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INTRODUCTION

Client Address	Hampshire County Council PBR Three Minsters House 76 High Street Winchester Hampshire SO23 8UL
Site Name	Forest Court NCU
Site Address	Forest Way Tatchbury Mount Calmore Hampshire SO40 2PZ
Site contact	Jan Cresdee
Site telephone number	02380 664770
Last risk assessment carried out by	Freeston Water Treatment Limited
Date of risk assessment	May 2011
Date of previous review	N/A
Date of new review	14th March 2012
Review carried out by	Mr Chris Wilson

This Review has been carried out in accordance with ACoP L8 'The control of Legionella bacteria in water systems' (APPROVED CODE OF PRACTICE & GUIDANCE) and BS 8580 (RISK ASSESSMENTS FOR LEGIONELLA CONTROL-CODE OF PRACTICE).

REVIEW COMPLIANCE

The Review was commissioned in order to identify and assess the risk of Legionellosis from the water sources on the premises using the previous Risk Assessment. General and specific observations on the systems made during the course of the Survey are also recorded and the more general requirements of L8 are also commented on where applicable.

The specific observations made in this Review, together with the most recent Risk Assessment should be read in conjunction with the practices and procedures detailed in the recommendations section and also with ACoP L8.

The Assessment should be reviewed regularly (at least every two years) and whenever there is reason to suspect it is no longer valid. An indication of when to review the Assessment and what needs to be reviewed should be recorded.

This may result from example:

Changes to the water system or its use

Changes to the use of the building in which the water system is installed

The availability of new information about risks or control measures

The results of checks indicating that control measures are no longer effective

A case of Legionnaires disease/Legionellosis is associated with the system

SITE REVIEW

This Review relates to observations made and information supplied from the existing Risk Assessment together with information supplied by others.

LOG BOOK

Is there a copy of the last Risk Assessment carried out on the domestic water system?	Yes	A copy of the original Risk Assessment was seen filed within the main office.
Is there a domestic water systems logbook in place?	Yes	A water systems log book is in place but was not being used at the time of this Review; this was located within the main office.
Are the management structure duty holder, responsible person and deputies nominated in writing?	Yes	The duty holder and responsible person have been nominated in writing but no deputy responsible persons have been nominated.
Are contact details written in writing within the logbook documentation?	Yes	The contact details for the duty holder and responsible person was seen written within the logbook documentation.

MONITORING

Is hot water temperature monitoring being carried out on a monthly basis and results recorded within the logbook documentation?	No	Monthly temperature monitoring of the domestic hot water system is not being carried out and recorded in the relevant section of the logbook.
Is cold water temperature monitoring being carried out on a monthly basis and results recorded within the logbook documentation?	No	Monthly temperature monitoring of the domestic cold water system is not being carried out and recorded in the relevant section of the logbook.
Are hot water calorifier flow temperatures being taken and results recorded within the logbook documentation?	No	Monthly temperature monitoring of the hot water calorifier and the hot water storage vessel storage temperatures are not being carried out and recorded in the relevant section of the logbook.
Are hot water calorifier return temperatures being taken and results recorded within the logbook documentation?	No	Monthly temperature monitoring of the hot water calorifier and the hot water storage vessel return temperatures are not being carried out and recorded in the relevant section of the logbook.
Are monitoring records recorded within the logbook documentation up to date?	No	Monitoring was last to be up to date as of November 2011 at the time of this Review.
Is weekly flushing of infrequently used outlets being carried out and recorded within the logbook documentation?	No	It should be ensured that all infrequently used outlets are flushed through at least on a weekly basis; record in logbook documentation when carried out.

COLD WATER STORAGE

Have cold water storage tanks where fitted been cleaned and disinfected annually?	Yes	The cold water storage tanks are being cleaned and disinfected annually if required.
Have storage tank cleaning and disinfection certification been filed within the logbook documentation?	No	No storage tank cleaning and disinfection certification was seen within the logbook documentation.
Storage tank cleaning and disinfection was last carried out on?		26 th May 2011
Are water storage tanks being inspected on a six monthly basis and temperatures recorded within the logbook documentation when carried out?	No	The cold water storage tanks should be inspected on a six monthly basis and temperatures from the tanks and remote from the ball valves be recorded within the logbook documentation.

SHOWERS

Are showerheads being cleaned and descaled on a quarterly basis or as required?	No	All showerheads and hoses should be inspected / cleaned and descaled at least quarterly or as required.
Is it being recorded within the logbook documentation when showerheads are cleaned and descaled?	No	Showerheads are not being inspected /cleaned and descaled and documented within the logbook documentation when carried out.
Is showerhead cleaning and descaling up to date?	No	Showerhead inspection / cleaning and descaling were last up to date in August 2011.

DRAWINGS

Are schematic drawings up to date with any changes made to the domestic water systems?	Yes	Schematic diagrams are filed within the Risk Assessment. It is thought that no changes have been made to the systems.
Are schematic drawings suitable and show all relevant storage and system details?	Yes	Schematic diagrams were seen to show relevant storage areas and system details. Copies should be filed within the logbook documentation.

TMV's

Are TMV's where fitted being serviced and maintained?	Yes	TMV's should be serviced and maintained as directed by the manufacturers.
Is documentation available to indicate when TMV's were last serviced / maintained?	Yes	TMV's should be serviced and maintained as directed by the manufacturers; and recorded within the logbook documentation when carried out. Records show that the TMV's were last serviced in August 2011.

SAMPLING

Has any Legionella or bacteriological water sampling been carried out on the domestic water systems?	No	Legionella water sampling should be carried out on the domestic water systems if the relevant water temperatures as recommended in the ACoP L8 and BS8580 are not constantly maintained.
Have Legionella or bacteriological water sampling test results if taken been filed within the logbook documentation?	No	Ensure all water sampling test results if taken are filed within the relevant section of the water systems logbook.

REMEDIAL WORKS

Has any remedial works identified within previous Risk Assessments / Reviews been carried out?	Yes	Remedial works highlighted within the Risk Assessment have been carried out in some areas.
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ANCILLARY EQUIPMENT

<p>Is there any ancillary equipment on site?</p>	<p>Yes</p>	<p>Main kitchen - water softener Main kitchen - cartridge on electric water boiler. Boiler room - inline scale reducer. Roof space - silver/copper ionisation unit Sensory room - bubble tube.</p>
<p>Is ancillary equipment being serviced and maintained to the manufacturer's recommendations?</p>	<p>Yes</p>	<p>Main kitchen - water softener This may require servicing and disinfecting; this has not been carried out. I would recommend that the manufacturer is contacted for maintenance recommendations. Main kitchen - cartridge on electric water boiler. It is unknown if this has been cleaned / replaced. I would recommend that the manufacturer is contacted for maintenance recommendations. Boiler room - inline scale reducer. It is unknown if this has been cleaned / replaced. I would recommend that the manufacturer is contacted for maintenance recommendations. Roof space - silver/copper ionisation unit. Records within a separate logbook (held within the main office) show that this is being inspected monthly by the supplier - EMG Water Tech (LM) Ltd although no work report could be found for January 2012. Sensory room - bubble tube. It is unknown if this has been cleaned / disinfected and is dosed with a biocide. I would recommend that the manufacturer is contacted for maintenance recommendations.</p>

HOT WATER STORAGE

Hot water storage at Forest Court - NCU is by one calorifier and one hot water storage vessel located within the boiler room. There is also a standby electric calorifier that is currently turned off and drained.

The main calorifier was manufactured by Andrews Water Heaters and is supplied by the domestic cold water storage tanks within the loft via a pressure reducer and booster pump set. The calorifier has insulation under the factory fitted metal outer casings, is of a steel construction and is directly heated by gas.

The hot water storage vessel was manufactured by Heizer and has insulation under the factory fitted metal outer casings and is of a stainless steel construction.

The standby calorifier was manufactured by ACV E-Tech and is supplied by the domestic cold water storage tanks within the loft via the same pressure reducer and booster pumps as for the main calorifier and is heated by electric elements.

The main calorifier supplies the storage vessel that in turn supplies all the hot water on site. There is an anti stratification pump that takes some of the hot water from the storage vessel and returns it to the calorifier to be reheated. At the time of the Survey the anti-stratification pump appeared to be working correctly. ACoP L8 recommends that de-stratification / shunt pumps are operated automatically by a time clock and run for one hour every day before first use. I would recommend that this be carried out as it will become a dead leg if not used within a week.

The return pipework from the building returns to the storage vessel via a circulation pump which at the time of the Survey also appeared to be working correctly.

There is a three way valve just before the hot water storage vessel return pipe enters the calorifier which diverts water either to the calorifier or the standby calorifier. There is also a three way valve on the flow pipe on top of the calorifier that diverts either the main calorifier flow or the standby calorifier flow to the hot storage vessel.

The cold water booster pump set has two pumps that appeared to switch automatically. I would recommend that the calorifier and storage vessel be purged to drain to check the water quality on at least a six monthly period and recorded within a water systems logbook when carried out. I was informed that this is not being carried out.

ACoP L8 recommends that calorifiers and storage vessel are checked internally for scale and sludge on an annual basis. It is unknown if this is being carried out.

I would recommend that the standby calorifier is filled and brought up to **70°C** for one hour before use to thermally disinfect the unit and pipes.

There are temperature gauges on the calorifier to show the storage but not on the return pipe from the storage vessel but this is not necessary as it is a small length of pipe and will be the same as the storage vessel storage temperature. There are temperature gauges on the hot water storage vessel to show the storage and return temperature from the building. There is a temperature gauge on the standby calorifier to show the storage temperature and another on the return pipe.

ACoP L8 recommends hot water storage to be a minimum of **60°C** and the return to be maintained at a minimum of **50°C** at all times.

Domestic water services should operate at temperatures that prevent the proliferation of Legionella. The ACoP L8 specifies that hot water should be stored at no less than 60°C and distributed at no less than 50°C, obtainable at user outlets within one minute of opening.

The temperature of the water at the time of this Review were:-

Calorifier	Storage	58.5°C	Not Satisfactory
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I would recommend the calorifier is adjusted to store hot water at a minimum of 60°C

HOT WATER CALORIFIER AND PHOTOGRAPHS

Boiler Room

The fill pipe from the booster pumps to the calorifiers has a small dead leg on the supply pipe to the standby calorifier as it is too long and should be shortened as much as possible.



Boiler Room

The fill pipe from the booster pumps to the standby calorifiers has a small dead leg on the drain valve as the pipe is too long and should be shortened as much as possible.



Boiler Room

There is a small dead leg on the hot water storage vessel drain as it is too long and should be shortened as much as possible.



COLD WATER STORAGE

Domestic cold water storage at Forest Court - NCU consists of two domestic cold water storage tanks located within the roof space above Violet Wing. There is also a water storage tank for the fire sprinkler system located outside. As this is a 'closed system' it does not pose a Legionella risk in normal operation and is therefore not covered by this Survey.

The domestic cold water storage tanks are of a sectional, double skinned GRP construction and are in good condition. There are screened vents on the lids, the inlet valve housing lids and also screens on the overflow pipes and overflow warning pipes. This vessel has integral insulation to the body, lid and hatch but the lid on the inlet valve housing is single skinned and not insulated, I would recommend that this be insulated if water temperature becomes elevated to near 20°C in the hotter months.

There is a satisfactory cross flow of water through the tanks with the inlets and outlets being at opposing ends of the vessels and also a circulation pump that comes from separate outlet pipes from the main outlet and pumps the water through a Silver / Copper Ionisation unit and then back into the top of each vessel.

At the time of this Review Survey the pump appeared to be working correctly.

The inside of the tank no. 1 (nearest to the roof space access hatch) showed a medium deposit of sediment on the base and a medium amount of biofilm on the sides.

The inside of the tank no. 2 (furthest the roof space access hatch) also showed a medium deposit of sediment on the base and a medium to heavy amount of biofilm on the sides.

Sediment, corrosion and biofilm act as nutrients and an ideal environment for the proliferation of bacteria including Legionella.

The vessels were cleaned and disinfected on the 26th May 2011 and I would therefore recommend that it be carried out again.

It is suspected that all the cold water outlets and appliances on site (with the exception of the mains fed heating boilers pressurisation unit, the fire sprinkler tank and the tap within the boiler room) are supplied by the boosted cold water from the tanks but this requires further investigation to be confirmed.

The water temperature of the water storage tank at the time of the Review Survey was:

Storage tank no. 1 9.7°C Satisfactory

The water temperature of the water storage tank at the time of the Review Survey was:

Storage tank no. 2 9.7°C Satisfactory

COLD WATER STORAGE TANKS PHOTOGRAPHS

Internal view of cold water storage tank no. 1.



Internal view of cold water storage tank no. 2.



ADDITIONAL PHOTOGRAPHS

Boiler Room

Scale reducer device.



Sensory Room

Bubble tube.



Main kitchen wash up area

Water softener.



Main Kitchen

Scale inhibitor on electric water boiler.



Roof Space

Circulation pump and filter / strainer on the domestic cold water storage tanks.



Roof Space

The steel housing containing the Silver / Copper Ionisation unit on the domestic cold water storage tanks circulation system.



SELECTED HOT & COLD WATER TEMPERATURES TAKEN AT REVIEW

Domestic water services should operate at temperatures that prevent the proliferation of Legionella.

ACoP L8 specifies that hot water should be stored at no less than 60°C and distributed at no less than 50°C, obtainable at user outlets within one minute of opening.

Cold water should be stored and distributed at no more than 20°C, obtainable at user outlets within two minutes of opening.

The temperature of mixed/ blended water from thermostatic mixing valves should be no more than 43°C to prevent scalding and ideally no less than 39 °C.

The following hot and cold water temperatures were taken at selected outlets as follows:-

Location	Hot °C	Cold °C	Mixed °C	Comments
Lavender Wing Kitchenette Sink	42.8	13.3	42.8	Not Satisfactory
Jasmine Wing Kitchenette Sink	52.9	13.4	42.9	Satisfactory
Rose Wing Room 41 Hand Basin	50.6	13.4	42.7	Satisfactory
Honeysuckle Wing Room 41 Hand Basin	51.3	14.1	43.3	Not Satisfactory
Reception Area Main Kitchen Sink	56.8	14.1	N/A	Satisfactory
Reception Area Kitchen Wash Up Area Sink	57.4	11.2	N/A	Satisfactory
Bluebell Wing Kitchenette Sink	47.6	13.3	44.3	Not Satisfactory

RECOMMENDATIONS

- Dead leg pipework are ideal areas for the proliferation of bacteria and should be removed or put on a weekly flushing regime (without creating an aerosol) and recorded. Dead legs were found in the following areas:-
 - Boiler Room – The fill pipe from the booster pumps to the calorifiers has a small dead leg on the supply pipe to the standby calorifier as it is too long and should be shortened as much as possible.
 - Boiler Room - The fill pipe from the booster pumps to the standby calorifiers has a small dead leg on the drain valve as the pipe is too long and should be shortened as much as possible. **This only applies when the standby calorifier is in service and the pipe is charged, it is currently empty.**
 - Boiler Room – The pipe from the booster pumps to the building has a small pipe from it just before it enters the wall. This pipe runs to the quick fill pipe of the standby calorifier. The valve off the header pipe is open and therefore the line is a complete dead leg. The valve at the header should be closed and this will eliminate the dead leg. The water within the pipe should be drained without creating an aerosol.
 - Boiler Room - There is a small dead leg on the hot water storage vessel drain as it is too long and should be shortened as much as possible.
 - Boiler Room - There is a small dead leg on the flow pipe on top of the calorifier.
- Adjust the calorifier to achieve a minimum stored water temperature of 60°C and a minimum return temperature of 50°C on the calorifier and storage vessel at all times.

- IF STANDBY CALORIFIER IS TO BE USED.

Fill the standby calorifier and bring up to 70°C for one hour to thermally disinfect the unit and pipework.

- If access allows, visually inspect the calorifier and hot water storage vessel internally for scale and sludge on an annual basis.
- Purge the calorifier and hot water storage vessel to drain on at least a six monthly basis and record when carried out.
- ACoP L8 recommends that destratification / shunt pumps are operated automatically by a time clock and run for one hour every day before first use. I would recommend that this be carried out as it will become a dead leg if not used within a week.
- Start weekly flushing of all infrequently used outlets and record in water systems logbook when carried out.
- Commence six monthly temperature monitoring of the cold water storage tanks and record results within the logbook.
- Clean and disinfect the domestic cold water storage tanks. Inspect annually and repeat if required.
- Fit extra insulation to the cold water storage tank inlet valve housing lids if needed in hotter months.
- Commence monthly temperature monitoring of all domestic sentinel hot and cold water and additional outlets and record in the water systems logbook.
- Commence cleaning and descaling all showerheads and hoses at least quarterly or as required; ensure this is maintained up to date at all times.

- Ensure schematic drawings are maintained up to date and file copies within the water systems logbook.
- There is an inline scale reducing device on the inlet of the cold water booster pump set in the boiler room and on the supply pipe to the electric water boiler within the main kitchen. Both should be cleaned / maintained in line with the manufacturer's recommendations. It is not thought that this is being carried out.
- There is a strainer on the inlet of the cold water booster pump set in the boiler room. This should be cleaned / maintained in line with the manufacturer's recommendations. It is not thought that this is being carried out.
- The bubble tube in the Sensory room should be dosed with an appropriate and safe biocide, cleaned and maintained in line with manufacturer's recommendations. I was informed that it is not known if this being carried out.
- There is a water softener for the dishwashers within the main kitchen wash up area. This should be disinfected and maintained in line with the manufacturer's recommendations. It is unknown if this is being carried out.
- I would recommend Bacteriological and Legionella water samples be taken if the temperatures fall out of the recommended limits.
- All tests, servicing and maintenance on the Silver / Copper Ionisation unit (and pump, strainer / filter) should be carried out and at the correct intervals in line with the manufacturers recommendations.
- I would recommend that further investigation be carried out to confirm that the mains cold water only supplies the boiler room outside tap, the heating boilers pressurisation unit and the two cold water storage tanks.
- Transfer all current and relevant documentation from the old water logbook to the new water logbook.

- Ensure Deputy Responsible Persons are appointed and are competent and adequately trained.
- Ensure the new maintenance operative on site is competent and adequately trained in Legionella management.

SUMMARY

Since the Risk Assessment was carried out a new water systems logbook has been put in place for 2012 but is not being used.

A new maintenance operative has been appointed since the Risk Assessment but had only started two weeks prior to the time of this Review. He informed me that he was very keen to implement any Legionella management recommendations necessary for the safe operation of the site and I would therefore recommend that he be adequately trained in Legionella management as soon as is practicable.

Some remedial works have been carried out by Freeston Water Treatment Limited since the last Risk Assessment and this is an ongoing planned maintenance agreement between Freeston and Hampshire County Council.

Completed remedial work carried at Forest Court includes tank cleaning and some dead leg removal.

The domestic cold water storage tanks were cleaned and disinfected on the 26th May 2011 but this needs to be carried out again within the near future.

Roof Space - Silver/Copper Ionisation Unit

Records within a separate logbook (held within the main office) show that the Silver/Copper Ionisation unit is being inspected monthly by the supplier - EMG Water Tech (LM) Ltd. although no work report could be found for January 2012.

All Legionella management including temperature monitoring of outlets, calorifier and hot water storage vessel and cold water storage tanks and flushing of infrequently used outlets ceased in 2011. **I would recommend that all Legionella management as stated within this report is recommenced as soon as is practicable and recorded within the logbook when carried out.**