ANNUAL INSPECTION OF INSTALLATION

**AIM:** *To inspect and check the water supply installations of all members of the Association up to the point of entry to the supply tank.*

1. The inspection is normally carried out in February/March of each year. Members will be notified through the 'phone tree' of the period over which inspections will be carried out.
2. Obtain all relevant details held by the Association for the particular installation including the number of units of supply and previous inspection reports.
3. If thought necessary, check the operation of the toby supplying the installation.
4. Turn off the tap to the supply tank.
5. Undo the fittings to access the flow valve.
6. Turn on the tap to check the flow. If the discharge is feathered, remove the flow valve and inspect the insert. Clean the insert or replace as necessary.
7. Reassemble the flow valve and reinstall to measure the flow rate.
8. Check the flow rate on the basis of the number of units of supply.

Units	Time (secs) to fill One litre container (Flow Rate)	Flow Valve Number
1	86	0.7
2	43	1.5
3	29	2.0
4	22	2.9
5	17	3.7
6	14	4.5
7	12	5.0
8	11	
9		

9. If the flow rate corresponds with the number of units of supply the installation is passed, reassembled, and the tap to the supply tank turned on.
10. If the flow rate is not correct, replace the insert and repeat steps 6 and 7 above.
11. Record details of the inspection including, date of inspection, people involved, what was done, and any unusual features or happenings.
12. The folder containing the inspection information is held by the Chairman and is available for review by members on request.

# FERNRIDGE WATER SUPPLY ASSOCIATION INC

## Standard Operating Procedure No: 12

### HYGIENE CODE OF PRACTICE FOR SYSTEM MAINTENANCE AND REPAIRS

1. The attached Water System Maintenance Protocol, 1998, *Appendix vii* prepared by NZET is to be used by all those who carry out work on the Fernridge Water Supply System, or come in contact with the system or its components, including FWSA members, plumbers, contractors, or visitors.
2. A member of the FWSA Management Committee shall be appointed as Water System Hygiene Officer whose role shall be to ensure the Hygiene Code or Protocol, is fully implemented.
3. Copies of the Protocol shall be circulated by the Secretary on a regular basis, together with a covering letter, to FWSA members, plumbers working in the area, the Masterton District Council Environmental Health Office and to Choice Health.
4. Copies of the Protocol shall be provided to FWSA members involved in the annual check of valves, or carrying out repairs or maintenance, and to all contractors employed on a regular basis on maintenance of the supply system. A suitable audit scheme or QA system shall be set up by the FWSA Water System Hygiene Officer to ensure the Protocol is followed.
5. The Protocol shall be part of the specification/conditions of contract for all contracts let for work on the system and the procedures shall be subject to audit by the FWSA Water System Hygiene Officer.
6. Following major repairs or alterations to the Pump House piping from the primary filter, the rising main, the reservoir, or the reticulation it will be necessary to super-chlorinate the reservoir. It is important that the Hygiene Code of Practice is applied to all parts of the system from and including the primary filter but the Codes' objectives should also be applied, where practicable, from the submersible pumps onwards. For pump replacement etc consideration should be given to super-chlorination of the water in the well.
7. The Hygiene Code of Practice, the Protocol, and its implementation, shall be reviewed by the Management Committee at regular intervals, not greater than two years.  
The next review shall be in 2004.

## DISINFECTION OF CONTAMINATED TANK WATER USING CHLORINATION

The following table shows the amounts required using a 3% or 4% sodium hypochlorite solution (fresh plain house hold bleach for example unscented Janola) to enable chlorination.

Tank Volume	Required amount of fresh plain household bleach (ml)	
	3%	4%
50	8	6
100	17	13
150	25	19
200	33	25
250	42	31
300	50	38
350	58	44
400	67	50
450	75	56
500	83	62
600	100	75
700	117	88
800	133	100
900	150	112
1000	167	125
2000	333	248
3000	500	375
4000	667	500
5000	833	625
6000	1000	750
7000	1167	875
8000	1333	1000
9000	1500	1125
10000	1667	1250
20000	3333	2500

To use this table:

1. Calculate volume of tank in litres.
2. Read the amount of fresh plain household bleach (in ml) that corresponds to the volume of the tank.
3. Add the required millilitres of fresh plain household bleach to the tank and mix thoroughly, using a hose connected to a tap on your pumped supply.

There may be chlorine odour evident after this process due to the formation of by products by reactions with the free available chlorine and any organic matter present. This odour is caused by not enough chlorine being added and failure to reach the required break point level of chlorination. A further dose of chlorine (the same amount as the initial dose) needs to be added.

