

**Bundle of documents for Oral hearings  
commencing from 19 August 2024 in  
relation to the Queen Elizabeth University  
Hospital and the Royal Hospital for  
Children, Glasgow**

**Bundle 27 – Volume 1  
Miscellaneous Documents**

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## JOB DESCRIPTION

### 1. JOB IDENTIFICATION

**Job Title:** General Manager – Estates

**Responsible to:** *Associate Director (Facilities)*

**Job Reference number (coded):**

### 2. JOB PURPOSE

The post holder will report directly to the Associate Director (Facilities) for NHSGG&C and will professionally manage all aspects of operational estates by development of strategic aims and objectives to underpin Board and National Policy as it relates to Estates management.

To lead on the Operational Estates Strategy for NHSGG&C aligning it to the Boards Clinical Strategy and Boards Clinical Strategy and Property Strategy. This will include leading on the ten year estate development plan to improve service delivery to users and to improve building maintenance in an innovative and creative way.

To ensure that the hospital environment is safe, secure and attractive whilst driving improvements to the estates health and safety culture and staff satisfaction levels.

The post holder will be expected to work at national level and contribute in conjunction with Senior NHS and Health Facilities Scotland staff to develop pan Scotland strategies and Policies, representing NHSGG&C on a range of Operational Estates Projects and Boards.

The post holder will be expected to work with and develop synergies with the Boards capital Team and Property Management Team.

Potholder will develop the input of estates to the management of PFI and Hub Schemes with the Associate Director (Facilities)

The post holder will be responsible for the development of a trained, professional, proactive estates workforce within the Board.

General Managers with geographic responsibility have day to day operational responsibility and accountability for the delivery of operational estates in accordance with Board Policy. The post holder will liaise with the General Managers to deliver a high level of compliance operationally with Board Policy.

The post holder will allocate Sector Estates Managers, Site Estates Managers and Estates Officers specific tasks to ensure that NHSGG&C meets its national and statutory requirements.

The post holder will directly manage the Boards Energy Team, Sustainable Development Action Plan, Carbon Management Plan and all aspects of statutory compliance.

The post holder requires to work in partnership with Senior Management and staff side across NHSGG&C whilst reacting to evolving National Strategies Operational Estates impacts directly on clinical care of patients and as such is an integral activity between Facilities, Clinical and Non Clinical Specialties Board wide.

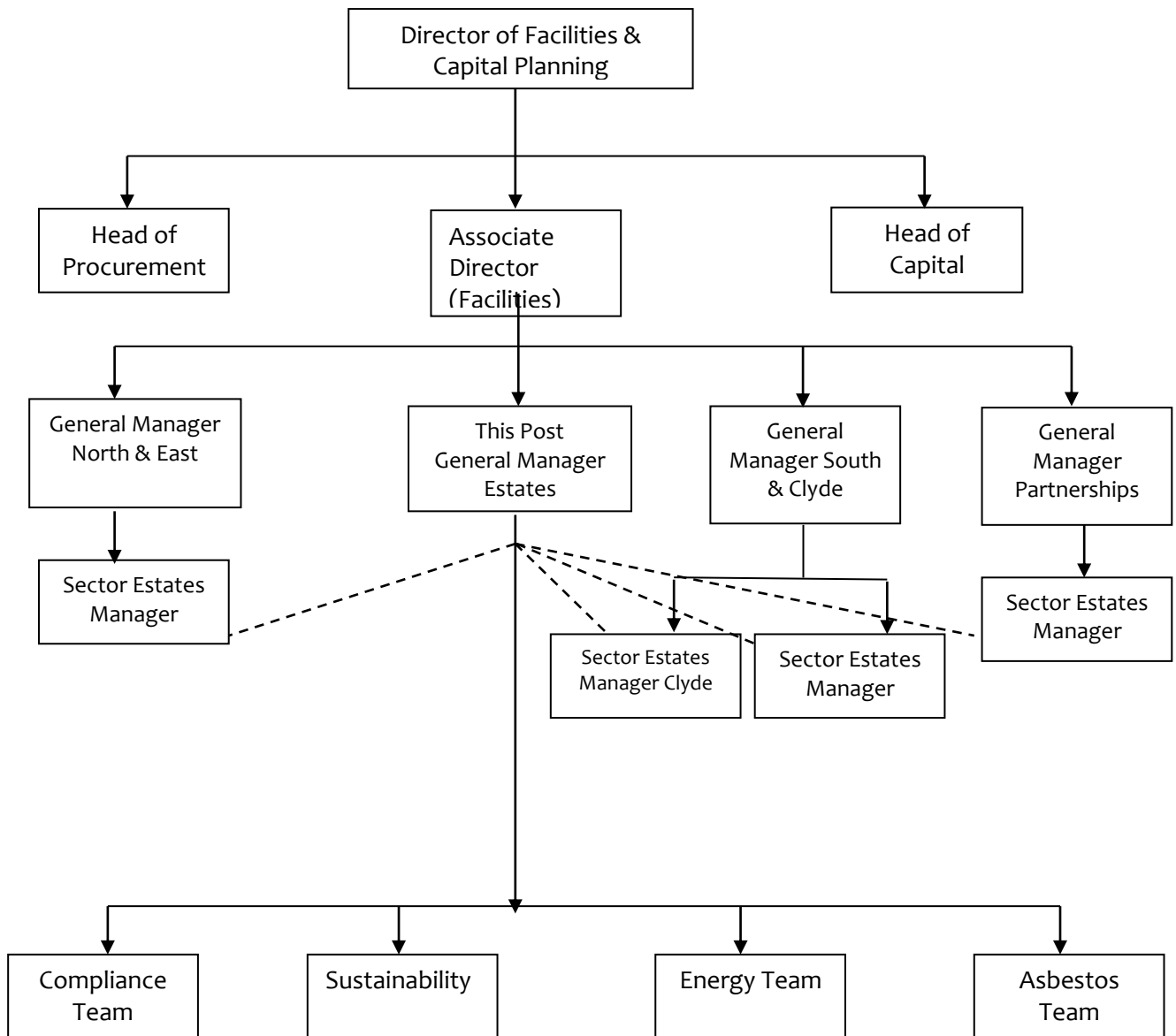
The focus of the post is on consistent high quality service levels, improved value for money, expenditure management, governance of compliance management and the delivery of NHSGG&C strategic targets, providing clear leadership, mentoring, direction and innovation are essential to the post.

The primary requirements of the post are:

- To deliver the strategic aims and objectives of NHSGG&C
- To deliver Strategy and vision for Estates in conjunction with the Head of Facilities and the Facilities Senior Management Team
- To provide technical and professional guidance on the delivery of estates management, energy management and sustainability at local site level, sector level, Board level and nationally
- To project manage a range of Estates initiatives from inception to delivery on behalf of NHSGG&C
- To ensure sound financial controls are in place and administered effectively on behalf of NHSGG&C
- To provide professional leadership to the operational estates workforce
- Actively liaise with colleagues in the Capital Planning and Procurement operational structures



### 3. ORGANISATIONAL POSITION



----- Professional responsibility and accountability  
 ————— Direct management control

#### 4. SCOPE AND RANGE

The approximate square metreage of NHSGG&C properties is 931,506 employed within Operational estates are circa 433.20WTE staff with a Pay Budget of £15.2M.

The overall supplies budget for the Board is circa £58.5M per annum including utilities which has a value of around £33M

#### 5. Role of the Department

The Facilities & Capital Planning Directorate is a Corporate Directorate within NHSGG&C. plays an essential role in supporting clinical activity and healthcare provision across all care settings (hospitals, health centres, clinics, dental surgeries, office accommodation etc.) for the population of NHSGG&C and beyond.

There are a number of regional and national centres for clinical care provided within the Board with the age of the estate ranging from Victorian buildings to purpose build conventional capital funded of PFI funded premises.

The Facilities and Capital Planning Directorate provides a varied range of services and covers :

- ❖ Catering, including two central cook-freeze production units, Domestic, Portering, Sewing Rooms, Linen and Laundry Services with an offsite central laundry, Transport, Car Parking, Grounds maintenance, Pest Control, Cashiers, Sterile Services with Endoscopy Units and two Central Production Units for instrumentation, Procurement, Capital Planning and Operational Estates.

The directorate is a highly complex organisation in its own right which supports all aspects of healthcare.

The total Directorate scope and range is :

£ 155 m            and            4365 wte

The directorate is requires to provide professional and technical facilities management advice and leadership for NHSGG&C at all levels of the organisation in the current changing healthcare environment the directorate plays a critical role in corporate and strategic planning.

## 6. Key Results Areas

### Sector Level

- a) Professional accountability for all aspects of estates maintenance strategy delivery linking with General Managers and Sector Estates Managers.
- b) Ensure Estates and Energy services and strategies within operational sectors are provided, operated and maintained to comply with statutory requirements, NHS and relevant guidance to satisfy the needs of NHSGG&C
- c) To develop an ensure operational estates deliver all statutory compliance requirements on a consistent basis linking with the Capital Team in developing longer term strategic site developments which support and enhance this requirement
- d) Develop Sector and Site Carbon Plans with local management teams and local groups
- e) Ensure a culture of patient & customer focussed operational estates delivery is maintained at all times.
- f) Review and contribute to local PPM scheduling.
- g) Participate in prioritisation of backlog maintenance requests by local sector Estates Teams.
- h) Support Sector Estates Team and Capital Planning Team liaison.
- i) Provide advice, leadership and professional direction to Sector Estates Teams and General Managers

### Board Level

- a) Provision of technical expertise leadership planning and communication on policy development and implementation impacting on the safe operation of the Board service provision (statutory and mandatory compliance).
- b) Coordination of effective recruitment, management and development of NHSGG&C operational estates staff ensuring clear roles, responsibilities and accountability are in place to provide value for money, comply with standing Financial Instructions, KPI's statutory and mandatory Professional standards.
- c) Development of workforce planning tools and arrangements supported by demonstrable changes in culture to patient focussed / customer focussed delivery of service.
- d) To lead and coordinate the Boards approach to Sustainability, Carbon Management, Energy Management and Environmental initiatives.
- e) Deliver single system working approach to Estates
- f) Advise on PPI/PFI Hard FM compliance and professional service delivery standards
- g) Development of effective and robust reporting mechanisms for all aspects of operational estates.

- h) Participate in Business case preparation as required.
- i) Liaise directly with the Boards Asset Team ensuring that information retained within all data bases informing decision making reflect the current position

### **National Level**

- a) Work in conjunction with Senior SEHD and HFS staff to develop / establish and deliver effective national Strategies and Policies for Operational Estates and Environmental matters.
- b) Effectively work with other Health Boards / Agencies and contractors to develop and manage local national and regional projects as required.
- c) Effectively represent NHSGG&C on national and Regional Projects.
- d) Liaise with other Health Boards and Agencies to effectively deliver best practice in NHSGG&C

## **7. DECISIONS AND JUDGEMENTS**

The post holder will be self motivated and establish long terms strategies and work plans for themselves and others which will be reviewed and agreed with the Head of Facilities and the Director of Facilities & Capital Planning. These may then require endorsement by NHSGG&C.

The post holder will have a high degree of autonomy at local, Board and National level. This will require planning and analytical skills of the highest order to ensure appropriate and timely allocation of resources.

Post holder will require to have good IT skills to support data analysis and development.

Service performance indicators will require analytical analysis to understand key organisational trends which will influence and shape areas of strategy , service and business development.

Much of the workload will be driven by the Boards Clinical Strategy and business objectives. However, a good understanding and experience of asset management is required in order to develop appropriate supporting strategies and work closely with the Boards Capital Planning Team members at various levels and in various roles.

Performance review will be completed annually by the setting of agreed objectives and individual appraisal by the Head of Facilities.

The post holder will assign work to various senior Facilities management managers and will require to work closely with Facilities General Managers to balance workloads and resources to deliver business objectives and operational delivery of service.

The post holder will continuously review his/her work to ensure satisfactory standards are achieved and will brief the Head of Facilities regularly against delivery of objectives

## 8. COMMUNICATIONS AND RELATIONSHIPS

The post requires oral and written communication skills of the highest order to process complex, sensitive and often contentious information at senior management level within NHS GG&C and on a national basis, whilst having the strength of character to deliver strategies and operational objectives.

Due to the sensitive nature of some of the subject matter the post holder requires to be politically aware with good interpersonal and influencing skills as well as a first class communicator.

There is a crucial role to be fulfilled in influencing professional service development and peer organisations to advance the interests of NHS GG&C. This can be written, oral or visual in nature but requires high level negotiation skills

### **Internal Communication**

Communication with patients, visitors and staff to ensure delivery of services  
Extensive communication with general managers of all disciplines, Senior Clinical staff, Staff Partnership colleagues and Senior Non Clinical staff

### **External Communication**

Extensive communication with Senior Management Teams from other Health Boards  
SEHD

Health Facilities Scotland

PPI Contracts

Enforcement Agencies

Media via Comms Team

Development Agencies

CHCP Partners

Politicians and Ministers

Universities & Colleges

Trade Union Organisations

PFI Providers

Local Authority Partners

## 9. Most Challenging Part of Job

Balancing the delivery of the Boards strategic objectives with statutory and mandatory requirements and operational delivery is without doubt the most challenging component of the role.

Meeting the needs and objectives of a range of highly motivated and academic individuals within the Estates and Facilities community whilst establishing sound leadership roles and professional development of operational staff needs to be managed very carefully by the post holder to ensure that business objectives and statutory requirements are met.

The professional leadership of estates within NHS GG&C is of paramount importance to ensure that estates are delivered as first in class all of the time with appropriate levels of continuity of service.

**10. Knowledge, Training and Experience**

Must be chartered professional in an Engineering or Construction related discipline.

Requirements of which are;

- Must have an accredited Bachelors degree at honours level *plus either*
- An appropriate masters Degree or further learning to masters level or an accredited M.Eng degree *plus*
- A management qualification of HNC or above

Must have a record of achievement in large scale complex environments, preferably healthcare which demonstrates problem solving capability, strategy development and implementation, change management, people influencing skills and political awareness, Project management experience and a minimum of 10 years at senior management level experience.

**Action List****Ward 6A****Gram Negative Bacteraemia (GNB) and Mycobacterium *chelonae* Incident Management Team**

| <b>Date Agreed Action</b> | <b>Action</b>  | <b>Responsible Person/s</b> | <b>Completion Date</b> | <b>Status/Update</b>   |
|---------------------------|--|-----------------------------|------------------------|--|
| 03/07/19                  | All point of use filters removed for routine replacement are to be labelled and kept until water results have been returned  | Darryl Conner               |                        | Complete as per David Watsons Email  |
| 03/07/19                  | Every 2 weeks water testing is to be carried out for half of Ward 6A then carried out for the other half   | Darryl Conner               | 8/7/19                 | Teresa Changed this action directly with David from DMA to cover all cold taps for the whole ward on 08/07/2019 as per David DMAs email. |
| 03/07/19                  | Karen Connelly will contact Anne Harkness to seek approval for the removal of the ARJO bath.   | Karen Connelly              |                        | Complete   |
| 03/07/19                  | ARJO bath is to be removed from Ward 6A and cap the water outlet to the bath once approval has come from Anne Harkness   | Darryl Connor               | 20/7/19                | Request to decommission Arjo Bath left with IC to confirm the process, Mel has had no endorsement from IC to continue further. Complete. |
| 03/07/19                  | Sink within DSR may be getting a retrofitted filter attached to it. Currently speak to manufacturer  | Darryl Conner               | 23/7/19                | Tap replaced and filter added.   |
| 03/07/19                  | Alan Gallagher is to create a detailed plan on what measures will be taken to minimise disruption to patients and clinical service when shock dosing treatment is implemented. | Alan Gallagher              | See status             | Shock dosing did not take place as not required.   |
| 03/07/19                  | Drain cleaning is to be carried out in Nuclear Medicine and MRI where ward 6A patients have been visiting.   | Darryl Conner               | Ongoing                | On-going as per updated action list, access is extremely poor for scan areas.  |
| 03/07/19                  | Tap within unused prep room in ward 6A is to be replaced as no point of use filter can be fitted.  | Darryl Conner               | 07/07/19               | Done but not effective, Tap spout is to short.   |

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| 03/07/19           | Dr Inkster and Kevin Hill are to agree on general communication that can be shared between patient's/parents and NHS staff.  | Teresa Inkster<br>Kevin Hill    |                        | Completed through general communication. |
| 03/07/19           | Dr Inkster & Prof Gibson are to meet up with Steve Russell to discuss the current development of ward 2A/2B, RHC   | Teresa Inkster<br>Brenda Gibson |                        | Complete                                 |
| 25/06/19           | Annette Rankin is to obtain a list of all positive M.Chelonae cases in Scotland  | Annette Rankin                  |                        | Complete                                 |
| <b>Date Agreed</b> | <b>Action</b>  | <b>Responsible Person/s</b>     | <b>Completion Date</b> | <b>Status</b>                            |
| 25/06/19           | Patient recently transferred to Edinburgh Children's Hospital is to be included in the Gram Negative patient timeline  | Susie Dodd                      | 25/06/19               | Complete                                 |
| 25/06/19           | Dr Iain Kennedy is to contact Scottish water to obtain samples of water being sent to QEUH campus to be tested within our own labs. Samples have been obtained from properties beside the QEUH and also from the Gartnavel site. | Dr Iain Kennedy                 | 01/07/19               | Complete                                 |
| 25/06/19           | Darryl and Gael to meet up to confirm when the best time to fit point of use filters to areas where Ward 6A patients are likely to attend i.e. Theatres  | Darryl Conner<br>Gael Rolls     | 01/07/19               | Complete                                 |
| 25/06/19           | Modification to the aluminium sphigots within CHWB in Theatres & CDU will be undertaken. Unable to carry out due to technicalities so it was agreed that bottle brushing the drains will be carried out instead.                 | Darryl Conner                   | 01/07/2019             | Complete                                 |
| 25/06/19           | Increase dosing of chlorine dioxide is to be undertaken to the water supply  | Colin Purdon                    | 01/07/19               | Complete                                 |

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|--------------------|---|--------------------------------|---------------------------------|---------------|
| 25/06/19           | Additional hand hygiene step involving gelling of hands after being washed is to be introduced.   | Gael Roll                      | 01/07/19                        | Complete      |
| 25/06/19           | Water samples are to be taken from chilled beams from Ward 6A   | Darryl Conner                  | 01/07/19                        | Complete      |
| 25/06/19           | A log of when and where water leaks have happened due to the chilled beams is to be completed.  | Darryl Conner                  | 01/07/19                        | Complete      |
| 25/06/19           | Air sampling for bacteria within Ward 6A is to be carried out while water is running into a CHWB to see if aerolisation is present  | Dr Teresa Inkster              | 01/07/19                        | Complete      |
| 25/06/19           | Kevin Hill & Dr Chris Deighan will take forward at Executive level regarding incidence of similar cases of Gram Negative Bacteraemia within similar units in with the rest of the UK.   | Kevin Hill<br>Dr Chris Deighan | 01/07/19                        | Complete      |
| 25/06/19           | Sandra Devine spoke to Dr Jennifer Armstrong about informing Edinburgh Royal Infirmary about testing their water supply before opening. She has requested that this should be carried out in a national forum and asked HPS for clarity. HPS informed the group that ventilation and water issues have been discussed at length between HPS and HFS | Sandra Devine                  | 01/07/19                        | Complete      |
| <b>Date Agreed</b> | <b>Action</b>   | <b>Responsible Person/s</b>    | <b>Expected Completion date</b> | <b>Status</b> |
| 19/6/19            | Compile Timeline of M.chelonae case (SJK)   | Susie Dodd                     | 20/06/19                        | Complete      |
| 19/6/19            | Apply POUFs to theatre outlets  | Colin Purdon                   | 21/06/19                        | Complete      |
| 19/6/19            | Check water cooler removed from 6A staff room   | Colin Purdon                   | 20/06/19                        | Complete      |
| 19/6/19            | Carry out water testing in ward 6A pre and post POUFs (incl showers) and in theatres pre POUF application.  | Colin Purdon                   | 24/06/19                        | Complete      |
| 19/6/19            | Water testing to be undertaken on outlets identified from timeline which currently have no filters.   | Colin Purdon                   | 24/06/19                        | Complete      |

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| 19/06/19 | Obtain Information from PAL to ensure that POUF are effective against Mycobacteria.                             | Colin Puirdon        | 24/06/19 | Complete |
| 19/6/19  | Compile report of water sampling results across RHC site to establish extent of M.chelonae within water supply. | Colin Purdon         | 24/06/19 | Complete |
| 19/6/19  | Situation update report for clinical staff  | Dr Chaudhury         | 20/06/19 | Complete |
| 19/6/19  | Prepare holding press statement   | Mark Dell/Dr Inkster | 20/06/19 | Complete |
| 19/6/19  | Provide email update to senior management teams   | Dr Teresa Inkster    | 19/06/19 | Complete |

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## Appendix A

### Enhanced ClO2 Treatment Schedule of Affected Area's

#### Schedule 5A

**Riser M25**

**Booster 1: Line 1 (1:1)**

**32-CAL01, 02 & 03(Adult Ward Tower "A")**

**Riser T12**

| Level       | Ward\Department Affected        |
|-------------|---------------------------------|
| Level 3     | NSGH Public Health Records      |
| Level 3     | <b>Adult Renal (RO Plant)</b>   |
| Level 4     | NSGH Higher Acute Renal<br>Ward |
| Level 4     | NSGH Dirty Core D               |
| Level 5     | NSGH Rheumatology Ward          |
| Level 5     | NSGH Dirty Core D               |
| Level 6     | NSGH General Ward               |
| Level 6     | NSGH Dirty Core D               |
| Level 7     | NSGH General Ward               |
| Level 7     | NSGH Dirty Core D               |
| Level 8     | NSGH General Ward               |
| Level 8     | NSGH Dirty Core D               |
| Level 9     | NSGH General Ward               |
| Level 9     | NSGH Dirty Core D               |
| Level<br>10 | NSGH General Ward               |
| Level<br>10 | NSGH Dirty Core D               |
| Level<br>11 | NSGH General Ward               |
| Level<br>11 | NSGH Dirty Core D               |

**Schedule 5B****Riser M25****Booster 1: Line 1 (1:1)****33-CAL01, 02 & 03 (Adult Ward Tower "D")****Riser T13**

| <b>Level</b> | <b>Ward\Department Affected</b> |
|--------------|---------------------------------|
| Level 4      | NSGH Renal Ward                 |
| Level 5      | NSGH General Ward               |
| Level 6      | NSGH General Ward               |
| Level 7      | NSGH General Ward               |
| Level 8      | NSGH General Ward               |
| Level 9      | NSGH General Ward               |
| Level 10     | NSGH General Ward               |
| Level 11     | NSGH General Ward               |



## **Atypical Mycobacterium Species (AMS) Infection Control Doctor (ICD) Request Domestic Cold water: Three State Action Plan**

The following action plan has been developed to support the above ICD request further to initial water samples having returned positive results for AMS species.

This 3 stage action plan aims to assess the extent and source of this environmental organisms as well as neutralising its presence within the hospitals water distribution system.

Stage 1: Test supply Chain

Stage 2: Increase continuous ClO<sub>2</sub> treatment Level

Stage 3: Enhanced short duration ClO<sub>2</sub> Treatment

### **Stage 1: Test the supply chain.**

Water samples were collected from the following locations to assess if AMS is present in the supply, sample were collected on Friday 28<sup>th</sup> June 2019 as submitted to the Glasgow Royal Infirmary Water Laboratory for analysis. The incubation period for this organism is 6 to 8 weeks, if AMS is isolated a further 7 to 10 days for species typing at an independent lab.

#### **Locations:**

- Utility supply points from:
  - Govan Road
  - Hardgate Road
- Raw water tanks
  - Intake
  - Dip sample
  - Drain cock sample
- Filtrate Tanks
  - Intake
  - Dip sample
  - Drain cock sample

### **Stage 2: Increase continuous ClO<sub>2</sub> treatment Level:**

Increase the continual water treatment regime from 0.3 to 0.5PPM residual value; this was implemented on Thursday 27<sup>th</sup> June 2019 at 08:00hrs. As of Monday 1<sup>st</sup> July 2019 ClO<sub>2</sub> residual levels at water outlets are being recorded at around 0.4ppm and will be continually monitored.

**Stage 2A: Increase continuous ClO<sub>2</sub> treatment level and increase AMS sampling regime:****Proposal**

Review results of AMS sampling within Ward 6A and if there are positive AMS results within these samples the following actions should take place;

- Increase AMS sampling regime across the QEUH A&C (taking 142 samples across the building(s)) and send for analysis; (this has already been carried out on 14/8 & 15/8 in advance with agreement of ICD);
- Increase the continual water treatment regime from 0.5 to 0.7PPM residual value;
- After approx 7 days (and after review of Data Graphs which evidence that 0.7 PPM has been achieved) a further sampling regime (approx 142 samples) will be taken and sent for analysis;
- A ward/area within the QEUH hospitals will be identified as a potential area for carrying out a 'local' short dosing regime in the event the 0.7PPM level still returns positive AMS results

**Stage 2B: Local Enhanced Short Dosing ClO<sub>2</sub> Treatment**

Implement enhanced short duration water treatment for a 12 hour period at a residual level of 1.2 PPM (3 times the current residual value). In a local ward/area identified in Stage 2A

**Stage 3: Enhanced short Duration ClO<sub>2</sub> Treatment:**

**(Note this needs further refinement)**

Implement enhanced short duration water treatment for a 12 hour period at a residual level of 1.2 PPM (3 times the current residual value). on a distribution zone plan, initially in addressing the high risk patient wards in tower A, the following is the outline plan for consultation in rolling out this enhanced treatment.

**Proposal for Enhanced short duration ClO<sub>2</sub> Treatment:**

Prior to works taking place suitable signage should be displayed at all water outlets warning users "WATER SYSTEM UNDER TEST - DO NOT DRINK". These should be placed on or directly above all outlets prior to "enhanced" levels of ClO<sub>2</sub> being drawn through the system.

Renal staff shall be made aware that ClO<sub>2</sub> water treatment water on the Boosted supply line 1:1 to the renal RO plant is being increased to from 0.5 - 0.8ppm (to be carried out by Scotmas), this will trigger the pre-alarm condition for the duration of the exercise. Renal technician(s) shall be on site for duration of works to monitor and test supply to the renal plant and to confirm the efficacy of the carbon filters.

The dosing unit supplying boosted line to Plantrooms 32 & 33 (Boosted Line 1.1) which in turn supplies the hot and cold water to Ward A and Ward D towers of the QEUH shall have the dosing point increased to 1.2ppm (to be carried out by Scotmas).

The local distribution zone cold water treatment plant supporting Plant rooms 32 & 33 (ward towers A & D) shall have the dosing level enhanced to 1.2ppm, three times the routine (to be carried out by Scotmas).

It has been agreed by the WTG expert advisors that the DHW service temperature of 60°C (i.e. >55°C) is sufficient to inhibit the growth of Atypical Myco-Bacteria species (AMS), therefore the hot water treatment plant will be maintained at its current setting.

The last sentinel point in each ward and direct cold outlets in all Wards supplied from these plantrooms shall then be flushed through until ClO<sub>2</sub> at 1.2ppm is detected in the cold systems.

This will be carried out working progressively down through the building from floor 11, floor 10 etc. until ClO<sub>2</sub> reserve required are detected on each level. Starting from level 11 will fully charge the risers to the enhance level, allowing for more rapid discharge to each floor once residual has been achieved at level 11.

Once satisfactory dosing levels achieved at the sentinel outlets in a ward then all cold outlets in each room shall be flushed through until ClO<sub>2</sub> of 1.2ppm is detected.

Once reserves are established throughout services being supplied these should be tested periodically (Tim Wafer to confirm frequency and minimum\maximum residual value range) to ensure minimum reserve is being maintained (e.g. hourly at designated point in each ward).

The enhanced treatment levels shall be maintained (and confirmed by testing as above) for a period of 12 hours.

Communication strategy statement will be required for issue to clinical management teams, Patient groups & the press.

Once the 12 hour period has elapsed the ClO<sub>2</sub> water treatment plant supplying Plant rooms 32 & 33 (Boosted Line 1.1) which in turn supplies the hot and cold water to Ward A and Ward D towers of the QEUH shall have the treatment settings decreased back to the original levels (to be carried out by Scotmas).

The local distribution zone cold water treatment plant supporting Plant rooms 32 & 33 (ward towers A & D) shall have the dosing point decreased back to the original setting (to be carried out by Scotmas).

The ClO<sub>2</sub> levels should then be monitored at designated test outlets over the next 12 – 24 hours (or longer should this be required) until levels return to <0.5ppm.

Signage will remain in place and bottled drinking water provided in all affected area's (See attached schedule appendix A) until the residual ClO<sub>2</sub> is returned to <0.5PPM

Renal technicians should continue to monitor the supply and filtration equipment during this period (48hrs).

Once Estates, Scotmas and Renal staff have confirmed ClO<sub>2</sub> levels are back to routine background dosing levels and system is operating normally all signage should be removed (ensuring no residue from labels being stuck to taps/IPS panels remains e.g. wipe panel tap with disinfectant wipe to remove residue) and the system returned to normal operation.

Microbiological sampling regime specified by Infection Control/Clinical staff shall then be implemented to determine the efficacy of the works after an agreed period since works completed. (Teresa Inkster to advise)

#### **Considerations for increased dosing to A & B Ward Towers (I.e. PR 32 & 33)**

1. Bottled drinking water would require to be made freely available to staff, patients, visitors etc.
2. Suitable method statements should be supplied by each party for approval by NHS Manager responsible for works, prior to works commencing (E.g. Scotmas, DMA, Estates etc.)
3. Agreement as to what labour is required from DMA, other contractors and NHS Estates and the allocation of management and operational tasks across all parties involved.
  - a) DMA
    - i. A team of 6 (TBC) operators for carry out ClO<sub>2</sub> draw through in shortest possible time scale.
    - ii. 2 off operatives to carry out ClO<sub>2</sub> residual monitoring frequency (48 hr window from start of enhanced ClO<sub>2</sub> level till return to normal residual level)
  - b) Scotmas

- i. 1 off Operative on site (48hr window), to control, monitor & adjust treatment plant as required.
- c) Estates
  - i. 2 off Estates Managers\Supervisors over seeing programme (48 hr window)
  - ii. 2 off Plumbers on standby to support any issues arising in the treated area's
  - iii. 6 off Estates operatives (Contingency support unforeseen circumstances)
  - iv. 8 off M&S Contract support
- d) Soft FM: 2-4 Porters: Bottled drinking water deployment and replenishment as required.
- e) Renal technician on site during the enhanced treatment (0.8ppm) of the boosted water line (12 – 18 hrs)

4. All support staff to be issued with Security id\access passes.

This requires a large workforce over a long 24 hour (see above requirements) working day including an overnight contact time, the 24 hour flushing period to return to normal residual levels (0.5ppm) monitoring end sentinel points in each ward, followed by flushing of each outlet to confirm normal residual levels achieved.

The following day would be a rest day so these staff would not be available for normal works underway and this would require acknowledgement and rescheduling

Warning sign will require to be deployed ahead of the states enhanced treatment time frame window.

Scotmas to advise what is the acceptable margin of error at each dosing station, to maintain efficacy of the ClO<sub>2</sub> levels being proposed.

Additional ClO<sub>2</sub> Testing Units (ChlordioXense), and the corresponding test strips would be required for use on each ward end sentinel points during the procedure (5 units required).

Test strips will be used to confirming ClO<sub>2</sub> detected at “non-sentinel” outlets with the ChlordioXense unit being used for sentinel outlets only?

To limit excessive working hours for Estates\contractors are spending on site domestic staff are requested to remove the do not drink signs and wipe the adhesive mark using sterile wipes (on formal notification from Estates) then pass on all signs to nominated Estates supervisor.

Renal Staff shall be made aware that ClO<sub>2</sub> dosing is being enhanced (0.8ppm) in the boosted line DCW system supplying the renal plant. Renal technician(s) should be on site for duration of works to monitor and test supply to the renal plant and to confirm the efficacy of the carbon filters.

- Scotmas: to inhibit 0.7ppm supply alarm parameter for the duration of the works.
- Scotmas: 1.0ppm supply valve protection to remain in place but be monitored.
- RO loop will automatically stop if Carbon filter break through is registered on the permanent ClO<sub>2</sub> residual sensors.
- Renal technician: existing renal action plans will be enabled under these circumstances

Validation and testing at end of lines and other selected points during the disinfection –

- Scotmas to confirm (To be agreed with Estates RP & AP Water\WSG\AE Water):
  - Minimum & Maximum acceptable Residual values to maintain the target 1.2ppm residual exposure during this treatment programme for verification of 12 hr exposure.
  - Frequency of end sentinels point monitoring to establish acceptable Enhance ClO<sub>2</sub> residual value.
  - Protocols for actions should this drop below stated minimum levels.
  - Protocols for actions should this rise above stated maximum levels.

Filters: Pall supporting literature confirms that the Pall PUO filters can withstand ClO<sub>2</sub> levels of up to 10ppm



A stock of PALL filters would be required to be held on site for replacement in the event of filters blocking.

Under these circumstances additional labour trained in filter replacement would be required.

This could also have an effect on labour resources and the proposed disinfection timescales.

Possibly also a knock-on effect in filter swap out regime if this is to continue after disinfection is completed.

However it is not anticipated that there is sufficient particulate matter in the system to cause wholesale POU filter blockages under the proposed treatment regime.

Any deadlegs or low use outlet should be incorporated into the disinfection regime to ensure that these are fully disinfected and not acting as a “seed” point for recontamination of the system.

Operational plans should in place for;

- any unforeseen circumstances which result in disinfection taking longer than anticipated
- a system failure in parts of the hospital/system being disinfected.
- Gas monitors indicating higher than anticipated ClO<sub>2</sub> levels in the air ( 2 held on each ward for use if strong chlorine odour detected)
- Disinfectant failing to maintain or achieve acceptable lower levels for duration of contact time (either generally or in specific locations).
- Multiple component failures (e.g. TMVS failing) during the disinfection – an acceptable level of failure may require to be established and an alternative methodology or protocol implemented should this “acceptable” point be exceeded during the process. (i.e. should a considerable number of TMVs fail, do operators get instructed to cease disinfecting through these components. (recommended spares kits should be available for remedial actions)

Clinical plans should in place to ensure patient safety and continuation of treatment etc. in the light of any operational issues arising as described above.

Clinical plans for any patient (or other persons) having a reaction to the disinfectant being used. Headaches, irritation of the eyes, mucous membranes, throat and respiratory system are all commonly reported side effects of exposure to chlorine dioxide (with some persons being more sensitive to these effects than others) at “high” levels. It is not considered to be “likely” at these levels though this should be confirmed by Scotmas\WSG.

Microbiological sampling procedure for Atypical Mycobacterium Species (AMS) should be formulated and agreed by ICD\ICT after works completed, detailing:

- Sample date. (i.e. 76 hours after return to normal residual ClO<sub>2</sub> levels?)
- Number and location of samples (e.g. TVC protocol Sentinel points (142 off), using pseudomonas sampling protocol?)
- Should the scope of sampling be extended for other organisms as well as AMS?
- Define acceptable limits for each organism to be tested.

See attached appendix “A “schedule of areas affected by the 1<sup>st</sup> stage of the proposed programme.

**Water Review Meeting (Technical)**  
**Friday 21<sup>st</sup> June 2019 at 1pm**  
**QEUH – CMB – Facilities Meeting Room and via Teleconference**

|                             |  |
|-----------------------------|--|
| <b>Present and on call:</b> |  |
| Ian Powrie (IP)             | Deputy General Manager – Estates                   |
| John Hood (JH)              | Consultant Microbiologist - GRI                    |
| Iain Kennedy (IK)           | Consultant in Public Health Medicine               |
| Colin Purdon (CP)           | Interim Sector Estates Manager, South Sector       |
| Eddie McLaughlin (EMcL)     | Principal Engineer – HFS (telephone)               |
| Tim Wafer (TW)              | Consultant (Water Solutions Group) (Telephone)     |
| Mark Riddell (MR)           | Sector Estates Manager                             |
| John Mallon (JM)            | Technical Services Manager – GRI                   |
| Alan Gallacher (AG)         | General Manager – Estates                          |
| Dennis Kelly (DK)           | Authorising Engineer                               |
|                             |  |
| <b>Apologies:</b>           |  |
| Tom Steele (TS)             | Director of Estates & Facilities                   |
| Mary Anne Kane (MAK)        | Associate Director of Estates & Facilities (Chair) |
| Teresa Inkster (TI)         | Consultant Microbiology                            |
|                             |  |
| <b>In Attendance :</b>      |  |
| Allyson Hirst (AH)          | Admin to Estates and Facilities                    |

| 1.        | Apologies  | Action    |
|-----------|--|-----------|
|           | As noted above   | -         |
| <b>2.</b> | <b>Minute of Previous Meeting 26<sup>th</sup> April 2019 (Draft)</b>   |           |
|           | The notes of the meeting were recorded as an accurate record of the meeting with some minor amendments to spellings  | <b>AH</b> |
| <b>3.</b> | <b>CD Snagging List</b>  |           |
|           | This has been concluded  |           |
| <b>4.</b> | <b>Test Results</b>  |           |
|           | Stenotrophomonas is being reported as well as Mycobacterium. Additional checking with infection control over the last few days to pick up on further water sampling to identify if this is embedded within the system with further tests on the outlets on three sentinel and three specified rooms this time with filters and place and also without to ensure that the filters efficacy. Both hot, and mixed will be sampled as required. It was agreed that this would be extended to areas that the patients may have used including theatres, play areas. Additional samples will be taken from the bulk storage tanks to check for organisms within the stored water and depending on the results it may be necessary to check further back in the water supply chain. |           |
|           | Samples have been taken from the incoming water supply and results are awaited but noted that these did not check for steno or myco as this was not asked for at the time of test and not standard organisms – this will determine the status of incoming water.   |           |
|           | IP noted that he had spoken to TM and suggested this is a common infection in patients having this treatment prep rooms for the patients drugs and to include any machinery i.e. heart bypass machines as this is a common bacteria found in these. By carrying out these checks it will ensure that all areas that the patients could have come in contact with will be checked. IK reported that this has never been reported from the heater coolers on these machines previous recorded this bacteria although it was noted that ECMO machines were  |           |

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|           | <p>found to be a source in the chimaeras incident. It was noted that the patients who have presented with the bacterium have also been treated at other hospitals and noted that the hospital might not be the source and it would be advisable to look at other possible sources of this. TW suggested that the Infection Control Journal would be a good source of information on the organism and the interaction with CD and what is required to eliminate this. Due to the texture of the bacteria we now need to look at how to remove this. It was suggested that an increase in the bulk storage containers with CD but will require to be at high levels which will require the water to be tagged as non drinking water until the dose takes effect and then cleared. This should only be considered if this is the root cause and all other aspects should be looked at prior to this being taken forward. It was agreed that the CD should be pushed to 0.5 but being mindful that we may get complaints about the water quality. IP agreed to check the requirements to clear this from the system. TM noted that the CD could be consumed in the highly affected areas and will need time to reduce this and cause a drop in levels within other areas. IP suggested that high dosing would be beneficially carried out in the heat treatment as this will reduce the impact to the drinking water. It was clear that there was a lag in the system and that it was clear from the beginning that there would be a requirement to allow the CD to breakdown the bio film prior to any considered increase if found to be ineffective. The group were reminded that there were limits to the levels that the pipework can accommodate as well as the users of the hospital. It was agreed that a strategic risk assessment would be carried out prior to this being progressed and communication plan to inform users and staff</p> |  |
|           | <p>DK noted that the CD is killing off the bacteria it was installed to remove and therefore could potentially be giving the other more resistant bacteria an opportunity to grow by removing the bio film. It was not clear but it was agreed that the test we are carrying out are not the routine testing criteria usually carried out in hospitals. It was noted that we are finding these bacteria as we are hyper focused on the water supply but that it could very feasibly be coming from external supply or source but that due to our patient demographic we are finding more than usual.</p>   |  |
|           | <p>TW noted that the CD system is relatively new to the site and it has been known for other sites to have 3-4 years of similar treatment prior to any clear results and he noted that the CD will be disturbing the organisms in the pipework and it will take time to clear – it was agreed that once the results are reported back this would become clearer in the way to progress.</p>  |  |
|           |  |  |
| <b>5.</b> | <b>Water Meters/Photographs</b>  |  |
|           | <p>IP had previously reported that to install the CD system the water meters had to be removed and reinstalled and it was found at this time to have growths. These were described as “calcium looking” growths. Due to these findings a report was requested on the water meters and it was found that the coating on the meters was found to be at various thicknesses and the lower thickness was allowing the growth and leaching of graphite. IP noted that the other components in the system with the same paint treatments have been reviewed and escalated to HFS to take up with WRAS under approval scheme. No detrimental impact to the water but not taken into account with interaction with chemicals used to treat water. It was noted that there was nothing in the guidance to stipulate. Manufacturer’s recommendation is to remove water meters, sanitise and then replace. The damage caused to the meters was noted and reported prior to the CD installation and could only come from the previous sanitisation during commissioning and therefore impact could potentially be seen in all healthcare areas. WRAS have been asked to offer comment to this. IK suggested that a water meter from recently implemented system is reviewed to ascertain what is within this</p>   |  |
|           | <p>IP reviewed the images taken. It was noted that the worst affected area appeared to be plant room 51. The images shown indicated that there was a restricted water flow with a possible build up of rust and debris within the pipe. The white nodules around and thought to be biological organisms and have been sent for review. Results are awaited. All 8 of the distribution systems were checked both painted and non painted. It was noted that brass standing up well but cast iron is deteriorating</p>   |  |
|           | <p>Expansion Vessels – these were shown as the previous vessels prior to changed to flow through type and not original to the project. Once these were stripped out the bladder indicates that this has shown signs of bio film. These have all been replaced in the last four</p>   |  |

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|  | <p>weeks and this was thought to have shown that the CD is making an attempt to overcome the bio film. DK noted that the CD would not have a sufficient quantity to overcome as there was no real flow of water in these vessels. The group agreed that we need to look at an alternative method of providing expansion. It was noted that the guidance does not have any information relating to this but does state requires flushing at specific times and a flushing programme is required. CP was asked to progress this on a weekly basis. It was noted that the bladders were made from EPDM and this was not a usually seen product in water products/ It was noted that the steel boss within the diaphragm which is used to hold in place had indications of rusting. Again this is a WRAS approved product and not providing the assurances that we require. This has bio film coating which would be provided nutrients from the rust to allow the bacteria to continue to grow.</p>  |  |
|  | <p>Hot water pump in plant room 33 has evidence of corrosion and build of material – noted that the material was noted to be sitting on top of the paint on this equipment to the naked eye but could potential be within the paint at a microscopic level.</p>   |  |
|  | <p>It was noted that there was concerns as to where this is coming from as the water is passed through micro filtration and surmised that it is coming from the cast metal or the paint treatment. IP noted that now we have identified this we need to remove these and have the removed pieces analysed and evaluated. The next determination is what these are to be replaced with and HFS are asked to offer their advice on the components in which replacements can be sought from.</p>   |  |
|  | <p>Water pH in the area – the water is chemically treated to bring up the pH level by Scottish Water</p>  |  |
|  | <p>Basement Booster Pump – deteriorated paint on the cast and bio film found in the modules within the body of the pump. TM noted that the dark areas are hard and the white nodules are soft and noted the darker particles appear to dissolve when removed but the white nodules have a sponge like texture with resemblance to bio film. Booster set 2 is made from stainless steel and looks to be in good condition. It was noted that part of the internal pump was noted to be deteriorating and is currently under high water pressure which could be aiding reseeding of the system</p>  |  |
|  | <p>PRV – this also shows a build up similar to above in texture</p>   |  |
|  | <p>The group noted their surprise at the condition of these as these pieces of equipment are considered fit and forget at least for an initial period of around 10 years.</p>   |  |
|  | <p>IP noted that it was imperative to source replacements to these components, plan their removal and impact to service and get a programme in place with a component that can accommodate the chemical dosing. Water meter with PTFE lining and there is no physical contact with the water flow and noted that the equivalent for PRVS and no return valves are not yet known. Stainless steel is considered the better option and possibly moving to food standards for their input. EMcL noted that he did not consider a response from WRAS would be forthcoming quickly and we should look at alternatives. IP asked if we should adopt food standard guidance until further standards can be agreed. EMcL noted that this appeared to be appropriate but it would be necessary to bring relevant people together to ensure that this has full agreement. TW noted that it might be considered appropriate to look at other hospitals that have recently opened to determine if they have been seeing similar. All of the images taken had swabs taken and the results will not be clear for around 3-4 weeks to determine exactly what these are. It was agreed that the more evidence we have the better the case to make the necessary changes in standards and it was noted that there will be a significant investment in time and manpower to conclude. TW noted that he is not seeing similar in his NHS England client base but we should consider that this was either a Scottish Water issue or only a QEUH issue but this could not be known at this time.</p> |  |
|  | <p>Brass Meter on the Hydrotherapy pool which is made of brass shows no indications of the same corrosion or growth</p>   |  |
|  | <p>Shunt Pump – brass body no evidence of growths or deterioration</p>  |  |
|  | <p>Return Valve – showing issues again on the painted areas</p>   |  |
|  | <p>IP asked for thoughts on what products we should be considering replacing with. IK suggested moving to food standards products – but noted are they so different as they also refer to RAS approval. IP noted that water carrying pipework and associated fittings are generally stainless steel but there is an over expectation and there is a need to look beyond this for</p>  |  |

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|    | our water. DK noted that within the expansion vessel the bladder is made of EPDM which is WRAS approve but this product is not allowed in flexible piping as it can cause bio film growth  |  |
|    | IP asked if all the relevant parts are available in stainless steel and we will need to review what the market has to offer. IP asked if it would be pertinent to bring on board a consultant who has experience in both areas? EMcL noted that by replacing we need to be aware that we are not creating further different issues. DK noted that within pharmaceutical plants use glass and or stainless steel. TW agreed to speak to a colleague who is an expert in food specialist/engineering and he will discuss within him. This would likely take place in early July and TW will feedback to MR who will take over from IP  |  |
|    | MR will work with Mel to identify a list of components and quantify the number of these. AG suggested that we start in one specific area and begin to work through this. Zutec will be used for the asset list. It was agreed that this will be raised via IRI and IP will take this forward.  |  |
|    | HFS engagement with WRAS – EMcL noted that they are planning to further progress this in the coming weeks  |  |
|    | Positive coli forms in testing – testing proved negative – IK noted that this would not be unexpected – sampling process was likely the cause for this. Psudomonas protocol only used if indicators are showing any growths. Further test results were not returned yet and TW will chase this up  |  |
|    | Water Tank Fungi Issues – An action plan has been created after finding continual fungi results. This was considered ambient fungal counts within the sample bottles and atmosphere – a review of the collection process but noted that the decontamination only take place at the connection end and this was now modified the process to dip sanitise to further eliminate any cross contamination issues. It was noted that within the sprinkler tank room next door there is a smell of mustiness and so noted potential issue with this room. The tank room was somewhat used as a storage room and this was agreed to be cleared and HPV sanitised. It was agreed to have all the rooms cleared of unnecessary items and have them cleaned and any leaks fixed. The manufacturer of the tanks has been contacted to resolve the leak issued found as the water is pooling and it was suggested that leaks are fixed, dehumidifiers are used to dry out the area and the tanks are sealed to the floor and the manufacturer has agreed that this was acceptable.<br>Air counts have been carried out and confirmed that fungi is in the air and it was suggested that prior to the work we carry out a continual microbiological count for set time which would give around 3-4 changes then sanitise and retest. It was noted that a machine would require being hired/purchased to carry this out. The group were asked for their opinion on whether this would be sufficient. It was noted that the basement would be accessible to the outside air which is known to have millions of coli forms. AG noted his concerns that we do not start to implement clinical standards within plant room areas so this was not fully agreed – all the repairs and seal but not the HPV aspect. It was agreed that we need to draw lines and deal with the issues that are clinically important and agreed that we can achieve clean tank rooms with no visible evidence of leak, algae or growths |  |
|    |  |  |
| 5. | <b>Domestic Hot Water Probes</b>   |  |
|    | It was noted that the water meters are oversized and so not getting proportional dosing and return probes have been installed to monitor the levels and inline pump to supplement the proportional dosing. 2 remain to be installed of the 8 and this should see residuals rising to 0.5 for the first week and will be increased with weekly sampling alongside TVC protocol. 4 consecutive clear weeks and then monthly for 3 consecutively clear. DK asked if the percentage of allowances – agreed that national guidance will be followed. As the hospital is broken down into zones each will be monitored and testing adjusted to account for the failures as each zone clears and the testing process then moves onto the next stage   |  |
|    |  |  |
| 6. | <b>Automatic Shower Flushing</b>   |  |
|    | MR this has been stopped and the room 2-16 are being investigated as removal of the IPS panels has shown mould growth. This was thought to be caused by 2 factors – welded joints defective and or the design of the room flooring and wall joint. A meeting is set for Monday with Hazel McIntyre and Aecom to review and look at a solution. It was noted that this has  |  |

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|            | only occurred since the automatic flushing was commenced but has highlighted the failure of the floor joints.  |           |
| <b>7.</b>  | <b>Helipad Sprinkler System Water Treatment</b>  |           |
|            | Foam cannons are located on the roof for fire control on the helipad which are tested weekly with water. IP noted that we should be putting D into this as this disperses and is within the sprinkler tanks. It was noted that there has been historic issues in others hospitals of issues coming from the helipad storage tanks as they are not usually treated. The budget to implement this is 15K – AG agreed that IP could progress this. IP noted that CD should not be used with aluminium which is what the helipad is made of and Scott mass have been asked to confirm concentrations as these need to be less than 8 PPM so not sufficient to pull through enough of the CD to be affective and will require at least a half tank dump per test but noted that the tank takes time to empty so this should not be fully emptied – it was agreed that this process should be written up and progress. IK noted that there should be other involved in this to ensure that this is sufficient – share with the fire offices to ensure that we are not progress inappropriately. IP will forward to CP to progress. | <b>CP</b> |
|            | Sprinklers – dosing initially higher and settle at 0.5. The pipework that is on this is mild steel. Would CD have impact on the joints? Booster pumps are tested every Wednesday – it was agreed that there were some oxidising biocides that could be used and this will need further review before making any decisions on this  |           |
| <b>8.</b>  | <b>Deadleg Removal</b>   |           |
|            | Still progressing but concluding   |           |
|            | Removal of Water Dispensers  |           |
|            | All high risk areas are have these removed and guidance sought from TI on those within the Beaton  | <b>TI</b> |
| <b>9.</b>  | <b>Pegler Report</b>   |           |
|            | IP noted that the express compressed joint was returned as the gap in the joint was sufficient to gather bio film. Others sampled and contained bio burden – we need to determine who is responsible for the issue as this could be through the entire system and it was agreed to flag this as an IRIC as a concern   |           |
| <b>10.</b> | <b>TMT</b>   |           |
|            | Lead Leachate – Information provided was reassuring after commissioning process reduces the lead but noted abnormal use. IK noted that it was highly likely that there would be sufficient lead coming out but we had high levels due to the stress corrosion crack and new fittings added and now no cracking and the catalyst including the shower cleaner and doubtful that this would occur in other areas as our issues were quite specific and shower sanitising was incorrectly carried out for less time than should have been done and it now necessary that we resanatised these but awaiting confirmation of a chemical we can use as the suggest isopropyl alcohol which cannot be used as it requires a license. It was agreed that we are comfortable that this does not present as risk   |           |
|            | Tap Replacement – High Risk Ward Areas – high risk areas have been identified and MR will take this forward. IP noted that the programme should be completed in 12 months but can progress over two financial years. AG noted that quantifying costs were required and NPR including the tap, servicing, accessibility etc so cost will be fully known and understood and also the way forward.  | <b>MR</b> |
| <b>11.</b> | <b>AOCB</b>  |           |
|            | There is a huge level of water samples taken across the Board on a regular basis – if we are asked to take on additional sample taking by clinicians then are we expected to take on costs and manpower to carry these out. IP noted that if this is requested by IC then we are required to follow through. It was agreed that at this time there is a higher than usual request level but as areas are clear the levels will drop to more usual levels of regular testing but agreed that increased testing can happen at any time if required   |           |

|            |   |           |
|------------|---|-----------|
|            | Scottish Health Action – Water Quality – it was decided that this document would be important to review   |           |
|            | Guidance on Testing – This is part of the managed service contract for Scott mass and IP will request a copy to ensure that Scott mass are following the new parameters |           |
|            |   |           |
| <b>12.</b> | <b>Date of Next Meeting</b>   |           |
|            | 19 <sup>th</sup> July 2019 at 1pm – Facilities Hub CMB – QEUH – this will be a quarterly meeting  | <b>AG</b> |

## WARD 6A Ongoing Compliance Works

### ESTATES ACTION PLAN

| Action  | Actionee              | Target Date | Position/Status   |
|---|-----------------------|-------------|---|
| Swab internal of ventilation ductwork & additional swabbing around chilled beam.  | T Inkster/C Purdon    | 16 Aug 19   | <b>Complete</b> – awaiting results.   |
| Re-sample LTHW to Chilled Beam and send to GRI lab  | C Purdon              | 8 Aug 19    | <b>Complete</b> – awaiting results.   |
| Supply product data on alternative Hepafilter for en-suites to ICD for information. Liaise with manufacturer regarding approved bracket system for hanging or wall mounting.  | D Conner              | 19 Aug 19   | <b>Complete</b> – Product data sheet shared with ICD. The manufacturer has stated that there are no 'off the shelf' brackets available for this equipment.  |
| Liaise with service around installation of heap filtration unit in an en-suite. Replace pipework 'push fit' fittings supplying chilled beam in the associated bedroom with compression fittings. Ensure an HAI Scribe is in place to cover this work. | K Clarkston           | 20 Aug 19   | <b>Complete</b> - Hepafilter unit being fitted on 21/8/19. Pipework for chilled beam being modified around 'push fit' fittings  |
| Review tap options to replace, or modify, the outlets in the DSR, Prep areas as well as DPT's to allow for the connection of a PoUF, or source an 'in-line' option.   | K Clarkston           | 31 Aug 19   | <b>Complete</b> - No tap option available to suit current set up. A new whb, tap and IPS panel is being procured. The patient pathway will be further investigated and where this current set up is in place (with sensor taps) the new proposed installation will be put in place. |
| Identify and share proposed biocide data sheets to ICD for inf. Chemical compatibility with other additives in the chilled beams need confirmed.  | K Clarkston           | 23 Aug 19   | <b>Complete</b> - Trizene & Sudokil has been identified as suitable biocides and will be introduced this week. Dat sheets have been shared with ICD.  |
| Review dates last month when dew point events happened and correlate this with visit by IC.   | D Conner/Mel McMillan | 23 Aug 19   | This will be investigated from beg June 19 by Darryl & Mel. A report will be produced to compare dates with Boiler dates below.   |
| Establish clearly dates of boiler failure and   | D Conner              | 23 Aug 19   | <b>Complete</b> - Boiler failure dates – 3/6; 10/6; 22/7; 1/8; 5/8  |



|   |                      |           |   |
|---|----------------------|-----------|---|
| provide evidence through BMS for length of time DHW temperature was lost. |                      |           |   |
| Supply revised 3 Stage Short Dosing paper to group for review.            | A Gallacher          | 19 Aug 19 | <b>Complete</b> – shared with IMT awaiting comments   |
| Explore alternative bulk water storage options, or main risers            | C Purdon/A Gallacher |           | <b>Complete</b> -This has been reviewed in detail. There are CD dosing points at the Filtration Plan and at the main filtered water tanks therefore overall the main water storage areas are addressed. |

| <b>COMPLETED ACTIONS</b>   |                          |                    |  |
|--|--------------------------|--------------------|--|
| <b>Action</b>  | <b>Actionee</b>          | <b>Target Date</b> | <b>Position/Status</b>   |
| Production of an enhanced SoP around cleaning of Chilled Beams                               | A Gallacher/<br>C Purdon | 8 Aug 19           | <b>Complete</b>  |
| An experience estates Manager will lead and co-ordinate ALL works in Ward 6a moving forward. | C Purdon                 | 7 Aug 19           | <b>Complete</b> – Kerr Clarkston will lead from Monday 12 Aug 2019.  |
| Chilled Beam manufacturer to be contacted about regards availability of 'spare grilles'.     | Mark McKaig/Bob Geddes   | 7 Aug 19           | <b>Complete</b>  |
| Condensation issue - Dewpoint algorithm to be implemented.                                   | D Conner                 | 6 Aug 19           | <b>Complete</b>  |
| Increase frequency of Chilled Beam grill cleaning to monthly/6 weekly                        | D Conner                 | 16 Aug 19          | <b>Complete</b> – changed to every 6 weeks.  |
| Toilet Seat Lids to be fitted to en-suites   | K Clarkston              | 8 Aug 19           | <b>Complete</b>  |
| Review Hydrostatic Cleaning of Chilled Beams/Vents/Grilles                                   | C Purdon                 | 7 Aug 19           | <b>Complete</b> – It was decided that Hydrostatic Cleaning of Grilles or HPV cleaving or rooms would have no positive effect as this was about the cleaning of chilled beam fins/vents which were difficult to access. |

Date 20 August 2019

## Water Quality Incident Action Plan. (05\06\2018)

| Action  | Expected Procurement time | Expected Lead Time            | Planned Start date  | Expected Installation/execution time | Indicative Costs £K (inc VAT) |
|---|---------------------------|-------------------------------|---------------------|--------------------------------------|-------------------------------|
| Clean and sanitise bulk water storage tanks                         | N/A                       | 2 weeks                       | 18\6\2018           | 4 weeks                              | 15                            |
| <b>Chlorine dioxide treatment plant</b>                             |                           |                               |                     |                                      |                               |
| Option 1: traditional ClO2 process                                  | 6 weeks                   | 8-10 weeks from placing Order | 8\6\2018            | 4-6 weeks                            | 175                           |
| Option 2: Chlorous 2 ClO2 process                                   |                           | 5 weeks from placing Order    |                     | 4 weeks                              | 275                           |
| <b>Commence Continuous water Treatment</b>                          |                           |                               |                     |                                      |                               |
| Option 1:   | N/A                       | N/A                           | 1\10\2018           | 4 weeks                              | 25 (per annum)                |
| Option 2:   | N/A                       | N/A                           | 6\9\2018            | 4 weeks                              |                               |
| <b>Pipework engineering modifications to support shock dosing</b>   | 2 weeks via framework     | 2 weeks                       | 2\7\2018            | 6-8 weeks                            | 200                           |
| <b>Shock dose process disrupt and discharge biofilm system with</b> |                           |                               |                     |                                      |                               |
| RHC & Adult OPD   |                           |                               | 5\10\2018           | 3 days (week end)                    | 50                            |
| Adult Podium:-AAU, MDU & Stroke wards, Theatres                     |                           |                               | 12\10\2018          | 3 days (week end)                    | 50                            |
| Adult&RHC ED, Adult ARU, ICU & CCU                                  |                           |                               | 15\10\2018          | 2 days                               | 50                            |
| Ward Tower "A" wing   |                           |                               | 18\10\2018          | 2 days                               | 35                            |
| Ward Tower "B" wing   |                           |                               | 22\10\2018          | 2 days                               | 35                            |
| Ward Tower "C" wing   |                           |                               | 25\10\2018          | 2 days                               | 35                            |
| Ward Tower "D" wing   |                           |                               | 29\10\2018          | 2 days                               | 35                            |
| <b>High Risk ward Tap Replacement ( run concurrently)</b>           | 6 Weeks                   | 4 weeks                       | 20\8\2018           | See each ward below                  | 420.                          |
| Ward 2A (Schiehallion)  |                           |                               | To run concurrently | 4 weeks                              |                               |
| Ward 4B (BMT)   |                           |                               |                     | 2 weeks                              |                               |
| Ward 4A (BMT 2 off isolation ROOMS)                                 |                           |                               |                     | 1 day                                |                               |
| Ward 1D (Paediatric Critical Care)                                  |                           |                               |                     | 4-6 weeks                            |                               |
| Ward 1E (Cardiology)  |                           |                               |                     | 3 weeks                              |                               |
| Maternity (NICU)  |                           |                               |                     | 3 weeks                              |                               |
| Adult Critical Care Unit  |                           |                               |                     | 8 weeks                              |                               |
| Coronary Care Unit  |                           |                               |                     | 2 weeks                              |                               |
| Institute Of Neuroscience (ICU)                                     |                           |                               |                     | 2 weeks                              |                               |
| <b>Replacement of critical ward Whb Flow regulators</b>             | N/A                       | N/A                           |                     | 6\6\2018                             | 2 weeks                       |
| <b>Risk associated slippage</b>                                     |                           |                               |                     | 2-4 weeks                            |                               |

Total

1,225

# AUTHORISED PERSON VENTILATION HTM 03-01

## CITY & GUILDS ASSURED (APV)

### Course Overview:

This course has been developed to provide the necessary information to understand the core duties and responsibilities of the Authorised Person following HTM 03-01 and other associated guidance. The course provides guidance on the legal requirements, design implications, maintenance and operation of ventilation within healthcare premises. It will also cover the inspection and verification requirements as well as the compulsory measurements of performance to ensure the system achieves minimum standards and operates to an acceptable performance level and remains fit for purpose.

### Who Is This Course For:

This course has been developed for healthcare managers, design engineers, estates and operations managers, technical staff and consultants who require an understanding of how to manage specialised ventilation systems in healthcare premises.

### Key Learning Areas Covered in This Course:

- Understand the standards of design & installation of NHS ventilation systems
- Principal Health & Safety issues associated with vent systems within hospital premises
- Legislation applicable to ventilation systems
- Need for and location of smoke & fire dampers and the function, of pressure stabilisation methods
- Vapour compression refrigeration system, and its relationship with air conditioning
- Understand the function of and maintenance requirements of system heat exchangers
- Humidification and de-humidification, explain its use within the NHS
- What precautions should be in place in NHS ventilation and air conditioning systems to control Legionella.
- Principles of psychrometry and its use for explaining ventilation processes.
- Inspection and verification of critical ventilation systems. Plus practical application.
- Instruments used to collate information from the ventilation systems and their practical use.
- Safe System of Work and the NHS risk assessment process model.

### Course Duration / Fees / Location:

5 day training course, £1,495+VAT per delegate. Available in York, Slough and On-site. Accommodation from £135+VAT (including DBB).

#### **Course Overview:**

This course has been developed to provide the necessary information to refresh the duties and responsibilities of the Authorised Person as detailed within HTM 03-01 and other associated guidance. The course covers the legal requirements, design implications, maintenance and operation of specialist ventilation within healthcare premises. It will also cover the inspection and verification requirements together with the compulsory measurements of performance to ensure the system achieves minimum standards, operating to an acceptable performance level and remains fit for purpose.

#### **Who Is This Course For:**

This course has been developed for existing Authorised Persons Ventilation, who require an understanding of how to manage specialised ventilation systems in healthcare premises to become eligible for reappointment.

#### **Key Learning Areas Covered in This Course:**

- Understand the standards of design & installation of NHS ventilation systems
- Principal Health & Safety issues associated with vent systems within hospital premises
- Legislation applicable to ventilation systems
- Need for and location of smoke & fire dampers and the function of pressure stabilisation methods
- Understand the function of and maintenance requirements of system heat exchangers
- Humidification and de-humidification, explain its use within the NHS
- What precautions should be in place in NHS ventilation and air conditioning systems to control Legionella.
- Principles of psychrometry and its use for explaining ventilation processes
- Inspection and verification of critical ventilation systems.
- Instruments used to collate information from the ventilation systems

#### **Course Duration / Fees / Location:**

3 day training course, £995+VAT per delegate. Available in York, Slough and On-site. Accommodation from £135+VAT (including DBB).

# COMPETENT PERSON VENTILATION HTM 03-01

## CITY & GUILDS ASSURED (CPV)

### Course Overview:

This course has been developed to provide the necessary information to understand the duties & responsibilities of the nominated Competent Person (HTM 03-01). The course will provide awareness of the different types of ventilation and air-conditioning systems, their component parts and typical layout that conform to healthcare applications. The course will identify the inspection, operation and maintenance activities required and are carried out safely without hazard to staff, patients or members of the public. Those required to inspect, verify or maintain ventilation equipment will need to show competence. You should have sufficient knowledge of correct operation and be able to recognise faults.

### Who Is This Course For:

This course has been developed for operations managers technical staff and consultants who require an understanding of how to operate and maintain specialised ventilation systems in healthcare premises.

### Key Learning Areas Covered in This Course:

- Types and purposes of ventilation systems within the NHS
- Statutory comfort standards requirements and sources of Department of Health and Industry guidance
- Identifying the role of smoke and fire dampers, their maintenance and inspection requirements
- Identifying the essential components of an air conditioning system
- Identifying appropriate filter grades required for NHS ventilation systems
- Humidification and de-humidification, explain its use within the NHS
- What precautions should be in place in NHS ventilation and air conditioning systems to control Legionella.
- Describe the function of control systems within ventilation systems
- Inspection and verification of critical ventilation systems. Plus practical application.
- Instruments used to collate information from the ventilation systems, and their practical use.
- Safe System of Work and the NHS risk assessment process model.

### Course Duration / Fees / Location:

3 day training course, £995+VAT per delegate. Available in York, Slough, Livingston and On-site. Accommodation from £135+VAT (including DBB).

## CITY & GUILDS ASSURED (WHS03)

### Course Overview:

This three day City & Guilds Assured course has been developed to provide you with both the legal and technical knowledge needed to control Legionella within hot and cold water systems in the healthcare environment. Throughout this course you will cover the statutory regulations that you will encounter when working within a healthcare environment, focusing on the Scottish Health Technical Memorandum 04-01: Water Safety for Healthcare Premises (SHTM 04-01), ACOP L8 and HSG274 Part 2. You will also gain a thorough understanding of water system designs, their inherent risks and the testing and control required to ensure your water systems are SHTM 04-01 compliant.

### Who Is This Course For:

This Legionella control course has been designed for the healthcare environment and is appropriate for anyone who is involved in the management or the operation of hot and cold water systems.

Completion of this SHTM 04-01 compliant Legionella course will ensure that you will have an understanding of the most up to date statutory regulations. In addition to the vital knowledge, successful delegates will receive a certificate of achievement and City & Guilds Assured digital credential, as formal recognition of your skills and knowledge.

### Key Learning Areas Covered in This Course:

- Legal issues, including statutory obligations
- ACOP L8 and HSG274 part 2
- SHTM 04-01 Water Safety Group and Water Safety Plan
- The sources, risks and medical aspects of Legionellosis with reference to its occurrence, ecology and transmission routes
- The identification of susceptible areas within a healthcare water system including storage cisterns, calorifiers, terminal fittings and associated distributing pipework
- Recommended methods of system modification and design to minimise colonisation by reference to the Water Supply (Water Fittings) Regulations, guidance documents and the use of approved water fittings
- Guidance on installation, and monitoring of thermostatic mixing valves
- Treatment and control programmes in accordance with SHTM 04-01
- Water sampling methods and required actions
- Principles of disinfection
- Records, reports and log books
- Course assessments

# LEGIONELLA AND WATER HYGIENE CONTROL WITHIN HOT AND COLD WATER SYSTEMS SHTM 04-01

Page 39

CITY & GUILDS ASSURED (WHS03)

## **Course Duration / Fees / Location:**

3 day training course, £910+VAT per delegate. Available in Livingston. Accommodation from £115+VAT (including DBB).

# LEGIONELLA CONTROL REFRESHER AND UPDATE CITY & GUILDS ASSURED (WH007)

## Course Overview:

This City & Guilds Assured course will provide you with the latest changes and updates to relevant legislation and the Approved Code of Practice (ACOP) L8, along with a refresher on the required management of legionella in water systems.

## Who Is This Course For:

This course is specifically for anyone who has completed a course on Legionella control and now find it necessary to update themselves on the requirements of the Approved Code of Practice L8, or changes on how the risk is controlled.

## Key Learning Areas Covered in This Course:

- Legionella/Legionellosis - update and recent changes
- Relevant statute documents and legal implications
- ACOP L8 & HSG274s and relevant technical support documents
- Water Safety Plan - written scheme of control
- Risk systems including Hot and Cold Water Services and Evaporative Cooling Systems
- Implementing and monitoring the written scheme of control
- Water sampling and subsequent actions
- Water hygiene/management log book
- Written question paper

## Course Duration / Fees / Location:

1 day training course, £325+VAT per delegate. Available in York, Slough, Livingston and On-site. Accommodation from £135+VAT (including DBB).



# LEGIONELLA MANAGEMENT FOR WATER SYSTEMS SHTM 04-01

## CITY & GUILDS ASSURED (WHS01)

### Course Overview:

This City & Guilds Assured course will provide an understanding of the duties and responsibilities of the nominated Competent Responsible Person, within the Water Safety Group, for the supervision, effective implementation and management of Legionella risk assessments, remedial work and management of water systems to help comply with Scottish Health Technical Memorandum 04-01.

We also offer this course as a online remote training course.

### Who Is This Course For:

For members of the Water Safety Group who have responsibility within a healthcare environment to ensure adequate control measures are in place for the safe operation of hot and cold water systems.

### Key Learning Areas Covered in This Course:

- Legionellosis - background - medical aspects
- Legal implications
- ACOP L8 and guidance on the control of legionella in water systems
- SHTM 04-01 - An insight into management requirements
- Water safety plan requirements
- Implementation of the written scheme
- Water sampling and necessary actions
- Ensuring competency of staff, consultants and contractors
- Water systems disinfection requirements
- Management of log book records
- Course assessment

### Course Duration / Fees / Location:

1 day training course, £325+VAT per delegate. Available in Livingston. Accommodation from £135+VAT (including DBB).

# LEVEL 3 LEGIONELLA CONTROL FOR RESPONSIBLE PERSONS (RQP)



**SERVICE**  
Training



**Highfield**  
Qualifications®

## Overview

Our Legionella Control for Responsible Persons course is aimed at those with managerial responsibility for Health and Safety, who have sufficient authority, competence and knowledge of water systems and water hygiene management, to interpret regulations such as the Approved Code of Practice L8:2013 and HSG 274 parts 1-3.

It is a Level 3 Award from Highfield Qualifications, one of the UK's most recognised awarding organisations and a global leader in compliance qualifications.

Topics covered on the course include:

- Ensuring delegates know of their individual roles, responsibilities and legal obligations.
- Growth requirements of Legionella, interactions with other microbiological species
- Factors affecting the accumulation of biofilm
- Effectiveness of chemical and non-chemical treatments against Legionella and biofilm
- Temperature as a Legionella control method
- Materials of construction, pipework installations
- Water treatment, monitoring and commissioning
- Design, operation, monitoring and maintenance of water systems
- Other water systems such as spa baths and decorative fountains
- Air conditioning system hygiene
- Investigation of outbreaks and routine HSE visits
- Consequences of non-compliance

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## Duration

The total qualification time (TQT) and guided learning hours (GLH) for this qualification is 8 hours.

TQT is an estimate of the total number of hours it would take an average learner to achieve and demonstrate the necessary level of attainment to be awarded with a qualification, both under direct supervision (forming guided learning hours) and without supervision (all other time). TQT and GLH values are advisory and assigned to a qualification as guidance.

## Assessment

This qualification is assessed by learner workbook. This assessment model requires learners to provide a short response to prescribed questions within a workbook set by Highfield Qualifications. Successful learners will have to demonstrate knowledge and understanding across the breadth of the qualification syllabus.

## Delivery

- At your site
- At an outside venue
- Via Teams

## Cost

On application.

For more information or to book a place on this course, please contact:

✉ [training@rockcompliance.co.uk](mailto:training@rockcompliance.co.uk)

## QEUH – WARD 2A REFURBISHMENT PROJECT LEAD CONSULTANT APPOINTMENT BRIEF

DATE : 10<sup>th</sup> December 2018



### Key Objectives

*The fundamental objective of this project is to ensure the upper portion of Ward 2A within the Children's Hospital (i.e. Mid-Ward & TCT area) is suitable for use by immuno-compromised patients. Therefore, it is proposed to convert existing accommodation/facilities to afford Enhanced (Positive Pressure) Single Bedrooms with En-Suite facilities, providing 10ac/hr positive pressure within each Bedroom space, and ensuring the Bedrooms are at +10Pa relative to the adjacent Corridors.*

*It will be necessary to ensure the mechanical ventilation systems are capable of achieving an accurate air flow cascade regime whilst maintaining correct pressure differentials within adjoining spaces. Furthermore, it is vital to ensure that plant/system failure does not adversely influence overall system operation, and thereby undermine the safety of patient care within this critical nursing environment.*

*Whilst at an early stage, it is envisaged the works will be predominately be focused around the complete replacement of existing mechanical ventilation installations serving this particular proportion of Ward 2A, together with significant improvement/upgrade in terms of internal building fabric locally within this part of the Hospital.*

*Some degree of modification/replacement with regards to other mechanical and electrical services installations is also anticipated (i.e. such as LTHW heating, chilled water, lighting, fire alarms, BMS, etc.).*

*The following aspects of the works are deemed to be of particular significance:-*

- *Works must be undertaken in accordance with design principles embodied within SHTM guidance documentation, in particular SHTM 03-01.*
- *As all other facilities within the Hospital will remain live and fully operational throughout the duration of the works, consideration must be duly given with regards to minimising system(s) downtime.*

*It will also be necessary to consider the ongoing function of adjoining facilities, ensuring that any disruption is minimised, and all accommodation remains safe for use at all times for the duration of the works (i.e. fire evacuation strategies, security, cleanliness, HAI-SCRIBE requirements, etc.).*

- *Existing mechanical ventilation ductwork distribution serving these areas is derived via centralised systems (i.e. supply/extract via AHU, and separate extract fan unit).*

*The works will necessitate disconnecting these particular sections of distribution from existing centralised/common installations, and rebalancing of existing retained systems. Any associated downtime of retained facilities must therefore be planned, managed, and minimised, accordingly.*

## QEUH – WARD 2A REFURBISHMENT PROJECT LEAD CONSULTANT APPOINTMENT BRIEF

DATE : 10<sup>th</sup> December 2018



- *New air handling plant installations shall be configured to afford 100% resilience (i.e. 2N+1 separate air handling units), which will necessitate careful consideration in terms of automatic changeover control strategies. This is necessary to ensure continued operation of facilities during any planned future maintenance or requirements pertaining to ongoing systems verification/validation, and to safeguard against any unplanned equipment failure (i.e. such as defective heating/cooling coils, etc).*
- *Supply air provisions must be equipped with H12 HEPA filtration, and must be capable of achieving the necessary air volumes automatically under dirty filter conditions (i.e. throughout typical life expectancy of filters).*
- *The potential use, and associated selection, of any heat recovery device must be carefully considered, ensuring cleanliness of air supplies is not compromised under any circumstances (i.e. use of a thermal wheel would not afford absolute air separation).*
- *The selection of suitable/appropriate supply and extract air terminals within each internal space must be carefully considered, particularly with regards to ensuring the cleanliness of equipment and associated air supplies. The siting of terminals must also be duly considered, as to maintain a comfortable environment for the occupants of the space.*
- *Existing internal fabric installations (i.e. suspended modular ceilings, partitions, services penetrations, IPS panels, doors, etc.) are probably unsuitable in terms of achieving the necessary 10Pa pressure differential required between Bedrooms and associated Corridors, due to probable excessive air leakage. In view of this, works must include all necessary upgrade/replacement of existing internal fabric installations to ensure adequate air tightness can be achieved/maintained. For clarity, the maximum air leakage rate from each space must not exceed 1l/s of air per m<sup>3</sup> @ 20Pa differential, and must be verifiable accordingly.*

*Monitoring, and associated automatic control, of Bedroom/Corridor pressure differentials will be required, together with appropriate alarm facilities pertaining to same.*

- *All air entering this particular section of Ward 2A must be derived via H12 HEPA filtration, and therefore, all internal fabric must be adequately sealed to ensure uncontrolled/unfiltered air does not inadvertently enter the Ward.*

*Furthermore, it is anticipated that new positively pressurised patient transfer Lobbies (sized to accommodate patient bed) will be necessary within the Corridor areas at either end of the Ward, preventing inadvertent air entry from other adjoining Corridors located directly adjacent to these facilities. This will probably involve internal layout alterations, and interlocking Lobby doors (i.e. enabling only one door to open/close at any time).*

*Monitoring, and associated automatic control, of Lobby/Corridor pressure differentials will be also required, together with appropriate alarm facilities pertaining to same.*

## QEUH – WARD 2A REFURBISHMENT PROJECT LEAD CONSULTANT APPOINTMENT BRIEF

DATE : 10<sup>th</sup> December 2018



- *Monitoring, and associated automatic control, of Bedroom/Corridor pressure differentials will be required, together with appropriate alarm facilities pertaining to same.*
- *Full consideration must be given to the modifications necessary with regards to the associated mechanical and electrical services installations, including replacement of existing where deemed appropriate (i.e. such as light fittings, fire alarms, LTHW heating installations, chilled water services, pumps, valves, BMS installations, etc.).*
- *Future air permeability testing shall be undertaken by NHS GG&C as part of ongoing facilities validation. Cognisance must be given to how this will be achieved, and detailed within outline proposals accordingly.*

### Proposed Programme

*It is expected that the successful bidder will complete stage “a” below within 2 weeks of formal appointment & stages “b to d” within 8 weeks of submission of the feasibility report.*

*With stage “e” contract period carried out strictly within a 6 – 8 month window to full contract completion, including full commissioning and validation, allowing NHS one month’s operational commissioning prior to patient reoccupation in December 2019.*

- Completion of Strategic Briefing Stage (including Feasibility Report)*
- Completion of Outline Proposals Stage*
- Completion of Production Information Stage*
- Completion of Tender Documentation & Tender Action Stage*
- Mobilisation, Construction, and Completion Stage*

### Appointment

*Appointment shall be on the basis of undertaking the role and responsibilities of Lead Consultant, typically as defined within ACE Agreement 1 : Design, and Schedule of Services Part G(e) for Lead Consultant (2009 Edition), any exclusions should be defined within your submission accordingly.*

*In addition to these duties, the Lead Consultant shall also make full allowance for the following:-*

- *As part of the initial project Appraisal Stage, undertake a Feasibility study to determine the practical viability of achieving Client requirements, together with any associated recommendations pertaining to same.*
- *Undertake the role and associated responsibilities of Principal Designer for the project, from inception to completion, ensuring compliance with the Construction (Design and Management) Regulations 2015.*

## QEUH – WARD 2A REFURBISHMENT PROJECT LEAD CONSULTANT APPOINTMENT BRIEF

DATE : 10<sup>th</sup> December 2018



- Provide complete Bills of Quantities, for all works associated with the project.

As part of this appointment the Lead Consultant will be required to engage and appoint any other Sub-Consultants deemed necessary to successfully, and competently, facilitate undertaking the works (i.e. Architect, Quantity Surveyor, etc.). The Lead Consultant shall be responsible for the performance and the payment of all Sub-Consultants. The Lead Consultants liabilities shall also be deemed to comprehensively cover/include all works undertaken by their appointed Sub-Consultants.

Part of the Lead Consultants obligations shall be to manage the project from inception to completion, which will include contract administration duties, arranging, chairing, and minuting all site meetings, undertaking site supervision and quality control, attendance during testing and commissioning, etc. All Sub-Consultants engaged via the Lead Consultant shall also make due allowance for attending meetings and undertaking site supervision and quality control duties accordingly.

Please note, it would be expected that technical/progress meetings would be held fortnightly on site for the duration of the project (i.e. pre-tender & post-tender). It would also be expected that site supervision would be afforded on a weekly basis, as a minimum, by all Consultants involved in the project.

**Clerk of works duties will be instructed separately and directly by the client.**

### Insurances

Professional Indemnity Insurance : Minimum level of cover £5m.

Public Liability Insurance : Minimum level of cover £10m.

Employers Liability Insurance : Minimum level of cover £10m.

### Fees

Fees shall be deemed to include all expenses including, but not limited to, printing, traveling, binding, survey tools, software, etc.

Notwithstanding the above, NHS Greater Glasgow and Clyde will reimburse the Lead Consultant for any fees, costs, or charges paid by the Consultant, or appointed Sub-Consultant, to local or other authorities for seeking and obtaining any necessary statutory permissions.

Any involvements necessary in terms of Value Engineering to achieve Client budgetary provision (i.e. workshops, redesign, etc.), shall be deemed to be included within the fee offer provided.

## QEUH – WARD 2A REFURBISHMENT PROJECT LEAD CONSULTANT APPOINTMENT BRIEF

DATE : 10<sup>th</sup> December 2018



*For pre-tender stages, fees shall be expressed as a fixed percentage based on the range of estimated project costs provided below. Fees will then be adjusted pro rata on actual tender cost for post tender duties.*

### Indicative range of total project values

1. £500,000 to £750,000
2. £750,000 to £1,000,000
3. £1,000,000 to £1,250,000
4. £1,250,000 to £1,500,000

*Fees shall be invoiced in arrears as works progress, with cumulative totals to each stage as identified below:-*

- |  |        |
|--|--------|
| a) Completion of Strategic Briefing Stage (including Feasibility Report) | : 10%  |
| b) Completion of Outline Proposals Stage                                 | : 20%  |
| c) Completion of Production Information Stage                            | : 65%  |
| d) Completion of Tender Documentation & Tender Action Stage              | : 70%  |
| e) Mobilisation, Construction, and Completion Stage                      | : 100% |

### Experience, Methodology, Technical/Quality & Cost

*The Tendering Lead Consultant must include the following information within their submission. Relevant information must also be provided in terms of any proposed Sub-Consultants engaged by the Lead Consultant, as necessary to complete other associated disciplines accordingly.*

*The information submitted by the Tendering Consultant must be comprehensive, and clear, with information provided specifically to each point/heading as outlined.*

*The method of scoring tender submissions shall be as follows;*

|                   |     |
|-------------------|-----|
| Experience        | 15% |
| Methodology       | 15% |
| Technical/Quality | 30% |
| Cost              | 40% |

*Responses provided for each section/heading will be duly assessed and measured as part of the Tender submission review and will be utilised to score overall Tender submission. As such, the*

## QEUEH – WARD 2A REFURBISHMENT PROJECT LEAD CONSULTANT APPOINTMENT BRIEF

DATE : 10<sup>th</sup> December 2018



*information provided may have a significant bearing on the overall scoring process and should be carefully considered accordingly. An outline of information required is provided below.*

### Experience (15%)

*To be considered for this project the Consultant must adequately demonstrate particular experience relating to work of this nature and provide details of at least three similar projects completed within the last five years. Exemplar projects must also be provided with references.*

*Please note that previous similar project experience for an NHS board will afford a greater weighting to scoring.*

*The following information should be provided for each example project;*

- *Client / Customer name and associated contact details*
- *Description of services/involvements undertaken*
- *Approximate Contract value*
- *Contract start and completion dates*
- *Details of any added benefit/value demonstrated by your organisation*

### Methodology (15%)

*Provide details explaining/demonstrating how your organisation will be able to deliver the project in accordance with the required timescales.*

*Provide detail with regards to the methodology your organisation would adopt to ensure works are completed to the quality/standard required.*

### Technical / Quality (30%)

*Provide statement of professional and technical skills of Engineers that are proposed for this particular project.*

*Provide comment with regards to the provision and requirement for multidisciplinary co-ordination as part of the project, together with previous examples of experience pertaining to same.*

*Confirm personnel within your organisation that would be assigned to undertake the lead co-ordination functions and responsibilities in respect of the works.*

*Please note that as a condition of appointment certain financial checks may be carried out on any potential Consultant, which would include checking audited accounts for the previous three years and*



## QEUH – WARD 2A REFURBISHMENT PROJECT LEAD CONSULTANT APPOINTMENT BRIEF

DATE : 10<sup>th</sup> December 2018



*details of agreed overdraft facilities, together with details of the extent these facilities were used over the previous fiscal year.*

### Cost (40%)

*For tender purposes, fees shall be based on a total project value of £1,250,000 (ex. VAT).*

### Client Contact

*All enquiries should be directed to:-*

**I. Powrie**

**Deputy General Manager (Estates)**

*Queen Elizabeth University Hospital Campus*

*Property, Procurement & Facilities Management Directorate*

*Facilities Corporate Services Dept*

*CMB Building*

*Glasgow*

*G51 4TF*

[REDACTED]

*Proposed Pre-Tender Briefing Meeting Ian Powrie on 8<sup>th</sup> January 2019.*

## **Additional Works Scope – Ward 2A BMT & Ward 2B Ventilation Systems**

The following works are additional to those identified within the LEAD CONSULTANT APPOINTMENT BRIEF document, dated 10<sup>th</sup> December 2018.

The principal objective of these additional works is to ensure all supply air provisions entering the BMT facilities of Ward 2A, and rooms throughout Ward 2B, are afforded H12 HEPA filtration. This includes the Ward 2A BMT Preparation Room, which was specifically requested by NHS GG&C Infection Control Specialists.

NHS GG&C have already made initial contact with the air handling unit manufacturer (Barkell) with a view to ascertaining the viability of incorporating centralised HEPA filtration within the existing units. Centralised HEPA filtration has been deemed the most practical solution, thereby shall be progressed accordingly. All associated information, together with the manufacturers technical team contact details, shall be provided.

As part of the works, it shall be necessary to ensure all rooms/facilities are appropriately re-balanced (i.e. positively/negatively pressurised, dependant on the use of each space relative to adjacency), and ensure a 'clean to dirty' air movement cascade strategy is appropriately achieved in all areas. It is acknowledged that the extent of pressurisation achievable within each space will be completely dependent on existing system limitations (i.e. existing supply and extract air volume flow rates), and associated building fabric air tightness.

In addition to the foregoing, a further element of these supplementary works shall involve reviewing the existing supply air volume flow rates within the peripheral areas of Ward 2B (i.e. such as Waiting Rooms), with a view to redirecting supply air provisions into the BMT and Day Stay Ward spaces. The purpose of this shall be to facilitate achieving a higher pressure differential relative to the adjacent Corridor, whilst also increasing fresh air supply rates within these specific spaces without significantly modifying/replacing existing ductwork distribution installations.

It should be noted that any potential subsequent change/influence in terms of pressurisation between other areas of the department must be duly considered accordingly.

Due cognisance must be given to any potential loss of service (i.e. system downtime) associated with any of the proposed works, particularly in terms of upper and lower level facilities given the use of common air handling units/systems. Any potential adverse influence/impact on Hospital facilities must be clearly identified during the initial feasibility stage, together with anticipated extent of downtime, to enable Client consideration/agreement of same.

To summarise, the Lead Consultant will be required to undertake all necessary site investigation/survey works, review O&M information (i.e. drawings, H&V commissioning data, etc.), perform all associated feasibility, scheme design, detailed design, cost analysis, BOQ's, site involvements, etc., as necessary, and in accordance with the main appointment role. These additional works shall form part of the overall project.



# Water System Risk Assessment



## NHS Greater Glasgow & Clyde

## Queen Elizabeth University Hospital And Royal Hospital for Children

Report Issue Date: July 2023 (Draft)  
Latest Recommended Review Date: July 2025



A49634718



VAT Registration No. 743 0970 35 Company Registration No. SC197200

DMA Canyon Ltd, 14 Canyon Road, Wishaw, ML2 0EG T: 01698 536790 E: office@dmacanyon.co.uk

## LEGIONELLA RISK ASSESSMENT

|               |  |          |            |
|---------------|--|----------|------------|
|               | DMA Canyon Ltd                                   |          |            |
| Address       | 14 Canyon Road<br>Netherton<br>Wishaw<br>ML2 0EG |          |            |
| Telephone No. | 01698 536790                                     |          |            |
| Fax No.       | 01698 360211                                     |          |            |
| e-mail        | office@dmacanyon.co.uk                           |          |            |
| Website       | www.dmacanyon.co.uk                              |          |            |
| DMA Contacts  | Mike Kinghorn                                    | Director | ██████████ |
|               | David Watson                                     | Director | ██████████ |
|               | Graeme McCullie                                  | Director | ██████████ |

|                                  |   |
|----------------------------------|---|
| Dates of Assessment<br>(On Site) | June & July 2023  |
| Draft Submission for Review      | July 2023   |
| Final Submission                 | TBC   |
| Risk Assessors                   | Fraser Murray<br>Assisted by;<br>David Watson<br>Craig Guyer & Mark Rawlinson (Site & System Knowledge) |

|  |                        |
|--|------------------------|
| Risk Assessor assisted on site by<br>(Site Representative) | No Assistance Provided |
| Position   | N/A                    |
| Knowledge of systems being surveyed                        | N/A                    |

**N.B.** The findings and recommendations presented in this report have been based on information made available and inspection of areas made accessible by site staff during the survey. DMA are only able to assess areas/systems, which they have been given access to and using information supplied by site personnel. This survey was undertaken only on pipe work/areas that were accessible and visible, and it is possible that some sections remained hidden during the survey. Schematic drawings, where produced, and how services link up, have been assumed to run as indicated using basic engineering principles and our experience. However, no responsibility can be accepted for systems and/or areas, which DMA have not been provided access to, or as a result of incorrect, misleading information supplied or information not provided. No guarantees as to the completeness of the information within this report are provided.

## WATER SYSTEM RISK ASSESSMENT

### DMA Staff Training and Competency

All DMA staff attending site are fully trained and deemed competent by DMA management for the tasks they have been allocated to carryout.

DMA training records are held centrally by DMA Canyon Ltd.

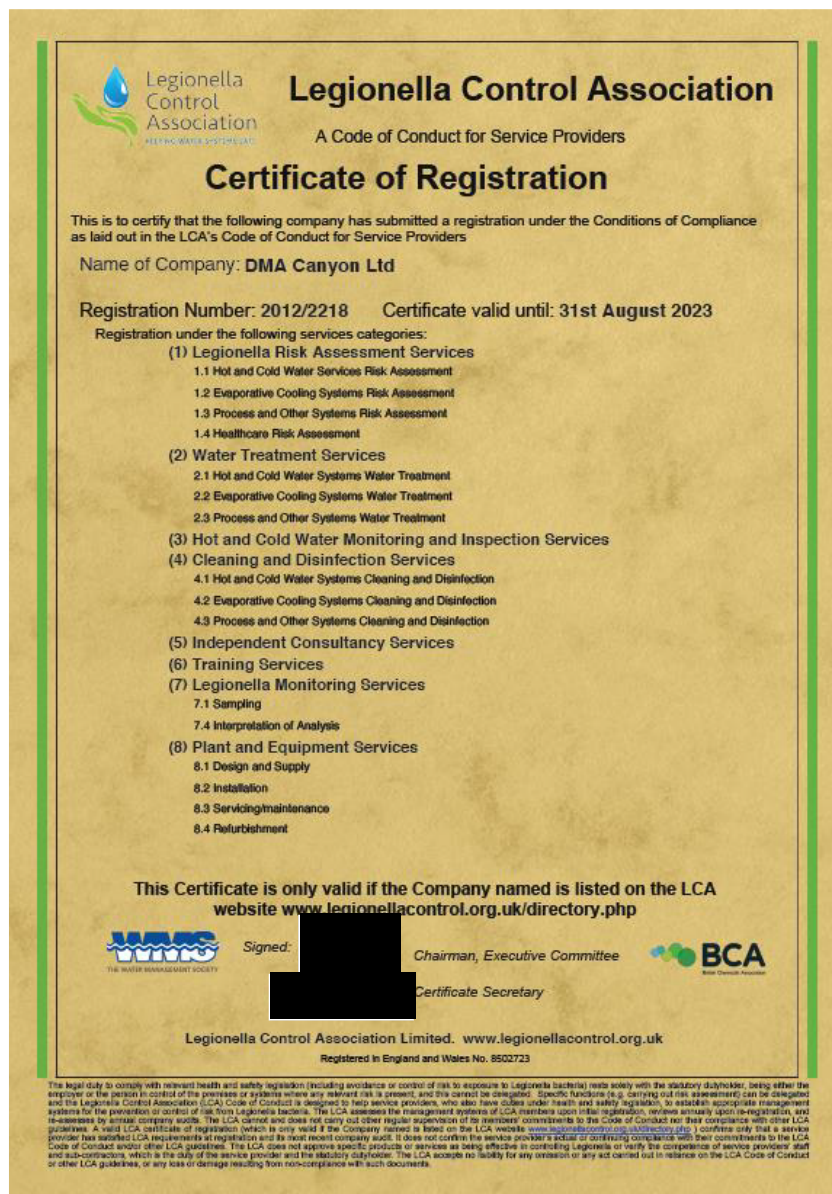
Copies of the relevant personnel training certificates can be supplied upon request.

Training and competency records for site/client/other staff involved in Legionella control should also be held.

DMA will only offer Legionella control services for which we have LCA accreditation.

An up to date copy of our LCA certificate and accreditation details can be found at [www.dmacanyon.co.uk](http://www.dmacanyon.co.uk)

For information on the LCA code of conduct for service providers and other information on the LCA requirements please refer to <http://www.legionellacontrol.org.uk/>



**Legionella Control Association**  
A Code of Conduct for Service Providers

### Certificate of Registration

This is to certify that the following company has submitted a registration under the Conditions of Compliance as laid out in the LCA's Code of Conduct for Service Providers


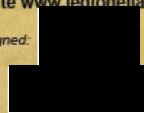
Name of Company: **DMA Canyon Ltd**


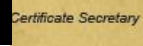
Registration Number: 2012/2218      Certificate valid until: 31st August 2023

Registration under the following services categories:

- (1) Legionella Risk Assessment Services
  - 1.1 Hot and Cold Water Services Risk Assessment
  - 1.2 Evaporative Cooling Systems Risk Assessment
  - 1.3 Process and Other Systems Risk Assessment
  - 1.4 Healthcare Risk Assessment
- (2) Water Treatment Services
  - 2.1 Hot and Cold Water Systems Water Treatment
  - 2.2 Evaporative Cooling Systems Water Treatment
  - 2.3 Process and Other Systems Water Treatment
- (3) Hot and Cold Water Monitoring and Inspection Services
- (4) Cleaning and Disinfection Services
  - 4.1 Hot and Cold Water Systems Cleaning and Disinfection
  - 4.2 Evaporative Cooling Systems Cleaning and Disinfection
  - 4.3 Process and Other Systems Cleaning and Disinfection
- (5) Independent Consultancy Services
- (6) Training Services
- (7) Legionella Monitoring Services
  - 7.1 Sampling
  - 7.4 Interpretation of Analysis
- (8) Plant and Equipment Services
  - 8.1 Design and Supply
  - 8.2 Installation
  - 8.3 Servicing/maintenance
  - 8.4 Reburishment

This Certificate is only valid if the Company named is listed on the LCA website [www.legionellacontrol.org.uk/directory.php](http://www.legionellacontrol.org.uk/directory.php)

 Signed:  Chairman, Executive Committee

  Certificate Secretary

Legionella Control Association Limited. [www.legionellacontrol.org.uk](http://www.legionellacontrol.org.uk)  
Registered in England and Wales No. 8502723

The legal duty to comply with relevant health and safety legislation (including avoidance or control of risk to exposure to Legionella bacteria) rests solely with the statutory dutyholder, being either the employer or the person in control of the premises or systems where any relevant risk is present, and this cannot be delegated. Specific functions (e.g. carrying out the assessment) can be delegated and the Legionella Control Association (LCA) Code of Conduct is designed to help service providers, who also have duties under health and safety legislation, to establish appropriate management systems for the provision or control of risk from Legionella bacteria. The LCA assesses the management systems of LCA members upon initial registration, reviews annually upon re-registration, and re-assesses by annual company audits. The LCA cannot and does not carry out other regular supervision of its members' commitments to the Code of Conduct nor their compliance with other LCA guidelines. A valid LCA certificate of registration (which is only valid if the company named is listed on the LCA website [www.legionellacontrol.org.uk/directory.php](http://www.legionellacontrol.org.uk/directory.php)) confirms only that a service provider has satisfied LCA requirements at registration and its most recent company audit. It does not confirm the service provider's actual or continuing compliance with their commitments to the LCA Code of Conduct and/or other LCA guidelines. The LCA does not approve specific products or services as being effective in controlling Legionella or verify the competence of service providers' staff and sub-contractors, which is the duty of the service provider and the statutory dutyholder. The LCA accepts no liability for any omission or any act carried out in reliance on the LCA Code of Conduct or other LCA guidelines, or any acts of damage resulting from non-compliance with such documents.

# **WATER SYSTEM RISK ASSESSMENT**

## **Table of Contents**

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- 6. Calorifiers and Water Heaters**
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- 9. Governance and Documentation**
- 10. Written Scheme Guidance**
- 11. Photographic Appendices**

**WATER SYSTEM RISK ASSESSMENT**

# **Section 1**

## **Executive Summary**

# **WATER SYSTEM RISK ASSESSMENT**

## **Executive Summary**

### **Building Overview**

(System information below adapted from information provided by Brookfield in 2015 with Water Hygiene Control comments by DMA)

This assessment covers the QEUH (Adult) Hospital and the adjoining Royal Hospital for Children. The Adult Hospital is 14 storeys, including the basement, with approximately 1100 beds and the Children's Hospital is 5 storeys, including the basement, with approximately 250 beds.

This facility has the largest Critical Care complex, one of the largest Emergency Departments in Scotland, offers acute specialist inpatient care, medical day care services and outpatient clinics servicing the local population.

The Children's Hospital provides specialist services to the West of Scotland and the wider population of Scotland in addition to the full range of secondary care services to people of Greater Glasgow and Clyde. Specialist services include cardiology and cardiac surgery, renal and bone marrow transplantation. For a number of these specialised services, the Children's Hospital is recognised as the sole provider in Scotland.

The construction phase ended in January 2015 with phased occupancy of patient areas beginning in April 2015 and full working occupancy achieved in July 2015. There have been departmental changes and small scale works in the intervening period (e.g. ward use changes and the required service alterations) with no significant water system alterations made to the water system, until some upgrade works which were carried out in late 2018/early 2019.

These upgrade works included the addition of a third filtration unit after the Raw Water CWSTs, alterations to the pipework configuration from the Raw Water CWSTs to the Filtration units (to allow all Raw Water CWSTs to supply each of the Filter Units), alterations to the post Filter Units Pipework to allow all three filter units to supply each of the four Post Filter CWSTs.

At this time Chlorine dioxide dosing system were introduced into the Post Filter CWSTs, on the backwash cycle of the Filtration Units, on the post booster pump lines to the various plantroom serving the hospital (PR21 line, PR22/41 line, PR 31 Line and PR32/PR33 Line), on the cold supply as it enters into the various plantrooms (PR21, PR22, PR31 (x2), PR32, PR33 & PR41, with an additional unit in PR31 on line to the Adults Theatres), and on the hot return lines at each of the calorifier locations in PR21 (Cals 21-1/2/3), PR22 (Cals 22-1/2/3), PR31 (Cals 31-1/2/3, Cals 31-4/5/6, Cals 31-7/8/9), PR32 (Cals 32-1/2/3), PR33 (Cals 33-1/2/3) & PR41 (Cals 41-1/2/3).

During the works carried out in late 2018/early 2019 all 24 calorifiers across the Adults hospital & RHC had standard expansion vessels replaced with flow through type vessels, with alterations made to the pipework around the calorifiers to accommodate the new vessels and the required flow to the vessels. At the time of this survey these flow through expansion vessels are again being replaced with Flamco flow through expansion vessels with pipework again being amended to accommodate the new vessels (See Section 06 for details of where the new vessels had been fitted at time of writing).

There are numerous ClO<sub>2</sub> monitoring stations situated through the Adults and RHC Hospitals, with specific units within both Adults and Children's Renal plantrooms, with carbon filters fitted to the lines to remove ClO<sub>2</sub> from the water supply to the Renal Systems.

In early 2018 an issue with regards to Cupriavidus bacteria being detected in the system water was identified in Wards 2A & 2B of the Children's Hospital. Various remedial works were carried out within this ward in order to remedy the situation, including disinfections work, localised ClO<sub>2</sub> dosing to the hot and cold water supplies to these wards( now removed), with the ward eventually being closed, with the Children being decanted to Ward 6A within the Adults hospital, and alterations made to the 2A/2B water system, including the removal of anti-room WHBs and taps within the BMT part of the ward, running hot flow and return services as close as is practical to the outlets, changing the Optitherm and Contour taps to be Markwik 21+ taps and changing WCs to models with no cistern.

A decision was also taken by Infection Control, Clinical Staff and Estates to fit anti-microbial (PALL) filters in "high risk" areas (as identified by ICT/Clinical) throughout the hospital. These filters have remained in place since 2018, with some additional Wards/Departments added to the filtered locations, and some locations where filters have been removed, after a comprehensive sampling regime has demonstrated to the satisfaction of ICT/Clinical that water quality in areas where filters being removed was of a satisfactory standard.

In Mid 2019 Ward 2A/2B was again closed to allow for an extensive upgrade to the ward including upgrade works to the Air Handling Units and Air Filtration, with some additional minor alterations made to the water system.



## **WATER SYSTEM RISK ASSESSMENT**

The ward remained closed until March 2022 where it was reopened and the children were decanted from Adults Ward 6A back to the newly refurbished Schiehallion Ward.

A Minor Injuries Unit (MIU) has been erected adjacent to the Adults A&E department with a cold water supply from this taken from the A&E department, running underground to the MIU where it supplies a water heater and outlets within the MIU. This unit shall be covered under a separate assessment.

Some other minor alterations have been made to the water system since building opening, though these have been localised (e.g. alterations made to dental clinics within the Childrens Clinic Area).

### **Town Mains**

There are 2 separate incoming mains water supplies serving the cold water storage tanks within the basement plantroom of the Adults and Children's hospital building, and a separate dedicated fire main line supplying the fire tanks in the adjacent plantroom.

The incoming mains enter the building in the MTHW/Chilled Plantroom (Govan Road Mains) and basement tank room (Hardgate Road Mains) and run into the tank room to serve four off "Raw" water storage tanks and a single Trades water tank (the second Trades water tank has been isolated, drained and disconnected from the water system(s)). These incoming mains both have double check valves and water meters fitted.

The water meters are linked to the BEMS system and allow the user to cross reference the quantity of water used against the quantity indicated on the external meter.

The Hardgate Road (small) mains supply feeds only the main fire sprinkler tanks in the basement fire tank plantroom.

There are various short deadlegs on the domestic water mains which may be used as drain down points, injection points or emergency bypass connection points. Some of these connection points (post filtered CWSTs) are being utilised by Scotmas for testing/sensor points for the chlorine dioxide (ClO<sub>2</sub>) background dosing systems. All other drain down/injection points are included within site flushing regime.

The Govan Road supply as described as medium risk due to the long connection to the long (>20 metres) branch to Children's Clinic 12 Hydrotherapy Pool Balance Tank top-up, which is a potential Category 5 backflow risk. **Note:** DMA are due to install a category 5 break tank and booster pump to this line to provide backflow protection from the hydrotherapy pool and top-up tank which when fitted should reduce this mains line to "low risk".

### **CWSTs and Filtration System**

#### **QEUH Adult and Children's Hospital CWSTs**

There are 10 domestic water storage tanks in the building which are all situated in the basement tank room.

Raw Water Tanks 1A/1B and 2A/2B are supplied by two town mains (Govan Road and Hardgate Road) to ensure continuity of supply in case of a town mains failure. The Raw Water tanks supply the Filtered Water tanks 1A/1B and 2A/2B via 3 x filtration sets (level of filtration advised by Estates is 0.2µm).

The filtration units fill the Filtered Water Tanks. Filtration sets should be maintained in accordance with manufacturer's instructions and maintenance schedule.

Each of the filtration units have a Scotmas ClO<sub>2</sub> dosing unit installed which operates on the backwash cycle of the filtration unit. These were fitted later than the original ClO<sub>2</sub> units on the domestic water systems to aid with microbiological control of the filters during backwashing. Note: the discharge water from the filtration unit backwash cycles are discharged to separate sumps to prevent stagnation in the sumps and assist with control microbiological growth in the sumps within the plantroom.

Filtered Water Tanks 1A and 1B are linked, with 2A and 2B also linked. All four tanks can be linked together (via valve on the supply lines to the booster pump sets) to supply domestic cold water including drinking water to the building with the exception of the trades system. The link between the tanks 1A/1B and 2A/2B was closed at the time survey with Filtered Tanks 1A/1B supplying the 5.3 Bar pump set (Boosted Pump Set 2) to plantrooms 21/22/41 and the corresponding outlets in these zones with 2A/2B supplying the 7.1 Bar pump set (Boosted Pump Set 1) to plantrooms 31/32/33 and the corresponding outlets in these zones.

## WATER SYSTEM RISK ASSESSMENT

In late 2018 and early 2019 a ClO<sub>2</sub> system was installed on the domestic water system. Each of the post filter CWSTs has a ClO<sub>2</sub> dosing system (dosing to 0.4-0.5ppm of ClO<sub>2</sub>) utilising water meter controlled proportional dosing (with in-tank reaction chambers) with ClO<sub>2</sub> and Chlorite monitoring stations fitted to the outlet lines prior to the booster pumps.

**N.B.** It should be noted that there is no separate dedicated supply to the Renal (or other medical) systems, with all being fed from the Filtered Water system. This means that system disinfections would require to be very carefully scheduled or carried out locally as the disinfection procedure/chemical may interfere with the renal/medical systems and impact on patient welfare.

On the Post Filter CWSTs in particular the internal supports/fittings are showing evidence of corrosion, with rust leaching into stored water and settling on tank base. It is recommended that all internal supports/fittings are replaced with suitable WRAS approved equivalents, or CWSTs replaced. Please also refer to Nicholson Plastics report from July 2021 regarding corrosion on support rods and nut/bolts within the CWSTs. DMA have submitted a proposal for replacing the CWSTs if original tank manufacturer/installer is unable to carryout a suitable repair of the corrosion issues.

Raised hatch screened vent on all of the domestic CWSTs appears unsuitable and should have suitably sized screened mesh fitted.

SHTM 04-01 recommends fitting water filled Glass Traps to the overflow and warning screens and Hepa Filtration to the air vents on the post filter CWST lids. If this is to be installed then vents on raised ball chamber would require to be sealed to ensure tanks remain sealed. It may be prudent to review the entire tank set-up to determine if this should be implemented and if any additional Category 5 weir overflows are required on the Raw Water CWSTs.

There are 2 x water booster sets in the water tank room. In the event of failure the outlet pipework from the booster pumps can be configured so that a single booster set could provide all water to the building (though DMA are unaware of this happening at any point during the buildings normal operations).

(Boosted Pump Set 1) – Feeding Plantroom 31, 32 & 33 - 7.1 Bar  
 (Boosted Pump Set 2) – Feeding Plantroom 21, 22 & 41 – 5.3 Bar

The expansion vessels attached to the CWST booster sets are not of a flow through design and they are not insulated. It appears that small, quarter turn valves have been fitted to both 7.1 Bar booster set and the Trade Water tank booster set. No fitted drain point on 5.0 Bar booster set at time of survey.

Each of the individual risers has a ClO<sub>2</sub> monitoring and top-up station fitted to the riser within the basement tank room which monitors the ClO<sub>2</sub> levels being discharged to the respective area supplied by the riser and is capable of topping up the ClO<sub>2</sub> levels within the line should this be required.

From the 2 No. water booster sets there are 8 domestic water systems:

- Plantroom 21
  - Via a Pressure reducing valve (PRV) the BCWS feed 21 CAL01/02/03
- Plantroom 22
  - Via a Pressure reducing valve (PRV) the BCWS feed 22 CAL01/02/03
- Plantroom 31
  - BCWS feeds 31 CAL01/02/03
- Plantroom 31
  - Via a Pressure reducing valve (PRV) the BCWS feeds 31 CAL07/08/09
- Plantroom 31
  - BCWS feeds 31 CAL04/05/06
- Plantroom 32
  - BCWS feeds 32 CAL01/02/03
- Plantroom 33
  - BCWS feeds 33 CAL01/02/03
- Plantroom 41
  - BCWS feeds 41 CAL01/02/03

## **WATER SYSTEM RISK ASSESSMENT**

On the cold supply into each of the plantrooms there are ClO<sub>2</sub> monitoring and top-up stations fitted to the plantroom supplies which monitors the ClO<sub>2</sub> levels being discharged to the respective area and is capable of topping up the ClO<sub>2</sub> levels within the line should this be required.

Additional ClO<sub>2</sub> units are fitted on the return lines to each of the Calorifiers (8 banks of calorifiers), within monitoring station fitted at various locations throughout the Adult and Children's Hospitals.

All ClO<sub>2</sub> units are maintained and serviced by Scotmas.

The water supply into each plantroom is metered by a CWS flow meter. This allows for monitoring of specific parts of the system for energy purposes.

There are various connection points onto other "non-domestic" outlets such as renal dialysis, endoscopy wash, pressurisation units, and MRI chiller cooling which are connected to the Filtered Water system. Note: the steam humidifier units have been removed completely or cut back as far as practical to source, since previous assessment.

Branch from Booster Set 01 to pool plant room emergency shower. Hot supply removed and flow/return looped in Pool Plant Room A-1 FMB-030, and operational. DCV fitted approx. 4m downstream of branch after water meter in Basement A-1 FMB -024. Bib tap and Pool top up tank within the pool plantroom have been disconnected/removed. Emergency Shower should be included within site flushing regime (Note: No drain within the tank room)

The Trades Water System originally supplied "Non-domestic" outlets such as bib taps in plantrooms, irrigation connections points (DMA understand these are now all disconnected) and the 12<sup>th</sup> floor heli-pad fire suppression system. One side of the Trades tank was isolated and drained with the make-up to the tank removed. This tank now only supplies the 12<sup>th</sup> floor heli-pad fire suppression and bib taps on the 12<sup>th</sup> floor.

### **Calorifiers (PHE's with Storage Vessels)**

The calorifiers are situated in various plant rooms throughout site. Locations are as follows:

- Plantroom 21 (Cals 21-1/2/3)
- Plantroom 22 (Cals 22-1/2/3)
- Plantroom 31 (Cals 31-1/2/3)
- Plantroom 31 (Cals 31-4/5/6)
- Plantroom 31 (Cals 31-7/8/9)
- Plantroom 32 (Cals 32-1/2/3)
- Plantroom 33 (Cals 33-1/2/3)
- Plantroom 41 (Cals 41-1/2/3)

These calorifiers, in turn supply domestic hot water services (DHWS) to designated zones within the hospital building. See Appendix 1 - Calorifier Wards and Areas Supplied and Appendix 2 - Distribution Zone Maps within section 6 of this report for calorifier locations and areas within the hospital fed from each Calorifier set.

Each set of calorifiers is a bank of 3-linked calorifiers fed from the boosted Bulk Water system, with heat source being via a plate heat exchanger on the outside of each calorifier fed from the MTHW system. A circulating pump on each calorifier/plate heat exchanger ensures the water is circulated throughout each vessel to maintain temperature.

Distribution flow temperatures were consistently above 60°C, with return temperatures to calorifiers consistently above 55°C on all calorifiers as recommended within L8/HSG 274 Part 2 and SHTM 04-01. All base temperature appeared satisfactory at time of survey also.

During the water system upgrade works during late 2018 and early 2019 each calorifier had the standard expansion vessel installed at construction phase removed and replaced with a flow through vessel, with appropriate pipework modifications to maintain flow to the system etc.

During the period of this survey all expansion vessels installed in 2018-19 were being replaced with new vessels.

Generally water flushed from drain on calorifiers and expansion vessels ran clear either instantly or after only a very short period of time (typically <10 seconds).



## **WATER SYSTEM RISK ASSESSMENT**

Each calorifier set share a linked return which supplies all three calorifiers.

## **WATER SYSTEM RISK ASSESSMENT**

### **Hot and Cold Water Systems**

The domestic cold water system within the hospital is fed from the Bulk Water tanks located in the basement tank room of the hospital. There are no outlets fed directly from Town Mains within the building.

“Non-domestic” outlets such as bib taps in plantrooms, irrigation connections points (now removed) and the 12<sup>th</sup> floor heli-pad fire suppression system are fed from the Trades Water tanks. Please refer to the section 5 for information and supporting data relating to the CWSTs.

There are however some connection points onto other “non-domestic” outlets such as renal dialysis (both plant and individual ‘emergency’ points), endoscopy wash, pressurisation units, steam humidifier units and MRI chiller cooling which are connected to the Bulk Water system.

**N.B.** NHS Estates have fitted ‘Emergency Dialysis’ points on cold water system since the initial installation. NHS should confirm location of all Emergency Dialysis Points and ensure System Drawings and Asset Lists (not produced as part of this assessment) are updated to reflect this. Additional filtration and testing procedures should be incorporated into the use of these emergency points in light of the chlorine dioxide background dosing systems being installed on the domestic water system.

There are also numerous connection points and drain points on the domestic water system within plantrooms and risers (which DMA have assumed were installed for flushing purposes and bypasses) which are creating deadlegs on the system. It is advised that these be removed wherever practicable. Larger deadleg/flushing points are included within the site flushing regime.

The domestic hot water systems are fed from a series of Calorifiers located on the 2<sup>nd</sup> and 3<sup>rd</sup> floors in the adult hospital and on the 4<sup>th</sup> floor of the children’s hospital. These calorifiers feed different areas/zones within the Hospital. Please refer to section 6 for information and supporting data relating to the calorifiers.

Cold water temperatures recorded by DMA vary with some indicating heat gain on the cold water system. Investigations should be carried out as to the reasons for this with appropriate remedial actions taken and ensuring that all outlets are in regular use, particularly where patients are bedbound/have low mobility and therefore less likely to use the water services within en-suite rooms.

Flushing valves are installed at a number of points on the domestic cold water system in the lower floors of the Adult and Children’s Hospitals, however DMA have not been provided a list of locations of all valves. The operating conditions for the valves (e.g. temperature controlled/timed) should be reviewed to ensure these are suitable for the intended purpose.

The hot water temperatures recorded at outlets were generally satisfactory though some areas there appears to be issues with the localised hot flow and return system. We would advise this is investigated and the flow and return (re-)commissioned as appropriate.

The majority of the pipework runs at high level within the wards/departments with no local flow and returns dropping to the WHBs, sinks showers etc. (with the exception of Ward 2A/2B in the RHC).

It was generally noted that hot temperatures rose quickly when outlet temperatures were being recorded throughout the building and the flow and return circuits appear to be circulating hot water in most areas (please refer to section 7 for supporting data and exceptions). Note: Only sentinel and selected other outlets were checked during this assessment and 100% of outlets was not requested (or was practical) to review as part of this assessment).

Domestic water pipework runs above ceilings throughout the building. Access for ongoing monitoring of flow and return loops is problematic as ceiling tiles cannot be easily removed within the hospital environment and alternative methods of monitoring should be considered should current BEMS monitoring points not be sufficient for the hot flow and return system (e.g. additional BEMS monitoring points installed).

The vast majority of Thermostatic mixing valves (TMVs) installed are TMV taps, (Horne Optitherm in clinical areas and Armitage Shanks Contours in non-clinical areas, with Ward 2A/2B having Markwik 21+ TMTs) with the only exceptions noted being in non-patient area toilets with infrared taps which have a TMV mounted approximately 0.5m from the outlet.

Showers appear to be a standard design throughout the hospital with no adjustable heads noted during the survey. A quarterly regime of exchanging the shower heads and hoses with recyclable Dupal components is in

## **WATER SYSTEM RISK ASSESSMENT**

place across the hospital.

DMA were advised by Mercury Engineering and Estates in 2015 that all materials fitted during the construction were WRAS approved and therefore do not support bacterial growth. However, subsequently DMA have been advised that some sections of pipework may have been 304 Stainless Steel rather than 316 Stainless Steel and that not all pipework and/or components are WRAS approved (Please also refer to Nicholson Plastics report from July 2021 regarding CWST components and comments within this assessment).

It is advised that should this be the case confirmation should be sought from the manufacturers and/or installers that the pipework/components are of a suitable standard and that this will not contribute to microbial growth, or in any other way impact on the safe operation of the water system(s).

EPDM flexible hoses have been installed in a small number of non-clinical areas (it is understood the majority (if not all of the Janitorial sinks within DSR/Facilities have flexible hoses) with the only patient areas DMA have noted as having flexible hoses being the connection to Arjo baths (both connections to the hot/cold system and internally within the actual bath). Wherever practicable it is recommend all flexi hoses are removed and connections hard piped. Note: at the time of survey DMA are working through list of connections to Arjo baths to replace flexible hoses with hard piped connections. This project will not replace any hoses on the internal sections of the Arjo baths.

Where flexible hoses cannot be removed then replacing with alternative WRAS approved hoses with linings other than EPDM should be considered. In healthcare premises additional guidance on the replacement and use of flexible hoses is provided in the "safety action notice SAN(SC)09/03".

Flexible hoses have also been noted on the boosted bulk water system on pressure reducing valves. If possible, these should be hard piped (stainless steel) or WRAS approved hoses with linings other than EPDM should be considered. Should these not be available for these types of units/connections then a regular inspection and replacement schedule should be implemented for these.

The 12<sup>th</sup> floor heli-pad fire suppression system and bib taps within the 12<sup>th</sup> Floor Plantroom are fed from the Trades system with very long pipework runs through the building and plantrooms to the outlets. These are included within site flushing regime. Please also refer to section 8 for information on other risk systems. Note: Bib taps in lower plantrooms and the irrigation systems have all been disconnected form the Trades System.

A single bib tap has been reinstated using a temporary Hep2O connection from the cold supply to PR31 Calorifiers to the roof Garden on level 3 between the Adults hospital and RHC. This connection point s to provide a water supply for works which are due to commence on upgrading the roof garden, with DMA understanding this is to be removed upon completion of works.

It should be noted that the information and recommendations included within these pages relates to the outlets surveyed only though many of the conditions highlighted are likely to be replicated throughout the hospital. Issues and information included should not be taken as a complete data set and should be treated as a representative sample of the system conditions found within the hospital. (NHS records should also be consulted for additional information e.g. temperature excursions)

### **Other Risk Systems**

There are various 'Other Risk Systems' on site which may create a risk from Legionellosis and or other waterborne bacteria. Please refer to Section 8 of this assessment for details of other systems.

## WATER SYSTEM RISK ASSESSMENT

### Risk Assessment Summary

|  |  |   |
|--|--|---|
| Site Name  | Queen Elizabeth University Hospital (Adults)<br>Royal Hospital for Children  |   |
| No of Storeys  | 14 in Adult Hospital and 5 in Children's Hospital (including basement).  |   |
| Date of construction   | Completed and handed over to NHS in January 2015 for phased occupation. Full occupancy achieved in July 2015.  |   |
| Date water services last upgraded  | Original system with modifications as described within the assessment occurring in late 2018/early 2019 and ward 2A/2B upgrade works being completed in 2022.  |   |
| Is building used by potentially "at Risk" groups?  | Persons with acute medical conditions  | As the building is used by persons with acute/underlying medical conditions which increases susceptibility to contracting legionellosis then the requirements for L8, HSG 274 and HTM/SHTM 04-01 compliance is of paramount importance. |
| Is there a history of legionella colonisation of the water system(s) on site?                    | Very few instances of positive legionella results being returned, despite extensive sampling carried out across the hospital.  |   |
| Is there a history of "other" water borne bacterial colonisation of the water system(s) on site? | There are instances of "other" bacteria being detected as part of the sampling regime(s) implemented across the hospital. These generally take the form of Gram-negative bacteria or yeast/moulds in low counts, with a disinfection, flushing and re-sampling regime implemented when results detected.   |   |
| Risk Rating  | <p>Due to the increased susceptibility of some system users the water systems would be categorised as:</p> <ul style="list-style-type: none"> <li>• Potential for system to pose a hazard – Possible<br/>(Mitigated by the control measures implemented in the form of a microbiological sampling regime, ClO<sub>2</sub> dosing and POU filters fitted in clinically designated "high Risk" areas.)</li> <li>• Condition of system being assessed (deficiencies/non-compliances found) – Major (CWSTs)<br/>(though there is mitigation measures in place as described above).</li> </ul> <p>Therefore the water systems and the control regime would be classified as <b>Low Risk</b></p> |   |

**LEGIONELLA RISK ASSESSMENT**

# **Section 2**

## **Recommendations**



## LEGIONELLA RISK ASSESSMENT

### Suggested Remedial Action Timescales

| Remedial Action Category | Recommended Remedial Action Timescale                  | Action   |
|--------------------------|--|--|
| <b>1</b>                 | <b>Immediately / as soon as reasonably practicable</b> | <p><b>Urgent Significant Investigation &amp; Urgent Remedial Action Required.</b><br/>Senior Management Action Required. Carryout Review of Control Procedures Recommendations within this category should be carried out immediately/as-soon as-is-reasonably practicable. where appropriate remedial actions to rectify the faults cannot be taken <b>immediately/as-soon as-is-reasonably practicable</b> alternative actions to reduce the risk should be carried out, and continue to be carried out, until such times as recommended actions can be completed.</p> |
| <b>2</b>                 | <b>As soon as reasonably practicable</b>               | <p><b>Significant Investigation &amp; Remedial Action Required.</b><br/>Senior Management Action Required. Carryout Review of Control Procedures Recommendations within this category should be carried out <b>as-soon as-is-reasonably practicable</b>. Where appropriate remedial actions to rectify the faults cannot be carried out quickly, alternative actions to reduce the risk should be carried out, and continue to be carried out, until such times as recommended actions can be completed.</p>   |
| <b>3</b>                 | <b>Within 3 months</b>                                 | <p><b>Investigate/Reduce.</b><br/>Remedial Actions Required. Management responsibility should be specified. Recommendations within this category should be carried out in a timely manner, though simple and/or inexpensive tasks which would reduce the risk should be carried out as-soon-as-reasonably-practicable (e.g. <b>Within 3 months</b>). Additional monitoring/inspection to ensure risk does not increase should be carried out until actions completed.</p>  |
| <b>4</b>                 | <b>At first available opportunity</b>                  | <p><b>Maintain Level</b><br/>Managed by Routine Planned Preventative Maintenance Procedures<br/>Whilst recommendations within this category do not significantly Alter the risk it is still advised that these actions are carried out <b>at first available opportunity</b>, typically within a 12 month period of recommendations being made.</p>  |

**For Details of Legionella Management Recommendations please refer to Section 9 of this assessment.**

**N.B.** Prior to any alterations being carried out on fire systems (where recommended) the fire brigade and/or site fire safety consultants should be consulted, and approval of changes received

## WATER SYSTEM RISK ASSESSMENT

| Location/Plant Item                           | Recommendations<br>(Mains Water/Water Source)  | Remedial<br>Action<br>Category | Assigned to | Actions Taken | Completed |
|---|--|--------------------------------|-------------|---------------|-----------|
| All plant items & pipework                    | All plant items, pipework and valves should be labelled for identification purposes.   | 4                              |             |               |           |
| Govan Road Mains Line                         | The is a long (>20 metres) branch via DCV and pressure reducer to Children's Clinic 12 Hydrotherapy Pool Balance Tank top-up. DCV on initial branch from incoming mains should be repositioned as close to tee as practical. Note: DMA are due to install a category 5 break tank and booster pump to this line to provide backflow protection from the hydrotherapy pool and top-up tank. | 3                              |             |               |           |
| Hardgate Road (Small Mains Line – Fire Tanks) | As this mains line is likely to have a low turnover of water (other than the site flushing regime) it is recommend the NHS confirms that this main is separated from domestic water mains by a double check valve or similar (possibly external to building) to prevent potentially stagnant water from contaminating the domestic mains.  | 3                              |             |               |           |
|   |  |                                |             |               |           |
|   |  |                                |             |               |           |
|   |  |                                |             |               |           |

## WATER SYSTEM RISK ASSESSMENT

| Location/Plant Item  | Recommendations<br>(CWSTs & Basement Tank Room)   | Remedial<br>Action<br>Category | Assigned to | Actions Taken | Completed |
|--|---|--------------------------------|-------------|---------------|-----------|
| Raw Water CWSTs 1A, 1B, 2A, 2B<br>Post Filter CWSTs 1A, 1B, 2A, 2B | All tanks have stainless-steel flange supports which may permit water ingress similar to hollow tank lid supports. Hollow tank supports are recommended to be replaced with solid support beams within HSG 274 and SHTM 04-01. Hollow flange supports are a much less common support structure and it is recommended that these supports are checked to ensure that they are not permitting water ingress, and if found that they are, should be removed and replaced with solid alternatives.                            | 2                              |             |               |           |
| Post Filter CWSTs 1A, 1B, 2A, 2B                                   | Internal supports/fittings showing evidence of corrosion, with rust leaching into stored water and settling on tank base. Recommend all internal supports/fittings are replaced with suitable WRAS approved equivalents. Please also refer to Nicholson Plastics report from July 2021 regarding corrosion on support rods and nut/bolts within the CWSTs. DMA have submitted a proposal for replacing the CWSTs if original tank manufacturer/installer is unable to carryout a suitable repair of the corrosion issues. | 2                              |             |               |           |
| Raw Water CWSTs 1A, 1B, 2A, 2B<br>Post Filter CWSTs 1A, 1B, 2A, 2B | Additional access hatches on tanks for cleaning/inspection purposes should be considered.   | 3                              |             |               |           |
| Raw Water CWSTs 1A, 1B, 2A, 2B<br>Post Filter CWSTs 1A, 1B, 2A, 2B | Raised hatch screened vent appears unsuitable and should have suitably sized screened mesh fitted.  | 3                              |             |               |           |
| Post Filter CWSTs 1A, 1B, 2A, 2B                                   | SHTM 04-01 recommends fitting water filled Glass Traps to the overflow and warning screens and Hepa Filtration to the air vents on the tank lids. If this is to be installed then vents on raised ball chamber would require to be sealed to ensure tanks remain sealed. It may be prudent to review the entire tank set-up to determine if this should be implemented and if any additional category 5 weir overflows are required on the Raw Water CWSTs.   | 3                              |             |               |           |

## WATER SYSTEM RISK ASSESSMENT

| Location/Plant Item  | Recommendations<br>(CWSTs & Basement Tank Room)   | Remedial<br>Action<br>Category | Assigned to | Actions Taken | Completed |
|--|---|--------------------------------|-------------|---------------|-----------|
| 7.1 Bar Pump Set (Boosted Pump Set 1)<br>5.3 Bar Pump Set (Boosted Pump Set 2)<br>Trade Water Tank 1 | Ideally all expansion vessels should be of flow through type – where this is not practical, they should be fitted vertically on the cold supply, as close to plant items as possible with a fitted drain valve (where compliant with current regulations) to allow regular recorded flushing of the vessel.   | 3                              |             |               |           |
| 7.1 Bar Pump Set (Boosted Pump Set 1)<br>5.3 Bar Pump Set (Boosted Pump Set 2)<br>Trade Water Tank 1 | Drain points should be fitted to pump manifolds to allow end of lines to be flushed (if practicable).   | 3                              |             |               |           |
| Trade Water Tank 1   | Relocate DCV closer to tee - >2m at present after meter.  | 3                              |             |               |           |
| 7.1 Bar Pump Set (Boosted Pump Set 1)<br>5.3 Bar Pump Set (Boosted Pump Set 2)                       | There is a link/breach pipe on the outlets of the Filtered/Filter water tanks prior to the pump sets which can be opened to allow all tanks both pump sets. This was closed at time of survey, though DMA have noted this link/breach pipe open on previous visits. This line should be opened and flushed as part of site flushing regime.   | 3                              |             |               |           |
| 7.1 Bar Pump Set (Boosted Pump Set 1)<br>5.3 Bar Pump Set (Boosted Pump Set 2)                       | There is a link pipe between the 5.3 bar (Boosted Pump Set 2) and 7.1 Bar (Boosted Pump Set 1) pipework systems after the booster sets. DMA advised previously by estates this section is drained and is in place for emergency purposes, should either of the booster sets fail to allow for water services to be maintained to the hospital. Prior to being put into use the link section should be thoroughly flushed and disinfected. | 3                              |             |               |           |

## WATER SYSTEM RISK ASSESSMENT

| Location/Plant Item                            | Recommendations<br>(CWSTs & Basement Tank Room)   | Remedial<br>Action<br>Category | Assigned to | Actions Taken | Completed |
|--|---|--------------------------------|-------------|---------------|-----------|
| Filtration Units                               | <p>It was noted during the survey of Level -1 Basement Plant Room CWSTs and associated filtration plant that 2 x non-WRAS approved butterfly valve assemblies have been installed on Filtration Unit 3.</p> <p>These valves (Tomoe 700Z) have diecast aluminium bodies and appear to be intended for marine/saltwater applications. Verification has been received from the manufacturer stating that these valves are not deemed suitable for potable use and carry no WRAS approval to date.</p> <p>It should be confirmed that all persons/contractors carrying out works on the domestic water systems on site, use only WRAS approved materials and that any/all materials used are deemed suitable for potable use and carry the required certifications/approvals.</p> | <b>3</b>                       |             |               |           |
| Deadlegs (Various) - See Section 5 for details | All deadlegs should be removed wherever practical (All on site flushing regime at present)  | <b>3<br/>(or Ongoing PPM)</b>  |             |               |           |
| All Plant items and Pipework                   | All associated valves should be correctly labelled for identification purposes.   | <b>4</b>                       |             |               |           |

## WATER SYSTEM RISK ASSESSMENT

| Location/Plant Item        | Recommendations<br>(Calorifiers & Associated Plantrooms)  | Remedial<br>Action<br>Category | Assigned to | Actions Taken | Completed |
|----------------------------|---|--------------------------------|-------------|---------------|-----------|
| Calorifier PR22 - 01/02/03 | Large deadlegs created on linked pipework to offline calorifier 1 – these should be included in recorded site flushing regime, until such times as reinstated to full daily use.  | <b>2</b>                       |             |               |           |
| Calorifier PR41 - 01/02/03 | Large deadlegs created on linked pipework to offline calorifiers 1 & 2 – these should be included in recorded site flushing regime, until such times as reinstated to full daily use. Checks should be made during upgrade works that hot water to Childrens hospital maintains correct flow and return temperatures.   | <b>2</b>                       |             |               |           |
| Plantroom 21               | There is a deadleg behind the water tank within the Childrens Renal Plantroom. Unable to locate where this branch is fed from. If practical this should be removed. (Note: Line currently included in site flushing regime).  | <b>3</b><br>(Or ongoing ppm)   |             |               |           |
| All Plantrooms             | Flexible hoses were noted on the pressure reducing valves on the cold supply into Plantroom 21. These should be checked to determine if these are EPDM. Should these be EPDM they should be replaced with a suitable alternative material (e.g. hard piped in stainless steel or PEX) if practicable or hoses inspected and replaced regularly (e.g. annually and/or as determined by periodic inspection) or as per manufacturer's instructions.   | <b>3</b>                       |             |               |           |
| Plantroom 21               | 15 mm lines branch from same line as supplying the AHUs and run approximately 50m to HTG pressurisation units (at pumps PR21 PU11/12/13 SH), with a separate branch running approximately 10m to CHW pressurisation unit (at pumps PR21 PU03/04/05 SCW). Lines to pressurisation units should, if practicable, be switched to trades system, or suitable backflow protection fitted (Note: Lines currently included in site flushing regime). Fast fill connections should be disconnected and have suitable backflow protection (e.g. RPZ) fitted to fast fill connection. | <b>3</b>                       |             |               |           |
| Plantroom 21               | There is a branch from the Boosted Cold Water Services (BCWS), dropping from high level and measuring approximately 150mm of 54mm pipework. This should be removed if no longer required or included within site flushing regime.   | <b>3</b><br>(Or ongoing ppm)   |             |               |           |

### WATER SYSTEM RISK ASSESSMENT

| Location/Plant Item | Recommendations<br>(Calorifiers & Associated Plantrooms)   | Remedial<br>Action<br>Category | Assigned to | Actions Taken | Completed |
|---------------------|--|--------------------------------|-------------|---------------|-----------|
| Plantroom 22        | 54mm line(s) to connection points would appear to have been installed during the construction phase and are likely to have been used for chemical cleaning/flushing of the HTG and CHW systems. The 54mm line(s) should be completely removed and piped through on main line as no longer routinely required, though Estates have advised the connection(s) may be required should the HTG or CHW systems require to be refilled at any point. Should connections require to be retained then lines should be cut back as far as is reasonably practicable with the resultant short connection point incorporated into the site flushing regime. | <b>3</b>                       |             |               |           |
| Plantroom 22        | Lines to pressurisation units should, if practicable, be switched to trades system, or suitable backflow protection fitted (Note: lines included within site flushing regime). Fast fill connections should be disconnected and have suitable backflow protection (e.g. RPZ) fitted fast fill connection.  | <b>3</b>                       |             |               |           |
| Plantroom 31        | 54mm line(s) to connection points would appear to have been installed during the construction phase and are likely to have been used for chemical cleaning/flushing of the HTG and CHW systems. The 54mm line(s) should be completely removed and piped through on main line as no longer routinely required, though Estates have advised the connection(s) may be required should the HTG or CHW systems require to be refilled at any point. Should connections require to be retained then lines should be cut back as far as is reasonably practicable with the resultant short connection point incorporated into the site flushing regime. | <b>3</b><br>(Or ongoing ppm)   |             |               |           |
| Plantroom 31        | There is a line branching at high level from the cold supply to Calorifiers 31-04/05/06 with a check valve fitted approximately 1metre from the tee off point which then runs approximately 20 metres to RPZ on supply line to MRI Chillers (emergency cooling supply). Line to MRI Chiller should, if practicable, be switched to trades system (confirm water quality, pressure and flow rates etc. required to chiller prior to amending supply line) (Note: line included within site flushing regime).  | <b>3</b><br>(Or ongoing ppm)   |             |               |           |

### WATER SYSTEM RISK ASSESSMENT

| Location/Plant Item | Recommendations<br>(Calorifiers & Associated Plantrooms)   | Remedial<br>Action<br>Category | Assigned to | Actions Taken | Completed |
|---------------------|--|--------------------------------|-------------|---------------|-----------|
| Plantroom 31        | Lines to pressurisation units should, if practicable, be switched to trades system, or suitable backflow protection fitted (Note: lines included within site flushing regime). Fast fill connections should be disconnected and have suitable backflow protection (e.g. RPZ) fitted fast fill connection.  | <b>3</b>                       |             |               |           |
| Plantroom 32        | 54mm line(s) to connection points would appear to have been installed during the construction phase and are likely to have been used for chemical cleaning/flushing of the HTG and CHW systems. The 54mm line(s) should be completely removed and piped through on main line as no longer routinely required, though Estates have advised the connection(s) may be required should the HTG or CHW systems require to be refilled at any point. Should connections require to be retained then lines should be cut back as far as is reasonably practicable with the resultant short connection point incorporated into the site flushing regime.                               | <b>3</b><br>(Or ongoing ppm)   |             |               |           |
| Plantroom 32        | Lines to pressurisation units should, if practicable, be switched to trades system, or suitable backflow protection fitted and lines incorporated into site flushing regime. Fast fill connections should be disconnected and have suitable backflow protection (e.g. RPZ) fitted fast fill connection. (Note: lines included within site flushing regime).  | <b>3</b>                       |             |               |           |
| Plantroom 33        | There is a branch from the Boosted Cold Water Services located at high level (Near entrance to plantroom) which measures approximately 25 metres with 2 x drops of 2 metres in 54mm pipework to capped and valved off connection points and also branching and reducing to 15mm to supply pressurisation units (with no visible check valves) on the line. Lines to pressurisation units should, if practicable, be switched to trades system, or suitable backflow protection fitted ( <b>Note : lines included within site flushing regime</b> ). Fast fill connections should be disconnected and have suitable backflow protection (e.g. RPZ) fitted fast fill connection. | <b>3</b>                       |             |               |           |



## WATER SYSTEM RISK ASSESSMENT

| Location/Plant Item  | Recommendations<br>(Calorifiers & Associated Plantrooms)   | Remedial<br>Action<br>Category | Assigned to | Actions Taken | Completed |
|--|--|--------------------------------|-------------|---------------|-----------|
| Plantroom 33   | 54mm line(s) to connection points would appear to have been installed during the construction phase and are likely to have been used for chemical cleaning/flushing of the HTG and CHW systems. The 54mm line(s) should be completely removed and piped through on main line as no longer routinely required, though Estates have advised the connection(s) may be required should the HTG or CHW systems require to be refilled at any point. Should connections require to be retained then lines should be cut back as far as is reasonably practicable with the resultant short connection point incorporated into the site flushing regime. | <b>3</b><br>(Or ongoing ppm)   |             |               |           |
| Plantroom 31<br>Optitherm Servicing and Thermal Disinfection Station | Optitherm Servicing and Thermal Disinfection Station (and line for future connection) should be removed fully from use leaving no deadlegs (DMA staff currently flush lines daily).  | <b>3</b><br>(Or ongoing ppm)   |             |               |           |
| Plantroom 31<br>Optitherm Servicing and Thermal Disinfection Station | As the TMV/Filter Service Room (DMA site office) is not a clinical area it is advised that insulation is fitted on hot and cold pipework as close as is practical to the outlets. This would aid in minimising heat gain in cold line to this room (though it would appear the majority of the heat gain on the cold lines would occur outwith the office area where pipework runs adjacent to hot water/heating pipework).  | <b>3</b>                       |             |               |           |
| Plantroom 31<br>Optitherm Servicing and Thermal Disinfection Station | Expansion vessel at Plate heat exchanger should be changed to flow through type, or have suitable drain fitted to line to allow vessel to be flushed.  | <b>3</b>                       |             |               |           |
| Plantroom 41   | There is a branch from the Boosted Cold Water Services located at high level near 41AHU03B which runs approximately 10 metres in 15mm pipework to supply a CHW pressurisation unit, with line hard piped into the closed system. This should be disconnected from closed system and line added to the flushing regime (Cat 4/5 backflow risk).   | <b>3</b>                       |             |               |           |

## WATER SYSTEM RISK ASSESSMENT

| Location/Plant Item | Recommendations<br>(Calorifiers & Associated Plantrooms)   | Remedial<br>Action<br>Category | Assigned to | Actions Taken | Completed |
|---------------------|--|--------------------------------|-------------|---------------|-----------|
| Plantroom 41        | There is a branch from the Boosted Cold Water Services located at high level near 41AHU05 which runs approximately 3m to blanked valve before splitting to run to two separate HTG Pressurisation units in 15mm – a 4m line to one unit and a 15 metre line to the other unit. (Note: one line included within site flushing regime). One of the lines is hard piped into the closed system. This should be disconnected from closed system and line added to the flushing regime (Cat 4/5 backflow risk).             | <b>3</b>                       |             |               |           |
| Plantroom 41        | There is a branch from the Boosted Cold Water Services located at high level which runs approximately 8 metres and reducing 22mm. This line formerly supplied a pressurisation unit and Condair Humidification units at 41AHU27A, though these has now been disconnected, and then continued on to supply a pressurisation unit and Condair Humidification units at 41AHU27B, which have also been disconnected. This line should be removed if no longer required. (Note: lines included within site flushing regime) | <b>3</b><br>(Or ongoing ppm)   |             |               |           |
| Plantroom 41        | There is a branch from the Boosted Cold Water Services located at high level above 41AHU24 which measures approximately 20 metres of 15mm pipework to supply CHW pressurisation unit. The line is hard piped into the closed system. This should be disconnected from closed system (Cat 4/5 backflow risk). (Note: line included within site flushing regime).  | <b>3</b>                       |             |               |           |
| Plantroom 41        | There is a 3m deadleg (15mm) to a valve from this line at 41AHU24 – this line should be removed if no longer required (Note: line included within site flushing regime).   | <b>3</b><br>(Or ongoing ppm)   |             |               |           |
| Plantroom 41        | Lines to pressurisation units should, if practicable, be switched to trades system, or suitable backflow protection fitted.  | <b>3</b>                       |             |               |           |

## WATER SYSTEM RISK ASSESSMENT

| Location/Plant Item          | Recommendations<br>(Calorifiers & Associated Plantrooms)   | Remedial<br>Action<br>Category | Assigned to | Actions Taken | Completed |
|------------------------------|--|--------------------------------|-------------|---------------|-----------|
| Plantroom 41                 | 54mm line(s) to connection points would appear to have been installed during the construction phase and are likely to have been used for chemical cleaning/flushing of the HTG and CHW systems. The 54mm line(s) should be completely removed and piped through on main line as no longer routinely required, though Estates have advised the connection(s) may be required should the HTG or CHW systems require to be refilled at any point. Should connections require to be retained then lines should be cut back as far as is reasonably practicable with the resultant short connection point incorporated into the site flushing regime. | <b>3</b><br>(Or ongoing ppm)   |             |               |           |
| All Calorifiers              | Short lines ( $\approx$ 200mm) to calorifier and expansion vessel drains – these should be incorporated into site flushing regime.   | <b>3</b>                       |             |               |           |
| All Calorifiers              | Suitable insulated jackets should be fitted to calorifier inspection hatch, to prevent heat loss from vessel.  | <b>3</b>                       |             |               |           |
| All Calorifiers              | Ensure all temperature gauges are calibrated correctly and/or replaced where required.   | <b>3</b>                       |             |               |           |
| All Plant items and Pipework | All associated valves should be correctly labelled for identification purposes.  | <b>4</b>                       |             |               |           |

## WATER SYSTEM RISK ASSESSMENT

| Location / Door Disc No..           | Riser No.   | Plantroom / Calorifier | Recommendations (Risers)  | Remedial Action Category | Assigned to | Actions Taken | Completed |
|-------------------------------------|-------------|------------------------|---|--------------------------|-------------|---------------|-----------|
| Children's 4th Floor CC4-021        | M39 (RHC)   | PR 41 01/02/03         | Cold temperature too high with lever valve in half open position - investigate and correct.   | 2                        |             |               |           |
| Children's Ground Floor CC0-008     | M38 (RHC)   | PR 41 01/02/03         | Deadleg on cold line should be removed if no longer required or incorporated into site flushing regime.   | 2                        |             |               |           |
| Adults 4th Floor Ward A RENW-278    | T12 (Adult) | PR32 01/02/03          | Investigate steady leak on hot flow pipework, replacing any/all pipework and fittings required in area. Fully replace all damaged pipework insulation in riser.   | 2                        |             |               |           |
| Children's Ground Floor CC0-021     | M39 (RHC)   | PR 41 01/02/03         | Investigate visible leak under hot return line, taking any required remedial actions to correct.  | 2                        |             |               |           |
| Children's 1st Floor CC1-021        | M39 (RHC)   | PR 41 01/02/03         | Small cold temperature too high - investigate and correct.  | 2                        |             |               |           |
| Adults 11th Floor Ward A GENW21-068 | T12 (Adult) | PR32 01/02/03          | There are lines to air vents (Approx. 500mm) at top of hot flow and return risers - ensure these are WRAS approved for potable use and operating correctly and not creating a column of stagnant water. | 2                        |             |               |           |
| Adults 11th Floor Ward C GENW23-068 | T5 (Adult)  | PR31 07/08/09          | There are lines to air vents (Approx. 500mm) at top of hot flow and return risers - ensure these are WRAS approved for potable use and operating correctly and not creating a column of stagnant water. | 2                        |             |               |           |
| Adults 11th Floor Ward B GENW24-068 | T4 (Adult)  | PR31 04/05/06          | There are lines to air vents (Approx. 500mm) at top of hot flow and return risers - ensure these are WRAS approved for potable use and operating correctly, not creating a column of stagnant water.    | 2                        |             |               |           |
| Adults 11th Floor Ward D GENW22-068 | T13 (Adult) | PR33 01/02/03          | There are lines to air vents (Approx. 500mm) at top of hot flow and return risers - ensure these are WRAS approved for potable use and operating correctly, not holding stagnant water.                 | 2                        |             |               |           |
| Adults 9th Floor Ward B GENW16-068  | T4 (Adult)  | PR31 04/05/06          | Visible leak from isolated deadleg branch on hot flow with corrosion visible on lever valve - further investigation required to establish if all pipework, fittings and connections are water tight.    | 2                        |             |               |           |

## WATER SYSTEM RISK ASSESSMENT

| Location / Door Disc No..                         | Riser No.      | Plantroom / Calorifier | Recommendations (Risers)  | Remedial Action Category | Assigned to | Actions Taken | Completed |
|---|----------------|------------------------|---|--------------------------|-------------|---------------|-----------|
| Adults<br>3rd Floor<br>Plantroom 31<br>at 31AHU29 | M7<br>(Adult)  | PR31<br>01/02/03       | 15mm line to open end (Valved off) - this should be removed if no longer required (or retained on site flushign regime)   | 3                        |             |               |           |
| Adults<br>9th Floor<br>Ward B<br>GENW16-068       | T4<br>(Adult)  | PR31<br>04/05/06       | Approximately 0.5 metre of insulation on hot flow missing due to leak damage - confirm all pipework, fittings and connections are water tight and replace insulation. | 3                        |             |               |           |
| Children's<br>1st Floor<br>CC1-008                | M38<br>(RHC)   | PR 41<br>01/02/03      | Ensure any leaks are recitified and any damage caused by the leaks is repaired.   | 3                        |             |               |           |
| Children's<br>2nd Floor<br>CC2-008                | M38<br>(RHC)   | PR 41<br>01/02/03      | Ensure any leaks are recitified and any damage caused by the leaks is repaired.   | 3                        |             |               |           |
| Children's<br>3rd Floor<br>CC3-008                | M38<br>(RHC)   | PR 41<br>01/02/03      | Ensure any leaks are recitified and any damage caused by the leaks is repaired.   | 3                        |             |               |           |
| Adults<br>1st Floor<br>Atrium<br>MDU-052          | M21<br>(Adult) | PR31<br>01/02/03       | Ensure temperature gauges are calibrated correctly.   | 3                        |             |               |           |
| Adults<br>2nd Floor<br>Theatres<br>THE-359        | M7<br>(Adult)  | PR31<br>01/02/03       | Evidence of historic leak damage on insulation - further investigation required to establish if all pipework, fittings and connections are water tight.               | 3                        |             |               |           |
| Adults<br>9th Floor<br>Ward D<br>GENW14-068       | T13<br>(Adult) | PR33<br>01/02/03       | Evidence of historic leak damage on insulation - further investigation required to establish if all pipework, fittings and connections are water tight.               | 3                        |             |               |           |
| Adults<br>4th Floor<br>Ward C<br>RENN-212         | T5<br>(Adult)  | PR31<br>07/08/09       | Evidence of historic leak damage on insulation - further investigation required to establish if all pipework, fittings and connections are water tight.               | 3                        |             |               |           |
| Adults<br>6th Floor<br>Ward C<br>GENW3-068        | T5<br>(Adult)  | PR31<br>07/08/09       | Evidence of historic leak damage on insulation - further investigation required to establish if all pipework, fittings and connections are water tight.               | 3                        |             |               |           |
| Adults<br>7th Floor<br>Ward C<br>GENW7-068        | T5<br>(Adult)  | PR31<br>07/08/09       | Evidence of historic leak damage on insulation - further investigation required to establish if all pipework, fittings and connections are water tight.               | 3                        |             |               |           |

## WATER SYSTEM RISK ASSESSMENT

| Location / Door Disc No..   | Riser No.      | Plantroom / Calorifier | Recommendations (Risers)   | Remedial Action Category | Assigned to | Actions Taken | Completed |
|---|----------------|------------------------|--|--------------------------|-------------|---------------|-----------|
| Adults<br>5th Floor<br>Ward C<br>GENWC-068                        | T5<br>(Adult)  | PR31<br>07/08/09       | Evidence of historic leak damage on insulation and visible leak from both flow and return branch fittings, with corrosion visible on fittings and valves - further investigation required to establish if all pipework, fittings and connections are water tight, replacing where required and repairing/replacing insulation where necessary. | 3                        |             |               |           |
| Adults<br>8th Floor<br>Ward C<br>GENW11-068                       | T5<br>(Adult)  | PR31<br>07/08/09       | Evidence of historic leak damage on insulation and visible leak from both flow and return branch fittings, with corrosion visible on fittings and valves - further investigation required to establish if all pipework, fittings and connections are water tight, replacing where required and repairing/replacing insulation where necessary. | 3                        |             |               |           |
| Adults<br>9th Floor<br>Ward C<br>GENW15-068                       | T5<br>(Adult)  | PR31<br>07/08/09       | Evidence of historic leak damage on insulation and water pooling under hot flow branch insulation, with corrosion visible on lever valve - further investigation required to establish if all pipework, fittings and connections are water tight.  | 3                        |             |               |           |
| Adults<br>9th Floor<br>Ward A<br>Next to GENW13-068               | T12<br>(Adult) | PR32<br>01/02/03       | Evidence of leak damage under hot flow insulation - further investigation required to establish if all pipework, fittings and connections are water tight.   | 3                        |             |               |           |
| Adults<br>7th Floor<br>Ward D<br>GENW6-068                        | T13<br>(Adult) | PR33<br>01/02/03       | Gauge on hot return damaged and missing screen - inspect return temperature gauges for accuracy - these should be recalibrated or replaced if required.  | 3                        |             |               |           |
| Childrens<br>1st Floor<br>Theatre Corridor<br>THE-027             | M30<br>(Adult) | PR22<br>01/02/03       | Hot return temperature gauge missing - this should be replaced.  | 3                        |             |               |           |
| Childrens<br>Ground Floor<br>X-Ray/Imaging<br>Corridor<br>RCG-008 | M30<br>(Adult) | PR22<br>01/02/03       | Hot return temperature gauge missing - this should be replaced.  | 3                        |             |               |           |

## WATER SYSTEM RISK ASSESSMENT

| Location / Door Disc No..   | Riser No.    | Plantroom / Calorifier | Recommendations (Risiers)   | Remedial Action Category | Assigned to | Actions Taken | Completed |
|---|--------------|------------------------|---|--------------------------|-------------|---------------|-----------|
| Childrens 1st Floor Theatre THE-132                                   | M38A (Adult) | PR22 01/02/03          | Hot return temperature gauge missing – this should be replaced.   | 3                        |             |               |           |
| Adults 1st Floor Atrium STW-012                                       | M10 (Adult)  | PR31 01/02/03          | Hot return temperature gauge missing where hot returns from below – this should be replaced.  | 3                        |             |               |           |
| Multiple Risers - See Section 7 Riser Surevy for details on locations |              |                        | Inspect return temperature gauge for accuracy – this should be recalibrated or replaced if required.  | 3                        |             |               |           |
| Adults 11th Floor Ward C GENW23-068                                   | T5 (Adult)   | PR31 07/08/09          | Investigate potential leak on hot return line on isolated branch - evidence of leak damage.   | 3                        |             |               |           |
| Children's 2nd Floor SCH-038  | M36 (RHC)    | PR 41 01/02/03         | Maintain dealegs on flushing regime, or remove if no longer required.   | 3<br>(or ongoing ppm)    |             |               |           |
| Adults 1st Floor Atrium STW-012                                       | M10 (Adult)  | PR31 01/02/03          | Minimal sections of insulation missing on cold, hot flow and hot return pipework (<1m) as it rises to supply services - this should be refitted.                    | 3                        |             |               |           |
| Adults 1st Floor Corridor (at 1C) STW-012                             | M7 (Adult)   | PR31 01/02/03          | Small deadleg on pipework - this should be removed if no longer required, or retained on site flushing regime.  | 3                        |             |               |           |
| Adults 5th Floor Ward D CA5-014                                       | T2 (Adult)   | N/A                    | There is limited access to the pipework in this riser due to ducting in front of it at door into riser cupboard. Access to pipework should be improved if possible. | 3                        |             |               |           |
| Adults 6th Floor Ward D CA6-014                                       | T2 (Adult)   | N/A                    | There is limited access to the pipework in this riser due to ducting in front of it at door into riser cupboard. Access to pipework should be improved if possible. | 3                        |             |               |           |
| Adults 7th Floor Ward D CA7-014                                       | T2 (Adult)   | N/A                    | There is limited access to the pipework in this riser due to ducting in front of it at door into riser cupboard. Access to pipework should be improved if possible. | 3                        |             |               |           |

## WATER SYSTEM RISK ASSESSMENT

| Location / Door Disc No..                    | Riser No.      | Plantroom / Calorifier | Recommendations (Risers)  | Remedial Action Category | Assigned to | Actions Taken | Completed |
|--|----------------|------------------------|---|--------------------------|-------------|---------------|-----------|
| Adults<br>8th Floor<br>Ward D<br>CA8-014     | T2<br>(Adult)  | N/A                    | There is limited access to the pipework in this riser due to ducting in front of it at door into riser cupboard. Access to pipework should be improved if possible. | 3                        |             |               |           |
| Adults<br>9th Floor<br>Ward D<br>CA9-014     | T2<br>(Adult)  | N/A                    | There is limited access to the pipework in this riser due to ducting in front of it at door into riser cupboard. Access to pipework should be improved if possible. | 3                        |             |               |           |
| Adults<br>10th Floor<br>Ward D<br>CA10-014   | T2<br>(Adult)  | N/A                    | There is limited access to the pipework in this riser due to ducting in front of it at door into riser cupboard. Access to pipework should be improved if possible. | 3                        |             |               |           |
| Adults<br>11th Floor<br>Ward 11D<br>CA11-014 | T2<br>(Adult)  | N/A                    | There is no access to the pipework in this riser due to ducting in front of it at door into riser cupboard. Access to pipework should be improved if possible.      | 3                        |             |               |           |
| Childrens<br>1st Floor<br>Theatre<br>THE-143 | M27<br>(Adult) | PR22<br>01/02/03       | All pipework should be correctly labelled for identification purposes.  | 4                        |             |               |           |
| Children's<br>Ground Floor<br>CC0-021        | M39<br>(RHC)   | PR 41<br>01/02/03      | BCWS line directional labelling appears incorrect - investigate and correct as required.  | 4                        |             |               |           |
| Adults<br>7th Floor<br>Ward C<br>GENW7-068   | T5<br>(Adult)  | PR31<br>07/08/09       | Hot flow and return pipework appears labelled incorrectly (wrong way round) - labelling should be corrected.  | 4                        |             |               |           |
| Children's<br>4th Floor<br>CC4-008           | M38<br>(RHC)   | PR 41<br>01/02/03      | Hot flow and return pipework labelled incorrectly (wrong way round) - labelling should be corrected.  | 4                        |             |               |           |
| Adults<br>4th Floor<br>Ward D<br>REnw-270    | T13<br>(Adult) | PR33<br>01/02/03       | Label all pipework within riser correctly for identification purposes.  | 4                        |             |               |           |
| Adults<br>4th Floor<br>Ward C<br>REnw-212    | T5<br>(Adult)  | PR31<br>07/08/09       | Label all pipework within riser correctly for identification purposes.  | 4                        |             |               |           |



## WATER SYSTEM RISK ASSESSMENT

| Location / Door Disc No..   | Riser No.   | Plantroom / Calorifier | Recommendations (Risers)   | Remedial Action Category  | Assigned to | Actions Taken | Completed |
|---|-------------|------------------------|--|---------------------------|-------------|---------------|-----------|
| Childrens 1st Floor Theatre Corridor THE-027                          | M30 (Adult) | PR22 01/02/03          | Pipework unlabelled - All pipework should be correctly labelled for identification purposes.   | <b>4</b>                  |             |               |           |
| Multiple Risers - See Section 7 Riser Surevy for details on locations |             |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply) | <b>Ongoing Monitoring</b> |             |               |           |

### WATER SYSTEM RISK ASSESSMENT

| Level | Adults / RHC | Department / Ward | Door Code  | Room Name       | Recommendations (Hot and Cold Outlets)  | Remedial Action Category | Assigned to | Actions Taken | Completed |
|-------|--------------|-------------------|------------|-----------------|---|--------------------------|-------------|---------------|-----------|
| 0     | Adults       | A&E               | EMC-037    | Disabled Toilet | Hot flow and return not operating correctly in area - further investigation required, to ensure system balanced correctly throughout, with Kemper Multitherm Regulating Valves set correctly. | 2                        |             |               |           |
| 0     | Adults       | Acute Assess      | AAW-193    | Toilet          | Hot flow and return not operating correctly in area - further investigation required, to ensure system balanced correctly throughout, with Kemper Multitherm Regulating Valves set correctly. | 2                        |             |               |           |
| 0     | Adults       | Acute Assess      | AAW-208    | Dirty Utility   | Hot flow and return not operating correctly in area - further investigation required, to ensure system balanced correctly throughout, with Kemper Multitherm Regulating Valves set correctly. | 2                        |             |               |           |
| 0     | Adults       | Orthotics         | ORT-045    | Toilet          | Hot flow and return not operating correctly in area - further investigation required, to ensure system balanced correctly throughout, with Kemper Multitherm Regulating Valves set correctly. | 2                        |             |               |           |
| 0     | Adults       | A&E               | EMC-086    | Facilities      | Hot flow and return not operating correctly in area - further investigation required, to ensure system balanced correctly throughout, with Kemper Multitherm Regulating Valves set correctly. | 2                        |             |               |           |
| 0     | Adults       | A&E               | EMC-111    | Female Change   | Hot flow and return not operating correctly in area - further investigation required, to ensure system balanced correctly throughout, with Kemper Multitherm Regulating Valves set correctly. | 2                        |             |               |           |
| 0     | Adults       | A&E               | EMC-135    | Store           | Hot flow and return not operating correctly in area - further investigation required, to ensure system balanced correctly throughout, with Kemper Multitherm Regulating Valves set correctly. | 2                        |             |               |           |
| 10    | Adults       | Ward 10D          | GENW18-028 | Bed 15          | Hot flow and return not operating correctly in area - further investigation required, to ensure system balanced correctly throughout, with Kemper Multitherm Regulating Valves set correctly. | 2                        |             |               |           |

### WATER SYSTEM RISK ASSESSMENT

| Level | Adults / RHC | Department / Ward | Door Code | Room Name          | Recommendations (Hot and Cold Outlets)   | Remedial Action Category | Assigned to | Actions Taken | Completed |
|-------|--------------|-------------------|-----------|--------------------|--|--------------------------|-------------|---------------|-----------|
| 9     | Adults       | Ward 9B           | GENWD-036 | Room 97 (en-suite) | Hot flow and return not operating correctly in area - further investigation required, to ensure system balanced correctly throughout, with Kemper Multitherm Regulating Valves set correctly.  | 2                        |             |               |           |
| 7     | Adults       | Ward 7B           | GENW6-036 | Bed 97 (en-suite)  | Hot flow and return not operating correctly in area - further investigation required, to ensure system balanced correctly throughout, with Kemper Multitherm Regulating Valves set correctly.  | 2                        |             |               |           |
| 7     | Adults       | Ward 7D           | GENW6-028 | Bed 44 (en-suite)  | Hot flow and return not operating correctly in area - further investigation required, to ensure system balanced correctly throughout, with Kemper Multitherm Regulating Valves set correctly.  | 2                        |             |               |           |
| 1     | Adults       | Critical Care     | CCW-126   | Dirty Utility      | Hot flow and return not operating correctly in area. Flow and return operates as a constant once through loop. All visible valves in open positions. Optitherms required 10 minutes flushing to achieve recorded temperature - further investigation required, to ensure system balanced correctly throughout, with Kemper Multitherm Regulating Valves set correctly. (Limited access to pipework in open ward area due to patient care). | 2                        |             |               |           |

## WATER SYSTEM RISK ASSESSMENT

| Level | Adults / RHC | Department / Ward   | Door Code | Room Name           | Recommendations (Hot and Cold Outlets)   | Remedial Action Category | Assigned to | Actions Taken | Completed |
|-------|--------------|---------------------|-----------|---------------------|--|--------------------------|-------------|---------------|-----------|
| 1     | Adults       | Children's Theatres | THE-069   | Lab                 | <p>Ice flaking machine and associated pre-filter taken from tee on cold supply to area. No visible backflow protection on supply to filter. Ensure any required backflow protection is fitted as close to tee where line branches.</p> <p>Ice should not be allowed to stagnate in an ice-making machine's storage bin, but should be changed frequently.</p> <p>For guidance on infection-control precautions with regard to ice-making machines, see Scottish Health Facilities Note 30: 'Infection control in the built environment'.</p> <p>Maintenance for ice-making machines should be carried out in accordance with the manufacturer's recommendations. Care should be taken to ensure that the water supply to the ice-making machine is not subjected to heat gain.</p> | 3                        |             |               |           |
| 1     | Adults       | OPD                 | OPD1-085  | Toilet              | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct.   | 3                        |             |               |           |
| 1     | Adults       | Children's Theatres | THE-118   | Anaesthetics Room 2 | Cold temperature high - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct.  | 3                        |             |               |           |
| 1     | Adults       | Children's Theatres | THE-156   | Bed Bay 2           | Cold temperature high - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct.  | 3                        |             |               |           |
| 4     | Adults       | Ward 4A             | RENW-028  | Bed 14 (En-suite)   | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct.   | 3                        |             |               |           |

### WATER SYSTEM RISK ASSESSMENT

| Level | Adults / RHC | Department / Ward | Door Code | Room Name            | Recommendations (Hot and Cold Outlets)   | Remedial Action Category | Assigned to | Actions Taken | Completed |
|-------|--------------|-------------------|-----------|----------------------|--|--------------------------|-------------|---------------|-----------|
| 4     | Adults       | Ward 4C           | RENW-156  | Room 63 Ensuite      | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 6     | Adults       | Corridor          | WS6-019   | Toilet               | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 6     | Adults       | Ward 6A           | GENW1-034 | Bedroom 14 (Ensuite) | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 6     | Adults       | Ward 6B           | GENW4-032 | Bathroom A           | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 6     | Adults       | Ward 6B           | GENW4-036 | Bed 96 (En-suite)    | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 7     | Adults       | Ward 7B           | GENW6-036 | Bed 97 (en-suite)    | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 7     | Adults       | Ward 7B           | GENW8-032 | Bed 98 (en-suite)    | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |

### WATER SYSTEM RISK ASSESSMENT

| Level | Adults / RHC | Department / Ward | Door Code  | Room Name          | Recommendations (Hot and Cold Outlets)   | Remedial Action Category | Assigned to | Actions Taken | Completed |
|-------|--------------|-------------------|------------|--------------------|--|--------------------------|-------------|---------------|-----------|
| 7     | Adults       | Ward 7D           | GENW6-034  | Bed 42 (En-suite)  | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 8     | Adults       | Ward 8A           | GENWD-029  | Room 13 (en-suite) | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 8     | Adults       | Ward 8D           | GENW10-058 | Room 32 (en-suite) | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 9     | Adults       | Corridor          | WS9-019    | Toilet             | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 9     | Adults       | Ward 9A           | GENW13-034 | Bathroom 15        | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 9     | Adults       | Ward 9D           | GENW14-034 | Bed 42 Ensuite     | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 10    | Adults       | Ward 10A          | GENWD-029  | Bed 13 (En-suite)  | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |

### WATER SYSTEM RISK ASSESSMENT

| Level | Adults / RHC | Department / Ward   | Door Code  | Room Name             | Recommendations (Hot and Cold Outlets)   | Remedial Action Category | Assigned to | Actions Taken | Completed |
|-------|--------------|---------------------|------------|-----------------------|--|--------------------------|-------------|---------------|-----------|
| 10    | Adults       | Ward 10B            | GENW20-032 | Bed 98 Ensuite        | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 11    | Adults       | Ward 11A            | GENWD-029  | Bed 13 (En-suite)     | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 1     | RHC          | Children's Theatres | THE-009    | WC                    | Cold temperature high - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct.  | 3                        |             |               |           |
| 2     | RHC          | Asceptic Unit       | ASU-036    | Staff Change          | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 2     | RHC          | Ward 2A             | SCH-003    | Bedroom 25 (En-suite) | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 3     | RHC          | Ward 3C             | GW1-048    | Staff WC              | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 9     | Adults       | Ward 9B             | GENWD-036  | Room 97 (en-suite)    | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |

### WATER SYSTEM RISK ASSESSMENT

| Level | Adults / RHC | Department / Ward                    | Door Code  | Room Name          | Recommendations (Hot and Cold Outlets)  | Remedial Action Category | Assigned to | Actions Taken | Completed |
|-------|--------------|--------------------------------------|------------|--------------------|---|--------------------------|-------------|---------------|-----------|
| 7     | Adults       | Ward 7D                              | GENW6-028  | Bed 44 (en-suite)  | Cold temperature high, though temperatures in surrounding area acceptable. Investigate and correct.   | 3                        |             |               |           |
| 10    | Adults       | Ward 10A                             | GENW17-034 | Room 15 (en-suite) | Cold temperature high, though temperatures in surrounding area acceptable. Investigate and correct.   | 3                        |             |               |           |
| 0     | RHC          | Children's A&E (Next to Courtyard 2) | EMC-018    | Childrens Resus    | Cold temperature high, though temperatures in surrounding area acceptable. Investigate and correct.   | 3                        |             |               |           |
| 0     | Adults       | A&E                                  | EMC-111    | Female Change      | Cold temperature slightly high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 0     | Adults       | Acute Assess                         | AAW-060    | Toilet             | Cold temperature slightly high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 0     | Adults       | Acute Assess                         | AAW-089    | Bedroom 85         | Cold temperature slightly high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 0     | Adults       | Discharge Lounge                     | DLO-006    | Toilet             | Cold temperature slightly high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 0     | Adults       | Radiology                            | RAG-068    | Toilet             | Cold temperature slightly high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |



### WATER SYSTEM RISK ASSESSMENT

| Level | Adults / RHC | Department / Ward | Door Code | Room Name                | Recommendations (Hot and Cold Outlets)  | Remedial Action Category | Assigned to | Actions Taken | Completed |
|-------|--------------|-------------------|-----------|--------------------------|---|--------------------------|-------------|---------------|-----------|
| 0     | Adults       | Radiology         | RAG-092   | Toilet                   | Cold temperature slightly high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 1     | Adults       | OPD               | OPD1-037  | Toilet                   | Cold temperature slightly high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 1     | Adults       | Radiology         | RAF-087   | Male Change Room         | Cold temperature slightly high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 1     | Adults       | Restaurant        | RES-035   | Disabled Toilet          | Cold temperature slightly high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 1     | Adults       | Stroke            | STW-082   | Therapies Treatment Room | Cold temperature slightly high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 2     | Adults       | Adult Theatres    | THE-079   | On Call Room en-suite    | Cold temperature slightly high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 2     | Adults       | Adult Theatres    | THE-319   | Dirty Utility            | Cold temperature slightly high - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct.  | 3                        |             |               |           |

### WATER SYSTEM RISK ASSESSMENT

| Level | Adults / RHC | Department / Ward | Door Code | Room Name                                  | Recommendations (Hot and Cold Outlets)  | Remedial Action Category | Assigned to | Actions Taken | Completed |
|-------|--------------|-------------------|-----------|--|---|--------------------------|-------------|---------------|-----------|
| 2     | Adults       | Dermatology       | DMW-031   | Bed 6 (En-suite)                           | Cold temperature slightly high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 4     | Adults       | Ward 4C           | REnw-153  | Room 62 Ensuite                            | Cold temperature slightly high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 5     | Adults       | Ward 5A           | GENWA-029 | Bed 13 Bathroom                            | Cold temperature slightly high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. | 3                        |             |               |           |
| 0     | Adults       | Acute Assess      | AAW-193   | Toilet                                     | Cold temperature slightly high - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct.  | 3                        |             |               |           |
| 0     | Adults       | Radiology         | RCG-068   | Baby Sleep                                 | Cold temperature slightly high - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct.  | 3                        |             |               |           |
| 1     | Adults       | OPD               | OPD1-063  | Dirty Utility                              | Cold temperature slightly high - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct.  | 3                        |             |               |           |
| 2     | Adults       | Dermatology       | DOPD-025  | Technician                                 | Cold temperature slightly high - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct.  | 3                        |             |               |           |
| 2     | Adults       | Renal             | RENO-064  | No name ("Laser in Use" sign next to door) | Cold temperature slightly high - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct.  | 3                        |             |               |           |

### WATER SYSTEM RISK ASSESSMENT

| Level | Adults / RHC | Department / Ward                    | Door Code | Room Name                                  | Recommendations (Hot and Cold Outlets)  | Remedial Action Category | Assigned to | Actions Taken | Completed |
|-------|--------------|--------------------------------------|-----------|--|---|--------------------------|-------------|---------------|-----------|
| 2     | Adults       | Renal                                | RENO-064  | No name ("Laser in Use" sign next to door) | Confirm suitable backflow protection fitted at tees to 2 x BCWS branches to Renal Test Points and 3 x isolated undersink connections. | 3                        |             |               |           |
| 1     | Adults       | Radiology                            | RAF-087   | Male Cyhange Room                          | LHS TMT out of specification and requires reset and/or fully serviced or replaced if required.  | 3                        |             |               |           |
| 0     | Adults       | Acute Assess                         | AAW-208   | Dirty Utility                              | TMT out of specification and requires reset and/or fully serviced or replaced if required.  | 3                        |             |               |           |
| 0     | Adults       | Acute Assess                         | AAW-240   | Toilet                                     | TMT out of specification and requires reset and/or fully serviced or replaced if required.  | 3                        |             |               |           |
| 0     | Adults       | OPD/ Concourse                       | OPDO-075  | Toilet                                     | TMT out of specification and requires reset and/or fully serviced or replaced if required.  | 3                        |             |               |           |
| 0     | Adults       | Radiology                            | RAG-103   | Store Room                                 | TMT out of specification and requires reset and/or fully serviced or replaced if required.  | 3                        |             |               |           |
| 1     | Adults       | Radiology                            | RNM-018   | NO SIGN ON DOOR                            | TMT out of specification and requires reset and/or fully serviced or replaced if required.  | 3                        |             |               |           |
| 2     | Adults       | Dermatology                          | DMW-025   | Bathroom A                                 | TMT out of specification and requires reset and/or fully serviced or replaced if required.  | 3                        |             |               |           |
| 5     | Adults       | Ward 5B                              | GENWD-032 | Disabled Toilet                            | TMT out of specification and requires reset and/or fully serviced or replaced if required.  | 3                        |             |               |           |
| 9     | Adults       | Corridor                             | WS9-019   | Toilet                                     | TMT out of specification and requires reset and/or fully serviced or replaced if required.  | 3                        |             |               |           |
| 0     | RHC          | Clinic 14                            | CPS-006   | Toilet                                     | TMT out of specification and requires reset and/or fully serviced or replaced if required.  | 3                        |             |               |           |
| 4     | RHC          | DCFP                                 | DCFP-013  | Staff Toilet                               | TMT out of specification and requires reset and/or fully serviced or replaced if required.  | 3                        |             |               |           |
| 0     | Adults       | Acute Assess                         | AAW-038   | Toilet                                     | TMT out of specification and requires reset and/or fully serviced or replaced if required.  | 3                        |             |               |           |
| 1     | Adults       | OPD                                  | OPD1-037  | Toilet                                     | TMT out of specification and requires reset and/or fully serviced or replaced if required.  | 3                        |             |               |           |
| 0     | RHC          | Children's A&E (Next to Courtyard 2) | EMC-018   | Childrens Resus                            | TMT out of specification and requires reset and/or fully serviced or replaced if required.  | 3                        |             |               |           |
| 2     | Adults       | Adult Theatres                       | THE-319   | Dirty Utility                              | TMT out of specification and requires reset and/or fully serviced or replaced if required.  | 3                        |             |               |           |
| 0     | Adults       | Acute Assess                         | AAW-060   | Toilet                                     | TMT slightly out of specification and requires reset and/or fully serviced or replaced if required.                                   | 3                        |             |               |           |
| 0     | Adults       | Acute Assess                         | AAW-193   | Toilet                                     | TMT slightly out of specification and requires reset and/or fully serviced or replaced if required.                                   | 3                        |             |               |           |

## WATER SYSTEM RISK ASSESSMENT

| Level | Adults / RHC | Department / Ward  | Door Code | Room Name          | Recommendations (Hot and Cold Outlets)  | Remedial Action Category | Assigned to | Actions Taken | Completed |
|-------|--------------|--------------------|-----------|--------------------|---|--------------------------|-------------|---------------|-----------|
| 9     | Adults       | Ward 9B            | GENWD-036 | Room 97 (en-suite) | Uninsulated hot & cold pipework in direct contact with each other, causing heat transfer - Investigate and correct.   | 3                        |             |               |           |
| 0     | Adults       | Discharge Lounge   | DLO-006   | Toilet             | Water Hammer and pulsing through solenoid/TMV - Investigate and correct.  | 3                        |             |               |           |
|       |              | All DSR/Facilities |           | All DSR/Facilities | Janitorial Sinks have EPDM flexible hoses installed within the sink unit. These should be replaced with hard piped serviced (if practical) or replaced with suitable alternative flexible hoses e.g. PEX) | 3                        |             |               |           |

**WATER SYSTEMS RISK ASSESSMENT**

# **Section 3**

## **Site/Client Details**

## WATER SYSTEMS RISK ASSESSMENT

### Site/Client Details

|                      |   |
|----------------------|---|
| Client               | GG&C QEUH   |
| Client address       | Queen Elizabeth University Hospital<br>1345 Govan Road<br>Glasgow                 |
| Client contact       | Kerr Clarkson   |
| Telephone No.        | ██████████  |
| E-mail               | kerr.clarkson ██████████  |
| Mobile No.           | ██████████  |
| Wards Being Assessed | Queen Elizabeth University Hospital (Adults)<br>Royal Hospital for Children (RHC) |

|                      |            |
|----------------------|------------|
| Method of Submission | Electronic |
|----------------------|------------|

## WATER SYSTEMS RISK ASSESSMENT

### General Site Details

|   |   |
|---|---|
| Site  | Queen Elizabeth University Hospital (Adults) and Royal Hospital for Children  |
| Age of building   | Opened in 2015 (Building and Commissioning 2011-2015)   |
| Years since upgrade/renovation of water services  | Original system with modifications as described within the assessment occurring in late 2018/early 2019 and ward 2A/2B upgrade works being completed in 2022. |
| Purpose/use of building   | Hospital  |
| Operational cycle of the water system being assessed?   | Continuous  |
| Potentially affected population   | Staff, Contractors, Visitors, Patients, General public  |
| Is the building used by "at risk" or "particularly vulnerable" persons                            | Yes - Acute medical conditions, with the likelihood that some may be more susceptible to legionellosis and or other water borne pathogens.                    |
| Total number of people usually in building (including staff/sub-contractors visitors/pupils etc.) | Variable depending on occupancy levels etc. (Approx. 1350 Beds, plus outpatient's departments etc.)   |
| Applicable Legionella standard(s)   | ACoP L8 (HSG-274), SHTM 04-01   |

## WATER SYSTEMS RISK ASSESSMENT

### Identification of Systems and Scope of Assessment

|  |  |                 |
|--|--|-----------------|
| Domestic Water System  | Present on Site<br>Included in Assessment  |                 |
| Evaporative cooling tower or condenser systems (and associated water system) | N/A  |                 |
| Fountains and water features   | N/A  |                 |
| Hydrotherapy Pool  | Present on site<br>Covered under separate assessment   |                 |
| Whirlpool/Arjo Baths   | Present on site<br>(Non Whirlpool variety)   |                 |
| Dental equipment   | Present on site  |                 |
| Vehicle wash systems (inc. Trolley Wash & Power Washing Plant)               | N/A  |                 |
| Emergency showers  | Present on site<br>(A&E Decontamination unit)  |                 |
| Irrigation systems   | N/A<br>Disconnected/No longer present on site  |                 |
| Sprinkler/Wet fire-fighting systems  | Present on site<br>Not covered under this assessment   |                 |
| Water softeners  | None identified to DMA   |                 |
| Industrial process water systems   | N/A  |                 |
| Machine coolants   | N/A  |                 |
| Air washers, wet scrubbers, particle and trivial gas scrubbers               | N/A  |                 |
| Spray humidifiers  | N/A<br>Disconnected/No longer present on site  |                 |
| Ultrasonic humidifiers/foggers and water misting systems                     | N/A  |                 |
| Recycled Water Systems   | N/A  |                 |
| Closed heating water systems (MTHW)  | Present on site  |                 |
| Closed chilled water systems   | Present on site  |                 |
| Other 'at-risk' systems  | Renal Dialysis Plant (Adults & Childrens)<br>(Plus other emergency dialysis points within wards) | Present on site |
|  | Endoscopy Wash/Filtration Unit   | Present on site |
|  | Medical Gases/Medical Equipment<br>(e.g. Nebulisers, incubators etc.)                            | Present on site |
|  | Emergency Cooling (MRI Chiller)  | Present on site |

**N.B.** Systems assessed in this document as per client specification.



## WATER SYSTEMS RISK ASSESSMENT

### Legionella Control Measures Currently Used on Site

| What is the primary control method for legionella control for the domestic water systems currently used on site and are there any supplementary or replacement control systems on site?# |  |
|--|--|
|  | <b>Control measure</b>   |
| Temperature controlled   | Primary  |
| Chlorine dioxide   | Secondary  |
| Hydrogen peroxide/silver ion   | Not used   |
| Silver/copper ion  | Not used   |
| Ultraviolet  | Not used   |
| Other (0.2µm filters between Raw and Bulk Tanks)   | Secondary  |
| Point of Use (Pall) Filters on Outlets   | Secondary<br>(Fitted in clinically designated "High Risk" areas) |

**WATER SYSTEM RISK ASSESSMENT**

# **Section 4**

## **Water Source**

## **WATER SYSTEM RISK ASSESSMENT**

### **Summary of Risk Potential**

Town mains water is generally not expected to present a significant risk for the contamination of a system with legionella, though it may be assumed that legionella in low concentrations could be present in the mains water on occasion. Therefore it must be assumed that it is not practical to prevent legionella entering the water system at some point.

There are, in addition, other bacteria, contaminants and physical factors that can create a risk to mains water users in the building.

Where the water source to the site is from a natural source, e.g. River, lake, spring or private water supply then the potential for legionella contamination increases.

**N.B.** Unless specifically stated otherwise the incoming mains/water source has been assessed from point of entry to the building. External & underground water services which serve the building and are not visible have not been assessed.

Please refer to water source sheets for specific recommendations and risk ratings.

## WATER SYSTEM RISK ASSESSMENT

| Id no.                    |                        | Hardgate Road (Large)                     | Recommendations and Comments   | Assigned to | Completed |
|---------------------------|------------------------|---|--|-------------|-----------|
| Labelled                  |                        | Mains: Yes<br>Pipework: Yes<br>Valves: No | <p>All plant items, pipework and valves should be labelled for identification purposes.</p> <p><b>Comments:</b><br/>No access to point where incoming mains enters the building. Access only available up to point where it enters into high level passageway before entering basement tank room.</p> <p>Deadlegs (drain points/injection points) on the incoming mains on are incorporated into site flushing regime.</p> |             |           |
| Access                    |                        | Good                                      |  |             |           |
| Type                      |                        | Town Mains                                |  |             |           |
| Supply company            |                        | Scottish Water                            |  |             |           |
| Services supplied         |                        | Raw Water CWSTs 1A & 2A                   |  |             |           |
| Location                  |                        | -1 Basement CWST Plant Room               |  |             |           |
| Size                      |                        | 150mm                                     |  |             |           |
| Material                  |                        | MDPE, Stainless steel                     |  |             |           |
| Double check valve fitted |                        | Yes                                       |  |             |           |
| Drain/injection point     |                        | None visible                              |  |             |           |
| Temperature (°c)          |                        | 9.4                                       |  |             |           |
| Pipework insulated        |                        | Yes                                       |  |             |           |
| Incoming Water            | pH                     | 7.4                                       |  |             |           |
|                           | Residual free chlorine | 0.43                                      |  |             |           |
| Isolation valve           |                        | Yes                                       |  |             |           |
| Deadlegs                  |                        | See comments                              |  |             |           |
| Non WRAS materials        |                        | None visible                              |  |             |           |
| Level of Risk             |                        | <b>Low</b>                                |  |             |           |

## WATER SYSTEM RISK ASSESSMENT

| Id no.                    | Govan Road   | Recommendations and Comments  | Assigned to | Completed |
|---------------------------|--|---|-------------|-----------|
| Labelled                  | Mains: Yes<br>Pipework: Yes<br>Valves: No  | All plant items, pipework and valves should be labelled for identification purposes.  |             |           |
| Access                    | Good   | <p>The is a long (&gt;20 metres) branch via DCV and pressure reducer to Children's Clinic 12 Hydrotherapy Pool Balance Tank top-up. DCV on initial branch from incoming mains should be repositioned as close to tee as practical. <b>Note:</b> DMA are due to install a category 5 break tank and booster pump to this line to provide backflow protection from the hydrotherapy pool and top-up tank.</p> <p><b>Comments:</b><br/>Water meter and check valve in main tank room after connection to trades water tank.</p> <p>Deadlegs (drain points/injection points) on the incoming mains within the tank room on are currently incorporated into site flushing regime.</p> <p>22mm-15mm branch supplying LTHW pressurisation unit within room where mains enters the building are currently incorporated into site flushing regime.</p> |             |           |
| Type                      | Town mains   |   |             |           |
| Supply company            | Scottish Water   |   |             |           |
| Services supplied         | Raw Water CWSTs 1B & 2B<br>LTHW Pressurisation Unit (A-1 FMB-006)<br>Hydrotherapy Pool Balance Tank Top-Up<br>Trade Water CWST 1 |   |             |           |
| Location                  | -1 Basement CWST Plant Room<br>(A-1 FMB-006)   |   |             |           |
| Size                      | 150mm  |   |             |           |
| Material                  | MDPE, Stainless steel  |   |             |           |
| Double check valve fitted | Yes  |   |             |           |
| Drain/injection point     | Yes  |   |             |           |
| Temperature (°c)          | 9.2  |   |             |           |
| Pipework insulated        | Yes  |   |             |           |
| Incoming Water            | pH   |   | 7.4         |           |
|                           | Residual free Chlorine   |   | 0.48        |           |
| Isolation valve           | Yes  |   |             |           |
| Deadlegs                  | See comments   |   |             |           |
| Non WRAS materials        | None visible   |   |             |           |
| Level of Risk             | <b>Medium</b>  |   |             |           |

## WATER SYSTEM RISK ASSESSMENT

| Id no.                    |                        | Hardgate Road (Small – Fire Tanks)        | <b>Recommendations and Comments</b>   | Assigned to | Completed |
|---------------------------|------------------------|---|---|-------------|-----------|
| Labelled                  |                        | Mains: Yes<br>Pipework: Yes<br>Valves: No | <p>As this mains line is likely to have a low turnover of water (other than the site flushing regime) it is recommend the NHS confirms that this main is separated from domestic water mains by a double check valve or similar (possibly external to building) to prevent potentially stagnant water from contaminating the domestic mains.</p> <p>All plant items, pipework and valves should be labelled for identification purposes.</p> <p><b>Comment:</b> The 2 basement Fire Tanks (within basement Fire Tank Room) are included within the site flushing regime with the tanks being flushed for a period of up to 30 minutes to flush fresh water into the tanks and to flush the mains make-up line to the tanks.</p> |             |           |
| Access                    |                        | Good                                      |   |             |           |
| Type                      |                        | Town mains                                |   |             |           |
| Supply company            |                        | Scottish Water                            |   |             |           |
| Services supplied         |                        | Fire tanks                                |   |             |           |
| Location                  |                        | -1 Basement CWST Plant Room               |   |             |           |
| Size                      |                        | 54mm                                      |   |             |           |
| Material                  |                        | MDPE, Stainless steel                     |   |             |           |
| Double check valve fitted |                        | Yes                                       |   |             |           |
| Drain/injection point     |                        | Yes                                       |   |             |           |
| Temperature (°c)          |                        | Not Run                                   |   |             |           |
| Pipework insulated        |                        | Yes                                       |   |             |           |
| Incoming Water            | pH                     | -   |   |             |           |
|                           | Residual free Chlorine | -   |   |             |           |
| Isolation valve           |                        | Yes                                       |   |             |           |
| Deadlegs                  |                        | None visible                              |   |             |           |



## WATER SYSTEM RISK ASSESSMENT

|                    |  |  |  |  |
|--------------------|--|--|--|--|
| Non WRAS materials | None visible   |  |  |  |
| Level of Risk      | <p style="text-align: center;"><b>Low</b></p> Only connected into fire fighting system<br>(and included within site flushing regime) |  |  |  |

## **WATER SYSTEM RISK ASSESSMENT**

# **Section 5**

## **Cold Water Storage Tanks**



## WATER SYSTEM RISK ASSESSMENT

### CWSTs and Filters

#### QEUE Adult and Children's Hospital CWSTs

There are 10 domestic water storage tanks in the building which are all situated in the basement tank room.

Raw Water Tanks 1A/1B and 2A/2B are supplied by two town mains (Govan Road and Hardgate Road) to ensure continuity of supply in case of a town mains failure. The Raw Water tanks supply the Filtered Water tanks 1A/1B and 2A/2B via 3 x filtration sets (level of filtration advised by Estates is 0.2µm).

The filtration units fill the Filtered Water Tanks. Filtration sets should be maintained in accordance with manufacturer's instructions and maintenance schedule.

Each of the filtration units have a Scotmas ClO<sub>2</sub> dosing unit installed which operates on the backwash cycle of the filtration unit. These were fitted later than the original ClO<sub>2</sub> units on the domestic water systems to aid with microbiological control of the filters during backwashing. Note: the discharge water from the filtration unit backwash cycles are discharged to separate sumps to prevent stagnation in the sumps and assist with control microbiological growth in the sumps within the plantroom.

Filtered Water Tanks 1A and 1B are linked, with 2A and 2B also linked. All four tanks can be linked together (via valve on the supply lines to the booster pump sets) to supply domestic cold water including drinking water to the building with the exception of the trades system. The link between the tanks 1A/1B and 2A/2B was closed at the time survey with Filtered Tanks 1A/1B supplying the 5.3 Bar pump set (Boosted Pump Set 2) to plantrooms 21/22/41 and the corresponding outlets in these zones with 2A/2B supplying the 7.1 Bar pump set (Boosted Pump Set 1) to plantrooms 31/32/33 and the corresponding outlets in these zones.

All tanks have stainless-steel flange supports which may permit water ingress similar to hollow tank lid supports. Hollow tank supports are recommended to be replaced with solid support beams within HSG 274 and SHTM 04-01. Hollow flange supports are a much less common support structure and it is recommended that these supports are checked to ensure that they are not permitting water ingress, and if found that they are, should be removed and replaced with solid alternatives.

In late 2018 and early 2019 a ClO<sub>2</sub> system was installed on the domestic water system. Each of the post filter CWSTs has a ClO<sub>2</sub> dosing system (dosing to 0.4-0.5ppm of ClO<sub>2</sub>) utilising water meter controlled proportional dosing (with in-tank reaction chambers) with ClO<sub>2</sub> and Chlorite monitoring stations fitted to the outlet lines prior to the booster pumps.

**N.B.** It should be noted that there is no separate dedicated supply to the Renal (or other medical) systems, with all being fed from the Filtered Water system. This means that system disinfections would require to be very carefully scheduled or carried out locally as the disinfection procedure/chemical may interfere with the renal/medical systems and impact on patient welfare.

There are 2 x water booster sets in the water tank room. In the event of failure the outlet pipework from the booster pumps can be configured so that a single booster set could provide all water to the building (though DMA are unaware of this happening at any point during the buildings normal operations).

(Boosted Pump Set 1) – Feeding Plantroom 31, 32 & 33 - 7.1 Bar  
(Boosted Pump Set 2) – Feeding Plantroom 21, 22 & 41 – 5.3 Bar

The expansion vessels attached to the CWST booster sets are not of a flow through design and they are not insulated. It appears that small, quarter turn valves have been fitted to both 7.1 Bar booster set and the Trade Water tank booster set. No fitted drain point on 5.0 Bar booster set at time of survey.

Each of the individual risers has a ClO<sub>2</sub> monitoring and top-up station fitted to the riser within the basement tank room which monitors the ClO<sub>2</sub> levels being discharged to the respective area supplied by the riser and is capable of topping up the ClO<sub>2</sub> levels within the line should this be required.

From the 2 No. water booster sets there are 8 domestic water systems:

- Plantroom 21
  - Via a Pressure reducing valve (PRV) the BCWS feed 21 CAL01/02/03

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- Plantroom 22
  - Via a Pressure reducing valve (PRV) the BCWS feed 22 CAL01/02/03
- Plantroom 31
  - BCWS feeds 31 CAL01/02/03
- Plantroom 31
  - Via a Pressure reducing valve (PRV) the BCWS feeds 31 CAL07/08/09
- Plantroom 31
  - BCWS feeds 31 CAL04/05/06
- Plantroom 32
  - BCWS feeds 32 CAL01/02/03
- Plantroom 33
  - BCWS feeds 33 CAL01/02/03
- Plantroom 41
  - BCWS feeds 41 CAL01/02/03

On the cold supply into each of the plantrooms there are ClO<sub>2</sub> monitoring and top-up stations fitted to the plantroom supplies which monitors the ClO<sub>2</sub> levels being discharged to the respective area and is capable of topping up the ClO<sub>2</sub> levels within the line should this be required.

Additional ClO<sub>2</sub> units are fitted on the return lines to each of the Calorifiers (8 banks of calorifiers), within monitoring station fitted at various locations throughout the Adult and Children's Hospitals.

All ClO<sub>2</sub> units are maintained and serviced by Scotmas.

The water supply into each plantroom is metered by a CWS flow meter. This allows for monitoring of specific parts of the system for energy purposes.

There are various connection points onto other "non-domestic" outlets such as renal dialysis, endoscopy wash, pressurisation units, and MRI chiller cooling which are connected to the Filtered Water system. Note: the steam humidifier units have been removed completely or cut back as far as practical to source, since previous assessment.

Branch from Booster Set 01 to pool plant room emergency shower. Hot supply removed and flow/return looped in Pool Plant Room A-1 FMB-030, and operational. DCV fitted approx. 4m downstream of branch after water meter in Basement A-1 FMB -024. Bib tap and Pool top up tank within the pool plantroom have been disconnected/removed. Emergency Shower should be included within site flushing regime (Note: No drain within the tank room)

The Trades Water System originally supplied "Non-domestic" outlets such as bib taps in plantrooms, irrigation connections points (DMA understand these are now all disconnected) and the 12<sup>th</sup> floor heli-pad fire suppression system. One side of the Trades tank was isolated and drained with the make-up to the tank removed. This tank now only supplies the 12<sup>th</sup> floor heli-pad fire suppression and bib taps on the 12<sup>th</sup> floor.

### **Additional Comments/Recommendations:**

It was noted during the survey of Level -1 Basement Plant Room CWSTs and associated filtration plant that 2 x non-WRAS approved butterfly valve assemblies have been installed on Filtration Unit 3.

These valves (Tomoe 700Z) have diecast aluminium bodies and appear to be intended for marine/saltwater applications. Verification has been received from the manufacturer stating that these valves are not deemed suitable for potable use and carry no WRAS approval to date.

It should be confirmed that all persons/contractors carrying out works on the domestic water systems on site, use only WRAS approved materials and that any/all materials used are deemed suitable for potable use and carry the required certifications/approvals.

## WATER SYSTEM RISK ASSESSMENT

| Name/number of CWST             |   | Raw Water Tank 1A               |                  |  | Recommendations   | Assigned to | Completed |
|---------------------------------|---|---------------------------------|------------------|--|---|-------------|-----------|
| Location of CWST                |   | -1 Basement Tank Plant Room     |                  |  |   |             |           |
| Labelled                        | <b>CWST</b>   | <b>Pipework</b>                 | <b>Valves</b>    |  | Risk Rating – <b>Low Risk</b>   |             |           |
|                                 | Yes   | Yes                             | Yes              |  |   |             |           |
| Type                            | Sectional   |                                 |                  |  | Additional access hatches on tanks for cleaning/inspection purposes should be considered.   |             |           |
| Materials                       | GRP   |                                 |                  |  |   |             |           |
| Lined                           | No  |                                 |                  |  | Raised hatch screened vent appears unsuitable and should have suitably sized screened mesh fitted.  |             |           |
| Dimensions (m)                  | 5.0 x 5.0 x 2.0   |                                 |                  |  |   |             |           |
| Volume (litres)                 | 50,000 Nominal – Actual volume of stored water variable depending on set point on BMS |                                 |                  |  | <b>Comments</b>   |             |           |
| Linked/single                   | Linked to Raw Water 1B  |                                 |                  |  |   |             |           |
| M/U opposite draw off           | Diagonal  |                                 |                  |  | Deadleg to the tank drain valve is included within the site recorded flushing regime.   |             |           |
| Make up source                  | Town Mains (Hardgate Road)  |                                 |                  |  |   |             |           |
| Services supplied               | Filtered Water CWSTs 1A - 2B (via filtration units 1-3)                               |                                 |                  |  | A regular sampling regime is carried out on the CWSTs, which periodically highlight "out-of-Specification" results for GNB and Yeast/Moulds, particularly from drain point samples. Tank drains are included within the site flushing regime, with additional disinfection/flushing carried out in as/when "out-of-Specification" results returned. |             |           |
| Temperature °C                  | <b>Make Up</b>  | <b>Tank Water</b>               | <b>Plantroom</b> |  |   |             |           |
|                                 | Not Running   | 9.3                             | 13.6             |  |   |             |           |
| Internal condition              | Internal  | Good                            |                  |  |   |             |           |
|                                 | Waterline   | Light Marking                   |                  |  |   |             |           |
|                                 | Dirt & silt   | Clean                           |                  |  |   |             |           |
| Water condition                 | Clear   |                                 |                  |  |   |             |           |
| Stagnation                      | None Evident  |                                 |                  |  |   |             |           |
| Deadlegs around CWST            | See details of deadlegs, connection and flushing points within basement plantroom     |                                 |                  |  |   |             |           |
| Close fitting lid/screened vent | Yes   | Fitted – TBC Suitable           |                  |  |   |             |           |
| Warning Pipe Screen             | Fitted – End of Line  |                                 |                  |  |   |             |           |
| Overflow Screen                 | Fitted - Integral   |                                 |                  |  |   |             |           |
| Insulation                      | Yes - Integral  |                                 |                  |  |   |             |           |
| Access                          | Good – Fixed Ladder   |                                 |                  |  |   |             |           |
| Vents returning to CWST         | No  |                                 |                  |  |   |             |           |
| Is drain present?               | Yes – Creating Deadleg (Flushing Regime)  |                                 |                  |  |   |             |           |
| Booster pumps                   | Fitted  | <b>See Filtered Water Tanks</b> |                  |  |   |             |           |
|                                 | Vibration Couplings   |                                 |                  |  |   |             |           |
|                                 | Expansion Vessel  |                                 |                  |  |   |             |           |
|                                 | Drain on Vessel?  |                                 |                  |  |   |             |           |

## WATER SYSTEM RISK ASSESSMENT

| Name/number of CWST             |  | Raw Water Tank 1B               |                  |   | Recommendations and Comments  | Assigned to | Completed |
|---------------------------------|--|---------------------------------|------------------|---|-------------------------------|-------------|-----------|
| Location of CWST                |  | -1 Basement Tank Plant Room     |                  |   |                               |             |           |
| Labelled                        | <b>CWST</b>  | <b>Pipework</b>                 | <b>Valves</b>    |   | Risk Rating – <b>Low Risk</b> |             |           |
|                                 | Yes  | Yes                             | Yes              |   |                               |             |           |
| Type                            | Sectional  |                                 |                  | Additional access hatches on tanks for cleaning/inspection purposes should be considered.   |                               |             |           |
| Materials                       | GRP  |                                 |                  |   |                               |             |           |
| Lined                           | No   |                                 |                  | Raised hatch screened vent appears unsuitable and should have suitably sized screened mesh fitted.  |                               |             |           |
| Dimensions (m)                  | 5.0 x 5.0 x 2.0  |                                 |                  |   |                               |             |           |
| Volume (litres)                 | 50,000 Nominal – Actual volume of stored water variable depending on set point on BMS            |                                 |                  | <b>Comments</b>   |                               |             |           |
| Linked/single                   | Linked to Raw Water 1A   |                                 |                  |   |                               |             |           |
| M/U opposite draw off           | Diagonal   |                                 |                  | Deadleg to the tank drain valve is included within the site recorded flushing regime.   |                               |             |           |
| Make up source                  | Town mains (Govan Road)  |                                 |                  |   |                               |             |           |
| Services supplied               | Filtered Water CWSTs 1A - 2B (via filtration units 1-3)<br><b>See Raw Water Tank 1A Comments</b> |                                 |                  | A regular sampling regime is carried out on the CWSTs, which periodically highlight "out-of-Specification" results for GNB and Yeast/Moulds, particularly from drain point samples. Tank drains are included within the site flushing regime, with additional disinfection/flushing carried out in as/when "out-of-Specification" results returned. |                               |             |           |
| Temperature °C                  | <b>Make Up</b>   | <b>Tank Water</b>               | <b>Plantroom</b> |   |                               |             |           |
|                                 | Not Running  | 9.4                             | 13.6             |   |                               |             |           |
| Internal condition              | Internal   | Good                            |                  |   |                               |             |           |
|                                 | Waterline  | Light Marking                   |                  |   |                               |             |           |
|                                 | Dirt & silt  | Clean                           |                  |   |                               |             |           |
| Water condition                 | Clear  |                                 |                  | None Evident  |                               |             |           |
| Stagnation                      |  |                                 |                  |   |                               |             |           |
| Deadlegs around CWST            | See details of deadlegs, connection and flushing points within basement plantroom                |                                 |                  | Yes   | Fitted – TBC Suitable         |             |           |
| Close fitting lid/screened vent |  |                                 |                  |   |                               |             |           |
| Warning Pipe Screen             | Fitted – End of Line   |                                 |                  | Fitted - Integral   |                               |             |           |
| Overflow Screen                 |  |                                 |                  |   |                               |             |           |
| Insulation                      | Yes - Integral   |                                 |                  | Good – Fixed Ladder   |                               |             |           |
| Access                          |  |                                 |                  |   |                               |             |           |
| Vents returning to CWST         | No   |                                 |                  | Yes – Creating Deadleg (Flushing Regime)  |                               |             |           |
| Is drain present?               |  |                                 |                  |   |                               |             |           |
| Booster pumps                   | Fitted   | <b>See Filtered Water Tanks</b> |                  |   |                               |             |           |
|                                 | Vibration Couplings  |                                 |                  |   |                               |             |           |
|                                 | Expansion Vessel   |                                 |                  |   |                               |             |           |
|                                 | Drain on Vessel?   |                                 |                  |   |                               |             |           |

## WATER SYSTEM RISK ASSESSMENT

| Name/number of CWST             |                     | Raw Water Tank 2A  |                   |                  | Recommendations and Comments  | Assigned to | Completed |
|---------------------------------|---------------------|--|-------------------|------------------|---|-------------|-----------|
| Location of CWST                |                     | -1 Basement Tank Plant Room  |                   |                  |   |             |           |
| Labelled                        | <b>CWST</b>         | <b>Pipework</b>  | <b>Valves</b>     |                  | Risk Rating – <b>Low Risk</b>   |             |           |
|                                 | Yes                 | Yes  | Yes               |                  |   |             |           |
| Type                            |                     | Sectional  |                   |                  | Additional access hatches on tanks for cleaning/inspection purposes should be considered.   |             |           |
| Materials                       |                     | GRP  |                   |                  |   |             |           |
| Lined                           |                     | No   |                   |                  | Raised hatch screened vent appears unsuitable and should have suitably sized screened mesh fitted.  |             |           |
| Dimensions (m)                  |                     | 5.0 x 5.0 x 2.0  |                   |                  |   |             |           |
| Volume (litres)                 |                     | 50,000 Nominal – Actual volume of stored water variable depending on set point on BMS            |                   |                  | <b>Comments</b>   |             |           |
| Linked/single                   |                     | Linked to Raw Water 2B   |                   |                  |   |             |           |
| M/U opposite draw off           |                     | Diagonal   |                   |                  | Deadleg to the tank drain valve is included within the site recorded flushing regime.   |             |           |
| Make up source                  |                     | Town Mains (Hardgate Road)   |                   |                  |   |             |           |
| Services supplied               |                     | Filtered Water CWSTs 1A - 2B (via filtration units 1-3)<br><b>See Raw Water Tank 1A Comments</b> |                   |                  | A regular sampling regime is carried out on the CWSTs, which periodically highlight "out-of-Specification" results for GNB and Yeast/Moulds, particularly from drain point samples. Tank drains are included within the site flushing regime, with additional disinfection/flushing carried out in as/when "out-of-Specification" results returned. |             |           |
| Temperature °C                  |                     | <b>Make Up</b>   | <b>Tank Water</b> | <b>Plantroom</b> |   |             |           |
|                                 |                     | 8.7  | 8.7               | 13.6             |   |             |           |
| Internal condition              | Internal            | Good   |                   |                  |   |             |           |
|                                 | Waterline           | Light Marking  |                   |                  |   |             |           |
|                                 | Dirt & silt         | Clean  |                   |                  |   |             |           |
| Water condition                 |                     | Clear  |                   |                  | None Evident  |             |           |
| Stagnation                      |                     |  |                   |                  |   |             |           |
| Deadlegs around CWST            |                     | See details of deadlegs, connection and flushing points within basement plantroom                |                   |                  | Fitted – TBC Suitable   |             |           |
| Close fitting lid/screened vent |                     | Yes  |                   |                  |   |             |           |
| Warning Pipe Screen             |                     | Fitted – End of Line   |                   |                  | Fitted - Integral   |             |           |
| Overflow Screen                 |                     |  |                   |                  |   |             |           |
| Insulation                      |                     | Yes - Integral   |                   |                  | Good – Fixed Ladder   |             |           |
| Access                          |                     |  |                   |                  |   |             |           |
| Vents returning to CWST         |                     | No   |                   |                  | Yes – Creating Deadleg (Flushing Regime)  |             |           |
| Is drain present?               |                     |  |                   |                  |   |             |           |
| Booster pumps                   | Fitted              | <b>See Filtered Water Tanks</b>  |                   |                  |   |             |           |
|                                 | Vibration Couplings |  |                   |                  |   |             |           |
|                                 | Expansion Vessel    |  |                   |                  |   |             |           |
|                                 | Drain on Vessel?    |  |                   |                  |   |             |           |

## WATER SYSTEM RISK ASSESSMENT

| Name/number of CWST             |  | Raw Water Tank 2B               |                  |   | Recommendations and Comments  | Assigned to | Completed |
|---------------------------------|--|---------------------------------|------------------|---|-------------------------------|-------------|-----------|
| Location of CWST                |  | -1 Basement Tank Plant Room     |                  |   |                               |             |           |
| Labelled                        | <b>CWST</b>  | <b>Pipework</b>                 | <b>Valves</b>    |   | Risk Rating – <b>Low Risk</b> |             |           |
|                                 | Yes  | Yes                             | Yes              |   |                               |             |           |
| Type                            | Sectional  |                                 |                  | Additional access hatches on tanks for cleaning/inspection purposes should be considered.   |                               |             |           |
| Materials                       | GRP  |                                 |                  |   |                               |             |           |
| Lined                           | No   |                                 |                  | Raised hatch screened vent appears unsuitable and should have suitably sized screened mesh fitted.  |                               |             |           |
| Dimensions (m)                  | 5.0 x 5.0 x 2.0  |                                 |                  |   |                               |             |           |
| Volume (litres)                 | 50,000 Nominal – Actual volume of stored water variable depending on set point on BMS            |                                 |                  | <b>Comments</b>   |                               |             |           |
| Linked/single                   | Linked to Raw Water 2A   |                                 |                  |   |                               |             |           |
| M/U opposite draw off           | Diagonal   |                                 |                  | Deadleg to the tank drain valve is included within the site recorded flushing regime.   |                               |             |           |
| Make up source                  | Town Mains (Govan Road)  |                                 |                  |   |                               |             |           |
| Services supplied               | Filtered Water CWSTs 1A - 2B (via filtration units 1-3)<br><b>See Raw Water Tank 1A Comments</b> |                                 |                  | A regular sampling regime is carried out on the CWSTs, which periodically highlight "out-of-Specification" results for GNB and Yeast/Moulds, particularly from drain point samples. Tank drains are included within the site flushing regime, with additional disinfection/flushing carried out in as/when "out-of-Specification" results returned. |                               |             |           |
| Temperature °C                  | <b>Make Up</b>   | <b>Tank Water</b>               | <b>Plantroom</b> |   |                               |             |           |
|                                 | Not Running  | 8.9                             | 13.6             |   |                               |             |           |
| Internal condition              | Internal   | Good                            |                  |   |                               |             |           |
|                                 | Waterline  | Light Marking                   |                  |   |                               |             |           |
|                                 | Dirt & silt  | Clean                           |                  |   |                               |             |           |
| Water condition                 | Clear  |                                 |                  | None Evident  |                               |             |           |
| Stagnation                      |  |                                 |                  |   |                               |             |           |
| Deadlegs around CWST            | See details of deadlegs, connection and flushing points within basement plantroom                |                                 |                  | Yes   | Fitted – TBC Suitable         |             |           |
| Close fitting lid/screened vent |  |                                 |                  |   |                               |             |           |
| Warning Pipe Screen             | Fitted – End of Line   |                                 |                  | Fitted - Integral   |                               |             |           |
| Overflow Screen                 |  |                                 |                  |   |                               |             |           |
| Insulation                      | Yes - Integral   |                                 |                  | Good – Fixed Ladder   |                               |             |           |
| Access                          |  |                                 |                  |   |                               |             |           |
| Vents returning to CWST         | No   |                                 |                  | Yes – Creating Deadleg (Flushing Regime)  |                               |             |           |
| Is drain present?               |  |                                 |                  |   |                               |             |           |
| Booster pumps                   | Fitted   | <b>See Filtered Water Tanks</b> |                  |   |                               |             |           |
|                                 | Vibration Couplings  |                                 |                  |   |                               |             |           |
|                                 | Expansion Vessel   |                                 |                  |   |                               |             |           |
|                                 | Drain on Vessel?   |                                 |                  |   |                               |             |           |

## WATER SYSTEM RISK ASSESSMENT

| Name/number of CWST             |  | Filtered Water Tank 1A                     |                  |   | Recommendations and Comments  | Assigned to | Completed |
|---------------------------------|--|--|------------------|---|---|-------------|-----------|
| Location of CWST                |  | -1 Basement Tank Plant Room                |                  |   |   |             |           |
| Labelled                        | <b>CWST</b>  | <b>Pipework</b>                            | <b>Valves</b>    |   | Risk Rating – <b>High Risk</b>  |             |           |
|                                 | Yes  | Yes  | Yes              |   |   |             |           |
| Type                            | Sectional  |  |                  | Additional access hatches on tanks for cleaning/inspection purposes should be considered.   |   |             |           |
| Materials                       | GRP  |  |                  |   |   |             |           |
| Lined                           | No   |  |                  | Internal supports/fittings showing evidence of corrosion, with rust leaching into stored water and settling on tank base. Recommend all internal supports/fittings are replaced with suitable WRAS approved equivalents. Please also refer to Nicholson Plastics report from July 2021 regarding corrosion on support rods and nut/bolts within the CWSTs.  |   |             |           |
| Dimensions (m)                  | 13.5 x 5.0 x 2.0   |  |                  |   |   |             |           |
| Volume (litres)                 | 135,000 Nominal - Actual volume of stored water variable depending on set point on BMS |  |                  | DMA have submitted a proposal for replacing the CWSTs if original tank manufacturer/installer is unable to carryout a suitable repair of the corrosion issues.  |   |             |           |
| Linked/single                   | Linked to Filtered Water CWST 1B   |  |                  |   |   |             |           |
| M/U opposite draw off           | Diagonal   |  |                  | Raised hatch screened vent appears unsuitable and should have suitably sized screened mesh fitted.  |   |             |           |
| Make up source                  | Raw Water CWSTs 1A, 1B, 2A & 2B  |  |                  |   |   |             |           |
| Services supplied               | See information within page 2 above - Pump Set 1 (5.3)                                 |  |                  | SHTM 04-01 recommends fitting water filled Glass Traps to the overflow and warning screens and Hepa Filtration to the air vents on the tank lids. If this is to be installed then vents on raised ball chamber would require to be sealed to ensure tanks remain sealed. It may be prudent to review the entire tank set-up to determine if this should be implemented and if any additional category 5 weir overflows are required on the Raw Water CWSTs. |   |             |           |
| Temperature °C                  | <b>Make Up</b>   | <b>Tank Water</b>                          | <b>Plantroom</b> |   |   |             |           |
|                                 | Not Running  | 9.5  | 13.6             |   |   |             |           |
| Internal condition              | Internal   | Corroded Internal Supports/Fittings        |                  |   | SHTM 04-01 recommends fitting water filled Glass Traps to the overflow and warning screens and Hepa Filtration to the air vents on the tank lids. If this is to be installed then vents on raised ball chamber would require to be sealed to ensure tanks remain sealed. It may be prudent to review the entire tank set-up to determine if this should be implemented and if any additional category 5 weir overflows are required on the Raw Water CWSTs. |             |           |
|                                 | Waterline  | Light Marking                              |                  |   |   |             |           |
|                                 | Dirt & silt  | Evidence of Rust Leaching/Settling on Base |                  |   |   |             |           |
| Water condition                 | Clear  |  |                  | <b>Comments:</b><br>Deadleg to the tank drain valve is included within the site recorded flushing regime  |   |             |           |
| Stagnation                      | None Evident   |  |                  |   |   |             |           |
| Deadlegs around CWST            | See details of deadlegs, connection and flushing points within basement plantroom      |  |                  | A regular sampling regime is carried out on the CWSTs, which periodically highlight "out-of-Specification" results for GNB and Yeast/Moulds, particularly from drain point samples (though less often in the post filter CWSTs than in the Raw Water CWSTs). Tank drains are included within the site flushing regime, with additional disinfection/flushing carried out in as/when "out-of-Specification" results returned.                                |   |             |           |
| Close fitting lid/screened vent | Yes  | Fitted – TBC Suitable                      |                  |   |   |             |           |
| Warning Pipe Screen             | Fitted – End of Line   |  |                  |   |   |             |           |
| Overflow Screen                 | Fitted - Integral  |  |                  |   |   |             |           |
| Insulation                      | Yes - Integral   |  |                  |   |   |             |           |
| Access                          | Good – Fixed Ladder  |  |                  |   |   |             |           |
| Vents returning to CWST         | No   |  |                  |   |   |             |           |
| Is drain present?               | Yes – Creating Deadleg (Flushing Regime)   |  |                  |   |   |             |           |
| Booster pumps                   | Fitted   | <b>See Booster Pump Information</b>        |                  |   |   |             |           |
|                                 | Vibration Couplings  |  |                  |   |   |             |           |
|                                 | Expansion Vessel   |  |                  |   |   |             |           |
|                                 | Drain on Vessel?   |  |                  |   |   |             |           |

## WATER SYSTEM RISK ASSESSMENT

| Name/number of CWST             |                     | Filtered Water Tank 1B   |                   |                  | Recommendations and Comments  | Assigned to           | Completed |
|---------------------------------|---------------------|--|-------------------|------------------|---|-----------------------|-----------|
| Location of CWST                |                     | -1 Basement Tank Plant Room  |                   |                  |   |                       |           |
| Labelled                        | <b>CWST</b>         | <b>Pipework</b>  | <b>Valves</b>     |                  | Risk Rating – <b>High Risk</b>  |                       |           |
|                                 | Yes                 | Yes  | Yes               |                  |   |                       |           |
| Type                            |                     | Sectional  |                   |                  | Additional access hatches on tanks for cleaning/inspection purposes should be considered.   |                       |           |
| Materials                       |                     | GRP  |                   |                  |   |                       |           |
| Lined                           |                     | No   |                   |                  | Internal supports/fittings showing evidence of corrosion, with rust leaching into stored water and settling on tank base. Recommend all internal supports/fittings are replaced with suitable WRAS approved equivalents. Please also refer to Nicholson Plastics report from July 2021 regarding corrosion on support rods and nut/bolts within the CWSTs. DMA have submitted a proposal for replacing the CWSTs if original tank manufacturer/installer is unable to carryout a suitable repair of the corrosion issues. |                       |           |
| Dimensions (m)                  |                     | 14.0 x 5.0 x 2.0   |                   |                  |   |                       |           |
| Volume (litres)                 |                     | 140,000 Nominal – Actual volume of stored water variable depending on set point on BMS |                   |                  | Raised hatch screened vent appears unsuitable and should have suitably sized screened mesh fitted.  |                       |           |
| Linked/single                   |                     | Linked to Filtered Water CWST 1A   |                   |                  |   |                       |           |
| M/U opposite draw off           |                     | Diagonal   |                   |                  | SHTM 04-01 recommends fitting water filled Glass Traps to the overflow and warning screens and Hepa Filtration to the air vents on the tank lids. If this is to be installed then vents on raised ball chamber would require to be sealed to ensure tanks remain sealed. It may be prudent to review the entire tank set-up to determine if this should be implemented and if any additional category 5 weir overflows are required on the Raw Water CWSTs.   |                       |           |
| Make up source                  |                     | Raw Water CWSTs 1A, 1B, 2A & 2B  |                   |                  |   |                       |           |
| Services supplied               |                     | See information within page 2 above - Pump Set 1 (5.3)                                 |                   |                  | <b>Comments:</b><br>Deadleg to the tank drain valve is included within the site recorded flushing regime  |                       |           |
| Temperature °C                  |                     | <b>Make Up</b>   | <b>Tank Water</b> | <b>Plantroom</b> |   |                       |           |
|                                 |                     | Not Running  | 9.5               | 13.6             | A regular sampling regime is carried out on the CWSTs, which periodically highlight "out-of-Specification" results for GNB and Yeast/Moulds, particularly from drain point samples (though less often in the post filter CWSTs than in the Raw Water CWSTs). Tank drains are included within the site flushing regime, with additional disinfection/flushing carried out in as/when "out-of-Specification" results returned.  |                       |           |
| Internal condition              | Internal            | Corroded Internal Supports/Fittings  |                   |                  |   |                       |           |
|                                 | Waterline           | Light Marking  |                   |                  |   |                       |           |
|                                 | Dirt & silt         | Evidence of Rust Leaching/Settling on Base   |                   |                  |   |                       |           |
| Water condition                 |                     | Clear  |                   |                  | See details of deadlegs, connection and flushing points within basement plantroom   |                       |           |
| Stagnation                      |                     | None Evident   |                   |                  |   |                       |           |
| Deadlegs around CWST            |                     |  |                   |                  | Yes   | Fitted – TBC Suitable |           |
| Close fitting lid/screened vent |                     |  |                   |                  |   |                       |           |
| Warning Pipe Screen             |                     | Fitted – End of Line   |                   |                  | Fitted - Integral   |                       |           |
| Overflow Screen                 |                     |  |                   |                  |   |                       |           |
| Insulation                      |                     | Yes - Integral   |                   |                  | Good – Fixed Ladder   |                       |           |
| Access                          |                     |  |                   |                  |   |                       |           |
| Vents returning to CWST         |                     | No   |                   |                  | Yes – Creating Deadleg (Flushing Regime)  |                       |           |
| Is drain present?               |                     |  |                   |                  |   |                       |           |
| Booster pumps                   | Fitted              | <b>See Booster Pump Information</b>  |                   |                  |   |                       |           |
|                                 | Vibration Couplings |  |                   |                  |   |                       |           |
|                                 | Expansion Vessel    |  |                   |                  |   |                       |           |
|                                 | Drain on Vessel?    |  |                   |                  |   |                       |           |



## WATER SYSTEM RISK ASSESSMENT

| Name/number of CWST             |                     | Filtered Water Tank 2A   |                       |                  | Recommendations and Comments  | Assigned to | Completed |
|---------------------------------|---------------------|--|-----------------------|------------------|---|-------------|-----------|
| Location of CWST                |                     | -1 Basement Tank Plant Room  |                       |                  |   |             |           |
| Labelled                        | <b>CWST</b>         | <b>Pipework</b>  | <b>Valves</b>         |                  | Risk Rating – <b>High Risk</b>  |             |           |
|                                 | Yes                 | Yes  | Yes                   |                  |   |             |           |
| Type                            |                     | Sectional  |                       |                  | Additional access hatches on tanks for cleaning/inspection purposes should be considered.   |             |           |
| Materials                       |                     | GRP  |                       |                  |   |             |           |
| Lined                           |                     | No   |                       |                  | Internal supports/fittings showing evidence of corrosion, with rust leaching into stored water and settling on tank base. Recommend all internal supports/fittings are replaced with suitable WRAS approved equivalents. Please also refer to Nicholson Plastics report from July 2021 regarding corrosion on support rods and nut/bolts within the CWSTs. DMA have submitted a proposal for replacing the CWSTs if original tank manufacturer/installer is unable to carryout a suitable repair of the corrosion issues. |             |           |
| Dimensions (m)                  |                     | 13.5 x 5.0 x 2.0   |                       |                  |   |             |           |
| Volume (litres)                 |                     | 135,000 Nominal - Actual volume of stored water variable depending on set point on BMS |                       |                  | DMA have submitted a proposal for replacing the CWSTs if original tank manufacturer/installer is unable to carryout a suitable repair of the corrosion issues.  |             |           |
| Linked/single                   |                     | Linked to Filtered Water CWST 2B   |                       |                  |   |             |           |
| M/U opposite draw off           |                     | Diagonal   |                       |                  | Raised hatch screened vent appears unsuitable and should have suitably sized screened mesh fitted.  |             |           |
| Make up source                  |                     | Raw Water CWSTs 1A, 1B, 2A & 2B  |                       |                  |   |             |           |
| Services supplied               |                     | See information within page 2 above - Pump Set 2 (7.1)                                 |                       |                  | SHTM 04-01 recommends fitting water filled Glass Traps to the overflow and warning screens and Hepa Filtration to the air vents on the tank lids. If this is to be installed then vents on raised ball chamber would require to be sealed to ensure tanks remain sealed. It may be prudent to review the entire tank set-up to determine if this should be implemented and if any additional category 5 weir overflows are required on the Raw Water CWSTs.   |             |           |
| Temperature °C                  |                     | <b>Make Up</b>   | <b>Tank Water</b>     | <b>Plantroom</b> |   |             |           |
|                                 |                     | 10.4   | 9.4                   | 13.6             | <b>Comments:</b><br>Deadleg to the tank drain valve is included within the site recorded flushing regime  |             |           |
| Internal condition              | Internal            | Corroded Internal Supports/Fittings  |                       |                  |   |             |           |
|                                 | Waterline           | Light Marking  |                       |                  |   |             |           |
|                                 | Dirt & silt         | Evidence of Rust Leaching/Settling on Base   |                       |                  |   |             |           |
| Water condition                 |                     | Clear  |                       |                  | A regular sampling regime is carried out on the CWSTs, which periodically highlight "out-of-Specification" results for GNB and Yeast/Moulds, particularly from drain point samples (though less often in the post filter CWSTs than in the Raw Water CWSTs). Tank drains are included within the site flushing regime, with additional disinfection/flushing carried out in as/when "out-of-Specification" results returned.  |             |           |
| Stagnation                      |                     | None Evident   |                       |                  |   |             |           |
| Deadlegs around CWST            |                     | See details of deadlegs, connection and flushing points within basement plantroom      |                       |                  | <b>Comments:</b><br>Deadleg to the tank drain valve is included within the site recorded flushing regime  |             |           |
| Close fitting lid/screened vent |                     | Yes  | Fitted – TBC Suitable |                  |   |             |           |
| Warning Pipe Screen             |                     | Fitted – End of Line   |                       |                  | A regular sampling regime is carried out on the CWSTs, which periodically highlight "out-of-Specification" results for GNB and Yeast/Moulds, particularly from drain point samples (though less often in the post filter CWSTs than in the Raw Water CWSTs). Tank drains are included within the site flushing regime, with additional disinfection/flushing carried out in as/when "out-of-Specification" results returned.  |             |           |
| Overflow Screen                 |                     | Fitted - Integral  |                       |                  |   |             |           |
| Insulation                      |                     | Yes - Integral   |                       |                  | A regular sampling regime is carried out on the CWSTs, which periodically highlight "out-of-Specification" results for GNB and Yeast/Moulds, particularly from drain point samples (though less often in the post filter CWSTs than in the Raw Water CWSTs). Tank drains are included within the site flushing regime, with additional disinfection/flushing carried out in as/when "out-of-Specification" results returned.  |             |           |
| Access                          |                     | Good – Fixed Ladder  |                       |                  |   |             |           |
| Vents returning to CWST         |                     | No   |                       |                  | A regular sampling regime is carried out on the CWSTs, which periodically highlight "out-of-Specification" results for GNB and Yeast/Moulds, particularly from drain point samples (though less often in the post filter CWSTs than in the Raw Water CWSTs). Tank drains are included within the site flushing regime, with additional disinfection/flushing carried out in as/when "out-of-Specification" results returned.  |             |           |
| Is drain present?               |                     | Yes – Creating Deadleg (Flushing Regime)   |                       |                  |   |             |           |
| Booster pumps                   | Fitted              | <b>See Booster Pump Information</b>  |                       |                  | A regular sampling regime is carried out on the CWSTs, which periodically highlight "out-of-Specification" results for GNB and Yeast/Moulds, particularly from drain point samples (though less often in the post filter CWSTs than in the Raw Water CWSTs). Tank drains are included within the site flushing regime, with additional disinfection/flushing carried out in as/when "out-of-Specification" results returned.  |             |           |
|                                 | Vibration Couplings |  |                       |                  |   |             |           |
|                                 | Expansion Vessel    |  |                       |                  |   |             |           |
|                                 | Drain on Vessel?    |  |                       |                  |   |             |           |

## WATER SYSTEM RISK ASSESSMENT

| Name/number of CWST             |                     | Filtered Water Tank 2B   |                       |  | Recommendations and Comments  | Assigned to | Completed |
|---------------------------------|---------------------|--|-----------------------|--|---|-------------|-----------|
| Location of CWST                |                     | -1 Basement Tank Plant Room  |                       |  |   |             |           |
| Labelled                        | <b>CWST</b>         | <b>Pipework</b>  | <b>Valves</b>         |  | Risk Rating – <b>High Risk</b>  |             |           |
|                                 | Yes                 | Yes  | Yes                   |  |   |             |           |
| Type                            |                     | Sectional  |                       |  | Additional access hatches on tanks for cleaning/inspection purposes should be considered.   |             |           |
| Materials                       |                     | GRP  |                       |  |   |             |           |
| Lined                           |                     | No   |                       |  | Internal supports/fittings showing evidence of corrosion, with rust leaching into stored water and settling on tank base. Recommend all internal supports/fittings are replaced with suitable WRAS approved equivalents. Please also refer to Nicholson Plastics report from July 2021 regarding corrosion on support rods and nut/bolts within the CWSTs. DMA have submitted a proposal for replacing the CWSTs if original tank manufacturer/installer is unable to carryout a suitable repair of the corrosion issues. |             |           |
| Dimensions (m)                  |                     | 14.0 x 5.0 x 2.0   |                       |  |   |             |           |
| Volume (litres)                 |                     | 140,000 Nominal - Actual volume of stored water variable depending on set point on BMS |                       |  | Raised hatch screened vent appears unsuitable and should have suitably sized screened mesh fitted.  |             |           |
| Linked/single                   |                     | Linked to Filtered Water CWST 2A   |                       |  |   |             |           |
| M/U opposite draw off           |                     | Diagonal   |                       |  | SHTM 04-01 recommends fitting water filled Glass Traps to the overflow and warning screens and Hepa Filtration to the air vents on the tank lids. If this is to be installed then vents on raised ball chamber would require to be sealed to ensure tanks remain sealed. It may be prudent to review the entire tank set-up to determine if this should be implemented and if any additional category 5 weir overflows are required on the Raw Water CWSTs.   |             |           |
| Make up source                  |                     | Raw Water CWSTs 1A, 1B, 2A & 2B  |                       |  |   |             |           |
| Services supplied               |                     | See information within page 2 above - Pump Set 2 (7.1)                                 |                       |  | <b>Comments:</b>  |             |           |
| Temperature °C                  | <b>Make Up</b>      | <b>Tank Water</b>  | <b>Plantroom</b>      |  |   |             |           |
|                                 | 10.4                | 9.6  | 13.6                  |  |   |             |           |
| Internal condition              | Internal            | Corroded Internal Supports/Fittings  |                       |  | Deadleg to the tank drain valve is included within the site recorded flushing regime  |             |           |
|                                 | Waterline           | Light Marking  |                       |  |   |             |           |
|                                 | Dirt & silt         | Evidence of Rust Leaching/Settling on Base   |                       |  |   |             |           |
| Water condition                 |                     | Clear  |                       |  | A regular sampling regime is carried out on the CWSTs, which periodically highlight "out-of-Specification" results for GNB and Yeast/Moulds, particularly from drain point samples (though less often in the post filter CWSTs than in the Raw Water CWSTs). Tank drains are included within the site flushing regime, with additional disinfection/flushing carried out in as/when "out-of-Specification" results returned.  |             |           |
| Stagnation                      |                     | None Evident   |                       |  |   |             |           |
| Deadlegs around CWST            |                     | See details of deadlegs, connection and flushing points within basement plantroom      |                       |  | <b>See Booster Pump Information</b>   |             |           |
| Close fitting lid/screened vent |                     | Yes  | Fitted – TBC Suitable |  |   |             |           |
| Warning Pipe Screen             |                     | Fitted – End of Line   |                       |  |   |             |           |
| Overflow Screen                 |                     | Fitted - Integral  |                       |  |   |             |           |
| Insulation                      |                     | Yes - Integral   |                       |  |   |             |           |
| Access                          |                     | Good – Fixed Ladder  |                       |  |   |             |           |
| Vents returning to CWST         |                     | No   |                       |  |   |             |           |
| Is drain present?               |                     | Yes – Creating Deadleg (Flushing Regime)   |                       |  |   |             |           |
| Booster pumps                   | Fitted              |  |                       |  |   |             |           |
|                                 | Vibration Couplings |  |                       |  |   |             |           |
|                                 | Expansion Vessel    |  |                       |  |   |             |           |
|                                 | Drain on Vessel?    |  |                       |  |   |             |           |

## WATER SYSTEM RISK ASSESSMENT

### Filtered Water Booster Pump Information

| Name/number of Booster Pumps | 7.1 Bar Pump Set (Boosted Pump Set 1)   | Recommendations and Comments   | Assigned to | Completed |
|------------------------------|---|--|-------------|-----------|
| Location                     | -1 Basement Tank Plant Room   | <p>Ideally all expansion vessels should be of flow through type – where this is not practical, they should be fitted vertically on the cold supply, as close to plant items as possible with a fitted drain valve (where compliant with current regulations) to allow regular recorded flushing of the vessel.</p> <p>Drain points should be fitted to pump manifolds to allow end of lines to be flushed (if practicable).</p> <p><b>Comment:</b> Reflex anti-legionella valves fitted to Booster pump hydraulic accumulators (8 litres) – drain points fitted.</p> |             |           |
| No. Of Pumps                 | 5   |  |             |           |
| Vibration Couplings          | No Vibration Couplings Visible<br>No Flexible Hoses Visible   |  |             |           |
| Expansion Vessel             | Yes<br>2 x Hydraulic Accumulator (8 litre) Vessel Mounted Vertically, Directly onto Pump Manifold<br>1 x 500 litre Upright Vessel (not flow through)<br>Located Adjacent to Pump Set<br>(no evidence of heat gain on expansion vessels) |  |             |           |
| Drain on Vessel?             | Fitted Drain Point on 500 Litre Vessel<br>Reflex Anti-Legionella Valve<br>fitted to Hydraulic Accumulator with Associated Drain Point   |  |             |           |
| Services Supplied            | Filtered Water Tanks 1A & 1B supply the 7.1 Bar Pump Set<br>Which in Turn Supplies Plant Rooms 31, 32 & 33.   |  |             |           |

| Name/number of Booster Pumps | 5.3 Bar Pump Set (Boosted Pump Set 2)   | Recommendations and Comments   | Assigned to | Completed |
|------------------------------|---|--|-------------|-----------|
| Location                     | -1 Basement Tank Plant Room   | <p>Ideally all expansion vessels should be of flow through type – where this is not practical, they should be fitted vertically on the cold supply, as close to plant items as possible with a fitted drain valve (where compliant with current regulations) to allow regular recorded flushing of the vessel.</p> <p>Drain points should be fitted to pump manifolds to allow end of lines to be flushed (if practicable).</p> <p><b>Comment:</b> Reflex anti-legionella valves fitted to Booster pump hydraulic accumulators (8 litres) – drain points fitted.</p> |             |           |
| No. Of Pumps                 | 5   |  |             |           |
| Vibration Couplings          | No Vibration Couplings Visible<br>No Flexible Hoses Visible   |  |             |           |
| Expansion Vessel             | Yes<br>2 x Hydraulic Accumulator (8 litre) Vessel Mounted Vertically, Directly onto Pump Manifold<br>1 x 500 litre Upright Vessel (not flow through)<br>Located Adjacent to Pump Set<br>(no evidence of heat gain on expansion vessels) |  |             |           |
| Drain on Vessel?             | Fitted Drain Point on 500 Litre Vessel<br>Reflex Anti-Legionella Valve<br>fitted to Hydraulic Accumulator with Associated Drain Point   |  |             |           |
| <b>Services Supplied</b>     | Filtered Water Tanks 2A & 2B supply the 5.3 Bar Pump Set<br>Which in Turn Supplies Plant Rooms 21, 22 & 41.   |  |             |           |

## WATER SYSTEM RISK ASSESSMENT

| Name/number of CWST             |                     | Trade Water Tank 1  |                       |                          | Recommendations and Comments  | Assigned to | Completed |
|---------------------------------|---------------------|---|-----------------------|--------------------------|---|-------------|-----------|
| Location of CWST                |                     | -1 Basement Tank Plant Room   |                       |                          |   |             |           |
| Labelled                        | <b>CWST</b>         | <b>Pipework</b>   | <b>Valves</b>         |                          | Risk Rating – <b>Medium Risk</b>  |             |           |
|                                 | Yes                 | Yes   | Yes                   |                          |   |             |           |
| Type                            |                     | Sectional   |                       |                          | Ideally all expansion vessels should be of flow through type – where this is not practical, they should be fitted vertically on the cold supply, as close to plant items as possible with a fitted drain valve (where compliant with current regulations) to allow regular recorded flushing of the vessel. |             |           |
| Materials                       |                     | GRP   |                       |                          |   |             |           |
| Lined                           |                     | No  |                       |                          | Ideally a drain should be fitted to pump manifold to allow end of lines to be flushed (if practicable).   |             |           |
| Dimensions (m)                  |                     | 2.0 x 1.0 x 1.0   |                       |                          |   |             |           |
| Volume (litres)                 |                     | 2000 Nominal - 1400 Actual  |                       |                          | Relocate DCV closer to tee - >2m at present after meter.<br><br><b>Note:</b> Trades CWST 2 has been completely disconnected from CWST 1 with no inlet or take-off connected into the live systems.  |             |           |
| Linked/single                   |                     | Single (Trade Water Tank 2 completely isolated)   |                       |                          |   |             |           |
| M/U opposite draw off           |                     | Outlet on Base  |                       |                          | Relocate DCV closer to tee - >2m at present after meter.<br><br><b>Note:</b> Trades CWST 2 has been completely disconnected from CWST 1 with no inlet or take-off connected into the live systems.  |             |           |
| Make up source                  |                     | Town Mains (Govan Road)   |                       |                          |   |             |           |
| Services supplied               |                     | Designated “Non-Domestic” Outlets (i.e. irrigation, 12 <sup>th</sup> floor Heli-Pad Fire Suppression and Plant Room Bib Taps on 12 <sup>th</sup> floor) |                       |                          | Relocate DCV closer to tee - >2m at present after meter.<br><br><b>Note:</b> Trades CWST 2 has been completely disconnected from CWST 1 with no inlet or take-off connected into the live systems.  |             |           |
| Temperature °C                  |                     | <b>Make Up</b>  | <b>Tank Water</b>     | <b>Plantroom/Ambient</b> |   |             |           |
|                                 |                     |   |                       | 13.6                     | Relocate DCV closer to tee - >2m at present after meter.<br><br><b>Note:</b> Trades CWST 2 has been completely disconnected from CWST 1 with no inlet or take-off connected into the live systems.  |             |           |
| Internal condition              | Internal            | Good  |                       |                          |   |             |           |
|                                 | Waterline           | None  |                       |                          |   |             |           |
|                                 | Dirt & silt         | Clean   |                       |                          |   |             |           |
| Water condition                 |                     | Clear   |                       |                          | Relocate DCV closer to tee - >2m at present after meter.<br><br><b>Note:</b> Trades CWST 2 has been completely disconnected from CWST 1 with no inlet or take-off connected into the live systems.  |             |           |
| Stagnation                      |                     | None Evident  |                       |                          |   |             |           |
| Deadlegs around CWST            |                     | None Visible  |                       |                          | Relocate DCV closer to tee - >2m at present after meter.<br><br><b>Note:</b> Trades CWST 2 has been completely disconnected from CWST 1 with no inlet or take-off connected into the live systems.  |             |           |
| Close fitting lid/screened vent |                     | Yes   | Fitted – TBC Suitable |                          |   |             |           |
| Warning Pipe Screen             |                     | Fitted  |                       |                          | Relocate DCV closer to tee - >2m at present after meter.<br><br><b>Note:</b> Trades CWST 2 has been completely disconnected from CWST 1 with no inlet or take-off connected into the live systems.  |             |           |
| Overflow Screen                 |                     | Fitted  |                       |                          |   |             |           |
| Insulation                      |                     | Integral  |                       |                          | Relocate DCV closer to tee - >2m at present after meter.<br><br><b>Note:</b> Trades CWST 2 has been completely disconnected from CWST 1 with no inlet or take-off connected into the live systems.  |             |           |
| Access                          |                     | Good  |                       |                          |   |             |           |
| Vents returning to CWST         |                     | No  |                       |                          | Relocate DCV closer to tee - >2m at present after meter.<br><br><b>Note:</b> Trades CWST 2 has been completely disconnected from CWST 1 with no inlet or take-off connected into the live systems.  |             |           |
| Is drain present?               |                     | Yes   |                       |                          |   |             |           |
| Booster pumps                   | Fitted              | Yes x 3   |                       |                          | Relocate DCV closer to tee - >2m at present after meter.<br><br><b>Note:</b> Trades CWST 2 has been completely disconnected from CWST 1 with no inlet or take-off connected into the live systems.  |             |           |
|                                 | Vibration Couplings | None Visible  |                       |                          |   |             |           |
|                                 | Expansion Vessel    | Yes (500 Litre) – Not Flow Through  |                       |                          |   |             |           |
|                                 | Drain on Vessel?    | Yes   |                       |                          |   |             |           |

## WATER SYSTEM RISK ASSESSMENT

| Location           | Recommendations and Comments   | Assigned to | Completed |
|--------------------|--|-------------|-----------|
| Basement Plantroom | <p>There is a link/breach pipe on the outlets of the Filtered/Filter water tanks prior to the pump sets which can be opened to allow all tanks both pump sets. This was closed at time of survey, though DMA have noted this link/breach pipe open on previous visits. This line should be opened and flushed as part of site flushing regime.</p> <p>There is a link pipe between the 5.3 bar (Boosted Pump Set 2) and 7.1 Bar (Boosted Pump Set 1) pipework systems after the booster sets. DMA advised previously by estates this section is drained and is in place for emergency purposes, should either of the booster sets fail to allow for water services to be maintained to the hospital. Prior to being put into use the link section should be thoroughly flushed and disinfected.</p> <p>On the Govan Road mains line to CWSTs there are two short 22mm deadlegs (one upturned, one downwards) and a 54mm connection point (upturned) prior to tank isolation valves – these are included within site flushing regime.</p> <p>On the Hardgate Road mains line to CWSTs there is a 54mm connection point (upturned) prior to tank isolation valves – – these are included within site flushing regime.</p> <p>There is a deadleg to the tank drain valve (on all Raw and Filtered/Filtered water tanks), measuring 0.7 – 1.0 metres of 54mm pipework, created due to the lever valve unable to close due to proximity to support beams – these are included within site flushing regime.</p> <p>There are connection points/deadlegs (28mm) at low level on both of the supply lines to the filtration units form the Raw Water tanks just prior to the filtration units – these are included within site flushing regime.</p> <p>On the riser to Plantrooms 41/22 there is a connection point (54mm) immediately after isolation valve (DMA understand this was used to fill system directly from mains during construction phase, bypassing the filtration units) – – these are included within site flushing regime.</p> <p>All tank drains (including Trades Water Tank) are included within the site flushing regime.</p> <p><b>Comments:</b></p> <p>There are connection points/deadlegs (54mm) at low level on both of the supply lines to the pump sets form the Filtered/Filtered Water tanks just prior to the pump sets – these have been utilised as drain points to run into the ClO<sub>2</sub> monitoring probe stations.</p> <p>During the upgrade works in late 2018/early 2019 to incorporate ClO<sub>2</sub> dosing into the domestic water system an additional filtration unit was installed (Filter Unit 3) and the pipework to/from the filtration units was amended so that all of the Raw water CWST outlets were linked and supply all 3 filter units, and all pipework from the filter units were linked and supply all post filter CWSTs. ClO<sub>2</sub> dosing was incorporated into the backwash cycle of each of the filtration units (monitored and maintained by Scotmas)</p> |             |           |

## **WATER SYSTEM RISK ASSESSMENT**

# **Section 6**

## **Calorifiers & Associated Plantrooms**

## WATER SYSTEM RISK ASSESSMENT

### Calorifiers (PHE's with Storage Vessels)

The calorifiers are situated in various plant rooms throughout site. Locations are as follows:

- Plantroom 21 (Cals 21-1/2/3)
- Plantroom 22 (Cals 22-1/2/3)
- Plantroom 31 (Cals 31-1/2/3)
- Plantroom 31 (Cals 31-4/5/6)
- Plantroom 31 (Cals 31-7/8/9)
- Plantroom 32 (Cals 32-1/2/3)
- Plantroom 33 (Cals 33-1/2/3)
- Plantroom 41 (Cals 41-1/2/3)

These calorifiers, in turn supply domestic hot water services (DHWS) to designated zones within the hospital building. See Appendix 1 - Calorifier Wards and Areas Supplied and Appendix 2 - Distribution Zone Maps below for calorifier locations and areas within the hospital fed from each Calorifier set.

Each set of calorifiers is a bank of 3-linked calorifiers fed from the boosted Filtered Water system, with heat source being via a packaged plate heat exchanger on the outside of each calorifier fed from the MTHW system. A circulating pump on each calorifier/plate heat exchanger ensures the water is circulated throughout each vessel to maintain temperature.

Distribution flow temperatures were consistently above 60°C, with return temperatures to calorifiers consistently above 55°C on all calorifiers as recommended within L8/HSG 274 Part 2 and SHTM 04-01. All base temperature appeared satisfactory at time of survey also.

During the water system upgrade works during late 2018 and early 2019 each calorifier had the standard expansion vessel installed at construction phase removed and replaced with a flow through vessel, with appropriate pipework modifications to maintain flow to the system etc.

During the period of this survey all expansion vessels installed in 2018-19 were being replaced with new vessels.

Generally water flushed from drain on calorifiers and expansion vessels ran clear either instantly or after only a very short period of time (typically <10 seconds).

Each calorifier set share a linked return which supplies all three calorifiers.

| ID No./Name                |                                    | P21 - 01/02/03                             |                      |              |        |    | Recommendations and Comments   | Assigned to | Completed |
|----------------------------|------------------------------------|--|----------------------|--------------|--------|----|--|-------------|-----------|
| Location                   |                                    | Plantroom 21                               |                      |              |        |    |  |             |           |
| Labelled                   | Cal                                | Yes  | Pipes                | Yes          | Valves | No | <p>All associated valves should be correctly labelled for identification purposes.</p> <p>Ensure all temperature gauges are calibrated correctly and/or replaced where required.</p> <p>Suitable insulated jackets should be fitted to calorifier inspection hatch, to prevent heat loss from vessel.</p> <p>Short lines (<math>\approx 200\text{mm}</math>) to calorifier and expansion vessel drains – these should be incorporated into site flushing regime.</p> <p><b>Comments:</b></p> <p>There is a ClO<sub>2</sub> monitoring and top-up station installed on the return line to the calorifiers (monitored by Scotmas).</p> <p>New expansion vessels fitted on all 3 Water heaters at the time of survey.</p> |             |           |
| Type                       | Plate Heat Exchanger               |  |                      |              |        |    |  |             |           |
| Materials                  | Stainless steel                    |  |                      |              |        |    |  |             |           |
| Access                     | Good                               |  |                      |              |        |    |  |             |           |
| Linked/single              | Linked                             |  |                      |              |        |    |  |             |           |
| Heat source                | MTHW via Packaged PHX              |  |                      |              |        |    |  |             |           |
| Make up source             | CWSTs 1A & 1B (Filtered)           |  |                      |              |        |    |  |             |           |
| Services supplied (area)   | See Appendix 1 & 2 of this section |  |                      |              |        |    |  |             |           |
| Size (m)                   | 2.2 x 1.0 $\emptyset$              |  |                      |              |        |    |  |             |           |
| Cold feed location         | Base                               |  |                      |              |        |    |  |             |           |
| Vent or pressure relief    | Pressure relief                    |  |                      |              |        |    |  |             |           |
| Circulation pump           | Fitted / No. / Check Valve         | Yes  | x 1<br>Linked Return | None visible |        |    |  |             |           |
| Destrat pump               | Fitted                             | None visible                               |                      |              |        |    |  |             |           |
| Pumps                      | Vibration couplings                | None visible                               |                      |              |        |    |  |             |           |
| Expansion / buffer vessel  | Fitted?                            | Yes – Aquapresso Flow Through (500 litres) |                      |              |        |    |  |             |           |
|                            | Vessel able to be Flushed          | N/A  |                      |              |        |    |  |             |           |
| Insulation                 | Fitted                             |  |                      |              |        |    |  |             |           |
| Inspection Hatch (mm)      | 380mm approx                       |  |                      |              |        |    |  |             |           |
| Deadlegs around Calorifier | None visible                       |  |                      |              |        |    |  |             |           |
| Non WRAS materials         | None visible                       |  |                      |              |        |    |  |             |           |
| Temperatures (°c)          | Calorifier                         | 01   | 02                   | 03           |        |    |  |             |           |
|                            | Flow                               | 61.5                                       | 62.3                 | 62.4         |        |    |  |             |           |
|                            | Flow Gauge                         | 65.0                                       | 60.0                 | 60.0         |        |    |  |             |           |
|                            | Return(Linked)                     | 59.0                                       |                      |              |        |    |  |             |           |
|                            | Base/Drain                         | 61.3                                       | 62.0                 | 61.8         |        |    |  |             |           |
|                            | Base Gauge                         | 70.0                                       | 62.0                 | 64.0         |        |    |  |             |           |
| Drain                      | Water Quality                      | Clear                                      | Clear                | Clear        |        |    |  |             |           |



| Location     | Recommendations and Comments   | Assigned to | Completed |
|--------------|--|-------------|-----------|
| Plantroom 21 | <p>There is a branch from the Boosted Cold Water Services (BCWS), dropping from high level and measuring approximately 150mm of 54mm pipework. This should be removed if no longer required or included within site flushing regime.</p> <p>15 mm lines branch from same line as supplying the AHUs and run approximately 50m to HTG pressurisation units (at pumps PR21 PU11/12/13 SH), with a separate branch running approximately 10m to CHW pressurisation unit (at pumps PR21 PU03/04/05 SCW). Lines to pressurisation units should, if practicable, be switched to trades system, or suitable backflow protection fitted (<b>Note: Lines currently included in site flushing regime</b>). Fast fill connections should be disconnected and have suitable backflow protection (e.g. RPZ) fitted to fast fill connection.</p> <p>Flexible hoses were noted on the pressure reducing valves on the cold supply into Plantroom 21. These should be checked to determine if these are EPDM. Should these be EPDM they should be replaced with a suitable alternative material (e.g. hard piped in stainless steel or PEX) if practicable or hoses inspected and replaced regularly (e.g. annually and/or as determined by periodic inspection) or as per manufacturer's instructions.</p> <p>There is a deadleg behind the water tank within the Childrens Renal Plantroom. Unable to locate where this branch is fed from. If practical this should be removed. (<b>Note: Line currently included in site flushing regime</b>).</p> <p><b>Comments:</b></p> <p>A ClO<sub>2</sub> monitoring and top point was installed on the cold supply line as it enters Plantroom 21 (monitored by Scotmas).</p> <p>Connection to Children's renal system is fed from the cold supply line within plantroom 21 – Carbon filters and ClO<sub>2</sub> monitoring station fitted within Children's Renal Plantroom to prevent ClO<sub>2</sub> being drawn into the Renal system. This is monitored by Renal Technicians and Scotmas.</p> <p>Line to humidifiers at 21AHU23 &amp; 21AHU32 has been disconnected.</p> |             |           |

| ID No./Name                |                                    | P22 - 01/02/03                             |                      |              |        |    | Recommendations and Comments   | Assigned to | Completed |
|----------------------------|------------------------------------|--|----------------------|--------------|--------|----|--|-------------|-----------|
| Location                   |                                    | Plantroom 22                               |                      |              |        |    |  |             |           |
| Labelled                   | Cal                                | Yes  | Pipes                | Yes          | Valves | No | <p>All associated valves should be correctly labelled for identification purposes.</p> <p>Ensure all temperature gauges are calibrated correctly and/or replaced where required.</p> <p>Suitable insulated jackets should be fitted to calorifier inspection hatch, to prevent heat loss from vessel.</p> <p>Large deadlegs created on linked pipework to offline calorifier 1 – these should be included in recorded site flushing regime, until such times as reinstated to full daily use.</p> <p>Short lines (≈200mm) to calorifier and expansion vessel drains – these should be incorporated into site flushing regime. (2)</p> <p><b>Comments:</b></p> <p>There is a ClO<sub>2</sub> monitoring and top-up station installed on the return line to the calorifiers (monitored by Scotmas).</p> <p>Corroded hard stands and fittings in poor condition.</p> <p>New expansion vessels have not been fitted to these calorifiers at time of survey. Ones fitted date from 2018-2019 upgrade works.</p> |             |           |
| Type                       | Plate Heat Exchanger               |  |                      |              |        |    |  |             |           |
| Materials                  | Stainless steel                    |  |                      |              |        |    |  |             |           |
| Access                     | Good                               |  |                      |              |        |    |  |             |           |
| Linked/single              | Linked                             |  |                      |              |        |    |  |             |           |
| Heat source                | MTHW via Packaged PHX              |  |                      |              |        |    |  |             |           |
| Make up source             | CWSTs 1A & 1B (Filtered)           |  |                      |              |        |    |  |             |           |
| Services supplied (area)   | See Appendix 1 & 2 of this section |  |                      |              |        |    |  |             |           |
| Size (m)                   | 2 x 1.0 ø                          |  |                      |              |        |    |  |             |           |
| Cold feed location         | Base                               |  |                      |              |        |    |  |             |           |
| Vent or pressure relief    | Pressure relief                    |  |                      |              |        |    |  |             |           |
| Circulation pump           | Fitted / No. / Check Valve         | Yes  | x 1<br>Linked Return | None visible |        |    |  |             |           |
| Destrat pump               | Fitted                             | None visible                               |                      |              |        |    |  |             |           |
| Pumps                      | Vibration couplings                | None visible                               |                      |              |        |    |  |             |           |
| Expansion / buffer vessel  | Fitted?                            | Yes – Aquapresso Flow Through (500 litres) |                      |              |        |    |  |             |           |
|                            | Vessel able to be Flushed          | N/A  |                      |              |        |    |  |             |           |
| Insulation                 | None visible                       |  |                      |              |        |    |  |             |           |
| Inspection Hatch (mm)      | 380mm approx                       |  |                      |              |        |    |  |             |           |
| Deadlegs around Calorifier | Offline Calorifier 1               |  |                      |              |        |    |  |             |           |
| Non WRAS materials         | None visible                       |  |                      |              |        |    |  |             |           |
| Temperatures (°C)          | Calorifier                         | 01 (Middle)                                | 02 (RHS)             | 03 (LHS)     |        |    |  |             |           |
|                            | Flow                               | <b>Offline</b>                             | 63.1                 | 62.8         |        |    |  |             |           |
|                            | Flow Gauge                         |  | 30.0                 | 60.0         |        |    |  |             |           |
|                            | Return(Linked)                     |  | 59.0                 |              |        |    |  |             |           |
|                            | Base/Drain                         |  | 63.0                 | 62.5         |        |    |  |             |           |
|                            | Base Gauge                         |  | 62.0                 | 60.0         |        |    |  |             |           |
| Drain                      | Water Quality                      |  | Clear                | Clear        |        |    |  |             |           |

| Location     | Recommendations and Comments   | Assigned to | Completed |
|--------------|--|-------------|-----------|
| Plantroom 22 | <p>There is a branch from the Boosted Cold Water Services located at high level which measures approximately 10 metres of 54mm pipework before 1<sup>st</sup> tee off and a further 8 metres to HTG pressurisation unit. The BCWS also branches in 54mm and runs a further 8 metres before reducing to 15mm to supply CHW pressurisation unit (<b>Note: lines included within site flushing regime</b>).</p> <p>The BCWS branches also from cold supply at high level prior to the calorifiers and runs for approximately 40 metres through adjoining plant room areas to a fitted RPZ valve at 22AHU19 with no visible check valve fitted at tee off point. (<b>Note: lines included within site flushing regime</b>).</p> <p>Lines to pressurisation units should, if practicable, be switched to trades system, or suitable backflow protection fitted (<b>Note: lines included within site flushing regime</b>). Fast fill connections should be disconnected and have suitable backflow protection (e.g. RPZ) fitted fast fill connection.</p> <p>54mm line(s) to connection points would appear to have been installed during the construction phase and are likely to have been used for chemical cleaning/flushing of the HTG and CHW systems. The 54mm line(s) should be completely removed and piped through on main line as no longer routinely required, though Estates have advised the connection(s) may be required should the HTG or CHW systems require to be refilled at any point. Should connections require to be retained then lines should be cut back as far as is reasonably practicable with the resultant short connection point incorporated into the site flushing regime.</p> <p>Flexible hoses were noted on the pressure reducing valves on the cold supply into Plantroom 22. These should be checked to determine if these are EPDM. Should these be EPDM they should be replaced with a suitable alternative material (e.g. hard piped in stainless steel or PEX) if practicable or hoses inspected and replaced regularly (e.g. annually and/or as determined by periodic inspection) or as per manufacturer's instructions.</p> <p><b>Comments:</b></p> <p>A ClO<sub>2</sub> monitoring and top point was installed on the cold supply line as it enters Plantroom 22 (monitored by Scotmas).</p> |             |           |

| ID No./Name                |                            | P31 - 01/02/03                             |                      |              |        | Recommendations and Comments | Assigned to  | Completed |
|----------------------------|----------------------------|--|----------------------|--------------|--------|------------------------------|--|-----------|
| Location                   |                            | Plantroom 31                               |                      |              |        |                              |  |           |
| Labelled                   | Cal                        | Yes  | Pipes                | Yes          | Valves | No                           | <p>All associated valves should be correctly labelled for identification purposes.</p> <p>Ensure all temperature gauges are calibrated correctly and/or replaced where required.</p> <p>Suitable insulated jackets should be fitted to calorifier inspection hatch, to prevent heat loss from vessel.</p> <p>Short lines (<math>\approx 200\text{mm}</math>) to calorifier and expansion vessel drains – these should be incorporated into site flushing regime. (2)</p> <p><b>Comments:</b></p> <p>There is a ClO<sub>2</sub> monitoring and top-up station installed on the return line to the calorifiers (monitored by Scotmas).</p> <p>Pump at cold draw off to calorifier 3 Plate heat exchanger vibrating and a leak was noted from the plate heat exchanger.</p> <p>New expansion vessels fitted on all 3 Water heaters at the time of survey.</p> |           |
| Type                       |                            | Indirect – Vertical (Buffer)               |                      |              |        |                              |  |           |
| Materials                  |                            | Stainless steel                            |                      |              |        |                              |  |           |
| Access                     |                            | Good                                       |                      |              |        |                              |  |           |
| Linked/single              |                            | Linked                                     |                      |              |        |                              |  |           |
| Heat source                |                            | MTHW via Packaged PHX                      |                      |              |        |                              |  |           |
| Make up source             |                            | CWSTs 2A & 2B (Filtered)                   |                      |              |        |                              |  |           |
| Services supplied (area)   |                            | See Appendix 1 & 2 of This Section         |                      |              |        |                              |  |           |
| Size (m)                   |                            | 2.0 x 0.8 $\phi$                           |                      |              |        |                              |  |           |
| Cold feed location         |                            | Base                                       |                      |              |        |                              |  |           |
| Vent or pressure relief    |                            | Pressure relief                            |                      |              |        |                              |  |           |
| Circulation pump           | Fitted / No. / Check Valve | Yes  | x 1<br>Linked Return | None visible |        |                              |  |           |
| Destrat pump               | Fitted                     | None visible                               |                      |              |        |                              |  |           |
| Pumps                      | Vibration couplings        | None visible                               |                      |              |        |                              |  |           |
| Expansion / buffer vessel  | Fitted?                    | Yes – Aquapresso Flow Through (300 litres) |                      |              |        |                              |  |           |
|                            | Vessel able to be Flushed  | N/A  |                      |              |        |                              |  |           |
| Insulation                 |                            | Fitted Jacket                              |                      |              |        |                              |  |           |
| Inspection Hatch (mm)      |                            | 300mm Approx                               |                      |              |        |                              |  |           |
| Deadlegs around Calorifier |                            | None Visible                               |                      |              |        |                              |  |           |
| Non WRAS materials         |                            | None visible                               |                      |              |        |                              |  |           |
| Temperatures (°c)          | Calorifier                 | 01   | 02                   | 03           |        |                              |  |           |
|                            | Flow                       | 63.4                                       | 64.1                 | 62.9         |        |                              |  |           |
|                            | Flow Gauge                 | 62.0                                       | 65.0                 | 61.0         |        |                              |  |           |
|                            | Return(Linked)             | 59.7                                       |                      |              |        |                              |  |           |
|                            | Base/Drain                 | 61.0                                       | 62.5                 | 63.0         |        |                              |  |           |
|                            | Base Gauge                 | 60.0                                       | 60.0                 | 60.0         |        |                              |  |           |
| Drain                      | Water Quality              | Clear                                      | Clear                | Clear        |        |                              |  |           |

| ID No./Name                |                            | P31 - 04/05/06                             |                      |              |        | Recommendations and Comments | Assigned to   | Completed |  |
|----------------------------|----------------------------|--|----------------------|--------------|--------|------------------------------|---|-----------|--|
| Location                   |                            | Plantroom 31                               |                      |              |        |                              |   |           |  |
| Labelled                   | Cal                        | Yes  | Pipes                | Yes          | Valves | No                           | <p>All associated valves should be correctly labelled for identification purposes.</p> <p>Ensure all temperature gauges are calibrated correctly and/or replaced where required.</p> <p>Suitable insulated jackets should be fitted to calorifier inspection hatch, to prevent heat loss from vessel.</p> <p>Large deadlegs created on linked pipework to offline calorifier 1 – these should be included in recorded site flushing regime, until such times as reinstated to full daily use.</p> <p><b>Comments:</b></p> <p>There is a ClO<sub>2</sub> monitoring and top-up station installed on the return line to the calorifiers (monitored by Scotmas) – Note: this was off at time of survey awaiting repair.</p> <p>Line to standard expansion vessel removed and short deadleg remaining now incorporated into site flushing regime.</p> <p>Short lines (≈200mm) to calorifier and expansion vessel drains – these should be incorporated into site flushing regime.</p> <p>New expansion vessels fitted on all 3 Water heaters at the time of survey.</p> |           |  |
| Type                       |                            | Indirect – Vertical (Buffer)               |                      |              |        |                              |   |           |  |
| Materials                  |                            | Stainless steel                            |                      |              |        |                              |   |           |  |
| Access                     |                            | Good                                       |                      |              |        |                              |   |           |  |
| Linked/single              |                            | Linked                                     |                      |              |        |                              |   |           |  |
| Heat source                |                            | MTHW via Packaged PHX                      |                      |              |        |                              |   |           |  |
| Make up source             |                            | CWSTs 2A & 2B (Filtered)                   |                      |              |        |                              |   |           |  |
| Services supplied (area)   |                            | See Appendix 1 & 2 of this section         |                      |              |        |                              |   |           |  |
| Size (m)                   |                            | 2.2 x 1.0 ø                                |                      |              |        |                              |   |           |  |
| Cold feed location         |                            | Base                                       |                      |              |        |                              |   |           |  |
| Vent or pressure relief    |                            | Pressure relief                            |                      |              |        |                              |   |           |  |
| Circulation pump           | Fitted / No. / Check Valve | Yes  | x 1<br>Linked Return | None visible |        |                              |   |           |  |
| Destrat pump               | Fitted                     | None visible                               |                      |              |        |                              |   |           |  |
| Pumps                      | Vibration couplings        | None visible                               |                      |              |        |                              |   |           |  |
| Expansion / buffer vessel  | Fitted?                    | Yes – Aquapresso Flow Through (500 litres) |                      |              |        |                              |   |           |  |
|                            | Vessel able to be Flushed  | N/A  |                      |              |        |                              |   |           |  |
| Insulation                 |                            | Fitted Jacket                              |                      |              |        |                              |   |           |  |
| Inspection Hatch (mm)      |                            | 300mm Approx                               |                      |              |        |                              |   |           |  |
| Deadlegs around Calorifier |                            | Offline Calorifier 05                      |                      |              |        |                              |   |           |  |
| Non WRAS materials         |                            | None visible                               |                      |              |        |                              |   |           |  |
| Temperatures (°C)          | Calorifier                 | 04   | 05                   | 06           |        |                              |   |           |  |
|                            | Flow                       | 65.1                                       | <b>Offline</b>       | 63.0         |        |                              |   |           |  |
|                            | Flow Gauge                 | 70.0                                       |                      |              | 62.0   |                              |   |           |  |
|                            | Return(Linked)             | 60.1                                       |                      |              |        |                              |   |           |  |
|                            | Base/Drain                 | 62.0                                       |                      |              | 63.0   |                              |   |           |  |
|                            | Base Gauge                 | 63.0                                       |                      |              | 63.0   |                              |   |           |  |
| Drain                      | Water Quality              | Clear                                      |                      |              | Clear  |                              |   |           |  |

| ID No./Name                |                                    | P31 - 07/08/09                             |                   |                 |        | Recommendations and Comments | Assigned to   | Completed |
|----------------------------|------------------------------------|--|-------------------|-----------------|--------|------------------------------|---|-----------|
| Location                   |                                    | Plantroom 31                               |                   |                 |        |                              |   |           |
| Labelled                   | Cal                                | Yes  | Pipes             | Yes             | Valves | No                           | <p>All associated valves should be correctly labelled for identification purposes.</p> <p>Ensure all temperature gauges are calibrated correctly and/or replaced where required.</p> <p>Suitable insulated jackets should be fitted to calorifier inspection hatch, to prevent heat loss from vessel.</p> <p>Short lines (<math>\approx 200\text{mm}</math>) to calorifier and expansion vessel drains – these should be incorporated into site flushing regime.</p> <p><b>Comments:</b></p> <p>There is a ClO<sub>2</sub> monitoring and top-up station installed on the return line to the calorifiers (monitored by Scotmas).</p> <p>New expansion vessels have not been fitted to these calorifiers at time of survey. Ones fitted date from 2018-2019 upgrade works.</p> |           |
| Type                       | Indirect – Vertical (Buffer)       |  |                   |                 |        |                              |   |           |
| Materials                  | Stainless steel                    |  |                   |                 |        |                              |   |           |
| Access                     | Good                               |  |                   |                 |        |                              |   |           |
| Linked/single              | Linked                             |  |                   |                 |        |                              |   |           |
| Heat source                | MTHW via Packaged PHX              |  |                   |                 |        |                              |   |           |
| Make up source             | CWSTs 2A & 2B (Filtered)           |  |                   |                 |        |                              |   |           |
| Services supplied (area)   | See Appendix 1 & 2 of this section |  |                   |                 |        |                              |   |           |
| Size (m)                   | 2.5 x 1.0 $\emptyset$              |  |                   |                 |        |                              |   |           |
| Cold feed location         | Base                               |  |                   |                 |        |                              |   |           |
| Vent or pressure relief    | Pressure relief                    |  |                   |                 |        |                              |   |           |
| Circulation pump           | Fitted / No. / Check Valve         | Yes  | x 1 Linked Return | Yes             |        |                              |   |           |
| Destrat pump               | Fitted                             | None visible                               |                   |                 |        |                              |   |           |
| Pumps                      | Vibration couplings                | None visible                               |                   |                 |        |                              |   |           |
| Expansion / buffer vessel  | Fitted?                            | Yes – Aquapresso Flow Through (700 litres) |                   |                 |        |                              |   |           |
|                            | Vessel able to be Flushed          | N/A  |                   |                 |        |                              |   |           |
| Insulation                 | Fitted Jacket                      |  |                   |                 |        |                              |   |           |
| Inspection Hatch (mm)      | 300mm Approx                       |  |                   |                 |        |                              |   |           |
| Deadlegs around Calorifier | None Visible                       |  |                   |                 |        |                              |   |           |
| Non WRAS materials         | None visible                       |  |                   |                 |        |                              |   |           |
| Temperatures (°C)          | Calorifier                         | 07   | 08                | 09              |        |                              |   |           |
|                            | Flow                               | 62.3                                       | 60.0              | 62.4            |        |                              |   |           |
|                            | Flow Gauge                         | 70.0                                       | 60.0              | 40.0            |        |                              |   |           |
|                            | Return(Linked)                     | 60.1                                       |                   |                 |        |                              |   |           |
|                            | Base/Drain                         | 62.3                                       | 61.0              | 61.2            |        |                              |   |           |
|                            | Base Gauge                         | 65.0                                       | 60.0              | Off Scale - Low |        |                              |   |           |
| Drain                      | Water Quality                      | Clear                                      | Clear             | Clear           |        |                              |   |           |

| Location     | Recommendations and Comments  | Assigned to | Completed |
|--------------|---|-------------|-----------|
| Plantroom 31 | <p>There is a branch from the Boosted Cold Water Services located at high level above Calorifiers 31-01/02/03 which measures approximately 25 metres of 54mm pipework before 1<sup>st</sup> tee off and a further 10 metres before reducing to 15mm to supply HTG pressurisation unit at pumps PR31 PU11/12/13/14 SH. The BCWS also branches and runs for approximately 15m in 54mm and runs a further 15 metres before reducing to 15mm to supply CHW pressurisation unit at pumps 31 PU 01/02/03/04 SCW. (<b>Note:</b> <i>line included within site flushing regime</i>).</p> <p>54mm line(s) to connection points would appear to have been installed during the construction phase and are likely to have been used for chemical cleaning/flushing of the HTG and CHW systems. The 54mm line(s) should be completely removed and piped through on main line as no longer routinely required, though Estates have advised the connection(s) may be required should the HTG or CHW systems require to be refilled at any point. Should connections require to be retained then lines should be cut back as far as is reasonably practicable with the resultant short connection point incorporated into the site flushing regime.</p> <p>There is a line branching at high level from the cold supply to Calorifiers 31-04/05/06 with a check valve fitted approximately 1metre from the tee off point which then runs approximately 20 metres to RPZ on supply line to MRI Chillers (emergency cooling supply). Line to MRI Chiller should, if practicable, be switched to trades system (confirm water quality, pressure and flow rates etc. required to chiller prior to amending supply line) (<b>Note:</b> <i>line included within site flushing regime</i>).</p> <p>Lines to pressurisation units should, if practicable, be switched to trades system, or suitable backflow protection fitted (<b>Note:</b> <i>lines included within site flushing regime</i>). Fast fill connections should be disconnected and have suitable backflow protection (e.g. RPZ) fitted fast fill connection.</p> <p>Flexible hoses were noted on the pressure reducing valves on the cold supply into Plantroom 31. These should be checked to determine if these are EPDM. Should these be EPDM they should be replaced with a suitable alternative material (e.g. hard piped in stainless steel or PEX) if practicable or hoses inspected and replaced regularly (e.g. annually and/or as determined by periodic inspection) or as per manufacturer's instructions.</p> <p><b>Comments:</b></p> <p>A ClO<sub>2</sub> monitoring and top point was installed on the cold supply line as it enters Plantroom 31 at the Arran side (Adjacent to Calorifiers 4/5/6 and at the Bute site immediately as you enter the plantroom. There is also an additional unit installed on the line to supply the Theatres running through Plantroom 31 at Arran side (all units monitored by Scotmas).</p> <p>Cold supply line to Calorifiers 31-04/05/06 branches as it enters Plantroom 31 at high level, through pressure reducing valves (with flexible hoses – see recommendation above) with a 54mm line running to supply the Endoscopy Wash unit (no backflow protection noted on line to Endoscopy Wash plant) and then continuing on to riser M12 where it appears to supply cold water services within the Adults Theatre area (hot services in this riser fed from Calorifiers 31-01/02/03) (<b>Note:</b> ClO<sub>2</sub> dosing unit installed on this line to the Theatres).</p> |             |           |

| Location   |   | Assigned to | Completed |
|--|---|-------------|-----------|
| <p>Plantroom 31<br/>Optitherm Servicing and<br/>Thermal Disinfection Station</p> | <p>A cold water line branches from the cold supply to calorifier 31/09. This line then splits to supply a plate heat exchanger behind the calorifiers and off in the other direction to supply a dishwasher spray wash outlet and a Horne Optitherm in the TMV/Filter Service Room (DMA site office).</p> <p>The Plate Heat Exchanger (PHE) heats the cold water and then circulates via a small pump through the PHE and around a flow and return circuit in the TMV/Filter Service Room(DMA site office). There are hot outlets off this line to the dishwasher spray wash outlet and the Horne Optitherm, in addition to a connection (via a switched solenoid) to the Optitherm Servicing and Thermal Disinfection Station. There is also a line for a future additional station (also connected via a switched solenoid) – though the line to this is isolated.</p> <p>There is an 8 litre expansion vessel fitted on the cold/hot return line, with the line to the vessel being approx. 1.5m long. The vessel does not have a drain on it to permit flushing of the vessel and the vessel is not of a flow-through design.</p> <p>There are check valves fitted on the cold line and the hot return line to the plate heat exchanger to prevent backflow.</p> <p>The Optitherm Servicing and Thermal Disinfection Station is not operational, and hasn't been in use since it was installed. This in effect is creating 2 deadlegs (one to the installed service station and one designated for future installation ) of approximately 150mm (though these are flushed daily by DMA staff). The dishwasher spray wash outlet and Horne Optitherm are in regular use by DMA, who utilise this area as their site office.</p> <p>Hot flow and return temperatures in excess of 60°C were measured at points along the flow and return circuit.</p> <p>Significant heat gain has been noted at the cold outlets in the TMV/Filter Service Room (DMA site office) (at times up to 28°C) and cold temperatures can take up to 3 – 4 minutes to drop to temperatures consistent with other cold outlets in the building.</p> <p>Hot and cold lines are insulated in plantroom and above ceiling of the TMV/Filter Service Room (DMA site office), but no insulation in the actual room.</p> <p><b>Recommendations</b><br/>                     Optitherm Servicing and Thermal Disinfection Station (and line for future connection) should be removed fully from use leaving no deadlegs (DMA staff currently flush lines daily).<br/>                     As the TMV/Filter Service Room (DMA site office) is not a clinical area it is advised that insulation is fitted on hot and cold pipework as close as is practical to the outlets. This would aid in minimising heat gain in cold line to this room (though it would appear the majority of the heat gain on the cold lines would occur outwith the office area where pipework runs adjacent to hot water/heating pipework).<br/>                     Expansion vessel at Plate heat exchanger should be changed to flow through type, or have suitable drain fitted to line to allow vessel to be flushed.</p> |             |           |



| ID No./Name                |  | P32 - 01/02/03                     |  |                   |       | Recommendations and Comments | Assigned to | Completed   |  |
|----------------------------|--|------------------------------------|--|-------------------|-------|------------------------------|-------------|---|--|
| Location                   |  | Plantroom 32                       |  |                   |       |                              |             |   |  |
| Labelled                   |  | Cal                                | Yes  | Pipes             | Yes   | Valves                       | Yes         | <p>All associated valves should be correctly labelled for identification purposes.</p> <p>Ensure all temperature gauges are calibrated correctly and/or replaced where required.</p> <p>Suitable insulated jackets should be fitted to calorifier inspection hatch, to prevent heat loss from vessel.</p> <p>Short lines (<math>\approx 200\text{mm}</math>) to calorifier and expansion vessel drains – these should be incorporated into site flushing regime. (2)</p> <p><b>Comments:</b></p> <p>There is a ClO<sub>2</sub> monitoring and top-up station installed on the return line to the calorifiers (monitored by Scotmas).</p> <p>New expansion vessels have not been fitted to these calorifiers at time of survey. Ones fitted date from 2018-2019 upgrade works.</p> |  |
| Type                       |  | Indirect – Vertical (Buffer)       |  |                   |       |                              |             |   |  |
| Materials                  |  | Stainless steel                    |  |                   |       |                              |             |   |  |
| Access                     |  | Good                               |  |                   |       |                              |             |   |  |
| Linked/single              |  | Linked                             |  |                   |       |                              |             |   |  |
| Heat source                |  | MTHW via Packaged PHX              |  |                   |       |                              |             |   |  |
| Make up source             |  | CWSTs 2A & 2B (Filtered)           |  |                   |       |                              |             |   |  |
| Services supplied (area)   |  | See Appendix 1 & 2 of this section |  |                   |       |                              |             |   |  |
| Size (m)                   |  | 2.3 x 1.0 $\emptyset$              |  |                   |       |                              |             |   |  |
| Cold feed location         |  | Base                               |  |                   |       |                              |             |   |  |
| Vent or pressure relief    |  | Pressure relief                    |  |                   |       |                              |             |   |  |
| Circulation pump           |  | Fitted / No. / Check Valve         | Yes  | x 1 Linked Return | Yes   |                              |             |   |  |
| Destrat pump               |  | Fitted                             | None visible                               |                   |       |                              |             |   |  |
| Pumps                      |  | Vibration couplings                | None visible                               |                   |       |                              |             |   |  |
| Expansion / buffer vessel  |  | Fitted?                            | Yes – Aquapresso Flow Through (500 litres) |                   |       |                              |             |   |  |
|                            |  | Vessel able to be Flushed          | N/A  |                   |       |                              |             |   |  |
| Insulation                 |  | Fitted Jacket                      |  |                   |       |                              |             |   |  |
| Inspection Hatch (mm)      |  | 380mm Approx                       |  |                   |       |                              |             |   |  |
| Deadlegs around Calorifier |  | None Visible                       |  |                   |       |                              |             |   |  |
| Non WRAS materials         |  | None visible                       |  |                   |       |                              |             |   |  |
|                            |  | Calorifier                         | 01   | 02                | 03    |                              |             |   |  |
| Temperatures (°c)          |  | Flow(Linked)                       | 64.0                                       |                   |       |                              |             |   |  |
|                            |  | Flow Gauge                         | No Reasonable Access                       |                   |       |                              |             |   |  |
|                            |  | Return(Linked)                     | 59.0                                       |                   |       |                              |             |   |  |
|                            |  | Base/Drain                         | 61.5                                       | 60.9              | 64.1  |                              |             |   |  |
|                            |  | Base Gauge                         | 62.0                                       | 60.0              | 70.0  |                              |             |   |  |
| Drain                      |  | Water Quality                      | Clear                                      | Clear             | Clear |                              |             |   |  |

| Location     | Recommendations and Comments  | Assigned to | Completed |
|--------------|---|-------------|-----------|
| Plantroom 32 | <p>There is a branch from the Boosted Cold Water Services located at high level at which measures approximately 2 metres of 54mm pipework reducing to 15mm, running for 10 metres, supplying a pressurisation unit. (<b>Note:</b> lines included within site flushing regime).</p> <p>54mm line(s) to connection points would appear to have been installed during the construction phase and are likely to have been used for chemical cleaning/flushing of the HTG and CHW systems. The 54mm line(s) should be completely removed and piped through on main line as no longer routinely required, though Estates have advised the connection(s) may be required should the HTG or CHW systems require to be refilled at any point. Should connections require to be retained then lines should be cut back as far as is reasonably practicable with the resultant short connection point incorporated into the site flushing regime.</p> <p>Lines to pressurisation units should, if practicable, be switched to trades system, or suitable backflow protection fitted and lines incorporated into site flushing regime. Fast fill connections should be disconnected and have suitable backflow protection (e.g. RPZ) fitted fast fill connection. (<b>Note:</b> lines included within site flushing regime).</p> <p><b>Comments:</b></p> <p>A ClO<sub>2</sub> monitoring and top point was installed on the cold supply line as it enters Plantroom 32 (monitored by Scotmas).</p> <p>Connection to Adult's renal system is fed from the cold supply line within plantroom 32 – Carbon filters and ClO<sub>2</sub> monitoring station fitted within Adult's Renal Plantroom to prevent ClO<sub>2</sub> being drawn into the Renal system. This is monitored by Renal Technicians and Scotmas.</p> |             |           |

| ID No./Name                |                | P33 - 01/02/03                     |  |       |     |        | Recommendations and Comments | Assigned to   | Completed |  |
|----------------------------|----------------|------------------------------------|--|-------|-----|--------|------------------------------|---|-----------|--|
| Location                   |                | Plantroom 33                       |  |       |     |        |                              |   |           |  |
| Labelled                   |                | Cal                                | Yes  | Pipes | Yes | Valves | No                           | <p>All associated valves should be correctly labelled for identification purposes.</p> <p>Ensure all temperature gauges are calibrated correctly and/or replaced where required.</p> <p>Suitable insulated jackets should be fitted to calorifier inspection hatch, to prevent heat loss from vessel.</p> <p>Short lines (<math>\approx 200\text{mm}</math>) to calorifier and expansion vessel drains - these should be incorporated into site flushing regime.</p> <p><b>Comments:</b></p> <p>There is a ClO<sub>2</sub> monitoring and top-up station installed on the return line to the calorifiers (monitored by Scotmas).</p> <p>New expansion vessels have not been fitted to these calorifiers at time of survey. Ones fitted date from 2018-2019 upgrade works.</p> |           |  |
| Type                       |                | Plate Heat Exchanger               |  |       |     |        |                              |   |           |  |
| Materials                  |                | Stainless steel                    |  |       |     |        |                              |   |           |  |
| Access                     |                | Good                               |  |       |     |        |                              |   |           |  |
| Linked/single              |                | Linked                             |  |       |     |        |                              |   |           |  |
| Heat source                |                | MTHW via Packaged PHX              |  |       |     |        |                              |   |           |  |
| Make up source             |                | CWSTs 2A & 2B (Filtered)           |  |       |     |        |                              |   |           |  |
| Services supplied (area)   |                | See Appendix 1 & 2 of this section |  |       |     |        |                              |   |           |  |
| Size (m)                   |                | 2.3 1.0 $\emptyset$                |  |       |     |        |                              |   |           |  |
| Cold feed location         |                | Base                               |  |       |     |        |                              |   |           |  |
| Vent or pressure relief    |                | Pressure relief                    |  |       |     |        |                              |   |           |  |
| Circulation pump           |                | Fitted / No. / Check Valve         | Yes  | 1     | Yes |        |                              |   |           |  |
| Destrat pump               |                | Fitted                             | None visible                               |       |     |        |                              |   |           |  |
| Pumps                      |                | Vibration couplings                | None visible                               |       |     |        |                              |   |           |  |
| Expansion / buffer vessel  |                | Fitted?                            | Yes - upright                              |       |     |        |                              |   |           |  |
|                            |                | Vessel able to be Flushed          | Yes - Aquapresso Flow Through (700 litres) |       |     |        |                              |   |           |  |
| Insulation                 |                | None visible                       |  |       |     |        |                              |   |           |  |
| Inspection Hatch (mm)      |                | 380mm approx                       |  |       |     |        |                              |   |           |  |
| Deadlegs around Calorifier |                | Yes                                |  |       |     |        |                              |   |           |  |
| Non WRAS materials         |                | None visible                       |  |       |     |        |                              |   |           |  |
| Temperatures (°c)          | Calorifier     | 01                                 | 02   | 03    |     |        |                              |   |           |  |
|                            | Flow           | 62.9                               | 61.9                                       | 61.4  |     |        |                              |   |           |  |
|                            | Flow Gauge     | 60.0                               | 62.0                                       | 62.0  |     |        |                              |   |           |  |
|                            | Return(Linked) | 58.5                               |  |       |     |        |                              |   |           |  |
|                            | Base/Drain     | 64.0                               | 62.7                                       | 63.0  |     |        |                              |   |           |  |
|                            | Base Gauge     | 70.0                               | 62.0                                       | 62.0  |     |        |                              |   |           |  |
| Drain                      | Water Quality  | Clear                              | Clear                                      | Clear |     |        |                              |   |           |  |

| Location     | Recommendations and Comments   | Assigned to | Completed |
|--------------|--|-------------|-----------|
| Plantroom 33 | <p>There is a branch from the Boosted Cold Water Services located at high level (Near entrance to plantroom) which measures approximately 25 metres with 2 x drops of 2 metres in 54mm pipework to capped and valved off connection points and also branching and reducing to 15mm to supply pressurisation units (with no visible check valves) on the line. Lines to pressurisation units should, if practicable, be switched to trades system, or suitable backflow protection fitted (<b>Note: lines included within site flushing regime</b>). Fast fill connections should be disconnected and have suitable backflow protection (e.g. RPZ) fitted fast fill connection.</p> <p>54mm line(s) to connection points would appear to have been installed during the construction phase and are likely to have been used for chemical cleaning/flushing of the HTG and CHW systems. The 54mm line(s) should be completely removed and piped through on main line as no longer routinely required, though Estates have advised the connection(s) may be required should the HTG or CHW systems require to be refilled at any point. Should connections require to be retained then lines should be cut back as far as is reasonably practicable with the resultant short connection point incorporated into the site flushing regime.</p> <p><b>Comments:</b></p> <p>A ClO<sub>2</sub> monitoring and top point was installed on the cold supply line as it enters Plantroom 33 (monitored by Scotmas).</p> |             |           |

| ID No./Name                |                            | P41 - 01/02/03                             |                                  |               |              |        | Recommendations and Comments | Assigned to  | Completed |  |
|----------------------------|----------------------------|--|----------------------------------|---------------|--------------|--------|------------------------------|--|-----------|--|
| Location                   |                            | Plantroom 41                               |                                  |               |              |        |                              |  |           |  |
| Labelled                   |                            | Cal  | Yes                              | Pipes         | Yes          | Valves | Yes                          | <p>All associated valves should be correctly labelled for identification purposes.</p> <p>Ensure all temperature gauges are calibrated correctly and/or replaced where required.</p> <p>Suitable insulated jackets should be fitted to calorifier inspection hatch, to prevent heat loss from vessel.</p> <p>Large deadlegs created on linked pipework to offline calorifiers 1 &amp; 2 – these should be included in recorded site flushing regime, until such times as reinstated to full daily use. Checks should be made during upgrade works that hot water to Childrens hospital maintains correct flow and return temperatures.</p> <p>Short lines (≈200mm) to calorifier and expansion vessel drains – these should be incorporated into site flushing regime.</p> <p><b>Comments:</b></p> <p>There is a ClO<sub>2</sub> monitoring and top-up station installed on the return line to the calorifiers (monitored by Scotmas).</p> <p>Open face on safety valve.</p> <p>New expansion vessels in the process of being fitted on all 2 Water heaters at the time of survey, with 1 water heater (3) still having expansion vessel which was fitted date from 2018-2019 upgrade works. (Note: temps taken from Calorifier 1 prior to expansion vessel works commencing).</p> |           |  |
| Type                       |                            | Indirect – Vertical (Buffer)               |                                  |               |              |        |                              |  |           |  |
| Materials                  |                            | Stainless steel                            |                                  |               |              |        |                              |  |           |  |
| Access                     |                            | Good                                       |                                  |               |              |        |                              |  |           |  |
| Linked/single              |                            | Linked                                     |                                  |               |              |        |                              |  |           |  |
| Heat source                |                            | MTHW via Packaged PHX                      |                                  |               |              |        |                              |  |           |  |
| Make up source             |                            | CWSTs 1A & 1B (Filtered)                   |                                  |               |              |        |                              |  |           |  |
| Services supplied (area)   |                            | See Appendix 1 & 2 of this section         |                                  |               |              |        |                              |  |           |  |
| Size (m)                   |                            | 2.0 x 1.0 ø                                |                                  |               |              |        |                              |  |           |  |
| Cold feed location         |                            | Base                                       |                                  |               |              |        |                              |  |           |  |
| Vent or pressure relief    |                            | Pressure relief                            |                                  |               |              |        |                              |  |           |  |
| Circulation pump           | Fitted / No. / Check Valve | Yes  | x 1                              | Linked Return | None visible |        |                              |  |           |  |
| Destrat pump               | Fitted                     | None visible                               |                                  |               |              |        |                              |  |           |  |
| Pumps                      | Vibration couplings        | None visible                               |                                  |               |              |        |                              |  |           |  |
| Expansion / buffer vessel  | Fitted?                    | Yes – Aquapresso Flow Through (300 litres) |                                  |               |              |        |                              |  |           |  |
|                            | Vessel able to be Flushed  | N/A  |                                  |               |              |        |                              |  |           |  |
| Insulation                 |                            | Fitted Jacket                              |                                  |               |              |        |                              |  |           |  |
| Inspection Hatch (mm)      |                            | 300mm Approx                               |                                  |               |              |        |                              |  |           |  |
| Deadlegs around Calorifier |                            | Offline Calorifier 02                      |                                  |               |              |        |                              |  |           |  |
| Non WRAS materials         |                            | None visible                               |                                  |               |              |        |                              |  |           |  |
| Temperatures (°c)          | Calorifier                 | 01   | 02                               | 03            |              |        |                              |  |           |  |
|                            | Flow                       | 64.0                                       | <b>Offline at time of survey</b> | 64.0          |              |        |                              |  |           |  |
|                            | Flow Gauge                 | 60.0                                       |                                  | 60.0          |              |        |                              |  |           |  |
|                            | Return(Linked)             | 59.5                                       |                                  | 59.5          |              |        |                              |  |           |  |
|                            | Base/Drain                 | 61.5                                       |                                  | 61.9          |              |        |                              |  |           |  |
|                            | Base Gauge                 | 60.0                                       |                                  | 60.0          |              |        |                              |  |           |  |
| Drain                      | Water Quality              | Clear                                      |                                  | Clear         |              |        |                              |  |           |  |

| Location     | Recommendations and Comments   | Assigned to | Completed |
|--------------|--|-------------|-----------|
| Plantroom 41 | <p>There is a branch from the Boosted Cold Water Services located at high level near 41AHU03B which runs approximately 10 metres in 15mm pipework to supply a CHW pressurisation unit, with line hard piped into the closed system. This should be disconnected from closed system and line added to the flushing regime (Cat 4/5 backflow risk).</p> <p>There is a branch from the Boosted Cold Water Services located at high level near 41AHU05 which runs approximately 3m to blanked valve before splitting to run to two separate HTG Pressurisation units in 15mm – a 4m line to one unit and a 15 metre line to the other unit. <b>(Note: one line included within site flushing regime).</b> One of the lines is hard piped into the closed system. This should be disconnected from closed system and line added to the flushing regime (Cat 4/5 backflow risk).</p> <p>There is a branch from the Boosted Cold Water Services located at high level which runs approximately 8 metres and reducing 22mm. This line formerly supplied a pressurisation unit and Condair Humidification units at 41AHU27A, though these has now been disconnected, and then continued on to supply a pressurisation unit and Condair Humidification units at 41AHU27B, which have also been disconnected. This line should be removed if no longer required. <b>(Note: lines included within site flushing regime).</b></p> <p>There is a branch from the Boosted Cold Water Services located at high level above 41AHU24 which measures approximately 20 metres of 15mm pipework to supply CHW pressurisation unit. The line is hard piped into the closed system. This should be disconnected from closed system (Cat 4/5 backflow risk). <b>(Note: line included within site flushing regime).</b></p> <p>There is also a 3m deadleg (15mm) to a valve from this line at 41AHU24 – this line should be removed if no longer required <b>(Note: line included within site flushing regime).</b></p> <p>Lines to pressurisation units should, if practicable, be switched to trades system, or suitable backflow protection fitted.</p> <p>54mm line(s) to connection points would appear to have been installed during the construction phase and are likely to have been used for chemical cleaning/flushing of the HTG and CHW systems. The 54mm line(s) should be completely removed and piped through on main line as no longer routinely required, though Estates have advised the connection(s) may be required should the HTG or CHW systems require to be refilled at any point. Should connections require to be retained then lines should be cut back as far as is reasonably practicable with the resultant short connection point incorporated into the site flushing regime.</p> <p><b>Comments:</b></p> <p>A ClO<sub>2</sub> monitoring and top point was installed on the cold supply line as it enters Plantroom 41 at entrance through the DCFP Ward (monitored by Scotmas). Note: this was off at time of survey awaiting repair.</p> <p>2 x new pressurisation units were installed within plantroom 41 as part of the Ward 2A/2B upgrade works completed in March 22 near the Plantroom entrance at DCFP side (BMT PU1 &amp; BMU PU2) <b>(Note: lines included within site flushing regime).</b></p> |             |           |

# WATER SYSTEM RISK ASSESSMENT

## Section 6 Appendix 1

### Calorifier Wards and Areas Supplied

#### Plantroom 21

| Calorifiers 01, 02 & 03 <sup>1</sup> |                             |
|--------------------------------------|-----------------------------|
| Level                                | Department                  |
| Level 0                              | RHSC Emergency Department   |
| Level 0                              | ADULTS Emergency Department |
| Level 0                              | ADULTS Acute Assessment     |
| Level 1                              | ADULTS CCU                  |
| Level 1                              | ADULTS Critical Care        |

#### Plantroom 22

| Calorifiers 01, 02 & 03 <sup>1</sup> |   |
|--------------------------------------|---|
| Level                                | Department  |
| Level -1                             | FM and Kithcen                                      |
| Level 0                              | ADULTS Discharge Lounge                             |
| Level 0                              | ADULTS OPD  |
| Level 0                              | ADULTS Rehab and Therapies                          |
| Level 0                              | ADULTS Entrance                                     |
| Level 0                              | ADULTS Retail                                       |
| Level 0                              | ADULTS Snack Bar                                    |
| Level 0                              | ADULTS Radiology                                    |
| Level 0                              | ADULTS Pharmacy                                     |
| Level 0                              | Medical Illustration                                |
| Level 1                              | ADULTS OPD  |
| Level 1                              | ADULTS Restaurant Visitors Dining and Coffee Lounge |
| Level 1                              | Nuclear Medicine                                    |
| Level 1                              | RHSC Theatres                                       |
| Level 1                              | RHSC Radiology & Interventional Radiology           |
| Level 2                              | ADULTS Renal Dialysis OPD                           |
| Level 2                              | ADULTS Renal Dermatology OPD                        |
| Level 2                              | ADULTS Theatres                                     |
| Level 2                              | ADULTS Endoscopy                                    |
| Level 2                              | Female Change (Core D)                              |

# WATER SYSTEM RISK ASSESSMENT

## Section 6 Appendix 1

### Plantroom 31

| Calorifiers 01, 02 & 03 <sup>1</sup> |                         |
|--------------------------------------|-------------------------|
| Level                                | Department              |
| Level 0                              | ADULTS Acute Assessment |
| Level 1                              | ADULTS MDU              |
| Level 1                              | ADULTS Stroke Ward      |
| Level 2                              | ADULTS Theatres         |

| Calorifiers 04, 05, 06 <sup>1</sup> |                             |
|-------------------------------------|-----------------------------|
| Level                               | Department                  |
| Level 4                             | ADULTS Haemo Oncology Ward  |
| Level 4                             | ADULTS Core C Regen Kitchen |
| Level 5                             | ADULTS ENT Ward             |
| Level 5                             | ADULTS Core C Regen Kitchen |
| Level 6                             | ADULTS Generic Ward         |
| Level 6                             | ADULTS Core C Regen Kitchen |
| Level 7                             | ADULTS Generic Ward         |
| Level 7                             | ADULTS Core C Regen Kitchen |
| Level 8                             | ADULTS Generic Ward         |
| Level 8                             | ADULTS Core C Regen Kitchen |
| Level 9                             | ADULTS Generic Ward         |
| Level 9                             | ADULTS Core C Regen Kitchen |
| Level 10                            | ADULTS Generic Ward         |
| Level 10                            | ADULTS Core C Regen Kitchen |
| Level 11                            | ADULTS Generic Ward         |
| Level11                             | ADULTS Core C Regen Kitchen |

| Calorifiers 07, 08, 09 <sup>1</sup> |                             |
|-------------------------------------|-----------------------------|
| Level                               | Department                  |
| Level 4                             | ADULTS Renal Ward           |
| Level 5                             | ADULTS ENT Ward             |
| Level 5                             | ADULTS Core C Regen Kitchen |
| Level 6                             | ADULTS Generic Ward         |
| Level 6                             | ADULTS Core C Regen Kitchen |
| Level 7                             | ADULTS Generic Ward         |
| Level 7                             | ADULTS Core C Regen Kitchen |
| Level 8                             | ADULTS Generic Ward         |
| Level 8                             | ADULTS Core C Regen Kitchen |
| Level 9                             | ADULTS Generic Ward         |
| Level 9                             | ADULTS Core C Regen Kitchen |
| Level 10                            | ADULTS Generic Ward         |
| Level 10                            | ADULTS Core C Regen Kitchen |
| Level 11                            | ADULTS Generic Ward         |
| Level11                             | ADULTS Core C Regen Kitchen |



# WATER SYSTEM RISK ASSESSMENT

## Section 6 Appendix 1

### Plantroom 32

| Calorifiers 01, 02, 03 <sup>1</sup> |                                |
|-------------------------------------|--------------------------------|
| Level                               | Department                     |
| Level 3                             | ADULTS Public Health Records   |
| Level 4                             | ADULTS Higher Acute Renal Ward |
| Level 4                             | ADULTS Dirty Core D            |
| Level 5                             | ADULTS Rheumatology Ward       |
| Level 5                             | ADULTS Dirty Core D            |
| Level 6                             | ADULTS General Ward            |
| Level 6                             | ADULTS Dirty Core D            |
| Level 7                             | ADULTS General Ward            |
| Level 7                             | ADULTS Dirty Core D            |
| Level 8                             | ADULTS General Ward            |
| Level 8                             | ADULTS Dirty Core D            |
| Level 9                             | ADULTS General Ward            |
| Level 9                             | ADULTS Dirty Core D            |
| Level 10                            | ADULTS General Ward            |
| Level 10                            | ADULTS Dirty Core D            |
| Level 11                            | ADULTS General Ward            |
| Level 11                            | ADULTS Dirty Core D            |

### Plantroom 33

| Calorifiers 01, 02, 03 <sup>1</sup> |                     |
|-------------------------------------|---------------------|
| Level                               | Department          |
| Level 4                             | ADULTS Renal Ward   |
| Level 5                             | ADULTS General Ward |
| Level 6                             | ADULTS General Ward |
| Level 7                             | ADULTS General Ward |
| Level 8                             | ADULTS General Ward |
| Level 9                             | ADULTS General Ward |
| Level 10                            | ADULTS General Ward |
| Level 11                            | ADULTS General Ward |

# WATER SYSTEM RISK ASSESSMENT

## Section 6 Appendix 1

### Plantroom 41 (Children's)

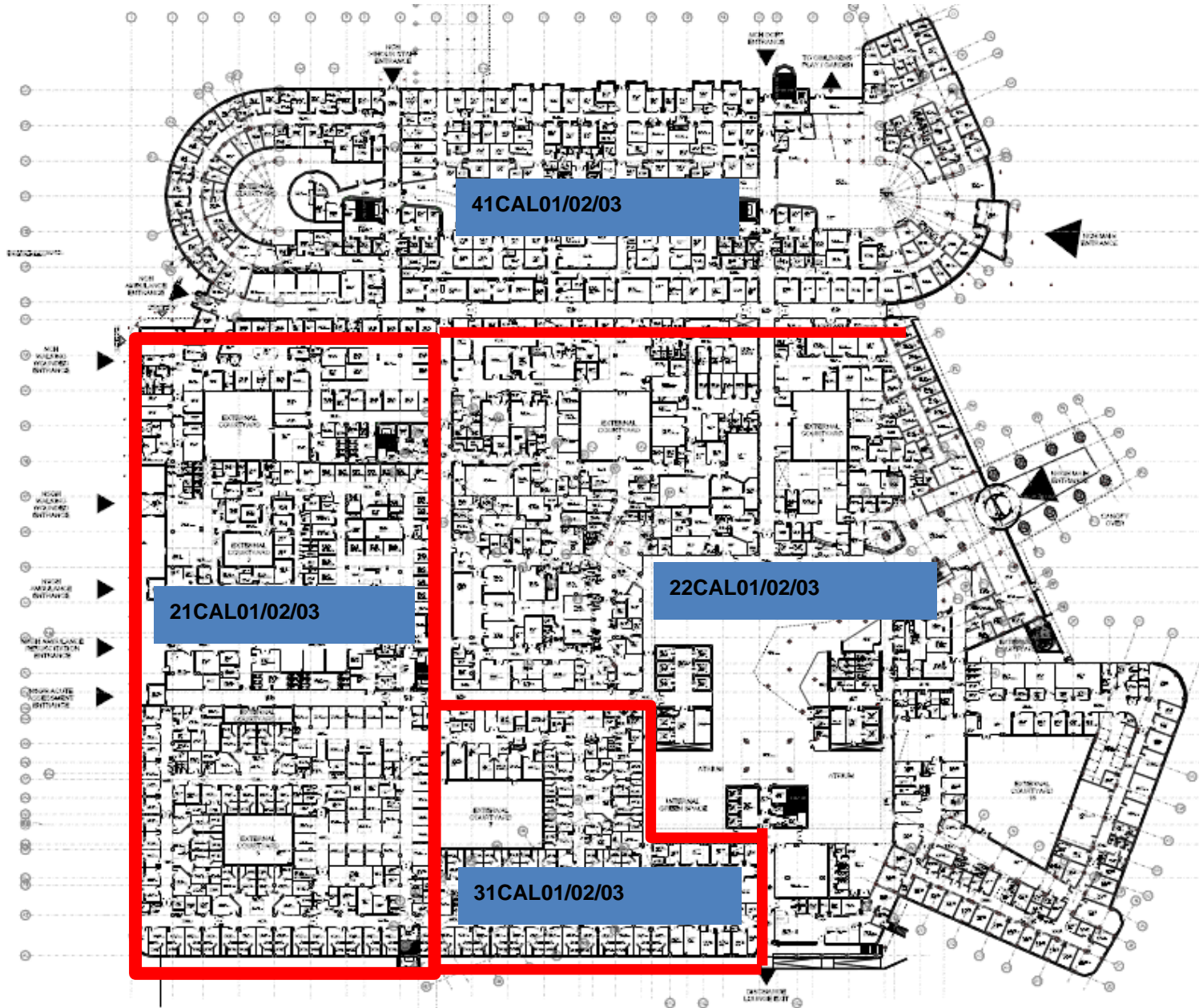
| Calorifiers 01, 02, 03 <sup>1</sup> |                                      |
|-------------------------------------|--------------------------------------|
| Level                               | Department                           |
| Level 0                             | NSH Public Observation Ward          |
| Level 0                             | RHSC Sanctuary/Child Protection Unit |
| Level 0                             | RHSC OPD                             |
| Level 0                             | RHSC Support                         |
| Level 0                             | Retail Unit and Snack Bar            |
| Level 1                             | RHSC Critical Care (PICU)            |
| Level 1                             | RHSC PICU Support                    |
| Level 1                             | RHSC MDU                             |
| Level 1                             | RHSC Theatres                        |
| Level 1                             | RHSC Special Feeds                   |
| Level 1                             | RHSC Cardiology Ward                 |
| Level 1                             | RHSC 23 Hours Unit                   |
| Level 2                             | RHSC Acute Receiving Ward            |
| Level 2                             | Aseptic Suite                        |
| Level 2                             | RHSC Day Case Unit                   |
| Level 2                             | RHSC Schiehallion Ward               |
| Level 2                             | RHSC Ward Support                    |
| Level 2                             | RHSC Teenage Cancer Trust            |
| Level 3                             | RHSC Inpatient Ward                  |
| Level 3                             | RHSC Ward Support                    |
| Level 3                             | RHSC Generic Ward                    |
| Level 4                             | RHSC DCFP                            |

<sup>1</sup> Information as to which zones/wards supplied by each calorifier set is as provided by Mercury/Brookfield and NHS GG&C.  
 QEUH A&C - Section 6 - Appendix 1  
 Calorifiers and Water Heaters



Section 6 Appendix 2 - Distributions Zone Map

Ground Floor



**PLantroom 41 Calorifiers 01, 02 & 03**

| Level   | Department                           |
|---------|--------------------------------------|
| Level 0 | RHSC Public Observation Ward         |
| Level 0 | RHSC Sanctuary/Child Protection Unit |
| Level 0 | RHSC OPD                             |
| Level 0 | RHSC Support                         |
| Level 0 | Retail Unit and Snack Bar            |

**PLantroom 21 Calorifiers 01, 02 & 03**

| Level   | Department                |
|---------|---------------------------|
| Level 0 | RHSC Emergency Department |
| Level 0 | Emergency Department      |
| Level 0 | Acute Assessment          |

**PLantroom 22 Calorifiers 01, 02 & 03**

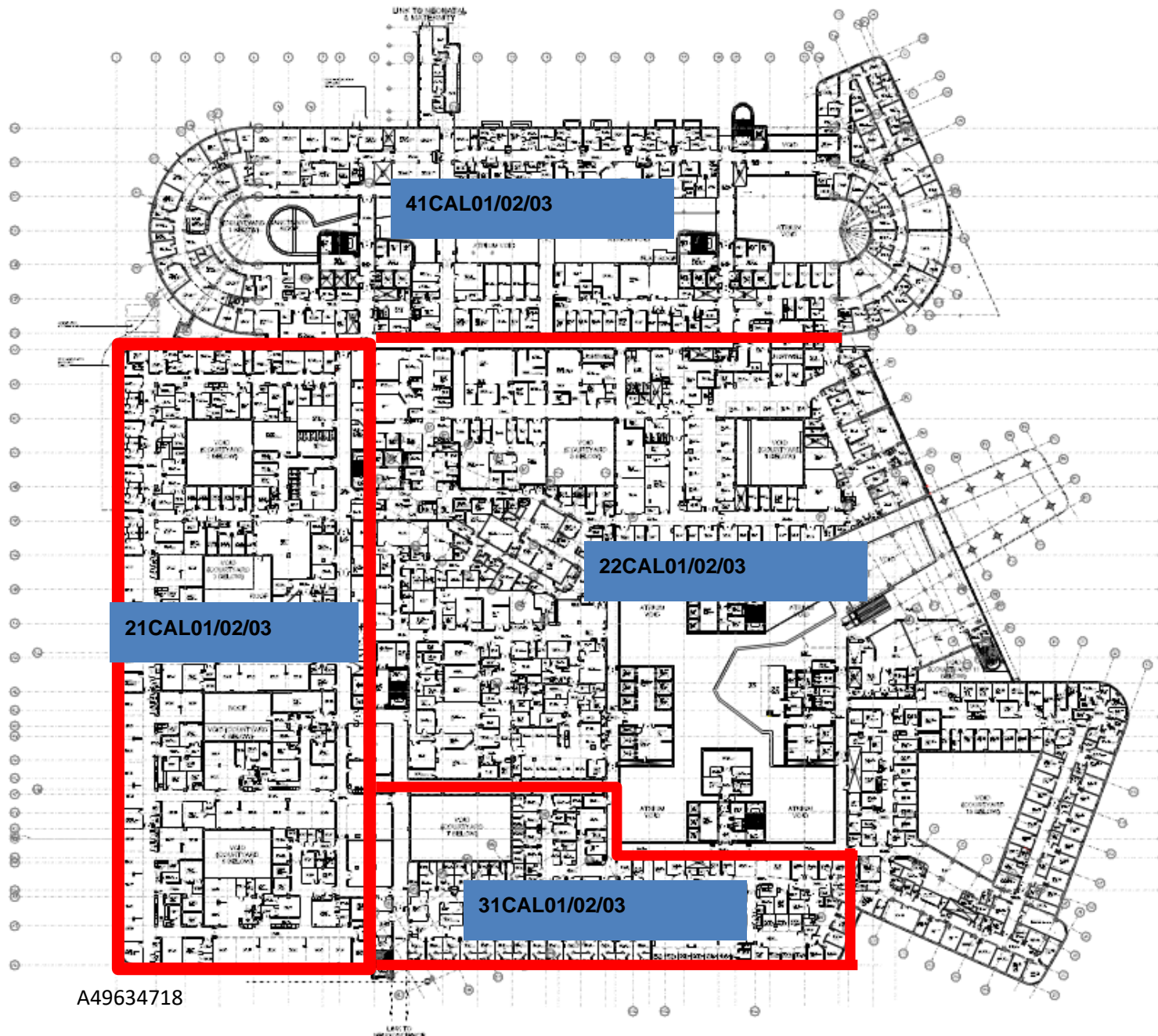
| Level    | Department           |
|----------|----------------------|
| Level -1 | FM and Kitchen       |
| Level 0  | Discharge Lounge     |
| Level 0  | OPD                  |
| Level 0  | Rehab and Therapies  |
| Level 0  | Entrance             |
| Level 0  | Retail               |
| Level 0  | Snack Bar            |
| Level 0  | Radiology            |
| Level 0  | Pharmacy             |
| Level 0  | Medical Illustration |

**PLantroom 31 Calorifiers 01, 02 & 03**

| Level   | Department       |
|---------|------------------|
| Level 0 | Acute Assessment |

Section 6 Appendix 2 - Distributions Zone Map

1<sup>st</sup> Floor



**PLantroom 41 Calorifiers 01, 02 & 03**

| Level   | Department               |
|---------|--------------------------|
| Level 1 | NCH Critical Care (PICU) |
| Level 1 | RHSC PICU Support        |
| Level 1 | RHSC MDU                 |
| Level 1 | RHSC Theatres            |
| Level 1 | RHSC Special Feeds       |
| Level 1 | RHSC Cardiology Ward     |

**PLantroom 21 Calorifiers 01, 02 & 03**

| Level   | Department    |
|---------|---------------|
| Level 1 | CCU           |
| Level 1 | Critical Care |

**PLantroom 22 Calorifiers 01, 02 & 03**

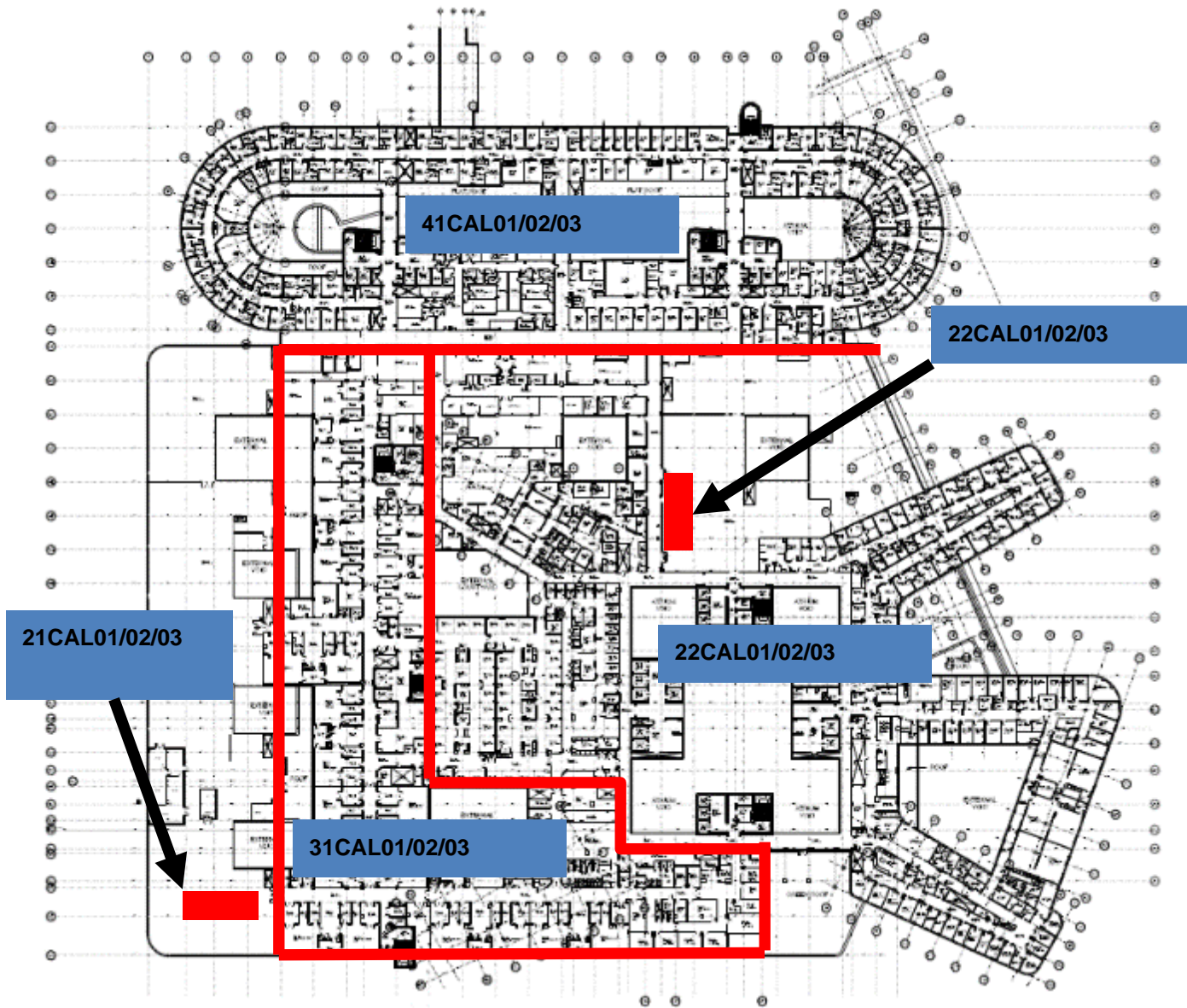
| Level   | Department                                   |
|---------|--|
| Level 1 | OPD  |
| Level 1 | Restaurant Visitors Dining and Coffee Lounge |
| Level 1 | Nuclear Medicine                             |
| Level 1 | RHSC Theatres                                |
| Level 1 | RHSC Radiology & Interventional Radiology    |

**PLantroom 31 Calorifiers 01, 02 & 03**

| Level   | Department         |
|---------|--------------------|
| Level 1 | ADULTS MDU         |
| Level 1 | ADULTS Stroke Ward |

Section 6 Appendix 2 - Distributions Zone Map

2<sup>nd</sup> Floor



**PLantroom 41 Calorifiers 01, 02 & 03**

| Level   | Department                |
|---------|---------------------------|
| Level 2 | RHSC Acute Receiving Ward |
| Level 2 | Aseptic Suite             |
| Level 2 | RHSC Day Case Unit        |
| Level 2 | RHSC Schiehallion Ward    |
| Level 2 | RHSC Ward Support         |

**PLantroom 22 Calorifiers 01, 02 & 03**

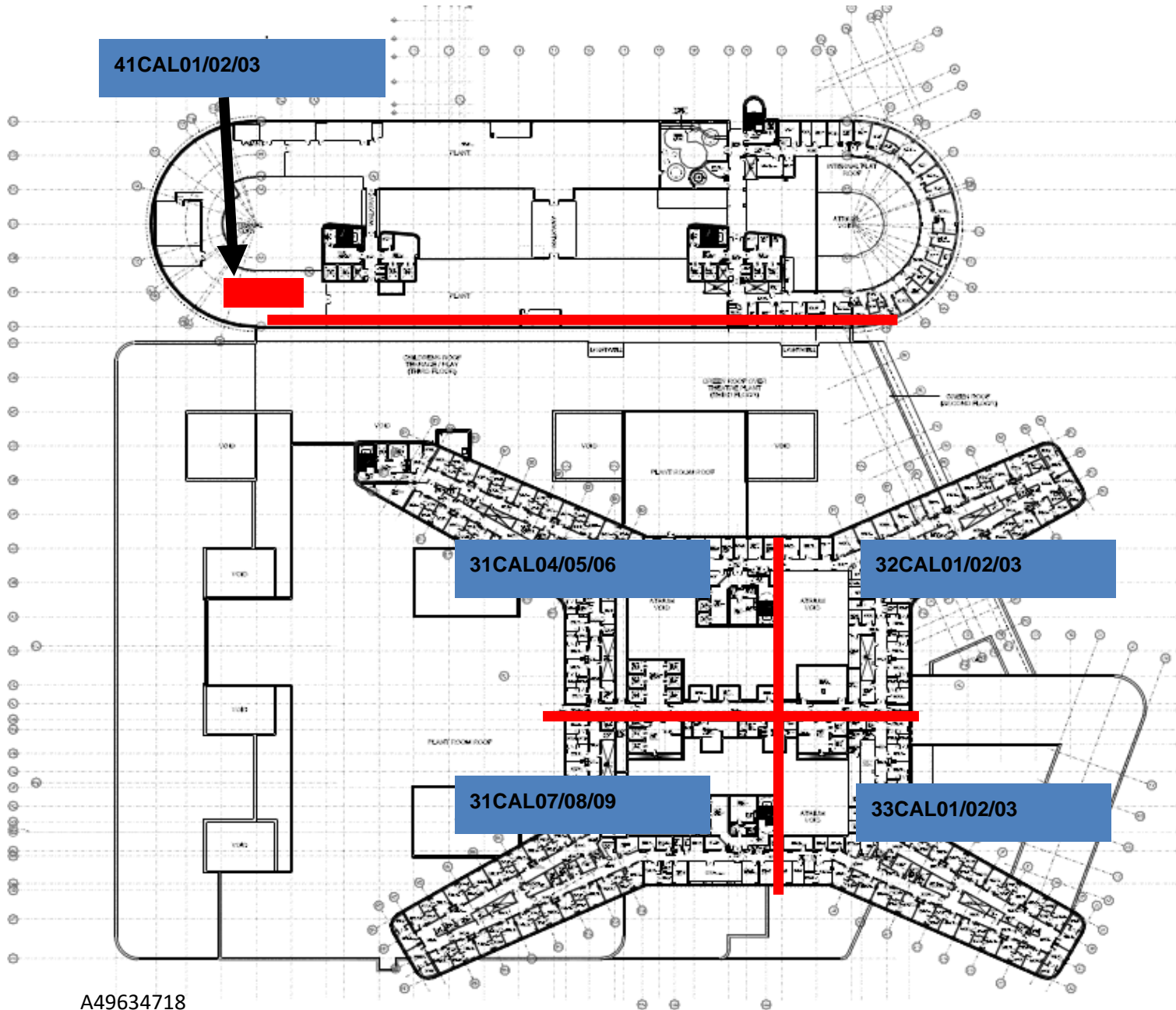
| Level   | Department             |
|---------|------------------------|
| Level 2 | Renal Dialysis OPD     |
| Level 2 | Renal Dermatology OPD  |
| Level 2 | Theatres               |
| Level 2 | Endoscopy              |
| Level 2 | Female Change (Core D) |

**PLantroom 31 Calorifiers 01, 02 & 03**

| Level   | Department      |
|---------|-----------------|
| Level 2 | ADULTS Theatres |

Section 6 Appendix 2 - Distributions Zone Map

3<sup>rd</sup> Floor



**Plantroom 41 Calorifiers 01, 02 & 03**

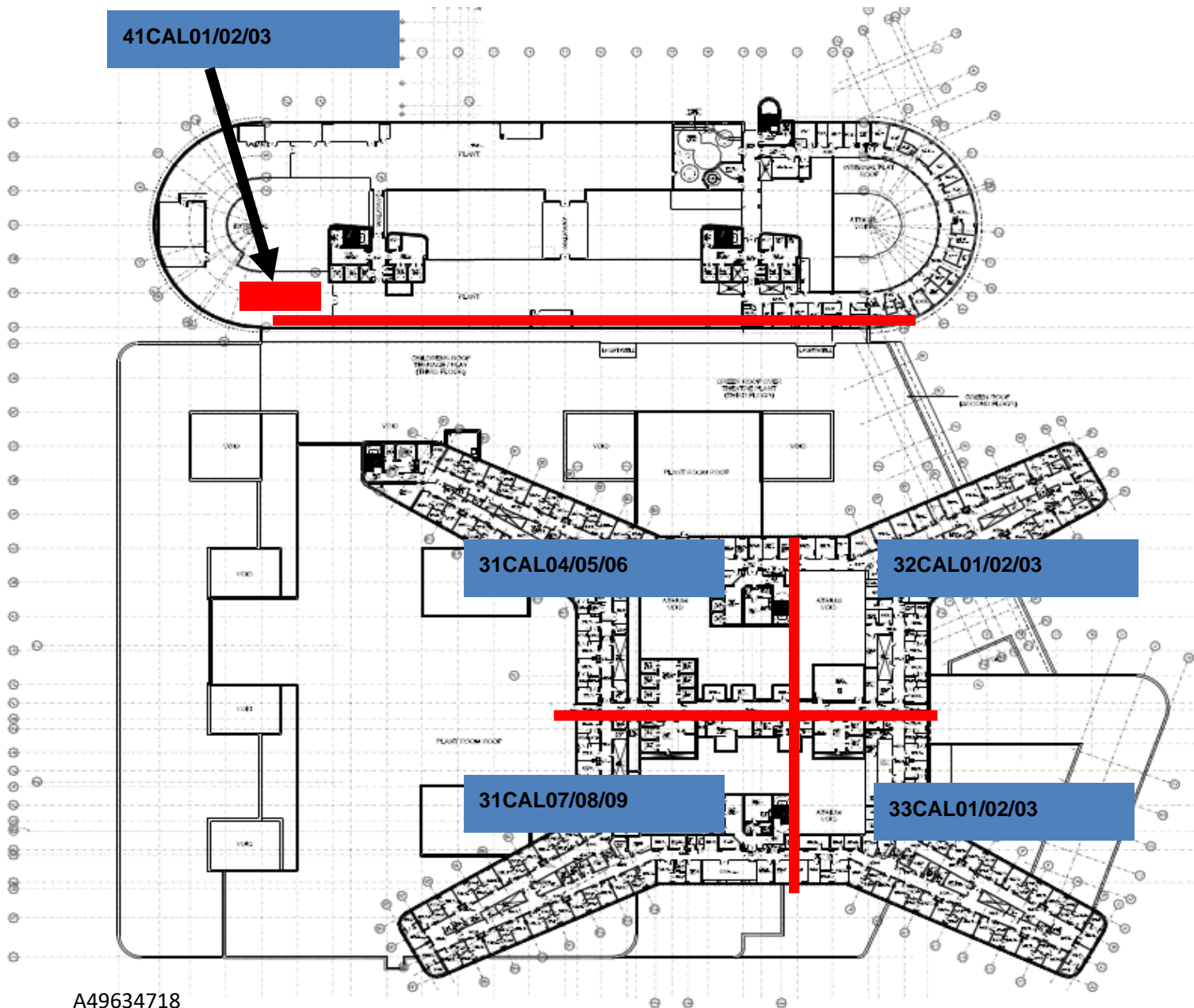
| Level   | Department          |
|---------|---------------------|
| Level 3 | RHSC Inpatient Ward |
| Level 3 | RHSC Ward Support   |
| Level 3 | RHSC Generic Ward   |

**Plantroom 32 Calorifiers 01, 02 & 03**

| Level   | Department            |
|---------|-----------------------|
| Level 3 | Public Health Records |

Section 6 Appendix 2 - Distributions Zone Map

4<sup>th</sup> Floor



41CAL01/02/03

31CAL04/05/06

32CAL01/02/03

31CAL07/08/09

33CAL01/02/03

**Plantroom 41 Calorifiers 01, 02 & 03**

| Level   | Department |
|---------|------------|
| Level 4 | RHSC DCFP  |

**Plantroom 32 Calorifiers 01, 02 & 03**

| Level   | Department              |
|---------|-------------------------|
| Level 4 | Higher Acute Renal Ward |
| Level 4 | ADULTS Dirty Core D     |

**Plantroom 31 Calorifiers 04, 05 & 06**

| Level   | Department                  |
|---------|-----------------------------|
| Level 4 | Haemo Oncology Ward         |
| Level 4 | ADULTS Core C Regen Kitchen |

**Plantroom 31 Calorifiers 07, 08 & 09**

| Level   | Department |
|---------|------------|
| Level 4 | Renal Ward |

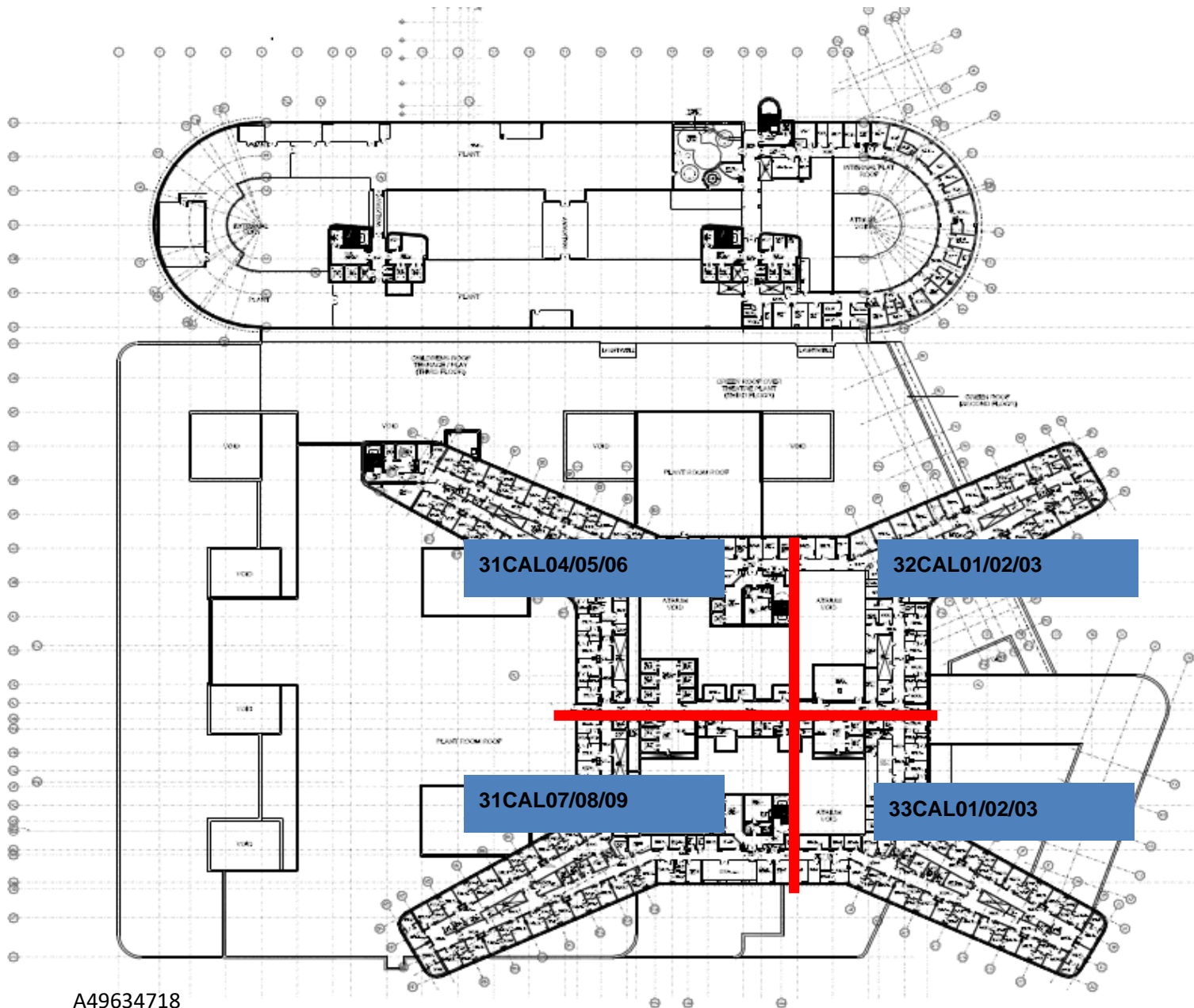
**33-CAL 01, 02 & 03**

| Level   | Department |
|---------|------------|
| Level 4 | Renal Ward |



Section 6 Appendix 2 - Distributions Zone Map

5<sup>th</sup> Floor



**PLantroom 32 Calorifiers 01, 02 & 03**

| Level   | Department        |
|---------|-------------------|
| Level 5 | Rheumatology Ward |
| Level 5 | Dirty Core D      |

**PLantroom 31 Calorifiers 04, 05 & 06**

| Level   | Department           |
|---------|----------------------|
| Level 5 | ENT Ward             |
| Level 5 | Core C Regen Kitchen |

**PLantroom 31 Calorifiers 07, 08 & 09**

| Level   | Department           |
|---------|----------------------|
| Level 5 | ENT Ward             |
| Level 5 | Core C Regen Kitchen |

**33-CAL 01, 02 & 03**

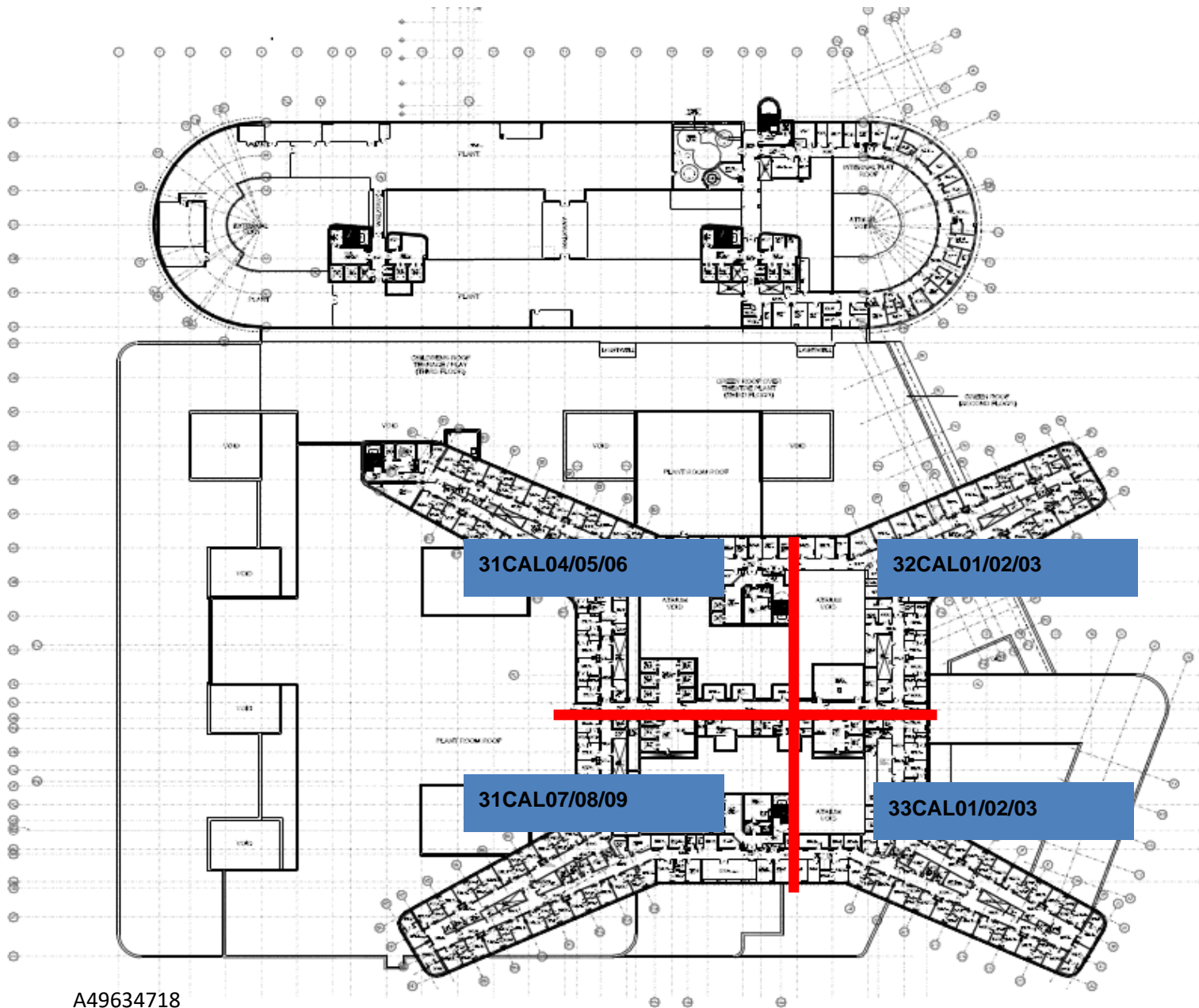
| Level   | Department   |
|---------|--------------|
| Level 5 | General Ward |





Section 6 Appendix 2 - Distributions Zone Map

6<sup>th</sup> Floor



**PLantroom 32 Calorifiers 01, 02 & 03**

| Level   | Department   |
|---------|--------------|
| Level 6 | General Ward |
| Level 6 | Dirty Core D |

**PLantroom 31 Calorifiers 04, 05 & 06**

| Level   | Department           |
|---------|----------------------|
| Level 6 | Generic Ward         |
| Level 6 | Core C Regen Kitchen |

**PLantroom 31 Calorifiers 07, 08 & 09**

| Level   | Department           |
|---------|----------------------|
| Level 6 | Generic Ward         |
| Level 6 | Core C Regen Kitchen |

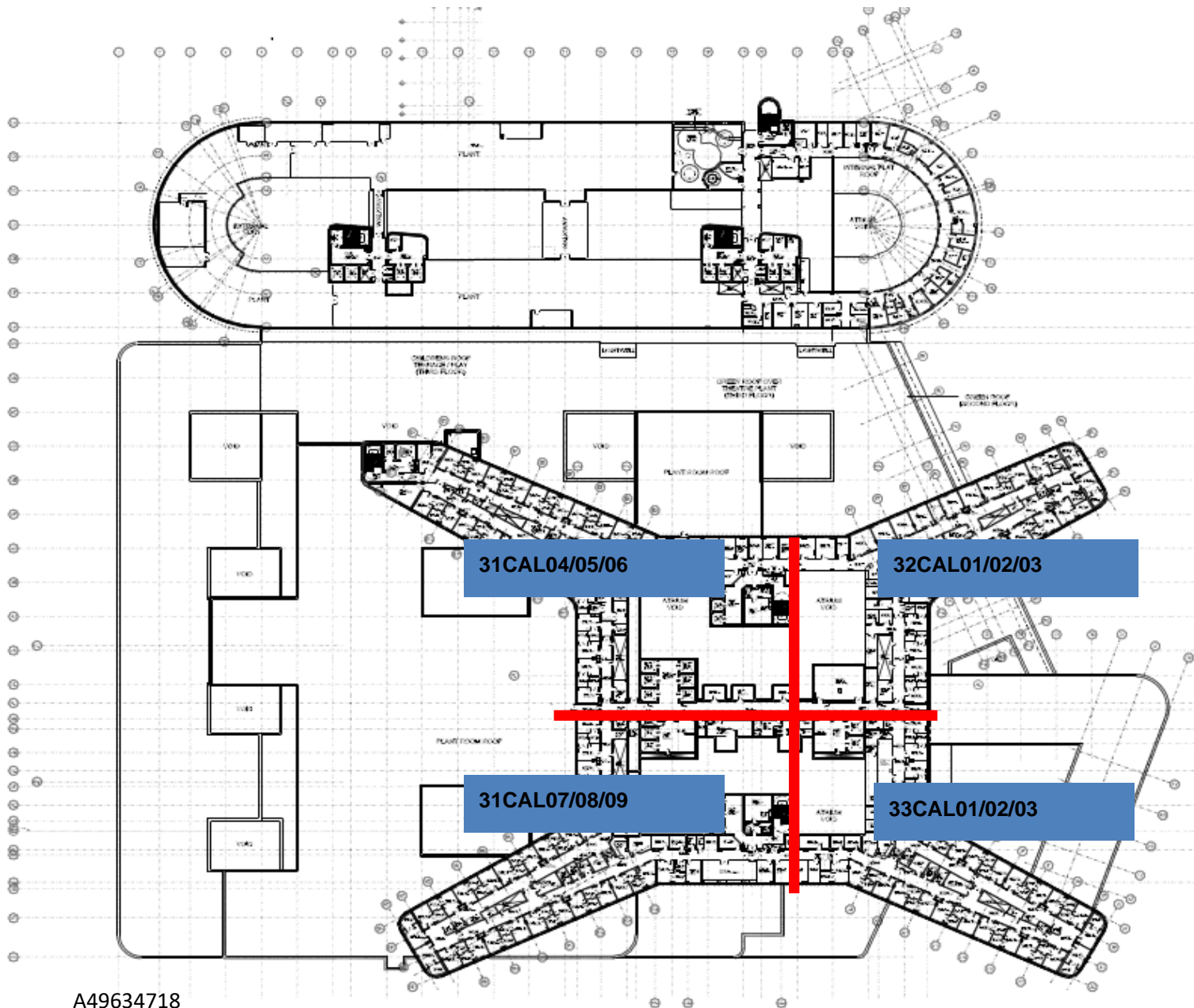
**33-CAL 01, 02 & 03**

| Level   | Department   |
|---------|--------------|
| Level 6 | General Ward |



Section 6 Appendix 2 - Distributions Zone Map

7<sup>th</sup> Floor



**PLantroom 32 Calorifiers 01, 02 & 03**

| Level   | Department           |
|---------|----------------------|
| Level 7 | Generic Ward         |
| Level 7 | Core C Regen Kitchen |

**PLantroom 31 Calorifiers 04, 05 & 06**

| Level   | Department   |
|---------|--------------|
| Level 7 | General Ward |
| Level 7 | Dirty Core D |

**PLantroom 31 Calorifiers 07, 08 & 09**

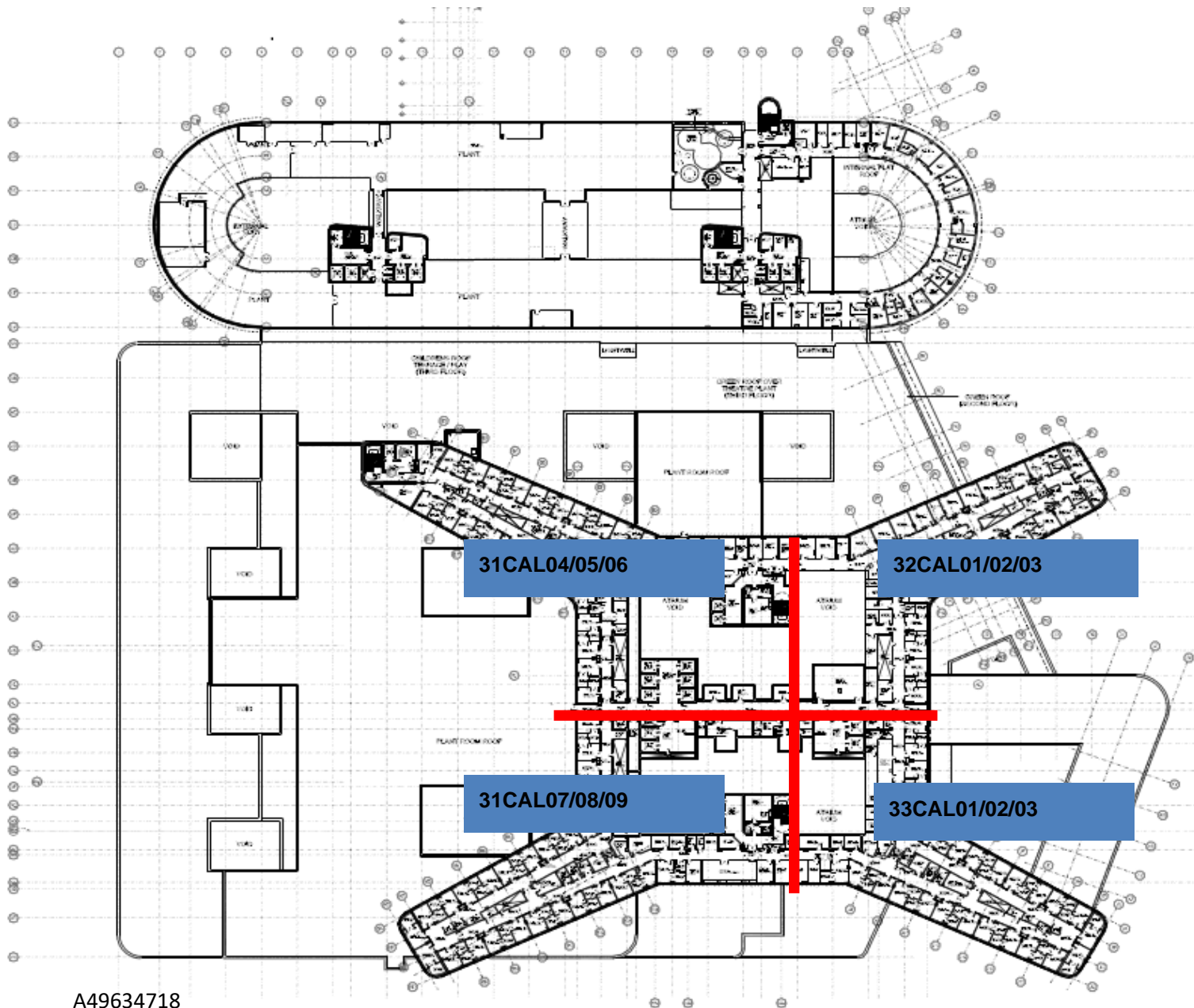
| Level   | Department           |
|---------|----------------------|
| Level 7 | Generic Ward         |
| Level 7 | Core C Regen Kitchen |

**33-CAL 01, 02 & 03**

| Level   | Department   |
|---------|--------------|
| Level 7 | General Ward |

Section 6 Appendix 2 - Distributions Zone Map

8<sup>th</sup> Floor



**PLantroom 32 Calorifiers 01, 02 & 03**

| Level   | Department           |
|---------|----------------------|
| Level 8 | Generic Ward         |
| Level 8 | Core C Regen Kitchen |

**PLantroom 31 Calorifiers 04, 05 & 06**

| Level   | Department   |
|---------|--------------|
| Level 8 | General Ward |
| Level 8 | Dirty Core D |

**PLantroom 31 Calorifiers 07, 08 & 09**

| Level   | Department           |
|---------|----------------------|
| Level 8 | Generic Ward         |
| Level 8 | Core C Regen Kitchen |

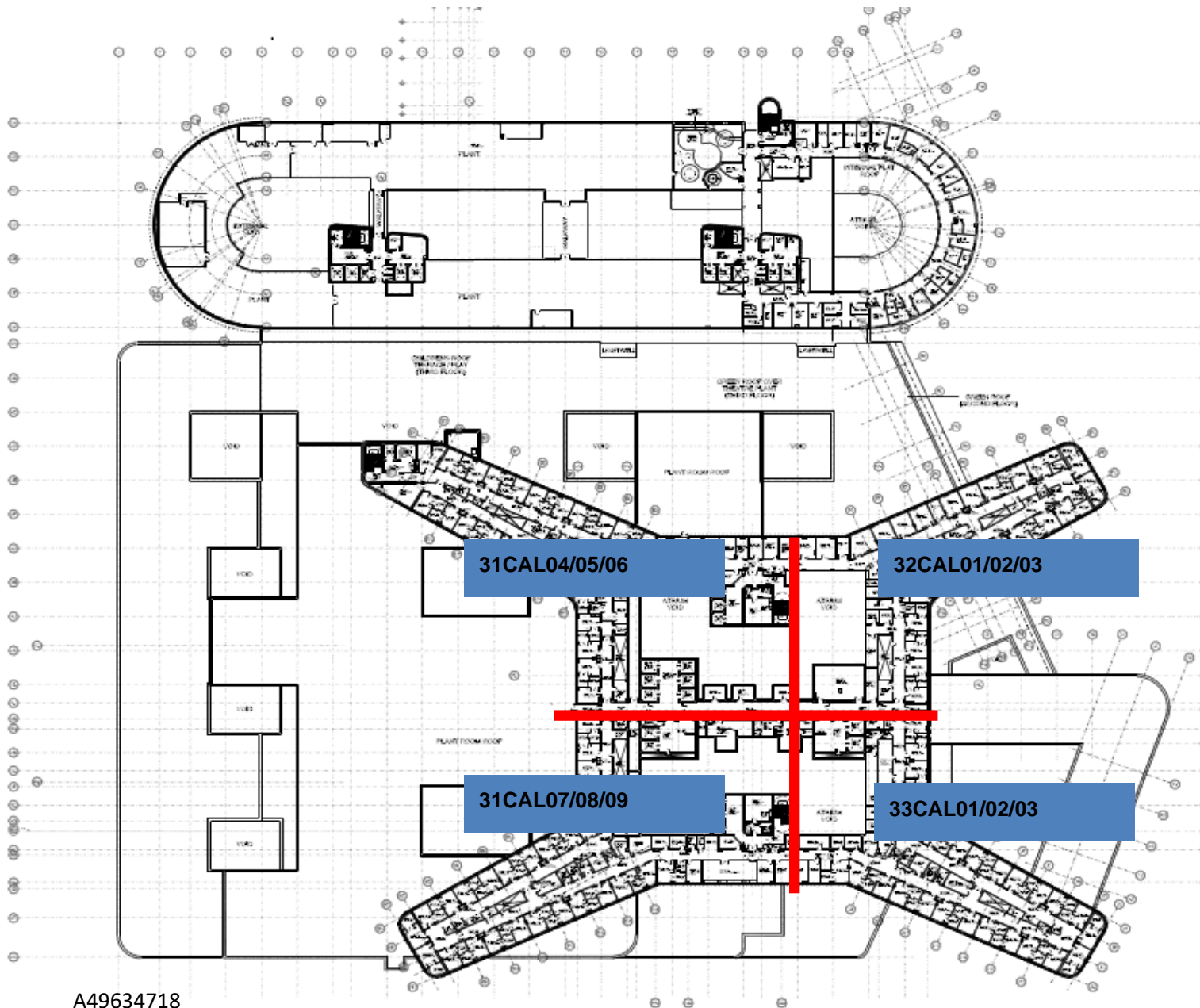
**33-CAL 01, 02 & 03**

| Level   | Department   |
|---------|--------------|
| Level 8 | General Ward |



Section 6 Appendix 2 - Distributions Zone Map

9<sup>th</sup> Floor



**PLantroom 32 Calorifiers 01, 02 & 03**

| Level   | Department           |
|---------|----------------------|
| Level 9 | Generic Ward         |
| Level 9 | Core C Regen Kitchen |

**PLantroom 31 Calorifiers 04, 05 & 06**

| Level   | Department   |
|---------|--------------|
| Level 9 | General Ward |
| Level 9 | Dirty Core D |

**PLantroom 31 Calorifiers 07, 08 & 09**

| Level   | Department           |
|---------|----------------------|
| Level 9 | Generic Ward         |
| Level 9 | Core C Regen Kitchen |

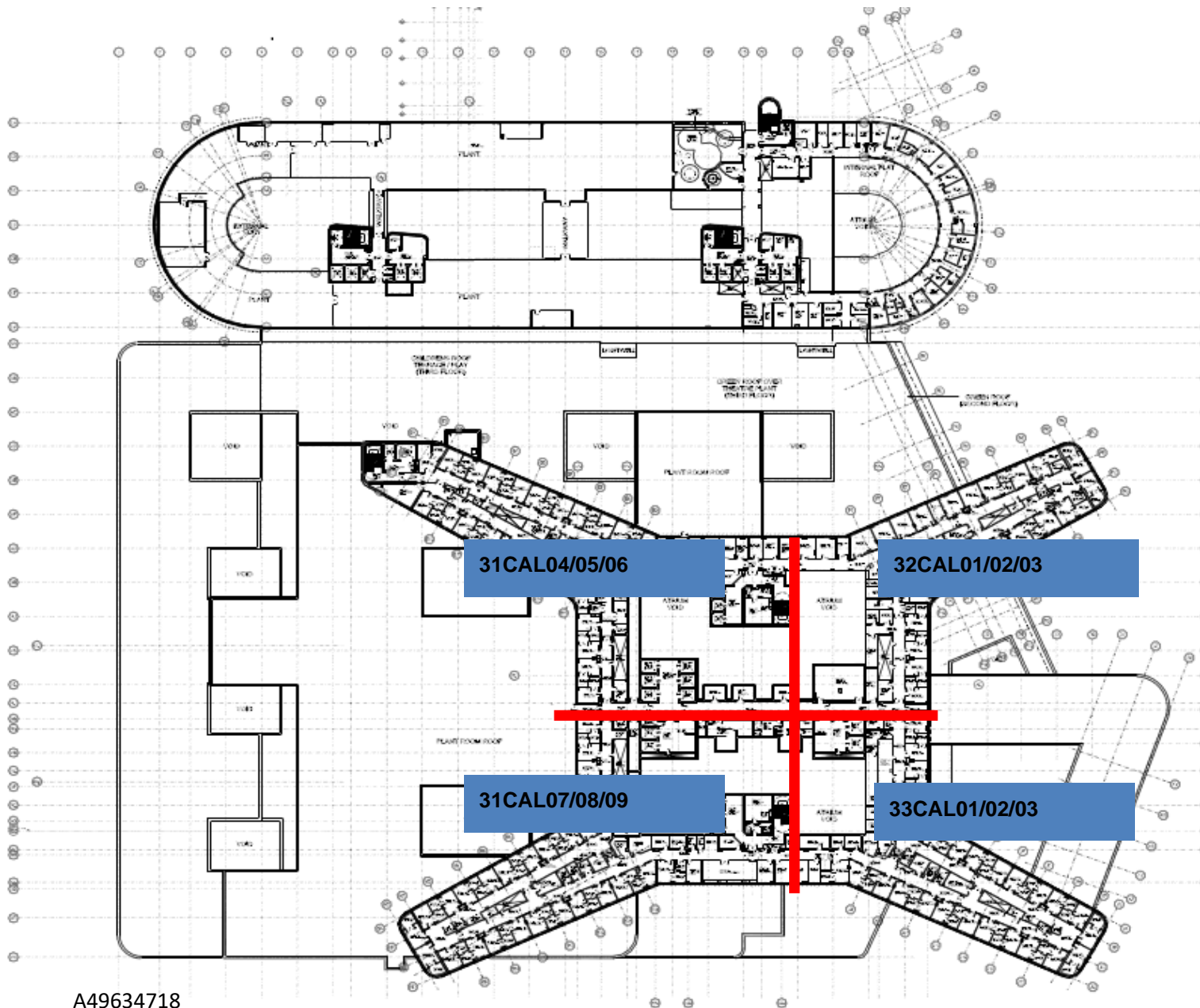
**33-CAL 01, 02 & 03**

| Level   | Department   |
|---------|--------------|
| Level 9 | General Ward |



Section 6 Appendix 2 - Distributions Zone Map

10<sup>th</sup> Floor



**PLantroom 32 Calorifiers 01, 02 & 03**

| Level    | Department           |
|----------|----------------------|
| Level 10 | Generic Ward         |
| Level 10 | Core C Regen Kitchen |

**PLantroom 31 Calorifiers 04, 05 & 06**

| Level    | Department   |
|----------|--------------|
| Level 10 | General Ward |
| Level 10 | Dirty Core D |

**PLantroom 31 Calorifiers 07, 08 & 09**

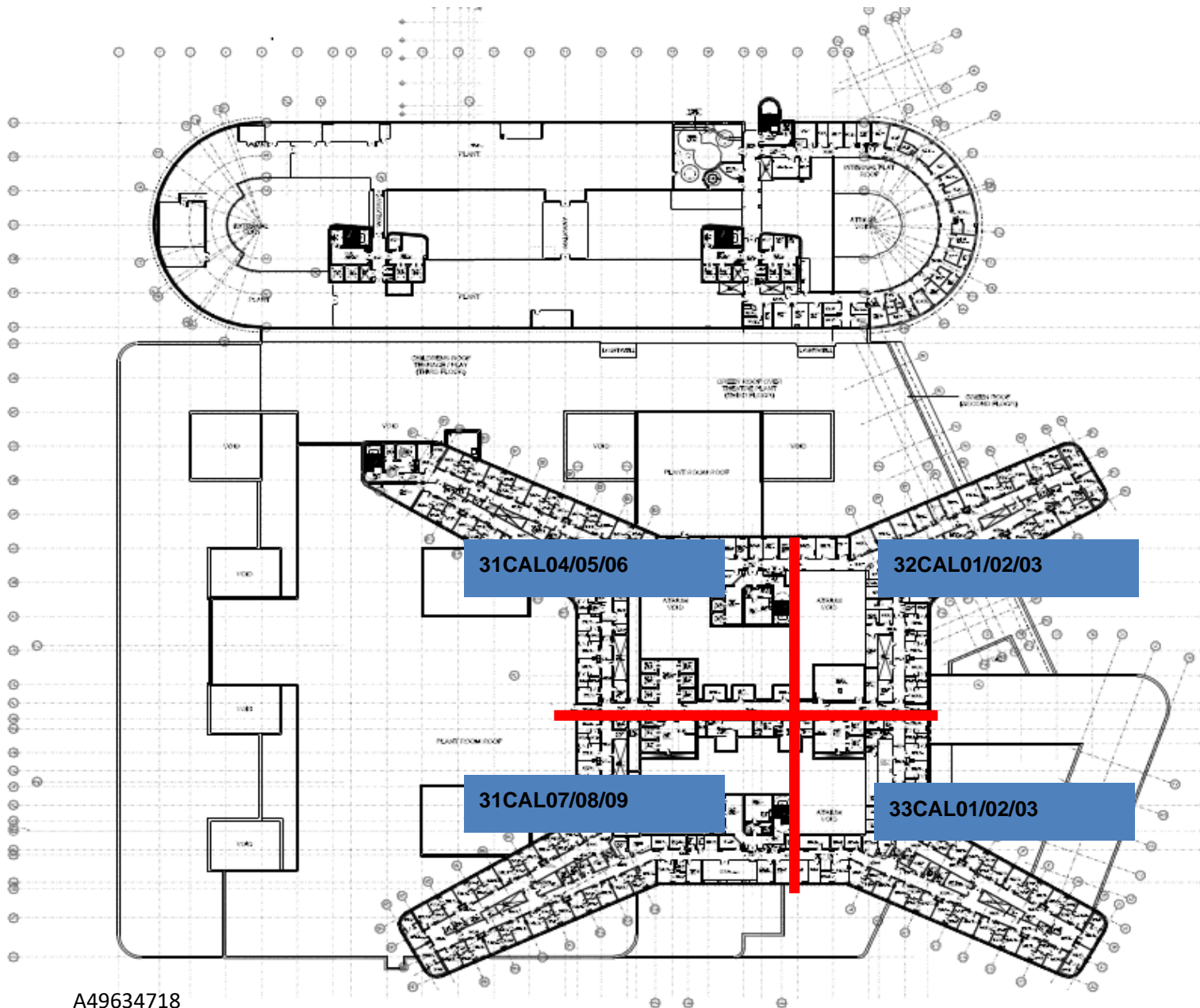
| Level    | Department           |
|----------|----------------------|
| Level 10 | Generic Ward         |
| Level 10 | Core C Regen Kitchen |

**33-CAL 01, 02 & 03**

| Level    | Department   |
|----------|--------------|
| Level 10 | General Ward |

Section 6 Appendix 2 - Distributions Zone Map

11<sup>th</sup> Floor



**PLantroom 32 Calorifiers 01, 02 & 03**

| Level    | Department           |
|----------|----------------------|
| Level 11 | Generic Ward         |
| Level 11 | Core C Regen Kitchen |

**PLantroom 31 Calorifiers 04, 05 & 06**

| Level    | Department   |
|----------|--------------|
| Level 11 | General Ward |
| Level 11 | Dirty Core D |

**PLantroom 31 Calorifiers 07, 08 & 09**

| Level    | Department           |
|----------|----------------------|
| Level 11 | Generic Ward         |
| Level 11 | Core C Regen Kitchen |

**33-CAL 01, 02 & 03**

| Level    | Department   |
|----------|--------------|
| Level 11 | General Ward |

**WATER SYSTEMS RISK ASSESSMENT**

# **Section 7**

## **Hot and Cold Water Outlets**

## **LEGIONELLA RISK ASSESSMENT**

### **Showers and other spray outlets**

Since showers produce fine water droplets or spray they present a significantly higher risk for the development of Legionnaires' disease than other types of hot and cold outlets.

Water temperature, system design/installation, showerhead design, frequency of use and cleanliness of the outlet are the most significant factors in determining the risk potential.

### **Hot and cold water outlets**

Hot and cold-water outlets do not normally present a risk for the development of Legionnaires' disease unless the outlets create fine droplets or spray. Outlets that do create sprays/droplets significantly increase the risk.

Water temperature, system design/installation, frequency of use, tap design and cleanliness of the outlet are the most significant factors in determining the risk potential.

Basic principles being looked at in this section are the physical condition, and the design of the water services pipework and outlets, and the temperature profile of the water being distributed to the outlets. There should be no unused outlets or deadlegs (blank ends) on any parts of the systems. Hot water should be delivered to all outlets at a minimum of 50°C (55°C within healthcare premises) within 1 minute of outlet being run and cold water below 20°C within 2 minutes of being run. Cold water should be no more than 2°C higher at the outlet than the water source for this outlet (e.g. CWST). This section also incorporates details of spray outlets/aerosol generators (showers etc.), low use outlets and unused outlets.

Please refer to outlet sheets for specific recommendations & risk ratings.

Risk factors incorporated within this section of the document are classified as "additional localised risk rating". This refers only to the condition of the localised pipework distribution and services and the risk rating applied is in addition to risk rating of the plant items feeding the services.

All outlets fed from CWSTs or calorifiers etc. Inherently carry the risk associated to these plant items, and these risk factors must be taken into account in determining the actual risk posed by the system as a whole.

Please refer to appropriate sections on legionella management, CWSTs, calorifiers and water source to determine the inherent risk factors of water being supplied to the outlets being assessed in this section.



## LEGIONELLA RISK ASSESSMENT

### Hot and Cold Water Outlet Notes

1. Thermostatic mixing valves (TMVs) should be serviced and have fail safe tests carried out routinely (every 6 months) and strainers should be cleaned on a regular basis as per manufacturer's recommendations. Ideally TMVs should feed single outlets and be situated as close as possible to the outlet (preferably TMV Taps should be fitted).
2. All flexi hoses connecting taps/outlets should be WRAS approved and should be replaced every 2 years or sooner if damaged or twisted. Wherever possible DMA would recommend all flexi hoses are removed and connections hard piped. Where flexible hoses cannot be removed then replacing with alternative WRAS approved hoses with linings other than EPDM should be considered. In healthcare premises flexible hoses should only be used on essential equipment subject to vibration or articulation and wherever practical alternative lining materials should be considered with hoses be inspected, assessed and replaced at regular intervals. Refer to HTM/SHTM 04-01 for further details.
3. All lead (Pb) pipework should be removed and replaced with copper or other suitable WRAS approved pipework.
4. Wherever possible, DMA would recommend that spray taps are removed and replaced with taps which do not create an aerosol. Tap diffusers should also be removed where possible to minimise aerosol creation and the build-up of dirt/scale etc. On the diffusers wherever possible. In healthcare premises adjustable flow showerheads should not be fitted (replace with non-adjustable showerheads).
5. Drain cocks fitted at the end of pipe runs should be removed if not required for operational reasons or periodically flushed (weekly) and checks carried out to ensure that inserts/washers etc. are WRAS approved.
6. Adequate backflow protection as per Water Regulations Guide & Water Byelaws (Scotland) – section 6, should be incorporated into the water services within the building. Suitable backflow protection should be fitted to all point of use water heaters, multi point water heaters, tea boilers etc., if not fitted inside heater itself, on pressurised systems (e.g. Mains fed or boosted cold water fed). Before fitting any double check valves or other forms of backflow protection ensure that adequate pressure relief valves/expansion vessels are fitted and working in the event of excessive pressure or temperature build up within water heaters.
7. Water coolers and drinks machines should have regular servicing carried out (generally six monthly) as per manufacturers recommendations.
8. Where passive infra-red (PIR) flush controls are fitted on urinals these have batteries fitted. Make sure these batteries are working and all PIR(s) are serviced every two years or as per manufacturers' recommendations otherwise these may become low flow or deadleg areas.
9. All low use outlets, and all associated pipework, should be removed leaving no deadlegs if outlets no longer required, or incorporated into low use flushing regime.
10. All deadlegs should be removed wherever possible. Where deadlegs are unable to be removed provision to allow flushing of the deadlegs weekly as part of the flushing regime should be made. (i.e. Valves fitted at end of deadlegs to allow flushing to be carried out).
11. All plant items, valves. CWSTS, calorifiers etc. Should be clearly labelled to identify what services and areas they serve.
12. All equipment hoses (e.g. Kitchen/laundry appliances) should be WRAS approved and inspected and replaced on a regular basis.
13. Cold water should be delivered to outlets (and cold feed to thermostatic mixing valves) at less than 20°C within 2 minutes of outlet being run, and not more than 2°C above outlet water source temperature (e.g. CWST)
14. Hot water should be delivered to outlets (and hot feed to thermostatic mixing valves) at more than 50°C (55°C in healthcare premises), within 1 minute of outlet being run<sup>1</sup>

<sup>1</sup> Hot supply temperatures in healthcare premises varies from non-healthcare premises. Please refer to HSG 274 Part 2 and HTM/SHTM 04/01 for further details.

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |           |                 |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations  |
|-----------------------------|--------------|-------------------|-----------|-----------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|---|
| Level                       | Adults / RHC | Department / Ward | Door Code | Room Name       | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |   |
| 0                           | Adults       | A&E               | EMC-020   | Toilet          | 1 x Contour  | 14.8           | 0.39                        |               |                            | 41.3            | 0.17                         |   |
| 0                           | Adults       | A&E               | EMC-031   | Triage B        | 1 x Optitherm  | 13.1           | 0.36                        |               |                            | 41.7            | 0.15                         |   |
| 0                           | Adults       | A&E               | EMC-037   | Disabled Toilet | 1 x Contour  | 18.2           | 0.36                        | 56.8          |                            | 40.3            | 0.19                         | Hot flow and return not operating correctly in area - further investigation required, to ensure system balanced correctly throughout, with Kemper Multitherm Regulating Valves set correctly. |
| 0                           | Adults       | A&E               | EMC-041   | Toilet          | 1 x Contour  | NA             | NA                          |               |                            | 47.9            | 0.11                         | TMT out of specification and requires reset and/or fully serviced or replaced if required.  |
| 0                           | Adults       | A&E               | EMC-059   | Bed Bay 5       | 1 x Optitherm  | 14.5           | 0.4                         |               |                            | 40.1            | 2.06                         |   |
| 0                           | Adults       | A&E               | EMC-060   | Bed Bay 6       | 1 x Optitherm  | 14.8           | 0.42                        |               |                            | 39              | 0.15                         |   |
| 0                           | Adults       | A&E               | EMC-063   | Bed Bay 8       | 1 x Optitherm  | 17.3           | 0.39                        |               |                            | 40.5            | 0.17                         |   |
| 0                           | Adults       | A&E               | EMC-076   | Bed Bay No. 8   | 1 x Optitherm  | 16.4           |                             |               |                            | 40.9            | 0.09                         |   |
| 0                           | Adults       | A&E               | EMC-086   | Facilities      | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 17.8           | 0.37                        | 47.8          | <0.02                      | 40.2            |                              | Hot flow and return not operating correctly in area - further investigation required, to ensure system balanced correctly throughout, with Kemper Multitherm Regulating Valves set correctly. |
| 0                           | Adults       | A&E               | EMC-093   | Bed 14          | 1 x Optitherm  | 14.4           | 0.34                        |               |                            | 41.8            | 0.15                         |   |
| 0                           | Adults       | A&E               | EMC-100   | Service         | 1 x Optitherm<br>1 x SSS   | 14.4           | 0.41                        |               |                            | 40.2            | 2.19                         |   |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |           |                       |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations  |
|-----------------------------|--------------|-------------------|-----------|-----------------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|---|
| Level                       | Adults / RHC | Department / Ward | Door Code | Room Name             | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |   |
| 0                           | Adults       | A&E               | EMC-111   | Female Change         | 3 x Contours<br>2 x Showers  | 20.3           | 0.32                        | 52            |                            | 41.4            | 0.14                         | Hot flow and return not operating correctly in area - further investigation required, to ensure system balanced correctly throughout, with Kemper Multitherm Regulating Valves set correctly. Cold temperature slightly high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. |
| 0                           | Adults       | A&E               | EMC-135   | Store                 | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)                        | 14.2           | 0.31                        | 46.1          | 0.02                       | 40.7            |                              | Hot flow and return not operating correctly in area - further investigation required, to ensure system balanced correctly throughout, with Kemper Multitherm Regulating Valves set correctly.   |
| 0                           | Adults       | Acute Assess      | AAW-007   | Facilities            | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 12.1           | 0.33                        | 61.6          | 0.02                       |                 |                              |   |
| 0                           | Adults       | Acute Assess      | AAW-017   | Bed 111               | 1 x Optitherm  | 13.6           | 0.38                        |               |                            | 40.9            | 0.17                         |   |
| 0                           | Adults       | Acute Assess      | AAW-032   | Bedroom 104           | 1 x Optitherm<br>1 x Contour<br>1 x Shower   | 19.8           | 0.3                         | 58.2          |                            | 39.9            | 0.15                         |   |
| 0                           | Adults       | Acute Assess      | AAW-038   | Toilet                | 1 x Contour<br>1 x WC  | 19.8           | NA                          | 61.8          |                            | 57.5            | 0.03                         | TMT out of specification and requires reset and/or fully serviced or replaced if required.  |
| 0                           | Adults       | Acute Assess      | AAW-045   | Treatment Room        | 1 x Optitherm  | 14.6           | 0.35                        |               |                            | 40.2            | 0.14                         |   |
| 0                           | Adults       | Acute Assess      | AAW-060   | Toilet                | 1 x Contour  | 20.5           | 0.18                        | 59.2          |                            | 38.2            | 0.25                         | TMT slightly out of specification and requires reset and/or fully serviced or replaced if required. Cold temperature slightly high, though taken from surface temp/via a contour and temperatures in surrounding area acceptable. Investigate and correct.  |
| 0                           | Adults       | Acute Assess      | AAW-089   | Bedroom 85 (En suite) | 1 x Optitherm<br>1 x Contour<br>1 x Shower   | 20.5           | 0.3                         | 57.9          |                            | 40.2            | 0.15                         | Cold temperature slightly high, though taken from surface temp/via a contour and temperatures in surrounding area acceptable. Investigate and correct.  |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |           |                     |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations   |
|-----------------------------|--------------|-------------------|-----------|---------------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|--|
| Level                       | Adults / RHC | Department / Ward | Door Code | Room Name           | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |  |
| 0                           | Adults       | Acute Assess      | AAW-096   | Toilet (Room 81)    | 1 x Contour<br>2 x Shower  | 18.2           | 0.39                        |               |                            | 41.9            | 0.2                          |  |
| 0                           | Adults       | Acute Assess      | AAW-108   | Bedroom 92 Bathroom | 1 x Optitherm<br>1 x Contour<br>1 x Shower   | 19             | 0.33                        |               |                            | 41.1            | 0.18                         |  |
| 0                           | Adults       | Acute Assess      | AAW-125   | Facilities C27501A  | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 14.1           | 0.37                        | 63.8          | <0.02                      |                 |                              |  |
| 0                           | Adults       | Acute Assess      | AAW-156   | Staff Kitchen       | 1 x Infrared<br>1 x SSS  | 15.1           | 0.32                        | 59.2          | <0.02                      |                 |                              |  |
| 0                           | Adults       | Acute Assess      | AAW-173   | Facilities          | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 16.5           | 0.37                        | 62.5          | 0.06                       |                 |                              |  |
| 0                           | Adults       | Acute Assess      | AAW-174   | Facilities          | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 13.8           | 0.33                        |               |                            | 40.2            | 0.15                         |  |
| 0                           | Adults       | Acute Assess      | AAW-193   | Toilet              | 1 x Optitherm  | 21             | 0.27                        | 53.8          |                            | 37.1            | 2.3                          | Hot flow and return not operating correctly in area - further investigation required, to ensure system balanced correctly throughout, with Kemper Multitherm Regulating Valves set correctly. TMT slightly out of specification and requires reset and/or fully serviced or replaced if required. Cold temperature slightly high, though temperatures in surrounding area acceptable. Investigate and correct. |
| 0                           | Adults       | Acute Assess      | AAW-208   | Dirty Utility       | 2 x Optitherm  | 18.5           | 0.35                        | 46.8          |                            | 24              | <0.02                        | Hot flow and return not operating correctly in area - further investigation required, to ensure system balanced correctly throughout, with Kemper Multitherm Regulating Valves set correctly. TMT out of specification and requires reset and/or fully serviced or replaced if required.   |
| 0                           | Adults       | Acute Assess      | AAW-226   | Lab                 | 1 x Optitherm  | 16.9           | 0.35                        |               |                            | 40              | 0.06                         |  |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |           |                            |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations  |
|-----------------------------|--------------|-------------------|-----------|----------------------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|---|
| Level                       | Adults / RHC | Department / Ward | Door Code | Room Name                  | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |   |
| 0                           | Adults       | Acute Assess      | AAW-240   | Toilet                     | 1 x Optitherm  | 19.7           | 0.29                        | 60.8          |                            | 47.3            | 0.13                         | TMT out of specification and requires reset and/or fully serviced or replaced if required.  |
| 0                           | Adults       | Acute Assess      | AAW-247   | Kitchen                    | 1 x Infrared Contour<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)                 | 14.3           | 0.28                        | 63.3          | ?                          |                 |                              |   |
| 0                           | Adults       | Acute Assess      | AAW-265   | Bedroom 63                 | 1 x Optitherm<br>1 x Contour<br>1 x Shower   | 15.6           | 0.37                        |               |                            | 39.5            | 0.18                         |   |
| 0                           | Adults       | Acute Assess      | AAW-313   | Facilities                 | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 16.6           | 0.33                        | 61.6          | 0.02                       |                 |                              |   |
| 0                           | Adults       | Acute Assess      | AAW-375   | Bed 73                     | 1 x Optitherm  | 14.8           | 0.41                        |               |                            | 40.9            | 0.16                         |   |
| 0                           | Adults       | Concourse         | ENT-038   | Baby Change                | 1 x Optitherm  | 15.9           | 0.38                        |               |                            | 39.2            | 0.2                          |   |
| 0                           | Adults       | Concourse         | ENT-052   | Male Toilet                | 1 x Contour<br>1 x Shower  |                |                             |               |                            | 39.7            | 0.23                         |   |
| 0                           | Adults       | Concourse         | ENT-062   | Facilities (outside X-Ray) | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 14             | 0.39                        | 62.3          | 0.02                       |                 |                              |   |
| 0                           | Adults       | De-contamination  | DCU-003   | Wet Room Treatment         |  | 19             | 0.33                        |               |                            | 42.7            | 0.12                         |   |
| 0                           | Adults       | Discharge Lounge  | DLO-146   | Consulting Room            | 1 x Optitherm  | 16.3           | 0.38                        |               |                            | 40.8            | 0.017                        |   |
| 0                           | Adults       | Discharge Lounge  | DLO-006   | Toilet                     | 1 x Infrared Tap   | 20.3           |                             | 58.9          |                            | 39              | 0.2                          | Cold temperature slightly high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct.<br>Water Hammer and pulsing through solenoid/TMV - Investigate and correct. |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                      |                        |                     |   | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations  |
|-----------------------------|--------------|----------------------|------------------------|---------------------|---|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|---|
| Level                       | Adults / RHC | Department / Ward    | Door Code              | Room Name           | Outlets in Room   | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |   |
| 0                           | Adults       | Medical Illustration | MIL-010                | Studio              | 1 x Optitherm   | 17.1           | 0.39                        |               |                            | 39.1            | 0.23                         |   |
| 0                           | Adults       | OPD                  | OPDO-146               | Consulting Room 5   | 1 x Optitherm   | 16.2           | 0.37                        |               |                            | 41.6            | 0.17                         |   |
| 0                           | Adults       | OPD                  | OPDO-003               | Male Changing       | 1 x Shower  |                |                             |               |                            |                 |                              |   |
| 0                           | Adults       | OPD                  | OPDO-029               | Clean Utility       | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps) | 14.2           | 0.35                        | 59.2          | 0.02                       |                 |                              |   |
| 0                           | Adults       | OPD                  | OPDO-049               | Treatment Room 23   | 1 x Optitherm   | 18.4           | 0.38                        |               |                            | 41.7            | 0.16                         |   |
| 0                           | Adults       | OPD                  | OPDO-067               | Dirty Utility       | 2 x Optitherm   | 18.8           | 0.31                        |               |                            | 40.2            | 0.2                          | Cold temperature slightly high, though temperatures in surrounding area acceptable. Investigate and correct.  |
| 0                           | Adults       | OPD/ Concourse       | OPDO-073               | Toilet              | 1 x Shower<br>1 x IR Tap  |                |                             |               |                            | 42.9            | 0.22                         |   |
| 0                           | Adults       | OPD/ Concourse       | OPDO-075               | Toilet              | 1 x Contour   | 19.8           | 0.42                        | 59.8          |                            | 46.5            | 0.16                         | TMT out of specification and requires reset and/or fully serviced or replaced if required.  |
| 0                           | Adults       | Orthotics            | ORT-015-2              | Staff Change Toilet | 1 x Contour   | 19.2           | 0.36                        |               |                            | 39.5            | 0.02                         |   |
| 0                           | Adults       | Orthotics            | ORT-017                | Disabled WC         | 1 x Contour   | 17.4           | 0.39                        |               |                            | 42.8            | 0.13                         |   |
| 0                           | Adults       | Orthotics            | ORT-027                | Treatment Room 33   | 1 x Optitherm   | 15.7           | 0.385                       |               |                            | 43              | 0.1                          |   |
| 0                           | Adults       | Orthotics            | ORT-045                | Toilet              | 1 x Contour   | 17.9           | 0.43                        | 45            |                            | 39.2            | 0.23                         | Hot flow and return not operating correctly in area - further investigation required, to ensure system balanced correctly throughout, with Kemper Multitherm Regulating Valves set correctly. |
| 0                           | Adults       | Pharmacy             | NO DOOR CODE (PHA-008) | Clinical Trial Prep | 1 x Optitherm   | 16.2           | 0.42                        |               |                            | 40.4            | 0.18                         |   |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |            |                 |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations  |
|-----------------------------|--------------|-------------------|------------|-----------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|---|
| Level                       | Adults / RHC | Department / Ward | Door Code  | Room Name       | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |   |
| 0                           | Adults       | Pharmacy          | PHA-002DSR | Facilities      | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 15.2           | 0.33                        | 62.5          | 0.02                       |                 |                              |   |
| 0                           | Adults       | Radiology         | RAG-004    | Dirty Utility   | 2 x Optitherm  | 15             | 0.35                        |               |                            | 40.3            | 0.2                          |   |
| 0                           | Adults       | Radiology         | RAG-029    | X-Ray 6         | 1 x Optitherm  | 17.5           | 0.37                        |               |                            | 40.4            | 0.15                         |   |
| 0                           | Adults       | Radiology         | RAG-055    | Toilet          | 1 x Contour  | 17.9           | 0.39                        |               |                            | 39              | 0.21                         |   |
| 0                           | Adults       | Radiology         | RAG-068    | Toilet          | 1 x Contour  | 21.9           | 0.57                        | 61.3          |                            | 40.6            | 0.18                         | Cold temperature slightly high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. |
| 0                           | Adults       | Radiology         | RAG-079    | Disabled Toilet | 1 x Contour  | 15.1           | 0.37                        |               |                            | 41.6            | 0.02                         |   |
| 0                           | Adults       | Radiology         | RAG-092    | Toilet          | 1 x Infrared Tap   | 20.8           |                             | 59.4          |                            | 39.2            | 0.2                          | Cold temperature slightly high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. |
| 0                           | Adults       | Radiology         | RAG-103    | Store Room      | 1 x Optitherm  | 19.8           | 0.3                         |               |                            | 33.8            | 0.02                         | TMT out of specification and requires reset and/or fully serviced or replaced if required.  |
| 0                           | Adults       | Radiology         | RAG-130    | Disabled Toilet | 1 x Contour  | 19.4           | 0.35                        |               |                            | 39.38           | 0.24                         |   |
| 0                           | Adults       | Radiology         | RCG-022    | Male Change     | 1 x Contour  | 18.3           | 0.49                        |               |                            | 41.1            | 0.18                         |   |
| 0                           | Adults       | Radiology         | RCG-068    | Baby Sleep      | 1 x Optitherm  | 21.8           | 0.34                        |               |                            | 39.4            | 0.2                          | Cold temperature slightly high, though temperatures in surrounding area acceptable. Investigate and correct.  |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |           |                     |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations |
|-----------------------------|--------------|-------------------|-----------|---------------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|----------------------------|
| Level                       | Adults / RHC | Department / Ward | Door Code | Room Name           | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |                            |
| 0                           | Adults       | Radiology         | RCG087    | Dirty Utility       | 2 x Optitherm  | 18.6           | 0.49                        |               |                            | 39.7            | 0.21                         |                            |
| 0                           | Adults       | Rehab             | REH-006   | Disabled Toilet     | 1 x Contour  | 15.4           | 0.38                        |               |                            | 40.3            | 0.18                         |                            |
| 0                           | Adults       | Rehab             | REH-013   | OT Room             | 1 x Contour  | 15.8           | 0.41                        |               |                            | 40.9            | 0.17                         |                            |
| 0                           | Adults       | Rehab             | REH-026   | Toilet              | 1 x Contour  | 19.4           | 0.34                        | 58.5          |                            | 39.4            | 0.21                         |                            |
| 0                           | Adults       | Rehab             | REH-035   | Casting             | 2 x Optitherm  | 14.1           | 0.43                        |               |                            | 40.9            | 0.19                         |                            |
| 0                           | Adults       | Rehab             | REH-048   | Toilet              | 1 x Contour  | 16.9           | 0.34                        |               |                            | 41.5            | 0.17                         |                            |
| 1                           | Adults       | Critical Care     | CCU-004   | Staff Kitchen       | 1 x Contour<br>1 x SSS   | 16.5           | 0.36                        | 59.2          | 0.02                       |                 |                              |                            |
| 1                           | Adults       | Critical Care     | CCU-036   | Bedroom 60          | 1 x Optitherm  | 18.5           | 0.38                        | 59.2          |                            | 40.5            | 0.02                         |                            |
| 1                           | Adults       | Critical Care     | CCW-017   | Facilities          | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 14.8           | 0.38                        | 59            | 0.03                       | 40.7            |                              |                            |
| 1                           | Adults       | Critical Care     | CCW-029   | Patient Shower Room | 1 x Contour<br>1 x Shower  | 19.8           | 0.02                        | 60.3          |                            | 41.2            | 0.14                         |                            |
| 1                           | Adults       | Critical Care     | CCW-048   | Bed Bay 1           | 1 x Optitherm  | 14.3           | 0.32                        |               |                            | 42.3            | 0.18                         |                            |
| 1                           | Adults       | Critical Care     | CCW-087   | HAD 4 Bed 37        | 1 x Optitherm  | 16.3           | 0.36                        |               |                            | 41.1            | 0.12                         |                            |



### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |           |                   |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations   |
|-----------------------------|--------------|-------------------|-----------|-------------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|--|
| Level                       | Adults / RHC | Department / Ward | Door Code | Room Name         | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |  |
| 1                           | Adults       | Critical Care     | CCW-089   | HDU 4 Bed Bat     | 1 x Optitherm  | 17.6           | 0.37                        |               |                            | 40.9            | 0.18                         |  |
| 1                           | Adults       | Critical Care     | CCW-093   | Lab               | 1 x Optitherm  | 15.6           | 0.37                        |               |                            | 42.2            | 0.14                         |  |
| 1                           | Adults       | Critical Care     | CCW-109   | HDU 3 Bed Bay 26  | 1 x Optitherm  | 16.6           | 0.39                        |               |                            | 39.6            | 0.06                         |  |
| 1                           | Adults       | Critical Care     | CCW-113   | Facilities        | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 14.6           | 0.32                        | 61.2          | 0.07                       |                 |                              |  |
| 1                           | Adults       | Critical Care     | CCW-126   | Dirty Utility     | 2 x Optitherm  | 17             | 0.35                        | 40.6          |                            | 36.8 / 39.3     | 0.1                          | Hot flow and return not operating correctly in area. Flow and return operates as a constant once through loop. All visible valves in open positions. Optitherms required 10 minutes flushing to achieve recorded temperature - further investigation required, to ensure system balanced correctly throughout, with Kemper Multitherm Regulating Valves set correctly. (Limited access to pipework in open ward area due to patient care). |
| 1                           | Adults       | Critical Care     | CCW-130   | Service           | 1 x Pillar Tap<br>1 x Optitherm  | 17.2           | 0.33                        |               |                            | 42.9            | 0.02                         |  |
| 1                           | Adults       | Critical Care     | CCW-131   | Pharmacy Support  | 1 x Optitherm  | 17.5           | 0.33                        |               |                            | 39.4            | 0.19                         |  |
| 1                           | Adults       | Critical Care     | CCW-141   | Bed 44 (en-suite) | 1 x Contour<br>1 x Shower  |                |                             |               |                            |                 |                              |  |
| 1                           | Adults       | Critical Care     | CCW-200   | Facilities        | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 15.2           | 0.33                        | 63.23         | 0.02                       |                 |                              |  |
| 1                           | Adults       | Critical Care     | CCW-202   | Shower Room       | 1 x Contour<br>1 x Shower  | 17.5           | 0.34                        |               |                            | 41.8            | 0.16                         |  |
| 1                           | Adults       | Critical Care     | CCW-214   | Male Change       | 3 x Contours<br>3 x Showers  | 17.9           | 0.31                        |               |                            | 40.7            | 0.15                         |  |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                     |           |                     |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations   |
|-----------------------------|--------------|---------------------|-----------|---------------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|--|
| Level                       | Adults / RHC | Department / Ward   | Door Code | Room Name           | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |  |
| 1                           | Adults       | FM Facilities       | FMA1-001  | Facilities          | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 14.6           | 0.13                        | 60.2          | 0.02                       |                 |                              |  |
| 1                           | Adults       | Children's Theatres | THE-069   | Lab                 | 1 x Optitherm  | 17.1           | 0.38                        | 59.9          |                            | 41.4            | 0.19                         | Ice flaking machine and associated pre-filter taken from tee on cold supply to area. No visible backflow protection on supply to filter. Ensure any required backflow protection is fitted as close to tee where line branches.<br><br>Ice should not be allowed to stagnate in an ice-making machine's storage bin, but should be changed frequently.<br><br>For guidance on infection-control precautions with regard to ice-making machines, see Scottish Health Facilities Note 30: 'Infection control in the built environment'. Maintenance for ice-making machines should be carried out in accordance with the manufacturer's recommendations. Care should be taken to ensure that the water supply to the ice-making machine is not subjected to heat gain. |
| 1                           | Adults       | Children's Theatres | THE-090   | Theatres            | Scrub Sink - 3 x Optitherm   | 19.3           | 0.285                       | 61            |                            | 39.8            | 0.15                         |  |
| 1                           | Adults       | Children's Theatres | THE-102   | Facilities          | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 18.8           | 0.24                        | 63.3          | 0.02                       |                 |                              |  |
| 1                           | Adults       | Children's Theatres | THE-106   | Anaesthesia Room 3  | 1 x Optitherm  | 16.8           | 0.27                        |               |                            | 40.6            | 0.13                         |  |
| 1                           | Adults       | Children's Theatres | THE-118   | Anaesthetics Room 2 | 1 x Optitherm  | 22.1           | 0.23                        |               |                            | 42.3            | 0.14                         | Cold temperature high - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct.  |
| 1                           | Adults       | Children's Theatres | THE-156   | Bed Bay 2           | 1 x Optitherm  | 24.1           | 0.2                         |               |                            | 41.1            | 0.1                          | Cold temperature high - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct.  |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |                   |                   |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations |
|-----------------------------|--------------|-------------------|-------------------|-------------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|----------------------------|
| Level                       | Adults / RHC | Department / Ward | Door Code         | Room Name         | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |                            |
| 1                           | Adults       | Medical Unit      | MDU-012           | Treatment Room 22 | 1 x Optitherm  | 15.3           | 0.34                        |               |                            | 41.4            | 0.12                         |                            |
| 1                           | Adults       | Medical Unit      | MDU-012           | Treatment Room 22 | 1 x Optitherm  | 14             | 0.26                        |               |                            | 40.6            | 0.15                         |                            |
| 1                           | Adults       | Medical Unit      | MDU-020           | Blood Test        | 1 x Optitherm  | 15.2           | 0.31                        |               |                            | 40.4            | 0.08                         |                            |
| 1                           | Adults       | Medical Unit      | MDU-046           | Facilities        | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 17.2           | 0.33                        | 58.3          | 0.02                       | 39.9            |                              |                            |
| 1                           | Adults       | Medical Unit      | MDU-048           | Dirty Utility     | 2 x Optitherm  | 15.4           | 0.33                        |               |                            | 42.1            | 0.16                         |                            |
| 1                           | Adults       | Medical Unit      | MDU-050           | Consulting Room 2 | 1 x Optitherm  | 16.8           | 0.37                        |               |                            | 40.1            | 0.2                          |                            |
| 1                           | Adults       | Medical Unit      | MDU-051           | Consulting Room 1 | 1 x Optitherm  | 14             | 0.3                         |               |                            | 40.5            | 0.33                         |                            |
| 1                           | Adults       | Medical Unit      | Medical Unit1-146 | Blood Test        | 1 x Optitherm  | 16.9           | 0.42                        |               |                            | 39.9            | 0.14                         |                            |
| 1                           | Adults       | Medical Unit      | Medical Unit1-146 | Dirty Utility     | 2 x Optitherm  | 17             | 0.36                        |               |                            | 41.8            | 0.14                         |                            |
| 1                           | Adults       | Medical Unit      | Medical Unit1-146 | Clean Utility     | 2 x Pillar Tap(H+C)<br>1 x Optitherm   | 16.9           | 0.38                        | 63.1          | 0.04                       |                 |                              |                            |
| 1                           | Adults       | OPD               | OPD1-006          | Public Toilet     | 1 x Contour  | 18.3           | 0.4                         | 58.9          |                            | 42.8            | 0.21                         |                            |
| 1                           | Adults       | OPD               | OPD1-008          | Toilet            | 1 x Infrared Tap   |                |                             |               |                            | 42              | 0.17                         |                            |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |           |                     |   | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations  |
|-----------------------------|--------------|-------------------|-----------|---------------------|---|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|---|
| Level                       | Adults / RHC | Department / Ward | Door Code | Room Name           | Outlets in Room   | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |   |
| 1                           | Adults       | OPD               | OPD1-037  | Toilet              | 1 x Contour   | 21.2           | 0.22                        | 58.6          |                            | 46.3            | 0.14                         | TMT out of specification and requires reset and/or fully serviced or replaced if required.<br>Cold temperature slightly high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. |
| 1                           | Adults       | OPD               | OPD1-040  | Consulting Room 117 | 1 x Contour   | 15.5           | 0.33                        | 59            |                            | 39.5            | 0.15                         |   |
| 1                           | Adults       | OPD               | OPD1-046  | Measurement Bay 127 | 1 x Optitherm   | 15.7           | 0.53                        |               |                            | 41.2            | 0.13                         |   |
| 1                           | Adults       | OPD               | OPD1-048  | Blood Lab           | 1 x Optitherm   | 16.7           | 0.35                        |               |                            | 41.1            | 0.19                         |   |
| 1                           | Adults       | OPD               | OPD1-063  | Dirty Utility       | 2 x Optitherm   | 22.1           | 0.23                        |               |                            | 41.3            | 0.11                         | Cold temperature slightly high, though temperatures in surrounding area acceptable. Investigate and correct.  |
| 1                           | Adults       | OPD               | OPD1-070  | Podiatry Room 120   | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps) | 14.6           | 0.36                        |               |                            | 39.9            | 0.16                         |   |
| 1                           | Adults       | OPD               | OPD1-085  | Toilet              | 1 x Contour   | 26.5           | 0.3                         |               |                            | 42.4            | 0.15                         | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct.  |
| 1                           | Adults       | OPD               | OPD1-113  | Measurement Bay     | 1 x Optitherm   | 18.7           | 0.3                         |               |                            | 42.7            | 0.12                         |   |
| 1                           | Adults       | OPD               | OPD1-146  | Dirty Utility       | 2 x Optitherm   | 19             | 0.33                        |               |                            | 39.6            | 0.19                         |   |
| 1                           | Adults       | OPD               | POA-006   | Consulting Room     | Unknown   |                |                             |               |                            |                 |                              |   |
| 1                           | Adults       | OPD               | POA-014   | Consulting Room 57  | 1 x Optitherm   | 15.8           | 0.43                        |               |                            | 40.8            | 0.17                         |   |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |           |                         |   | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations   |
|-----------------------------|--------------|-------------------|-----------|-------------------------|---|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|--|
| Level                       | Adults / RHC | Department / Ward | Door Code | Room Name               | Outlets in Room   | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |  |
| 1                           | Adults       | OPD               | POA-015   | Consulting Room         | 1 x Optitherm   | 15.7           | 0.35                        |               |                            | 40.5            | 0.15                         |  |
| 1                           | Adults       | OPD               | POA-019   | Clean Utility           | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps) | 15.2           | 0.32                        | 61            | 0.02                       |                 |                              |  |
| 1                           | Adults       | Radiology         | RAF-003   | Disabled WC at Entrance | 1 x Contour   | 14.9           | 0.35                        |               | 0.2                        | 39.3            |                              |  |
| 1                           | Adults       | Radiology         | RAF-087   | Male Cyhange Room       | 2 x Contours  | 22.2           | 0.31                        | 59.2          |                            | 46.7            | 0.17                         | LHS TMT out of specification and requires reset and/or fully serviced or replaced if required.<br>Cold temperature slightly high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility.<br>Investigate and correct. |
| 1                           | Adults       | Radiology         | RAF-095   | Toilet                  | 1 x Contour   | 19.5           | 0.4                         |               |                            | 41.2            | 0.15                         |  |
| 1                           | Adults       | Radiology         | RAF-115   | Toilet                  | 1 x WHB contour<br>1 x WC   | 17.9           | 0.31                        |               |                            | 41              | 0.2                          |  |
| 1                           | Adults       | Radiology         | RAF-127   | Dirty Utility 1357B     | 2 x Optitherm   | 14.7           | 0.38                        |               | 0.14                       | 40.6            | 40.6                         |  |
| 1                           | Adults       | Radiology         | RNM-018   | NO SIGN ON DOOR         | 1 x WHB<br>1 x WC<br>1 x Shower                                   | 17.1           | 0.4                         |               |                            | 37.7            | 0.2                          | TMT out of specification and requires reset and/or fully serviced or replaced if required.   |
| 1                           | Adults       | Radiology         | RNM-025   | Office                  | No Acc  |                |                             |               |                            |                 |                              |  |
| 1                           | Adults       | Restaurant        | RES-015   | Male Toilet             | 2 x Infrared Taps   |                |                             |               |                            | 40              | 0.19                         |  |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |           |                          |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations  |
|-----------------------------|--------------|-------------------|-----------|--------------------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|---|
| Level                       | Adults / RHC | Department / Ward | Door Code | Room Name                | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |   |
| 1                           | Adults       | Restaurant        | RES-035   | Disabled Toilet          | 1 x Contour  | 20.9           | 0.42                        | 60.3          |                            | 42.8            | 0.09                         | Cold temperature slightly high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. |
| 1                           | Adults       | Stroke            | STW-014   | Bed 2                    | 1 x Optitherm  | 14.8           | 0.37                        |               | 0.18                       | 40.9            |                              |   |
| 1                           | Adults       | Stroke            | STW-038   | Bed 11                   | 1 x Optitherm  | 17.6           | 0.36                        |               |                            | 40.3            | 0.15                         |   |
| 1                           | Adults       | Stroke            | STW-045   | Bed 13 Ensuite           | 1 x Contour<br>1 x Shower<br>1 x Toilet  | 17.9           | 0.32                        |               |                            | 41.3            | 0.16                         |   |
| 1                           | Adults       | Stroke            | STW-070   | Bed 25                   | 1 x Optitherm  | 15.5           | 0.36                        |               |                            | 41.2            | 0.14                         |   |
| 1                           | Adults       | Stroke            | STW-082   | Therapies Treatment Room | 1 x Contour  | 23.8           | 0.31                        |               | 0.17                       | 42.5            |                              | Cold temperature slightly high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or  |
| 2                           | Adults       | Adult Theatres    | THE-026   | Toilet                   | 1 x Contour (WHB)  | 15.5           | 0.3                         |               |                            | 41.2            | 0.14                         |   |
| 2                           | Adults       | Adult Theatres    | THE-044   | Male Theatre Change Room | 3 x Shower<br>3 x Toilet<br>3 x Contour  | 17.7           | 0.34                        |               |                            | 40.3            | 0.14                         |   |
| 2                           | Adults       | Adult Theatres    | THE-060   | Facilities               | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 14             | 0.41                        | 57.3          | 0.02                       |                 |                              |   |
| 2                           | Adults       | Adult Theatres    | THE-079   | On Call Room en-suite    | 1 Contour (WHB)<br>1 x Shower<br>1 x WC  | 29.8           | 0.14                        |               |                            | 40.9            | 0.14                         | Cold temperature slightly high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. |
| 2                           | Adults       | Adult Theatres    | THE-091   | Dirty Utility 2          | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)                        | 14.3           | 2.33                        |               |                            | 42.5            |                              |   |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |           |                             |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations  |
|-----------------------------|--------------|-------------------|-----------|-----------------------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|---|
| Level                       | Adults / RHC | Department / Ward | Door Code | Room Name                   | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |   |
| 2                           | Adults       | Adult Theatres    | THE-105   | Dirty Utility 4             | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)                        | 14.5           | 0.35                        | 63.7          | 0.02                       |                 |                              |   |
| 2                           | Adults       | Adult Theatres    | THE-106   | Scrub Room 4                | 3 x Optitherm  | 15.3           | 0.3                         |               |                            | 40.2            | 0.18                         |   |
| 2                           | Adults       | Adult Theatres    | THE-117   | Scrub Room 5                | 3 x Optitherm  | 13.7           | 0.3                         |               |                            | 40.3            | 0.17                         |   |
| 2                           | Adults       | Adult Theatres    | THE-280   | Disabled Toilet             | 1 x Toilet<br>1 x Contour  | 18.7           | 0.34                        |               |                            | 39.3            | 0.17                         |   |
| 2                           | Adults       | Adult Theatres    | THE-287   | Theatre Recovery Area       | 1 x Optitherm  | 19.6           | 0.32                        |               |                            | 39.7            | 0.17                         |   |
| 2                           | Adults       | Adult Theatres    | THE-289   | Corri WHB Near Staff Bay A1 | 1 x Optitherm  | 17.6           | 0.35                        |               | 0.09                       | 40.3            |                              |   |
| 2                           | Adults       | Adult Theatres    | THE-302   | Bed Bay A7                  | 1 x Optitherm  | 17             | 0.39                        |               |                            | 39.9            | 0.07                         |   |
| 2                           | Adults       | Adult Theatres    | THE-319   | Dirty Utility               | 2 x Optitherm  | 22.5           | 0.31                        |               |                            | 20.4            | 0.16                         | TMT out of specification and requires reset and/or fully serviced or replaced if required. Cold temperature slightly high, though temperatures in surrounding area acceptable. Investigate and correct. |
| 2                           | Adults       | Adult Theatres    | THE-327   | Recovery B4                 | 1 x Optitherm  | 19.9           | 0.33                        |               | 0.15                       | 42.5            |                              |   |
| 2                           | Adults       | De contamination  | DCT-015   | Wash Room DSR               | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 17.3           | 0.29                        | 64.2          | <0.02                      |                 |                              |   |
| 2                           | Adults       | Dermatology       | DMW-004   | Photo Therapy Suite         | 1 x Optitherm  | 14.7           | 0.42                        |               |                            | 41.1            | 0.17                         |   |
| 2                           | Adults       | Dermatology       | DMW-025   | Bathroom A                  | 1 x Contour  | 16.2           | 0.42                        | 59.3          |                            | 44.3            | 0.16                         | TMT out of specification and requires reset and/or fully serviced or replaced if required.  |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |           |                      |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations  |
|-----------------------------|--------------|-------------------|-----------|----------------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|---|
| Level                       | Adults / RHC | Department / Ward | Door Code | Room Name            | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |   |
| 2                           | Adults       | Dermatology       | DMW-031   | Bed 6 (En-suite)     | 1 x Contour<br>1 x Shower  | 20.3           | 0.46                        |               |                            | 42.8            | 0.15                         | Cold temperature slightly high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. |
| 2                           | Adults       | Dermatology       | DMW-060   | Facilities           | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 16.5           | 0.35                        | 64.1          | <0.02                      |                 |                              |   |
| 2                           | Adults       | Dermatology       | DOPD-004  | Toilet               | 1 x IR Tap   |                |                             |               |                            | 42              | 0.18                         |   |
| 2                           | Adults       | Dermatology       | DOPD-025  | Technician           | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)                        | 20.4           | 0.36                        | 61.8          | <0.02                      | 40.5            |                              | Cold temperature slightly high, though temperatures in surrounding area acceptable. Investigate and correct.  |
| 2                           | Adults       | Endoscopy         | END-002   | Nurses Station       | 1 x Optitherm  | 13.1           | 0.38                        |               |                            | 42.8            | 0.16                         |   |
| 2                           | Adults       | Endoscopy         | END-013   | Facilities           | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 15.2           | 0.35                        | 64.6          | 0.02                       |                 |                              |   |
| 2                           | Adults       | Endoscopy         | END-029   | Bed Bay 4            | 4 x Optitherm  | 16.9           | 0.39                        |               |                            | 42.2            | 0.21                         |   |
| 2                           | Adults       | FM Facilities     | FMA2-014  | Toilet               | 1 x Toilet<br>1 x Contour  | 17.8           | 0.51                        |               |                            | 40.5            | 0.23                         |   |
| 2                           | Adults       | Medical Physics   | MP-013    | Facilities           | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 14             | 0.34                        | 63.5          | 0.02                       |                 |                              |   |
| 2                           | Adults       | Medical Physics   | MP-020    | Devices (Adult)      | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)                        | 14.2           | 0.34                        |               |                            | 40.6            | 0.15                         |   |
| 2                           | Adults       | Renal             | RENO-003  | CAPD Training Room 1 | 1 x Optitherm  | 14.3           | 0.35                        |               |                            | 40.9            | 0.17                         |   |
| 2                           | Adults       | Renal             | RENO-016  | Room 3               | 1 x Optitherm  | 18.3           | 0.33                        |               |                            | 40.9            | 0.18                         |   |



### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |                |  |   | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations   |
|-----------------------------|--------------|-------------------|----------------|--|---|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|--|
| Level                       | Adults / RHC | Department / Ward | Door Code      | Room Name  | Outlets in Room   | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |  |
| 2                           | Adults       | Renal             | RENO-033       | Clean Utility  | 1 x Optitherm<br>1 x Direct                                       | 19.9           | 0.39                        | 58.3          | <0.02                      |                 |                              |  |
| 2                           | Adults       | Renal             | RENO-046       | WC (inside change room)  | 1 x Contour<br>1 x Shower   | 19.1           | 0.33                        |               |                            | 40.6            | 0.22                         |  |
| 2                           | Adults       | Renal             | RENO-064       | No name ("Laser in Use" sign next to door)<br>Disc Code on Dividing Wall in Room. Room Opposite Riser RENO-062 | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps) | 23.3           | 0.43                        | 63            | <0.02                      | 39.5            |                              | Cold temperature slightly high, though temperatures in surrounding area acceptable. Investigate and correct.<br>Confirm suitable backflow protection fitted at tees to 2 x BCWS branches to Renal Test Points and 3 x isolated undersink connections.          |
| 4                           | Adults       | Corridor          | WS4-014        | Facilities (Regen Kitchen)   | 1 x IR Tap<br>1 x Swan Neck<br>1 x Pillar Tap                     | 17.4           | 0.4                         | 63            | <0.02                      |                 |                              |  |
| 4                           | Adults       | Corridor          | WS4-017        | Male Change  | 1 x Contour<br>1 x Shower<br>1 x Toilet                           | 17.4           | 0.3                         |               |                            | 40              | 0.49                         |  |
| 4                           | Adults       | Waiting room      | WS4-004        | Toilet   | 1 x Toilet<br>1 x Contour   | 17.3           | 0.34                        |               |                            | 39.3            | 0.22                         |  |
| 4                           | Adults       | Waiting room      | WS4-007 Toilet | Public Toilet  | 1 x IR Tap  |                |                             |               |                            | 42.6            | 0.13                         |  |
| 4                           | Adults       | Ward 4A           | RENW-007       | Toilet   | 1 x Contour<br>1 x Shower   | 15.7           | 0.36                        |               |                            | 39.7            | 0.17                         |  |
| 4                           | Adults       | Ward 4A           | RENW-024       | Room 12 Ensuite  | 1 x Contour<br>1 x Shower<br>1 x Toilet                           | 19.4           | 0.4                         |               |                            | 40.9            | 0.16                         |  |
| 4                           | Adults       | Ward 4A           | RENW-028       | Bed 14 (En-suite)  | 1 x Contour<br>1 x Shower   | 22.3           | 0.27                        | 59.8          |                            | 40.5            | 0.16                         | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. |
| 4                           | Adults       | Ward 4A           | RENW-055       | Bed 23   | 1 x Optitherm   | 14.6           | 0.41                        |               |                            | 40.8            | 0.16                         |  |
| 4                           | Adults       | Ward 4C           | RENW-127       | Consulting Room E  | 1 x Optitherm   | 15.8           | 0.29                        |               |                            | 40.4            | 0.19                         |  |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |           |                 |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations  |
|-----------------------------|--------------|-------------------|-----------|-----------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|---|
| Level                       | Adults / RHC | Department / Ward | Door Code | Room Name       | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |   |
| 4                           | Adults       | Ward 4C           | RENW-153  | Room 62 Ensuite | 1 x Contour<br>1 x Shower<br>1 x Toilet  | 21.6           | 0.29                        | 60.3          |                            | 42.2            | 0.14                         | Cold temperature slightly high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. |
| 4                           | Adults       | Ward 4C           | RENW-156  | Room 63 Ensuite | 1 x Contour<br>1 x Shower<br>1 x Toilet  | 20.2           | 0.31                        | 59            |                            | 40.4            | 0.18                         | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct.          |
| 4                           | Adults       | Ward 4C           | RENW-180  | Bed 72          | 1 x Optitherm  | 14.3           | 0.38                        |               |                            | 41.8            | 0.19                         |   |
| 4                           | Adults       | Ward 4C           | RENW-193  | Bed 77          | 1 x Optitherm  | 16.3           | 0.35                        |               |                            | 41.1            | 0.14                         |   |
| 4                           | Adults       | Ward 4D           | RENW-060  | Room 25         | 1 x Optitherm  | 16.5           | 0.34                        |               |                            | 40.3            | 0.23                         |   |
| 4                           | Adults       | Ward 4D           | RENW-092  | Bed 38          | 1 x Optitherm  | 14.8           | 0.34                        |               |                            | 40.3            | 0.17                         |   |
| 4                           | Adults       | Ward 4D           | RENW-122  | Handover Room   | 1 x Optitherm  | 16.7           | <0.02                       |               |                            | 41.5            | 0.21                         |   |
| 5                           | Adults       | Corridor          | WS5-021   | Male Change     |  | 18.8           | 0.34                        |               |                            | 40.4            | 0.12                         |   |
| 5                           | Adults       | Corridor          | WS5-027   | Facilities      | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 19.6           | 0.31                        | 61.7          | <0.02                      |                 |                              |   |
| 5                           | Adults       | Corridor          | WS5-027   | Facilities      | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 17.6           | 0.36                        | 63.5          | <0.02                      |                 |                              |   |
| 5                           | Adults       | Waiting Room      | WS5-005   | Toilet          | 1 x Contour  | 16.2           | 0.36                        |               |                            | 41.6            | 0.18                         |   |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |           |                 |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations  |
|-----------------------------|--------------|-------------------|-----------|-----------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|---|
| Level                       | Adults / RHC | Department / Ward | Door Code | Room Name       | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |   |
| 5                           | Adults       | Waiting room      | WS5-011   | Toilet          | 1 x Contour<br>1 x Shower  | 19.7           | 0.21                        | 59.4          |                            | 41.2            | 0.17                         |   |
| 5                           | Adults       | Ward 5A           | GENWA-001 | Bed 13 Ensuite  | 1 x Optitherm  | 16.1           | 0.44                        |               |                            | 41.5            | 0.14                         |   |
| 5                           | Adults       | Ward 5A           | GENWA-029 | Bed 13 Bathroom | 1 x Contour<br>1 x Shower  | 23.5           | 0.2                         | 60.3          |                            | 40.1            | 0.16                         | Cold temperature slightly high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. |
| 5                           | Adults       | Ward 5A           | GENWA-033 | Bed 15          | 1 x Optitherm  | 14.8           | 0.36                        | 60.7          |                            | 40.6            | 0.23                         |   |
| 5                           | Adults       | Ward 5A           | GENWA-065 | Bed 28          | 1 x Optitherm  | 13.3           | 0.45                        |               |                            | 42.1            | 0.16                         |   |
| 5                           | Adults       | Ward 5A           | GENWA-066 | Facilities      | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 13             | 0.35                        | 63.1          | 0.02                       |                 |                              |   |
| 5                           | Adults       | Ward 5B           | GENW-065  | Bed 85          | 1 x Optitherm  | 13             | 0.33                        |               |                            | 39.7            | 0.16                         |   |
| 5                           | Adults       | Ward 5B           | GENW-066  | Facilities      | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 13             | 0.32                        | 61.8          | 0.02                       |                 |                              |   |
| 5                           | Adults       | Ward 5B           | GENWD-032 | Bed 98 Ensuite  | 1 x Contour<br>1 x Shower  | 21             | 0.33                        | 60.5          |                            | 39.7            | 0.15                         | Cold temperature slightly high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. |
| 5                           | Adults       | Ward 5B           | GENWD-035 | Bed 97          | 1 x Optitherm  | 14.7           | 0.32                        |               |                            | 40.6            | 0.13                         |   |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |           |                   |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations   |
|-----------------------------|--------------|-------------------|-----------|-------------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|--|
| Level                       | Adults / RHC | Department / Ward | Door Code | Room Name         | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |  |
| 5                           | Adults       | Ward 5C           | GENC-033  | Bed 71            | 1 x Optitherm  | 13.6           | 0.31                        |               |                            | 39.8            | 0.12                         |  |
| 5                           | Adults       | Ward 5C           | GENW-065  | Bed 84            | 1 x Optitherm  | 13.1           | 0.33                        |               |                            | 40.5            | 0.15                         |  |
| 5                           | Adults       | Ward 5C           | GENW-066  | Facilities        | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 13             | 0.3                         | 63.7          | 0.02                       |                 |                              |  |
| 5                           | Adults       | Ward 5C           | GENWc-001 | Bed 57            | 1 x Optitherm  | 16             | 0.34                        |               |                            | 39.9            | 0.13                         |  |
| 5                           | Adults       | Ward 5D           | GENW-065  | Bed 29            | 1 x Optitherm  | 13.2           | 0.29                        |               |                            | 40.5            | 0.18                         |  |
| 5                           | Adults       | Ward 5D           | GENW-066  | Facilities        | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 13             | 0.36                        | 63.7          | 0.05                       |                 |                              |  |
| 5                           | Adults       | Ward 5D           | GENWB-028 | Bed 44 (en-suite) | 1 x Optitherm  | 15.6           | 0.35                        | 59.8          |                            | 40.3            | 0.13                         |  |
| 5                           | Adults       | Ward 5D           | GENWB-033 | Bed 42            | 1 x Optitherm  | 13.5           | 0.34                        |               |                            | 40.6            | 0.19                         |  |
| 5                           | Adults       | Ward 5D           | GENWB-057 | Bed 32            | 1 x Optitherm  | 14.8           | 0.42                        |               |                            | 41.7            | 0.2                          |  |
| 5                           | Adults       | Ward 5D           | GENWD-001 | Bed 56            | 1 x Optitherm  | 13.8           | 0.3                         |               |                            | 39.4            | 0.2                          |  |
| 6                           | Adults       | Corridor          | WS6-019   | Toilet            | 1 x Contour  | 21.7           | 0.28                        | 60.6          |                            | 39.8            | 0.19                         | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |           |                      |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations   |
|-----------------------------|--------------|-------------------|-----------|----------------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|--|
| Level                       | Adults / RHC | Department / Ward | Door Code | Room Name            | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |  |
| 6                           | Adults       | Corridor          | WS6-027   | Facilities           | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 18.9           | 0.33                        | 61.6          | <0.02                      | 39.9            | 0.14                         |  |
| 6                           | Adults       | Waiting Room      | WS6-011   | Toilet               | 1 x Contour  | 17.8           | 0.41                        |               |                            | 42.5            | 0.21                         |  |
| 6                           | Adults       | Ward 6A           | GENW1-028 | Bed 12 Bathroom      | 1 x Contour<br>1 x Shower  | 19.3           | 0.38                        |               |                            | 40.1            | 0.36                         |  |
| 6                           | Adults       | Ward 6A           | GENW1-034 | Bedroom 14 (Ensuite) | 1 x Contour<br>1 x Shower  | 22             | 0.26                        | 58.8          |                            | 42              | 0.11                         | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. |
| 6                           | Adults       | Ward 6A           | GENW1-065 | Bed 27               | 1 x Optitherm  | 16.3           | 0.35                        |               |                            | 42              | 0.15                         |  |
| 6                           | Adults       | Ward 6A           | GENW1-066 | Facilities           | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 15.1           | 0.47                        | 59.1          | 0.08                       |                 |                              |  |
| 6                           | Adults       | Ward 6A           | GENW4-065 | Bed 84               | 1 x Optitherm  | 16.4           | 0.38                        |               |                            | 41.6            | 0.21                         |  |
| 6                           | Adults       | Ward 6B           | GENW1-001 | Procedure Room       | 1 x Contour<br>1 x Swan Neck   | 16.1           | 0.37                        | 63.5          | <0.02                      |                 |                              |  |
| 6                           | Adults       | Ward 6B           | GENW4-032 | Bathroom A           | 1 x Contour<br>1 x Shower  | 23             | 0.3                         | 61.8          |                            | 41.4            | 0.12                         | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. |
| 6                           | Adults       | Ward 6B           | GENW4-036 | Bed 96 (En-suite)    | 1 x Contour<br>1 x Shower  | 20.5           | 0.3                         | 59            |                            | 41.8            | 0.15                         | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |           |                |  | After 2 mins     |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations |
|-----------------------------|--------------|-------------------|-----------|----------------|--|------------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|----------------------------|
| Level                       | Adults / RHC | Department / Ward | Door Code | Room Name      | Outlets in Room  | Cold Temp (°C)   | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |                            |
| 6                           | Adults       | Ward 6B           | GENW4-066 | Facilities     | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 14.6             | 0.37                        | 65.4          | <0.02                      |                 |                              |                            |
| 6                           | Adults       | Ward 6C           | GENW3-001 | Bed 56         | 1 x Optitherm  | 18.8             | 0.32                        | 60.6          |                            | 40.5            | 0.13                         |                            |
| 6                           | Adults       | Ward 6C           | GENW3-028 | Bed 68         | 1 x Optitherm  | 15.7             | 0.4                         |               |                            | 41.7            | 0.17                         |                            |
| 6                           | Adults       | Ward 6C           | GENW3-065 | Room 83        | 1 x Optitherm  | 16.2             | 0.34                        |               |                            | 39.9            | 0.18                         |                            |
| 6                           | Adults       | Ward 6C           | GENW3-066 | Facilities     | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 16               | 0.34                        | 64.9          | <0.02                      |                 |                              |                            |
| 6                           | Adults       | Ward 6D           | GENW2-001 | Bed 55         | 1 x Optitherm  | 14.3             | 0.36                        |               |                            | 39.2            | 0.19                         |                            |
| 6                           | Adults       | Ward 6D           | GENW2-028 | Bed 41         | 1 x Optitherm  | 16               | 0.35                        |               |                            | 40.9            | 0.12                         |                            |
| 6                           | Adults       | Ward 6D           | GENW2-034 | Bed 41 Ensuite | 1 x Contour<br>1 x Shower<br>1 x Toilet  | 29.7 (Cold Temp) | 0.27                        |               |                            | 41.1            | 0.21                         |                            |
| 6                           | Adults       | Ward 6D           | GENW2-057 | Bed 31         | 1 x Optitherm  | 14.4             | 0.38                        |               |                            | 39.5            | 0.19                         |                            |
| 6                           | Adults       | Ward 6D           | GENW2-066 | Facilities     | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 15.1             | 0.34                        | 63.4          | 0.05                       |                 |                              |                            |
| 6                           | Adults       | Ward 6D           | GENW2-066 | DSR            | 1 x Optitherm  | 14.1             | 0.36                        |               |                            | 40.9            | 0.19                         |                            |
| 7                           | Adults       | Corridor          | WS7-011   | Toilet         | 1 x Infrared Tap   | 16.7             | 0.35                        |               |                            | 42.5            | 0.13                         |                            |
| 7                           | Adults       | Ward 7A           | GENW5-033 | Bed 15         | 1 x Optitherm  | 18.3             | 0.34                        |               |                            | 41.5            | 0.14                         |                            |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |           |                   |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations  |
|-----------------------------|--------------|-------------------|-----------|-------------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|---|
| Level                       | Adults / RHC | Department / Ward | Door Code | Room Name         | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |   |
| 7                           | Adults       | Ward 7A           | GENW5-035 | Bed 16            | 1 x Optitherm  | 14.8           | 0.38                        |               |                            | 39.5            | 0.2                          |   |
| 7                           | Adults       | Ward 7A           | GENW5-065 | Bed 28            | 1 x Optitherm  | 14.8           | 0.38                        |               |                            | 40.4            | 0.16                         |   |
| 7                           | Adults       | Ward 7A           | GENW5-065 | Bed 28            | 1 x Optitherm  | 16.2           | 0.32                        |               |                            | 39.7            | 0.17                         |   |
| 7                           | Adults       | Ward 7A           | GENW5-066 | Facilities        | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink |                |                             | 63            | <0.02                      |                 |                              |   |
| 7                           | Adults       | Ward 7B           | GENW6-036 | Bed 97 (en-suite) | 1 x Contour  | 22.9           | 0.29                        | 54            |                            | 41.5            | 0.17                         | Hot flow and return not operating correctly in area - further investigation required, to ensure system balanced correctly throughout, with Kemper Multitherm Regulating Valves set correctly.<br>Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. |
| 7                           | Adults       | Ward 7B           | GENW8-032 | Bed 98 (en-suite) | 1 x Contour  | 22.9           | 0.27                        | 56            |                            | 39.9            | 0.12                         | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct.  |
| 7                           | Adults       | Ward 7B           | GENW8-065 | Bed 85            | 1 x Optitherm  | 16             | 0.34                        |               |                            | 39.1            | 0.17                         |   |
| 7                           | Adults       | Ward 7B           | GENW8-066 | Facilities        | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 16.1           | 0.36                        | 63.4          | <0.02                      |                 |                              |   |
| 7                           | Adults       | Ward 7C           | GENW7-001 | Bed 57            | 1 x Optitherm  | 15.5           | 0.36                        |               |                            | 39.9            | 0.13                         |   |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |           |                   |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations  |
|-----------------------------|--------------|-------------------|-----------|-------------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|---|
| Level                       | Adults / RHC | Department / Ward | Door Code | Room Name         | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |   |
| 7                           | Adults       | Ward 7C           | GENW7-026 | Bed 68            | 1 x Optitherm  | 16.1           | 0.52                        |               |                            | 41              | 0.18                         |   |
| 7                           | Adults       | Ward 7C           | GENW7-028 | Bed 69            | 3 x Optitherm  |                |                             |               |                            |                 |                              |   |
| 7                           | Adults       | Ward 7C           | GENW7-065 | Bed 84            | 1 x Optitherm  | 19.6           | 0.39                        |               |                            | 40.2            | 0.15                         |   |
| 7                           | Adults       | Ward 7C           | GENW7-066 | Facilities        | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 16.1           | 0.42                        | 61.8          | 0.04                       |                 |                              |   |
| 7                           | Adults       | Ward 7D           | GENW6-028 | Bed 44 (en-suite) | 1 x Optitherm  | 21             | 0.35                        | 53            |                            | 39.1            | 0.18                         | Hot flow and return not operating correctly in area - further investigation required, to ensure system balanced correctly throughout, with Kemper Multitherm Regulating Valves set correctly. Cold temperature high, though temperatures in surrounding area acceptable. Investigate and correct. |
| 7                           | Adults       | Ward 7D           | GENW6-033 | Bed 42            | 1 x Optitherm  | 16.7           | 0.31                        |               |                            | 40.2            | 0.18                         |   |
| 7                           | Adults       | Ward 7D           | GENW6-034 | Bed 42 (En-suite) | 1 x Contour<br>1 x Shower  | 21.9           | 0.28                        | 53            |                            | 40.5            | 0.16                         | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct.                                    |
| 7                           | Adults       | Ward 7D           | GENW6-065 | Bed 29            | 1 x Optitherm  | 16.1           | 0.32                        |               |                            | 41.1            | 0.19                         |   |
| 7                           | Adults       | Ward 7D           | GENW6-065 | Bed 29            | 1 x Optitherm  | 14.5           | 0.36                        |               |                            | 40.8            | 0.19                         |   |
| 7                           | Adults       | Ward 7D           | GENW6-066 | DSR (SSS)         | Swan Neck SSS  | 14             | 0.32                        | 63.3          | 0.11                       |                 |                              |   |
| 8                           | Adults       | Corridor          | WS8-005   | Diswabled Toilet  | 1 x Contour  | 15.5           | 0.38                        |               |                            | 40.5            | 0.14                         |   |



### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |            |                    |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations   |
|-----------------------------|--------------|-------------------|------------|--------------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|--|
| Level                       | Adults / RHC | Department / Ward | Door Code  | Room Name          | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |  |
| 8                           | Adults       | Corridor          | WS8-011    | Toilet             | 1 x Contour<br>1 x Toilet  | 19.7           | 0.37                        | 59.2          |                            | 42.5            | 0.17                         |  |
| 8                           | Adults       | Corridor          | WS8-019    | Diswabled Toilet   | 1 x Contour  | 16.3           | 0.36                        |               |                            | 41.8            | 0.15                         |  |
| 8                           | Adults       | Corridor          | WS8-027    | Facilities         | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 16.4           | <0.02                       | 63.3          | <0.02                      |                 |                              |  |
| 8                           | Adults       | Ward 8A           | GENW9-001  | Bed 1              | 1 x Optitherm  | 18             | 0.32                        |               |                            | 40.9            | 0.15                         |  |
| 8                           | Adults       | Ward 8A           | GENW9-065  | Bed 28             | 1 x Optitherm  | 13.3           | 0.38                        |               |                            | 40.3            | 0.16                         |  |
| 8                           | Adults       | Ward 8A           | GENW9-066  | Facilities         | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 13.4           | 0.34                        | 62            | 0.02                       |                 |                              |  |
| 8                           | Adults       | Ward 8A           | GENWA-033  | Bed 15             | 1 x Optitherm  | 16             | 0.42                        |               |                            | 39.4            | 0.17                         |  |
| 8                           | Adults       | Ward 8A           | GENWD-029  | Room 13 (en-suite) | 1 x Contour<br>1 x Shower  | 21.6           | 0.27                        | 60.2          |                            | 40.8            | 0.19                         | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. |
| 8                           | Adults       | Ward 8B           | GENW12-032 | Bed 98 (En-suite)  | 1 x Contour<br>1 x Shower  | 16.1           | 0.35                        | 63.5          |                            | 42.2            | 0.11                         |  |
| 8                           | Adults       | Ward 8B           | GENW12-035 | Bed 97             | 1 x Optitherm  | 13             | 0.44                        |               |                            | 40.1            | 0.14                         |  |
| 8                           | Adults       | Ward 8B           | GENW12-065 | Bed 85             | 1 x Optitherm  | 13.1           | 0.55                        |               |                            | 41.2            | 0.12                         |  |
| 8                           | Adults       | Ward 8B           | GENW12-066 | Facilities         | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 14.4           | 0.41                        | 59.1          | 0.02                       |                 |                              |  |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |            |                    |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations   |
|-----------------------------|--------------|-------------------|------------|--------------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|--|
| Level                       | Adults / RHC | Department / Ward | Door Code  | Room Name          | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |  |
| 8                           | Adults       | Ward 8C           | GENW11-033 | Bed 71             | Optitherm  | 18.1           | 0.31                        |               |                            | 41.8            | 0.12                         |  |
| 8                           | Adults       | Ward 8C           | GENW11-065 | Bed 84             | Optitherm  | 16.9           | 0.28                        |               |                            | 41.6            | 0.09                         |  |
| 8                           | Adults       | Ward 8C           | GENW11-066 | Facilities         | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 16.8           | 0.34                        | 62.5          | <0.02                      |                 |                              |  |
| 8                           | Adults       | Ward 8C           | GENWD-065  | Room 84            | 1 x Optitherm  | 15.5           | 0.02                        |               |                            | 39.2            | 0.18                         |  |
| 8                           | Adults       | Ward 8D           | GENW-065   | Bed 29             | 1 x Optitherm  | 13.2           | 0.3                         |               |                            | 39.9            | 0.18                         |  |
| 8                           | Adults       | Ward 8D           | GENW-066   | Facilities         | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 13             | 0.3                         | 61.2          | 0.06                       |                 |                              |  |
| 8                           | Adults       | Ward 8D           | GENW10-033 | Bed 42             | 1 x Optitherm  | 14.8           | 0.32                        |               |                            | 39.6            | 0.21                         |  |
| 8                           | Adults       | Ward 8D           | GENW11-033 | Bed 71             | Optitherm  | 18.1           | 0.29                        |               |                            | 41.8            | 0.12                         |  |
| 8                           | Adults       | Ward 8D           | GENWD-028  | Room 44            | 1 x Optitherm  | 17             | 0.36                        |               |                            | 39              | 0.23                         |  |
| 8                           | Adults       | Ward 8D           | GENW10-058 | Room 32 (en-suite) | 1 x Contour<br>1 x Shower (no cold)  | 22             | 0.23                        | 60.3          |                            | 40.8            | 0.23                         | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |            |                 |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations  |
|-----------------------------|--------------|-------------------|------------|-----------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|---|
| Level                       | Adults / RHC | Department / Ward | Door Code  | Room Name       | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |   |
| 9                           | Adults       | Corridor          | WS9-019    | Toilet          | 1 x Contour  | 21.8           | 0.38                        | 60.7          |                            | 58.3            | 0.02                         | TMT out of specification and requires reset and/or fully serviced or replaced if required. Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. |
| 9                           | Adults       | Corridor          | WS9-027    | Facilities      | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 18.6           | 0.35                        |               | <0.02                      |                 |                              |   |
| 9                           | Adults       | Waiting Room      | WS9-006    | Staff Area      | 1 x Water Contour only   | 9.9            | 0.02                        |               |                            |                 |                              |   |
| 9                           | Adults       | Waiting Room      | WS9-011    | Disabled WC     | 1 x Infrared   | 19             |                             | 59.2          |                            | 41.8            | 0.16                         |   |
| 9                           | Adults       | Ward 9A           | GENW13-001 | Room 12 Ensuite | 1 x Optitherm  | 16.3           | 0.32                        |               |                            | 41.1            | 0.18                         |   |
| 9                           | Adults       | Ward 9A           | GENW13-031 | Bed 14          | 1 x Optitherm  | 17             | 0.35                        |               |                            | 39.7            | 0.16                         |   |
| 9                           | Adults       | Ward 9A           | GENW13-034 | Bathroom 15     | 1 x Contour<br>1 x Shower  | 21.5           | 0.26                        |               |                            | 39              | 0.17                         | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct.  |
| 9                           | Adults       | Ward 9A           | GENW13-066 | Facilities      | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 16.4           | 0.47                        | 63            | 0.02                       |                 |                              |   |
| 9                           | Adults       | Ward 9A           | GENW13-065 | Bed 28          | 1 x Optitherm  | 14.6           | 0.32                        |               |                            | 39.3            | 0.14                         |   |
| 9                           | Adults       | Ward 9B           | GENW16-032 | Bathroom        | 1 x Contour<br>1 x Shower  | 19             | 0.34                        |               |                            | 40.1            | 0.1                          |   |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |            |                    |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations   |
|-----------------------------|--------------|-------------------|------------|--------------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|--|
| Level                       | Adults / RHC | Department / Ward | Door Code  | Room Name          | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |  |
| 9                           | Adults       | Ward 9B           | GENW16-066 | Facilities         | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 16.3           | 0.4                         | 63.9          | 0.02                       |                 |                              |  |
| 9                           | Adults       | Ward 9B           | GENW16-036 | Room 97 (en-suite) | 1 x Contour<br>1 x Shower  | 22             | 0.31                        | 56.8          |                            | 41.7            | 0.17                         | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct.<br>Hot flow and return not operating correctly in area - further investigation required, to ensure system balanced correctly throughout, with Kemper Multitherm Regulating Valves set correctly.<br>Uninsulated hot & cold pipework in direct contact with each other, causing heat transfer - Investigate and correct. |
| 9                           | Adults       | Ward 9B           | GENW16-065 | Bed 85             | 1 x Optitherm  | 14.5           | 0.32                        | 64.2          | 0.12                       | 42.5            | 0.13                         |  |
| 9                           | Adults       | Ward 9C           | GENW15-065 | Bed 84             | 1 x Optitherm  | 13.3           | 0.32                        |               |                            | 41.3            | 0.13                         |  |
| 9                           | Adults       | Ward 9C           | GENW15-066 | Facilities         | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 13.6           | 0.32                        | 62.7          | 0.02                       |                 |                              |  |
| 9                           | Adults       | Ward 9C           | GENW15-001 | Bed 57             | 1 x Optitherm  | 14.2           | 0.38                        |               |                            | 40.4            | 0.17                         |  |
| 9                           | Adults       | Ward 9C           | GENWD-033  | Bed 71             | 1 x Optitherm  | 16.8           | 0.31                        |               |                            | 41.7            | 0.11                         |  |
| 9                           | Adults       | Ward 9D           | GENW14     | Room 29            | 1 x Optitherm  | 14.5           | 0.32                        |               |                            | 39.7            | 0.2                          |  |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |            |                    |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations   |
|-----------------------------|--------------|-------------------|------------|--------------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|--|
| Level                       | Adults / RHC | Department / Ward | Door Code  | Room Name          | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |  |
| 9                           | Adults       | Ward 9D           | GENW14-034 | Bed 42 Ensuite     | 1 x Contour<br>1 x Shower<br>1 x Toilet  | 21.2           | 0.2                         | 58.8          |                            | 42.7            | 0.22                         | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. |
| 9                           | Adults       | Ward 9D           | GENWD-001  | Room 56            | 1 x Optitherm  | 13.8           | 0.4                         |               |                            | 41.3            | 0.2                          |  |
| 9                           | Adults       | Ward 9D           | GENWD-028  | Bed 44 (En-suite)  | 1 x Contour<br>1 x Shower  | 19.6           | 0.31                        |               |                            | 39.2            | 0.05                         |  |
| 9                           | Adults       | Ward 9D           | GENWD-066  | Facilities         | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 15.5           | 0.3                         |               |                            |                 |                              |  |
| 9                           | Adults       | Ward 9D           | GENWD-5    | Bed 32             | 1 x Optitherm  | 17.4           | 0.33                        |               |                            | 40.1            | 0.17                         |  |
| 10                          | Adults       | Central Corridor  | WS10-027   | Facilities         | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 141.5          | 0.45                        | 61.1          | <0.02                      |                 |                              |  |
| 10                          | Adults       | Corridor          | WS10-019   | Toilet             | 1 x Contour  | 18.5           | 0.33                        |               |                            | 41.3            | 0.15                         |  |
| 10                          | Adults       | Waiting Room      | WS10-011   | RHS Toilet         | 1 x Infrared Tap   |                |                             |               |                            | 41.3            | 0.19                         |  |
| 10                          | Adults       | Ward 10A          | GENW17-001 | Bed 1              | 1 x Optitherm  | 16.5           | 0.32                        |               |                            | 39.6            | 0.18                         |  |
| 10                          | Adults       | Ward 10A          | GENW17-034 | Room 15 (en-suite) | 1 x Optitherm<br>1 x Contour<br>1 x Shower   | 21.5           | 0.44                        | 59            |                            | 39.5            | 0.18                         | Cold temperature high, though temperatures in surrounding area acceptable. Investigate and correct.  |
| 10                          | Adults       | Ward 10A          | GENW17-066 | Facilities         | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 16.4           | 0.31                        | 63.3          | 0.02                       |                 |                              |  |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |            |                   |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations   |
|-----------------------------|--------------|-------------------|------------|-------------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|--|
| Level                       | Adults / RHC | Department / Ward | Door Code  | Room Name         | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |  |
| 10                          | Adults       | Ward 10A          | GENWD-029  | Bed 13 (En-suite) | 1 x Contour<br>1 x Shower  | 21             | 0.29                        | 60.9          |                            | 41.3            | 0.15                         | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. |
| 10                          | Adults       | Ward 10A          | GENWD-065  | Bed 26            | 1 x Optitherm  | 14.8           | 0.31                        |               |                            | 41.5            | 0.14                         |  |
| 10                          | Adults       | Ward 10B          | GENW20-032 | Bed 98 Ensuite    | 1 x Shower<br>1 x Contour<br>1 x WC  | 21.3           | 0.28                        | 58.8          |                            | 41.9            | 0.02                         | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. |
| 10                          | Adults       | Ward 10B          | GENW20-036 | Room 97 Bathroom  | 1 x Optitherm  | 19.7           | 0.36                        |               |                            | 41.5            | 0.16                         |  |
| 10                          | Adults       | Ward 10B          | GENW20-066 | Facilities        | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 16             | 0.33                        | 63.7          | 0.02                       |                 |                              |  |
| 10                          | Adults       | Ward 10B          | GENWD-065  | Bed 85            | 1 x Optitherm  | 14.9           | 0.49                        |               |                            | 41.4            | 0.14                         |  |
| 10                          | Adults       | Ward 10C          | GENW19-028 | Room 69           | 1 x Optitherm  | 14.6           | 0.39                        |               |                            | 41.1            | 0.14                         |  |
| 10                          | Adults       | Ward 10C          | GENW19-066 | Facilities        | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 16.3           | 0.3                         | 63.6          | 0.02                       |                 |                              |  |
| 10                          | Adults       | Ward 10C          | GENWD-001  | Room 57           | 1 x Optitherm  | 13.7           | 0.41                        |               |                            | 41.6            | 0.14                         |  |
| 10                          | Adults       | Ward 10C          | GENWD-065  | Bed 84            | 1 x Optitherm  | 16             | 0.45                        |               |                            | 40.3            | 0.14                         |  |
| 10                          | Adults       | Ward 10D          | GENW18-006 | Facilities        | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 16.8           | 0.37                        | 60.7          | 0.06                       |                 |                              |  |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |            |                  |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations  |
|-----------------------------|--------------|-------------------|------------|------------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|---|
| Level                       | Adults / RHC | Department / Ward | Door Code  | Room Name        | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |   |
| 10                          | Adults       | Ward 10D          | GENW18-028 | Bed 15           | 1 x Optitherm  | 17.9           | 0.36                        | 43.8          |                            | 40.1            |                              | Hot flow and return not operating correctly in area - further investigation required, to ensure system balanced correctly throughout, with Kemper Multitherm Regulating Valves set correctly. |
| 10                          | Adults       | Ward 10D          | GENW18-057 | Bed 32           | 1 x Optitherm  | 16.8           | 0.36                        |               |                            | 41.8            | 0.05                         |   |
| 10                          | Adults       | Ward 10D          | GENW18-065 | Bed 29 WHB       | 1 x Optitherm  | 17.1           | 0.34                        |               |                            | 40.8            | 0.19                         |   |
| 10                          | Adults       | Ward 10D          | GENWD-001  | Bed 56           | 1 x Optitherm  | 14.5           | 0.33                        |               |                            | 41.1            | 0.16                         |   |
| 10                          | Adults       | Ward 10D          | GENWD-034  | Bed 42 (Ensuite) | 1 x Contour<br>1 x Shower  | 19.4           | 0.29                        | 60.3          |                            | 41.2            | 0.23                         |   |
| 11                          | Adults       | Central Corridor  | WS11-018   | Facilities Regen | 1 x SSS<br>1 x Potwash<br>1 x Infrared Tap   | 17.2           | 0.31                        | 62.1          | 0.02                       |                 |                              |   |
| 11                          | Adults       | Central Corridor  | WS11-019   | Toilet           | 1 x Contour  | 19.7           | 0.37                        |               |                            | 41.9            | 0.14                         |   |
| 11                          | Adults       | Public Toilets    | WS11-011   | Toilet           | 1 x Contour  | 19.4           | 0.17                        | 61.3          |                            | 42.4            | 0.17                         |   |
| 11                          | Adults       | Ward 11A          | GENW-065   | Bed 28           | 1 x Optitherm  | 13.3           | 0.31                        |               |                            | 39.8            | 0.12                         |   |
| 11                          | Adults       | Ward 11A          | GENW-066   | Facilities       | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 13.3           | 0.29                        | 62.5          | 0.02                       |                 |                              |   |
| 11                          | Adults       | Ward 11A          | GENW21-001 | Bed 1            | 1 x Optitherm  | 16.4           | 0.33                        |               |                            | 39.6            | 0.16                         |   |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |            |                   |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations   |
|-----------------------------|--------------|-------------------|------------|-------------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|--|
| Level                       | Adults / RHC | Department / Ward | Door Code  | Room Name         | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |  |
| 11                          | Adults       | Ward 11A          | GENW21-029 | Bed 13 (En-suite) | 1 x Contour<br>1 x Shower  | 21.5           | 0.34                        | 60.4          |                            | 41.3            | 0.15                         | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. |
| 11                          | Adults       | Ward 11A          | GENW21-033 | Bed 15            | 1 x Optitherm  | 15.6           | 0.33                        |               |                            | 39.7            | 0.13                         |  |
| 11                          | Adults       | Ward 11B          | GENW-065   | Bed 85            | 1 x Optitherm  | 13.1           | 0.37                        |               |                            | 40.1            | 0.13                         |  |
| 11                          | Adults       | Ward 11B          | GENW-066   | Facilities        | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 13.2           | 0.28                        | 61.9          | 0.02                       |                 |                              |  |
| 11                          | Adults       | Ward 11B          | GENWD-031  | Bed 99            | 1 x Optitherm  | 18.1           | <0.02                       | 59.2          |                            | 40.2            | 0.12                         |  |
| 11                          | Adults       | Ward 11B          | GENWD-035  | Bed 97            | 1 x Optitherm  | 14.6           | 0.31                        |               |                            | 40.5            | 0.1                          |  |
| 11                          | Adults       | Ward 11C          | GENW18-066 | Facilities        | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 15.9           | 0.32                        | 60.8          | <0.02                      |                 |                              |  |
| 11                          | Adults       | Ward 11C          | GENW23-031 | Bed70             | 1 x Optitherm  | 17.1           | 0.29                        |               |                            | 42.2            | 0.11                         |  |
| 11                          | Adults       | Ward 11C          | GENW23-065 | Bed 84            | 1 x Optitherm  | 16.7           | 0.33                        |               |                            | 40.5            | 0.17                         |  |
| 11                          | Adults       | Ward 11C          | GENWD-001  | Bed 57            | 1 x Optitherm  | 14.4           | 0.35                        |               |                            | 42.1            | 0.13                         |  |
| 11                          | Adults       | Ward 11D          | GENW-065   | Bed 29            | 1 x Optitherm  | 13.4           | 0.31                        |               |                            | 42              | 0.18                         |  |
| 11                          | Adults       | Ward 11D          | GENW-066   | Facilities        | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 13.4           | 0.31                        | 62.1          | 0.08                       |                 |                              |  |



### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                                      |            |                 |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations  |
|-----------------------------|--------------|--------------------------------------|------------|-----------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|---|
| Level                       | Adults / RHC | Department / Ward                    | Door Code  | Room Name       | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |   |
| 11                          | Adults       | Ward 11D                             | GENW22-031 | Bed 43          | 1 x Optitherm  | 16.5           | 0.32                        |               |                            | 40.1            | 0.14                         |   |
| 11                          | Adults       | Ward 11D                             | GENWD-001  | Bed 56          | 1 x Optitherm  | 14.1           | 0.28                        |               |                            | 40.5            | 0.19                         |   |
| 11                          | Adults       | Ward 11D                             | GENWD-033  | Bed 42          | 1 x Optitherm  | 15.4           | 0.33                        |               |                            | 41.3            | 0.2                          |   |
| 11                          | Adults       | Ward 11D                             | GENWD-057  | Bed 32          | 1 x Optitherm  | 15.6           | 0.34                        |               |                            | 39.5            | 0.17                         |   |
| -1                          | RHC          | Basement                             | FMB-010    | Bed Wash        | 1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink                  | 13.5           | 0.39                        | 62.6          | 0.02                       |                 |                              |   |
| -1                          | RHC          | Kitchen                              | KIT-031    | Plant Kitchen   | 1 x Infrared   |                |                             |               |                            | 39.8            | 0.18                         |   |
| 0                           | RHC          | Children's A&E (Next to Courtyard 2) | EMC-018    | Childrens Resus | 1 x Infrared<br>1 x WC   | 21.9           | <0.02                       | 60.2          |                            | 39.8            | <0.02                        | Cold temperature high, though temperatures in surrounding area acceptable. Investigate and correct. |
| 0                           | RHC          | Clinic 14                            | CPS-003    | Consulting Room | 1 x Optitherm  | 16.2           | 0.36                        | 59.8          |                            | 43              | 0.15                         |   |
| 0                           | RHC          | Clinic 14                            | CPS-006    | Toilet          | 1 x Contour<br>1 x Shower<br>1 x Toilet  | 16.9           | 0.35                        |               |                            | 47.2            | 0.23                         | TMT out of specification and requires reset and/or fully serviced or replaced if required.          |
| 0                           | RHC          | Concourse                            | ENT-014    | Childrens Club  | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)                        | 13.8           | 0.35                        |               |                            | 40.6            | 0.15                         |   |
| 0                           | RHC          | Concourse                            | ENT-036    | Facilities      | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 13.3           | 0.35                        | 60.9          | 0.02                       |                 |                              |   |
| 0                           | RHC          | Concourse                            | ENT-022    | N/A             | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)                        | 19.2           | 0.35                        | 58.8          |                            | 42.7            | 0.13                         |   |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                       |           |                                       |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations |
|-----------------------------|--------------|-----------------------|-----------|---------------------------------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|----------------------------|
| Level                       | Adults / RHC | Department / Ward     | Door Code | Room Name                             | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |                            |
| 0                           | RHC          | Observation           | OBW-014   | Bed 6                                 | 1 x Optitherm  | 14.1           | 0.35                        |               |                            | 39.9            | 0.14                         |                            |
| 0                           | RHC          | Observation           | OBW-030   | Bed 14                                | 1 x Optitherm  | 13.6           | 0.36                        |               |                            | 40.2            | 0.18                         |                            |
| 0                           | RHC          | Observation           | OBW-034   | Facilities                            | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 13.4           | 0.33                        | 63.5          | 0.02                       |                 |                              |                            |
| 0                           | RHC          | OPD                   | NO CODE   | Toilet (and wheelchair symbol)        | 1 x Contour  | 15.2           | 0.45                        |               |                            | 40.3            | 0.21                         |                            |
| 0                           | RHC          | OPD                   | OPD-009   | WC (plus male and female silhouettes) | 1 x Markwick   | 13.8           | 0.42                        |               |                            | 39              | 0.22                         |                            |
| 0                           | RHC          | OPD                   | OPD-026   | Clinic 1 Facilities                   | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 14.5           | 0.38                        | 64.1          | <0.02                      |                 |                              |                            |
| 0                           | RHC          | OPD                   | OPD-060   | Toilet                                | 1 x Contour  | 19.4           | 0.41                        |               |                            | 41.2            | 0.26                         |                            |
| 0                           | RHC          | OPD                   | OPD-073   | Plaster Room                          | 2 x Optitherm<br>2 x Stainless Steel Sink (Swan Neck/Pillar Taps)                        | 14.6           | 0.5                         |               |                            | 41              | 0.18                         |                            |
| 0                           | RHC          | OPD                   | OPD-075   | Disabled WC (and wheelchair symbol)   | 1 x Contour  | 17.9           | 0.39                        | 60.4          |                            | 42.8            | 0.13                         |                            |
| 0                           | RHC          | OPD Clinic 2          | OPD-175   | Consulting Room 6                     | 1 x Optitherm  | 14.8           | 0.37                        |               |                            | 40.9            | 0.19                         |                            |
| 0                           | RHC          | OPD Clinic 3          | OPD-120   | Toilet (and wheelchair symbol)        | 1 x Contour  | 19.4           | 0.37                        |               |                            | 40.4            | 0.13                         |                            |
| 0                           | RHC          | OPD Clinic 4          | OPD-103   | Disabled Toilet                       | 1 x Contour  | 18.1           | 0.3                         |               |                            | 39.8            | 0.2                          |                            |
| 0                           | RHC          | OPD Next to Clinic 14 | OPD-125   | Female Change                         | 1 x Contour  | 14             | 0.37                        |               |                            | 42.5            | 0.16                         |                            |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                     |           |                            |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations   |
|-----------------------------|--------------|---------------------|-----------|----------------------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|--|
| Level                       | Adults / RHC | Department / Ward   | Door Code | Room Name                  | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |  |
| 1                           | RHC          | Cardiology          | CAR-036   | Room 5                     | 1 x Optitherm  | 14.1           | 0.47                        |               |                            | 41.4            | 0.16                         |  |
| 1                           | RHC          | Critical Care       | CCW-014   | Medical Physics Department | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)                        | 16.1           | 0.41                        | 63.4          | <0.02                      |                 |                              |  |
| 1                           | RHC          | Critical Care       | CCW-021   | Toilet                     | 1 x Contour<br>1 x Shower<br>1 x Toilet  | 17.8           | 0.35                        |               |                            | 41.5            | 0.11                         |  |
| 1                           | RHC          | Critical Care       | CCW-027   | Women's Change             | 2 x Shower<br>4 x Contour  | 15.3           | 0.41                        |               |                            | 41.7            | <0.02                        |  |
| 1                           | RHC          | Critical Care       | CCW-083   | PICU Bed Bay 1-4           | 4 x Optitherm  | 15.2           | 0.43                        |               |                            | 39.9            | 0.16                         |  |
| 1                           | RHC          | Critical Care       | CCW-084   | Bed 5                      | 1 x Optitherm  | 15.4           | 0.44                        |               |                            | 41.3            | 0.13                         |  |
| 1                           | RHC          | Critical Care       | CCW-092   | Dirty Utility              | 2 x Optitherm  | 16.5           | 0.42                        |               |                            | 40.8            | 0.18                         |  |
| 1                           | RHC          | Critical Care       | CCW-098   | Bed Bay 13-16              | 4 x Optitherm  | 19.6           | 0.4                         |               |                            | 40              | 0.17                         |  |
| 1                           | RHC          | Critical Care       | CCW-118   | Facilities                 | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 13.8           | 0.38                        | 64.6          | <0.02                      |                 |                              |  |
| 1                           | RHC          | Children's Theatres | 23HU-041  | Toilet                     | 1 x Contour<br>1 x Shower  | 17.8           | 0.4                         |               |                            | 39.8            | 0.25                         |  |
| 1                           | RHC          | Children's Theatres | 23HU-051  | WC                         | 1 x Contour  | 16.3           | 0.37                        |               |                            | 42.7            | 0.16                         |  |
| 1                           | RHC          | Children's Theatres | THE-009   | WC                         | 1 x Contour  | 20.1           | 0.33                        |               |                            | 41.6            | 0.1                          | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                          |           |                               |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations   |
|-----------------------------|--------------|--------------------------|-----------|-------------------------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|--|
| Level                       | Adults / RHC | Department / Ward        | Door Code | Room Name                     | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |  |
| 1                           | RHC          | Children's Theatres      | THE-026   | Toilet                        | 1 x Contour<br>1 x Toilet  | 17.6           | 0.4                         |               |                            | 40.6            | 0.18                         |  |
| 1                           | RHC          | Children's Theatres      | THE-033   | Female Change Toilets/Showers | 6 x Contour<br>6 x Toilet<br>6 x Shower (2nd from right tested)                          | 17.7           | 0.39                        |               |                            | 42.1            | 0.18                         |  |
| 1                           | RHC          | Special Feeds            | SPF-007   | Special Feeds                 | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 19.3           | <0.02                       | 58            | <0.02                      |                 |                              |  |
| 1                           | RHC          | Ward 1C Medical Day Unit | MDU-002   | Consulting Room 1             | 1 x Optitherm  | 13.6           | 0.39                        |               |                            | 40.1            | 0.14                         |  |
| 1                           | RHC          | Ward 1C Medical Day Unit | MDU-014   | Facilities                    | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 13.2           | 0.35                        | 63.3          | 0.25                       |                 |                              |  |
| 1                           | RHC          | Ward 1C Medical Day Unit | MDU-015   | Dirty Utility 2               | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)                        | 13.4           | 0.49                        |               |                            | 40.5            | 0.17                         |  |
| 2                           | RHC          | AFD Corridor             | AFD-022   | Staff Toilet                  | 1 x Contour  | 16.9           | 0.38                        |               |                            | 40.8            | 0.21                         |  |
| 2                           | RHC          | Asceptic Unit            | ASU-036   | Staff Change                  | 1 x Contour<br>1 x Shower  | 24.6           | 0.3                         |               |                            | 42.9            | 0.15                         | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. |
| 2                           | RHC          | Asceptic Unit            | ASU-042   | Corridor                      | 1 x Optitherm  | 14.6           | 0.42                        |               |                            | 42.8            | 0.19                         |  |
| 2                           | RHC          | Children's Corridor      | NO CODE   | 2C Regen Kitchen              | 1 X IF Tap<br>1 x Potwash<br>1 x SSS   | 16.3           | 0.42                        | 56.8          | <0.02                      |                 |                              |  |
| 2                           | RHC          | Ward 2A                  | SCH-003   | Bedroom 25 (En-suite)         | 1 x WHB Contour<br>1 x WC<br>1 x Shower  | 22.5           | 0.25                        |               |                            | 43              | 0.12                         | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |           |                    |   | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations |
|-----------------------------|--------------|-------------------|-----------|--------------------|---|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|----------------------------|
| Level                       | Adults / RHC | Department / Ward | Door Code | Room Name          | Outlets in Room   | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |                            |
| 2                           | RHC          | Ward 2A           | SCH-040   | WC Staff           | 1 x Markwick 21+ Mono Tap   | 15.6           | 0.39                        |               |                            | 41.8            | 0.15                         |                            |
| 2                           | RHC          | Ward 2A           | SCH-061   | Room 16            | 1 x Markwick  | 1513.8         | 0.35                        |               |                            | 42.4            | 0.14                         |                            |
| 2                           | RHC          | Ward 2A           | SCH-063   | Prep Room          | 1 x Markwick 21+  | 19.8           | 0.38                        | 61.2          |                            | 42.9            | 0.18                         |                            |
| 2                           | RHC          | Ward 2A           | SCH-087   | Store (Facilities) | 1 x Swan Neck<br>1 x Janitorial Sink<br>1 x Markwick 21+          | 16.1           | 0.42                        | 63.1          | 0.02                       |                 |                              |                            |
| 2                           | RHC          | Ward 2A           | SCH-093   | Staff Room         | 1 x Swan Neck<br>1 x Markwick                                     | 14.4           | 0.37                        | 63.5          | 0.02                       |                 |                              |                            |
| 2                           | RHC          | Ward 2B           | DCU-005   | Toilet             | 1 x Contour   | 18             | 0.46                        |               |                            | 40.6            | 0.17                         |                            |
| 2                           | RHC          | Ward 2B           | DCU-011   | Room 13            | 1 x Markwick  | 17.5           | 0.37                        |               |                            | 42.5            | 0.22                         |                            |
| 2                           | RHC          | Ward 2C           | ARU-023   | Bed 14             | 1 x Optitherm   | 14.5           | 0.35                        |               |                            | 39.6            | 0.7                          |                            |
| 2                           | RHC          | Ward 2C           | ARU-046   | Room 24            | 1 x Optitherm   | 14.7           | 0.36                        |               |                            | 40              | 0.19                         |                            |
| 2                           | RHC          | Ward 2C           | ARU-050   | Bed 25             | 1 x Optitherm   | 14.8           | 0.33                        |               |                            | 40.7            | 0.15                         |                            |
| 2                           | RHC          | Ward 2C           | ARU-085   | Bed 33             | 1 x Optitherm   | 14.1           | 0.31                        |               |                            | 40.5            | 0.14                         |                            |
| 2                           | RHC          | Ward 2C           | ARU-094   | Clean Utility      | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps) | 13.8           | 0.39                        | 63.3          | 0.02                       |                 |                              |                            |
| 3                           | RHC          | 3A - 3C Corridor  | GWS-004   | Staff Kitchen      | 1 x Swan Neck<br>1 x Optitherm                                    | 16.9           | 0.43                        | 59.9          | 0.02                       |                 |                              |                            |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |           |                  |  | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations   |
|-----------------------------|--------------|-------------------|-----------|------------------|--|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|--|
| Level                       | Adults / RHC | Department / Ward | Door Code | Room Name        | Outlets in Room  | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |  |
| 3                           | RHC          | 3A - 3C Corridor  | GWS-011   | Facilities       | 1 x IR Tap<br>2 x Stainless Steel Sink (Swan Neck/Pillar Taps)                           | 14.6           | 0.37                        | 64.2          | 0.02                       |                 |                              |  |
| 3                           | RHC          | 3A - 3C Corridor  | GWS-014   | Renal Staff Only | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)                        | 14.8           | 0.41                        | 63.3          | <0.02                      |                 |                              |  |
| 3                           | RHC          | 3A - 3C Corridor  | GWS-033   | Toilet           | 1 x Contour  | 19.6           | 0.41                        | 60.3          |                            | 42.7            | 0.17                         |  |
| 3                           | RHC          | Ward 3A           | GW3-005   | Bed 8 Ensuite    | 1 x Contour<br>1 x Shower  | 18.4           | 0.4                         |               |                            | 39.1            | 0.2                          |  |
| 3                           | RHC          | Ward 3A           | GW3-043   | Play Room        | 1 x SSS<br>1 x Optitherm   |                | 0.39                        | 62.3          | 0.16                       |                 |                              |  |
| 3                           | RHC          | Ward 3B           | GW2-025   | Bed 20           | 1 x Optitherm  | 14.4           | 0.39                        |               |                            | 41.1            | 0.18                         |  |
| 3                           | RHC          | Ward 3B           | GW2-036   | Play Room        | 2 1 x SSS<br>1 x Optitherm   | 16.7           | 0.38                        | 60.3          | 0.12                       |                 |                              |  |
| 3                           | RHC          | Ward 3B           | GW2-057   | Facilities       | 1 x Optitherm<br>1 x Stainless Steel Sink (Swan Neck/Pillar Taps)<br>1 x Janitorial Sink | 13.5           | 0.44                        | 63.5          | 0.02                       |                 |                              |  |
| 3                           | RHC          | Ward 3B           | GW2-058   | Bed 4            | 1 x Optitherm  | 14.1           | 0.36                        |               |                            | 42.3            | 0.17                         |  |
| 3                           | RHC          | Ward 3B           | GWR-037   | Beds 11-14       | 2 x Optitherm  | 14.6           | 0.39                        |               |                            | 39.2            | 0.17                         |  |
| 3                           | RHC          | Ward 3C           | GW1-002   | Renal Day Unit   | 3 x Optitherm (RHS of Door)  | 14.9           | 0.38                        |               |                            | 39.8            | 0.14                         |  |
| 3                           | RHC          | Ward 3C           | GW1-048   | Staff WC         | 1 x Contour  | 22.6           | 0.3                         |               |                            | 42.6            | 0.13                         | Cold temperature high (Taken from contour/surface temp which may impact temp recorded) - ensure all outlets are flushed daily to minimise heat gain, particularly in empty rooms or when patients are bedbound/have limited mobility. Investigate and correct. |

### LEGIONELLA RISK ASSESSMENT

| A&C Outlet Locations Tested |              |                   |           |              |                 | After 2 mins   |                             | After 60 secs |                            | After 60 secs   |                              | Comments / Recommendations   |
|-----------------------------|--------------|-------------------|-----------|--------------|-----------------|----------------|-----------------------------|---------------|----------------------------|-----------------|------------------------------|--|
| Level                       | Adults / RHC | Department / Ward | Door Code | Room Name    | Outlets in Room | Cold Temp (°C) | Cold ClO <sub>2</sub> (ppm) | Hot Temp (°C) | Hot ClO <sub>2</sub> (ppm) | Mixed Temp (°C) | Mixed ClO <sub>2</sub> (ppm) |  |
| 4                           | RHC          | DCFP              | DCFP-013  | Staff Toilet | 1 x Contour     | 19.8           | 0.32                        | 59.6          |                            | 44.5            | 0.16                         | TMT out of specification and requires reset and/or fully serviced or replaced if required. |

## WATER SYSTEM RISK ASSESSMENT (Draft)

| Location / Door Disc No..    | Riser No.                 | Plantroom / Calorifier | Large Cold Temp (°C)   | Large Hot Flow Temp (°C) | Large Hot Return Temp (°C) | Small Cold Temp (°C) | Small Hot Flow Temp (°C) | Small Hot Return Temp (°C) | Deadlegs Present                                  | Additional Info  |
|------------------------------|---------------------------|------------------------|--|--------------------------|----------------------------|----------------------|--------------------------|----------------------------|---|--|
| Children's 4th Floor CC4-021 | M39 (Children's Hospital) | PR 41 01/02/03         | 26.2   | 63.0                     | 57.2                       | N/A                  | N/A                      | N/A                        | None visible                                      |  |
|                              |                           |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |  |
|                              |                           |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |   |  |
| <b>Recommendations:</b>      |                           |                        | Cold temperature too high with lever valve in half open position - investigate and correct.  |                          |                            |                      |                          |                            |   |  |
| Children's 3rd Floor CC3-021 | M39 (Children's Hospital) | PR 41 01/02/03         | 18.8   | 62.2                     | 59.0                       | N/A                  | N/A                      | N/A                        | None visible                                      |  |
|                              |                           |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |  |
|                              |                           |                        | N/A  | N/A                      | 62.0                       | N/A                  | N/A                      | N/A                        |   |  |
| <b>Recommendations:</b>      |                           |                        | Inspect return temperature gauges for accuracy – these should be recalibrated or replaced if required.   |                          |                            |                      |                          |                            |   |  |
| Children's 2nd Floor CC2-021 | M39 (Children's Hospital) | PR 41 01/02/03         | 18.6   | 61.8                     | 56.3                       | N/A                  | N/A                      | N/A                        | Minimal isolated horizontal branch on hot return. | Cold line branches from this riser to supply Plantroom 22. A branch from the line to PR 22 supplies Ward 2B and part of Ward 2A.<br>2 x CIO2 units in situ but not operational - connections to domestic system currently included in recorded site flushing regime.<br>Additional insulation required on cold & hot pipework. |
|                              |                           |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |  |
|                              |                           |                        | N/A  | N/A                      | 59.0                       | N/A                  | N/A                      | N/A                        |   |  |
| <b>Recommendations:</b>      |                           |                        | Inspect return temperature gauges for accuracy – these should be recalibrated or replaced if required.<br>There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in CIO2 control levels or microbial control. |                          |                            |                      |                          |                            |   |  |
| Children's 1st Floor CC1-021 | M39 (Children's Hospital) | PR 41 01/02/03         | 18.3   | 62.0                     | 56.0                       | 26.0                 | N/A                      | N/A                        | None visible                                      | Additional insulation required on cold & hot pipework.<br>Evidence of leak damage on pipework.   |
|                              |                           |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |  |
|                              |                           |                        | N/A  | N/A                      | 52.0                       | N/A                  | N/A                      | N/A                        |   |  |
| <b>Recommendations:</b>      |                           |                        | Inspect return temperature gauges for accuracy – these should be recalibrated or replaced if required.<br>Small cold temperature too high - investigate and correct.   |                          |                            |                      |                          |                            |   |  |



## WATER SYSTEM RISK ASSESSMENT (Draft)

| Location / Door Disc No..                 | Riser No.                 | Plantroom / Calorifier | Large Cold Temp (°C)   | Large Hot Flow Temp (°C) | Large Hot Return Temp (°C) | Small Cold Temp (°C) | Small Hot Flow Temp (°C) | Small Hot Return Temp (°C) | Deadlegs Present  | Additional Info   |
|---|---------------------------|------------------------|--|--------------------------|----------------------------|----------------------|--------------------------|----------------------------|---|---|
| Children's Ground Floor CCO-021           | M39 (Children's Hospital) | PR 41 01/02/03         | 18.7   | 61.8                     | 59.5                       | N/A                  | N/A                      | N/A                        | Yes - deadlegs/flushing points at bottom of hot flow and hot return lines (Approx. 300mm in length) |   |
|   |                           |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |   |
|   |                           |                        | N/A  | N/A                      | 62.0                       | N/A                  | N/A                      | N/A                        |   |   |
| <b>Recommendations:</b>                   |                           |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control.<br>Investigate visible leak under hot return line, taking any required remedial actions to correct.<br>BCWS line directional labelling appears incorrect - investigate and correct as required.<br>Inspect return temperature gauge for accuracy - this should be recalibrated or replaced if required. |                          |                            |                      |                          |                            |   |   |
| Children's Basement CCB-021               | M39 (Children's Hospital) | N/A                    | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        | None visible  | Only cold pipework rising through building - main riser supplying Childrens hospital (and branching on level 2 to supply Plantroom 22).<br><br>Corrosion visible on fitted meter and associated butterfly valves. |
|   |                           |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |   |
|   |                           |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |   |   |
| <b>Recommendations:</b>                   |                           |                        |  |                          |                            |                      |                          |                            |   |   |
| Children's 4th Floor Across from DCFP-050 | M36 (Children's Hospital) | PR 41 01/02/03         | 17.8   | 62.5                     | 56.5                       | N/A                  | N/A                      | N/A                        | None visible  |   |
|   |                           |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |   |
|   |                           |                        | N/A  | N/A                      | 55.0                       | N/A                  | N/A                      | N/A                        |   |   |
| <b>Recommendations:</b>                   |                           |                        | Inspect return temperature gauges for accuracy - these should be recalibrated or replaced if required.   |                          |                            |                      |                          |                            |   |   |
| Children's 3rd Floor Across from GWS-035  | M36 (Children's Hospital) | PR 41 01/02/03         | 18.7   | 61.3                     | 55.0                       | N/A                  | N/A                      | N/A                        | None visible  | Approx 1.0 metre of insulation missing on hot flow.   |
|   |                           |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |   |
|   |                           |                        | N/A  | N/A                      | 55.0                       | N/A                  | N/A                      | N/A                        |   |   |
| <b>Recommendations:</b>                   |                           |                        |  |                          |                            |                      |                          |                            |   |   |
| Children's 2nd Floor SCH-038              | M36 (Children's Hospital) | PR 41 01/02/03         | 19.2   | 62.1                     | 58.0                       | N/A                  | N/A                      | N/A                        | Multiple isolated branches on hot & cold supplies - included in site recorded flushing regime.      |   |
|   |                           |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |   |
|   |                           |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |   |   |
| <b>Recommendations:</b>                   |                           |                        | Maintain dealegs on flushing regime, or remove if no longer required.  |                          |                            |                      |                          |                            |   |   |
| Children's                                | M36                       |                        | 18.3   | 61.9                     | 57.9                       | N/A                  | N/A                      | N/A                        |   | Pipework drops through floor to ground floor - no corresponding riser on ground floor - assumed pipework turns and runs above   |

## WATER SYSTEM RISK ASSESSMENT (Draft)

| Location / Door Disc No..    | Riser No.                 | Plantroom / Calorifier | Large Cold Temp (°C)   | Large Hot Flow Temp (°C) | Large Hot Return Temp (°C) | Small Cold Temp (°C) | Small Hot Flow Temp (°C) | Small Hot Return Temp (°C) | Deadlegs Present   | Additional Info  |  |
|------------------------------|---------------------------|------------------------|--|--------------------------|----------------------------|----------------------|--------------------------|----------------------------|--|--|--|
| Children's 1st Floor CC1-051 | M30 (Children's Hospital) | PR 41 01/02/03         | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      | Minimal isolated horizontal branch on hot flow & return.<br>Minimal isolated horizontal branch on cold line. | riser on ground floor - assumed pipework turns and runs above ceiling in ground floor to supply ground floor services.<br>Additional insulation required on cold & hot pipework.<br>Evidence of leak damage on pipework. |  |
|                              |                           |                        | N/A  | N/A                      | 50.0                       | N/A                  | N/A                      | N/A                        |  |  |  |
| <b>Recommendations:</b>      |                           |                        | Inspect return temperature gauges for accuracy – these should be recalibrated or replaced if required.   |                          |                            |                      |                          |                            |  |  |  |
| <b>Recommendations:</b>      |                           |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. |                          |                            |                      |                          |                            |  |  |  |
| Children's 4th Floor CC4-008 | M38 (Children's Hospital) | PR 41 01/02/03         | 18.8   | 62.6                     | 59.0                       | N/A                  | N/A                      | N/A                        | Minimal isolated horizontal branch on cold line.   |  |  |
|                              |                           |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |  |
|                              |                           |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |  |  |  |
| <b>Recommendations:</b>      |                           |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. |                          |                            |                      |                          |                            |  |  |  |
| <b>Recommendations:</b>      |                           |                        | Hot flow and return pipework labelled incorrectly (wrong way round) - labelling should be corrected.   |                          |                            |                      |                          |                            |  |  |  |
| Children's 3rd Floor CC3-008 | M38 (Children's Hospital) | PR 41 01/02/03         | 18.6   | 62.0                     | 58.1                       | N/A                  | N/A                      | N/A                        | None visible   | Evidence of leak damage on hot return pipework.  |  |
|                              |                           |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |  |
|                              |                           |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |  |  |  |
| <b>Recommendations:</b>      |                           |                        | Ensure any leaks are rectified and any damage caused by the leaks is repaired.   |                          |                            |                      |                          |                            |  |  |  |
| Children's 2nd Floor CC2-008 | M38 (Children's Hospital) | PR 41 01/02/03         | 18.6   | 62.2                     | 57.9                       | N/A                  | N/A                      | N/A                        | None visible   | Evidence of leak damage on hot flow & return pipework.   |  |
|                              |                           |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |  |
|                              |                           |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |  |  |  |
| <b>Recommendations:</b>      |                           |                        | Ensure any leaks are rectified and any damage caused by the leaks is repaired.   |                          |                            |                      |                          |                            |  |  |  |
| Children's 1st Floor CC1-008 | M38 (Children's Hospital) | PR 41 01/02/03         | 18.6   | 62.0                     | 58.8                       | N/A                  | N/A                      | N/A                        | None visible   | Evidence of leak damage on hot flow & return pipework/fittings.  |  |
|                              |                           |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |  |
|                              |                           |                        | N/A  | N/A                      | 59.0                       | N/A                  | N/A                      | N/A                        |  |  |  |
| <b>Recommendations:</b>      |                           |                        | Ensure any leaks are rectified and any damage caused by the leaks is repaired.   |                          |                            |                      |                          |                            |  |  |  |

### WATER SYSTEM RISK ASSESSMENT (Draft)

| Location / Door Disc No..       | Riser No.                 | Plantroom / Calorifier | Large Cold Temp (°C)   | Large Hot Flow Temp (°C) | Large Hot Return Temp (°C) | Small Cold Temp (°C) | Small Hot Flow Temp (°C) | Small Hot Return Temp (°C) | Deadlegs Present   | Additional Info  |  |
|---------------------------------|---------------------------|------------------------|--|--------------------------|----------------------------|----------------------|--------------------------|----------------------------|--|--|--|
| Children's Ground Floor CCO-008 | M38 (Children's Hospital) | PR 41 01/02/03         | 18.7   | 63.5                     | 59.5                       | N/A                  | N/A                      | N/A                        | Downturned/isolated branch on cold line (Approx. 1m in length) recorded temperature of 25.2°C on deadleg branch pre-isolation. | No commissioning valves evident on hot flow and return. Hot flow and return looped on drop to riser and operational. No labelling of domestic pipework.            |  |
|                                 |                           |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |  |
|                                 |                           |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |  |  |  |
| <b>Recommendations:</b>         |                           |                        | Deadleg on cold line should be removed if no longer required or incorporated into site flushing regime.  |                          |                            |                      |                          |                            |  |  |  |
| Children's 3rd Floor GWS-013    | M18 (Children's Hospital) | PR 41 01/02/03         | 18.5   | 62.4                     | 57.6                       | N/A                  | N/A                      | N/A                        | None visible   | No commissioning valves evident on hot flow and return   |  |
|                                 |                           |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |  |
|                                 |                           |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |  |  |  |
| <b>Recommendations:</b>         |                           |                        |  |                          |                            |                      |                          |                            |  |  |  |
| Children's 2nd Floor ARU-121    | M18 (Children's Hospital) | PR 41 01/02/03         | 18.3   | 62.7                     | 58.5                       | N/A                  | N/A                      | N/A                        | None visible   | No commissioning valves evident on hot flow and return. Cold valve not fully open (Approx. 2/3rds open) Approx 1 metre of missing insulation on hot flow to below. |  |
|                                 |                           |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |  |
|                                 |                           |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |  |  |  |
| <b>Recommendations:</b>         |                           |                        |  |                          |                            |                      |                          |                            |  |  |  |
| Children's 1st Floor CCW-076    | M18 (Children's Hospital) | PR 41 01/02/03         | 19.4   | 62.8                     | 59.2                       | N/A                  | N/A                      | N/A                        | Minimal isolated horizontal branch on hot flow & return. Minimal isolated horizontal branch on cold line.                      | Evidence of leak damage on hot flow pipework.  |  |
|                                 |                           |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |  |
|                                 |                           |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |  |  |  |
| <b>Recommendations:</b>         |                           |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. |                          |                            |                      |                          |                            |  |  |  |

### WATER SYSTEM RISK ASSESSMENT (Draft)

| Location / Door Disc No..         | Riser No.             | Plantroom / Calorifier | Large Cold Temp (°C)   | Large Hot Flow Temp (°C) | Large Hot Return Temp (°C) | Small Cold Temp (°C) | Small Hot Flow Temp (°C) | Small Hot Return Temp (°C) | Deadlegs Present  | Additional Info                      |  |
|-----------------------------------|-----------------------|------------------------|--|--------------------------|----------------------------|----------------------|--------------------------|----------------------------|---|--------------------------------------|--|
| Adults 11th Floor Ward A CA11-006 | T1 (Adult's Hospital) | N/A                    | 16.3   | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        | Minimal isolated branches - 1 x horizontal and 1 x capped vertical. | No hot water services in this riser. |  |
|                                   |                       |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |                                      |  |
|                                   |                       |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |   |                                      |  |
| <b>Recommendations:</b>           |                       |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. |                          |                            |                      |                          |                            |   |                                      |  |
| Adults 10th Floor Ward A CA11-006 | T1 (Adult's Hospital) | N/A                    | 16.3   | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        | Minimal isolated horizontal branch.                                 | No hot water services in this riser. |  |
|                                   |                       |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |                                      |  |
|                                   |                       |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |   |                                      |  |
| <b>Recommendations:</b>           |                       |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. |                          |                            |                      |                          |                            |   |                                      |  |
| Adults 9th Floor Ward A CA9-006   | T1 (Adult's Hospital) | N/A                    | 16.8   | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        | Minimal isolated horizontal branch.                                 | No hot water services in this riser  |  |
|                                   |                       |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |                                      |  |
|                                   |                       |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |   |                                      |  |
| <b>Recommendations:</b>           |                       |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. |                          |                            |                      |                          |                            |   |                                      |  |
| Adults 8th Floor Ward A CA8-006   | T1 (Adult's Hospital) | N/A                    | 16.5   | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        | Minimal isolated horizontal branch.                                 | No hot water services in this riser  |  |
|                                   |                       |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |                                      |  |
|                                   |                       |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |   |                                      |  |
| <b>Recommendations:</b>           |                       |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. |                          |                            |                      |                          |                            |   |                                      |  |
| Adults 7th Floor Ward A CA7-006   | T1 (Adult's Hospital) | N/A                    | 17.8   | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        | Minimal isolated horizontal branch.                                 | No hot water services in this riser. |  |
|                                   |                       |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |                                      |  |
|                                   |                       |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |   |                                      |  |
| <b>Recommendations:</b>           |                       |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. |                          |                            |                      |                          |                            |   |                                      |  |

### WATER SYSTEM RISK ASSESSMENT (Draft)

| Location / Door Disc No..           | Riser No.              | Plantroom / Calorifier | Large Cold Temp (°C)   | Large Hot Flow Temp (°C) | Large Hot Return Temp (°C) | Small Cold Temp (°C) | Small Hot Flow Temp (°C) | Small Hot Return Temp (°C) | Deadlegs Present  | Additional Info  |
|-------------------------------------|------------------------|------------------------|--|--------------------------|----------------------------|----------------------|--------------------------|----------------------------|---|--|
| Adults 6th Floor Ward A CA6-006     | T1 (Adult's Hospital)  | N/A                    | 17.3   | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        | Minimal isolated horizontal branch.   | No hot water services in this riser.   |
|                                     |                        |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |  |
|                                     |                        |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |   |  |
| <b>Recommendations:</b>             |                        |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control.   |                          |                            |                      |                          |                            |   |  |
| Adults 5th Floor Ward A CA5-006     | T1 (Adult's Hospital)  | N/A                    | 17.1   | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        | None visible  | No hot water services in this riser.   |
|                                     |                        |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |  |
|                                     |                        |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |   |  |
| <b>Recommendations:</b>             |                        |                        |  |                          |                            |                      |                          |                            |   |  |
| Adults 4th Floor Ward A CA4-006     | T1 (Adult's Hospital)  | N/A                    | 19.0   | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        | 2 x Minimal isolated horizontal branches on cold line.<br>2 x Minimal isolated horizontal branches on hot flow & return lines.  | No hot water services in this riser.   |
|                                     |                        |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |  |
|                                     |                        |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |   |  |
| <b>Recommendations:</b>             |                        |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control.   |                          |                            |                      |                          |                            |   |  |
| Adults 11th Floor Ward A GENW21-068 | T12 (Adult's Hospital) | PR32 01/02/03          | 17.5   | 63.0                     | 59.0                       | N/A                  | 62.8                     | 58.3                       | Minimal isolated horizontal branch and larger capped vertical branch on cold line.<br>Large vertical lines to Flamco Flevent automatic air vents on top of hot flow and hot return lines - confirm suitability for potable use. | 25.1°C recorded on vertical cold cap, pre-isolation.<br>Kemper regulation valves with fitted gauges on hot return. |
|                                     |                        |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |  |
|                                     |                        |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | 60.0/58.0                  |   |  |
| <b>Recommendations:</b>             |                        |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply) |                          |                            |                      |                          |                            |   |  |
|                                     |                        |                        | There are lines to air vents (Approx. 500mm) at top of hot flow and return risers – ensure these are WRAS approved for potable use and operating correctly and not creating a column of stagnant water.  |                          |                            |                      |                          |                            |   |  |
| Adults 10th Floor Ward A GENW17-068 | T12 (Adult's Hospital) | PR32 01/02/03          | 16.7   | 63.4                     | 58.5                       | N/A                  | 62.9                     | 56.4/59.2                  | Minimal isolated horizontal branch on cold line.<br>Minimal isolated horizontal branch on hot flow & return lines.  | Kemper regulation valves with fitted gauges on hot return.   |
|                                     |                        |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |  |
|                                     |                        |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | 55.0/60.0                  |   |  |
| <b>Recommendations:</b>             |                        |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply) |                          |                            |                      |                          |                            |   |  |

### WATER SYSTEM RISK ASSESSMENT (Draft)

| Location / Door Disc No..                           | Riser No.                    | Plantroom / Calorifier | Large Cold Temp (°C)   | Large Hot Flow Temp (°C) | Large Hot Return Temp (°C) | Small Cold Temp (°C) | Small Hot Flow Temp (°C) | Small Hot Return Temp (°C) | Deadlegs Present   | Additional Info  |
|---|------------------------------|------------------------|--|--------------------------|----------------------------|----------------------|--------------------------|----------------------------|--|--|
| Adults<br>9th Floor<br>Ward A<br>Next to GENW13-068 | T12<br>(Adult's<br>Hospital) | PR32<br>01/02/03       | 16.8   | 63.0                     | 59.3                       | N/A                  | 61.5/62.0                | 57.5/57.5                  | Minimal isolated horizontal branch on cold line.<br>Minimal isolated horizontal branch on hot flow & return lines. | Kemper regulation valves with fitted gauges on hot return.<br>Evidence of leakage under hot flow insulation. |
|   |                              |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |
|   |                              |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | 55.0/55.0                  |  |  |
| <b>Recommendations:</b>                             |                              |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply) |                          |                            |                      |                          |                            |  |  |
|   |                              |                        | Evidence of leak damage under hot flow insulation - further investigation required to establish if all pipework, fittings and connections are water tight.   |                          |                            |                      |                          |                            |  |  |
|   |                              |                        | Inspect return temperature gauges for accuracy - these should be recalibrated or replaced if required.   |                          |                            |                      |                          |                            |  |  |
| Adults<br>8th Floor<br>Ward A<br>GENW9-068          | T12<br>(Adult's<br>Hospital) | PR32<br>01/02/03       | 16.6   | 63.4                     | 60.5                       | N/A                  | 62.5/62.3                | 58.7/58.9                  | Minimal isolated horizontal branch on cold line.<br>Minimal isolated horizontal branch on hot flow & return lines. | Kemper regulation valves with fitted gauges on hot return.   |
|   |                              |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |
|   |                              |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | 59.0/60.0                  |  |  |
| <b>Recommendations:</b>                             |                              |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply) |                          |                            |                      |                          |                            |  |  |
| Adults<br>7th Floor<br>Ward A<br>GENW5-068          | T12<br>(Adult's<br>Hospital) | PR32<br>01/02/03       | 17.2   | 62.6                     | 59.5                       | N/A                  | 62.1/62.4                | 58.9/59.0                  | Minimal isolated horizontal branch on cold line.   |  |
|   |                              |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |
|   |                              |                        | N/A  | N/A                      | 60.0                       | N/A                  | N/A                      | 60.0/60.0                  |  |  |
| <b>Recommendations:</b>                             |                              |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply) |                          |                            |                      |                          |                            |  |  |
| Adults<br>6th Floor<br>Ward A<br>GENW1-068          | T12<br>(Adult's<br>Hospital) | PR32<br>01/02/03       | 19.6   | 62.7                     | 61.4                       | N/A                  | N/A                      | 59.7                       | None Visible   | Different key required for this riser (PG1 rather than standard PG2 plantroom key).                          |
|   |                              |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |
|   |                              |                        | N/A  | N/A                      | 60.0                       | N/A                  | N/A                      | 60.0                       |  |  |
| <b>Recommendations:</b>                             |                              |                        |  |                          |                            |                      |                          |                            |  |  |
| Adults<br>5th Floor<br>Ward A<br>GENWA-068          | T12<br>(Adult's<br>Hospital) | PR32<br>01/02/03       | 17.3   | 63.4                     | 62.2                       | N/A                  | 62.4/62.2                | 59.0/59.3                  | None visible   | Kemper regulation valve with fitted gauge on hot return.<br>Evidence of historic leak damage on insulation.  |
|   |                              |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |
|   |                              |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | 60.0/60.0                  |  |  |
| <b>Recommendations:</b>                             |                              |                        |  |                          |                            |                      |                          |                            |  |  |
| Adults  | T12                          |                        | 19.0   | 62.7                     | 60.2                       | 19.2                 | 62.2/62.4                | 59.6/59.8                  | 2 x Minimal isolated horizontal branches on cold line.   |  |

### WATER SYSTEM RISK ASSESSMENT (Draft)

| Location / Door Disc No..                    | Riser No.                 | Plantroom / Calorifier | Large Cold Temp (°C)  | Large Hot Flow Temp (°C) | Large Hot Return Temp (°C) | Small Cold Temp (°C) | Small Hot Flow Temp (°C) | Small Hot Return Temp (°C) | Deadlegs Present  | Additional Info   |  |
|--|---------------------------|------------------------|---|--------------------------|----------------------------|----------------------|--------------------------|----------------------------|---|---|--|
| 4th Floor Ward A<br>RENW-278                 | T12<br>(Adult's Hospital) | PR32<br>01/02/03       | Gauge   | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      | 2 x Minimal isolated horizontal branches on cold line.<br>2 x Minimal isolated horizontal branches on hot flow & return lines.  | Kemper regulation valves with fitted gauges on hot return.<br>Evidence of existing leak and damage to insulation on hot flow. |  |
|  |                           |                        | N/A   | N/A                      | N/A                        | N/A                  | N/A                      | 60/60                      |   |   |  |
| <b>Recommendations:</b>                      |                           |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply)<br>Investigate steady leak on hot flow pipework, replacing any/all pipework and fittings required in area. Fully replace all damaged pipework insulation in riser.   |                          |                            |                      |                          |                            |   |   |  |
| Adults<br>11th Floor<br>Ward B<br>GENW24-068 | T4 (Adult's Hospital)     | PR31<br>04/05/06       | 16.6  | 63.2                     | 59.2                       | N/A                  | 63.0                     | 59.0                       | Minimal isolated horizontal branch and isolated capped vertical branch on cold line.<br>Large vertical lines to Flamco Flevent automatic air vents on top of hot flow and hot return lines - confirm suitability for potable use. | Kemper regulation valves with fitted gauges on hot return.  |  |
|  |                           |                        | Gauge   | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |   |  |
|  |                           |                        | N/A   | N/A                      | N/A                        | N/A                  | N/A                      | 60.0                       |   |   |  |
| <b>Recommendations:</b>                      |                           |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply)<br>There are lines to air vents (Approx. 500mm) at top of hot flow and return risers – ensure these are WRAS approved for potable use and operating correctly, not creating a column of stagnant water.  |                          |                            |                      |                          |                            |   |   |  |
| Adults<br>10th Floor<br>Ward B<br>GENW20-068 | T4 (Adult's Hospital)     | PR31<br>04/05/06       | 16.4  | 63.0                     | 59.6                       | N/A                  | 62.3                     | 58.4                       | Minimal isolated horizontal branch on cold line.<br>Minimal isolated horizontal branch on hot flow line.  | Kemper regulation valve with fitted gauge on hot return.<br>Evidence of historic leak damage on insulation.                   |  |
|  |                           |                        | Gauge   | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |   |  |
|  |                           |                        | N/A   | N/A                      | N/A                        | N/A                  | N/A                      | 58.0                       |   |   |  |
| <b>Recommendations:</b>                      |                           |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply)  |                          |                            |                      |                          |                            |   |   |  |
| Adults<br>9th Floor<br>Ward B<br>GENW16-068  | T4 (Adult's Hospital)     | PR31<br>04/05/06       | 16.4  | 62.9                     | 59.3                       | N/A                  | 62.0                     | 56.8                       | Minimal isolated horizontal branch on cold line.<br>Minimal isolated horizontal branch on hot return line.  | Kemper regulation valve with fitted gauge on hot return.<br>Evidence of historic leak damage on insulation.                   |  |
|  |                           |                        | Gauge   | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |   |  |
|  |                           |                        | N/A   | N/A                      | N/A                        | N/A                  | N/A                      | 56.0                       |   |   |  |
| <b>Recommendations:</b>                      |                           |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply)<br>Approximately 0.5 metre of insulation on hot flow missing due to leak damage - confirm all pipework, fittings and connections are water tight and replace insulation.<br>Visible leak from isolated deadleg branch on hot flow with corrosion visible on lever valve - further investigation required to establish if all pipework, fittings and connections are water tight. |                          |                            |                      |                          |                            |   |   |  |

### WATER SYSTEM RISK ASSESSMENT (Draft)

| Location / Door Disc No..  | Riser No.             | Plantroom / Calorifier | Large Cold Temp (°C)  | Large Hot Flow Temp (°C) | Large Hot Return Temp (°C) | Small Cold Temp (°C) | Small Hot Flow Temp (°C) | Small Hot Return Temp (°C) | Deadlegs Present  | Additional Info  |
|--|-----------------------|------------------------|---|--------------------------|----------------------------|----------------------|--------------------------|----------------------------|---|--|
| Adults<br>8th Floor<br>Ward B<br>GENW12-068  | T4 (Adult's Hospital) | PR31<br>04/05/06       | 16.4  | 63.0                     | 61.4                       | N/A                  | 62.0                     | 60.3                       | None visible  | Kemper regulation valve with fitted gauge on hot return. Visible leak onto hot return branch from 9th Floor Ward B GENW16-068 riser above. |
|  |                       |                        | Gauge   | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |  |
|  |                       |                        | N/A   | N/A                      | N/A                        | N/A                  | N/A                      | 61.0                       |   |  |
| <b>Recommendations:</b>  |                       |                        | See 9th Floor Ward B GENW16-068 riser above for linked recommendation (re leaking pipework) |                          |                            |                      |                          |                            |   |  |
| Adults<br>7th Floor<br>Ward B<br>GENW8-068   | T4 (Adult's Hospital) | PR31<br>04/05/06       | 16.4  | 61.9                     | 59.3                       | N/A                  | N/A                      | N/A                        | None visible  |  |
|  |                       |                        | Gauge   | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |  |
|  |                       |                        | N/A   | N/A                      | 60.0                       | N/A                  | N/A                      | N/A                        |   |  |
| <b>Recommendations:</b>  |                       |                        |   |                          |                            |                      |                          |                            |   |  |
| Adults<br>6th Floor<br>Ward B<br>GENW4-068   | T4 (Adult's Hospital) | PR31<br>04/05/06       | 17.2  | 62.8                     | 61.9                       | N/A                  | 62.8                     | 60.2                       | None visible  | Kemper regulation valve with fitted gauge on hot return. Evidence of historic leak damage on insulation.                                   |
|  |                       |                        | Gauge   | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |  |
|  |                       |                        | N/A   | N/A                      | N/A                        | N/A                  | N/A                      | 59.0                       |   |  |
| <b>Recommendations:</b>  |                       |                        |   |                          |                            |                      |                          |                            |   |  |
| Adults<br>5th Floor<br>Ward B<br>GENWD-068   | T4 (Adult's Hospital) | PR31<br>04/05/06       | 17.3  | 63.2                     | 62.0                       | N/A                  | 62.6                     | 57.8                       | None visible  | Kemper regulation valve with fitted gauge on hot return. Evidence of historic leak damage on insulation.                                   |
|  |                       |                        | Gauge   | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |  |
|  |                       |                        | N/A   | N/A                      | N/A                        | N/A                  | N/A                      | 58.0                       |   |  |
| <b>Recommendations:</b>  |                       |                        |   |                          |                            |                      |                          |                            |   |  |
| Adults<br>4th Floor<br>Ward B<br>HOW-207   | T4 (Adult's Hospital) | PR31<br>04/05/06       |   |                          |                            |                      |                          |                            |   | No Access due to Infection Control.  |
|  |                       |                        | Gauge   | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |  |
|  |                       |                        | N/A   | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |   |  |
| <b>Recommendations:</b>  |                       |                        |   |                          |                            |                      |                          |                            |   |  |
| Adults<br>11th Floor<br>Ward C<br>GENW23-068   | T5 (Adult's Hospital) | PR31<br>07/08/09       | 17.1  | 63.7                     | 59.0                       | N/A                  | 62.8                     | 58.9                       | Minimal isolated horizontal branch and isolated capped vertical branches on cold line.<br>Minimal isolated horizontal branch on hot flow & return lines.<br>Large vertical lines to Flamco Flevent automatic air vents on top of hot flow and hot return lines - confirm suitability for potable use. | Kemper regulation valves with fitted gauges on hot return.   |
|  |                       |                        | Gauge   | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |  |
|  |                       |                        | N/A   | N/A                      | N/A                        | N/A                  | N/A                      | 60.0/58.0                  |   |  |
| There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply) |                       |                        |   |                          |                            |                      |                          |                            |   |  |



## WATER SYSTEM RISK ASSESSMENT (Draft)

| Location / Door Disc No..                    | Riser No.             | Plantroom / Calorifier | Large Cold Temp (°C)   | Large Hot Flow Temp (°C) | Large Hot Return Temp (°C) | Small Cold Temp (°C) | Small Hot Flow Temp (°C) | Small Hot Return Temp (°C) | Deadlegs Present   | Additional Info   |  |
|--|-----------------------|------------------------|--|--------------------------|----------------------------|----------------------|--------------------------|----------------------------|--|---|--|
| <b>Recommendations:</b>                      |                       |                        | There are lines to air vents (Approx. 500mm) at top of hot flow and return risers – ensure these are WRAS approved for potable use and operating correctly and not creating a column of stagnant water.  |                          |                            |                      |                          |                            |  |   |  |
|  |                       |                        | Investigate potential leak on hot return line on isolated branch - evidence of leak damage.  |                          |                            |                      |                          |                            |  |   |  |
| Adults<br>10th Floor<br>Ward C<br>GENW19-068 | T5 (Adult's Hospital) | PR31<br>07/08/09       | 16.4   | 62.9                     | 59.3                       | N/A                  | 62.9/62.5                | 59.4/59.7                  | Minimal isolated horizontal branch on cold line.<br>Minimal isolated horizontal branch on hot flow & return lines. | Kemper regulation valves with fitted gauges on hot return.<br>Evidence of historic leak damage on insulation. |  |
|  |                       |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |   |  |
|  |                       |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | 60.0/60.0                  |  |   |  |
| <b>Recommendations:</b>                      |                       |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply)   |                          |                            |                      |                          |                            |  |   |  |
| Adults<br>9th Floor<br>Ward C<br>GENW15-068  | T5 (Adult's Hospital) | PR31<br>07/08/09       | 16.4   | 62.9                     | 59.3                       | N/A                  | 61.7/61.5                | 58.7/59.0                  | Minimal isolated horizontal branch on cold line.<br>Minimal isolated horizontal branch on hot flow & return lines. | Kemper regulation valves with fitted gauges on hot return.<br>Evidence of historic leak damage on insulation. |  |
|  |                       |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |   |  |
|  |                       |                        | N/A  | N/A                      | 60.0                       | N/A                  | N/A                      | 60.0/58.0                  |  |   |  |
| <b>Recommendations:</b>                      |                       |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply)<br>Evidence of historic leak damage on insulation and water pooling under hot flow branch insulation, with corrosion visible on lever valve - further investigation required to establish if all pipework, fittings and connections are water tight.  |                          |                            |                      |                          |                            |  |   |  |
| Adults<br>8th Floor<br>Ward C<br>GENW11-068  | T5 (Adult's Hospital) | PR31<br>07/08/09       | 16.5   | 63.2                     | 59.5                       | N/A                  | 62.4/61.9                | 60.3/58.3                  | Minimal isolated horizontal branch on cold line.<br>Minimal isolated horizontal branch on hot flow & return lines. | Kemper regulation valves with fitted gauges on hot return.<br>Evidence of historic leak damage on insulation. |  |
|  |                       |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |   |  |
|  |                       |                        | N/A  | N/A                      | 58.9                       | N/A                  | N/A                      | 60.0/58.0                  |  |   |  |
| <b>Recommendations:</b>                      |                       |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply)<br>Evidence of historic leak damage on insulation and visible leak from both flow and return branch fittings, with corrosion visible on fittings and valves - further investigation required to establish if all pipework, fittings and connections are water tight, replacing where required and repairing/replacing insulation where necessary. |                          |                            |                      |                          |                            |  |   |  |
| Adults<br>7th Floor<br>Ward C<br>GENW7-068   | T5 (Adult's Hospital) | PR31<br>07/08/09       | 19.3   | 62.5                     | 59.8                       | N/A                  | 62.1                     | 59.6                       | Minimal isolated horizontal branch on pipework.  | Evidence of damage to insulation and corrosion etc. from leak on 11th Floor.                                  |  |
|  |                       |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |   |  |
|  |                       |                        | N/A  | N/A                      | 62.0                       | N/A                  | N/A                      | 65/60                      |  |   |  |
| <b>Recommendations:</b>                      |                       |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply)<br>Evidence of historic leak damage on insulation - further investigation required to establish if all pipework, fittings and connections are water tight.<br>Hot flow and return pipework appears labelled incorrectly (wrong way round) - labelling should be corrected.  |                          |                            |                      |                          |                            |  |   |  |

### WATER SYSTEM RISK ASSESSMENT (Draft)

| Location / Door Disc No..                    | Riser No.              | Plantroom / Calorifier | Large Cold Temp (°C)   | Large Hot Flow Temp (°C) | Large Hot Return Temp (°C) | Small Cold Temp (°C) | Small Hot Flow Temp (°C) | Small Hot Return Temp (°C) | Deadlegs Present  | Additional Info   |  |
|--|------------------------|------------------------|--|--------------------------|----------------------------|----------------------|--------------------------|----------------------------|---|---|--|
| Adults<br>6th Floor<br>Ward C<br>GENW3-068   | T5 (Adult's Hospital)  | PR31<br>07/08/09       | 17.4   | 63.8                     | 61.6                       | N/A                  | 62.8/61.9                | 60.4/60.2                  | Minimal isolated horizontal branch on cold line.<br>Minimal isolated horizontal branch on hot flow & return lines.  | Kemper regulation valves with fitted gauges on hot return.<br>Evidence of historic leak damage on insulation.   |  |
|  |                        |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |   |  |
|  |                        |                        | N/A  | N/A                      | 62.0                       | N/A                  | N/A                      | 61.0/61.0                  |   |   |  |
| <b>Recommendations:</b>                      |                        |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply) |                          |                            |                      |                          |                            |   |   |  |
|  |                        |                        | Evidence of historic leak damage on insulation - further investigation required to establish if all pipework, fittings and connections are water tight.  |                          |                            |                      |                          |                            |   |   |  |
| Adults<br>5th Floor<br>Ward C<br>GENWC-068   | T5 (Adult's Hospital)  | PR31<br>07/08/09       | 17.2   | 62.9                     | 59.7                       | N/A                  | 62.0/61.7                | 58.5/58.3                  | Minimal isolated horizontal branch on cold line.<br>Minimal isolated horizontal branch on hot flow & return lines.  | Kemper regulation valves with fitted gauges on hot return.<br>Evidence of historic leak damage on insulation.   |  |
|  |                        |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |   |  |
|  |                        |                        | N/A  | N/A                      | 63.0                       | N/A                  | N/A                      | 65.0/65.0                  |   |   |  |
| <b>Recommendations:</b>                      |                        |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply) |                          |                            |                      |                          |                            |   |   |  |
|  |                        |                        | Evidence of historic leak damage on insulation and visible leak from both flow and return branch fittings, with corrosion visible on fittings and valves - further investigation required to establish if all pipework, fittings and connections are water tight, replacing where required and repairing/replacing insulation where necessary.   |                          |                            |                      |                          |                            |   |   |  |
|  |                        |                        | Inspect return temperature gauges for accuracy - these should be recalibrated or replaced if required.   |                          |                            |                      |                          |                            |   |   |  |
| Adults<br>4th Floor<br>Ward C<br>RENW-212    | T5 (Adult's Hospital)  | PR31<br>07/08/09       | 16.9   | 62.4                     | 59.0                       | N/A                  | 62.4/62.2                | 58.5/58.7                  | 2 x Minimal isolated horizontal branches on cold line.<br>2 x Minimal isolated horizontal branches on hot flow & return lines.  | Kemper regulation valves with fitted gauges on hot return.<br>Evidence of historic leak damage on hot flow<br>Hot return not labelled on main branch. |  |
|  |                        |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |   |  |
|  |                        |                        | N/A  | N/A                      | 58.0                       | N/A                  | N/A                      | 58.0/60                    |   |   |  |
| <b>Recommendations:</b>                      |                        |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply) |                          |                            |                      |                          |                            |   |   |  |
|  |                        |                        | Evidence of historic leak damage on insulation - further investigation required to establish if all pipework, fittings and connections are water tight.  |                          |                            |                      |                          |                            |   |   |  |
|  |                        |                        | Label all pipework within riser correctly for identification purposes.   |                          |                            |                      |                          |                            |   |   |  |
| Adults<br>11th Floor<br>Ward D<br>GENW22-068 | T13 (Adult's Hospital) | PR33<br>01/02/03       | 17.1   | 62.9                     | 57.5                       | N/A                  | N/A                      | N/A                        | Minimal isolated horizontal branch and minimal isolated capped vertical branch on cold line.<br>Large vertical lines to Flamco Flevent automatic air vents on top of hot flow and hot return lines - confirm suitability for potable use. | Kemper regulation valve with fitted gauge on hot return.  |  |
|  |                        |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |   |   |  |
|  |                        |                        | N/A  | N/A                      | 56.0                       | N/A                  | N/A                      | N/A                        |   |   |  |
| <b>Recommendations:</b>                      |                        |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply) |                          |                            |                      |                          |                            |   |   |  |
|  |                        |                        | There are lines to air vents (Approx. 500mm) at top of hot flow and return risers - ensure these are WRAS approved for potable use and operating correctly, not holding stagnant water.  |                          |                            |                      |                          |                            |   |   |  |

### WATER SYSTEM RISK ASSESSMENT (Draft)

| Location / Door Disc No..                    | Riser No.                 | Plantroom / Calorifier | Large Cold Temp (°C)  | Large Hot Flow Temp (°C) | Large Hot Return Temp (°C) | Small Cold Temp (°C) | Small Hot Flow Temp (°C) | Small Hot Return Temp (°C) | Deadlegs Present   | Additional Info  |  |
|--|---------------------------|------------------------|---|--------------------------|----------------------------|----------------------|--------------------------|----------------------------|--|--|--|
| Adults<br>10th Floor<br>Ward D<br>GENW18-068 | T13<br>(Adult's Hospital) | PR33<br>01/02/03       | 16.5  | 63.4                     | 61.8                       | N/A                  | 62.9                     | 61.6                       | Minimal isolated horizontal branch on cold line.<br>Minimal isolated horizontal branch on hot flow line.           | Kemper regulation valve with fitted gauge on hot return.<br>Approx 0.5 metre missing insulation on hot flow with evidence of historic leak damage. |  |
|  |                           |                        | Gauge   | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |  |
|  |                           |                        | N/A   | N/A                      | N/A                        | N/A                  | N/A                      | 62.0                       |  |  |  |
| <b>Recommendations:</b>                      |                           |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply)  |                          |                            |                      |                          |                            |  |  |  |
| Adults<br>9th Floor<br>Ward D<br>GENW14-068  | T13<br>(Adult's Hospital) | PR33<br>01/02/03       | 19.0  | 62.5                     | 61.3                       | 19.4                 | 62.0                     | 60.4                       | Minimal isolated horizontal branch on cold line.<br>Minimal isolated horizontal branch on hot flow & return lines. | Different key required for this riser (PG1 rather than standard PG2 plantroom key).  |  |
|  |                           |                        | Gauge   | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |  |
|  |                           |                        | N/A   | N/A                      | N/A                        | N/A                  | N/A                      | 60.0                       |  |  |  |
| <b>Recommendations:</b>                      |                           |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply)<br>Evidence of historic leak damage on insulation - further investigation required to establish if all pipework, fittings and connections are water tight. |                          |                            |                      |                          |                            |  |  |  |
| Adults<br>8th Floor<br>Ward D<br>GENW10-068  | T13<br>(Adult's Hospital) | PR33<br>01/02/03       | 16.7  | 63.1                     | 62.8                       | N/A                  | 62.2                     | 61.6                       | Minimal isolated horizontal branch on cold line.<br>Minimal isolated horizontal branch on hot flow & return lines. | Kemper regulation valve with fitted gauge on hot return.   |  |
|  |                           |                        | Gauge   | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |  |
|  |                           |                        | N/A   | N/A                      | N/A                        | N/A                  | N/A                      | 62.0                       |  |  |  |
| <b>Recommendations:</b>                      |                           |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply)  |                          |                            |                      |                          |                            |  |  |  |
| Adults<br>7th Floor<br>Ward D<br>GENW6-068   | T13<br>(Adult's Hospital) | PR33<br>01/02/03       | 17.4  | 63.0                     | 59.0                       | N/A                  | N/A                      | 58.5                       | Minimal isolated horizontal branch on cold line.<br>Minimal isolated horizontal branch on hot flow & return lines. | Kemper regulation valve with fitted gauge on hot return - damaged with missing gauge cover.<br>Evidence of historic leak damage.                   |  |
|  |                           |                        | Gauge   | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |  |
|  |                           |                        | N/A   | N/A                      | N/A                        | N/A                  | N/A                      | 40.0                       |  |  |  |
| <b>Recommendations:</b>                      |                           |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply)<br>Gauge on hot return damaged and missing screen - inspect return temperature gauges for accuracy - these should be recalibrated or replaced if required. |                          |                            |                      |                          |                            |  |  |  |
| Adults<br>6th Floor<br>Ward D<br>GENW2-068   | T13<br>(Adult's Hospital) | PR33<br>01/02/03       | 17.2  | 63.2                     | 59.5                       | N/A                  | N/A                      | 59.7                       | Minimal isolated horizontal branch on cold line.<br>Minimal isolated horizontal branch on hot flow & return lines. | Kemper regulation valve with fitted gauge on hot return.<br>Evidence of historic leak damage.  |  |
|  |                           |                        | Gauge   | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |  |
|  |                           |                        | N/A   | N/A                      | N/A                        | N/A                  | N/A                      | 60.0                       |  |  |  |
| <b>Recommendations:</b>                      |                           |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply)  |                          |                            |                      |                          |                            |  |  |  |

### WATER SYSTEM RISK ASSESSMENT (Draft)

| Location / Door Disc No..                    | Riser No.                    | Plantroom / Calorifier | Large Cold Temp (°C)  | Large Hot Flow Temp (°C) | Large Hot Return Temp (°C) | Small Cold Temp (°C) | Small Hot Flow Temp (°C) | Small Hot Return Temp (°C) | Deadlegs Present   | Additional Info   |
|--|------------------------------|------------------------|---|--------------------------|----------------------------|----------------------|--------------------------|----------------------------|--|---|
| Adults<br>5th Floor<br>Ward D<br>GENWB-068   | T13<br>(Adult's<br>Hospital) | PR33<br>01/02/03       | 17.2  | 63.2                     | 59.5                       | N/A                  | N/A                      | 57.3                       | None visible   | Kemper regulation valve with fitted gauge on hot return.<br>Evidence of historic leak damage.   |
|  |                              |                        | Gauge   | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |   |
|  |                              |                        | N/A   | N/A                      | N/A                        | N/A                  | N/A                      | 57.0                       |  |   |
| <b>Recommendations:</b>                      |                              |                        |   |                          |                            |                      |                          |                            |  |   |
| Adults<br>4th Floor<br>Ward D<br>RENW-270    | T13<br>(Adult's<br>Hospital) | PR33<br>01/02/03       | 19.3  | 62.2                     | 60.8                       | 19.3                 | 62.0                     | 58.7                       | Minimal isolated horizontal branch on cold line.<br>Minimal isolated horizontal branch on hot flow & return lines. | Kemper regulation valve with fitted gauge on hot return.<br>Evidence of historic leak damage.<br>Boosted cold not labelled.<br>Hot flow and return directional arrows incorrect and require reversal. |
|  |                              |                        | Gauge   | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |   |
|  |                              |                        | N/A   | N/A                      | N/A                        | N/A                  | N/A                      | 55.0                       |  |   |
| <b>Recommendations:</b>                      |                              |                        | <p>There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply)</p> <p>Inspect return temperature gauges for accuracy – these should be recalibrated or replaced if required.</p> <p>Label all pipework within riser correctly for identification purposes.</p> |                          |                            |                      |                          |                            |  |   |
| Adults<br>11th Floor<br>Ward 11D<br>CA11-014 | T2 (Adult's<br>Hospital)     | N/A                    | <b>NO Suitable Access</b>   | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        | Minimal isolated branches - 1 x horizontal and 1 x capped vertical.  | No hot water services in this riser.  |
|  |                              |                        | Gauge   | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |   |
|  |                              |                        | N/A   | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |  |   |
| <b>Recommendations:</b>                      |                              |                        | <p>There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply)</p> <p>There is no access to the pipework in this riser due to ducting in front of it at door into riser cupboard. Access to pipework should be improved if possible.</p>                       |                          |                            |                      |                          |                            |  |   |
| Adults<br>10th Floor<br>Ward D<br>CA10-014   | T2 (Adult's<br>Hospital)     | N/A                    | 17.0  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        | None visible   | No hot water services in this riser<br>Limited access to pipework in riser due to ducting - surface temperature possible only.  |
|  |                              |                        | Gauge   | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |   |
|  |                              |                        | N/A   | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |  |   |
| <b>Recommendations:</b>                      |                              |                        | There is limited access to the pipework in this riser due to ducting in front of it at door into riser cupboard. Access to pipework should be improved if possible.   |                          |                            |                      |                          |                            |  |   |
| Adults<br>9th Floor<br>Ward D<br>CA9-014     | T2 (Adult's<br>Hospital)     | N/A                    | 16.5  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        | None visible   | No hot water services in this riser<br>Limited access to pipework in riser due to ducting - surface temperature possible only.  |
|  |                              |                        | Gauge   | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |   |
|  |                              |                        | N/A   | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |  |   |
| <b>Recommendations:</b>                      |                              |                        | There is limited access to the pipework in this riser due to ducting in front of it at door into riser cupboard. Access to pipework should be improved if possible.   |                          |                            |                      |                          |                            |  |   |
| Adults                                       |                              |                        | 16.7  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |  | No hot water services in this riser   |

### WATER SYSTEM RISK ASSESSMENT (Draft)

| Location / Door Disc No..       | Riser No.             | Plantroom / Calorifier | Large Cold Temp (°C)   | Large Hot Flow Temp (°C) | Large Hot Return Temp (°C) | Small Cold Temp (°C) | Small Hot Flow Temp (°C) | Small Hot Return Temp (°C) | Deadlegs Present                                 | Additional Info  |  |
|---------------------------------|-----------------------|------------------------|--|--------------------------|----------------------------|----------------------|--------------------------|----------------------------|--|--|--|
| 8th Floor Ward D CA8-014        | T2 (Adult's Hospital) | N/A                    | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      | None visible                                     | No hot water services in this riser<br>Limited access to pipework in riser due to ducting - surface temperature possible only. |  |
|                                 |                       |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |  |  |  |
| <b>Recommendations:</b>         |                       |                        | There is limited access to the pipework in this riser due to ducting in front of it at door into riser cupboard. Access to pipework should be improved if possible.  |                          |                            |                      |                          |                            |  |  |  |
| Adults 7th Floor Ward D CA7-014 | T2 (Adult's Hospital) | N/A                    | 17.3   | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        | Minimal isolated horizontal branch on cold line. | No hot water services in this riser<br>Limited access to pipework in riser due to ducting - surface temperature possible only. |  |
|                                 |                       |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |  |
|                                 |                       |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |  |  |  |
| <b>Recommendations:</b>         |                       |                        | There is limited access to the pipework in this riser due to ducting in front of it at door into riser cupboard. Access to pipework should be improved if possible.  |                          |                            |                      |                          |                            |  |  |  |
| <b>Recommendations:</b>         |                       |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply) |                          |                            |                      |                          |                            |  |  |  |
| Adults 6th Floor Ward D CA6-014 | T2 (Adult's Hospital) | N/A                    | 17.2   | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        | Minimal isolated horizontal branch on cold line. | No hot water services in this riser<br>Limited access to pipework in riser due to ducting - surface temperature possible only. |  |
|                                 |                       |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |  |
|                                 |                       |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |  |  |  |
| <b>Recommendations:</b>         |                       |                        | There is limited access to the pipework in this riser due to ducting in front of it at door into riser cupboard. Access to pipework should be improved if possible.  |                          |                            |                      |                          |                            |  |  |  |
| <b>Recommendations:</b>         |                       |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply) |                          |                            |                      |                          |                            |  |  |  |
| Adults 5th Floor Ward D CA5-014 | T2 (Adult's Hospital) | N/A                    | 17.4   | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        | None visible                                     | No hot water services in this riser  |  |
|                                 |                       |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |  |
|                                 |                       |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |  |  |  |
| <b>Recommendations:</b>         |                       |                        | There is limited access to the pipework in this riser due to ducting in front of it at door into riser cupboard. Access to pipework should be improved if possible.  |                          |                            |                      |                          |                            |  |  |  |
| Adults 4th Floor Ward D CA4-014 | T2 (Adult's Hospital) | N/A                    | 18.9   | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        | Minimal isolated horizontal branch on cold line. | No hot water services in this riser  |  |
|                                 |                       |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |  |
|                                 |                       |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |  |  |  |
| <b>Recommendations:</b>         |                       |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply) |                          |                            |                      |                          |                            |  |  |  |

### WATER SYSTEM RISK ASSESSMENT (Draft)

| Location / Door Disc No..                 | Riser No.              | Plantroom / Calorifier | Large Cold Temp (°C)   | Large Hot Flow Temp (°C) | Large Hot Return Temp (°C) | Small Cold Temp (°C) | Small Hot Flow Temp (°C) | Small Hot Return Temp (°C) | Deadlegs Present   | Additional Info  |
|---|------------------------|------------------------|--|--------------------------|----------------------------|----------------------|--------------------------|----------------------------|--|--|
| Adults Basement CAB-037                   |                        | N/A                    | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        | None visible   | Only cold pipework rising through building   |
|   |                        |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |
|   |                        |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |  |  |
| <b>Recommendations:</b>                   |                        |                        |  |                          |                            |                      |                          |                            |  |  |
| Adults Basement CAB-038                   |                        | N/A                    | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        | None visible   | Only cold pipework rising through building, with a 15mm line coming from above which appears to supply the Estates Workshop (FMB-003 and M&S(?) Store (Locked - no access) |
|   |                        |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |
|   |                        |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |  |  |
| <b>Recommendations:</b>                   |                        |                        |  |                          |                            |                      |                          |                            |  |  |
| Adults 2nd Floor Dialysis Centre RENO-086 | T13 (Adult's Hospital) | PR22 01/02/03          | 16.7   | 60.7                     | 55.4                       | N/A                  | N/A                      | N/A                        | None visible   | No local branches or isolation to outlets.   |
|   |                        |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |
|   |                        |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |  |  |
| <b>Recommendations:</b>                   |                        |                        |  |                          |                            |                      |                          |                            |  |  |
| Adults Atrium OPD1 OPD1-059               | T13 (Adult's Hospital) | PR22 01/02/03          | 16.8   | 63.0                     | 55.0                       | N/A                  | N/A                      | N/A                        | Minimal, low level isolated branches on hot flow/return & cold.  | AHU Ducts labelled PR33?<br>Kemper regulation valve with fitted gauge on hot return.<br>Hot return borderline 55.0°C.  |
|   |                        |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |
|   |                        |                        | N/A  | N/A                      | 55.0                       | N/A                  | N/A                      | N/A                        |  |  |
| <b>Recommendations:</b>                   |                        |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply) |                          |                            |                      |                          |                            |  |  |
| Adults 1st Floor Atrium RNM-004           | M26 (Adult's Hospital) | PR22 01/02/03          | 19.4   | 61.9                     | 58.6                       | N/A                  | N/A                      | N/A                        | Minimal isolated horizontal branch on cold line.<br>Minimal isolated horizontal branch on hot flow & return lines. |  |
|   |                        |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |
|   |                        |                        | N/A  | N/A                      | 58.0                       | N/A                  | N/A                      | N/A                        |  |  |
| <b>Recommendations:</b>                   |                        |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply) |                          |                            |                      |                          |                            |  |  |
| Adults 2nd Floor Atrium END-020           | M26 (Adult's Hospital) | PR22 01/02/03          | 16.3   | 60.7                     | 59.5                       | N/A                  | N/A                      | N/A                        | Minimal isolated horizontal branch on line.  | Kemper regulation valve with fitted gauge on hot return.   |
|   |                        |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |  |
|   |                        |                        | N/A  | N/A                      | 59.0                       | N/A                  | N/A                      | N/A                        |  |  |
| <b>Recommendations:</b>                   |                        |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply) |                          |                            |                      |                          |                            |  |  |

### WATER SYSTEM RISK ASSESSMENT (Draft)

| Location / Door Disc No..                             | Riser No.               | Plantroom / Calorifier | Large Cold Temp (°C)   | Large Hot Flow Temp (°C) | Large Hot Return Temp (°C) | Small Cold Temp (°C) | Small Hot Flow Temp (°C) | Small Hot Return Temp (°C) | Deadlegs Present   | Additional Info   |  |
|---|-------------------------|------------------------|--|--------------------------|----------------------------|----------------------|--------------------------|----------------------------|--|---|--|
| Childrens 1st Floor Theatre Corridor THE-027          | M30 (Adult's Hospital)  | PR22 01/02/03          | 19.5   | 61.9                     | 57.8                       | N/A                  | N/A                      | N/A                        | None visible   | Temp Gauge Missing<br>Bib Tap connected to MDPE in riser - runs to open end outside Riser CC1-021. Confirm usage, removing completely if no longer required - this pipework should not be used to connect to any domestic pipework in the future. |  |
|   |                         |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |   |  |
|   |                         |                        | N/A  | N/A                      | Missing                    | N/A                  | N/A                      | N/A                        |  |   |  |
| <b>Recommendations:</b>                               |                         |                        | Hot return temperature gauge missing – this should be replaced.  |                          |                            |                      |                          |                            |  |   |  |
|   |                         |                        | Pipework unlabelled - All pipework should be correctly labelled for identification purposes.   |                          |                            |                      |                          |                            |  |   |  |
| Childrens Ground Floor X-Ray/Imaging Corridor RCG-008 | M30 (Adult's Hospital)  | PR22 01/02/03          | 18.9   | 62.3                     | 59.0                       | N/A                  | N/A                      | N/A                        | Minimal isolated horizontal branch on cold line.   | Temp Gauge Missing  |  |
|   |                         |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |   |  |
|   |                         |                        | N/A  | N/A                      | Missing                    | N/A                  | N/A                      | N/A                        |  |   |  |
| <b>Recommendations:</b>                               |                         |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply) |                          |                            |                      |                          |                            |  |   |  |
|   |                         |                        | Hot return temperature gauge missing – this should be replaced.  |                          |                            |                      |                          |                            |  |   |  |
| Childrens 1st Floor Theatre THE-143                   | M27 (Adult's Hospital)  | PR22 01/02/03          | 19.3   | 62.9                     | 60.4                       | N/A                  | N/A                      | N/A                        | Minimal isolated horizontal branch on cold line.<br>Minimal isolated horizontal branch on hot flow & return lines. |   |  |
|   |                         |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |   |  |
|   |                         |                        | N/A  | N/A                      | 65.0                       | N/A                  | N/A                      | N/A                        |  |   |  |
| <b>Recommendations:</b>                               |                         |                        | All pipework should be correctly labelled for identification purposes.   |                          |                            |                      |                          |                            |  |   |  |
|   |                         |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply) |                          |                            |                      |                          |                            |  |   |  |
| Childrens 1st Floor Theatre THE-132                   | M38A (Adult's Hospital) | PR22 01/02/03          | 18.8   | 62.4                     | 59                         | N/A                  | N/A                      | N/A                        | Minimal isolated horizontal branch on cold line.<br>Minimal isolated horizontal branch on hot flow & return lines. | Temp Gauge Missing  |  |
|   |                         |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |  |   |  |
|   |                         |                        | N/A  | N/A                      | Missing                    | N/A                  | N/A                      | N/A                        |  |   |  |
| <b>Recommendations:</b>                               |                         |                        | There were minimal isolated/capped branches noted throughout the majority of main risers on site - it may be prudent to remove these branches if no longer required or include in site flushing regime if routine monitoring/sampling results show a consistent failure in ClO2 control levels or microbial control. (Note: Elevated cold temperature recorded on vertical capped branch on cold supply) |                          |                            |                      |                          |                            |  |   |  |
|   |                         |                        | Hot return temperature gauge missing – this should be replaced.  |                          |                            |                      |                          |                            |  |   |  |

### WATER SYSTEM RISK ASSESSMENT (Draft)

| Location / Door Disc No..                      | Riser No.              | Plantroom / Calorifier | Large Cold Temp (°C)   | Large Hot Flow Temp (°C) | Large Hot Return Temp (°C) | Small Cold Temp (°C) | Small Hot Flow Temp (°C) | Small Hot Return Temp (°C) | Deadlegs Present | Additional Info   |
|--|------------------------|------------------------|--|--------------------------|----------------------------|----------------------|--------------------------|----------------------------|------------------|---|
| Adults 1st Floor HDU Unit 1 CCW-046            | M1 (Adult's Hospital)  | PR21 01/02/03          |  |                          |                            | N/A                  | N/A                      | N/A                        | None Visible     | No Access as Stored Items Blocking Way  |
|  |                        |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |                  |   |
|  |                        |                        | N/A  | N/A                      |                            | N/A                  | N/A                      | N/A                        |                  |   |
| <b>Recommendations:</b>                        |                        |                        |  |                          |                            |                      |                          |                            |                  |   |
| Adults 1st Floor Critical Care Offices CCW-230 | M5 (Adult's Hospital)  | PR21 01/02/03          | 19.4   | 62.1                     | 58.7                       | N/A                  | N/A                      | N/A                        | None visible     |   |
|  |                        |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |                  |   |
|  |                        |                        | N/A  | N/A                      | 58.0                       | N/A                  | N/A                      | N/A                        |                  |   |
| <b>Recommendations:</b>                        |                        |                        |  |                          |                            |                      |                          |                            |                  |   |
| Adults 1st Floor Coronary Care CCU-069         | M6 (Adult's Hospital)  | PR21 01/02/03          | 19.3   | 62.5                     | 60.4                       | N/A                  | N/A                      | N/A                        | None visible     |   |
|  |                        |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |                  |   |
|  |                        |                        | N/A  | N/A                      | 60.0                       | N/A                  | N/A                      | N/A                        |                  |   |
| <b>Recommendations:</b>                        |                        |                        |  |                          |                            |                      |                          |                            |                  |   |
| Adults 1st Floor Atrium STW-012                | M10 (Adult's Hospital) | PR31 01/02/03          | 16.9   | 63.2                     | 58.3                       | N/A                  | N/A                      | N/A                        | None visible     | Small sections of insulation missing on hot flow/return and cold supplies.<br>2 x Kemper regulation valves with 1 x fitted gauge missing on hot return from below.<br>Corrosion/leak damage evident on exposed return pipework. |
|  |                        |                        | Gauge  | Gauge                    | 58.0                       | Gauge                | Gauge                    | Gauge                      |                  |   |
|  |                        |                        | N/A  | N/A                      | 59.0                       | N/A                  | N/A                      | N/A                        |                  |   |
| <b>Recommendations:</b>                        |                        |                        | Hot return temperature gauge missing where hot returns from below - this should be replaced.<br>Minimal sections of insulation missing on cold, hot flow and hot return pipework (<1m) as it rises to supply services - this should be refitted. |                          |                            |                      |                          |                            |                  |   |
| Adults 1st Floor Atrium MDU-052                | M21 (Adult's Hospital) | PR31 01/02/03          | 16.5   | 63.4                     | 58.6                       | N/A                  | N/A                      | N/A                        | None Visible     | 2 x Kemper regulation valves with fitted gauges on hot returns.   |
|  |                        |                        | Gauge  | Gauge                    | 62.0/60.0                  | Gauge                | Gauge                    | Gauge                      |                  |   |
|  |                        |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |                  |   |
| <b>Recommendations:</b>                        |                        |                        | Ensure temperature gauges are calibrated correctly.  |                          |                            |                      |                          |                            |                  |   |
| Adults 2nd Floor Theatres THE-359              | M7 (Adult's Hospital)  | PR31 01/02/03          | 17.5   | 63.0                     | 61.0                       | N/A                  | 62.2                     | 59.8                       | None visible     |   |
|  |                        |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |                  |   |
|  |                        |                        | N/A  | 62.0                     | N/A                        | N/A                  | N/A                      | 65.0                       |                  |   |



### WATER SYSTEM RISK ASSESSMENT (Draft)

| Location /<br>Door Disc No.. | Riser No. | Plantroom<br>/ Calorifier | Large<br>Cold<br>Temp<br>(°C)   | Large<br>Hot<br>Flow<br>Temp<br>(°C) | Large Hot<br>Return<br>Temp (°C) | Small<br>Cold<br>Temp<br>(°C) | Small Hot<br>Flow Temp<br>(°C) | Small Hot<br>Return<br>Temp (°C) | Deadlegs Present | Additional Info |
|------------------------------|-----------|---------------------------|---|--------------------------------------|----------------------------------|-------------------------------|--------------------------------|----------------------------------|------------------|-----------------|
| <b>Recommendations:</b>      |           |                           | Evidence of historic leak damage on insulation - further investigation required to establish if all pipework, fittings and connections are water tight. |                                      |                                  |                               |                                |                                  |                  |                 |
|                              |           |                           | Inspect return temperature gauges for accuracy – these should be recalibrated or replaced if required.  |                                      |                                  |                               |                                |                                  |                  |                 |

### WATER SYSTEM RISK ASSESSMENT (Draft)

| Location / Door Disc No..  | Riser No.              | Plantroom / Calorifier | Large Cold Temp (°C)  | Large Hot Flow Temp (°C) | Large Hot Return Temp (°C) | Small Cold Temp (°C) | Small Hot Flow Temp (°C) | Small Hot Return Temp (°C) | Deadlegs Present | Additional Info   |
|--|------------------------|------------------------|---|--------------------------|----------------------------|----------------------|--------------------------|----------------------------|------------------|---|
| Adults 2nd Floor Theatres THE-056  | M21 (Adult's Hospital) | PR31 01/02/03          | 17.1  | 62.2                     | 58.3                       | N/A                  | N/A                      | N/A                        | None visible     | No local branches or isolation to outlets. Kemper regulation valve with fitted gauge on hot return. |
|  |                        |                        | Gauge   | Gauge                    | 59.0                       | Gauge                | Gauge                    | Gauge                      |                  |   |
|  |                        |                        | N/A   | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |                  |   |
| <b>Recommendations:</b>  |                        |                        |   |                          |                            |                      |                          |                            |                  |   |
| Adults 2nd Floor Theatres THE-008  | M10 (Adult's Hospital) | PR31 01/02/03          | 16.7  | 62.2                     | 58.3                       | N/A                  | N/A                      | N/A                        | None visible     | No local branches or isolation to outlets. Corrosion Visible on CHW Fittings                        |
|  |                        |                        | Gauge   | Gauge                    | 59.0                       | Gauge                | Gauge                    | Gauge                      |                  |   |
|  |                        |                        | N/A   | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |                  |   |
| <b>Recommendations:</b>  |                        |                        |   |                          |                            |                      |                          |                            |                  |   |
| Adults 1st Floor Entrance to Neurological Sciences Link Corridor STW-041 | M7 (Adult's Hospital)  | PR31 01/02/03          | 17.0  | 60.8                     | 57.7                       | N/A                  | N/A                      | N/A                        | None visible     | No connection to local services - pipework runs straight through riser with no branches             |
|  |                        |                        | Gauge   | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |                  |   |
|  |                        |                        | N/A   | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |                  |   |
| <b>Recommendations:</b>  |                        |                        |   |                          |                            |                      |                          |                            |                  |   |
| Adults 1st Floor Corridor (at 1C) STW-012                                | M7 (Adult's Hospital)  | PR31 01/02/03          | N/A   | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        | Small deadleg.   | No connection to local services - pipework runs straight through riser with no branches             |
|  |                        |                        | Gauge   | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |                  |   |
|  |                        |                        | N/A   | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |                  |   |
| <b>Recommendations:</b>  |                        |                        | Small deadleg on pipework - this should be removed if no longer required, or retained on site flushing regime.          |                          |                            |                      |                          |                            |                  |   |
| Adults 3rd Floor Plantroom 31 at 31AHU29                                 | M7 (Adult's Hospital)  | PR31 01/02/03          | 18.2  | 62.8                     | 56.9                       | N/A                  | N/A                      | N/A                        | None visible     | 15mm line to open end (Valved off)  |
|  |                        |                        | Gauge   | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |                  |   |
|  |                        |                        | N/A   | N/A                      | 58.0                       | N/A                  | N/A                      | N/A                        |                  |   |
| <b>Recommendations:</b>  |                        |                        | 15mm line to open end (Valved off) - this should be removed if no longer required (or retained on site flushign regime) |                          |                            |                      |                          |                            |                  |   |

### WATER SYSTEM RISK ASSESSMENT (Draft)

| Location / Door Disc No..                 | Riser No.               | Plantroom / Calorifier | Large Cold Temp (°C)   | Large Hot Flow Temp (°C) | Large Hot Return Temp (°C) | Small Cold Temp (°C) | Small Hot Flow Temp (°C) | Small Hot Return Temp (°C) | Deadlegs Present | Additional Info  |
|---|-------------------------|------------------------|--|--------------------------|----------------------------|----------------------|--------------------------|----------------------------|------------------|--|
| Adults 2nd Floor Theatres                 | M12 (Adult's Hospital)  | PR31 01/02/03          | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        | None visible     | Cold supply from calorifier 31 04/05/06 supply line.   |
|   |                         |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |                  |  |
|   |                         |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |                  |  |
| <b>Recommendations:</b>                   |                         |                        |  |                          |                            |                      |                          |                            |                  |  |
| Adults 3rd Floor Plantroom 31 at 31AHU19  |                         | PR31 01/02/03          | 18.4   | 62.3                     | 56.4                       | N/A                  | N/A                      | N/A                        |                  | Appears to supply 3rd Floor Facilities offices and changing rooms  |
|   |                         |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |                  |  |
|   |                         |                        | N/A  | N/A                      | 50.0                       | N/A                  | N/A                      | N/A                        |                  |  |
| <b>Recommendations:</b>                   |                         |                        | Inspect return temperature gauges for accuracy – these should be recalibrated or replaced if required. |                          |                            |                      |                          |                            |                  |  |
| Adults 2nd Floor Staff Core Lifts CA2-037 | M25A (Adult's Hospital) | TBC                    | LHS - 18.4<br>RHS - 18.6   | N/A                      | N/A                        | 21.7<br>TBC Trade    | N/A                      | N/A                        | None Visible     | Elevated cold temperature on what appears to be Trade CWST 1 supply to roof.<br>No Domestic Isolation.<br>Isolated Branch from Trade TBC |
|   |                         |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |                  |  |
|   |                         |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |                  |  |
| <b>Recommendations:</b>                   |                         |                        | TBC  |                          |                            |                      |                          |                            |                  |  |
| Adults 2nd Floor Staff Core Lifts CA2-038 | M25 (Adult's Hospital)  | TBC                    | 18.0   | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        | None Visible     | No Domestic Isolation.   |
|   |                         |                        | Gauge  | Gauge                    | Gauge                      | Gauge                | Gauge                    | Gauge                      |                  |  |
|   |                         |                        | N/A  | N/A                      | N/A                        | N/A                  | N/A                      | N/A                        |                  |  |
| <b>Recommendations:</b>                   |                         |                        |  |                          |                            |                      |                          |                            |                  |  |

**WATER SYSTEM RISK ASSESSMENT**

# **Section 8**

## **Other 'At Risk Systems'**

## WATER SYSTEM RISK ASSESSMENT

### Other Risk Systems

All other "at risk" systems should have a suitable L8 risk assessment carried out with an appropriate L8 monitoring regime implemented.

*HSG 274 Legionnaire's disease: Technical guidance Part 3: The control of legionella bacteria in other risk systems* provides guidance on identification and frequency of inspections for these systems.

Please also refer to outlets (section 7 for information and section 2 for recommendation) relating to supplies from domestic water system to process systems described below.

Other systems identified to DMA as being present on site:

- Children's Hydrotherapy Pool (completed under separate assessment)
- Arjo Baths
- Dental equipment (Clinic 2)
- Emergency showers (A&E – Decontamination Unit)
- Sprinkler/Wet firefighting systems (Main firefighting tanks in basement fire tank room, and helipad fire fighting system in 12<sup>th</sup> floor plantroom)
- Renal dialysis (x2 systems – One in Adults Hospital (PR 32) and one in RHC (adjacent to PR 21)) with additional 'Emergency Dialysis Points' which are directly supply from domestic cold water system. NHS Estates and/or Renal technicians should confirm location of all Emergency Dialysis Points.
- Endoscopy Wash (2<sup>nd</sup> floor)
- Medical Gases/Medical Equipment (e.g. Nebulisers, incubators, etc.)
- Emergency Cooling - MRI chiller (3<sup>rd</sup> Floor Adults Roof between PR 31 and PR 32)
- Closed heating systems
- Closed chilled water systems
- Air Conditioning/Air Handling Units
- No longer part of the water system - Irrigation systems
- No longer part of the water system - Steam Humidification– now disconnected.

This assessment provides a brief description of each system and an initial assessment however we would advise specialists in each field are consulted to confirm this initial assessment is reflective of the function of the system and would present these findings as draft only until this is confirmed.

N.B. DMA were advise no Ice making machines or machines with "open" cooling system (e.g. lathes) are used on site

## WATER SYSTEM RISK ASSESSMENT

|                     |  |
|---------------------|--|
| <b>System</b>       | <b>Hydrotherapy Pool</b>   |
| Location(s)         | Ground floor - Children's Hospital                                 |
| Responsibility      | Estates/Clinical staff   |
| Description         | Hydrotherapy pool  |
| Water Source        | Domestic Water supplies CWST in basement Hydrotherapy plantroom    |
| Filtration Present  | Pool filtration plant in hydrotherapy plantroom in basement        |
| Running Temperature | Typically 35-40°C  |
| Use                 | Advised daily  |
| Aerosol Created     | Potential for some aerosol release                                 |
| Comments            | This has been assessed under separate cover by Brio Group in 2023. |
| Recommendations     | Refer to risk assessment.  |

|                     |   |  |  |  |  |
|---------------------|---|--|--|--|--|
| <b>System</b>       | <b>Arjo Baths</b>   |  |  |  |  |
| Location(s)         | Various locations throughout the hospital (Wards)<br>Note: – Many of the Arjo baths have been removed.  |  |  |  |  |
|                     | <b>Adults<br/>Hospital</b><br>Ward 2A<br>DMW-011<br>DMW-013   | <b>Childrens<br/>Hospital</b><br>4th Floor<br>DCFP-038 | <b>Childrens<br/>Hospital</b><br>3 <sup>rd</sup> Floor<br>Ward 3C<br>GW1-068<br>Ward 3B<br>GW2-039<br>Ward 3A<br>GW3-059 | <b>Childrens<br/>Hospital</b><br>2 <sup>nd</sup> Floor<br>Ward 2C<br>ARU-006 | <b>Childrens<br/>Hospital</b><br>1 <sup>st</sup> Floor<br>Ward 1D PICU<br>CCW-051<br>Ward 1E,<br>CAR-048 |
| Responsibility      | Estates/Clinical staff  |  |  |  |  |
| Description         | Medical bath (Baths seen by DMA do not appear to have any obvious air or water jet facility)  |  |  |  |  |
| Water Source        | Domestic Water System   |  |  |  |  |
| Filtration Present  | None  |  |  |  |  |
| Running Temperature | Typically 35-45°C   |  |  |  |  |
| Use                 | Clinical staff to advise if not routinely used daily.   |  |  |  |  |
| Aerosol Created     | Shower attachment   |  |  |  |  |
| Comments            | Flexible hoses on connection to hot/cold water system in addition to internal flexible connections. Estates unable to confirm maintenance instructions.   |  |  |  |  |
| Recommendations     | Maintain in accordance with manufacturers/installers instructions. Where flexible hoses (i.e. internal to bath unit) cannot be removed then replacing with alternative WRAS approved hoses with linings other than EPDM should be considered. <i>Note: at the time of survey DMA are working through list of connections to Arjo baths to replace flexible hoses with hard piped connections. This project will not replace any hoses on the internal sections of the Arjo baths.</i> If practicable consider shortening shower hoses as it was noted that these can in some areas reach into adjacent WCs and WHBs (though it should be noted that Arjo have advised that the baths contain an integral Category 5 protection system). DMA advised these are maintained by a sub-contractor. |  |  |  |  |

## WATER SYSTEM RISK ASSESSMENT

| System              | Dental Equipment   |
|---------------------|--|
| Location(s)         | Ground floor Children's Hospital (Clinics)   |
| Responsibility      | Clinical staff   |
| Description         | DMA advised that dental chairs now utilise bottled water with Water tank and booster pump now disconnected (Line to this is incorporated into the site flushing regime).   |
| Water Source        | Bottled water within chair.  |
| Filtration Present  | None   |
| Running Temperature | Variable depending on bottled water refill/storage temperature.  |
| Use                 | TBC  |
| Aerosol Created     | Potential aerosol release from dental tools  |
| Comments            |  |
| Recommendations     | <p>HSG 274 Part 3 states "<i>Drain down, clean, flush and disinfect all system components, pipework and bottles twice daily. Disinfectant contact time as recommended by manufacturer. Take microbiological measurements (Refer to Decontamination HTM 01-05)</i>"</p> <p>SHTM 04-01 Part G states "<i>Drain down and clean at the end of each working day</i>".</p> <p>HTM 01-05 provides advice and recommendations for on-going maintenance and this should be followed in addition to manufacturers and installers instructions.</p> <p>Clarify governance and maintenance responsibilities within the written scheme.</p> |

## WATER SYSTEM RISK ASSESSMENT

| System              | Emergency Showers  |
|---------------------|--|
| Location(s)         | A&E Decontamination Room<br>(Note: - Shower in Hydrotherapy plantroom now disconnected)  |
| Responsibility      | Estates  |
| Description         | Emergency drench system  |
| Water Source        | Domestic Water   |
| Filtration Present  | None   |
| Running Temperature | TBC though 'Domestic water system'   |
| Use                 | Included in site flushing regime   |
| Aerosol Created     | Shower   |
| Comments            |  |
| Recommendations     | HSG 274 Part 3 recommends minimum six-monthly flushing of emergency/deluge shower, though Risk Control Notice 11/advises "flush through and purge to drain twice per week- source SHTM 04-01 Part G. This is included within site flushing regime. |

| System              | Renal Dialysis (Adult)  |
|---------------------|---|
| Location(s)         | Plantroom 32 then runs to renal ward areas (Ward 4A)  |
| Responsibility      | Estates/Renal Technicians   |
| Description         | A constantly circulating purified water system supplying renal dialysis outlets in the Adult hospital   |
| Water Source        | Domestic Water  |
| Filtration Present  | Various   |
| Running Temperature | TBC though 'Domestic water system'  |
| Use                 | Daily   |
| Aerosol Created     | Unlikely during normal operation  |
| Comments            | As supplied by Domestic Water this makes domestic water system disinfections problematic.<br><br>New line fitted from entrance to plantroom 32 to bypass the chlorine dioxide "top-up" unit installed within this plantroom. Carbon filters and ClO <sub>2</sub> monitoring system installed by Scotmas and test protocols implemented by Renal specialists.  |
| Recommendations     | Maintain in accordance with manufacturers/installers instructions, current NHS (SHTM) protocols and "Clinical Practice Guideline by the UK Renal Association of Renal Technologists". Ensure aerosol creation is minimised during maintenance and testing procedures.<br><br>Due cognisance of potential for ClO <sub>2</sub> in supply water should be taken and appropriate testing/filtering of water to ensure safe operation of the system is maintained (Implemented by Scotmas monitoring system and Renal technicians). |



## WATER SYSTEM RISK ASSESSMENT

| System              | Renal Dialysis (Adult – Emergency Points)   |
|---------------------|---|
| Location(s)         | To be confirmed by NHS Estates  |
| Responsibility      | Estates/Renal Technicians   |
| Description         | Emergency connection points have been installed in rooms which were not in the proximity of the dedicated renal dialysis systems.   |
| Water Source        | Domestic Cold Water System  |
| Filtration Present  | On renal dialysis machines  |
| Running Temperature | See section 7 for description of cold water conditions.   |
| Use                 | Points are for emergency use only and are likely to be creating deadlegs on the system.   |
| Aerosol Created     | Typically, Low  |
| Comments            | As supplied by Domestic Water this makes domestic water system disinfections problematic.<br><br>System is now dosed with ClO <sub>2</sub> from the basement supply.  |
| Recommendations     | Maintain in accordance with manufacturers/installers instructions, current NHS (SHTM) protocols and “Clinical Practice Guideline by the UK Renal Association of Renal Technologists”. Ensure aerosol creation is minimised during maintenance and testing procedures.<br><br>Due cognisance of potential for ClO <sub>2</sub> in supply water should be taken and appropriate testing/filtering of water to ensure safe operation of the system is maintained |
| Risk (Legionella)   | Low   |

## WATER SYSTEM RISK ASSESSMENT

| System              | Renal Dialysis (Children)   |
|---------------------|---|
| Location(s)         | Plantroom 22 then runs to renal ward areas  |
| Responsibility      | Estates/Specialist  |
| Description         | A constantly circulating purified water system supplying renal dialysis outlets in the Adult hospital   |
| Water Source        | Domestic Water  |
| Filtration Present  | Various   |
| Running Temperature | TBC though 'Domestic water system'  |
| Use                 | Daily   |
| Aerosol Created     | Typically Low   |
| Comments            | <p>As supplied by Domestic Water this makes domestic water system disinfections problematic.</p> <p>New line fitted from entrance to plantroom 21 to bypass the chlorine dioxide "top-up" unit installed within this plantroom. Carbon filters and ClO<sub>2</sub> monitoring system installed by Scotmas and test protocols implemented by Renal specialists.</p>  |
| Recommendations     | <p>Maintain in accordance with manufacturers/installers instructions, current NHS (SHTM) protocols and "Clinical Practice Guideline by the UK Renal Association of Renal Technologists". Ensure aerosol creation is minimised during maintenance and testing procedures.</p> <p>Due cognisance of potential for ClO<sub>2</sub> in supply water should be taken and appropriate testing/filtering of water to ensure safe operation of the system is maintained (Implemented by Scotmas monitoring system and Renal technicians).</p> |

## WATER SYSTEM RISK ASSESSMENT

| <b>System</b>       | <b>Endoscopy Wash Filtration Unit</b>   |
|---------------------|---|
| Location(s)         | Plantroom 31  |
| Responsibility      | Estates/Specialist  |
| Description         | A constantly circulating purified water system supplying endoscopy wash machines in the Adult hospital  |
| Water Source        | Domestic Water  |
| Filtration Present  | Various   |
| Running Temperature | TBC though 'Domestic water system'  |
| Use                 | Daily (TBC)   |
| Aerosol Created     | Advised aerosol contained within the endoscopy wash units during normal operation.  |
| Comments            | DMA advised this is a clinical responsibility with no input from estates.   |
| Recommendations     | Maintain in accordance with manufacturers/installers instructions and current NHS (SHTM) protocols. Ensure aerosol creation is minimised during maintenance and testing procedures. |

| <b>System</b>       | <b>Water Softeners</b>  |
|---------------------|---|
| Location(s)         | Various   |
| Responsibility      | Estates/Specialist  |
| Description         | Softeners form part of various medical (e.g. Renal/Endoscopy) and other processes (e.g. steam ovens)  |
| Water Source        | Domestic Water  |
| Filtration Present  | N/A   |
| Running Temperature | TBC though 'Domestic water system'  |
| Use                 | See relevant process/equipment  |
| Aerosol Created     | N/A (Contained systems)   |
| Comments            | Estates unable to confirm servicing history or local responsibilities (Estates/Medical Physics/Clinical)  |
| Recommendations     | Maintain in accordance with manufacturers/installers instructions (including cleaning and disinfection of resin and brine tanks). Confirm responsibilities. Ensure aerosol creation is minimised during maintenance and testing procedures. |

## WATER SYSTEM RISK ASSESSMENT

|                 |  |
|-----------------|--|
| <b>System</b>   | <b>Medical Gases/Medical Equipment</b> (e.g. Nebulisers, incubators, etc.)   |
| Location(s)     | Throughout Hospital  |
| Responsibility  | Estates/Clinical Staff/Infection Control/Specialist  |
| Recommendations | Conduct a risk assessment of each system, preferably using an assessment team comprising members knowledgeable in legionella management and control, as well as those familiar with the design and operation of the system and Infection Control/Clinical staff where appropriate. Control procedures within appropriate SHTM (or other relevant guidance) for system being assessed should be taken in to account during assessment(s). Any water softeners or other filtration equipment connected to these systems should be assessed at this time. Devise a control scheme based on the risk assessment. |

|                     |   |
|---------------------|---|
| <b>System</b>       | <b>Emergency Cooling (MRI chiller)</b>  |
| Location(s)         | 3 <sup>rd</sup> Floor Roof adjacent to Plantroom 31 at Calorifiers 31-04/05/06.   |
| Responsibility      | Estates/Specialist  |
| Description         | DMA were advised by NHS Estates that the water supply to these units (via an RPZ valve) is for emergency use in the event the chillers fail. The water would be used in a once through loop flowing through the unit and direct to drain.   |
| Water Source        | Domestic Water  |
| Filtration Present  | None noted (Fed via RPZ valve)  |
| Running Temperature | TBC though 'Domestic water system'  |
| Use                 | Emergency use only  |
| Aerosol Created     | TBC - DMA have not witnessed this system in use, though likely to be minimal.   |
| Comments            |   |
| Recommendations     | Connection point to MRI unit(s) included in site flushing regime. A check valve has been fitted approx. 1m from the tee off to the MRI unit, with an RPZ fitted just prior to line running through wall to the units. Ensure aerosol creation minimised when running to drain in emergency use and during flushing. |

## WATER SYSTEM RISK ASSESSMENT

| <b>System</b>       | <b>Closed Heating Systems</b>   |
|---------------------|---|
| Location(s)         | Throughout hospital   |
| Responsibility      | Estates   |
| Description         | Closed heating systems  |
| Water Source        | Top up by Domestic Water system   |
| Filtration Present  | None  |
| Running Temperature | 70 – 105°C (approx.)  |
| Use                 | Constantly circulating systems  |
| Aerosol Created     | Enclosed system.  |
| Comments            |   |
| Recommendations     | Minimise aerosol creation during maintenance procedures. Maintain in accordance with manufacturers/installers instructions. |

| <b>System</b>       | <b>Closed Chilled Systems</b>   |
|---------------------|---|
| Location(s)         | Throughout hospital   |
| Responsibility      | Estates   |
| Description         | Closed chilled systems  |
| Water Source        | Top up by Domestic Water system   |
| Filtration Present  | None  |
| Running Temperature | 6 - 20°C (approx.)  |
| Use                 | Constantly circulating systems  |
| Aerosol Created     | Enclosed system.  |
| Comments            |   |
| Recommendations     | Minimise aerosol creation during maintenance procedures. Maintain in accordance with manufacturers/installers instructions. |

## WATER SYSTEM RISK ASSESSMENT

| <b>System</b>       | <b>Air Conditioning/Ventilation</b>   |
|---------------------|---|
| Location(s)         | Plantrooms (Air Handling Units)   |
| Responsibility      | Estates   |
| Description         | Air handling units  |
| Water Source        | N/A   |
| Filtration Present  | Air filters present.  |
| Running Temperature | N/A   |
| Use                 | Variable depending on building and department requirements  |
| Aerosol Created     | N/A - unless under fault conditions, where water pools in the condensate tray of the unit and does not drain freely away. |
| Comments            |   |
| Recommendations     | Maintain in accordance with manufacturers/installers instructions and as required under SHTM 03-01 and SHTM 04-01 Part G. |

## WATER SYSTEM RISK ASSESSMENT

| <b>System</b>       | <b>Decorative Bubble Lamps</b>  |
|---------------------|---|
| Location(s)         | Children's Hospital Atrium  |
| Responsibility      | Estates/Contractor (TBC)  |
| Description         | Decorative water and air bubble lamps   |
| Water Source        | N/A (Sealed System)   |
| Filtration Present  | N/A (Sealed System)   |
| Running Temperature | Ambient   |
| Use                 | Variable (Multiple times daily) - Bubbles released into water tubes at base when button pressed on unit |
| Aerosol Created     | Unit appears to be completely sealed so aerosols would be contained.                                    |
| Comments            |   |
| Recommendations     | DMA advised these are sealed units and no further actions required.                                     |

## **WATER SYSTEMS RISK ASSESSMENT**

# **Fire Suppression Systems**



## WATER SYSTEMS RISK ASSESSMENT

### 12<sup>TH</sup> FLOOR HELI-PAD FIRE SUPPRESSION SYSTEM

|                                 |   |   |                          |
|---------------------------------|---|---|--------------------------|
| Name/number of CWST             | 12 <sup>th</sup> Floor Fire Suppression Tank  |   |                          |
| Location of CWST                | 12 Floor Plant Room   |   |                          |
| Labelled                        | <b>CWST</b>   | <b>Pipework</b>                           | <b>Valves</b>            |
|                                 | No  | No  | No                       |
| Type                            | Sectional   |   |                          |
| Materials                       | GRP   |   |                          |
| Lined                           | No  |   |                          |
| Dimensions (m)                  | 3 x 2 x 2   |   |                          |
| Volume (litres)                 | 12,000 (actual approx. 9,000)   |   |                          |
| Linked/single                   | Single  |   |                          |
| M/U opposite draw off           | Diagonal  |   |                          |
| Make up source                  | Trades Water  |   |                          |
| Services supplied               | Fire Suppression  |   |                          |
| Temperature °C                  | <b>Make Up</b>  | <b>Tank Water</b>                         | <b>Plantroom/Ambient</b> |
|                                 | 19.6  | 19.5                                      | 19.0                     |
| Internal condition              | Internal  | Clean – Tanks cleaned in June 2023 by DMA |                          |
|                                 | Waterline   | Clean                                     |                          |
|                                 | Dirt & silt   | Clean                                     |                          |
| Water condition                 | Clear   |   |                          |
| Stagnation                      | No evidence   |   |                          |
| Deadlegs around CWST            | On fire system  |   |                          |
| Close fitting lid/screened vent | Yes   | Yes                                       |                          |
| Warning Pipe Screen             | No  |   |                          |
| Overflow Screen                 | Weir overflow screened, no screens visible on overflow and warning pipe   |   |                          |
| Insulation                      | Pre-insulated   |   |                          |
| Access                          | Good  |   |                          |
| Vents returning to CWST         | Recirculating line from system  |   |                          |
| Is drain present?               | Yes (short)   |   |                          |
| Booster pumps                   | Fitted  | 2 x Fire System Pumps                     |                          |
|                                 | Vibration Couplings   |   |                          |
|                                 | Expansion Vessel  |   |                          |
|                                 | Drain on Vessel?  |   |                          |
| ClO <sub>2</sub> Dosing         | System is dosed with ClO <sub>2</sub> tablets weekly, with a submersible pump circulating water/ClO <sub>2</sub> within the tank and has water drawn off from the base 3 times per week as part of the site flushing regime.  |   |                          |
| Comments                        | During 2021-2022 there was an issue with the pumps overrunning after testing causing the water to heat up within the CWST. On occasion the water could heat up to >50°C within the tank. This issue appears to have been rectified with wate within tank now consistently at ambient temperature. |   |                          |
| Overall risk rating             | <b>High</b>   |   |                          |

## WATER SYSTEMS RISK ASSESSMENT

|                     |  |
|---------------------|--|
| <b>System</b>       | <b>12<sup>th</sup> Floor Heli-pad fire suppression system</b>  |
| Location(s)         | 12 <sup>th</sup> Floor heli-pad fire tank/suppression system   |
| Responsibility      | Estates & Facilities   |
| Water Source        | Trades Water via 12m <sup>3</sup> Cold Water Storage Tank in 12 <sup>th</sup> floor Plantroom. Trades system runs approx. 100m from last tee-off in 12 <sup>th</sup> floor before supplying the tank (and last tee-off is itself approx. 50m to a tap which is unlikely to be used)  |
| Filtration Present  | None   |
| Running Temperature | Ambient  |
| Use                 | <p>In order to maintain readiness in case of emergency both cannons are tested for 5 to 10 mins per week, with cannons using 30 litres of water per min.</p> <p>Advised a weekly test using water (no foam) is carried out through all areas of the system with staff wearing appropriate PPE. Thereafter this for Emergency use only.</p> <p>Testing creates a significant quantity of spray and therefore aerosols are expected to be released in a significant enough volume as to warrant implementation of control measures.</p> <p>As testing is carried out on the roof aerosols may spread over the surrounding as drift from a cooling tower would with the greatest density of aerosol (weather conditions permitting) being disseminated onto users of the immediate areas, which would be users of the Queen Elizabeth University Hospital and local residents.</p>  |
| Aerosol Created     | <p>Fire cannon (Droplet size undetermined). As the system is located on the rooftop any aerosol could be dispersed over a larger area (similar to a cooling tower)</p> <p>In addition to direct dissemination there are air conditioning systems located in the Adults and Children's Hospitals and other hospital buildings where aerosols could then be dispersed within buildings.</p>  |
| Comments            | <p>Due to the volumes of water used during fire cannon testing it is not anticipated that weekly testing will turn over the full contents of the storage tank until several months of testing has elapsed though this requires confirmation from NHS Estates.</p> <p>DMA were advised that following use, the system drains down naturally which we understand will mean some lower points of the system remain fully wetted and other areas dry. This may create conditions for biofilm formation within the pipework, increasing the likelihood of legionella proliferation. Pipework is constructed from Mild Steel and Galvanised Steel which also may be conducive to Legionella growth.</p> <p>There are 3 x recirculation lines back to the tank which may also return potential contamination from pipework back to the tank.</p> <p>The CWST was cleaned and disinfected in June 2023.</p> <p>Further guidance on this can be found in "<i>FIA Guidance for the Fire Protection Industry - Guidance on Legionella in Fire Fighting Systems and Equipment</i>"</p> |

## WATER SYSTEMS RISK ASSESSMENT

### System Description

Fire suppression/sprinkler system (including water cannon).

The 12<sup>th</sup> floor CWST supplies two fire 'cannons' on the roof top helipad which are required for emergency fire fighting.

In order to maintain readiness in case of emergency both cannons are tested for 5 to 10 mins per week, with cannons using 30 litres of water per min.

Testing creates a significant quantity of spray and therefore aerosols are expected to be released in a significant enough volume as to warrant implementation of control measures. NHS Estates/Facilities advised a foam suppressant is added to the discharged water when in use for emergency only, during weekly testing only water is used with no foam.

As testing is carried out on the roof, aerosols may spread over the surrounding area (similar to the drift from a cooling tower) with the highest density of aerosol (weather conditions dependant) being disseminated onto persons in the immediate area, i.e. users of the Queen Elizabeth University Hospital and surrounding industrial and residential areas.

In addition to direct dissemination, there are air conditioning systems located in the Adults and Children's Hospitals and other hospital buildings which aerosols could be drawn into and dispersed within buildings.

Estates advised DMA that the system pipework is steel, with short flexible hoses also present, and may be lined internally, though DMA were not provided with any supporting literature to confirm this. It has been noted that there are also what appear to be mild steel/iron valves which are corroding and these should potentially be replaced, if practicable. It appears reasonable to presume therefore that nutrients may be available to aid bacterial growth, including Legionella.

There are various bypasses and drain points on the system which we would normally recommend are removed or included in a site flushing regime (e.g. weekly) though we would advise that the manufacturer or supplier confirms what elements, pipework etc. can be safely flushed and/or removed without potentially affecting the operation of this critical system.

Facilities advised the system remains full and charged with water at all times with no drain down after usage. Therefore, water within the pipework will only be replaced during weekly flushing and will remain at ambient temperature for the majority of that time. This is of particular concern during summer months when ambient temperature is likely to be within the growth range for Legionella. Insulation is likely to be of limited use in maintaining lower temperatures, given the length of time between uses.

As the CWST contains approx. 9,000 litres of water with testing expected to use approximately 500 litres per test, water within the CWST will stagnate, though this is less likely to be an issue as tank now on a 3 x per week flushing regime. Water quality within the CWST was good as the tank was cleaned recently.

As turnover through the supply line and trades system generally is low, stagnation within the system may contribute to poor water quality within the tank, though this should be mitigated by the 3 x per week flushing regime implemented on the tank.

### Recommendations

Minimise aerosol creation during maintenance procedures (if practicable). Maintain in accordance with manufacturers/installers instructions.

Ensure all points on the trades system (including inlet to fire tank) are maintained on site flushing regime.

Consider implementing a sampling regime to include the storage tank and points on the system and the supply. This would be particularly important during summer months where ambient temperatures are likely to be higher.

It is advised temperature monitoring and visual inspection should be carried out on the Storage Tank on a weekly basis prior to testing and should the storage temperature exceed 20°C then additional precautions should be considered (E.g. flush the tank to reduce stored water temperature, manually dose tank with suitable disinfectant chemical if no automated system installed).

## **WATER SYSTEMS RISK ASSESSMENT**

Given the potential control issues described above, but the need for such a system to be in place, it would be prudent to consider a permanent chemical dosing system or process for microbial control, and/or filtration system, for this water system (though it should be confirmed that any chemicals used on this system would not interfere with the foam used for emergencies) with suitable testing and monitoring included.

The fire system supplier should confirm that treatment will not be detrimental to system operation or maintenance or provide suitable alternatives.

Control and management parameters and procedures should be compiled along with procedures for correction of out of specification results and any escalation procedures that may be required.

We would advise a full clean and disinfection is carried out, including through the cannons, if practicable. The manufacturer should be consulted to confirm which disinfectant(s) are suitable.

Increased turnover of the system may be achieved by additional flushing, which may be automated or manual. However, the poor make-up may result in a reduction in the volume of stored water immediately afterwards which may have an impact in emergency situations. Similarly reducing the capacity of stored water may have a detrimental impact in emergency situations.

Rodents screens should be fitted to overflow and warning pipes.

# WATER SYSTEMS RISK ASSESSMENT

## BASEMENT FIRE TANKS/SPRINKLER SYSTEM

|                                 |                     |   |                   |                          |
|---------------------------------|---------------------|---|-------------------|--------------------------|
| Name/number of CWST             |                     | Sprinkler Tanks   |                   |                          |
| Location of CWST                |                     | Basement Sprinkler  |                   |                          |
| Labelled                        |                     | <b>CWST</b>   | <b>Pipework</b>   | <b>Valves</b>            |
|                                 |                     | No  | No                | No                       |
| Type                            |                     | Sectional   |                   |                          |
| Materials                       |                     | GRP   |                   |                          |
| Lined                           |                     | No  |                   |                          |
| Dimensions (m)                  |                     | 2 off (8 x 2.5 x 5)   |                   |                          |
| Volume (litres)                 |                     | 2 off 100,000   |                   |                          |
| Linked/single                   |                     | 2 off Linked  |                   |                          |
| M/U opposite draw off           |                     | Yes   |                   |                          |
| Make up source                  |                     | Town Mains (Dedicated)  |                   |                          |
| Services supplied               |                     | Sprinkler   |                   |                          |
| Temperature °C                  |                     | <b>Make Up</b>  | <b>Tank Water</b> | <b>Plantroom/Ambient</b> |
|                                 |                     | Not run   | 20.4              | 20.9                     |
| Internal condition              | Internal            | Difficult to confirm internal condition due to water condition          |                   |                          |
|                                 | Waterline           | Ok  |                   |                          |
|                                 | Dirt & silt         | Heavy   |                   |                          |
| Water condition                 |                     | Cloudy/Dirty  |                   |                          |
| Stagnation                      |                     | Yes   |                   |                          |
| Deadlegs around CWST            |                     | On fire system  |                   |                          |
| Close fitting lid/screened vent |                     | Yes   | No                |                          |
| Warning Pipe Screen             |                     | No  |                   |                          |
| Overflow Screen                 |                     | Weir overflow screened, no screens visible on overflow and warning pipe |                   |                          |
| Insulation                      |                     | Pre-insulated   |                   |                          |
| Access                          |                     | Good  |                   |                          |
| Vents returning to CWST         |                     | 2 x Recirculating lines returning to each tank                          |                   |                          |
| Is drain present?               |                     | Yes (short)   |                   |                          |
| Booster pumps                   | Fitted              | 2 x Fire System Pumps   |                   |                          |
|                                 | Vibration Couplings |   |                   |                          |
|                                 | Expansion Vessel    |   |                   |                          |
|                                 | Drain on Vessel?    |   |                   |                          |
| Overall risk rating             |                     | <b>High (Emergency use)</b>   |                   |                          |

## WATER SYSTEMS RISK ASSESSMENT

| System              | Sprinkler/wet fire-fighting system (Sprinkler System)  |
|---------------------|--|
| Location(s)         | Main fire tanks in basement (Sprinkler system throughout the building)   |
| Responsibility      | Estates  |
| Water Source        | Fed from dedicated fire main (Hardgate Road – Small) via Dedicated Sprinkler System Storage Tanks in the Basement  |
| Filtration Present  | None   |
| Running Temperature | Ambient  |
| Use                 | NHS Estates were unable to confirm if any manual testing is carried out. Outwith any manual testing, the system is used for emergency use only.  |
| Aerosol Created     | High when discharging. (Droplet size undetermined)   |
| Comments            | The CWSTs were very dirty internally when inspected and heavily stagnant.<br><br>Further guidance on this can be found in " <i>FIA Guidance for the Fire Protection Industry - Guidance on Legionella in Fire Fighting Systems and Equipment</i> " |

### System Description

Fire suppression/sprinkler system.

DMA witnessed routine testing of the system by Estates. Estates staff advised the sprinkler system is tested every week by estates. Testing involves running the system pumps with water returning via the small bore return line to the tanks (1 pump returns to each tank). On an annual basis inspection and maintenance is carried out by a contractor with water recirculated to the CWSTs via the large bore pipe (this was not run during DMA survey).

Return lines enter the tank with very small gaps to accommodate the pipe. Returns enter the tank in proximity of the weir overflow which could allow aerosol to reach maintenance personnel involved in testing. However, the weir overflows appeared to remain dry (to the naked eye) during the testing witnessed by DMA and although aerosols are very fine suspensions of water particles we would anticipate larger droplets being created and collected by the mesh.

In addition, there was no evidence of rust or other deposits on the mesh to provide indications of longer term wetting and drying (and no records to advise the mesh had been changed).

Estates advised water is never run off from the system as part of maintenance procedures.

Steel pipework on make up to the LHS tank is unlikely to be WRAS approved.

### Recommendations

Consider clean and disinfection of the CWST and then regular inspection as per domestic water tanks with cleaning/disinfection as required by inspection.

Minimise aerosol creation during maintenance procedures. Consider wearing suitable masks to prevent ingestion as recommended by the FIA guidance, and prevent access by unauthorised personnel into test area.

Maintain in accordance with manufacturers/installers instructions.

Weir overflow, overflow and warning pipework connected at inappropriate heights to function as intended. This should be corrected.

Given the potential control issues described above, but the need for such a system to be in place, it would be prudent to consider a permanent chemical dosing system, and/or filtration system, for this water system with suitable testing and monitoring included. If chemical dosing systems are implemented then control and management parameters and procedures should be compiled along with procedures for correction of out of specification results and any escalation procedures that may be required. The fire system supplier should confirm that treatment will not be detrimental to system operation or maintenance or provide suitable alternatives.



## **WATER SYSTEMS RISK ASSESSMENT**

Rodents screens should be fitted to overflow and warning pipes.

**LEGIONELLA RISK ASSESSMENT**

**Section 9**

**Legionella Control**



## LEGIONELLA RISK ASSESSMENT

### Legionella control and documentation

Inadequate management, lack of training and poor communication have all been identified as contributory factors in outbreaks of legionnaires' disease. This is particularly important where several people are responsible for different aspects of the treatment or precautions.

Communications should be 'fail-safe'. The record system is the method to ensure that precautions continue to be carried out and that information is available for checking what is done in practice.

### Legionella Management Structure

For Legionella and Water Safety Management Structure please refer to site Governance & Documentation Review

| Previous risk assessment & drawings | Produced by  | Date  |
|-------------------------------------|--|---|
| Previous L8 risk assessment         | Previous risk assessment carried out by DMA Water Treatment Ltd  | 2018  |
| Review of previous assessment       | N/A  | N/A   |
| System drawings                     | As fitted drawings supplied at time of construction and provided as part of the upgrade works within the basement area and Wards 2A/2B in the RHC. | 2015 (with supplementary drawings provided in 2018/19 and 2022 for upgrade works) |

| Logbook/Record Auditing  |  |
|--|--|
| Is an audit system in place for legionella management and control? | This is carried out by Authorising Engineer. |

## LEGIONELLA RISK ASSESSMENT

| <b>L8 monitoring</b>                                   |                                     |   |
|--|-------------------------------------|---|
| Is a water systems monitoring regime already in place? |                                     | Yes   |
| Do L8 monitoring records include:                      | Flushing of low use outlets?        | Yes – low use outlets in non-clinical areas flushed by DMA (when highlighted and requested of DMA). Other areas added into flushing regime to assist with out-of-specification results and when areas notified to DMA as out of use for a period of time.<br>Other flushing within occupied wards etc. carried out by Clinical/Domestic staff |
|  | Outlet temperature monitoring?      | Yes - carried out by DMA as oart of the ClO <sub>2</sub> monitoring regime  |
|  | Calorifier temperature monitoring   | Yes - carried out by DMA  |
|  | Water heater temperature monitoring | Yes - carried out by DMA  |
|  | Shower head and hose Replacement    | Yes - carried out by DMA  |
|  | Spray Outlet Disinfection           | No spray outlets present  |
|  | Tank Inspections                    | Yes - carried out by DMA  |
|  | Calorifier Base Flushing            | Yes   |
|  | Calorifier Inspections              | Carried out by NHS Estates.   |
|  | C&D of Water Systems                | Carried out annually and on an as required basis dependant upon sample results. Generally CWSTs only disinfected routinely as building operates 24/7 and services cannot be taken offline for routine disinfections. Local disinfections carried out on new upgraded areas as part of handover of upgraded wards etc.                         |
|  | TMV Servicing/Testing               | Yes – in service testing carried out by DMA   |
|  | Maintenance/Service Records         | TBC   |
|  | Pumps alternating                   | N/A - Single pumps only on each calorifier  |
|  | Biocidal Control                    | Yes - ClO <sub>2</sub> checks carried out by DMA on a weekly/monthly basis. Scotmas responsible for topping up ClO <sub>2</sub> chemicals and maintaining ClO <sub>2</sub> dosing units.  |
|  | POU Filters                         | POU filters fitted in designated high risk wards. Management and replacement of filters managed by DMA on a Monthly/Bi-monthly basis.   |
| Other (Specify)  |                                     |   |

## LEGIONELLA RISK ASSESSMENT

| <b>Microbiological sampling</b>   |  |
|---|--|
| Is there a microbiological sampling regime in place?  | Yes – carried out by DMA   |
| Frequency of samples taken?   | High risk areas (Ward RHC Ward 2A/2B, Ward 1D (PICU) and Clinics 1 & 2 Sampled Weekly.<br>Designated Sentinel Sampling points sampled Monthly<br>“Critical Care” designated sampling points sampled monthly.<br>CWSTs and Filtration Units Sampled Monthly.  |
| Are legionella samples taken as part of sampling regime?  | Yes  |
| Are potable samples taken as part of sampling regime?   | Yes  |
| Are pseudomonas samples taken as part of sampling regime?   | Yes  |
| Does sampling regime adequately reflect the complexity and scope of the water system?                 | Yes  |
| Are suitable remedial actions and resamples taken after out of specification sample results recorded? | Yes - see Governance & Documentation Review document   |
| Is there a history of Legionella colonisation of the water systems on site?                           | Very few instances of positive legionella results being returned, despite extensive sampling carried out across the hospital.  |
| Is there a history of “other” bacterial colonisation of the water systems on site?                    | There are instances of “other” bacteria being detected as part of the sampling regime(s) implemented across the hospital. These generally take the form of Gram-negative bacteria or yeast/moulds in low counts, with a disinfection, flushing and re-sampling regime implemented when results detected. |

## **WATER SYSTEM RISK ASSESSMENT**

# **Section 10**

## **Summary of PPM Tasks Recommended for Written Scheme / Water Safety Plan**

## WATER SYSTEMS RISK ASSESSMENT

| Summary of Governance Tasks Recommended for L8 and SHTM 04-01 Compliance   | Guidance Documents                   | Allocated to |
|--|--------------------------------------|--------------|
| Regular check to ensure that legislation and guidance has not changed  | L8<br>HSG 274 Pt 2<br>SHTM 04-01     |              |
| Create register and regularly review all policies relating to legionella control (e.g. Maintenance, Water Treatment, Water Management, Energy) to ensure still valid and correct   | L8<br>HSG 274 Pt 2<br>SHTM 04-01     |              |
| Regular review of Water Systems Management Structure to ensure up-to-date and accurate   | L8<br>HSG 274 Pt 2<br>SHTM 04-01     |              |
| Regular review of communication lines to ensure still accurate and correct   | L8<br>HSG 274 Pt 2<br>SHTM 04-01     |              |
| Regular review of escalation & emergency procedures to ensure still valid and correct  | L8<br>HSG 274 Pt 2<br>SHTM 04-01     |              |
| Regular review of duties allocated to site staff and ensure accurate and recorded (including any changes in use of wards/departments).   | L8<br>HSG 274 Pt 2<br>SHTM 04-01     |              |
| Regular review of roles allocated to individual departments in relation to the water systems and ensure accurate and recorded  | L8<br>HSG 274 Pt 2<br>SHTM 04-01     |              |
| Regular review of duties of sub-contractors to ensure accurate and recorded and contractors are suitably qualified/competent for tasks assigned to them (e.g. Water Hygiene contractors should be LCA Approved, Plumbing contractors should be SNIPEF and Water Safe Registered, etc.) | L8<br>HSG 274 Pt 2<br>SHTM 04-01     |              |
| Create register and regularly review staff training and competency requirements and update training matrix   | L8<br>HSG 274 Pt 2<br>SHTM 04-01     |              |
| Create register and regularly review PPM requirements, method statements, SOPs and risk assessments to ensure still valid and correct  | L8<br>HSG 274 Pt 2<br>SHTM 04-01     |              |
| Create register and regularly review remedial work progress  | L8<br>HSG 274 Pt 2<br>SHTM 04-01     |              |
| Regular review of site documentation to ensure all records up to date and present  | L8<br>HSG 274 Pt 2<br>SHTM 04-01     |              |
| Create register and regularly review "Patient Risk Rating" for all areas of hospital (including any changes in use of wards/departments).  | SHTM 04-01<br>Part B                 |              |
| Create register and regularly review sentinel outlet locations register (inc. Sentinel TMV/TMTs).  | SHTM 04-01<br>Part B                 |              |
| Create register and regularly review little-used outlet locations register (input from clinical staff required, and including any changes in use of wards/departments)   | SHTM 04-01<br>Part G                 |              |
| Create register and regularly review deadlegs/blind ends locations register (input from clinical staff required, and including any changes in use of wards/departments)  | SHTM 04-01<br>Part G                 |              |
| Create register and regularly review POU/Anti-microbial (PALL) filters locations (and manufacturer's/types of filters fitted)  | SHTM 04-01<br>Part G                 |              |
| Create register and regularly review TMV/TMT locations and manufacturer/model.   | SHTM 04-01<br>Part G                 |              |
| Create register and regularly review shower & spray outlet locations (including emergency/deluge showers)  | SHTM 04-01<br>Part G                 |              |
| Create register and regularly review primary, sub-ordinate and tertiary hot flow and return loops to reflect any system alterations.   | HSG 274 Pt 2                         |              |
| Create register and regularly review and record all plant, valves, equipment and services and their associated maintenance schedules).   | HSG 274 Pt 2<br>SHTM 04-01<br>Part B |              |

**Cont...**

**N.B.** Ensure all actions are recorded and stored in the site Water Systems, or other appropriate Logbooks

## WATER SYSTEMS RISK ASSESSMENT

| <b>Summary of Governance Tasks Recommended for L8 and SHTM 04-01 Compliance</b>  | <b>Guidance Documents</b>                | <b>Allocated to</b> |
|--|--|---------------------|
| Create register and regularly review BEMS temperature sensor locations to reflect any system alterations   | HSG 274 Pt 2                             |                     |
| Create register and regularly review schematic/as-fitted drawings to ensure up-to-date and accurate  | L8<br>HSG 274 Pt 2<br>SHTM 04-01         |                     |
| Create register and regularly review all backflow prevention device locations/type (E.g. Check valves, RPZs etc.) to reflect any system alterations.   | L8<br>HSG 274 Pt 2<br>SHTM 04-01         |                     |
| Create register and regularly review all flexible hoses locations (EPDM) (E.g. at Arjo baths, Pressure reducing valves etc.) to reflect any system alterations.  | SHTM 04-01                               |                     |
| Create register of drains to be cleaned and disinfected and frequency  | Good practice in light of ongoing issues |                     |
| Review of water systems risk assessment as a "live" document (DMA recommend a maximum period of 2 years). An indication of when to review the assessment and what to consider should be recorded and this may result from, e.g.: <ul style="list-style-type: none"> <li>• a change to the water system or its use;</li> <li>• a change to the use of the building where the system is installed;</li> <li>• new information available about risks or control measures;</li> <li>• the results of checks indicating that control measures are no longer effective;</li> <li>• changes to key personnel;</li> <li>• a case of legionnaires' disease/legionellosis associated with the system.</li> </ul> | L8<br>SHTM 04-01                         |                     |

**N.B.** By "Regular" e.g. a Quarterly or 6 monthly review of all tasks above or as and when there are changes in system operation, management or other control parameters which would warrant a review of any particular task. (e.g. if change of use or changes in legislation or any other factor which could affect validity of the current documentation)

**N.B.** Ensure all actions are recorded and stored in the site Water Systems, or other appropriate Logbooks

## WATER SYSTEMS RISK ASSESSMENT

| Summary of ppm tasks recommended within site Written Scheme/Water Safety Plan   | Recommended  | Allocated To |
|---|--|--------------|
| Daily review of BEMS records (temperature records, alarms etc.)   | Yes  |              |
| Daily check the flow and return temperatures on the domestic hot water calorifier systems using the temperature gauges fitted or a suitable surface temperature probe – <i>required when BEMS is not operational.</i>   | Yes<br>(if/when BEMS not operational)  |              |
| Daily water draw-off should form part of the daily cleaning process.  | Yes  |              |
| Daily flushing of all outlets in “High Risk Areas”. Hot and cold outlets should be flushed for a minimum of 3 minutes and until the water temperature stabilises in line with current temperature profile.  | Yes  |              |
| Verification that entire body of calorifier reaches 60°C for a period of 1 hour each day (generally at a time of low use e.g. Early morning/late evening).  | Yes<br>Monitored on BEMS   |              |
| Incoming Water Mains – maintain in accordance with installation/design guidelines, ensuring alteration of incoming mains lines to run at least daily. (advised 9 hourly swap over)  | Yes<br>Monitored on BEMS   |              |
| Cyclical alteration of CWST booster pumps (ensuring every pump runs at least weekly)  | Yes<br>Automatic on BEMS systems   |              |
| Daily check of pumps/filters on Veolia Filter Unit  | Yes  |              |
| Twice-weekly flushing of all outlets in unoccupied areas and low use/sporadically used outlets. Hot and cold outlets should be flushed for a minimum of 3 minutes and until the water temperature stabilises in line with current temperature profile (<20°C for cold water and >55°C for hot water) (or until removal is carried out) <sup>1 &amp; 2</sup>                                     | Yes  |              |
| Twice weekly flushing of emergency/deluge shower for a minimum of 3 minutes and until the water temperature stabilises in line with current temperature profile (<20°C for cold water and >55°C for hot water) – located in A&E Decontamination Room and Hydrotherapy Pool Plantroom <sup>1 &amp; 2</sup>   | Yes  |              |
| Twice weekly flushing of deadlegs/blind ends (inc CWST Drain pipework where these cannot be removed) where these cannot be removed. Hot and cold outlets should be flushed for a minimum of 3 minutes and until the water temperature stabilises in line with current temperature profile (<20°C for cold water and >55°C for hot water) (or until removal is carried out) <sup>1 &amp; 2</sup> | Yes  |              |
| Weekly Chloramination sampling from hot and cold water outlet point, representative of each secondary distribution pipework system. These should initially be conducted weekly and then subject to ongoing trend based frequency risk assessment, limited to no less than at once per month sampling test frequency.  | N/A<br>(Estates advised Scottish Water have confirmed mains supply is not Chloraminated) |              |
| Weekly check of water levels within water tanks   | Yes<br>Monitored on BEMS   |              |
| Weekly alteration of hot water secondary circulation pumps (ensuring every pump runs at least weekly)   | N/A<br>Individual pumps  | N/A          |
| Weekly test to confirm booster, recirculation and de-stratification pumps operating correctly   | Yes  |              |
| Weekly initially and then moving to Monthly measure the concentration of chlorine dioxide at the sentinel taps – the concentration should be at least 0.1 mg/l (or as advised by WSG); and adjust the chlorine dioxide dosage to establish the required residual at the sentinel sample points.   | Yes  |              |
| Weekly initially and then moving to Monthly test the treated water for both chlorine dioxide and total oxidant/chlorite at an outlet close to the point of injection to verify the dosage rate and conversion yield.  | Yes  |              |
| Weekly check on the ClO <sub>2</sub> dosing system(s) operation to ensure operating correctly and dosing at correct levels (as per HSG 274 Part 2, NHS GG&C Dosing System Specifications and in accordance with manufacturer’s instructions) and chemical stocks in the reservoir   | Yes  |              |

**Cont...**

**N.B.** Ensure all actions are recorded and stored in the site Water Systems, or other appropriate Logbooks

## WATER SYSTEMS RISK ASSESSMENT

| Summary of ppm tasks recommended within site Written Scheme/Water Safety Plan  | Recommended                              | Allocated To |
|--|--|--------------|
| Monthly calorifier/water heater storage (including plate heat exchangers) temperatures checks at top (flow) and return pipework (where applicable). Recommended flow temperature – min 60°C, return temperature – min 55°C.<br>*also note potential scald risks  | Yes<br>Monitored on<br>BEMS              |              |
| Monthly temperature checks on hot outlets at sentinel, little-used & selected outlets. >55°C within 1 minute (also note potential scald risks and out of spec TMVs) to create a temperature profile of systems.  | Yes                                      |              |
| Monthly temperature checks on cold outlets at sentinel, little-used & selected outlets. <20°C within 2 minutes to create a temperature profile of building and monitor heat gain within the cold water system.   | Yes                                      |              |
| Monthly temperature checks on all primary flow and return loops to confirm they are at a minimum of 55°C and to create a temperature profile of the whole system.  | Yes<br>Partially<br>monitored on<br>BEMS |              |
| Monthly/Quarterly take temperatures (ideally on a rolling monthly rota to ensure all covered on a quarterly basis) at return legs of subordinate loops to confirm they are at a minimum of 55°C and to create a temperature profile of the whole system. (Note: this is not practical in many areas as pipework runs above ceilings and doesn't drop to actual outlets with a Hi Scribe required to access above ceiling). | Yes                                      |              |
| Monthly/Annually take temperatures (ideally on a rolling monthly rota to ensure all covered on an annual basis) at return legs of tertiary loops to confirm they are at a minimum of 55°C and to create a temperature profile of the whole system. (Note: this is not practical in many areas as pipework runs above ceilings and doesn't drop to actual outlets with a Hi Scribe required to access above ceiling).       | Yes                                      |              |
| Monthly flushing of accumulator vessels (at CWST Booster pumps) as not 'flow through' design   | Yes                                      |              |
| Monthly changing of tap/showerhead POU/Anti-microbial filters within designated Wards/Departments/Rooms (i.e. Children's Wards 2A & 2B)  | Yes                                      |              |
| Monthly changing of inline POU/Anti-microbial dishwasher filters   | Yes                                      |              |
| Monthly Inspect, clean & log glass traps and overflow condition on Air Handling Units (and if fitted to CWST overflow/warning pipes)   | Yes                                      |              |
| Bi-Monthly (i.e. 62 days) changing of tap/showerhead POU/Anti-microbial filters within designated "High-Risk" Wards/Departments/Rooms  | Yes                                      |              |
| Quarterly <sup>1</sup> descaling, cleaning and disinfection of showerheads & hoses & spray outlets, or replace with new Shower Head and Hose (or frequency as indicated by the rate of fouling or other risk factors, e.g. areas with high risk patients)  | Yes                                      |              |
| Quarterly inspection and cleaning of system strainers (including angle valve strainers) (or frequency as indicated by the rate of fouling or other risk factors, e.g. areas with high risk patients)   | Yes                                      |              |
| Quarterly, each calorifier and any associated storage/buffer vessels should be flushed through its drain valve by opening the drain valve 3 times, each time for a 3 minute period. Arrange for samples to be taken from hot water calorifiers, to note condition of drain water.  | Yes                                      |              |
| Quarterly (or frequency as indicated by the rate of fouling) inspection of outlets for evidence of scale formation (descaling as necessary).   | Yes                                      |              |
| Quarterly changing of Horne Optitherm Diffuser/Flow Straightener on non-filtered outlets   | Yes                                      |              |

**Cont...**

<sup>1</sup> HSG Part 2 recommends that all showers are cleaned and descaled quarterly at least quarterly. SHTM 04-01 Part G recommends that this should be carried out "Three-monthly for high risk areas and as required elsewhere, but at least once annually".

**N.B.** Ensure all actions are recorded and stored in the site Water Systems, or other appropriate Logbooks



## WATER SYSTEMS RISK ASSESSMENT

| Summary of ppm tasks recommended within site Written Scheme/Water Safety Plan   | Recommended  | Allocated To |
|---|--|--------------|
| Quarterly during periods of Change -<br>Water System Sampling (at random water outlets in High Risk Patient Areas) in Water Systems still serving High Patient Risk Areas   | Yes  |              |
| Six Monthly servicing TMV/TMTs or mixer valves, including fail safe tests and cleaning/disinfection of strainers within "Designated High Risk Area"/ICUs (more frequently if manufacturer recommends – or if 'drift' in excess of 1°C at mixed outlet temperature when highlighted during temperature monitoring or other maintenance) including thermal pasteurisation where practical and as directed by ICT/manufacturer's instructions. | Yes  |              |
| As required/as directed by ICT – drain cleaning and disinfection of drains and traps in designated areas  | Yes  |              |
| Six monthly cold water summer / Winter temperature monitoring of cold water at inlet to building. Also to be continuously monitored by BEMS & log of all alarms   | Yes<br>Monitored on BEMS                                       |              |
| Six monthly CWST condition inspection noting appearance of water, stagnation, odour, rust, scale, sediment, debris, paint/liner condition, bio film accumulation, tank lid fitting satisfactorily and insulation condition  | Yes  |              |
| Six monthly CWST temperature checks on tank supply and stored water at opposite side from tank inlet if possible (inlet and stored water should be <20°C, with stored water no more than 2°C warmer than make-up water.)  | Yes  |              |
| Six monthly or Annual <sup>2</sup> servicing TMV/TMTs or mixer valves, including fail safe tests and cleaning/disinfection of strainers. (more frequently if manufacturer recommends – or if 'drift' in excess of 1°C at mixed outlet temperature when highlighted during temperature monitoring or other maintenance)  | Yes  |              |
| Six monthly chemical and microbiological water samples from water tanks which feed drinking water outlets   | Yes  |              |
| Six monthly inspection of Air Handling Units humidity section (where installed) and cooling section   | Yes  |              |
| Cleaning and Disinfection of Air Handling Units   | Yes<br>See frequency guidelines provided below                 |              |
| Annually arrange for samples to be taken from hot water calorifiers/water heaters in order to note condition of drain water.  | Yes  |              |
| Cleaning and disinfection of Cold Water Storage Tanks (and water systems if practicable) in accordance with BS EN806/BS 8558 (Formerly BS 6700) as and when required (dependant on CWST inspection & sample results). Other remedial works to be carried out as necessary where highlighted during routine inspections or whilst tanks drained etc.   | Yes<br>See frequency guidelines provided below                 |              |
| Annual internal inspection and cleaning/descaling of the calorifier/water heater with disinfection/pasteurisation upon completion   | Yes  |              |
| Arrange for microbiological samples to be taken from water system which represent the complexity of the water system(s) and particularly in areas of concern. All sampling should be carried out in accordance with BS 7592:2008 and all analysis by a UKAS accredited laboratory. <sup>3</sup>   | Yes<br>Dependant on Monitoring results, and as directed by ICT |              |
| Pasteurisation/disinfection of calorifier/water heaters carried out as and when required dependent on temperature monitoring and sample results   | Yes<br>See frequency guidelines provided below                 |              |
| Annual turnover test on cold water storage system. Checks should be carried out to ensure that volume of water stored is no more than would generally be used in a normal 12 hour period.   | Yes  |              |

<sup>2</sup> TMV Servicing frequency is contradictory in the various guidance documents. We would advise an initial sweep of servicing with ongoing frequency determined based on the findings of the initial servicing.

<sup>3</sup> Sampling regime should be formulated by site/client based on the known history of the water systems and the details included within this and previous risk assessments, with assistance of specialist legionella consultant (e.g. DMA) if necessary. Although L8 does not specifically request legionella sampling in cases where there are incorrect distribution or supply temperatures, water quality issues or other factors which may increase the likelihood of legionella (and other bacterial) proliferation and dissemination sampling should be carried out. For further guidance please refer to HSG 274 Part 2, HTM/SHTM 04-01 and BS 7592:2008

**N.B.** Ensure all actions are recorded and stored in the site Water Systems, or other appropriate Logbooks

## WATER SYSTEMS RISK ASSESSMENT

|   |     |  |
|---|-----|--|
| Annually test the chlorine dioxide and total oxidant/chlorite concentration at a representative selection of outlets throughout the distribution system – the concentration should be at least 0.1 mg/l chlorine dioxide. | Yes |  |
| Annual inspection of vibration coupling on pumps/plant, replacing as necessary (more frequently if recommended by manufacturer)   | Yes |  |

**Cont...**

| Summary of ppm tasks recommended within site Written Scheme/Water Safety Plan  | Recommended  | Allocated To |
|--|--|--------------|
| Annual inspection & cleaning of buffer/accumulator vessels (more frequently if recommended by manufacturer)  | Yes<br>Flow Through<br>Vessels Being<br>Installed at Present |              |
| Annual inspection of plant and pipework insulation, repairing where necessary.   | Yes  |              |
| Annual test to ensure that plant temperature, pressure gauges and thermostats are accurate (Also note during routine temperature monitoring where appropriate)   | Yes  |              |
| Biennial stratification checks on calorifiers. These checks should extend over a period of seven (7) days using a logging device to establish that the water temperature at the base of the vessel achieves 60°C.  | Yes  |              |
| Maintenance/servicing of Veolia filtration plant as per manufacturers recommend frequency  | Yes  |              |
| Annual (or periodic as specified by manufacturer) servicing of backflow prevention devices (i.e. RPZ)  | Yes  |              |
| Drinking water dispensers - maintain in accordance with manufacturers guidelines. Please note freestanding drinking water machines (i.e. bottled) and ice machines should not be installed in healthcare premises and should be removed wherever found. <b>N.B.</b> Drinking water dispensers removed from hospital at time of survey with lines incorporated into site flushing regime.   | Yes<br>If Water Coolers<br>Reinstated                        |              |
| Reports have been received intimating that high levels of Pseudomonas and Legionella bacteria have been found in water samples taken from outlets fed by flexible hoses lined with ethylene propylene diene monomer (EPDM) due to colonisation of the lining, although it is possible that other lining materials and washers within couplings could be similarly affected. Wherever practical these should be replaced with services hard piped. Where this is not practical should be given to changing EPDM flexible hoses and other lining materials and washers. Where changing to alternative materials is not practical periodic (e.g. six monthly) monitoring should be implemented on EPDM hoses, with hoses swapped out as necessary dependant on sample results and/or rate of fouling witnessed. | Yes  |              |
| All plant and equipment should be serviced and maintained in accordance with manufacturers recommendations   | Yes  |              |
| Closed Heating and Chilled Water Systems – Minimise aerosol creation during maintenance procedures. Maintain in accordance with manufacturer's/installers instructions.  | Yes  |              |
| Air Conditioning and Ventilation – Maintain in accordance with manufacturer's/installers instructions and SHTM 03-01.  | Yes  |              |

*Task frequencies described above are for guidance only. Frequencies may vary dependent on system conditions highlighted during routine monitoring. Suitable Method Statements/SOPs should be followed for each task.*

**N.B.** Ensure all actions are recorded and stored in the site Water Systems, or other appropriate Logbooks

## WATER SYSTEMS RISK ASSESSMENT

| System / Service  | Circumstance Requiring Cleaning and Disinfection   | Frequency   |
|---|--|-------------|
| Domestic Cold Water Tank                                  | New installations<br>Re-commissioning empty/unused tanks<br>Tank temperature exceeds 25°C<br>Tank contains moderate sediment, i.e. a complete covering of the tank base.<br>Evidence of tank corrosion<br>Any contamination of tank (by organic, by vermin or vermin faeces or similar)<br>Gross organic contamination e.g. large number of dead insects, feathers, animal or bird bodies etc. | As required |
|   | Regular programme for high-risk healthcare category, with disinfection   | Annually    |
| Domestic Cold Water Distribution System                   | New installations and modifications or additions<br>Temperature exceeds 25°C<br>Any contamination of tank (by organic, by vermin or vermin faeces or similar)<br>Gross organic contamination e.g. large number of dead insects, feathers, animal or bird bodies etc.   | As required |
| Domestic Hot Water Calorifier and Storage/ Buffer Vessels | New installations and modifications or additions<br>Temperature has fallen below 45°C<br>Re-commissioning of empty/unused plant<br>Any contamination of header tank (by organic, by vermin or vermin faeces or similar)  | As required |
|   | Regular programme  | Annually    |
| Domestic Hot Water Distribution System                    | New installations and modifications or additions<br>Temperature has fallen below 45°C<br>Any contamination of header tank (by organic, by vermin or vermin faeces or similar)  | As required |
| Air Handling Units  | Any contamination (by organic, by vermin or vermin faeces or similar)<br>Gross organic contamination e.g. large number of dead insects, feathers, animal or bird bodies etc.   | As required |
|   | Chiller battery, drip trays and drainage pipework  | 6 monthly   |

**N.B.** Information in table above taken from SHTM 04-01

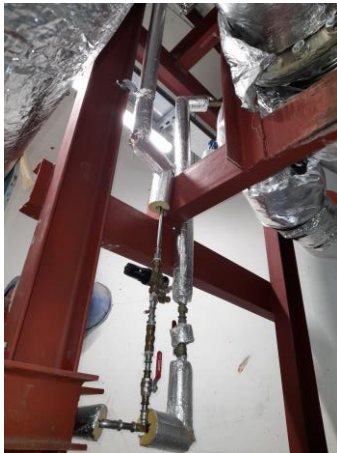
**N.B.** Ensure all actions are recorded and stored in the site Water Systems, or other appropriate Logbooks

**LEGIONELLA RISK ASSESSMENT**

# **Section 11**

## **Photographic Appendix**

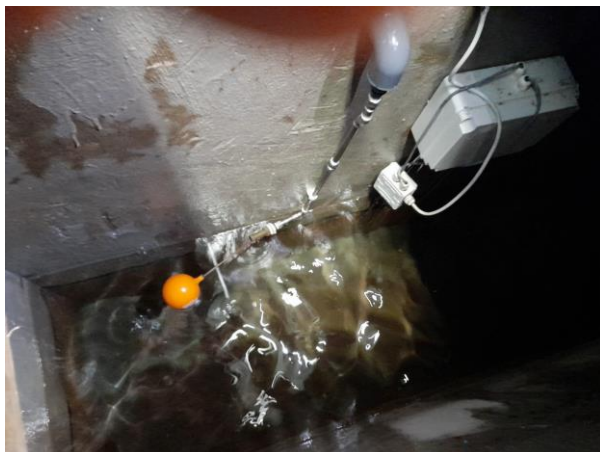
## **LEGIONELLA RISK ASSESSMENT**



**Govan Road Mains with Branch to Pressurisation Unit & Supply to Children's Hydrotherapy Pool Balance Tank - DCV Fitted Upstream of PRV.**



**Hardgate Road Incoming Town Mains & Fire Tanks Main**



**Children's Hydropool Balance Tank - No Suitable Air Gap on Mains Supply**



**Example 1 of Corroded Internal Supports & Fittings in Filtered Water CWSTs**



**Example 2 of Corroded Internal Supports & Fittings in Filtered Water CWSTs**



**Example 3 of Corroded Internal Supports & Fittings in Filtered Water CWSTs**

# **LEGIONELLA RISK ASSESSMENT**



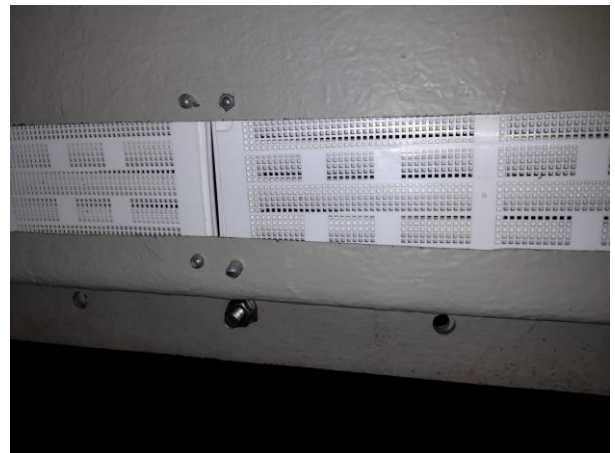
**Example CWST Drain Points - Flushing Regime**



**Example of CWSTs Fittings Condition**



**Example of Staining on CWSTs Raised Chambers**



**Example of CWSTs Raised Chamber Screen**

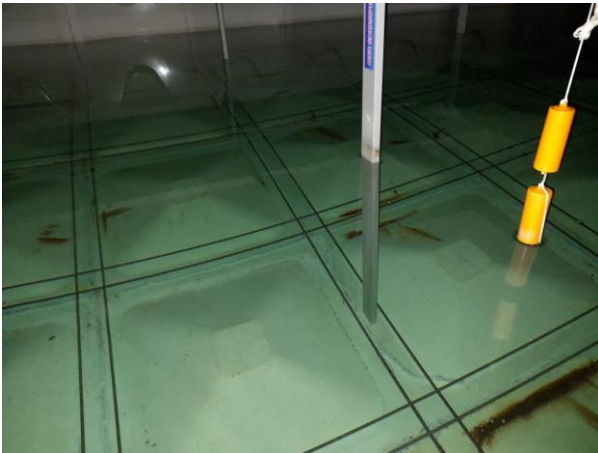


**Filtered Water Booster Set 1**



**Filtered Water Booster Set 2**

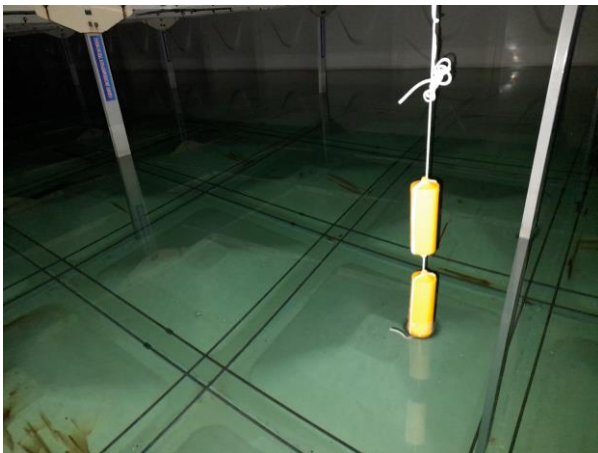
# **LEGIONELLA RISK ASSESSMENT**



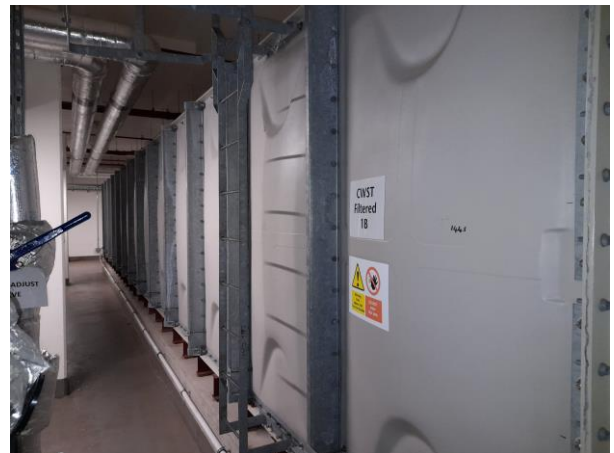
**Filtered Water CWST 1A Internal**



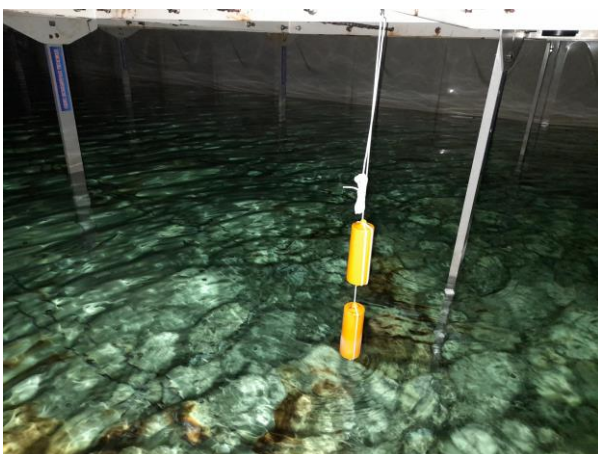
**Filtered Water CWST 1A**



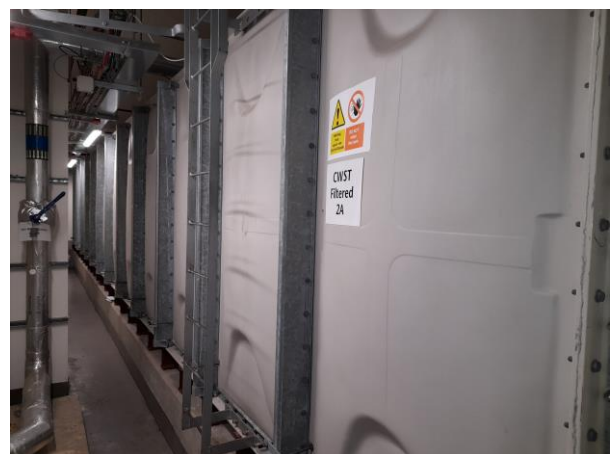
**Filtered Water CWST 1B Internal**



**Filtered Water CWST 1B**

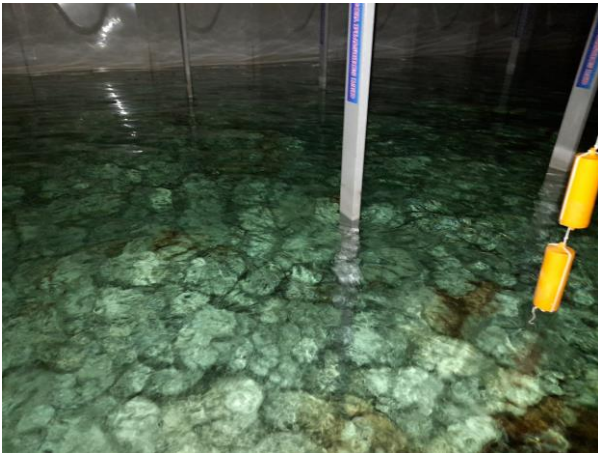


**Filtered Water CWST 2A Internal**



**Filtered Water CWST 2A**

# **LEGIONELLA RISK ASSESSMENT**



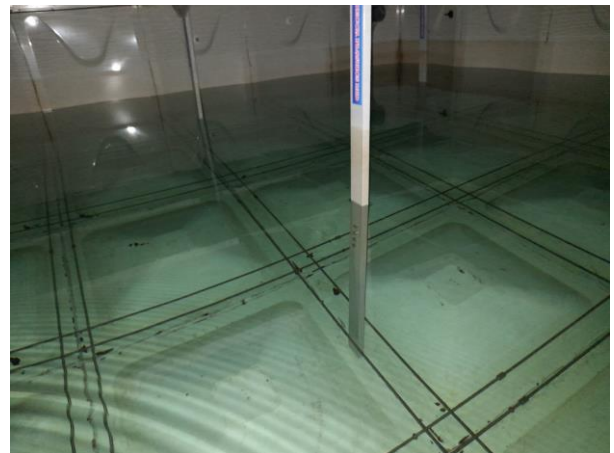
**Filtered Water CWST 2B Internal**



**Filtered Water CWST 2B**



**Position of DCV on Supply to Trade Water CWST 1 after Water Meter.**



**Raw Water CWST 1A Internal**



**Raw Water CWST 1A**



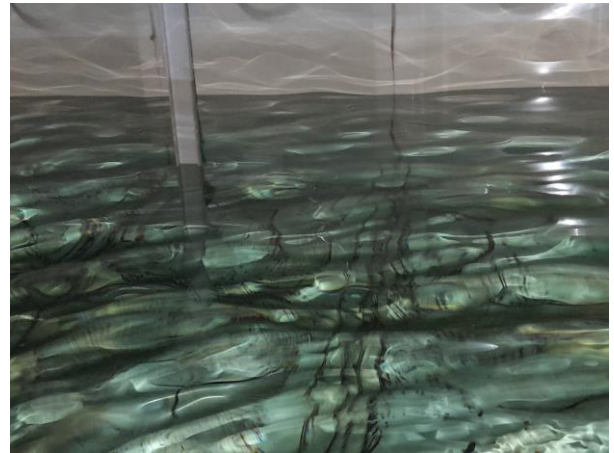
**Raw Water CWST 1B Internal**



# **LEGIONELLA RISK ASSESSMENT**



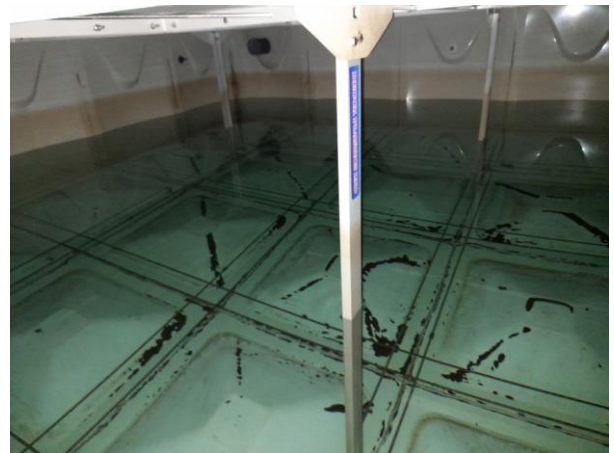
**Raw Water CWST 1B**



**Raw Water CWST 2A Internal**



**Raw Water CWST 2A**



**Raw Water CWST 2B Internal**



**Raw Water CWST 2B**



**Raw Water CWSTs Filtration Unit 1**

# **LEGIONELLA RISK ASSESSMENT**



**Raw Water CWSTs Filtration Unit 2**



**Raw Water CWSTs Filtration Unit 3**



**Trade Water CWSTs 1 & 2**



**Trade Water CWSTs Booster Set**



**Open Face Safety Valve in Calorifier Plant Room  
41**



**Plant Room 22 Offline Calorifier 1 (Mid)**

# **LEGIONELLA RISK ASSESSMENT**



**Plant Room 31 - Calorifiers 1-3**



**Plant Room 31 - Calorifiers 4-6**



**Plant Room 31 - Calorifiers 4-6**



**Plant Room 32 - Calorifiers 1-3**



**Plant Room 41 - Calorifiers 1-3**



**Plant Room 41 - Calorifiers 1-3**

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## Authorising Engineer Water Systems Management and Compliance Audit of NHS Water Systems

|  |   |   |
|--|---|---|
| <b>Site Address:</b>   |   |   |
| Queen Elizabeth University Hospital and the Royal Hospital for Children Hospital,<br>1345 Govan Rd,<br>Glasgow<br>G51 4TF  |   |   |
| <b>Date of Audit:</b>  | <b>Auditor:</b>                                   | <b>Staff Interviewed:</b>   |
| 11 <sup>th</sup> January 2024  | Dennis H Kelly Snr – Authorising Engineer (Water) | Kerr Clarkson – Operational Estates Manager<br>Matt Feeney – Trainee Compliance |
| <b>Date of Previous Audit:</b>   |   |   |
| 11 <sup>th</sup> January 2023  |   |   |
| <b>Site General Description:</b>   |   |   |
| <p>This audit was completed on the NHS GGC QEUH and RHC properties only.</p> <p>The QEUH adult Hospital building comprises of 12 stories, with the basement housing mainly FM areas. Connected to the main building is the RHC Hospital comprising of 4 storeys. Both buildings are served by the same water system.</p> <p>There are two mains water supplies coming into the buildings and these are switched on a regular basis to limit the opportunity for stagnation in the mains water supply pipework.</p> <p>Raw mains water is held in raw water tanks before being passed through a 0.02 micron membrane filtration process, The water is then stored in treated water storage tanks prior to being distributed around the building.</p> <p>Cold water is then distributed through the hospitals via booster pump sets located in the tank room. Hot water is provided by a number of calorifier heating stations installed throughout the hospitals.</p> |   |   |

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## Authorising Engineer Water Systems Management and Compliance Audit of NHS Water Systems

The hospital water systems are secondary disinfected with chlorine dioxide via multiple retrofitted dosing systems located throughout the hospitals.

Given the size of the two hospitals the water systems are large and complex. There are around 1400 en suite bedrooms and in excess of 6000 TMV/TMT's in the buildings.

### **Executive Summary:**

The previous audit was completed on January 11<sup>th</sup> 2023.

This current audit yielded 7 recommendations. one less than the 2022 audit. This can be favourably compared to the audit review of two years ago which had twenty-three recommendations.

A summary of the current situation with regard to the water systems at the QEUH/RHC hospital is that the delivery of the required risk reduction processes and procedures is in safe hands.

There are some recommendations in this regard to improve this further.

The level of knowledge and understanding of the onsite Estates' staff is extremely high and a diligent approach is taken to ensuring that the water systems are operated in a manner required to deliver high quality risk reduction processes and procedures.

Thanks are due to Kerr Clarkson and Matt Feeney of NHS GGC for their help and support in completing this audit.

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## Authorising Engineer Water Systems Management and Compliance Audit of NHS Water Systems

### Description of Levels of Risk:

|                  |  |
|------------------|--|
| <b>Very High</b> | Urgent Remedial Action – Lp growth and aerosol opportunity with susceptible people present on site |
| <b>High</b>      | Remedial Action is needed but not immediately – Lp growth opportunity is present                   |
| <b>Medium</b>    | Acceptable risk but some concerns– Lp likely to be controlled but improvements should be sought    |
| <b>Low</b>       | Risk controlled and acceptable   |

### Levels of Risk found during the Audit:

The levels of risk detailed below reflects the highest level of risk identified during the audit of that particular topic.

The audit process reviews the following 9 areas.:-

| <b>Audited Topic</b>                  | <b>Level of Risk</b> |
|---------------------------------------|----------------------|
| Risk Assessment                       | Medium               |
| Schematic Drawings                    | Low                  |
| Management and Competency             | Medium               |
| Written Scheme Monitoring and Records | Low                  |
| Task Completion                       | Very High            |
| On Going Water Treatment              | Low                  |
| Cleaning and Disinfection Procedures  | Low                  |
| New Build and Refurb Capital Projects | Low                  |
| Water Safety Group                    | Low                  |

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## Authorising Engineer Water Systems Management and Compliance Audit of NHS Water Systems

| Summary of Actions                                  |   |            |                 |            |
|---|---|------------|-----------------|------------|
| Actions   |   | Risk Level | Completion Date | Signature  |
| 1.  | It is recommended that section 9 of the new risk assessment is checked to ensure that the current risk reduction procedures, and any other procedures mentioned below in this audit (sections 1.8 and 1.9) as being part of section 9, have been assessed as part of the risk assessment process. |            |                 |            |
| 2.  | It is recommended that when the outstanding section 10 of the new risk assessment is received, a check is completed to see if guidance is included in what should be in a written scheme.   |            |                 |            |
| 3.  | It is recommended that a process that ensures that any changes made which require updated drawings can be passed to the CAD manager for inclusion in the drawings file.   |            |                 |            |
| 4.  | It is recommended that schematic drawings are reviewed at least annually and amended and updated to reflect any water system changes.   |            |                 |            |
| 5.  | It is recommended that a check is made to ensure that the draft Water Policy Document is approved by NHS GGC and once this is completed it should be adopted by site.   |            |                 |            |
| 6.  | It is recommended that the contractors, and in particular Livingston Mechanical, are contacted with a view to getting updated training records.   |            |                 |            |
| 7.  | It is recommended that flushing of the non-flow through expansion vessels is initiated and recorded as soon as possible.  |            |                 |            |
| Question Set and Associated Comments from the Audit |   |            |                 |            |
| Section 1<br>Risk Assessment                        | Y/N   | Comments   |                 | Risk Level |

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### Authorising Engineer Water Systems Management and Compliance Audit of NHS Water Systems

|     |   | U/K,<br>N/A or<br>Partial |  |  |
|-----|---|---------------------------|--|--|
| 1.1 | Is there a written risk assessment in place for the building water systems?           | Y                         |  |  |
| 1.2 | Was the risk assessment completed and delivered to site within the past two years?    | Y                         | In the previous audit, completed on 11 <sup>th</sup> January, 2023, there was a recommendation that a new risk assessment should be completed. This has now been done although sections 8 to 11 of the new risk assessment were yet to be delivered to site at the time of this audit. The supplier was contacted during the audit and they confirmed that the outstanding sections of the RA would be supplied. It was confirmed to the AE Water, prior to completing the write up of this audit, that sections 8 to 11 had now been delivered to site. Given the size of the QEUH RHC hospital it is noted that the new risk assessment requires many months of site time to complete. |  |
| 1.3 | Does the site/organisation have plans about reviewing or redoing the risk assessment? | Y                         | It is understood by the auditor that NHS GGC have a process that involves redoing the risk assessments of acute sites on a minimum two-yearly cycle.   |  |
| 1.4 | Does the risk assessment address all the water systems in the building?               | N                         | Section 3 of the new risk assessment details the various other water systems in the QEUH RHC and includes a comment as to whether the system was included in this new risk assessment. The compliance manager evidenced the communications between Estates and other departments where nebulisers etc are used. Communications have also been held with dental regarding water and its use in the dental chair in the RHC. It was then stated at the time of the audit that discussions have taken place on addressing the audits of the other water systems not covered by the DMA Canyon risk assessment. The hydrotherapy pool has been risk assessed.                                |  |



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### Authorising Engineer Water Systems Management and Compliance Audit of NHS Water Systems

|     |  |     |   |  |
|-----|--|-----|---|--|
|     |  |     | It appears therefore that the QEUH RHC hot and cold water systems are being looked after from a risk assessment point of view, and that the other systems, which are outside the control of the Estates Department, will be addressed by others.  |  |
| 1.5 | Are there any systems that are defined as being excluded from the assessment in the RA scope?  | Y   | Although the Hydrotherapy pool was mentioned in the list of additional water systems, the risk assessment document did state that the pool was assessed separately by a specialist pool supplier. The Hydrotherapy pool was risk assessed by the BRIO in 2023.  |  |
| 1.6 | Does the risk assessment review the current risk reduction processes and procedures that are currently in use at the site?   | U/K | The current risk reduction processes are normally reviewed in Section 9 of the RA document. Section 9 had not yet been delivered at the time of this audit and therefore it is not possible to comment on this question. This item was addressed in section 9 of the previous risk assessment.<br>It is recommended that section 9 of the new risk assessment is checked to ensure that the current risk reduction procedures, and any other procedures mentioned below in this audit (sections 1.8 and 1.9) as being part of section 9, have been assessed as part of the risk assessment process. |  |
| 1.7 | Does the risk assessment contain details of the people/organisations who are involved in the risk reduction processes and procedures? This should include comments on the dutyholder, the responsible person, any deputy responsible persons and also service providers and contractors. | U/K | In a DMA risk assessment this information is normally contained in Section 9. Section 9 of the risk assessment document is entitled "Governance and Documentation Review". This section normally contains a comprehensive description of the roles and responsibilities for water within the NHS GGC organisation and the named individuals that hold these roles. However, as section 9 of the new risk assessment was still to be delivered at the time of this audit it is not possible to make a comment here.<br>The recommendation made in section 1.7 covers this situation.                 |  |
| 1.8 | Is there an assessment of the competency of all involved parties in the risk assessment?   | U/K | The recommendation made in section 1.7 covers this situation.   |  |

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### Authorising Engineer Water Systems Management and Compliance Audit of NHS Water Systems

|      |  |     |  |  |
|------|--|-----|--|--|
| 1.9  | Does the risk assessment specifically address and comment on evidence of the current defect/remedial action processes and procedures?  | U/K | Section 9 of a DMA risk assessment normally includes a gap analysis which comments on the evidence of the current remedial processes and procedures.<br>The recommendation made in section 1.7 covers this situation.  |  |
| 1.10 | Is there an assessment of the susceptibility of persons who may be affected by the building water systems?   | Y   | This is covered in Section 1 of the risk assessment document on page 13 of the new risk assessment.  |  |
| 1.11 | Is there a schematic diagram provided with the risk assessment?  | N   | There are no schematics in the risk assessment document as this was not part of the scope of supply, but as fitted drawings for both hospitals are available elsewhere in the Zutec system and are stored electronically.<br>It may be the case that the supply of schematic diagrams was not part of the scope of supply covering the new risk assessment.  |  |
| 1.12 | Is there a new written scheme provided as part of the risk assessment?   | U/K | This may not have been part of the scope of supply agreed with the risk assessment supplier.<br>There is normally guidance provided in section 10 of a DMA risk assessment as to what should be included in a written scheme.<br>Site has created a comprehensive written scheme.<br>It is recommended that when the outstanding section 10 of the new risk assessment is received, a check is completed to see if guidance is included in what should be in a written scheme. |  |
| 1.13 | Does the assessment contain details of all the component parts of the water systems? This could include tanks, calorifiers, pipework and pipework layout, outlets, TMV's, expansion vessels etc etc etc. | Y   |  |  |

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### Authorising Engineer Water Systems Management and Compliance Audit of NHS Water Systems

|      |   |   |   |  |
|------|---|---|---|--|
| 1.14 | Is consideration given to system design, flow, temperature and the opportunity for bacteria to grow and develop in the water systems? | Y |   |  |
| 1.15 | Does the risk assessment identify any areas of spray and aerosol creation?  | Y | The previous risk assessment format included details of all of the water outlets, and on the same page comments were made as to whether the outlet was considered to be little used, or whether it was likely to lead to the creation of spray.<br>Discussions with the RA provider stated that the only areas of spray generation were the showers.<br>Therefore no other areas of spray generation were identified in the RA document.  |  |
| 1.16 | Are areas of low use and low flow identified in the risk assessment?  | N | It was stated by the RA provider that all outlets were in use and that there were no areas with LUO's. Where there are LUO's in the plant rooms these are flushed under contract by DMA.<br>Additionally, the Estates department write to clinical heads of the various departments every three months asking that any outlets which are now little used are notified to Estates and that flushing procedures are put in place.   |  |
| 1.17 | Are deadlegs specifically detailed in the risk assessment?  | Y | Deadlegs are mentioned in various sections of the RA report. On page 3 of section 2 there is a statement saying details of deadlegs are mentioned in section 5 of the risk assessment. Section 5 has remedial recommendations for storage tanks and which may contain some information on deadlegs.<br>However, it could be the case that there are other deadlegs not associated with the cold water storage tanks.<br>Deadlegs are also covered in the remedials action section of the RA report. |  |

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## Authorising Engineer Water Systems Management and Compliance Audit of NHS Water Systems

|  |   |  |   |                       |
|--|---|--|---|-----------------------|
| 1.18   | Is there a set of remedial actions clearly identified in the risk assessment?                   | Y  | The remedial actions are detailed in section 2 in the RA document in the section titled Recommendations.  |                       |
| 1.19   | Is there a clearly explained risk scoring system in the risk assessment?                        | Y  |   |                       |
| 1.20   | Are there any areas of augmented care in the hospital?  | Y  | There are areas of augmented care in the hospital as per the criteria detailed in HPS guidelines.   |                       |
| <b>Actions on the Risk Assessment</b>  |   |  |   |                       |
| <ol style="list-style-type: none"> <li>It is recommended that section 9 of the new risk assessment is checked to ensure that the current risk reduction procedures, and any other procedures mentioned below in this audit (sections 1.8 and 1.9) as being part of section 9, have been assessed as part of the risk assessment process.</li> <li>It is recommended that when the outstanding section 10 of the new risk assessment is received, a check is completed to see if guidance is included in what should be in a written scheme.</li> </ol> |   |  |   |                       |
| <b>Section 2<br/>Schematic Drawings</b>  |   | <b>Y/N<br/>U/K,<br/>N/A or<br/>Partial</b> | <b>Comments</b>   | <b>Risk<br/>Level</b> |
| 2.1  | Are schematic drawings available in the written scheme, or in some other place in the property? | Y  | There is a note in the Smart Sheet electronic data management system detailing the locations of the soft copies of the drawings as being available on ZUTEC (electronic data storage system). |                       |
| 2.2  | Do the schematic drawings show all the components of the water systems?                         | Y  | The drawings are as fitted and detail the entire system configuration including all component parts.  |                       |
| 2.3  | Are the water system return legs shown on the schematic drawings?                               | Y  |   |                       |

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### Authorising Engineer Water Systems Management and Compliance Audit of NHS Water Systems

|   |  |         |   |  |
|---|--|---------|---|--|
| 2.4   | Are secondary and tertiary loops shown on the schematic drawings?                      | Y       |   |  |
| 2.5   | Have any amendments been made to the schematic drawings?                               | Y       | <p>As an example, Scotmas, who provided the chlorine dioxide dosing systems, are also contracted to supply drawings of the tank room pipework which was altered to allow for the installation of the dosage equipment. It was stated at the time of the audit that these drawings had not yet been created and delivered.</p> <p>The entry in the Smartsheet system states that all the Scotmas related drawings have been added to the SCART ClO2 folder.</p> <p>The recently completed on the water systems in wards 2A and 2B had pipework modifications and drawings have been provided and are held in the SCART folder projects file.</p> <p>It was stated during the audit that any changes made to pipework are reflected in new drawings being provided at the time. Discussions were held with the Estates Technical Officer on the CAD drawings. It is recommended that a process that ensures that any changes made which require updated drawings can be passed to the CAD manager for inclusion in the drawings file.</p> |  |
| 2.6   | If amendments have been made are they signed and dated?                                | N/A     |   |  |
| 2.7   | Is there any indication that drawings are regularly inspected and updated if required? | Partial | <p>It was stated that drawings will be checked during the working year as and when required. There is no formal process in place.</p> <p>It is recommended that schematic drawings are reviewed at least annually and amended and updated to reflect any water system changes.</p>  |  |
| <b>Actions on Schematic Drawings</b>  |  |         |   |  |
| <p>3. It is recommended that a process that ensures that any changes made which require updated drawings can be passed to the CAD manager for inclusion in the drawings file.</p> |  |         |   |  |

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### Authorising Engineer Water Systems Management and Compliance Audit of NHS Water Systems

| 4. It is recommended that schematic drawings are reviewed at least annually and amended and updated to reflect any water system changes. |  |                                  |   |               |
|--|--|----------------------------------|---|---------------|
| Section 3<br>Management and Competency   |  | Y/N<br>U/K,<br>N/A or<br>Partial | Comments  | Risk<br>Level |
| 3.1  | Is there a nominated duty holder?  | Y                                | <p>There is a copy of an updated NHS GGC Policy Document dated 2023 available electronically. The document is in final draft format and at the time of this audit it is awaiting WSG approval.</p> <p>In appendix 2 of the policy document, it states that the Duty Holder is the Chief Executive.</p> <p>A more detailed hierarchy table was also available in Appendix 4.</p> <p>At the time of this audit, final WSG approval is awaited for the Policy document and this is expected imminently.</p> <p>It is recommended that a check is made to ensure that the draft Water Policy Document is approved by NHS GGC and once this is completed it should be adopted by site.</p> |               |
| 3.2  | Is there a responsible person nominated in writing?  | Y                                | In NHS GGC, the sector estates manager is regarded as the responsible person and this is recorded, and is up to date, in the on-site WSP. The responsible person covering the QEUH is Euan Smith and a copy of the appointment letter was available during the audit.   |               |
| 3.3  | Is there a clearly defined management structure which includes the relevant on-site personnel and all service providers and contractors? | Y                                | <p>The management structure is defined in appendix 4 of the NHS GGC water policy.</p> <p>It is further defined in Section 3.2 of the Written Scheme document.</p>   |               |

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### Authorising Engineer Water Systems Management and Compliance Audit of NHS Water Systems

|      |   |   |   |  |
|------|---|---|---|--|
| 3.4  | Is there a clearly defined line of communication in the written scheme?                                       | Y | The management structure is defined in appendix 1 of the NHS GGC water policy.<br>It is further defined in Section 3.2 of the Written Scheme document.  |  |
| 3.5  | Are the responsibilities of all involved parties clearly defined in the written scheme?                       | Y | Roles and responsibilities are clearly defined in the NHS GGC Water Policy document and also in the site water safety plan.   |  |
| 3.6  | Does the organisation have an up to date and current policy document?   | Y | NHS GGC has an updated policy document which is awaiting imminent approval by the Board WSG.  |  |
| 3.7  | Does the organisation have an up to date and current procedures document?                                     | Y | NHS GGC has a Written Scheme document for the QEUH Campus. It is dated October 2023 and is revision H.  |  |
| 3.8  | Do all staff have relevant up to date training in place?  | Y | The details of the training records are available in the WSP in section 3.4 The board wide water skills register is available on Smart Sheet. The Smart Sheet training record system was comprehensive. There are 7 APs and 6 CPs listed as being trained. 3 staff are detailed as requiring updated training and a recommendation for this will be covered in the 2024 training plans.   |  |
| 3.9  | Are copies of the site personnel training records available in the written scheme?                            | Y | Site training records were examined, and all certification was in place in the Smartsheet system.   |  |
| 3.10 | Is there evidence available in the written scheme of the competency of service provider and contractor staff? | Y | This issue is normally addressed at the procurement stage. The water hygiene contractor, DMA Canyon Ltd, is a member of the LCA and training records for the DMA Canyon Ltd staff are available. Copies of the DMA Canyon personnel training records were available and filed on Teams.<br>It is known that the framework plumbing contractor, Livingston Mechanical, have also had their plumbing staff undertake Legionella Awareness training and that this training appears to be updated on a regular basis. |  |

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### Authorising Engineer Water Systems Management and Compliance Audit of NHS Water Systems

|      |   |   |   |  |
|------|---|---|---|--|
|      |   |   | It is recommended that the contractors, and in particular Livingston Mechanical, are contacted with a view to getting updated training records.   |  |
| 3.11 | Are service providers and contractors LCA registered?   | Y | DMA Canyon Ltd is LCA registered. Evidence of the registration is available on the LCA website. The main plumbing contractor is not LCA registered but it should be noted that not many plumbing contractors are registered in the LCA system.  |  |
| 3.12 | If the suppliers are not LCA registered, do they have other means of proving competence?  | Y | Staff training certificates have been supplied by Livingston Mechanical who are the framework plumbing contractor for NHS GGC. It should be noted that very few plumbing organisations are registered with the LCA organisation. The auditor is aware of the fact that Livingston Mechanical have recently completed, and are planning on, further C and G accredited training.   |  |
| 3.13 | Is there a formal contractor management process in place or any evidence available in the written scheme of review meetings with service providers and contractors? | Y | Section 3.12 of the written scheme details that regular review meetings should be held with contractors. Monthly meetings are held with the main contractor, DMA Canyon Ltd, and that minutes of these meetings, and any subsequent required actions, are kept.   |  |
| 3.14 | Is there any evidence in the written scheme of management reviews of the data and results produced by the monitoring and control processes and procedures?          | Y | <p>Minuted meetings are held monthly with DMA Canyon Ltd. DMA Canyon Ltd who also submit monthly updates as to the various actions that are being undertaken on the water systems.</p> <p>There is close working cooperation between NHS GGC Estates and DMA Canyon Ltd.</p> <p>An out of spec summary document is produced and this is reviewed at the quarterly WSG meetings.</p> <p>The consultant microbiologist holds informal monthly meetings with Estates on out of spec microbiological results.</p> <p>Minuted meetings are also held with Scotmas, this supplier of the chlorine dioxide dosing equipment.</p> |  |



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|   |  |  |  |                       |
|---|--|--|--|-----------------------|
| 3.15  | Is there evidence that authorised person competency checks have been completed?  | Y  | AP competency checks are carried out by the AE Water as and when requested by site.<br>The Compliance Manager at the QEUH maintains a record of AP competency checks and these are currently up to date. |                       |
| <b>Actions on Management and Competency</b>   |  |  |  |                       |
| <p>5. It is recommended that a check is made to ensure that the draft Water Policy Document is approved by NHS GGC and once this is completed it should be adopted by site.</p> <p>6. It is recommended that the contractors, and in particular Livingston Mechanical, are contacted with a view to getting updated training records.</p> |  |  |  |                       |
| <b>Section 4<br/>Written Scheme, Monitoring and<br/>Records</b>   |  | <b>Y/N<br/>U/K,<br/>N/A or<br/>Partial</b> | <b>Comments</b>  | <b>Risk<br/>Level</b> |
| 4.1   | Is there a written scheme in place?  | Y  | The written scheme is entitled 'QEUH Campus Water Systems - Written Scheme – Controlling the risks to Legionella and other harmful bacteria in Water Systems – October 2023 Rev H.                       |                       |
| 4.2   | Is a copy of the written scheme available on site?   | Y  | A copy of the written scheme was provided electronically and in hard copy at the time of this audit.   |                       |
| 4.3   | Is there a statement in the written scheme of the expected “correct and safe operation” processes detailing targets for temperatures and other control measures? | Y  | There is a statement of correct and safe operation in the WSP document and can be found in section 4.1 of the WSP.   |                       |
| 4.4   | Is there evidence in the written scheme that any deadlegs have been removed?   | Y  |  |                       |

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|      |   |         |  |  |
|------|---|---------|--|--|
| 4.5  | Is temperature the primary means of control within the water systems?   | Partial | While temperature is the primary means of control it is supported by the use of chlorine dioxide as a secondary disinfectant.  |  |
| 4.6  | Is there any form of water treatment being applied to the water systems?  | Y       | The hot and cold water systems in the hospitals are dosed with chlorine dioxide on a continual basis.  |  |
| 4.7  | Is there any seasonal difference in the use profile of the water system?  | N       |  |  |
| 4.8  | Are any pieces of duty standby equipment that require to be switched on a weekly basis, and do the records show that they are being switched? | N       | Pump sets automatically change the lead pump on a daily basis and there is a record of checks on the pump sets in the logbook.   |  |
| 4.9  | Is there a logbook, either paper or electronic, defining all the required tasks for the risk reduction processes and procedures?              | Y       | Most of the data is held online although the water system checks completed by the Estates staff were available at the time of the audit. Evidence of these checks is held on paper records.  |  |
| 4.10 | Are all tasks in the records signed and dated?  | Y       |  |  |
| 4.11 | Are little used outlets (LUO's) listed and are they then flushed?   | Y       | <p>Some of the required LUO flushing is completed by DMA Canyon Ltd. Specifically, DMA Canyon Ltd flush the following:-</p> <ul style="list-style-type: none"> <li>• Three times per week flushing of supply pipes to unused or removed water coolers</li> <li>• Flushing of temporary dosage connections in the plant rooms twice per week</li> </ul> <p>DMA Canyon Ltd will also flush anything that they regard may be little used.</p> <p>Records for this were found in the Teams folder for the DMA flushing. Some of the flushing is completed by clinical staff and they make returns to the Estates department on a quarterly basis. These records are held in Estates. The level of returns is said to be improving.</p> |  |

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|      |  |   |  |  |
|------|--|---|--|--|
|      |  |   | Domestic staff flush every wash hand basin every day and records of this were presented at the time of the audit. Areas that are closed at weekends do not receive 7 daily flushes, and instead receive 5 flushes. |  |
| 4.12 | Is the flushing of little used outlets recorded in the records system?   | Y | Records were available for the DMA Canyon Ltd completed flushing procedures as well as the clinical and domestic staff flushing.   |  |
| 4.13 | Are the remedial actions from the risk assessment being completed and are they signed and dated?   | Y | The DMA risk assessment actions are filed in Smart Sheet. Evidence of the remedial actions being addressed for earlier risk assessments can be found in Teams.   |  |
| 4.14 | Does the written scheme contain any incident plans?  | Y | This is covered in section 5 of the written scheme document.   |  |
| 4.15 | Are non-conformances addressed in a timely manner?   | Y | There is an incident report procedure which ensures that any out of spec situations are handled quickly  |  |
| 4.16 | Does the written scheme contain an "audit trail" for out of specification situations that allows for remedial actions to be tracked through to completion? | Y | A job would be raised on FM First which automatically produces an audit trail. There is also an incident reporting process which ensures that there is an audit trail for all of spec situations                   |  |
| 4.17 | Is there a specific escalation procedure for positive Legionella results?  | Y | There is a response to a positive legionella result in section 5.4 (page 97) of the QEUH written scheme.   |  |
| 4.18 | Are Legionella samples being taken and who is taking the samples?  | Y | Legionella samples are taken by DMA Canyon Ltd on an NHS GGC agreed basis throughout the year.   |  |
| 4.19 | Are Legionella samples being taken in accordance with BS7592:2022?   | Y |  |  |
| 4.20 | Are Pseudomonas samples taken as part of the written scheme?   | Y | Pseudomonas samples are taken by DMA Canyon Ltd on an NHS GGC designated area basis throughout the year. A sweep of samples is taken every month.  |  |

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| 4.21   | Are the Pseudomonas samples taken in line with the guidance given in the relevant HPS documents?   | Y                          |  |  |               |
|--|--|----------------------------|--|--|---------------|
| 4.22   | Are there copies of method statements for any procedures that are completed in house?              | Y                          | Site monitoring tasks method statements are available in the written scheme document in Section 4. |  |               |
| 4.23   | Are there copies of method statements for any procedures that are completed by external providers? | Y                          | Copies of DMA Canyon Ltd method statements are held electronically.                                |  |               |
| <b>Actions on Written Scheme, Monitoring and Records</b> |  |                            |  |  |               |
| None   |  |                            |  |  |               |
| Section 5<br>Task Completion                             |  | Expected<br>Task<br>Levels | Actual<br>Records<br>Completed<br>or Planned   | Comments   | Risk<br>Level |
| 5.1  | Tank Inspections   | 2                          | 2  |  |               |
| 5.2  | Hot Water<br>Storage Vessel<br>blowdowns   | 4                          | 12   | These checks are completed by Estates staff and paper records, which will be loaded into the Teams system, were available at the time of this audit. |               |
| 5.3  | Hot Water<br>Storage Vessel<br>Internal<br>Inspections   | 1                          | 1  | These checks are completed by Estates staff.   |               |
| 5.4  | Shower/Spray<br>Heads  | 4                          | 4  | Shower heads and hoses are renewed every three months by DMA Canyon Ltd and the records can be found in the Teams system.                            |               |

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|      |  |                               |           |  |  |
|------|--|-------------------------------|-----------|--|--|
| 5.5  | Hot Water Storage Vessel F and R Temps | 12                            | 12        | These tasks are completed by NHS GGC Estates staff.  |  |
| 5.6  | PH Ex F and R Temps                    | 12                            | N/A       |  |  |
| 5.7  | Hot Sentinel Temps                     | 12                            | 12        | 12 sets of DMA records were available in the Teams system.   |  |
| 5.8  | Hot Secondary Loop Temps               | 4                             | Continual | There are BMS sensors are fitted on secondary loops on all levels of the adults and children's hospitals.  |  |
| 5.9  | Hot Tertiary Loop Temperatures         |                               |           | When the TMV's are being serviced, any lack of time in getting hot water to the outlet would be taken as an inference that the tertiary loops may not be operating correctly.  |  |
| 5.10 | Hot Representative Temperatures        | 1                             | Multiple  | These are completed when microbiological sampling is undertaken as well as when the TMV's are being serviced.  |  |
| 5.11 | Cold Sentinel Temperatures             | 12                            | 12        |  |  |
| 5.12 | Cold Sub Loop Temps                    | 12                            | N/A       |  |  |
| 5.13 | Cold Rep Temps                         |                               |           | These are completed when microbiological sampling is undertaken as well as when the TMV's are being serviced.  |  |
| 5.14 | POU Heater Temps                       | 1 – 6 times per year          | N/A       |  |  |
| 5.15 | Expansion Vessel Flushing              | 2 – 12 Monthly to six-monthly | Partial   | All hot expansion vessels are flow through but these are also flushed manually on a weekly basis.<br>Flushing records for monthly flushes can be found on the calorifier expansion vessels.<br>Flushing of cold water vessels in the basement tank rooms has not been completed although drain points have been installed and fit was stated at the time of this audit that lushing will now be initiated. |  |

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|      |  |                  |          |   |  |
|------|--|------------------|----------|---|--|
|      |  |                  |          | It is recommended that flushing of the non-flow through expansion vessels is initiated and recorded as soon as possible.  |  |
| 5.16 | TMV's/TMT's  | 1                | 1        | The servicing is completed by DMA Canyon Ltd. At the time of this audit it was stated that the site now programmes one service per year.  |  |
| 5.17 | Little used outlet flushing  | 104              | Multiple | As evidenced earlier in this report the LUO's are being flushed where required and records were available   |  |
| 5.18 | Check on the cold-water distribution pipework thermal insulation                                       | 1                | 1        | This is a recommendation in the HSG 274 document which can also be found in the SHTM 04-01 document. Any defects with the insulation would be reported on the contractor monthly report sheet and this would result in an entry into the water system defect report and the appropriate tasks would be completed as required. The insulation is viewed at least in part on a regular basis as staff visit plant rooms or look behind lift off panels. |  |
| 5.19 | Tank Clean and Disinfection  | 1                | 1        | This work is completed by a contractor.   |  |
| 5.20 | Legionella sampling  | Multiple samples |          | Samples are taken by DMA Canyon Ltd.  |  |
| 5.21 | Pseudomonas Sampling   | Multiple samples |          | Samples are taken by DMA Canyon Ltd.  |  |
| 5.22 | TVC Samples  | Multiple samples | 0        | Samples are taken by DMA Canyon Ltd.  |  |
| 5.23 | Chlorine dioxide testing   | 12               | 12       | All sentinel outlets are now tested   |  |
| 5.24 | Looking over the past twelve months have the required risk reduction tasks been completed on the site? |                  | Partial  | The records, as detailed above, shows that some tasks have been missed with regard to the flushing of single point of entry expansion vessels.  |  |

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|   |   |                                   |  |                       |
|---|---|-----------------------------------|--|-----------------------|
|   |   |                                   | However, it was stated at the time of the audit that these issues are being addressed.<br>Individual recommendations are made where appropriate earlier on in this section.  |                       |
| <b>Actions on Task Completion</b>   |   |                                   |  |                       |
| 7. It is recommended that flushing of the non-flow through expansion vessels is initiated and recorded as soon as possible. |   |                                   |  |                       |
| <b>Section 6<br/>On Going Water Treatment</b>   |   | <b>Y/N<br/>U/K or<br/>Partial</b> | <b>Comments</b>  | <b>Risk<br/>Level</b> |
| 6.1   | Is there any form of water treatment in use on site?          | Y                                 | Incoming mains water is treated via a membrane filtration system and is filtered down to 0.02 micron. The filtered mains water is then secondary disinfected using chlorine dioxide dosing.  |                       |
| 6.2   | Is there any form of secondary disinfection in place on site? | Y                                 | In the past, chlorine dioxide tests have been completed on the hot and cold water systems at 78 locations throughout the hospital. Previously it was stated that this did not cover all of the sentinel points in the hospital water systems, as recommended in the HSG 274 guidance document, but it was deemed by NHS GGC at that time to be representative of the levels of chlorine dioxide that would be found throughout the hospital water systems.<br>It was stated at the time of this audit that all sentinel points are now included in the monitoring process.<br>The BMS system monitors the chlorite levels as well as the chlorine dioxide levels constantly at the tank. Alarms are built in if certain chlorite levels are measured. The new Scotmas contract also has chlorite measurements included as a requirement. |                       |

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|   |   |     |   |  |
|---|---|-----|---|--|
| 6.3                                       | Are the required checks for secondary disinfection levels being completed and recorded on site? | Y   |   |  |
| 6.4                                       | Are the required levels of disinfection being achieved in the water systems?                    | Y   | Cold water and blended water chlorine dioxide residuals are generally within accepted limits. The hot water chlorine dioxide levels are reduced as would be expected in a hot water system as chlorine dioxide is a gas in solution.  |  |
| 6.5                                       | Is there a record of stock levels of biocide in the written scheme?                             | Y   | Biocide stock levels are checked as part of the Scotmas monthly contract. These checks should be made on a weekly basis but there are automatic measurements made of chemical stocks in the dosage tanks and these would alarm if the amounts of chemical dropped to an unacceptable level. |  |
| 6.6                                       | Is any of the water base exchange softened?   | N/A |   |  |
| 6.7                                       | Are service records for the base exchange softeners available in the written scheme?            | N/A |   |  |
| 6.8                                       | Is filtration in use in any of the water systems?   | Y   | Mains water is treated via a membrane filtration system. There are three membrane filtration sets in the hospital to allow for servicing of any unit if required.   |  |
| 6.9                                       | Are service records for the filtration equipment available in the written scheme?               | Y   | Veolia, the equipment supplier, has a service contract for the filtration equipment. The Veolia service records are held online in Smartsheet and can be accessed when required. The records were accessed and demonstrated to the auditor during this audit.                               |  |
| <b>Actions on Ongoing Water Treatment</b> |   |     |   |  |
| None                                      |   |     |   |  |



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| Section 7<br>Cleaning and Disinfection<br>Procedures |   | Y/N<br>U/K or<br>Partial | Comments  | Risk<br>Level |
|--|---|--------------------------|---|---------------|
| 7.1  | Are system cleaning and disinfection procedures in use on site?   | Y                        | Cold water storage tanks are cleaned and disinfected on an annual basis.  |               |
| 7.2  | Are the cleaning and disinfection procedures completed by in house staff?   | N                        |   |               |
| 7.3  | Are the in house staff trained and competent to complete cleans and disinfections?                                      | N/A                      |   |               |
| 7.4  | Are the contractor's staff trained and competent to complete cleans and disinfections?                                  | Y                        |   |               |
| 7.5  | Are cleaning and disinfection procedures completed as a matter of procedure?  | Y                        | Cold water storage tanks are normally cleaned on an annual basis.   |               |
| 7.6  | Are these cleaning and disinfection procedures completed in response to sampling/inspection results?                    | N                        | Any cleans and disinfections that would be required because of the ongoing risk reduction processes and procedures would be undertaken as required. |               |
| 7.7  | Are there suitable method statements available in the written scheme covering the cleaning and disinfection procedures? | Y                        | The method statements are held electronically. RAMS are held in the Teams folder.   |               |
| 7.8  | If chlorine is used, is the impact of pH considered in the disinfection process.  | N/A                      | Silver Hydrogen peroxide is used as the disinfectant of choice for the disinfections on site on a spray basis.                                      |               |
| 7.9  | Are there completion certificates in the written scheme covering any  | Y                        | This can be found on the Teams system   |               |

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|  |   |                                   |   |                       |
|--|---|-----------------------------------|---|-----------------------|
|  | disinfection procedures that have been undertaken?  |                                   |   |                       |
| 7.10   | Are localised outlet disinfections in use on site?  | N                                 | Localised outlet disinfections would be completed if it was deemed that they were required. |                       |
| 7.11   | Is there a suitable method statement available in the written scheme covering the localised cleaning and disinfection procedures? | Y                                 | DMA Canyon Ltd have method statements for localised cleans and disinfections.               |                       |
| <b>Actions on Cleaning and Disinfection Procedures</b>         |   |                                   |   |                       |
| None   |   |                                   |   |                       |
| <b>Section 8<br/>New Build and Refurb Capital<br/>Projects</b> |   | <b>Y/N<br/>U/K or<br/>Partial</b> | <b>Comments</b>   | <b>Risk<br/>Level</b> |
| 8.1  | Have any new build or refurbishment projects, which impacted on the water systems, been completed in the past 12 months           | N/A                               | No major projects have been completed in the past 12 months in the QEUH RHC hospitals.      |                       |
| 8.2  | Were the implications of this work risk assessed?   | N/A                               |   |                       |
| 8.3  | Was the assessment added to the logbook and water system records?   | N/A                               |   |                       |
| 8.4  | Was the written scheme amended to account for the implications of the new build/amended water systems?                            | N/A                               |   |                       |
| 8.5  | Were the details of the new systems discussed with the Estates  | N/A                               |   |                       |

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|   |   |                                   |  |                       |
|---|---|-----------------------------------|--|-----------------------|
|   | Department and any other involved personnel?  |                                   |  |                       |
| 8.6   | Are minutes of discussions regarding the new water systems recorded and entered into the logbook? | N/A                               |  |                       |
| 8.7   | Were systems, if required, cleaned and disinfected?   | N/A                               |  |                       |
| 8.8   | Are records of all cleans and disinfections available in the record systems?                      | N/A                               |  |                       |
| <b>Actions on New Build and Refurb Capital Projects</b> |   |                                   |  |                       |
| None  |   |                                   |  |                       |
| <b>Section 9<br/>Water Safety Group</b>                 |   | <b>Y/N<br/>U/K or<br/>Partial</b> | <b>Comments</b>  | <b>Risk<br/>Level</b> |
| 9.1   | Is there a Water Safety Group in place?   | Y                                 | NHS GGC holds WSG meetings on a quarterly basis  |                       |
| 9.2   | Does the WSG have all the required groups represented?  | U/K                               | It is recommended that a check is made to ensure that all the required groups are attending the water safety group meetings. |                       |
| 9.3   | Are WSG meetings held on a quarterly basis?   | Y                                 |  |                       |
| 9.4   | Are minutes and actions produced and followed through with the WSG?                               | Y                                 |  |                       |
| <b>Actions on the Water Safety Group</b>                |   |                                   |  |                       |
| None  |   |                                   |  |                       |



## QEUH Campus Water Systems

# **WATER SAFETY PLAN (WRITTEN SCHEME)**

Controlling the risks of exposure to Legionella and other harmful  
bacteria in Water Systems

2024 Rev J

Reviewed by: E. Smith (RP)  
K. Clarkson (DRP)  
M. MacMillan (Lead AP)  
A. Gallacher (Head of Compliance)  
M. Feeney (Compliance Manager)

An electronic copy of this document is held on the QEUH Shared Drive at folder path:

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And

Water Team Folder

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## 1.0 GENERAL OVERVIEW

Note 1: No work will be carried out on the water system without the knowledge and written consent of the Authorised Person (Water).

Note 2: This Written Scheme document is to be read in conjunction with the Operational Procedures for the Written Schemes document and should also be read in conjunction with the Control of Water Records document. For any alterations to the Water System this Written Scheme Document is to be read in conjunction with the Guidance for alterations to water systems document.

### 1.1 Introduction

This document contains six sections which have been derived from the Risk Assessment to aid the design, installation, maintenance and operational mode of all domestic and process water systems within the premises with respect to the likelihood of the proliferation of waterborne micro-organisms. The assessment also considered the risk of infection presented to building users and the general populous at large, and derived a series of risk ratings and appropriate Remedial Actions and Control Measures, which should be implemented to minimise the presented risks. This Risk Assessment was carried out in a manner consistent with the requirements of *BS8580:2010 Water Quality – Risk Assessments for Legionella Control – Code of Practice*, and is reviewed whenever system alterations or operational considerations may effect a change in the risk.

Section 1 contains an Executive Summary of the recommended control measures and corrective actions together with an overview of the QUEH Site layout and accommodation.

Section 2 contains a record of the logbook inspection, details on the location of records, defects, non-compliance issues, correspondence and archived information.

Section 3 provides information on the management structure associated with the control scheme for the water system and clear definitions of responsibilities held by those named, details of training undertaken and a summary of the designated tasks as detailed in section 4.

This section also provides information on the details of the risk assessment values associated with representative outlets, systems and plant items undertaken since 2013. A generic risk assessment for any positive legionella test results within designated Low Risk locations and a description of the installed plant and equipment with associated schematic layout plans for each of the installed water systems within the site is also contained within this section.

Section 4 of the document details the safe operation of the system and all appropriate Maintenance Procedures (Control Measures) which were derived from the Risk Assessment and recommendations within NHS Greater Glasgow and Clyde Water Systems Safety Policy.

This section of the document contains a task description with associated record (Log) sheet relating to these activities. It should be noted however, that in certain circumstances, specialist contractors are required to implement some Control Measures, and records pertaining to these activities may be held under separate cover. Such activities would typically include those associated with chemical water treatment regimes and drinks vending machines sanitising maintenance.

Refer to Section 2 for the location of records and archived information associated with the maintenance procedures and other control measures.

Section 5 contains supporting information relating to the Control Scheme, and should typically include the recording of system alterations or remedial actions together with utilised materials. Ad hoc maintenance activities should also be recorded in this section, such as system sterilisations which may be required from time to time. This section of the document also contains a glossary of supporting publications, where additional information relating to the risks associated with waterborne micro-organisms, and water quality generally, may be found.

## 1.2 Executive Summary

The purpose of this Written Scheme document is to assist in the correct and safe operation of the water systems within the QEUH Campus. The document outlines the specific roles, responsibilities, training requirements and regular maintenance procedures to be followed in order to ensure compliance with statutory and mandatory guidance.

Risk Assessments for the water services have been carried out on the instruction of the Board Water Safety Group. DMA Canyon Ltd are presently the appointed Water Systems Risk Assessor and have carried out Risk Assessments within all individual buildings on the campus.

Additionally there are two Hydrotherapy Pools in operation on the campus. These are situated within the RHC, and Spinal Injuries Unit. Separate Risk Assessments have been carried out for both of these facilities by a specialist Swimming Pool Risk Assessment provider.

Risk Assessments require to be reviewed and updated to reflect any changes in-use and / or functions that have taken place since the date of the original Risk Assessment or in the event of control measures becoming ineffective, changes in key personnel or in the event of a case of legionnaires disease / legionellosis associated with the water system. Guidance on the Risk Assessment review procedure is given in Appendix 3.

In 2019 various clinical assessments were carried out on Ear irrigator, Nebulisers, Humidified Oxygen, Optiflow Humidification for Mechanical Ventilators, Flushing NG Tubes, Rapid Infuser, Home suction machine for palliative care, gastrostomy water/ACE device, continual nebuliser, Humidified Oxygen, Humidifier for NIV, Pneumotach, pH studies, Liva Nova heater coolers, ECMO heaters, Rectal Irrigation.

In 2022 assessments were carried out on Arjo Baths, Emergency Showers, Irrigation Systems, Emergency Cooling (MRI Chiller), Closed Heating Systems, Closed Chilled Systems, Steam Humidification, Air Conditioning/Ventilation and Decorative Bubble lamps.

In 2024 assessment was made of an ice machine used in Theatres to ensure a maintenance contract was in place and that Theatre staff had a standard operating procedure in place.

Dental and Dialysis require separate risk clinical risk assessments.

Copies of the risk assessments above are available on the SCART22 folder and Water Teams folder.

All documentation and log sheets used to record maintenance activities follow the format contained within guidance document SHTM 04-01 Part G: *Operational Procedures and Exemplar Written Scheme*.

Part of the requirement is to identify risks from use of water as defined within a Water Hazzard Matrix for chemical, biological, physical and radiological risks as per table below :-

### 1.3 Water Hazard matrix

|                | Biological  | Physical  | Chemical   | Radiological   |
|----------------|---|---|--|--|
| Possible Risks | <b>Quality of water</b><br>Agreed potable testing in all buildings  | <b>Structural damage</b><br>Agreed Infection Control SOP for water damage   | <b>Supplementary</b><br>CL02 risk assessments in place<br>6 monthly independent audit<br>Checks carried out on CL02 and CL0 <sub>2</sub>   | <b>Hospitals</b><br>Procedures in place for access to these areas  |
|                | <b>Legionella</b><br>Risk Assessment and agreed sampling regime since 2018 via water technical group<br>High risk areas are fitted with POU's   | <b>Scald and burn</b><br>Draft risk assessment in place.<br>Will be added to SHaW by Health and Safety for each Manager to sign of annually.  | <b>Clean and disinfection</b><br>RAMS in place for water service provider  | <b>Laboratories</b><br>N/A   |
|                | <b>Pseudomonas Aeruginosa</b><br>Site Wide Risk Assessment.<br>SOP for Wards to assess risk and take actions.<br>High risk areas are fitted with POU's where requested by ICT.<br>Draft ICT/Clinical risk assessments in place for high risk areas.   | <b>Loss of services (water supply / power)</b><br>QEUH Site has full HV generation.<br>Emergency fill points for water on site.<br>Emergency supply in place with Scottish Water  | <b>COSHH assessments</b><br>Annual COSHH review carried out in smartsheet.<br>Estates Risk Assessment in place.  | <b>Industrial sites</b><br>N/A   |
|                | <b>Stenotrophomonas maltophilia</b><br>Agreed sampling regime since 2018 through Water Technical Group is agreed high risk areas.<br>High risk areas are fitted with POU's where requested by ICT.  | <b>Pressure issues (insufficient / excessive).</b><br>CAT 5 Tanks fitted in specific building. Pressure reduction valves fitted and booster sets fitted. Low pressure would be addressed with Scottish Water and emergency plan.                    | <b>Toxic leaching from components.</b><br>Only use WRAS approved parts or KIWA if necessary.<br>Leachate flushing in accordance with SHTM04-01 and as part of commissioning before handover. | <b>Radon Ingress</b><br><a href="#">UKradon - Radon in private water supplies</a><br><a href="#">resource_2697esab452534c5.pdf (ukradon.org)</a> |
|                | <b>Other waterborne pathogens.</b><br>Agreed sampling regime since 2018 through Water Technical Group is agreed high risk areas.<br>High risk areas are fitted with POU's where requested by ICT.   | <b>Drowning</b><br>Risk assessment in place for SUDD's by Facilities.<br>Hydrotherapy reviewing drown risk assessments.<br>Clinical risk assessment of use of baths.<br>Risk of drowning to be reviewed to add to SHaW by Health and Safety.        |  |  |
|                | <b>Fungi/Mould/Mcyobacteria</b><br>Agreed sampling regime since 2018 through Water Technical Group is agreed high risk areas.<br>High risk areas are fitted with POU's where requested by ICT.  | <b>Slips/ Trips</b><br>Part of SHaW calendar for all managers to assess.<br>Estates Risk Assessment in place.<br>Slips trips and falls audits carried out by NHS Health and Safety Auditors throughout year internally and externally of buildings. |  |  |
|                | <b>Contamination (ingress of vermin, sewage, flooding)</b><br>Procedures in place with specific service providers between Estates and Facilities.<br>Vermin bait traps and contract in place via Facilities. Drain cleaning and Sewage cleaning service providers in place via Estates.<br>ICD Contacts to assess 24/7.<br>Estates/Facilities presence 24/7.<br>Sampling and dosing contract in place for Closed loop water system in accordance with BSRIA requirements including Pseudomonas sampling.<br>QEUH although near a river is not on flood plane. | <b>Component (complexity / construction / suitability i.e. non-approved materials i.e. lead)</b><br>All components are WRAS or must on approval meet other standards such as KIWA approved.<br>Capital/Minor Works specify this in contracts        |  |  |
|                | <b>Leptospirosis</b><br>Contacted facilities to carry out risk assessment   | <b>Drains and Splash</b><br>High risk areas identified by ICT have weekly drain dosing by Facilities.<br>ICT to look at communication for clinical staff.   |  |  |
|                |   | <b>Cross connections</b><br>Only competent persons carry out installation works and for major works risk assessments are carried out which would identify any cross connections to be rectified   |  |  |
|                |   | <b>Equipment (ie, cardiac heater / cooler units)</b><br>All clinical equipment assessed and risk assessments completed.   |  |  |

## 1.4 Overview of Site Accommodation and Premises

The Adult Hospital building comprises of 12 stories, with the basement housing FM areas and the Royal Hospital for Children comprising of 4 stories.

On the retained estate there are individual buildings comprising of Neurology, Neurosurgery, Spinal Injuries Unit, PDRU, Maternity, Neo-Natal, Podiatry and Westmarc stand alone with the Teaching and learning and office block new additions.

Full descriptions and information on the individual written schemes are available in the Log book/Risk Assessment folders for each building. The building codes are as follows:

AC – Minor Injuries Unit  
AQ – Acute Medical Block (AMB)  
AS – Central Medical Block (CMB)  
BC – Neurosurgical Block (INS)  
BL – Maternity  
BW – Neurology  
DA – Spinal Injuries  
DB – Maternity Day Surgery  
DD – Podiatry  
DE – Physically Disabled Rehabilitation Unit (PDRU)  
DI – WestMARC  
EA – Neo Natal  
FA – Multi Storey Car Park 2  
FB – Multi Storey Car Park 1  
GA – Laboratory Medicine  
GB – Energy Centre  
HA – Adults Hospital  
HB – Childrens Hospital  
IA – Teaching & Learning Centre  
IB – Office Building  
IC – Imaging Centre of Excellence (ICE)

NOTE:

ICE building is owned by University of Glasgow (UoG). Facilities management and Estates maintenance is carried out under contract by NHS GG&C on behalf of UoG.

Langland Building is managed via PFI by Serco and MIU was managed by Vanguard however from April 2024 this was passed to the NHS to manage.

See Site Map in [Appendix 1](#).

## 2.0 RECORDING

### 2.1 Written Scheme Inspection Records

Anyone inspecting this written scheme (either as part of the Management Control System or otherwise) is invited to make an entry in this inspection record. **Under no circumstances may this Written Scheme or any part of it be removed from site.**

| Date/Time          | Comments   | Signature | Position   |
|--------------------|--|-----------|--|
| June 2018          | Written scheme has been reviewed and re-formatted into this current form (Revision D) by Colin Purdon as part of the water systems review.                                       |           | Site Manager Operational Estates                           |
| Feb 2019           | Written scheme has been reviewed and re-formatted into this current form (Revision E) by Colin Purdon as part of the water systems review.                                       |           | Interim Sector Estates Manager (Deputy Responsible Person) |
| May 2019 Rev B     | Written scheme has been reviewed and re-formatted into this current form (2019 Rev A) by Colin Purdon as part of the water systems review.                                       |           | Interim Sector Estates Manager (Deputy Responsible Person) |
| October 2020 Rev C | Written scheme has been reviewed to reflect changes to staff personnel and a review of procedures.   |           | Site Manager Operational Estates                           |
| May 2021 Rev D     | Written scheme has been reviewed to reflect changes to staff personnel and a review of procedures.   |           | Site Manager Operational Estates                           |
| Aug 2022 Rev E     | Written scheme has been reviewed to reflect changes to staff personnel and job titles. Additionally modified procedures for WS01 (Page 103)                                      |           | Site Manager Operational Estates                           |
| Jan 2023 Rev F     | Minor changes to words regarding daily flushing  |           | Site Manager Operational Estates                           |
| May 2023 Rev G     | Index section 2 missing now added back in  |           | Site Manager Operational Estates                           |
| Oct 2023 Rev H     | Inclusion of Vanguard who carry out maintenance of the MIU Unit and minor changes to wording. Also added fixed shower head disinfections. Changed Appendix 2 to reference WQS014 |           | Site Manager Operational Estates                           |

|                  |   |  |                                  |
|------------------|---|--|----------------------------------|
| April 2024 Rev I | Sorted responsibility titles. Removal of Vanguard, changes to staffing, modification of procedures to reflect 6 monthly TMT part of new tender, removed confusion over TMT maintenance to reflect annual maintenance, clean and disinfection. Fixed duplication in activities (since 2022). Added references to sections on summary. Added that information is uploaded to Teams folder. Added sampling regime. |  | Site Manager Operational Estates |
| May 2024 J       | Inclusion of Ice machine assessment information and reference to Water Safety plan, water hazard matrix and changes to roles. Minor word changes.   |  | Site Manager Operational Estates |

Additional entries should be completed on a separate sheet and inserted in Section 2.1 with this sheet.

## 2.2 Location of Records and Correspondence

Details of any correspondence, including Risk Assessments/Reviews and Ongoing Monitoring Reports, relating to water services are held on the water safety teams channel. Sources of data could also be held on BMS, from contractors and NHSGGC CP(W)

Any edits made to the written scheme of control should be entered on the sheet below.

| Date | Procedure or Record ref | Description | Completed by |
|------|-------------------------|-------------|--------------|
|      |                         |             |              |
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|      |                         |             |              |

Additional entries should be completed on a separate sheet and inserted in Section 2.2 with this sheet.

## 2.3 Non-Compliance Issues and Fault Detail Log

Incident form 04

All non-compliance and fault details in relation to the individual systems in each building must be recorded on Record Form 004 and brought to the attention of the Water Systems Lead AP as soon as possible. This process ensures that all non-compliance issues are documented, managed effectively and tracked through to completion and close-out of the issue. Copies of Record Form 004 are to be stored within the shared drive. SCART Compliance/22 Water/ and Water Teams Folder.

The process for sampling out of specification is documented in WQS – 017 Procedures in the event of out of specification sample for Legionella and other monitored bacteria, moulds etc.



## 2.4 Archived Information Record Sheet

All records associated with the management or maintenance procedures within this Written Scheme should be kept for a period of five years after they are no longer current. Records should be kept locally within the main Estates Office. The details of any archived information held separately in secure storage should be recorded in the table below.

| Date | Procedure or Record Reference                                 | Description | Held By/Location |
|------|---|-------------|------------------|
|      | Records are in water safety teams' channel and SCART 22/Water |             |                  |
|      |   |             |                  |
|      |   |             |                  |
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|      |   |             |                  |

Additional entries should be completed on a separate sheet and inserted in Section 2.4

## **2.5 Equipment Calibration Records**

All equipment used for the measurement of temperatures should be calibrated at least annually to ensure the accuracy and consistency of the recording procedures using UKAS accredited equipment.

Calibration certificates for handheld thermometers are held in hard copy within the QEUH Campus Log Book suite in the main estates office. Electronic copies are also held on the QEUH Shared Drive>SCART22/Water.

## 3.0 MANAGEMENT ARRANGEMENTS

### 3.1 Roles & Responsibilities (Ax.x is reference number in policy)

|  |   |
|--|---|
| <p><b>A2.1 Chief Executive – Duty Holder (Water) DH(W)</b></p> | <p>The Chief Executive has overall executive responsibility with accountability to NHSGGC’s Board for all safety, health and risk matters in NHSGGC. The Chief Executive, (<b>CE</b>), is the designated Duty Holder (Water) <b>DH(W)</b>, for NHSGGC.</p> <p>The responsibilities of the <b>DH(W)</b> include:</p> <ul style="list-style-type: none"> <li>• Assuring NHSGGC’s Board, via the Board’s Corporate Management Team (<b>CMT</b>), that the Board’s statutory responsibilities relating to Water Systems are being safely and appropriately discharged;</li> <li>• Participate in a <b>Compliance</b> defined training programme for this role to maintain personal knowledge and a level of expertise allowing the efficient discharge of the <b>DH(W)</b> responsibilities;</li> <li>• Ensuring the provision of adequate resources to safely maintain and to effectively manage and control identified risks arising from the Water Systems in the NHSGGC estate to an appropriate level;</li> <li>• Ensuring the implementation of and adherence to the NHSGGC Water Systems Safety Policy at all levels within the organisation;</li> <li>• Formally appointing the Designated Person (Pseudomonas) <b>DP(P)</b> and Designated Person (Water) <b>DP(W)</b> (and their deputies) to assist in the execution of these responsibilities, who for NHSGGC are respectively, the Infection Control Manager and the Director of Estates.</li> </ul>   |
| <p><b>A2.2 Board Corporate Management Team (CMT)</b></p>       | <p>The CMT will have managerial oversight of water-related issues and responsibility for communication in sufficient detail to NHSGGC Health Board, giving assurance that Water Systems are being safely and effectively managed and that the Board’s related Statutory obligations are being appropriately discharged.</p> <p>Refer to CMT ToR for full membership.</p> <p>The water-related responsibilities of the <b>CMT</b> include:</p> <ul style="list-style-type: none"> <li>• Having managerial oversight of, and assuring NHSGG&amp;C Health Board that the Board’s statutory responsibilities relating to Water Systems are being safely and appropriately discharged;</li> <li>• Individually participate in appropriate periodic training to establish and maintain personal knowledge and a level of expertise allowing the efficient discharge responsibilities related to this Policy;</li> <li>• Ensuring, through the Board’s management structure, the implementation of all ‘Statutory Instruments &amp; Mandatory Guidance’ related to Water Systems examples ‘Guidance’ at 3 and adherence to the NHSGGC Water Systems Safety Policy at all levels within NHSGGC;</li> <li>• Liaising with the <b>DP(P)</b> and the <b>DP(W)</b> to ensure the Boards Water Systems Policy is understood and applied across all areas of the Board;</li> <li>• With support from the <b>DP(P)</b> and the <b>DP(W)</b>, formulate a Water Systems Safety Compliance Programme, (for both passive and active measures) in existing properties and for new projects;</li> <li>• Performing governance oversight on behalf of the Board by reviewing the effectiveness of operational arrangements. The <b>CMT</b> will be advised on this by the <b>BICC</b> with contributions from the <b>DP(P)</b> and the <b>DP(W)</b> via the <b>BWSSG</b>.</li> </ul> |

|  |   |
|--|---|
| <p><b>A2.3 Director of Estates and Facilities (DE) – Designated Person (Water) DP(W)</b></p> | <p>The <b>DP(W)</b> has delegated executive responsibility with accountability to <b>DH(W)</b> for all safety, health and risk matters relating to Water Systems in NHSGGC, with the exception of the responsibilities delegated to the Designated Person (Pseudomonas) <b>DP(P)</b>.</p> <p>The Responsibilities of the <b>DP(W)</b> include:</p> <ul style="list-style-type: none"> <li>• Identify and ensure the efficient formal record of Water System risks and raising those considered appropriate from the <b>BWSSG</b> to the <b>CMT</b> via the <b>BICC</b>;</li> <li>• Provide formal reports from the <b>BWSSG</b> to assure the Health Board via the <b>CMT</b> that the Board’s statutory responsibilities relating to Water Systems are being safely and appropriately discharged;</li> <li>• Participate in a Compliance defined training programme for this role to maintain personal knowledge and a level of expertise allowing the efficient discharge of the <b>DP(W)</b> responsibilities;</li> <li>• Identify to the <b>CMT</b> a risk-based prioritisation of necessary resources required to effectively manage and control water system risks arising from the Water Systems in the NHSGGC estate, to an acceptable level;</li> <li>• Effectively manage the resources provided to safely maintain and to manage and control identified risks, to an acceptable level, as far as reasonably practicable;</li> <li>• Ensuring the implementation of all ‘Statutory Instruments &amp; Mandatory Guidance’ related to Water Systems, (see examples in section, ‘Guidance’, in this Policy), and adherence to the NHSGGC Water Systems Safety Policy at all levels within the Directorate of Estates;</li> <li>• Ensuring that Estates, through the Directorate management structure, are fully aware and appropriately trained in the Statutory and Mandatory requirements and standards for the provision and maintenance of Safe Water Systems;</li> <li>• Ensuring, with the <b>RP(P)</b>, that the Water System Safety Policy is regularly reviewed and updated;</li> <li>• Chair the NHSGGC <b>BWSSG (or nominated deputy)</b> as per SHTM requirements ;</li> <li>• Formally appoint a <b>DDP(W)</b>, who will deputise for the <b>DP(W)</b> as required, undertaking delegated responsibilities;</li> <li>• Formally appoint (or delegate the responsibility) to <b>RP(W)</b> at sector level, <b>DRP(W)</b> and <b>AP(W)</b> at site level and on larger sites also <b>LAP(W)</b>.</li> </ul> |
| <p><b>A2.4 Infection Control Director (ICD) – Designated Person (Pseudomonas) DP(P)</b></p>  | <p>The Infection Control Director has delegated executive responsibility with accountability to <b>DH(W)</b> for all Pseudomonas related safety, health and risk matters in Water Systems within NHSGGC premises. The <b>ICD</b> is the Designated Person (Pseudomonas), <b>DP(P)</b>, and will be supported by the Board’s designated <b>LICD</b>.</p> <p>The <b>DP(P)</b> responsibilities are outlined in the pseudomonas guidance and include :</p> <ul style="list-style-type: none"> <li>• Include <i>P. aeruginosa</i> from a blood culture as an alert organism via IC net from an adult or paediatric patient. Also include <i>P. aeruginosa</i> from any clinical specimen in a neonatal unit/Adults ICU as an alert organism via ICnet. IPCTs when assessing alert organisms be mindful that <i>P. aeruginosa</i> can be selected for by prior antibiotic usage.</li> <li>• Ensure they can detect in real time any possible outbreak early through effective local surveillance and monitoring of numbers of cases over time. e.g automatic trigger alerts as defined by the NHSGGC Surveillance Review Group.</li> <li>• Be able to facilitate early identification of possible source in collaboration with colleagues in estates and microbiology.</li> </ul>  |

|   |  |
|---|--|
|   | <ul style="list-style-type: none"> <li>• Have a contingency plan for NNUs and ICUs to enable safe patient care to continue without direct patient/water contact, e.g. use of patient wipes and sterile water in neonatal units.</li> <li>• Any local outbreak or incident should be assessed using the Hospital Infection Incident Assessment Tool (HIIAT) and reported to ARHAI if amber or red. In addition, if there is an active ongoing clinical incident, where the source is considered to be tap water, then ARHAI should also be informed regardless of the HIIAT.</li> <li>• An assessment of the clinical practice and ongoing care of invasive devices, cleaning of patient equipment and usage of hand wash stations that could compromise patients during incidents or outbreaks.</li> <li>• Review of cases each year to inform decision making around high risk areas and update the pseudomonas risk assessment yearly.</li> <li>• Instruct at the discretion of the ICD/IMT water testing during incidents or outbreaks.</li> <li>• Ensuring the implementation of all Guidance' related to the control of Pseudomonas, in particular, the 'ARHAI(2018) Guidance for Neonatal Units (NNU's) (levels 1, 2 &amp; 3) adult and Paediatric Intensive Care Units ICU's in Scotland', and adherence to the NHSGGC Water Systems Safety Policy at all levels in Infection Control Teams in all NHSGGC Premises;</li> <li>• Participate in a Compliance defined training programme for this role to maintain personal knowledge and a level of expertise allowing the efficient discharge of the <b>DP(P)</b> responsibilities;</li> </ul> |
| <b>A2.5 Assistant Director of Operational Estates, (ADOE) – Deputy Designated</b>         | <p>The Assistant Director of Estates and Facilities is the Assistant Designated Person (Water). They shall be responsible for assisting in :</p> <ul style="list-style-type: none"> <li>• The <b>DDP(W)</b> will be appointed by the <b>DP(W)</b> and in their absence have delegated executive responsibility with accountability to <b>DP(W)</b> for all safety, health and risk matters relating to Water Systems in NHSGGC, with the exception of the responsibilities delegated to the <b>DP(P)</b>., at <b>3.1.4</b> .</li> <li>• The <b>DDP(W)</b> will carry out all the duties and responsibilities of the <b>DP(W)</b> as stated in <b>3.1.2</b> above.</li> </ul>   |
| <b>A2.6 Head of Corporate Estates (HCE) – Corporate Responsible Person (Water) CRP(W)</b> | <p>The Head of Corporate Estates (<b>HCE</b>) has responsibilities delegated by the <b>DP(W)</b> with accountability to the <b>DDP(W)</b> for all safety, health and risk matters relating to Water Systems across NHSGGC Premises involved in minor works. The HCE is also the lead in ensuring SCART compliance, audits and training is in place with respect to Water Safety.</p> <p>The <b>CRP(W)</b> is responsible for:</p> <ul style="list-style-type: none"> <li>• Identifying and ensuring the efficient formal record of Sector related Water System risks and raising those considered appropriate to the <b>DDP(W)</b> &amp; <b>DP(W)</b> and the <b>BWSSG</b>;</li> <li>• Identifying and ensuring the efficient formal record of any related Water System risks due to minor works projects and raising those considered appropriate to the <b>RP(W)</b>, <b>AE(W)</b> and <b>DDP(W)</b>.</li> <li>• Unknown risks not apparent to design teams `during Minor Works Projects should also be highlighted during project scoping involving <b>AP(W)</b>'s and <b>AE(W)</b>.</li> <li>• Provide formal compliance reports to the <b>BWSSG</b> assuring the <b>DDP(W)</b> &amp; <b>DP(W)</b> that the Board's statutory responsibilities relating to Water Systems, in respective Sectors, are being safely and appropriately discharged;</li> </ul>   |

- Supporting the **DP(W)** and **DDP(W)** in the production of policies & procedures to ensure the quality of water in NHSGGC Premises is safely maintained;
- Appoint a Water Safety Authorising Engineer **AE(W)** to support NHSGG&C on all issues relating to Water;
- Working with the **AE(W)** and **DDP(W)** appoint Responsible Persons Water **RP(W)** across all sectors;
- Appoint Authorised Persons Water **AP(W)** across NHSGG&C on the recommendation of the Authorising Engineer Water **AE(W)**;
- Participate in a Compliance defined training programme for this role to maintain personal knowledge and a level of expertise allowing the efficient discharge of the **DRP(W)** responsibilities;
- Ensuring that Corporate staff, are fully trained as **TECHNICAL LEAD PROJECT (W)** to ensure that delegated projects comply with all NHSGG&C policy and procedures. This is to ensure that those working on water systems, **TECHNICAL LEAD PROJECT (W)** are appropriately trained in the statutory and mandatory requirements and standards for the design and provision of safe Water Systems including :-
- Ensuring that any new works undertaken or refurbishment within existing NHSGGC Premises shall comply with the requirements of this Policy and the Written Scheme and Operational Procedures for managing water safety including particularly, The Control of Legionella, Hygiene, ‘Safe’ Hot Water, Cold Water and Drinking Water Systems’;
- Ensuring all works are formally commissioned and handed over to the respective **LAP(W)** in compliance with the handover protocol for water as identified in the Written Scheme including but not limited to drawings, changes to schematics, WRAS approval documentation and modified or new risk assessment;
- Ensuring that all physical and control interfaces with existing Water Systems for new and refurbishment works shall be safely designed, installed, commissioned in a pre-planned, safe and effective manner particularly any derogations or deviations from applicable guidelines;
- Ensure, as **DRP(W)** that Corporate Estates modifications to installations in NHSGGC Premises can only be implemented following completion of **Form (025)**. This form should be completed by the Designer and then signed by **Designer, TLP(W), DRP(W)P** and **LAP(W)**;
- Formal handover to **LAP(W)** should be implemented via **Form (029)** Record form for acceptance of work to be conducted and confirmation of work completed on a water system; This form should be completed by **TLP(W)** and signed as accepted by **DH(W)** for **TLP(W)** and **LAP(W)**.
- Included in **Form (029)** is the requirement to complete the Confirmation of work completed and acceptance section. This section should be signed by the **Designer, TLP(W)** and **LAP(W)**;
- Liaise closely with other professionals to ensure consistency in application of Control Measures and other procedures designed to allow legislative and statutory compliance, comprehensively in all NHSGGC Premises;
- Compliance Audit Duties;
  - Ensuring a robust annual water audit regime is in place;
  - Ensuring that Written Schemes and Risk Assessments are in place and reviewed regularly;
  - Ensure the e-SCART tool is populated and updated regularly with action plans in place, where required;

|   |  |
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|   | <ul style="list-style-type: none"> <li>• Ensuring operational procedures are carried out and appropriately recorded;</li> <li>• Ensuring formal records are kept of all Water Systems and their purpose;</li> <li>• Ensure an Annual report on Water Compliance across NHSGG&amp;C is delivered to the <b>DDP(W)</b> and <b>DP(W)</b>.</li> <li>•</li> </ul>   |
| <p><b>A2.7 Assistant Head of Operational Estates – Responsible Person (Water) RP(W)</b></p> | <p>The Assistant Head of Operational Estates (<b>AHOE</b>) has responsibilities delegated by the <b>DP(W)</b> and <b>DDP(W)</b> with accountability to the <b>DDP(W)</b> &amp; <b>DP(W)</b> for all safety, health and risk matters relating to Water Systems in their respective Sectors of NHSGGC Premises. They will be nominated in writing by the <b>CRP(W)</b> and signed by the <b>DP(W)</b> and/or <b>DDP(W)</b> ;</p> <p>The <b>RP(W)</b> is responsible for:</p> <ul style="list-style-type: none"> <li>• Identifying and ensuring the efficient formal record of Sector related Water System risks and raising those considered appropriate to the <b>DDP(W)</b> &amp; <b>DP(W)</b> and the <b>BWSSG</b>;</li> <li>• Identifying and ensuring the efficient formal record of any related Water system risk due to Operational Estates projects and raising those considered appropriate to the <b>RP(W)</b>, <b>AE(W)</b> and <b>DDP(W)</b>.</li> <li>• Unknown risks not apparent to design teams `during Minor Works Projects should also be highlighted during project scoping involving <b>AP(W)</b>'s and <b>AE(W)</b>.</li> <li>• Provide formal reports to the <b>BWSSG</b> assuring the <b>CRP(W)</b>, <b>DDP(W)</b> &amp; <b>DP(W)</b> that the Board's statutory responsibilities relating to Water Systems, in respective Sectors, are being safely and appropriately discharged</li> <li>• Participate in a Compliance defined training programme for this role to maintain personal knowledge and a level of expertise allowing the efficient discharge of the <b>RP(W)</b> responsibilities;</li> <li>• Identify to the <b>BWSSG</b> a risk-based prioritisation of necessary resources required to effectively manage and control water system risks arising from the Water Systems to an acceptable level;</li> <li>• Effectively manage and control the resources provided to safely maintain and to effectively manage and control identified risks arising from the Water Systems in the Sector of the NHSGGC Premises, to an acceptable level, as far as reasonably practicable;</li> <li>• Ensure risk assessments, schematics and drawing are supplied to <b>LRP(W)</b> to effectively manage and control the resources provided to control risk in Water Systems in all new works in NHSGGC Premises, to an acceptable level, as far as reasonably practicable;</li> <li>• Ensuring the implementation of all 'Statutory Instruments &amp; Mandatory Guidance' related to Water Systems, (see examples in section, 'Guidance', in this Policy), and adherence to the NHSGG&amp;C Water Systems Safety Policy at all levels within Corporate Estates, particularly those related to guidance in SHTM 04-01, HSG274 Parts 1, 2 &amp; 3 and ACoP L8 and compliance to this guidance shall be formally certified by the Designer;</li> <li>• Ensuring the implementation of all 'Statutory Instruments &amp; Mandatory Guidance' related to Water Systems and adherence to the NHSGGC Water Systems Safety Policy at all levels within the Sector of the Directorate of Estates &amp; Facilities;</li> <li>• Ensuring that Sector estates staff, through the Directorate management structure, are fully aware and appropriately trained in the 'Statutory Instruments &amp; Mandatory Guidance' and standards for the provision and maintenance of safe Water Systems;</li> </ul> |

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|   | <ul style="list-style-type: none"> <li>• Ensuring the effective maintenance of engineering controls installed for the purposes of controlling water systems;</li> <li>• Ensuring that Written Schemes and risk assessments are in place and reviewed regularly;</li> <li>• Devising and maintaining procedures to ensure the quality of water in NHSGGC Premises is safely maintained;</li> <li>• Ensuring operational procedures are carried out and appropriately recorded;</li> <li>• Ensuring formal records are kept of all Water Systems and their purpose, giving locations recording and maintaining within the Board’s CAFM System;</li> <li>• Ensuring that all physical and control interfaces with existing Water Systems for new and refurbishment works shall be safely designed, installed, commissioned in a pre-planned, safe and effective manner particularly any derogations or deviations from applicable guidance;</li> <li>• Liaise closely with other professionals to ensure consistency in application of Control Measures and other procedures designed to allow legislative and statutory compliance, comprehensively in all NHSGGC Premises;</li> </ul>  |
| <p><b>A2.8 Authorising Engineer (Water), AE(W)</b></p>  | <p>The <b>AE(W)</b>, is appointed in writing by the <b>CRP(W)</b> and is employed independently of NHS GG&amp;C. The <b>AE(W)</b> acts as an independent professional advisor to NHSGGC with a brief to provide services in compliance with relative ‘Statutory Instruments &amp; Mandatory Guidance’, and particularly with Scottish Health Technical Memoranda (SHTM) 04-01, mandatory guidance for the NHS in Scotland.</p> <p>The <b>AE(W)</b> will have specialist knowledge of large scale domestic and commercial hot and cold water services installations including incoming supplies and Other Risk Systems as detailed in <b>Appendix 3</b> and in particular, those installations for which an Authorised Person (Water) will assume responsibility for.</p> <p>The <b>AE(W)</b> is free to comment on the performance of the organization against the operational risk base.</p> <p>The <b>AE(W)</b>’s main duties will include:</p> <ul style="list-style-type: none"> <li>• To be a formal Assessor, making recommendations to the <b>CRP(W)</b> for the appointment of <b>AP(W)</b> in terms of skills, training and site familiarity;</li> <li>• Formally monitoring the performance of NHSGGC against ‘Statutory Instruments &amp; Mandatory Guidance’, particularly, ACoP L8, HSG274 (Parts 1,2 &amp; 3), and SHTM 04-01 guidance;</li> <li>• The provision of a formal, annual L8 Audit at all NHSGGC Acute sites including our large hospitals where there are in/outpatients and an audit every 3 years for all remaining sites.</li> <li>• Reporting of potential risks (operational and through potential improvements).</li> </ul> |
| <p><b>A2.9 Assistant Director of Infrastructure, Planning and Delivery or nominated persons in Capital such as the Head(s) of Capital Projects – Deputy Responsible Person (Water), DRP(W)P</b></p> | <p>The above should be formally appointed as a <b>DRP(W)</b> for projects by the <b>DP(W)</b> or <b>DDP(W)</b>. They will be nominated in writing by the <b>CRP(W)</b> and signed by the <b>DP(W)</b> and/or <b>DDP(W)</b>;</p> <p>The <b>DRP(W)P</b> responsibilities include the following within any Infrastructure, Planning and Delivery (IPD) projects:</p> <ul style="list-style-type: none"> <li>• Identifying and ensuring the efficient formal record of any related Water System risks due to projects and raising those considered appropriate to the <b>RP(W)</b>, <b>DP(W)</b> &amp; <b>CRP(W)</b>;</li> <li>• Unknown risks not apparent to design teams during Projects should also be highlighted during scoping involving <b>AP(W)</b>’s and <b>AE(W)</b>.</li> </ul>   |



- Provide formal reports where required assuring the **RP(W)**, **DDP(W)** & **CRP(W)** that the Board's statutory responsibilities relating to extensions to, and refurbishments of Water Systems, are being safely and appropriately discharged;
- Participate in a Compliance defined training programme for this role to maintain personal knowledge and a level of expertise allowing the efficient discharge of the **DRP(W)** responsibilities;
- Ensuring that :- Property and Capital Planning Staff, are fully trained **OR**
  - A suitably trained person e.g. service provider is appointed for each project.
  - Either above to act as **Technical Lead Project TLP(W)** to ensure that delegated projects comply with all NHSGG&C policy and procedures. This is to ensure that those working on water systems are appropriately trained in the statutory and mandatory requirements and standards for the design and provision of safe Water Systems including :-
    - Risk assessments, schematics and drawing are supplied to **LRP(W)** to effectively manage and control the resources provided to control risk in Water Systems in all new works in NHSGGC Premises, to an acceptable level, as far as reasonably practicable;
    - The implementation of all 'Statutory Instruments & Mandatory Guidance' related to Water Systems, (see examples in section, 'Guidance', in this Policy), and adherence to the NHSGG&C Water Systems Safety Policy at all levels within projects, particularly those related to guidance in **SHTM 04-01**, **HSG274 Parts 1, 2 & 3** and **ACoP L8** and compliance to this guidance shall be formally certified by the Designer;
    - Any new works undertaken or refurbishment within existing NHSGGC Premises shall comply with the requirements of this Policy and the Written Scheme and Operational Procedures for managing water safety including particularly, The Control of Legionella, Hygiene, 'Safe' Hot Water, Cold Water and Drinking Water Systems';
    - All works are formally commissioned and handed over to the respective **LAP(W)** in compliance with the handover protocol for water as identified in the Written Scheme including but not limited to drawings, changes to schematics, WRAS approval documentation and modified or new risk assessment;
    - All physical and control interfaces with existing Water Systems for new and refurbishment works shall be safely designed, installed, commissioned in a pre-planned, safe and effective manner particularly any derogations or deviations from applicable guidelines; Ensure, as **DRP(W)P** that Capital works modifications to installations in NHSGGC Premises can only be implemented following completion of **Form (025)**. This form should be completed by the **Designer** and then signed by :-
      - **Designer.**
      - **TLP(W).**
      - **DRP(W)P.**
      - **LAP(W).**

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|  | <ul style="list-style-type: none"> <li>• Ensure that formal handover to <b>LAP(W)</b> should be implemented via <b>Form (029)</b> Record form for acceptance of work to be conducted and confirmation of work completed on a water system; This form should be completed by <b>TLP(W)</b> and signed as accepted by :- <ul style="list-style-type: none"> <li>• <b>Duty Holder (DH).</b></li> <li>• <b>TLP(W).</b></li> <li>• <b>LAP(W).</b></li> </ul> </li> <li>• Included in <b>Form (029)</b> is the requirement to complete the Confirmation of work completed and acceptance section. This section should be signed by :- <ul style="list-style-type: none"> <li>• <b>Designer.</b></li> <li>• <b>TLP(W).</b></li> <li>• <b>LAP(W).</b></li> </ul> </li> <li>• Liaise closely with other professionals to ensure consistency in application of Control Measures and other procedures designed to allow legislative and statutory compliance, comprehensively in all NHSGGC Premises;</li> </ul>  |
| <b>A2.10 Site Manager Operational Estates (SMOE) – Deputy Responsible Person (Water), DRP(W)</b> | <p>The Site Manager Operational Estates RP role shall be formally appointed in writing by the <b>CRP(W)</b>. They will be nominated in writing by the <b>CRP(W)</b> and signed by the <b>DP(W)</b> and/or <b>DDP(W)</b>;</p> <p>The <b>DRP(W)</b> responsibilities include:</p> <ul style="list-style-type: none"> <li>• Identifying and ensuring the efficient formal record of relative Water System risks and raising those considered appropriate to the <b>RP(W)</b> and the <b>SWSSG</b>;</li> <li>• Provide formal reports to the <b>SWSSG</b> assuring the <b>RP(W)</b> that the Board’s statutory responsibilities relating to Water Systems, in relative NHSGGC Premises, are being safely and appropriately discharged;</li> <li>• Participate in a Compliance defined training programme for this role to maintain personal knowledge and a level of expertise allowing the efficient discharge of the <b>DRP(W)</b> responsibilities;</li> <li>• Identify to the <b>SWSSG</b> a risk-based prioritisation of necessary resources required to effectively manage and control risks arising from the management of Water Systems to an acceptable level;</li> <li>• Effectively manage and control identified risks arising from the Water Systems in the relative locations of the NHSGG&amp;C Premises, to an acceptable level, as far as reasonably practicable;</li> <li>• Ensuring the implementation of all ‘Statutory Instruments &amp; Mandatory Guidance’ related to Water Systems, (see examples in section, ‘Guidance’, in this policy), and adherence to the NHSGG&amp;C Water Systems Safety Policy at all levels within the relative locations of the Directorate of E&amp;F;</li> <li>• Ensuring that Estates &amp; Facilities Staff, managed by the <b>DRP(W)</b>, through the Directorate management structure, are fully aware of their personal roles and responsibilities and appropriately trained in the statutory and mandatory requirements and standards for the management of safe Water Systems;</li> <li>• Ensuring Water Systems are operated in accordance with the current guidance, and with the assessed risk of the individual systems under the control of the <b>DRP(W)</b>;</li> </ul> |

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|   | <ul style="list-style-type: none"> <li>• Ensuring water system maintenance records are maintained and kept up-to-date;</li> <li>• Regularly checking maintenance records;</li> <li>• Ensuring all work is completed in accordance with the NHSGGC Operational Procedures.</li> </ul>  |
| <p><b>A2.11 Acute Services Directors, HSCP Directors and Corporate Division Directors</b></p> | <p>NHSGGC Directors and Senior Managers, play an essential role in the safe management of Water Systems, actively ensuring and demonstrating that water safety is embedded within the culture of the organisation. <b>CRP(W)</b> will arrange awareness and responsibility training.</p> <p>The responsibilities of Directors and Senior Managers include:</p> <ul style="list-style-type: none"> <li>• Identifying and ensuring necessary formal records are maintained relating to Policies and Operational Procedures for Water Systems and raising any potential risks relating to Water Systems to the <b>RP(W)</b> and the <b>SWSSG</b>;</li> <li>• Participate in training to maintain personal knowledge and a level of expertise allowing the efficient discharge of Director and Senior Manager responsibilities;</li> <li>• Effectively manage and control identified risks arising from the Water Systems in the relative NHSGGC Premises areas of responsibility, to an acceptable level, as far as reasonably practicable;</li> <li>• Ensuring the implementation of all ‘Statutory Instruments &amp; Mandatory Guidance’ and Operational Procedures related to Water Systems, (see examples in section, ‘Guidance’, in this Policy), and adherence to the NHSGG&amp;C Water Systems Safety Policy at all levels within the relative NHSGGC Premises areas of responsibility;</li> <li>• Ensuring that Staff, managed by the Director and Senior Manager are fully aware of their personal roles and responsibilities and appropriately trained in the statutory and mandatory requirements and standards for the management and operation of safe Water Systems;</li> <li>• Facilitating Staff to allow their timely attendance at Water Safety training at the appropriate frequency, as per the NHSGGC Water Safety Policy and Operational Procedures which underpin this Policy;</li> <li>• Ensuring Water Systems are operated in accordance with the current guidance, and NHSGGC Operational Procedures;</li> <li>• Ensuring Water Systems records, including Staff training records, are monitored and kept up-to-date;</li> <li>• Supporting the <b>DP(W)</b> and <b>DDP(W)</b> in the development of the Board’s overall strategy in relation to the safe management and operation of NHSGGC Water Systems and for ensuring and demonstrating implementation within their areas of responsibility;</li> <li>• Monitor and actively and effectively correct situations where inaction or actions by Staff put themselves and/or others at risk from actual or potential water safety incidents.</li> </ul> |

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| <p><b>A2.12 Heads of Service (HoS), Departmental Managers (DMs), Clinical Managers (CMs) and Senior Charge Nurses (SCNs)</b></p> | <p>All managers and SCNs have a responsibility in the safe management of Water Systems, actively ensuring and demonstrating that water safety is sufficiently embedded in their departments, and for the safe, day to day management of facilities, Staff or services, and/or premises. <b>CRP(W)</b> will arrange awareness and responsibility training.</p> <p>Water safety responsibilities that include:</p> <ul style="list-style-type: none"> <li>• Familiarise themselves with the NHSGGC Water Safety Policy and local control measures including any water risk assessments for their area(s) of responsibility;</li> <li>• Ensuring that persons in the department, clinic or ward are fully aware of their responsibilities and duties in respect of Water Safety, in particular, the action required of them should the area be defined as High Risk, listed in the site- specific Water Safety Written Scheme and Operational Procedures;</li> <li>• Ensure that persons in the department, clinic or ward are fully aware of the ‘Infrequently used Outlets’ definitions and Operating Procedure which underpins the NHSGGC Water Safety Policy;</li> <li>• Actively promoting Water Safety within the department or ward by maintaining good housekeeping within the department or ward at all times, ensuring that any flushing or documentation as described in the Water Safety Written Scheme and Operational Procedures documentation is completed on time ;</li> <li>• Responding appropriately to any water safety concerns of persons in the department, clinic or ward;</li> <li>• Encouraging their staff and themselves to promptly report any breaches in the water system, such as water ingress, leaks etc. to estates;</li> <li>• Nominating a responsible person to complete the Monthly ‘Infrequently used Outlets’ Audit for each area, forwarding a copy to the Site Maintenance/Estates Manager, thereby assisting NHSGGC to consistently comply with its statutory and mandatory obligations;</li> <li>• Ensuring that action is taken on a daily basis to address any access issues identified within the Cleaning Compliance Checklist Sign Off documentation retained in the Facilities Folder;</li> <li>• Liaising with the Estates Department as required and in particular when outlets cannot be flushed e.g. broken so actions can be taken promptly.</li> <li>• Ensure a flushing regime is place in accordance with specific duties under SHTM Guidelines (e.g. Clinical, Non-Clinical, Facilities, Domestic etc.) Ensure part empty wards or areas, have an appropriate flushing regime in place in accordance with SHTM guidelines (e.g. Clinical, Non-Clinical, Facilities, Domestic etc.)</li> </ul> |
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**A2.13 Technical Lead  
Project TLP(W) -  
Capital or Minor  
Works**

The person acting as the **TLP(W)**, has the key role and will be specifically qualified, trained and experienced to allow the efficient discharge of their responsibilities under **SHTM04-01** and to ensure that all aspects within the scope of the project installations/management comply with the requirements.

This role **can be outsourced for projects if resource internally is unavailable**.

The **TLP(W)** will ensure all Competent Contractors **CC(W)** managed by the **TLP(W)** are suitably trained, and formally engaged competent contractor(s) and assessed by the **LAP(W)**.

The responsibilities of the **TLP(W)** include:

- Ensuring that delegated projects comply with all NHS GG&C policy and procedures.
- Identifying and ensuring the efficient formal record of relative Water System risks within the scope of the project raising those considered appropriate to the **DRP(W)P** for projects or **CRP(W)** for Minor Works;
- Provide formal reports to the **DRP(W)P** for Capital or **CRP(W)** for Minor works assuring the **DP(W)** and **DDP(W)** that the Board's statutory responsibilities relating to Water Systems are being safely and appropriately discharged for projects;
- Participate in a Compliance defined training programme for this role to maintain personal knowledge and a level of expertise allowing the efficient discharge of the **TLP(W)** responsibilities;
- Identify to the **DRP(W)P** for Capital or **CRP(W)** for Minor works a risk-based prioritisation of necessary resources required to effectively manage and control water system risks arising from the Water Systems within the scope of the project, to an acceptable level;
- Ensure during projects that risks are effective for the Water Systems in the relative locations of the NHSGGC Premises, to an acceptable level, as far as reasonably practicable during the project duration e.g. construction water safety plan;
- Ensuring during projects the implementation of all 'Statutory Instruments & Mandatory Guidance' related to Water Systems, (see examples in section, 'Guidance', in this Policy), and adherence to the NHSGGC Water Systems Safety Policy at all levels within the relative locations of the Directorate of Estates & Facilities;
- The **TLP(W)** will also be able to demonstrate:
  - Successful completion of an appropriate professional course; o A sufficient level of professional experience;
  - Evidence of knowledge and skills relating to Water Systems;
- Participate in completion of :-
  - **Form (025)** Design checklist for alterations to water systems;
  - **Form (029)** Record form for acceptance of work to be conducted and confirmation of work completed on a water system;

**A2.14 Authorised  
Person's (Water)  
AP(W)**

**Operational Estates** – Estates Managers, Estates Supervisors etc.

The **AP(W)**, has the key operational role and will be specifically qualified, trained and experienced to allow the efficient discharge of their responsibilities. **AP(W)** will be recommended by the **AE(W)** for appointment by the **CRP(W)**.

Important elements of an **AP(W)** role are the comprehensive maintenance of formal records and the necessary quality of service and maintenance of systems to ensure their safety and integrity as detailed within the Written Scheme.

The **AP(W)** will also be responsible for establishing and formally appointing a sufficient number of NHSGGC Competent Persons (Water), **CP(W)**, to carry out maintenance and operational Procedures on Water Systems and signing off fully trained **CC(W)** managed by the **AP(W)** or **TLP(W)**.

Larger sites may require more than one **AP(W)**. Where more than one **AP(W)** is operating on a site, the **CRP(W)** will appoint one **AP(W)** to take a lead role **LAP(W)** ensuring effective, clear, unambiguous communications, with the purpose of safely discharging responsibilities and avoiding confusion and duplication.

The responsibilities of the **AP(W)** include:

- Identifying and ensuring the efficient formal record of relative Water System risks and raising those considered appropriate to the **RP(W)**;
- Provide formal reports to the **RP(W) and DRP(W)** assuring the **CRP(W), DP(W) and DDP(W)** that the Board's statutory responsibilities relating to Water Systems, in relative locations, are being safely and appropriately discharged;
- Participate in a Compliance defined training programme for this role to maintain personal knowledge and a level of expertise allowing the efficient discharge of the **AP(W)** responsibilities;
- Identify to the **RP(W) , DRP(W), CRP(W), DP(W) and DDP(W)** a risk-based prioritisation of necessary resources required to effectively manage and control water system risks arising from the Water Systems associated with the project to an acceptable level;
- Effectively manage and control identified risks arising from the Water Systems in the relative locations of the NHSGGC Premises, to an acceptable level, as far as reasonably practicable;
- Ensuring the implementation of all 'Statutory Instruments & Mandatory Guidance' related to Water Systems, (see examples in section, 'Guidance', in this Policy), and adherence to the NHSGGC Water Systems Safety Policy at all levels within the relative locations of the Directorate of Estates & Facilities;
- Ensuring that estates staff, managed by the **AP(W)**, through the Directorate management structure, are fully aware and appropriately trained in the 'Statutory Instruments & Mandatory Guidance' and standards for the provision and maintenance of safe Water Systems;
- The **AP(W)** will also be able to demonstrate:
  - Their application through familiarisation with the system(s) they are responsible for and the successful completion of an appropriate professional course;
  - A sufficient level of professional experience;
- Evidence of knowledge and skills relating to Water Systems;
- Review and formally acceptance all installations, adoptions and modifications prior to implementation, engage as required with respect to the scale, complexity and/or associated risks guidance. :-

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|   |               | <ul style="list-style-type: none"> <li>• <b>AE(W).</b></li> <li>• <b>DRP(W).</b></li> <li>• <b>RP(W).</b></li> <li>• <b>RP(W)P.</b></li> <li>• <b>TLP(W).</b></li> </ul>   |
| <b>Legionella Assessor</b>                            | <b>Risk</b>   | GG&C appoints in writing a Legionella Risk Assessor with terms of reference to provide services in accordance with BS 8580, SHTM 04-01 and HSE guidance under this Policy. They will be appointed in writing by the <b>CRP(W)</b> .  |
| <b>Competent Person (Water)</b>                       | <b>Person</b> | The Competent Person (Water) <b>CP(W)</b> provides skilled installation and/or maintenance of the specialist service. They will be appointed, or authorised to work (if a contractor) by the <b>AP(W)</b> . They will have completed and demonstrated competency and completed a specific City and Guilds <b>CP(W)</b> training course. They would work under the direction of an <b>AP(W)</b> or <b>TLP(W)</b> for projects in accordance with operating procedures, policies and standards of the service. However all <b>CP(W)</b> 's must be signed off as competent by the <b>AP(W)</b> .         |
| <b>Contractor / Water Management Service Provider</b> |               | A Contractor / Water Management Service Provider is the person or organisation designated by management to be responsible for the supply, installation, validation and verification of hot and cold water services, and for the conduct of the installation checks, tests and risk reduction measures in relation to the control of <i>Legionella and other bacteria</i> . Any service provider and staff must have completed specific training courses defined by the Compliance Manager prior to working (e.g. companies/individuals who are members of the <i>Legionella Control Association</i> ). |

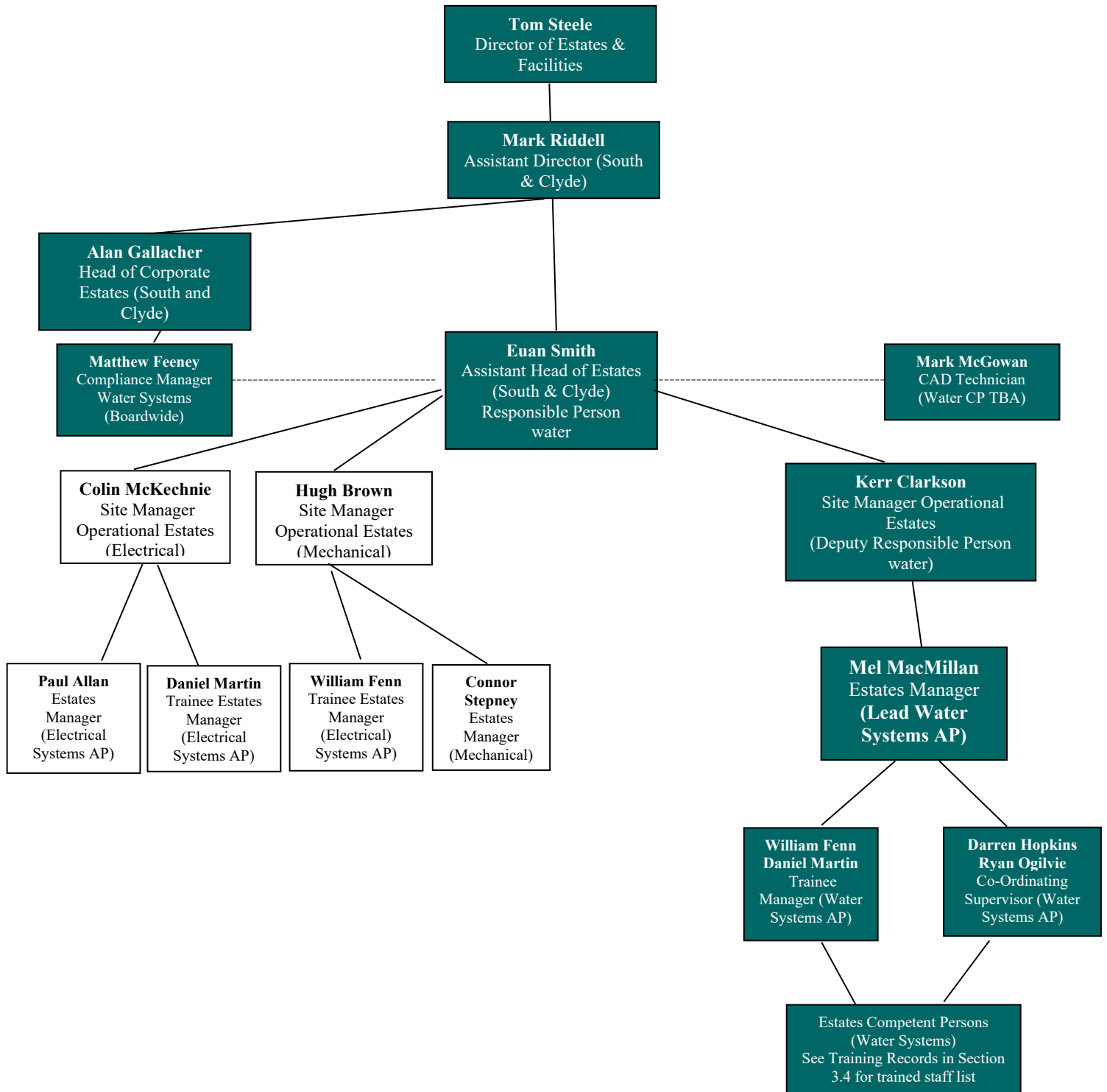
## NHS GG&C South Sector (QEUH) Hierarchy Appointment Table

| Designation                       | Position   | Name<br>Tel Number   |
|-----------------------------------|--|--|
| The Duty Holder                   | Chief Executive  | Jane Grant   |
| Designated Person (Water)         | Director of Estates and Facilities (Estates)   | Tom Steele   |
|                                   | Assistant Director (Estates)   | Mark Riddell   |
| Authorising Engineer (Water)      | AE   | Dennis Kelly   |
| Legionella Risk Assessor          | DMA  | David Watson<br>Mike Kinghorn  |
| Responsible Person (Water)        | Sector Estates Manger (South)  | Euan Smith   |
| Deputy Responsible Person (Water) | Site Manager Operational Estates (Building)  | Kerr Clarkson  |
| Deputy Responsible Person (Water) | Head of Capital Projects   | James Huddleston   |
| Lead Authorised Person            | Estates Manager  | Mel MacMillan  |
| Authorised Persons                | Co-ordinating Supervisor<br>Co-ordinating Supervisor<br>Trainee Estates Manager<br>Trainee Estates Manager<br>Co-ordinating Supervisor | Darren Hopkins<br>John Hetherton<br>William Fenn<br>Daniel Martin<br>Ryan Ogilvie (awaiting appointment) |
| Head of Compliance                | Head of Corporate Estates  | Alan Gallacher   |
| Compliance Manager                | Trainee Compliance Manager   | Matthew Feeney   |
| Competent Persons                 | CAD Technician   | Mark McGowan   |
| Competent Persons                 | Plumbers/Engineers   | See training records in Section 3.4  |
| <b>Others Involved</b>            |  |  |
| Microbiology                      | Consultant Microbiologist  | Alistair Leonard<br>Linda Bagraade<br>Aleksandra Marek   |
| Infection Control                 | Director<br>Lead Nurse<br>Lead Nurse   | Sandra Devine<br>Allan Kelly<br>Anne Gallacher   |
| Public Health                     |  | Dr Iain Kennedy  |
| Laboratory Services               |  | Sandra Higgins   |



### 3.2 QEUE Estates Staffing

Communication Pathway for QEUE Estates Dept as of Jan 24.



### 3.3 Required Maintenance Tasks

The maintenance and management of the water systems throughout the QEUH Campus is undertaken by a combination of both NHS Staff and external Contractors at the frequencies identified in the following tables.

**QEUH Management staff manage and oversee the following tasks:**

| Procedure Reference | Operation(s)  | Record Form Ref | Frequency                    |
|---------------------|---|-----------------|------------------------------|
| P1C1                | BMS Temperature Monitoring ( <b>Carried out by NHS Estates</b> )  |                 | <i>Daily</i>                 |
| P1CC1A              | Manual Temperature Monitoring for calorifiers (different form used ONLY REQUIRED if no BMS Monitoring)  | (005a)          | <i>Daily</i>                 |
| N/A                 | Filtration Plant Checks ( <b>Carried out by NHS Estates</b> )   | 028c            | <i>Twice Daily</i>           |
|                     |   |                 |                              |
| WS01                | Daily flushing of all outlets ( <b>Carried out by NHS Facilities</b> )  | -               | <i>Daily</i>                 |
| WS01                | Deluge shower/Eye wash flushing ( <b>1 off carried out by NHS Estates and 1 off by DMA</b> )  | (026)           | <i>Twice Weekly</i>          |
| WS01                | Flushing of INFREQUENTLY USED outlets * frequency based on risk ( <b>Carried out by NHS Clinical</b> ) see page 103   | -               | <i>Daily or Twice weekly</i> |
| P1C3                | Pump operation/duty rotation ( <b>Carried out by NHS Estates</b> )  | (028a)          | <i>Weekly</i>                |
|                     |   |                 |                              |
| P1C4                | Temperature, CL02 Recording of Sentinel Hot and Cold Water Outlets. ( <b>Carried out by DMA</b> )   | (005c)          | <i>Monthly</i>               |
| P1C4                | DHW Calorifier and Buffer Vessel Checks ( <b>Carried out by NHS Estates</b> )   | (005)           | <i>Monthly</i>               |
| P1C6                | DWS Calorifier, Expansion Vessel Flushing ( <b>Carried out by NHS Estates</b> )   | (006) (023)     | <i>Monthly</i>               |
|                     |   |                 |                              |
| WS01                | Review of Rarely Used Water Outlets and Changes In-Use (As required by NHS Estates)   |                 | <i>Quarterly</i>             |
|                     |   |                 |                              |
| P1C9                | DWS Calorifier / Expansion Vessel Inspection ( <b>Carried out by NHS Estates</b> )  | (006)           | <i>Annually</i>              |
| N/A                 | Water Services Pipework and Distribution System Checks ( <b>Carried out by NHS Estates during calorifier checks, Plant Room checks and by DMA during Tank Room checks</b> ) |                 | <i>Annually</i>              |
| N/A                 | Vibration coupling inspection (Carried out as part of checks on booster pumps) ( <b>Carried out by NHS Estates</b> )  |                 | <i>Annually</i>              |
| N/A                 | Carry out review of log books and Written Scheme  |                 | <i>Annually (Sep)</i>        |
| N/A                 | Carry out review of drawings and schematics   |                 | <i>Annually (Sep)</i>        |

### 3.3 Required Maintenance Tasks (cont)

In addition to the tasks undertaken by NHS directly employed Competent Persons, there are also tasks undertaken by Contractors on a selection of buildings within the campus.

**Appointed Service Providers presently undertake the following tasks:**

| Procedure Reference | Operation(s)  | Record Form Ref | Frequency           |
|---------------------|---|-----------------|---------------------|
| WS01                | Deluge shower/Eye wash flushing ( <b>Carried out by DMA</b> )   | DMA Records     | <i>Twice Weekly</i> |
| WS01                | Flushing Deadlegs and drain valves ( <b>Carried out by DMA</b> )  | DMA Records     | <i>Twice Weekly</i> |
| WS01                | Flushing Infrequently used outlets ( <b>Carried out by DMA</b> )  | DMA Records     | <i>Twice Weekly</i> |
| PIC4                | Temperature and CL02 monitoring of outlets ( <b>Carried out by DMA</b> )  | DMA Records     | <i>Monthly</i>      |
| -                   | PPM Schedule Monthly Visually inspect chemical delivery system, Check chemical suction and delivery lines for correct operation Chemical level check and refill , Cross check measured ClO <sub>2</sub> / Chlorite residual test against analyser & Palintest Kit, Check and Adjust controller settings as required ( <b>Carried out by ScotMas</b> )   | ScotMas Records | <i>Monthly</i>      |
| -                   | Monthly checks of heaters below <15l)   | DMA Records     | <i>Monthly</i>      |
| -                   | PAL Filters on taps outlets ( <b>Carried out by DMA</b> )   | DMA Records     |                     |
| -                   | Shower Head and Flexible Hose Exchange ( <b>Carried out by DMA</b> )  | DMA Records     | <i>Quarterly</i>    |
| -                   | Shower Head and Flexible Hose maintenance e.g. fixed shower heads, bath, eye wash heads etc ( <b>Carried out by WATER SERVICE PROVIDER</b> )  | DMA Records     | <i>Quarterly</i>    |
| WQS 001             | HORNE Tap Flow Straightener Exchange ( <b>Carried out by DMA</b> )  | DMA Records     | <i>Quarterly</i>    |
| -                   | External Fire Hydrant Valve Operation and Flushing Routines ( <b>Carried out by Chubb</b> )   | Chubb Records   | <i>6 Monthly</i>    |
| -                   | 'TMV/TMT' Tap and shower slam ( <b>PART OF NEW TENDER REQUIREMENTS</b> )  | TBC             | <i>6 Monthly</i>    |
| -                   | Maintenance of filtration units ( <b>Carried out by Veolia</b> )  | Veolia Records  | <i>6 Monthly</i>    |
| -                   | 6 Monthly Visit– All above, plus, Check ClO <sub>2</sub> gas detector functionality and recording levels, Simulate fault circuitry and alarm on Sentinel Monitor, Change probe electrolyte and cross calibration test, Carry out manual Chlorate & Chlorite validation tests (12 representative outlets), Check water meter operation and report o Electrolyte top up, Probe calibrations ( <b>Carried out by Scotmas</b> ) | ScotMas Records | <i>6 Monthly</i>    |
| PIC7                | CWST Inspection and Temperature Monitoring ( <b>Carried out by DMA</b> )  | DMA Records     | <i>6 Monthly</i>    |

### 3.3 Required Maintenance Tasks (cont)

|              | 'TMV' Tap Outlet Sanitisation and Operational Checks<br>( <b>Carried out by Vanguard - MIU</b> ) to April 2024<br><b>Thereafter DMA</b> for MIU. <b>DMA</b> for all others.   | <b>Vanguard<br/>Records / DMA<br/>Records</b> | <i>Annually</i>    |
|--------------|---|---|--------------------|
|              | CWST Inspection clean and disinfection ( <b>Carried out by<br/>DMA</b> )  | <b>DMA Records</b>                            | <i>Annually</i>    |
| -            | As per 6 monthly and ClO <sub>2</sub> & Chlorite Probe membrane<br>cap replacement, Dosing Pump diaphragm valve<br>replacements, Replace ClO <sub>2</sub> gas detector cartridge if<br>required ( <b>Carried out by Scotmas</b> ) | <b>ScotMas<br/>Records</b>                    | <i>Annually</i>    |
| <b>P1C10</b> | Representative Tap Temperature Monitoring<br>Note all tap temperatures are checked through TMT/TMV<br>maintenance ( <b>Carried out by DMA</b> )   | <b>DMA Records</b>                            | <i>Annually</i>    |
|              | BMS Sensors ( <b>Carried out by Schneider and MCE<br/>BMS Providers for respective BMS</b> )  | <b>Schneider &amp;<br/>MCE records</b>        | <i>Annually</i>    |
|              | Hot and Cold Tap Outlet Sanitisation and Operational<br>Checks (only carried out if issues identified e.g. through<br>sampling)   | <b>DMA Records</b>                            | <i>As required</i> |
|              | Flushing outlets due to issues identified through sampling  | <b>DMA Records</b>                            | <i>As required</i> |

### 3.4 Training Records

The following NHS personnel are certified to have the required ability, experience, instruction, information and training to carry out the work associated with legionella precautions at QEUH Campus.

| NAME   | POSITION                        | NATURE OF TRAINING<br>(QUALIFICATION, TRAINING COURSES<br>ATTENDED)   | DATE |
|--|---------------------------------|---|------|
| Euan Smith                                       | Sector Estates<br>Manager<br>RP | Responsible Person Course<br>ENAP City & Guilds Authorised Person<br>ENWS City & Guilds Managing Water Systems  |      |
| Kerr Clarkson                                    | Site Manager<br>Operational     | WHH01 – Legionella Management for Water<br>Systems SHTM-04 01<br>WH003 - Legionella Control Within Hot and Cold<br>Water Systems<br>Responsible Person Course |      |
| Mel MacMillan                                    | Estates Manager<br>Lead AP      | WHH01 – Legionella Management for Water<br>Systems SHTM-04 01<br>WH003 - Legionella Control Within Hot and Cold<br>Water Systems                              |      |
| Daniel Martin<br>William Fenn<br>John Hetherton  | Trainee Estates<br>Managers AP  | WHH01 – Legionella Management for Water<br>Systems SHTM-04 01<br>WH003 - Legionella Control Within Hot and Cold<br>Water Systems                              |      |
| Ryan Ogilvie<br>Darren Hopkins<br>John Hetherton | Supervisor AP                   | WHH01 – Legionella Management for Water<br>Systems SHTM-04 01<br>WH003 - Legionella Control Within Hot and Cold<br>Water Systems                              |      |

Copies of all relevant training records and appointment letters are held electronically on the QEUH Shared Drive within the folder path “Water Quality>Training and Appointments”.

The results achieved by each member of staff during their competency training are held on the central database managed by the Water Systems Compliance Manager.

| NAME            | POSITION        | NATURE OF TRAINING<br>(QUALIFICATION, TRAINING COURSES<br>ATTENDED) | DATE |
|-----------------|-----------------|---|------|
| Martin Inglis   | Tech Plumber    | Competent Persons   |      |
| Andrew Hamilton | Tech Plumber    | Competent Persons   |      |
| David Fickling  | Tech Plumber    | Competent Persons (requires refresher)                              |      |
| Mark McNally    | Tech Plumber    | Competent Persons (requires refresher)                              |      |
| Shawn O'Neill   | Tech Plumber    | Competent Persons   |      |
| Jason Weir      | Tech Plumber    | Competent Persons (requires refresher)                              |      |
| Adam Gardner    | Tech Plumber    | Competent Persons   |      |
| Gavin Goodall   | Apprentice      | Competent Persons   |      |
| Mark McGowan    | CAD Technician  | Competent Persons   |      |
| Ryan Saunders   | Mechanical Tech | Competent Persons   |      |

Copies of all relevant training records and appointment letters are held electronically on the QEUH Shared Drive within the folder path "Water Quality>Training and Appointments".

The results achieved by each member of staff during their competency training are held on the central database managed by the Water Systems Compliance Manager.

### 3.5 Training Requirements

A programme of training and procedures to assist in assessing and ensuring the competence of ALL persons responsible for the operation, maintenance, repair and alteration to the water distribution system and associated plant and equipment requires to be progressed, developed and implemented.

QEUEH Estates Staff - Interim Training Requirements:

| Item | Training Requirement                                 | Applicable to | Target Date for Completion | Date Completed |
|------|--|---------------|----------------------------|----------------|
| 1    | Toolbox talks on Written Scheme Section 4 for staff. | All plumbers  |                            |                |
| 2    | See Smartsheet for training records                  |               |                            |                |
| 3    |  |               |                            |                |
| 4    |  |               |                            |                |
| 5    |  |               |                            |                |
| 6    |  |               |                            |                |
| 7    |  |               |                            |                |
| 8    |  |               |                            |                |
| 9    |  |               |                            |                |
| 10   |  |               |                            |                |
| 11   |  |               |                            |                |
| 12   |  |               |                            |                |

**NOTE:-** This table should be updated on a regular basis as part of the review process described in **Section 3.10**.

### 3.6 Water Systems Risk Assessment

The duly appointed Legionella Risk Assessor for Legionella and Water Systems Safety will update the Legionella risk assessment database as directed by the board.

Risk assessments for each building have been conducted by and are filed in Smartsheet, SCART folder and Teams folder. Each contains details of individual systems and a summary of the associated risks. The risk assessments each contain unique information in regard to the water distribution systems in the buildings and also guidance on the recommended maintenance procedures for mitigating risk.

#### **Risk Assessment Review-Escalations**

During the Risk Assessment, whenever an anomaly is discovered on either the hot or cold water systems, the Risk Assessors e-mail the AP (water) with their findings. These anomalies are actioned by creating a FM job for the onsite CP Plumbing Technician. The findings are held in the Estates office in the folder named (Pre Risk Assessment Jobs completed).

#### **Risk Assessment Process for Removal of Identified Items**

Points are actioned that have been identified in the Risk Assessment, all drawings are updated to reflect the changes and the Risk Assessment action point is closed.

#### **Risk Assessment Review Schedule**

A review of the Risk Assessments MUST be carried out after or during the following:

- A change to the water system or its use
- A change to the use of the building/ward/clinic/department etc.
- Changes in legislation or updates in control measures
- Changes in immediate management or key personnel
- Control measures becoming ineffective
- Increased micro-bacterial levels found in the water system or a case of legionnaires disease/legionellosis associated with the water system.

Action plan details for each risk assessment are summarised on the Smartsheet tool.

Electronic copies of the Risk Assessments are also held on the QEUH Shared Drive at the folder path "SCART/22/Water" and Teams Folder.

Further information on reviewing Risk Assessments is detailed in [Appendix 3](#).



### 3.7 Plant Description and Schematics

Details of the plant in each building and schematic layouts are contained within the individual log books/risk assessments for each building. The log books/risk assessments are stored in the main Estates Office at QEUH.

These details are also held on the Shared Drive

All plant details and system schematics and as-fitted drawings for the Adult & Childrens Hospitals are contained in the ZUTEC cloud based document management system. All Estates Managers and Supervisors have access to these systems.

Additional access accounts can be set up at the request of the QEUH Site Manager Operational Estates.



### 3.8 Water Systems Audits/Review Procedures

A duly appointed Authorising Engineer (Water) will audit the entire Water Safety procedures within *NHS Board* annually.

The appointed Authorising Engineer for Water Safety will produce an annual report for management review. *See Section 3.1 pg 18 for current appointments.*

#### AE Audit

The Lead Authorised Person (Water) must regularly gather and maintain all the relevant information and records, including relevant Water Safety Risk Assessments and Written Schemes.

Working with the Authorising Engineer (Water) and Responsible Person (Water), the relevant Authorised Person (Water) will review and analyse all records for compliance with *Legionella* and other water safety parameters.

The relevant Authorised Person (Water) will detail on these records any deviations from the *Legionella* and other water safety parameters giving a brief description as to the reason for this deviation.

The Audit Programme will consist of planned audits on the following elements, for example:

- Risk Assessments;
- All documentation associated with this Written Scheme
- training review and records;
- schematic drawings;
- Water Safety Log Books/Maintenance records;
- BMS trend log comparison.

A report will be produced summarising the audit for submission to the Sector Water Safety Group.

The Lead Authorised Person (Water) will file locally, all relevant information and maintain hard copy records in the Water Safety Log Books stored within the main Estates Office. All actions identified should be tracked to ensure completion and closure.

## Summary of Internal/External Audit Procedures

| Frequency     | Task  | By Whom                         |
|---------------|---|---------------------------------|
| Annually      | Carry out Authorising Engineers Audit and produce report for submission to Sector Water Safety Group (Section 3.8 WS)     | Lead AP, AE,                    |
| Annually/Sept | Carry out annual review of written scheme and produce report for submission to Sector Water Safety Group (Section 3.9 WS) | RP/DRP, Lead AP, Compliance Mgr |
| 6 monthly     | Carry out management review (Section 3.10 WS)   | RP/DRP, Lead AP, Compliance Mgr |
| Monthly       | Carry out regular audit of SCART topic and update database (Section 3.11 WS)  | Lead AP                         |
| Monthly       | Conduct contractor meetings/audits to ensure compliance with legislation and training requirements.(Section 3.12 WS)      | Lead AP                         |

### 3.9 Written Scheme Audit Procedure

The Written Scheme will be audited at agreed intervals but should be at least annually.

An audit schedule will be prepared to ensure the entire procedure is audited. This should be done in conjunction with the Lead AP (Water Systems), Compliance manager, and Responsible Person (Water Systems). A report should be produced and submitted to the Sector Water Safety Group.

### 3.10 Management Review

The Responsible Person (Water) will hold regular review meetings to confirm current compliance with Water Safety System requirements, identification of any deficiencies and actions required to resolve staff training needs.

The management review will be based on following:

- Results of internal audits;
- Results of external audits;
- Staff suggestions;
- Training records;
- Operation of the system and procedures over a reasonable historic period (6 to 12 months)

### **3.11 Water Systems SCART Report**

The Lead Authorised Person (Water) must regularly gather and maintain all the relevant information for import into the Campus SCART system.

All evidence confirming the SCART position and justification for risk rating adjustments should be uploaded to the SCART database in electronic format and to Water Teams folder.

### 3.12 Contractor Management & Audit Report

#### Contractor Management Process

Regular review meetings should be set up with any contractors working on the water distribution system. Minutes of the meetings are held on the QEUH Estates Shared Drive at the path: SCART22/Water.

- Discussions should include:
- Ongoing works;
- Future task programme;
- Recording procedures;
- RAMS;

#### Contractor Competency

Regular checks should be performed to ensure that any contractors working on the water distribution system are deemed competent and all operatives are suitably trained to conduct the delegated tasks. Copies of all Risk Assessments and Method Statements should be refreshed and all training records reviewed by the Water Systems AP. Copies are stored on the QEUH Campus Shared Drive in SCART 22/Water and Water Teams Folder.

Main approved contractors include :

DMA Canyon – Water Management activities.

Veolia – Maintenance of Filtration.

MMM – Contract Plumbers.

Livingston – Contract Plumbers.

Scotmas – Maintenance of CL02.

Eden – Maintenance of Water Coolers.

Other contractors specific to minor works or capital projects must meet the same criteria and be signed off by Water AP for working on a water system.

#### Contractor Audit Report

A report should be produced at least annually to record the findings of the audit.

### 3.13 Permit to Work, Water Systems.

The Permit to Work Water Systems as per this written scheme is solely intended to be used when works on the hot and cold water systems and its ancillary equipment are to be completed within the QEUH and RHC campus. This includes break-ins to existing pipe work, removal of dead legs and any new installation works.

The Permit to Work may only be issued to Competent Persons (L8 approved) by the Authorised Person (AP) for water. This includes in house maintenance staff and approved contractors.

The Permit to Work form will include the following;

- Name of the organisation issuing the permit.
- Permit number.
- Name of Authorising Person (AP), including emergency contact details.
- Reasons for the works on the water system, (Plant Preventive Maintenance, Planned repairs or Emergency works).
- Exact location of the works
- Reference to any as built drawing numbers, (for update purposes).
- Name of Competent Person (CP) undertaking the works.
- Hazards and Risks, (copy of Risk assessment and Method Statements (RAMS) to be submitted for approval before start of works)
- Commissioning and Testing.

The above points on the Permit Work are broken into five categories, namely;

Part 1 Description of work and authorisation/permission to proceed.

Part 2 CP acceptance of work and conditions.

Part 3 Confirmation of work completion and engineering test results.

Part 4 Authorisation to use a system.

Part 5 Acceptance of system status by Nurse Manager.

Procedure to be followed for Permit to Work on water systems within the QEUH and RHC;

Sign into Estates office within the Laboratory building on the QEUH and RHC campus.

Receive induction from Authorised Person water.

Provide L8 Competent Person certification to Authorised Person water.

Provide applicable RAMS for the works to be completed.

### **3.14 Tool Box Talk, Hot and Cold Water Systems.**

Estates Tool Box Talk on Hot and Cold water Systems is located on the shared drive / water quality / Estates Tool Talk. This is carried out in the form of a power point presentation.



## 4.0 MAINTENANCE PROCEDURES

| Procedure Reference | Operation                      |
|---------------------|--------------------------------|
| 4.1                 | SYSTEM INFORMATION             |
| 4.2                 | MAINTENANCE PROCEDURES SUMMARY |
| 4.3                 | WEEKLY MAINTENANCE TASKS       |
| 4.4                 | MONTHLY MAINTENANCE TASKS      |
| 4.5                 | QUARTERLY MAINTENANCE TASKS    |
| 4.6                 | SIX MONTHLY MAINTENANCE TASKS  |
| 4.7                 | ANNUAL MAINTENANCE TASKS       |
| 4.9                 | BI-ANNUAL MAINTENANCE TASKS    |

### NOTE:

Completed Log Sheet to be submitted to either the Authorised Person (Water Systems) or Site Manager Operational Estates for authorisation and copies filed as indicated in Section 2.2.

Due to the volume of information required for the recording of test results for each of the assets being maintained, the Log Sheets provided within this document are for indicative purposes only.

Detailed information on the assets and test records for same will be retained within the specific 'Log Book' for the location being maintained.

## 4.1 System Information

### 4.1.1 Correct and Safe Operation of the System

Measures should be in place to ensure that the water system is operated within the specific parameters as detailed in the following paragraphs:

Temperature control, supplementary control consisting of Chlorine Dioxide and Point of Use Filters are control strategies used for QEUH.

### 4.1.2 Hot Water System

The storage of domestic hot water should be arranged to ensure that a water outflow temperature of at least 60°C is achieved. No two water systems are the same and through periodic monitoring operational system performance, the system outflow temperature should be set to over 60°C to ensure an outflow of 60°C is achieved under normal draw-off demand and achieve 55°C at the supply to the furthestmost draw-off point in the circulating system. It is important to maintain temperatures at above this figure (Legionellae organisms will survive for only a short period of time above this temperature - approximately two minutes).

Periodic performance monitoring and a system of continuous monitoring and recording of water temperatures via a building management system (BEMS) or data logger is essential to ensure compliant system performance.

The outflow water temperature, under prolonged maximum continuous demand (at least 20 minutes) from calorifiers should not be less than 60°C.

While it is accepted that occasionally under peak instantaneous or prolonged demand the water outflow temperature will fall, it is not acceptable if this occurs frequently (more than twice in any 24 hour period) and/or for long periods (exceeding 20 minutes).

Under no circumstances should the domestic hot water flow temperature fall below 55°C.

It is recommended that disinfection by pasteurisation is undertaken if the water temperature of the calorifier falls below 45°C. A minimum domestic hot water circulation (return) temperature of 55°C shall be maintained during the hours of occupancy.

This forms part of the control strategy e.g. temperature control for water safety.

### 4.1.3 Cold Water System

Cold Water to the QEUH is supplied by Scottish Water. Water to the site is via two supplies, although most buildings are only one supply. Adults and Childrens building though has two supplies and the BMS alternates this daily. Full drawings are available as part of the Scottish Water Emergency Plan (on SCART22 and Teams folder) which also details emergency fill points.

All domestic cold water storage cisterns and tanks shall comply with the requirements of the Scottish Water Byelaws.

Duplicate tanks often create a risk of water becoming stagnant in one of them, leading to risk of Legionella, Pseudomonas Spp or similar colonisation. Consideration should be given to taking one of the tanks out of service. See guidance in "Guidance for Alterations to Water Systems".

All cold water storage tanks are to be examined and the temperature tested on a regular summer / winter six monthly cycles and cleaned as required based on inspection or agreement (this may be annual).

Temperatures in cold water storage tanks and the mains inlet to them should be checked during periods of high ambient temperatures (e.g. summer afternoons between June and August). Water temperatures should be less than 20°C.

At the same time, the furthest and nearest draw off points in the system should be checked to ensure that the water distribution temperatures are less than 20°C within 1 minute of running the water (at full flow). A similar temperature check regime should be undertaken during the winter months to identify the performance of cold water distribution systems and the impact of heat gain from heating systems.

This forms part of the control strategy e.g. temperature control for water safety.

#### 4.1.4 Cold Water System Dump Valves

The cold water system installed in the Adult & Childrens Hospitals has a dump valve arrangement incorporated into the ground floor, 1<sup>st</sup> floor and 2<sup>nd</sup> floor layouts. The positions of the dump valves are shown on the Schneider BMS STRUXUREWARE system and connected via the KNX network.

Operating parameters for the dump valves are as follows:

Open at 23°C

Close at 20°C

#### 4.1.5 Use of CL02 as supplementary control

The following buildings incorporate CL02 as supplementary control.

- Adults and Childrens (one system).
  - CL02 dosing directly into post filtration cold tanks (0.2 – 0.4 mg/l). **Low alert (0.1mg/l) High alert (0.8mg/l).**
  - CL02 dosing directly into hot (0.4 mg/l) **High alert (0.5mg/l).**
  - Remote monitoring stations for cold (and backup for in line dosing)
  - Remote supplementary dosing for hot.
  - Chlorite monitoring from tanks.
  - Gas detection.
  - Incoming Chlorine levels on pre filtration tanks.
- Institute of Neurological Science, Neurology and Imaging Centre of Excellence (one system).
  - In line Dosing (0.2 – 0.4 mg/l). **High alert (0.7mg/l).**
  - Chlorite monitoring from tanks. (0.4mg/l).
  - Gas detection.
- Maternity (one system).
  - In line dosing (0.5mg/l). **Low alert (0.1mg/l) High alert (0.8mg/l).**
  - Gas detection.

CL02 is managed by Scotmas via online portal and Cl02 is monitored at each generator, monitoring stations downstream and in some case within tanks (Adults and Childrens).

[REDACTED]

The software monitors CL02 levels within agreed parameters and will automatically alert if thresholds are breached (either low, high or very high and the dosing automatically stops).

CL02 at outlets is also checked during sampling (outlets, tanks etc) and sentinel tap monitoring.

Chlorine gas detectors are also installed and if activated will shut down dosing.

Maintenance is carried out by Scotmas monthly, 6 monthly and annually (see next page). Further information can be found in O&M manuals in SCART22 folder.

**Schedule A - Description of Installed****Equipment Cold Water Dosing Plants**

Backwash Filter Plant A  
 Backwash Filter Plant B  
 Backwash Filter Plant C  
 Basement Filtrate Tank 1A/1B  
 Basement Filtrate Tank 2A/2B  
 Boosted Line 1.1  
 Boosted Line 1.2  
 Boosted Line 2.1  
 Boosted Line 2.2  
 Plant Room 21 Local Booster  
 Plant Room 22 Local Booster  
 Plant Room 31 123 Local Booster  
 Plant Room 31 456 Local Booster  
 Plant Room 31 789 Local Booster  
 Plant Room 32 Local Booster  
 Plant Room 33 Local Booster  
 Plant Room 41 Local Booster  
 Retained Estate Maternity Retained Estate Neurology

**Hot Water Dosing Plants**

Plantroom 21 HWS  
 Plantroom 22 HWS  
 Plantroom 31 123 HWS  
 Plantroom 31 456 HWS  
 Plantroom 31 789 HWS  
 Plantroom 32 HWS  
 Plantroom 33 HWS  
 Plantroom 41 HWS  
 Children's Ward 2 TCT Booster

**Remote Monitors**

Adult Critical Care  
 Medical Daycare  
 RHC Medical Physics  
 Ward 3D  
 Ward 4A  
 Ward 4B  
 Ward 4C  
 Ward 4D  
 Adult Renal  
 Childrens Renal

PPM Schedule

**Remote Monitoring:**

- o Confirmation of system operation in accordance with instruction received via Authorised Persons / Nominated Consultant
- o Carry out corrective actions as required

**Monthly Visit – All above, plus:**

- o Visually inspect chemical delivery system
- o Check chemical suction and delivery lines for correct operation
- o Chemical level check and refill
- o Cross check measured ClO<sub>2</sub> / Chlorite residual test against analyser & Palintest Kit
- o Check and Adjust controller settings as required

**6 Monthly Visit– All above, plus:**

- o Check ClO<sub>2</sub> gas detector functionality and recording levels
- o Simulate fault circuitry and alarm on Sentinel Monitor
- o Change probe electrolyte and cross calibration test
- o Carry out manual Chlorate & Chlorite validation tests
- o Check water meter operation and report
- o Electrolyte top up
- o Probe calibrations

**Annual Visit – All above, plus:**

- o ClO<sub>2</sub> & Chlorite Probe membrane cap replacement
- o Dosing Pump diaphragm valve replacements
- o Replace ClO<sub>2</sub> gas detector cartridge if required

#### 4.1.6 Use of mains filtration and local point of use filtration

A number of buildings use mains filtration and/or point of use filtration:-

- Adults Building and Childrens building have mains filtration. High risk areas have also been risk assessed and fitted with point of use filters. Backwash every 58 minutes and also treated with CL02 on backwash.
- Neo-Natal has mains filtration and high risk areas fitted with point of use filters. Backwash every 58 minutes.
- INS/Neurology/ICE has mains filtration (single supply to all buildings). Backwash every 58 minutes.
- Spinal has in-line mains filter cartridge.

For point of use filters SHTM04-01 Part A Page 28-29 indicates :-

*“Filters will also need to be changed routinely, depending on usage of the outlets. Their use, therefore, should be considered only as part of an overall regime of bacterial control to be used where the most vulnerable patients are to be treated.....Once a point-of-use filter has been installed it will require to be retained in use thereafter unless a risk assessment deems otherwise”*

Based on this specific locations POU’s have been fitted within the QEUH and RHC have been risk assessed based on patient grouping.

DMA maintain a register of these and arrange swaps for these.

RAMS for carrying out this task can be found in SCART22 folder and Water Teams folder.

#### 4.1.7 End of Line Sensors (EOLs)

The hot and cold water system also incorporates End of Line (EOL) sensors which monitor the temperatures at specific sentinel points across all 11 floors of the Adult & Childrens installation. These can also be viewed via the Schneider BMS system. These are checked daily as part of Estates shift reports.

#### 4.1.8 Sampling Plan

Within the QEUH Campus a significant sampling regime has been implemented as this is detailed in **Appendix 2**. This details the agreed sampling plan with, approximate sample number frequencies and what is being sampled for within QEUH which may includes - TVC@37°C, TVC@22°C, Coliform, E.coli, Legionella cfu/L, Pseudomonas, SAB@30c, Mould@25c, SAB@22c, Yeast@25c, Cuprivadis, AMS or GNB.

#### **General microbiological and Legionella sampling in hot & cold water systems**

Circumstances under which samples are taken:

- prior alterations to an existing water system;
- as part of commissioning process, prior to handover of a new building or introduction of a (altered, refurbished or new) water system into use;
- one week following handover of a new building or new water system;
- as part of the tank cleaning and disinfection process;
- as part of an assessment programme;
- in response to taste, odour or sustained discoloured water complaints.

When such samples are taken, a mains supply sample should be taken as a control to verify whether the supply could be the source of the identified problems. Scottish Water should also be contacted for distribution zone water quality data.

DMA agreed sampling protocols and RAMS is available on SCART22 and Water teams folder.

#### 4.1.9 WS01 – INFREQUENTLY USED Outlets

##### **Control of Legionella in Water Systems, Infrequently used Water Outlets and Showers, Standard Operating Procedure WS01.**

The Estates department is required to ensure that on a quarterly basis the list of 'infrequent' or 'infrequently' used water outlets or showers is reviewed to ensure it is accurate and up to date. Records of these reviews will be held within the system logbooks held locally.

If after investigation the taps or appliances identified within the reviewed list are deemed not necessary wherever possible the supply should be cut and the appliance removed from the water system. Where this is not possible then pipe work shall be cut back as close to the main circulating line as practicable to ensure that any dead-leg formed is minimised.

Nursing and other staff must be made aware of the issues surrounding legionella contamination and the link to low and underused water outlets and their assistance in formally identifying these possible outlets are sought.

Upon acknowledgement from the clinical staff of any infrequent or infrequently used outlets, the records are held on the Estates shared drive under Water Quality / WS01.

Any request from clinical staff regarding the removal of any infrequent or infrequently used outlets is assessed and surveyed by the AP (Water). If deemed appropriate a job is raised on FM for the Plumbing Technicians to remove, this is documented in the WS01 Records file in the Water Quality file on the shared drive. Subsequent hot and cold water pipe drawings are updated by the CAD Technician CP (water) where and when appropriate.

#### 4.1.10 Spray taps

There are no spray taps in use at the QEUH campus.

#### 4.1.11 Dead ends/Dead legs

Where dead ends or dead legs have been identified these will be added to a flushing regime by DMA until these can be removed.

### FILLING IN LOG SHEETS

Good water hygiene depends on maintaining high standards of cleanliness and freshness, together with careful temperature control. This section contains details of checks and recording sheets (marked "Log Sheets") to be filled in when checks and measurements are made to show that the necessary standards are being kept up. Alternatively, where an electronic PPM system is used, Procedure references should be entered.

Follow the instructions within the boxes and make entries as each task is completed. The tasks are all listed at the front of each section e.g. weekly tasks at the front of the weekly section, monthly section, quarterly 6 monthly etc. The summary list of tasks in this section is to remind you of what is required.

The Task and Log Sheets can be copied as required, completed Log Sheets will be filed where indicated in Section 2. **FM First ticket number MUST be included in all logsheets.**

### PLANNING

The tasks and forms are organised into weekly, monthly, quarterly and annual sections. Always aim to carry out tasks early in the period when they are due to leave an opportunity to do them later if an emergency delays your plans.

### ASK

If you have difficulties with the forms or do not understand the tasks, ask your Supervisor or line manager for clarification or guidance.

### CHECKING

Incomplete or incorrect records are unacceptable in that they are misleading and do not do justice to the effort put in to achieve standards. Each log sheet includes a space for comment and tells you to check that all the boxes are complete: do make use of the comment space and double check the form, otherwise the record will have gaps and whoever is responsible for auditing will concentrate on what is missing and may not give you credit for the work that has been done.

### LOG INSPECTION

Anyone inspecting this log (either as part of the Management Control System or not) is invited to make an entry in the inspection of Log Book record in front of Section One.

### SURVEY

For survey purposes all surveys will be carried out starting left to right, where 2 off access doors are available the left access shall be taken first. Surveys shall be undertaken from top to bottom.

## EQUIPMENT FITTINGS AND MATERIALS

Prior to carrying out alterations/ additions to distribution systems, the Water Fittings and Materials Directory published by the Water Regulations Advisory Scheme, should be consulted. This directory lists all materials and fittings approved for use to satisfy the requirements of current Water Byelaws.

Details of all new materials and fittings used in installations should be noted and recorded on the specific work document or project file for future reference.

## SYSTEM ADDITIONS AND ALTERATIONS

Any additions, modifications or improvements to the water distribution system are to be noted and recorded and system record's amended to reflect such changes.

## HYGIENE PRACTICES

Care should be taken to ensure high levels of personal hygiene, clean hands, clean clothing and PPE or gloves is maintained at all times when working on wholesome water operations. Tools, equipment, instrumentation and material's shall be free from contamination and appropriately disinfected before use.

Items such as pumps and hoses used in contact with water used for domestic purposes must be stored separately, clearly identified (ie colour coded or labelled) and **MUST NOT BE USED FOR ANY OTHER PURPOSE.**

Refer to Section 2.2 for location of maintenance records for the above.



## 4.2 Maintenance Procedures Summary

This section contains information in relation to the operational and maintenance checks managed by QEUH NHS Staff and appointed contractors to minimise the risk of exposure to *Legionella* and other waterborne micro-organisms within the domestic water systems, and to improve water quality. Procedures are as per the recommendations and exemplar models given in SHTM 04-01 Part G.

| Procedure Reference          | Operation(s)   | Record Form Ref            | Frequency                    |
|------------------------------|--|----------------------------|------------------------------|
| <b>P1C1</b><br><b>4.31</b>   | BMS Temperature Monitoring ( <b>Carried out by NHS Estates</b> )   | <b>Requires new number</b> | <i>Daily</i>                 |
| <b>WS01</b>                  | Flushing all outlets ( <b>Carried out by NHS Facilities</b> )  | -                          | <i>Daily</i>                 |
| <b>P1CC1A</b><br><b>4.32</b> | Manual Temperature Monitoring for calorifiers ( <b>different form used ONLY REQUIRED if no BMS Monitoring</b> )      | <b>(005a)</b>              | <i>Daily</i>                 |
| <b>4.33</b>                  | Filtration Plant Checks ( <b>Carried out by NHS Estates</b> )  | <b>028c</b>                | <i>Twice Daily</i>           |
| <b>WS01</b><br><b>4.41</b>   | Flushing of INFREQUENTLY USED outlets * frequency based on risk ( <b>Carried out by NHS Clinical</b> ) see page 103  | -                          | <i>Daily or Twice weekly</i> |
| <b>P1C3</b><br><b>4.45</b>   | Pump operation/duty rotation ( <b>Carried out by NHS Estates</b> )   | <b>(028a)</b>              | <i>Weekly</i>                |
| <b>WS01</b><br><b>4.46</b>   | Deluge shower/Eye wash flushing ( <b>1 off carried out by NHS Estates</b> )  | <b>(026)</b>               | <i>Twice Weekly</i>          |
| <b>P1C6</b><br><b>4.52</b>   | DWS Calorifier, Expansion Vessel Flushing. ( <b>Carried out by NHS Estates</b> )                                     | <b>(005)</b>               | <i>Monthly</i>               |
| <b>P1C4</b><br><b>4.52</b>   | DHW Calorifier and Buffer Vessel Checks ( <b>Carried out by NHS Estates</b> )  | <b>(005)</b>               | <i>Monthly</i>               |
| <b>WS01</b>                  | Review of Rarely Used Water Outlets and Changes In-Use ( <b>Carried out by NHS Estates</b> )                         |                            | <i>Quarterly</i>             |
| <b>P1C9</b><br><b>4.81</b>   | DWS Calorifier / Expansion Vessel Inspection ( <b>Carried out by NHS Estates</b> )                                   | <b>(006)</b>               | <i>Annually</i>              |
| <b>4.82</b>                  | Water Services Pipework and Distribution System Checks ( <b>Carried out by NHS Estates</b> )                         |                            | <i>Annually</i>              |
| <b>4.82</b>                  | Vibration coupling inspection (Carried out as part of checks on booster pumps) ( <b>Carried out by NHS Estates</b> ) |                            | <i>Annually</i>              |
| <b>N/A</b>                   | Carry out review of log books and Written Scheme   |                            | <i>Annually (Sep)</i>        |
| <b>N/A</b>                   | Carry out review of drawings and schematics  |                            | <i>Annually (Mar)</i>        |
| <b>4.89</b>                  | Carry out review of TMV/TMT use ( <b>Carried out by Sector Water Group</b> )   |                            | <i>Annually</i>              |

### 4.3 Maintenance Procedures Summary (cont.)

In addition to the tasks undertaken by NHS directly employed Competent Persons, there are also tasks undertaken by Contractors on a selection of buildings within the campus.

| Procedure Reference     | Operation(s)   | Record Form Ref        | Frequency                 |
|-------------------------|--|------------------------|---------------------------|
| <b>WS01<br/>4.44</b>    | Flushing of INFREQUENTLY USED outlets, deadlegs, out of specs, drain valves and other outlets requested <b>(Carried out by DMA)</b>  | <b>DMA Records</b>     | <i>Twice Weekly</i>       |
| <b>WS01<br/>4.44</b>    | Cold Water Booster vessel flushing <b>(Carried out by DMA)</b>   | <b>DMA Records</b>     | <i>Twice Weekly</i>       |
| <b>WS01<br/>4.45</b>    | Deluge shower/Eye wash flushing <b>(Carried out by DMA 2<sup>nd</sup> shower)</b>  | <b>DMA Records</b>     | <i>Twice Weekly</i>       |
| <b>WS01<br/>4.46</b>    | Cold Water Booster set flushing <b>(Carried out by DMA)</b>  | <b>DMA Records</b>     | <i>Twice Weekly</i>       |
| <b>P1C4<br/>4.51</b>    | Temperature Recording of Sentinel Hot and Cold Water Outlets for CL02 <b>(Carried out by DMA)</b>  | <b>DMA Records</b>     | <i>Monthly</i>            |
| <b>P1C4<br/>4.52</b>    | DHW Calorifier and Plate Heat Exchanger Checks <b>(Carried out by NHS Estates)</b>   | <b>(005)</b>           | <i>Monthly</i>            |
| <b>4.53</b>             | Representative Tap Temperature and CL02 Monitoring through sampling  | <b>DMA Records</b>     | <i>Monthly</i>            |
| <b>4.54</b>             | PPM Schedule Monthly Visually inspect chemical delivery system, Check chemical suction and delivery lines for correct operation Chemical level check and refill , Cross check measured ClO <sub>2</sub> / Chlorite residual test against analyser & Palintest Kit, Check and Adjust controller settings as required <b>(Carried out by ScotMas)</b>  | <b>Scotmas records</b> | <i>Monthly</i>            |
| <b>4.55</b>             | Water Heaters (<15l)   | <b>DMA Records</b>     | <i>Monthly</i>            |
| <b>4.65</b>             | Replacement of PAL filters <b>(Carried out by DMA)</b>   |                        | <i>31 Days or 62 Days</i> |
| <b>WQS 001<br/>4.62</b> | HORNE Tap Flow Straightener Exchange <b>(Carried out by DMA)</b>   | <b>DMA Records</b>     | <i>Quarterly</i>          |
|                         | Carry out maintenance and flushing of fire hydrants  | <b>Chubb Records</b>   | <i>Six monthly</i>        |
| <b>4.71</b>             | 'TMT/TMV Slam test <b>(Carried out by DMA)</b>   | <b>DMA Records</b>     | <i>Six-Monthly</i>        |
| <b>P1C7<br/>4.72</b>    | CWST Inspection and Temperature Monitoring (Carried out by DMA) <b>(Carried out by DMA)</b>  | <b>DMA Records</b>     | <i>Six-Monthly</i>        |
| <b>4.73</b>             | Maintenance of filtration units <b>(Carried out by Veolia)</b>   | <b>Veolia Records</b>  | <i>Six-Monthly</i>        |
| <b>4.74</b>             | 6 Monthly Visit– As per monthly, plus, Check ClO <sub>2</sub> gas detector functionality and recording levels, Simulate fault circuitry and alarm on Sentinel Monitor, Change probe electrolyte and cross calibration test, Carry out manual Chlorate & Chlorite validation tests (12 representative outlets), Check water meter operation and report o Electrolyte top up, Probe calibrations <b>(Carried out by Scotmas)</b> | <b>ScotMas Records</b> | <i>Six-Monthly</i>        |

## 4.3 Maintenance Procedures Summary (cont.)

| <b>Procedure Reference</b> | <b>Operation(s)</b>  | <b>Record Form Ref</b>           | <b>Frequency</b> |
|----------------------------|--|----------------------------------|------------------|
| <b>PIC10<br/>4.83</b>      | Representative Tap Temperature Monitoring<br>Note all tap temperatures are checked through TMT/TMV maintenance ( <b>Carried out by DMA</b> )   | <b>DMA Records</b>               | <i>Annually</i>  |
| <b>4.86</b>                | As per 6 monthly and ClO <sub>2</sub> & Chlorite Probe membrane cap replacement, Dosing Pump diaphragm valve replacements, Replace ClO <sub>2</sub> gas detector cartridge if required ( <b>Carried out by Scotmas</b> ) | <b>Scotmas records</b>           | <i>Annually</i>  |
| <b>4.87</b>                | TMV/TMT Annual Maintenance ( <b>Carried out by Vanguard for MIU only to April then DMA thereafter</b> )  | <b>Vanguard Records</b>          | <i>Annually</i>  |
| <b>4.87</b>                | TMV/TMT Annual Maintenance ( <b>Carried out by DMA</b> )   | <b>DMA Records</b>               | <i>Annually</i>  |
| <b>4.88</b>                | CWST Clean, disinfection and inspection ( <b>Carried out by DMA</b> )  | <b>DMA Records</b>               | <i>Annually</i>  |
|                            | Hot and Cold Tap Outlet Sanitisation and Operational Checks ( <b>NOT CARRIED OUT UNLESS ISSUE IDENTIFIED THROUGH SAMPLING</b> )  | -                                | <i>Annually</i>  |
|                            | BMS Sensors ( <b>Carried out by Schneider and MCE BMS Providers for respective BMS</b> )   | <b>Schneider and MCE records</b> | <i>Annually</i>  |

### 4.3 Daily Maintenance Tasks

| Reference | Operation                     |
|-----------|-------------------------------|
| 4.31      | BMS Temperature Monitoring    |
| 4.32      | Manual Temperature Monitoring |
| 4.33      | Filtration Plant Checks       |

**NOTE:**

Completed Log Sheet to be submitted to either the Authorised Person (Water Systems) or Site Manager Operational Estates for authorisation and copies filed as indicated in Section 2.2.

Due to the volume of information required for the recording of test results for each of the assets being maintained, the Log Sheets provided within this document are for indicative purposes only.

Detailed information on the assets and test records for same will be retained within the specific 'Log Book' for the location being maintained.

**4.31 – BMS TEMPERATURE MONITORING****DAILY**

FM First Template No 826

IN ACCORDANCE WITH SHTM 04-01 Part G (*V1 July 2015*) Page 26 para 3.11**RECORD FORM - (021)****PROCEDURE REF - P1C1****SCHEDULE REF – BMS 01****HAISCRIBE/Risk Assessment Ref – N/A See Appendix 4**The following actions must be undertaken **DAILY** as a minimum:**Description of Works**

- Refer to the BMS Temperature Monitoring Schedule BMS 01.
- Log onto both STRUXUREWARE BMS and DISTECH BMS front ends and check all temperatures from listed locations.
- Check domestic hot water flow and returns on principle loop, Check end of line sensors, check cold water storage tanks and check temperatures.
- Any temperatures found outside the defined parameters stated on the BMS Temperature Monitoring Schedule should be investigated and resolved immediately. Details must be entered on Shift report and escalated to the Water Systems AP.

**CHECK**

1. Record all details of any fault or discrepancy by completing an Incident Form (04) and report to Water Systems AP.
2. Complete Record Form ensuring that you date, sign it and enter FM First ticket number.
3. Return form to the Water Systems AP.
4. Ensure records are uploaded to SCART 22 Incident folder and teams folder.

**NOTE: Both Struxureware and Distech BMS systems are capable of generating temperature trend logs. These logs will be checked on a regular basis by the Water Systems AP to confirm accuracy of information.**

**4.32 – MANUAL TEMPERATURE MONITORING**  
**(in absence of BMS)**

**DAILY**

FM First Template No 830

IN ACCORDANCE WITH SHTM 04-01 Part G (*VI July 2015*) Page 26 para 3.15

**RECORD FORM – (005a) (021a)**

**PROCEDURE REF - P1CC1A**

**SCHEDULE REF – MTM 01**

**HAISCRIBE/Risk Assessment Ref – N/A** See Appendix 4

The following actions must be undertaken **DAILY** as a minimum:

**Description of Works**

- Refer to the Manual Temperature Monitoring Schedule MTM 01.
- MANUALLY visit each location and obtain and record temperatures from all plant as listed on Schedule MTM 01.
- Any temperatures found outside the defined parameters stated on the MTM 01 Temperature Monitoring Schedule should be investigated and resolved immediately. Details must be entered on Incident Form (004a) and escalated to the Water Systems AP.

**CHECK**

1. Record all details of any fault or discrepancy by completing an Incident Form (04) and report to Manager.
2. Complete Record Form ensuring that you date, sign it and enter FM First ticket number.
3. Return form to the Water Systems AP.
4. Ensure records are uploaded to Teams Folder.

**4.33 – FILTRATION PLANT CHECKS**

**TWICE DAILY**

FM First Template No 836

IN ACCORDANCE WITH BOARD POLICY

**RECORD FORM – (028c)**

**PROCEDURE REF – N/A**

**HAISCRIBE/Risk Assessment Ref – N/A See Appendix 4**

The following actions must be undertaken **TWICE DAILY** as a minimum AM and PM:

**Description of Works**

- Refer to the Filtration Plant Daily Checks Log sheet (028c).
- Complete all listed checks and ensure plant is running if selected as DUTY, or available to run if selected as STAND-BY.
- Details must be entered on Record Form (028c) and any issues escalated to the Water Systems AP immediately.

**CHECK**

1. Record all details of any fault or discrepancy by completing an Incident Form (04) and report to Manager.
2. Complete Record Form ensuring that you date, sign it and enter FM First ticket number.
3. Return form to the Water Systems AP.
4. Ensure records are uploaded to Teams Folder.

#### 4.4 Weekly Maintenance Checks

| Reference | Operation   |
|-----------|---|
| 4.41      | Flushing of water outlets – Facilities  |
| 4.42      | Flushing of infrequently used outlets - Clinical  |
| 4.43      | Flushing of INFREQUENTLY USED outlets, deadlegs, out of specs, drain valves and other outlets requested |
| 4.44      | Rotation of water services duty/stand-by pumps  |
| 4.45      | Operation and Checks to Emergency Deluge Shower/Eye Wash (Twice Weekly)                                 |
| 4.46      | Carry out flushing of cold water booster set vessels  |

**NOTE:**

Completed Log Sheet to be submitted to either the Authorised Person (Water Systems) or Site Manager Operational Estates for authorisation and copies filed as indicated in Section 2.2.

Due to the volume of information required for the recording of test results for each of the assets being maintained, the Log Sheets provided within this document are for indicative purposes only.

Detailed information on the assets and test records for same will be retained within the specific ‘Log Book’ for the location being maintained.



#### 4.41 – FLUSHING OF WATER OUTLETS - FACILITIES

FM First Template N/A

### DAILY AS PART OF CLEANING

IN ACCORDANCE WITH SHTM 04-01 Part G (*VI July 2015*) Page 101 para 6.36

#### **RECORD FORM - (Facilities flushing records)**

#### **PROCEDURE REF - WS01**

**HAISCRIBE/Risk Assessment Ref – N/A** See Appendix 4

The following actions must be undertaken as part of the cleaning routine:

#### **Carry out flushing of all water outlets**

Facilities (Domestic Services) Management to ensure that the specific water outlets agreed through risk assessment are ran daily where access is available and all ran for 1 minute **at full flow (but not so that splashing goes beyond the basin)**. However if taps cannot be ran at full flow then Domestic Supervisor must be informed to consider additional flushing based on specific assessment. Records must reflect where access is not available e.g. rooms/areas under Estates, Minor Works, Capital or no access at the weekend and flushing information sent to Estates monthly.

**Facilities Management send on flushing records of all taps to Water Systems AP monthly.**

**Refer to Facilities Procedure - Wash Hand Basin Cleaning (including point of use filter).**

Domestic Services Supervisors and Managers will also notify Estates if they identify any unused areas or outlets as per requirements of *SHTM04-01 Part G Section 8.3* daily in writing. These should be reflected on the department flushing records. These must be reviewed on a daily basis by the SCN and appropriate action taken when this is identified as not having been completed. Flushing records should be held in the department for auditing purposes.

Any problems or concerns relating to the safety, maintenance, reduced usage, any changes in use and cleanliness of all water outlets are identified must be reported to the ICT, Facilities and Estates Department as relevant by Departmental Managers.

#### **NOTES:**

In circumstances where there has been a lapse in the flushing regime, the stagnant and potentially contaminated water from within the shower or tap and associated dead leg should be purged to drain without discharge of aerosols before the appliance is used.

However the respective manager must contact the Water AP and Infection Control before initiating a flushing regime to review risk and any precautions.

**4.42 – FLUSHING OF INFREQUENTLY USED WATER OUTLETS - CLINICAL**

FM First Template N/A

**DAILY/TWICE WEEKLY**IN ACCORDANCE WITH SHTM 04-01 Part G (*VI July 2015*) Page 101 para 6.36**RECORD FORM – WS01a****PROCEDURE REF - WS01****HAISCRIBE/Risk Assessment Ref – N/A** See Appendix 4

- Flushing of water outlets is necessary to control the build-up of biofilm in water systems to reduce the risk of transmission of pathogens via the environment and equipment to patients. The Senior Charge Nurse (SCN) in each unit has responsibility (under current guidance) to ensure that the following recommendations are complied with in their area. The SCN should ensure that:
  - All INFREQUENTLY USED outlets outlets that are not used at least twice weekly in general areas and daily on high risk area identified on WS01a form. These must be **flushed at full flow (but not so that splashing goes beyond the basin)**. However if taps cannot be flushed on full flow they should be flushed for longer based on specific assessment. The manager responsible for the ward or department must put systems in place for the outlet to be flushed to waste for 3 minutes as per SHTM04-01 Part G Page 111.
  - Any problems or concerns relating to the safety, maintenance, reduced usage, any changes in use and cleanliness of all water outlets are identified must be reported to the ICT, Facilities and Estates Department as relevant by Departmental Managers.
  - If outlets have been identified that may not have been in use, the Manager must contact the Water AP and Infection Control before initiating a flushing regime to review risk and any precautions.

**Safe Purging of Stagnant Water**

Stagnant water may potentially contain large numbers of waterborne pathogens such as Legionellae. To avoid the risk of legionellosis, precautions shall be taken to avoid the creation of aerosols and to avoid individual exposure from aerosols that maybe present.

Safe purging of stagnant water should be completed to any outlet where:

- It has not been flushed for more than 1 week.
- An outlet has returned a positive legionella count >1000cfu/l

The specific precautions may vary according to the circumstances, but typically include:

- Running a hose from the outlet into a container of clean water;
- Running hoses directly into a drain cover;
- Running fire hoses at a distance from occupied buildings;
- Closing windows and air conditioning intakes where aerosols are created outdoors;
- Wearing respiratory protective equipment [remember this does not protect nearby members of the public and others who are not wearing masks].

Care shall be taken to avoid the possibility of back siphoning into mains water supplies.

NOTES:

In circumstances where there has been a lapse in the flushing regime, the stagnant and potentially contaminated water from within the shower or tap and associated dead leg should be purged to drain without discharge of aerosols before the appliance is used.

However the respective manager must contact the Water AP and Infection Control before initiating a flushing regime to review risk and any precautions.

**4.43 – FLUSHING OF INFREQUENTLY USED OUTLETS, DEADLEGS, OUT OF SPECS, DRAIN VALVES AND OTHER OUTLETS REQUESTED**

FM First Template No 827

**TWICE WEEKLY/DAILY IN HIGH RISK**

IN ACCORDANCE WITH SHTM 04-01 Part G (*VI July 2015*) Page 101 para 6.36

**RECORD FORM - (DMA)  
PROCEDURE REF – WS01**

**HAISCRIBE/Risk Assessment Ref – N/A** See Appendix 4

The following actions must be undertaken **TWICE WEEKLY** as a minimum or **DAILY** in HIGH RISK:

**Description of Works**

- Refer to the locations listed on Record Form (DMA).
- Flush water from ALL outlets identified on Record Form on a Weekly basis for a minimum period of 3 minutes per tap outlet taking care not to cause splashing or exposure to water aerosols / droplets. Drain Valves to be purged to ensure the removal of any built up residue in the line.

**CHECK**

1. Record all details of any fault or discrepancy by completing an Incident Form (04) and report to Manager.
2. Complete Record Form ensuring that you date, sign it and enter FM First ticket number.
3. Return form to the Water Systems AP.
4. Ensure records are uploaded to Teams Folder.

#### **4.44 – ROTATION OF WATER SERVICES DUTY/STAND-BY PUMPS**

FM First Template No 820

**WEEKLY**

IN ACCORDANCE WITH SHTM 04-01 Part G (*V1 July 2015*) Page 27 para. 3.24

**RECORD FORM - (028a)**

**PROCEDURE REF - P1C3**

**HAISCRIBE/Risk Assessment Ref – N/A** See Appendix 4

The following actions must be undertaken **WEEKLY**:

**Description of Works**

- Inspect and confirm operation of all listed duty/stand-by pumps by interrogating the programmer to check hours run for each pump motor.
- Check pump rig and associated valves for correct operation, signs of damage, leakage or corrosion.
- Record all details on Record Form (028a)

**CHECK**

1. Record all details of any fault or discrepancy by completing an Incident Form (04) and report to Manager.
2. Complete Record Form ensuring that you date, sign it and enter FM First ticket number.
3. Return form to the Water Systems AP.
4. Ensure records are uploaded to Teams Folder.

**4.45 – OPERATION AND CHECKS TO EMERGENCY DELUGE SHOWERS/EYE WASH**

FM First Template No 825

**TWICE WEEKLY**IN ACCORDANCE WITH SHTM 04-01 Part G (*V1 July 2015*) Page 57**RECORD FORM - (026c) and DMA record for separate shower.****PRECEDURE REF – WS01****HAISCRIBE/Risk Assessment Ref – N/A** See Appendix 4**RISK CONTROL NOTICE - RCN 11/04**The following actions must be undertaken **TWICE WEEKLY**:**Description of Works**

- Refer to the locations listed on Record Form (026c) NHS only (DMA complete flushing records).
- Operate shower for a minimum period of 3 minutes taking care not to cause splashing or exposure to water aerosols / droplets. Measure and record temperatures until discharge water drops to the same temperature as the incoming mains water.

*NOTE: For thermostatic showers and taps, the outlet should be flushed on the full cold setting for 2 minutes, then again on the full hot setting for a further 2 minutes, using override setting where available. Cold water should be less than 20°C, Hot water should be between 55°C and 60°C, and Mixed water in the range 41-43°C.*

**CHECK**

1. Record all details of any fault or discrepancy by completing an Incident Form (04) and report to Manager.
2. Complete Record Form ensuring that you date, sign it and enter FM First ticket number.
3. Return form to the Water Systems AP.
4. Ensure records are uploaded to Teams Folder.

#### **4.46 FLUSHING OF COLD WATER BOOSTER SETS VESSELS**

FM First Template No 825

**TWICE WEEKLY**

IN ACCORDANCE WITH SHTM 04-01 Part G (*V1 July 2015*) Page 57

**RECORD FORM - (DMA records)**

**PRECEDURE REF – WS01**

**HAISCRIBE/Risk Assessment Ref – N/A** See Appendix 4

**RISK CONTROL NOTICE - RCN 11/04**

The following actions must be undertaken **TWICE WEEKLY**:

**Description of Works**

- Carry out flushing of cold water booster sets to drain.
- Record condition of water if dirty.

**CHECK**

1. Record all details of any fault or discrepancy by completing an Incident Form (04) and report to Manager.
2. Complete Record Form ensuring that you date, sign it and enter FM First ticket number.
3. Return form to the Water Systems AP.
4. Ensure records are uploaded to Teams Folder.

#### 4.5 Monthly Maintenance Checks

| Reference | Operation   |
|-----------|---|
| 4.51      | Sentinel Outlet Temperature and CL02 Recording                      |
| 4.52      | DWS Calorifier/Expansion Vessel – Temperature Checks & Blowdown     |
| 4.53      | Representative Tap Temperature and CL02 Monitoring through sampling |
| 4.54      | CL02 Plant checks   |
| 4.55      | Monthly check of POU water heaters [< 15L]                          |

#### NOTE:

Completed Log Sheet to be submitted to Site Estates Manager / Authorised Person (Water) for authorisation and copies filed as indicated in Section 2.20.

Due to the volume of information required for the recording of test results for each of the assets being maintained, the Log Sheets provided within this document are for indicative purposes only.

Detailed information on the assets and test records for same will be retained within the specific 'Log Book' for the location being maintained.



**4.51 – SENTINEL OUTLET TEMPERATURE AND CL02 RECORDING**

FM First Template No 828

**MONTHLY**IN ACCORDANCE WITH SHTM 04-01 Part G (*V1 July 2015*) Page 28 para 3.27**RECORD FORM - DMA Records****PROCEDURE REF - P1C4****HAISCRIBE/Risk Assessment Ref – N/A** See Appendix 4The following actions must be undertaken **MONTHLY**:**Description of Work**

- Check the temperatures at the sentinel taps and CL02 as defined in the local plan of the system being checked. NOTE: Where the sentinel is a TMV or TMT the temperature readings should be taken from the pipework or directly from the hot and cold supply and also from the nearest straight hot and cold if pipework not accessible.
- Using a calibrated temperature probe, check the temperature of water from the cold water tap does not rise above 20°C after running the tap for 2 minutes.
- Using a calibrated temperature probe, check the temperature of water from the hot water tap does not drop below 55°C whilst running the tap for 1 minute.
- Record all temperatures and CL02 readings on DMA records.
- Escalate if CL02 levels are above thresholds as defined in 4.1.5 and in DMA RAMS/SOP'

**CHECK**

1. Record all details of any fault or discrepancy by completing an Incident Form (04) and report to Manager.
2. Complete Record Form ensuring that you date, sign it and enter FM First ticket number.
3. Return form to the Water Systems AP.
4. Ensure records are uploaded to Teams Folder.

## **4.52 - DWS CALORIFIER/EXPANSION VESSEL – TEMPERATURE CHECKS & BLOWDOWN**

FM First Template No 821

**MONTHLY**

IN ACCORDANCE WITH SHTM 04-01 Part G (*VI July 2015*) Page 28 para 3.30

**RECORD FORM - (005)**

**PROCEDURE REF - P1C4**

**HAISCRIBE/Risk Assessment Ref – N/A** See Appendix 4

The following actions must be undertaken **MONTHLY**:

### **Description of Work**

- MANUALLY CHECK and record the flow and return temperatures on the domestic hot water system as defined on Record Form (005), using the temperature gauges fitted or a suitable surface temperature probe.
- MANUALLY CHECK and record the calorifier storage temperature at top and bottom gauges if fitted.
- The flow temperature to be at least 60°C and the return temperature shall be no less than 55°C.
- MANUALLY CHECK and record the cold water feed temperature using the temperature gauges fitted or a suitable surface temperature probe.
- Blowdown drain valves (if fitted) on all calorifiers and expansion vessels by opening the drain valve 3 times, each time for a 3 minute period. Where required, the hose from the drain valve connection should be discharged to the nearest drain/gulley. If there is no drain valve make note on Record Form 005. Check for debris and colour of water and record on record form.
- Check all local pipework to and from calorifier is in good order and all insulation is intact.
- Operate all isolation valves through their full range of motion.
- Check, confirm and record operation of de-stratification pump.
- Check pressure indicator and arrange to re-pressurise/re-gas where required.
- Check rupture indicators on expansion vessels (where fitted).
- Record all information on the Record Form (005).

### **CHECK**

1. Record all details of any fault or discrepancy on the FAULT LOG and complete Incident Form (04) and report to Manager.
2. Complete Record Form (005) ensuring that you date, sign it and enter FM First ticket number.
3. Return form to the Water Systems AP and ensure records are uploaded to teams folder.

#### **4.53 – REPRESENTATIVE TAP TEMPERATURE AND CL02 MONIORING THROUGH SAMPLING**

FM First Template No 828

**MONTHLY**

IN ACCORDANCE WITH SHTM 04-01 Part G (*VI July 2015*) Page 28 para 3.27

#### **RECORD FORM - DMA Records**

#### **PROCEDURE REF - P1C4**

**HAISCRIBE/Risk Assessment Ref – N/A** See Appendix 4

The following actions must be undertaken **MONTHLY AS PART OF THE IDENTIFIED ROUTINE SAMPLING PROGRAMME:**

##### **Description of Work**

- Check the temperatures at the outlet and CL02.
- Using a calibrated temperature probe, check the temperature of water from the cold water tap does not rise above 20°C after running the tap for 2 minutes.
- Using a calibrated temperature probe, check the temperature of water from the hot water tap does not drop below 55°C whilst running the tap for 1 minute.
- Using a calibrated temperature probe, check the temperature of water from the mixed outlet whilst running the tap for 1 minute.
- Record all temperatures on DMA records.

##### **CHECK**

5. Record all details of any fault or discrepancy by completing an Incident Form (04) and report to Manager.
6. Complete Record Form ensuring that you date, sign it and enter FM First ticket number.
7. Return form to the Water Systems AP.
8. Ensure records are uploaded to Teams Folder.

#### 4.54 – CL02 PLANT CHECKS

**MONTHLY**

FM First Template N/A

IN ACCORDANCE WITH SHTM 04-01

**RECORD FORM – N/A**

**PROCEDURE REF – N/A**

**HAISCRIBE/Risk Assessment Ref – N/A** See Appendix 4

The following actions must be undertaken **MONTHLY**:

##### **Description of Work**

- PPM Schedule Monthly Visually inspect chemical delivery system.
- Check chemical suction and delivery lines for correct operation Chemical level check and refill.
- Cross check measured ClO<sub>2</sub> / Chlorite residual test against analyser & Palintest kit.
- Check and Adjust controller settings as required.

##### **CHECK**

1. Record all details of any fault or discrepancies and report to Water Lead AP who will complete Incident Form (04).
2. Service provider uploads records to portal. Copies should be uploaded by AP to Teams folder.

**4.55 – POU Water Heaters (<15l)**

FM First Template N/A

IN ACCORDANCE WITH SHTM 04-01

**RECORD FORM – N/A**

**PROCEDURE REF – N/A**

**HAISCRIBE/Risk Assessment Ref – N/A** See Appendix 4

The following actions must be undertaken **MONTHLY**:

**Description of Work**

- Check water temperatures to confirm the heater operates at 50–60 °C (55 °C in healthcare premises) or check the installation has a high turnover.

**CHECK**

1. Record all details of any fault or discrepancies and report to Water Lead AP who will complete Incident Form (04).
2. Service provider uploads records to portal. Copies should be uploaded by AP to Teams folder.

#### 4.6 Quarterly & Other Maintenance Checks (including POU exchange 31 or 62 days).

| Reference | Operation   |
|-----------|---|
| 4.61      | Shower Head and Flexible Hoses Disinfection/Replacement |
| 4.62      | HORNE Tap Flow straightener Exchange                    |
| 4.63      | Review of Rarely Used Water Outlets and Changes In-Use  |
| 4.64      | PAL filter replacement                                  |

#### NOTE:

Completed Log Sheet to be submitted to either the Authorised Person (Water Systems) or Site Manager Operational Estates for authorisation and copies filed as indicated in Section 2.2.

Due to the volume of information required for the recording of test results for each of the assets being maintained, the Log Sheets provided within this document are for indicative purposes only.

Detailed information on the assets and test records for same will be retained within the specific 'Log Book' for the location being maintained.

**4.61 SHOWER HEAD AND FLEXIBLE HOSE REPLACEMENT/MAINTENANCE**

FM First Template No 869  
Schedules: 1997 to 2724

|                  |
|------------------|
| <b>QUARTERLY</b> |
|------------------|

IN ACCORDANCE WITH SHTM 04-01 Part G (*VI July 2015*) Page 32 para 3.51

**RECORD FORM -See DMA records**

**PROCEDURE REF - P1C12 CURRENTLY CONTRACTED TO DMA**

**HAISCRIBE/Risk Assessment Ref – N/A** See Appendix 4

The following actions must be undertaken every **THREE MONTHS**:

**Description of Work**

- Exchange shower head and hose assembly inc sealing washers with new disposable unit. Place old shower head and hose assembly into re-sealable plastic bag.
- Check that the new head and hose package is intact;
- Open replacement new shower head and hose assembly sealed packaging, remove and fit following the manufacturer's instructions;
- Run water and flush for 3 minutes in accordance with Legionella Risk Assessment in such a way as to avoid the creation of aerosols;
- Check final temperature for compliance and working order and return shower appliance to use.
- Return redundant sealed bag with shower head and hose assembly to collection point for recycling in accordance with Waste Procedures;
- Record all actions on the Record Form (005b).

**CHECK**

1. Record all details of any fault or discrepancy by completing an Incident Form (04) and report to Manager.
2. Complete Record Form ensuring that you date, sign it and enter FM First ticket number.
3. Return form to the Water Systems AP.
4. Ensure records are uploaded to Teams Folder.

NOTE: This procedure replaces the previous Clean & Disinfect method from 1<sup>st</sup> April 2019 for majority of showers. Where fixed showers exist, eye wash stations, baths etc DMA will carry out clean disinfection of these.

**Fixed Shower Head / Bath shower, eye wash shower heads**

**Description of Work**

- Exchange shower head and hose assembly inc sealing washers with previously cleaned and sanitised unit. Place old shower head and hose assembly into re-sealable plastic bag.
- Check that the new clean disinfected head and hose package is intact;
- Open replacement new clean disinfected shower head and hose assembly sealed packaging, remove and fit following the manufacturer's instructions;
- Run water and flush for 3 minutes in accordance with Legionella Risk Assessment in such a way as to avoid the creation of aerosols;
- Check final temperature for compliance and working order and return shower appliance to use;
- Return redundant sealed bag with shower head and hose assembly to workshop for disposal in accordance with Waste Procedures;
- Record all actions on DMA Records.

**CHECK**

1. Record all details of any fault or discrepancy by completing an Incident Form (04) and report to Manager.
2. Complete Record Form ensuring that you date, sign it and enter FM First ticket number.
3. Return form to the Water Systems AP.
4. Ensure records are uploaded to Teams Folder.



**4.62 – HORNE TAP FLOW STRAIGHTENER EXCHANGE**

FM First Template No N/A

**QUARTERLY**

IN ACCORDANCE WITH IC GUIDANCE

**RECORD FORM – (See DMA Records)****PROCEDURE REF – WQS 001****HAISCRIBE/Risk Assessment Ref – N/A** See Appendix 4The following actions must be undertaken every **THREE MONTHS**:**Description of Work**

PPE:- Surgical gloves should be worn when carrying out this task. Cross contamination of the replacement flow straightener should be considered and avoided at all times.

Straightener should only be replaced at outlets without Point of use filters. If Point of use filter is fitted it should be left in place and noted on Record Form.

- Assemble all tools and materials required to complete task.
- Check with ward staff to ensure access can be granted to each area without Infection Control restriction.
- Remove existing straightener using the appropriate tool and dispose of the straightener in general waste.
- Use disinfectant wipes to sanitise tap outlet and tools used before re-fitting new straightener.
- Change gloves to avoid cross contamination of new components and tools.
- Unpack new straightener components and insert into tap as per the manufacturer's instructions.
- Test on completion and fill out log sheet to record all relevant information.

**CHECK**

1. Record all details of any fault or discrepancy by completing an Incident Form (04) and report to Manager.
2. Return form to the Water Systems AP.
3. Ensure records are uploaded to Teams Folder.

**4.63 - REVIEW OF INFREQUENTLY USED WATER OUTLETS/CHANGE IN-USE**

IN ACCORDANCE WITH BOARD POLICY

**QUARTERLY****RECORD FORM – WS01A****PROCEDURE REF – WS01a****HAISCRIBE/Risk Assessment Ref – N/A** See Appendix 4The following actions must be undertaken every **THREE MONTHS**:**Description of Work**

- Liaise with Heads of Department to review existing accommodation occupancy and usage on a 3 monthly basis by sending out WS01a reminded and requesting a response.
  - All responses sent to [REDACTED] indicating to cascade to all department staff.
  - As part of the Estates Departments regular review of Water System Safety we require you to read and reply to the following questions for your department within the next 31 days (**DATE**).
  - Our focus is to remove any outlets which are identified as ‘Little Used’ and as such may pose a risk to the water supply.
  - Required Information:
    - Please provide us with location details of any water outlets (basins, sinks, showers, baths, toilets, dispensers, etc) that are used less than twice weekly but you wish to keep.
    - Please provide us with details of the flushing regime\* your department has in place for the outlets you have listed from Question 1 above.
    - Please provide us with location details of any water outlets (basins, sinks, showers, baths, toilets, dispensers, etc) that you no longer require and Estates will assist in having them permanently removed. These will need to be flushed and recorded regularly until they are removed.
  - (NOTE: Agreement to remove any outlet must be obtained from Infection Control prior to logging a request with Estates.)
  - Flushing Regime- You must accept departmental responsibility for any INFREQUENTLY USED Outlets you wish to keep and as such you must record the regular flushing.
  - This can be recorded on the attached log sheet WS01a (PDF & Word Version).
  - Records should be kept locally for periodic inspection by Estate Management.
  - This reminder will be sent out on a 3 monthly basis to ensure any current arrangements are regularly reviewed.
  - If you have no INFREQUENTLY USED Outlets to report, please reply by stating “NIL RETURN” with the name of your department/location.

- Response rates from departments, Board wide are recorded by Deputy Responsible Person and reported to Board Water Safety Group Meeting
- Any lack of responses is escalated by Deputy Responsible Person

**4.65 – PAL FILTER REPLACEMENT**

**FM First Template No**

**31 & 62 Day**

**IN ACCORDANCE WITH AGREED FILTER LOCATIONS**

**RECORD FORM - DMA RECORDS**

**PROCEDURE REF -**

**HAISCRIBE/Risk Assessment Ref – N/A See Appendix 4**

The following actions must be undertaken every **31 Days or 62 Days based on filter types and locations**:

**Description of Work**

- Replace filters prior to end date on tap and shower filters as per programme.
- Process for replacement as per DMA Procedure and RAMS.
- Log all replacements as per DMA Procedures and record in DMA Records
- Any issues should be reported to Water Lead AP.

DMA maintains a register of all locations and completes exchange paperwork which also indicates barcode from previous and barcode for the new filter. This is also summarised in a spreadsheet and paperwork uploaded to Water teams folder.

#### 4.7 Six Monthly Checks

| Reference | Operation  |
|-----------|--|
| 4.71      | TMV/TMT & Thermostatic Shower Disinfection and Function Test |
| 4.72      | CWST Inspection and Temperature Monitoring                   |
| 4.73      | Maintenance of filtration units                              |
| 4.74      | CL02 checks  |

**NOTE:**

Completed Log Sheet to be submitted to either the Authorised Person (Water Systems) or Site Manager Operational Estates for authorisation and copies filed as indicated in Section 2.2.

Due to the volume of information required for the recording of test results for each of the assets being maintained, the Log Sheets provided within this document are for indicative purposes only.

Detailed information on the assets and test records for same will be retained within the specific 'Log Book' for the location being maintained.

#### 4.71 – TMV/TMT & TMS FAILSAFE FUNCTION TEST

**ON HOLD IS PART OF NEW FRAMEWORK  
TO BE AWARDED IN 2024**

**SIX MONTHLY**

**RECORD FORM -**

**PROCEDURE REF -**

**HAISCRIBE/Risk Assessment Ref – N/A See Appendix 4**

The following actions must be undertaken every **SIX MONTHS**:

**Description of Work**

- Examine all thermostatic taps for scale build-up or other deposits. De-scale any which are not clean.
- Verify fail safe operation by isolating hot and cold water supplies separately.
- Ensure thermostatic controls are re-adjusted to permit blending.
- Run and test tap and record hot and cold water inlet temperatures and mixed water outlet temperature. Record all details of any fault or discrepancy by completing an Incident Form (04) and report to Manager.
- Should controls not be able to be over-ridden, verify the temperatures at the inlet connections to the thermostatic valve utilising a contact type probe and electronic thermometer.
- Complete Record Form ensuring that you date, sign it and enter FM First ticket number.
- Access can be an issue either due to patient occupancy and/or access behind IPS panels for isolations. If no access is available/granted please ensure staff complete 'a denial of access form'. However try and re-arrange for access.
- SCRIBE requirement for high risk areas must be followed including ensure the rooms is vacated for patients and SCRIBE precautions implemented.
- Return forms to the Water Systems AP.
- Ensure records are uploaded to Teams Folder.

**4.72 – CWST INSPECTION AND TEMPERATURE MONITORING:**

FM First Template No 819

**SIX MONTHLY**IN ACCORDANCE WITH SHTM 04-01 Part G (*V1 July 2015*) Page 29 para 3.37**RECORD FORM – Carried out by DMA – refer to records****PROCEDURE REF – P1C7****HAISCRIBE/Risk Assessment Ref – N/A See Appendix 4**The following actions must be undertaken every **SIX MONTHS** seasonally during Summer and Winter:**Description of Work**

- Inspect the tank and associated pipework including insulation, valves etc for damage or corrosion and sediment.
- Operate all isolation valves through their full range of motion.
- Check the operation of the ball-valve by pressing down on it and lifting the float to confirm that water flows and stops.
- Inspect the tank overflows if visible. Confirm that there is no blockage or other foreign material and that the mesh screen is not damaged.
- Measure and record the temperature of the water in the tanks, by dipping the thermometer into the top as far from the ball-valve as possible.
- Check and record ambient outside air temp and tank room temp.
- Check the flow and record the temperature of water feeding the tanks. There should be a steady rapid flow when the ball float is down.

**CHECK**

1. Record all details of any fault or discrepancy on the FAULT LOG and complete Incident Form (04) and report to Manager.
2. Complete Records and send information to Water Systems AP.
3. Ensure records are uploaded to Teams Folder.

**4.73 – MAINTENANCE OF WATER FILTRATION UNITS:**

FM First Template N/A

**SIX MONTHLY**

N/A

**RECORD FORM – Carried out by Veolia– refer to records**

**PROCEDURE REF – N/A**

**HAISCRIBE/Risk Assessment Ref – N/A**

The following actions must be undertaken every **SIX MONTHS**:

**Description of Work**

- Check on feedwater quality
- Check on treated water quality & flows
- The condition of valves & diaphragms
- Operational cycle simulation
- General plant condition & safety
- The condition of system pumps
- The condition of the pre-filters
- Level control function

**CHECK**

1. Record all details of any fault or discrepancy and pass to Water Lead AP to record on the FAULT LOG and complete Incident Form (04).
2. Ensure records are uploaded to Teams Folder.



**4.74 – MAINTENANCE OF CL02 PLANT:**

FM First Template N/A

**SIX MONTHLY**

N/A

**RECORD FORM – Carried out by Scotmas– refer to records****PROCEDURE REF – N/A****HAISCRIBE/Risk Assessment Ref – N/A**The following actions must be undertaken every **SIX MONTHS**:**Description of Work**

- As per monthly plus :-
- Check ClO<sub>2</sub> gas detector functionality and recording levels.
- Simulate fault circuitry and alarm on Sentinel Monitor.
- Change probe electrolyte and cross calibration test.
- Carry out manual Chlorate & Chlorite validation tests (12 representative outlets).
- Check water meter operation and report on Electrolyte top up, Probe calibrations

**CHECK**

1. Record all details of any fault or discrepancy and pass to Water Lead AP to record on the FAULT LOG and complete Incident Form (04).
2. Ensure records are uploaded to Teams Folder.

## 4.8 Annual Maintenance Checks

| Reference | Operation  |
|-----------|--|
| 4.81      | DWS Calorifier / Expansion Vessel Inspection           |
| 4.82      | Water Services Pipework and Distribution System Checks |
| 4.83      | Representative Tap Temperature Monitoring              |
| 4.84      | Vibration coupling inspection                          |
| 4.85      | BMS Temperature Sensor Test                            |
| 4.86      | Maintenance of CL02 units                              |
| 4.87      | TMV/TMT/TMS Disinfection and function test             |
| 4.88      | Carry out clean and disinfection of water tanks        |
| 4.89      | Carry out annual review of TMV/TMT requirements        |

### NOTE:

Completed Log Sheet to be submitted to either the Authorised Person (Water Systems) or Site Manager Operational Estates for authorisation and copies filed as indicated in Section 2.2.

Due to the volume of information required for the recording of test results for each of the assets being maintained, the Log Sheets provided within this document are for indicative purposes only.

Detailed information on the assets and test records for same will be retained within the specific 'Log Book' for the location being maintained.

## 4.81 - DWS CALORIFIER/EXPANSION VESSEL INSPECTION

FM First Template No 821

**ANNUAL**

IN ACCORDANCE WITH SHTM 04-01 Part G (*VI July 2015*) Page 31 para 3.44

**RECORD FORM - (006)**

**PROCEDURE REF - P1C9**

**HAISCRIBE/Risk Assessment Ref – N/A** See Appendix 4

The following actions must be undertaken **ANNUALLY**

### Description of Work

Follow the manufacturers' maintenance instructions from O&M manuals. Record all actions where applicable on Record Form (006) for each system.

- Isolate domestic hot water calorifier or hot, cold or chilled water storage/buffer vessel service valves.
- Heat any domestic hot water calorifier or hot water storage/buffer vessel up until the contents has reached 70°C and hold at this temperature for a period of at least 1 hour.
- Drain domestic hot water calorifier and expansion vessel and remove inspection hatch.
- Hose out the domestic hot water calorifier to remove any debris, scale or other deposit. Care should be taken to keep aerosols to a minimum.
- If the domestic hot water calorifier or expansion vessel does not have an inspection hatch, the pipework at the top of the vessel should be disconnected to allow the insertion of a water hose to allow debris to be washed down off internal surfaces.
- Examine the internal and external condition of the domestic hot water calorifier any defects should be reported in writing to the relevant Authorised Person (Water). The safety valve should be checked, overhauled and reset as necessary. The temperature and pressure gauges to be checked for operation.
- On completion of examination and any repairs, the domestic hot water calorifier and expansion vessel should be re-assembled and the following sequence must be undertaken:
  - Refill with cold water.
  - Drain the domestic hot water calorifier and expansion vessel.
  - Refill with cold water, leave cold feed valve open.
  - Run domestic hot water calorifier and expansion vessel at a temperature of 70°C for at least 1 hour.
  - Test the operation of high limit cut-out system if fitted.
  - Check the temperature of the calorifier/vessel top and bottom with a surface thermometer. Adjust any controls as necessary.

NOTE: this flushing process can air lock the hot water system, so only carry it out when there is no hot water demand and the calorifier is valved off from the system.

CHECK

1. Record all details of any fault or discrepancy on the FAULT LOG and complete Incident Form (04) and report to Manager.
2. Complete Record Forms (006) ensuring that you date, sign them and enter FM First ticket number.
3. Return form to the Water Systems AP.
4. Ensure records are uploaded to Teams Folder.

**4.82 - PIPEWORK AND DISTRIBUTION SYSTEM CHECKS**

FM First Template No 829

**ANNUAL**IN ACCORDANCE WITH SHTM 04-01 Part G (*V1 July 2015*) Page 31 para 3.**RECORD FORM – DMA RECORDS / PLANT ROOM INSPECTION IN FM FIRST****PROCEDURE REF -****HAISCRIBE/Risk Assessment Ref – N/A** See Appendix 4The following actions must be undertaken **ANNUALLY**:

Estates Manager or Water Systems AP will define areas to be checked in each building.

**Description of Work**

- Check all accessible pipework for damage, or corrosion.
- Check for missing or damaged pipework insulation
- This is carried within the Tank Room by DMA during sampling and tank inspections monthly.
- This is carried out by NHS Estates within Plantrooms during plantroom inspections monthly
- This is carried out as per above procedures and noted on FM First PPM's..

**CHECK**

1. Record all details of any fault or discrepancy on the **FAULT LOG** and complete Incident Form (04) and report to Manager.
2. Complete Record Forms as per above procedures ensuring that you date, sign them and enter FM First ticket number.
3. Return form to the Water Systems AP.
4. Ensure records are uploaded to Teams Folder.

## 4.83 – REPRESENTATIVE TAP TEMPERATURE MONITORING THROUGH TMT/TMV MAINTENANCE

FM First Template No 917

**ANNUAL**

IN ACCORDANCE WITH SHTM 04-01 Part G (*VI July 2015*) Page 32 para 3.39

### **RECORD FORM – DMA RECORDS**

### **PROCEDURE REF – P1C10**

### **HAISCRIBE/Risk Assessment Ref – N/A See Appendix 4**

The following actions must be undertaken at regular intervals throughout the year to ensure 20% of the requirement is completed **ANNUALLY**:

#### Description of Work

- **OBJECTIVE:** Carry out water temperature monitoring to ensure consistency and performance of the system as per design. 20% of all outlets to be assessed annually to ensure entire system is completed within a 5 year period (*ref: SCART2 Question 54*)
- Check the temperatures at a representative number of hot and cold outlets on a rotational basis as defined in the local plan of the system being checked. Lead AP (Water) to define areas to be checked each month.
- Using a temperature probe check the temperature of the cold water tap does not go above 20°C after running the tap for 2 minutes;
- Using a temperature probe check the temperature of the hot water tap does not go below 55°C within running the tap for 1 minute;
- If the outlet being tested is protected by a TMV/TMT then temperatures should be taken directly from the supply pipework or by bypassing the thermostatic device by use of an appropriate purging kit. However access may not be available
- Access can be an issue either due to patient occupancy and/or access behind IPS panels for isolations. If no access is available/granted please ensure staff complete ‘a denial of access form’. However try and re-arrange for access.

SCRIBE requirement for high risk areas must be followed including ensure the rooms is vacated for patients and SCRIBE precautions implemented.

Record all temperatures at locations tested.

#### CHECK

1. Record all details of any fault or discrepancy on the FAULT LOG and complete Incident Form (04) and report to Manager.
2. Complete Record Forms (005d) ensuring that you date, sign them and enter FM First ticket number.
3. Return form to the Water Systems AP.

**4.84 - VIBRATION COUPLING INSPECTION**

**ANNUAL**

FM First Template No 831

IN ACCORDANCE WITH HSG 274 Part 2 (2014) Page 19 para 2.35

**RECORD FORM - (008)**

**PROCEDURE REF – WQMS 001**

**HAISCRIBE/Risk Assessment Ref – N/A** See Appendix 4

The following actions must be undertaken **ANNUALLY**:

**Description of Work**

- Refer to list of vibration coupling locations to be assessed.
- Visually check the condition of the coupling for any signs of leakage, deterioration or corrosion.
- Ensure flexible portion of coupling is intact and free from damage or deterioration.
- Carried out on Cold Water Booster sets as part of the inspection.

**CHECK**

1. Record all details of any fault or discrepancy on the FAULT LOG and complete Incident Form (04) and report to Manager.
2. Complete Record Forms ensuring that you date, sign them and enter FM First ticket number.
3. Return form to the Water Systems AP.

**4.85 – BMS TEMPERATURE SENSOR CALIBRATION**

FM First Template No

**ANNUAL**

IN ACCORDANCE WITH

**RECORD FORM -**

**PROCEDURE REF –**

**HAISCRIBE/Risk Assessment Ref – N/A** See Appendix 4

The following actions must be undertaken **ANNUALLY**:

**Description of Work**

- This task should be included in the BMS Service Contract Specification.
- All temperature sensors related to domestic hot and cold water services to be checked and calibrated annually using UKAS Lab certified equipment.
- All calorifiers, storage tanks, flow and return monitoring devices.
- Include all End of Line (EOL) sensors and cold water flushing devices.
- Records should be kept and made available to the estates dept on request.



**4.86 – MAINTENANCE OF CL02 UNITS:**

FM First Template N/A

**ANNUAL**

N/A

**RECORD FORM – Carried out by Scotmas– refer to records**

**PROCEDURE REF – N/A**

**HAISCRIBE/Risk Assessment Ref – N/A**

The following actions must be undertaken **ANNUALLY**:

**Description of Work**

- As per 6 monthly and ClO<sub>2</sub> & Chlorite Probe membrane cap replacement.
- Dosing Pump diaphragm valve replacements.
- Replace ClO<sub>2</sub> gas detector cartridge if required

**CHECK**

1. Record all details of any fault or discrepancy and pass to Water Lead AP to record on the FAULT LOG and complete Incident Form (04).

**4.87 – TMV/TMT/TMS DISINFECTION AND FUNCTION TEST****RECORD FORM -****ANNUAL****PROCEDURE REF -****HAISCRIBE/Risk Assessment Ref – N/A See Appendix 4**The following actions must be undertaken **ANNUALLY**:**Description of Work**

- Examine all thermostatic taps for scale build-up or other deposits. De-scale any which are not clean.
- Check and remove any installed plastic flow straighteners from tap outlet
- Inspect and Clean and Disinfect filters / strainers by removing and immersing in a solution as per agreed guidelines.
- Thermally disinfect outlets by over-riding thermostatic controls drawing water through each thermostatic tap until a temperature of 60°C is achieved. Run the tap at this temperature for five minutes. If this is not possible disassemble tap assembly and spray all accessible components with a suitable and agreed disinfection mixed to a 1:3 solution, (one part chemical, 3 parts water) or equal and approved and let stand for 5 minutes.
- Reassemble and verify fail safe operation by isolating hot and cold water supplies separately.
- Ensure thermostatic controls are re-adjusted to permit blending.
- Should controls not be able to be over-riden, verify the temperatures at the inlet connections to the thermostatic valve utilising a contact type probe and electronic thermometer.

Access can be an issue either due to patient occupancy and/or access behind IPS panels for isolations. If no access is available/granted please ensure staff complete 'a denial of access form'. However try and re-arrange for access.

SCRIBE requirement for high risk areas must be followed including ensure the rooms is vacated for patients and SCRIBE precautions implemented.

Run and test tap and record hot and cold water inlet temperatures and mixed water outlet temperature.

- Record condition of strainers.
- Carry out assessment if TMT/TMV is still required and add recommendation to records if this could be considered to be removed.
- Record all details of any fault or discrepancy on the FAULT LOG and complete Incident Form (04) and report to Manager.
- Ensuring that you date, sign them and enter FM First ticket number.
- Return form to the Water Systems AP.
- Ensure records are uploaded to Teams Folder.

## **4.88 – CLEAN AND DISINFECTION OF COLD WATER STORAGE TANKS**

**RECORD FORM -**

**ANNUAL**

**PROCEDURE REF -**

**HAISCRIBE/Risk Assessment Ref – N/A See Appendix 4**

The following actions must be undertaken as required:

### **Description of Work**

- Carry out clean and disinfection of tanks as per DMA RAMS.
- Note this will require CL02 to be stopped and safely discharged as per RAMS.
- This method statement will be used for the CLEANING AND DISINFECTION of COLD WATER STORAGE TANKS by chemical means using 2% Peroxide/Silver Ion (or equivalent) sprayed onto internal surfaces.
- Works shall be carried out by suitably trained/competent operators in accordance with this method statement, guided by BS EN 806 and HSG 274.
- CWST(s) internal condition shall be photographed prior to works commencing.
- Once the tank is empty, the tank shall then be physically cleaned using a wet vac and non-abrasive cleaning equipment so as not to damage tank surfaces and then flushed with fresh water.
- After cleaning, a 2% solution of Endosan shall be made and this sprayed onto all internal surfaces and left for a contact time of 15 mins. Surfaces should then be rinsed with fresh water.
- After contact period has elapsed the disinfectant shall be rinsed from walls and internal surfaces and base of tank flushed until disinfectant flushed from tank
- CWST shall then be flushed with fresh water and then refilled.
- Record all details of any fault or discrepancy on the FAULT LOG and complete Incident Form (04) and report to Manager. Ensuring that you date, sign them and enter FM First ticket number.
- Return form to the Water Systems AP.
- Ensure records are uploaded to Teams Folder.

**4.89 – ANNUAL REVIEW OF TMT/TMV REQUIREMENT**

**RECORD FORM -**

**ANNUAL**

**PROCEDURE REF -**

**HAISCRIBE/Risk Assessment Ref – N/A See Appendix 4**

The following actions must be undertaken as required:

**Description of Work**

- Carry out review at Sector Meeting of TMT/TMV's which can be removed or installed and record.

#### 4.9 Bi-Annual Maintenance Checks

| Reference | Operation  |
|-----------|--|
| 4.91      | Flexible Hose/Connection Inspection and Exchange |
| 4.92      | CWST Drop Test                                   |

#### **NOTE:**

Completed Log Sheet to be submitted to either the Authorised Person (Water Systems) or Site Manager Operational Estates for authorisation and copies filed as indicated in Section 2.2.

Due to the volume of information required for the recording of test results for each of the assets being maintained, the Log Sheets provided within this document are for indicative purposes only.

Detailed information on the assets and test records for same will be retained within the specific 'Log Book' for the location being maintained.

**4.91 – FLEXIBLE HOSE/CONNECTION INSPECTION AND EXCHANGE**

FM First Template No

**BI-ANNUAL****RECORD FORM - (009)****PROCEDURE REF – WQMS 002****HAISCRIBE/Risk Assessment Ref – N/A** See Appendix 4The following actions must be undertaken **BI-ANNUALLY**:**Description of Work**

- Refer to list of flexible connection locations to be assessed as per WQMS 002.
- Visually check the condition of the coupling for any signs of leakage, deterioration or corrosion.
- Safely isolate the water services and exchange the flexible connection with a BRAND NEW UNUSED replacement.
- Apply tag/label to indicate the intended date of future replacement (todays date + 24 months)
- Record all details on the Record Form (009).

**CHECK**

1. Record all details of any fault or discrepancy on the FAULT LOG and complete Incident Form (04) and report to Manager.
2. Complete Record Forms (009) ensuring that you date, sign them and enter FM First ticket number.
3. Return form to the Water Systems AP.

ONLY REQUIRED FOR EPDM Hoses and not required for PEX hoses.

**4.92 – CWST DROP TESTS**

FM First Template No 819

**BI-ANNUAL**

IN ACCORDANCE WITH

**RECORD FORM -****PROCEDURE REF -****HAISCRIBE/Risk Assessment Ref – N/A** See Appendix 4**REQUIRES CONFIRMATION IF THIS IS REQUIRED AS ALL TANKS ARE CLEANED ANNUALLY AND BY DEFINITION DROPPED.**The following actions must be undertaken **BI-ANNUALLY**:**Description of Work**

- Shut off mains cold water supply to tank.
- Record the start time and allow tank to drain naturally through usage. **DO NOT OPEN THE DRAIN.**
- Periodically monitor the tank until usage has reduced tank to exactly half of its starting capacity.
- Record the stop time and estimate the number of hours of storage of water in the tank.
- Record all inspection details on the Record Form (010).

**CHECK**

1. Record all details of any fault or discrepancy on the **FAULT LOG** and complete Incident Form (04) and report to Manager.
2. Complete Record Forms (010) ensuring that you date, sign them and enter FM First ticket number.
3. Return form to the Water Systems AP.

## 5.0 INCIDENT AND EMERGENCY PROCEDURES

| Procedure Reference | Operation                                      |
|---------------------|--|
| 5.1                 | FAILURE OF CONTROL MEASURES                    |
| 5.2                 | LOSS OF MAINS WATER                            |
| 5.2                 | LOSS OF CL02                                   |
| 5.3                 | HIGH COLD WATER SUPPLY TEMPERATURE             |
| 5.4                 | LOW HOT WATER SUPPLY TEMPERATURE               |
| 5.5                 | CALORIFIER OR HEAT EXCHANGER TEMPERATURE FAULT |
| 5.6                 | POSITIVE LEGIONELLA TEST RESULT                |
| 5.7                 | INFREQUENT OR INFREQUENTLY USED WATER OUTLETS  |
| 5.8                 | EMERGENCY REPAIRS                              |
| 5.9                 | DISINFECTION OF WATER SYSTEM                   |
| 5.10                | PSEUDOMONAS PROTOCOL                           |
| 5.10                | FLUSHING WATER OUTLETS                         |

### NOTE:

Completed Log Sheet to be submitted to either the Authorised Person (Water Systems) or Site Manager Operational Estates for authorisation and copies filed as indicated in Section 2.2.

Due to the volume of information required for the recording of test results for each of the assets being maintained, the Log Sheets provided within this document are for indicative purposes only.

Detailed information on the assets and test records for same will be retained within the specific 'Log Book' for the location being maintained.



## 5.1 Failure of control measures

THE FOLLOWING PAGES DESCRIBE REMEDIAL ACTIONS TO BE TAKEN IN THE EVENT OF AN INCIDENT, EMERGENCY, OUT-OF-SPECIFICATION TEST RESULT AND / OR WHERE *LEGIONELLA* HAS BEEN IDENTIFIED AND/OR BACTERIA COUNTS BEING IN EXCESS OF THE RECOMMENDED LIMITS IN THE WATER SYSTEM ARE IDENTIFIED.

The Health and Safety at Work Act places a duty on employers to ensure, so far as is reasonably practicable, the maintenance of safe working conditions without risks to health, not only to employees, but also to the general public.

The risk to personnel associated with the presence of *Legionella* depends on a number of variables and may be quite low. However, since the actions to eradicate it are straightforward and reasonably practicable, it would be wise to put them in hand without delay if *Legionella* has been identified.

When analysis confirms that the levels of bacteriological contamination are in excess of acceptable limits, and/or the presence of Coliforms or *E.coli* is identified, the procedures recommended in this section should be applied.

Where any reported test result, non-compliance issue or defect is made known which affects the integrity of the water system and indicates the failure of Control Measures and / or increased risk of bacteria proliferation the following procedures shall be followed and duly recorded within Section 2.3 of this document and brought to the attention of the relevant Infection Control Team and Water Management Group.

**IN ALL CASES THE INCIDENT RECORD FORM (004) SHOULD BE COMPLETED AND INSERTED IN THE BUILDING SPECIFIC WATER SAFETY LOG BOOK.**

## 5.2 Loss of mains water

In the event of the loss of mains water, there is agreed emergency plan in place with Scottish Water (located in SCART22 folder and Water Teams folder). This covers building locations, tank locations, emergency fill points, bottled water requirements and Scottish Water contact 24/7.

## 5.3 Loss of CL02

In the event of the loss of CL02, Scotmas can be contacted 24/7 to attend and resolve. (Number is on shift phone) and emergency contact detail in the shift folder on the Estates drive. Adults and Childrens building has backup units for the cold which allows for line injection, which can be agreed to be utilised as these do not automatically operate.

Discussions should take place with Infection Control to keep them informed of any long term outage so that any further actions can be considered.

## 5.4 High cold water temperature

### Incident Plan

In the event of plant failure suppliers and installers guidance should be consulted. The location of all relevant literature should be recorded in the site logbook (e.g. Mercury fault finding guidance).

### Mains and Stored Water

Currently there is no legal maximum water supply temperature from the Licensed Provider. In practice the water supply temperature to boundary point will be subject to seasonal variation. In winter this would normally be expected to be in the 5°C – 10°C range and in summer up to 20°C.

The following staged risk assessment escalation procedure should be employed where the water temperature in Cold Water Storage Tanks is 20°C or higher.

### Stage 1 - Verification

- Where tepid cold water occurrence (i.e.  $\geq 20^{\circ}\text{C}$ ) is reported from any numbers of cold water outlets, from maintenance/ppm, flushing procedures, from BEMS monitoring, or from the manual monitoring of storage tanks, the person identifying, or making a report must notify the relevant Authorised Person (Water) as soon as the problem is identified and confirm this in writing within 24 hours;
- The Authorised Person (Water) should liaise with the person identifying the problem and verify the problem by independently re-checking by means of taking the water temperature of the appropriate cold water storage tank, the temperature of each incoming mains supplies at the site boundary point (and building entry points of other buildings within the QEUH campus served by the same mains lines) and the outflow distribution temperature;
- If the cold water storage temperature is confirmed as being 20°C or higher at any of the above noted points, then the Authorised Person (Water) should record this in writing as well as conducting continuous monitoring of the incoming cold water mains, the cold water storage and the outflow temperatures to establish the temperature profiles and in more detail over at least a one week period to determine the level of risk;
- If only one of the incoming mains lines is  $\geq 20^{\circ}\text{C}$  the consideration should be given to switching to the other mains supply until such times as “out-of-specification” mains line has returned to compliant parameters. Ensure if either mains line is non-operational it is included in a daily flushing regime and treated as per escalation procedures to follow.
- The Authorised Person (Water) should also review the Water Safety Log Book and take into account the recent water system history specifically to include:
  - the primary water treatment levels (for mains cold water supplied with Chlorine or Chloramination treatment);
  - any water sampling results;
  - system monitoring data including temperature monitoring and water quality chlorine or chloramination checks;
  - recent maintenance history; recent alterations, changes or additions to the water system;
  - any other changes made by Duty Holders or users of the water system; On reviewing continuous monitoring temperature profiles action as Stage 2, 3 or 4 as appropriate of this escalation procedure should be undertaken. The Authorised Person (Water) will ensure that the Responsible Person (Water) is notified immediately in writing at each stage and also recorded in the Water Safety log book.

### Stage 2 - Initial Action – High Incoming Mains Cold Water Temperature

- Where the incoming mains cold water is 18°C or higher for more than a 48 hour period the Responsible Person (Water) should contact Business Stream (the Licensed Provider) who will work with Scottish Water to establish the reasons and determine a resolution. Continuous monitoring should continue and recorded in the risk assessment

### Stage 3 - Water temperatures fluctuating above and below 20°C (but not higher than 25°C)

- Where water temperatures are fluctuating above and below 20°C in a regular cyclical manner over 72 hour periods in response to regular user water demand (but not higher than 25°C) and are more than 2°C higher than the incoming cold water mains supply temperature at the building entry point, then continuous monitoring should be continued by the Authorised Person (Water). The reason(s) for failure(s) should be identified and rectified as soon as possible. This should be recorded by updated risk assessment (specifically in relation to the patient risk rating – where there may be increased risk and appropriate actions may be required to mitigate exposure. An up to date register of all areas and their subsequent patient risk ratings should be maintained).
- considerations for failures include:
  - accuracy of temperature sensors (requiring recalibration);
  - temperature sensors being located in water (requiring reposition where tank storage levels been reduced and sensor no longer sensing stored water);
  - inappropriate standby tank configuration;
  - temperature sensor in standby system;
  - temperature sensor measuring stagnation (requires reposition);
  - inappropriate siting (not in a cool location);
  - heat gain to the tank and pipework (due to lack of appropriate insulation or located close to heat gain from other heat sources);
  - storage capacity not minimised to match daily use (12 hours storage is recommended);
  - ingress of hot water through cross connection or mixing valve failure (i.e. from DHW system or MTHW systems);

### Stage 4 - water temperatures fluctuating above and below 25°C (and rarely below 20°C)

- In this situation continuous monitoring should be continued by the Authorised Person (Water), the reason(s) for failure(s) (as Stage 3) identified and rectified on an urgent basis. This should be recorded by updated risk assessment (specifically in relation to the patient risk rating – where there will be an increased risk and appropriate actions will be required to mitigate exposure. An up to date register of all areas and their subsequent patient risk ratings should be maintained);
- In this situation a permanent solution, such as ventilation for the plant room, or changing the water storage arrangements, or forming a circulating distribution system (with or without chilling depending on the circumstances) would require to be implemented;
- The Authorised Person (Water) should, unless instructed in writing to the contrary by Responsible Person (Water) implement the following:
  - arrange to drain the tank contents and clean if necessary (*and/or carry out local disinfections where appropriate*);
  - inform the users of the failed system that they must not draw off any water from the affected system until further notice;
  - suitable disinfection of the tank and/or distribution system shall be carried out.

**Please Note:** *Due to the system design and installation complete disinfection of all downservices fed from the Raw and Bulk water storage tanks may not be practical as “high risk” system such as renal dialysis is fed from these tanks. Alternative protocols/method statements for local disinfections should be prepared and maintained;*

- thereafter the tank/local area being disinfected shall be brought back into service;
- finally the users shall be informed that the system is back in operation.

The Authorised Person (Water) shall complete an Incident Report Record Form. An entry should also be made in the Water Safety Log Book and the Responsible Person (Water) should be notified in writing as soon as possible.

## 5.5 Low hot water temperature

### Incident Plan

In the event of plant failure suppliers and installers guidance should be consulted. The location of all relevant literature should be recorded in the site logbook (e.g. Mercury fault finding guidance).

### Mains and Stored Water

Currently there is no legal maximum water supply temperature from the Licensed Provider. In practice the water supply temperature to boundary point will be subject to seasonal variation. In winter this would normally be expected to be in the 5°C – 10°C range and in summer up to 20°C.

The following staged risk assessment escalation procedure should be employed where the water temperature in Cold Water Storage Tanks is 20°C or higher.

### Stage 1 - Verification

- Where tepid cold water occurrence (i.e.  $\geq 20^{\circ}\text{C}$ ) is reported from any numbers of cold water outlets, from maintenance/ppm, flushing procedures, from BEMS monitoring, or from the manual monitoring of storage tanks, the person identifying, or making a report must notify the relevant Authorised Person (Water) as soon as the problem is identified and confirm this in writing within 24 hours;
- The Authorised Person (Water) should liaise with the person identifying the problem and verify the problem by independently re-checking by means of taking the water temperature of the appropriate cold water storage tank, the temperature of each incoming mains supplies at the site boundary point (and building entry points of other buildings within the Southern General Hospital served by the same mains lines<sup>8</sup>) and the outflow distribution temperature;
- If the cold water storage temperature is confirmed as being 20°C or higher at any of the above noted points, then the Authorised Person (Water) should record this in writing as well as conducting continuous monitoring of the incoming cold water mains, the cold water storage and the outflow temperatures to establish the temperature profiles and in more detail over at least a one week period to determine the level of risk;
- If only one of the incoming mains lines is  $\geq 20^{\circ}\text{C}$  the consideration should be given to switching to the other mains supply until such times as “out-of-specification” mains line has returned to compliant parameters. Ensure if either mains line is non-operational it is included in a daily flushing regime and treated as per escalation procedures to follow.
- The Authorised Person (Water) should also review the Water Safety Log Book and take into account the recent water system history specifically to include:
  - the primary water treatment levels (for mains cold water supplied with Chlorine or Chloramination treatment);

- any water sampling results;
- system monitoring data including temperature monitoring and water quality chlorine or chloramination checks;
- recent maintenance history; recent alterations, changes or additions to the water system;
- any other changes made by Duty Holders or users of the water system;

On reviewing continuous monitoring temperature profiles action as Stage 2, 3 or 4 as appropriate of this escalation procedure should be undertaken. The Authorised Person (Water) will ensure that the Responsible Person (Water) is notified immediately in writing at each stage and also recorded in the Logbook via Incident form (04).

### Stage 2 - Initial Action – High Incoming Mains Cold Water Temperature

- Where the incoming mains cold water is 18°C or higher for more than a 48 hour period the Responsible Person (Water) should contact Business Stream (the Licensed Provider) who will work with Scottish Water to establish the reasons and determine a resolution. Continuous monitoring should continue and recorded in the risk assessment.

### Stage 3 - water temperatures fluctuating above and below 20°C (but not higher than 25°C)

- Where water temperatures are fluctuating above and below 20°C in a regular cyclical manner over 72 hour periods in response to regular user water demand (but not higher than 25°C) and are more than 2°C higher than the incoming cold water mains supply temperature at the building entry point, then continuous monitoring should be continued by the Authorised Person (Water). The reason(s) for failure(s) should be identified and rectified as soon as possible. This should be recorded by updated risk assessment (specifically in relation to the patient risk rating – where there may be increased risk and appropriate actions may be required to mitigate exposure. An up to date register of all areas and their subsequent patient risk ratings should be maintained).
- considerations for failures include:
  - accuracy of temperature sensors (requiring recalibration);
  - temperature sensors being located in water (requiring reposition where tank storage levels been reduced and sensor no longer sensing stored water);
  - inappropriate standby tank configuration;
  - temperature sensor in standby system;
  - temperature sensor measuring stagnation (requires reposition);
  - inappropriate siting (not in a cool location);
  - heat gain to the tank and pipework (due to lack of appropriate insulation or located close to heat gain from other heat sources);
  - storage capacity not minimised to match daily use (12 hours storage is recommended);
  - ingress of hot water through cross connection or mixing valve failure (i.e. from DHW system or MTHW systems);

### Stage 4 - water temperatures fluctuating above and below 25°C (and rarely below 20°C)

- In this situation continuous monitoring should be continued by the Authorised Person (Water), the reason(s) for failure(s) (as Stage 3) identified and rectified on an urgent basis. This should be recorded by updated risk assessment (specifically in relation to the patient risk rating – where there will be an increased risk and appropriate actions will be required to mitigate exposure. An up to date register of all areas and their subsequent patient risk ratings should be maintained);
- In this situation a permanent solution, such as ventilation for the plant room, or changing the water storage arrangements, or forming a circulating distribution system (with or without chilling depending on the circumstances) would require to be implemented;
- The Authorised Person (Water) should, unless instructed in writing to the contrary by Responsible Person (Water) implement the following:
  - arrange to drain the tank contents and clean if necessary (*and/or carry out local disinfections where appropriate*);

- inform the users of the failed system that they must not draw off any water from the affected system until further notice;
- suitable disinfection of the tank and/or distribution system shall be carried out.

**Please Note:** Due to the system design and installation complete disinfection of all downservices fed from the Raw and Bulk water storage tanks may not be practical as “high risk” system such as renal dialysis is fed from these tanks. Alternative protocols/method statements for local disinfections should be prepared and maintained;

- thereafter the tank/local area being disinfected shall be brought back into service;
- finally the users shall be informed that the system is back in operation.

The Authorised Person (Water) shall complete an Incident Report Record Form. An entry should also be made in the Water Safety Log Book and the Responsible Person (Water) should be notified in writing as soon as possible. Record on Incident form (04).

## Hot Water Services

When hot water storage or distribution temperatures fall below those required (60°C storage, 55°C at outlets and returning to calorifier) these will almost inevitably be caused a mechanical fault. Appropriate maintenance procedures, including the Mercury Fault Finding guidance documents, should be created and referenced to assist in timely rectification.

This escalation procedure (taken from SHTM 04-01 Part G (Draft)) should be employed if the Calorifier/Plate Heat Exchangers outflow temperature falls below 45°C.

The table below should be used to decide on the actions necessary in the event of a plant breakdown such as power failure or gas supply failure.

| Breakdown leading to temperature <45°C, lasting for: | Risk Category | Action               |
|--|---------------|----------------------|
| <12 hrs  | High          | Verify               |
|  | Significant   | Verify               |
|  | Moderate      | Verify               |
| >12 hrs  | High          | Thermally pasteurise |
|  | Significant   | Verify               |
|  | Moderate      | Verify               |
| >24 hrs  | High          | Thermally pasteurise |
|  | Significant   | Thermally pasteurise |
|  | Moderate      | Verify               |
| >72 hrs  | High          | Thermally pasteurise |
|  | Significant   | Thermally pasteurise |
|  | Moderate      | Thermally pasteurise |

In the event of a reduction in domestic hot water temperature the **Authorised Person (Water)** should be notified in writing as soon as possible. The reason for failure must be identified and rectified as soon as possible.

The **Authorised Person (Water)** shall notify the **Duty Holder** and users on the failed system that they must not draw off any hot water from the affected services until further notice.

The relevant **Duty Holder** shall ensure that their staff are aware of the situation, and that they in turn shall prevent patients from using affected services.

Where thermal pasteurisation is to be carried out, the temperature of the calorifier or plate heat exchanger shall be raised to 70°C, and the water shall be circulated throughout the affected distribution system for at least one 1 hour. Each tap or appliance should be run in sequence until full temperature is achieved (this should be measured). To be effective the temperature in the calorifier or plate heat exchanger should be high enough to ensure that all distribution outlets receive water at a temperature of greater than 60°C. Ensure the return flow to the calorifier or plate heat exchanger is no less than 55°C.

The **Authorised Person (Water)** shall inform users that the system is back in operation.

Bacteriological samples should be taken in consultation with the Infection Prevention and Control team.

The **Authorised Person (Water)** shall complete an Incident Report Record and ensure the **Responsible Person (Water)** is notified in writing as soon as possible. Maintain hard copy records in the Water Safety Log.

## 5.6 Positive legionella result

### Microbiological Sampling (Legionella)

Sampling requirements and frequency are to be formulated by NHS GG&C and written scheme should be updated as appropriate.

Legionella testing may be required:

- In systems where the temperature control regimes are not consistently achieved, frequent testing e.g. weekly should be carried out to provide early warning of loss of control. Once the system is brought back under control as demonstrated by monitoring, the frequency of testing should be reviewed
- Weekly checks are recommended until the system is brought under control;
- When an outbreak is suspected or has been identified;
- In wards with at-risk patients – for example those who are immuno-compromised (“high risk patient” areas still to be confirmed to DMA).

As a minimum, samples should be taken as follows:

- From the cold water storage and the furthest outlet from the tank, on every loop;
- From the calorifier flow, or the closest tap to the calorifier, and the furthest tap on the hot water service circulating system (these should be identified on sentinel outlet register);
- Additional samples should be taken from the base of the calorifier via drain valves;
- From areas where the target control parameters are not met (i.e. where temperatures are below 55°C for hot water systems or  $\geq 20^{\circ}\text{C}$  for cold water systems);
- From areas subject to low usage, stagnation, excess storage capacity, dead legs, excessive heat loss, crossflow from the water system or other anomaly.
- High Risk Patient Areas
- Additional random samples may also be considered appropriate where systems are known to be susceptible to colonisation.

The temperature control regime is the preferred strategy for reducing the risk from *Legionella* and other waterborne organisms in water systems. This will require monitoring on a regular basis. The recommended test frequencies for various outlets are set out in Table 2 in Section 7.

Actions to be taken following legionella sampling in hot and cold water systems in healthcare premises with susceptible patients.

If there is an outbreak of legionellosis or other infections there are processes which Infection Control lead on. Specifically this will be a PAG (Problem Assessment Group) or IMT (Infection Management Team). This will involve a number of stakeholders including but not limited to Clinical, Infection Control, Health and Safety, Estates, Facilities and Microbiology. This will follow specific governance and reporting requirements.

| Legionella bacteria (cfu/Litre)   | Action required  |
|-----------------------------------|--|
| Not detected or up to 100         | The primary concern is protecting susceptible patients, so any detection of Legionella should be investigated and, if necessary, the system resampled to aid interpretation of the results in line with the monitoring strategy and risk assessment. <b>As per procedures outlet will be resampled until 3 not detected.</b>   |
| More than 100 but less than 1,000 | If the minority of samples are positive, the system should be resampled. If similar results are found again, a review of control measures and a risk assessment should be carried out to identify any remedial action necessary, or If the majority of samples are positive, the system may be colonised, albeit at a low level. An immediate review of control measures and a risk assessment should be carried out to identify any other remedial action required. Disinfection of the system should be considered. <b>As per procedures outlet will be resampled until 3 not detected.</b><br><br>Discuss results with ICD and agree actions and any closure of area. Use of POU's should be discussed with ICD or taking outlets out of use. |
| More than 1,000                   | The system should be resampled and an immediate review of the control measures and a risk assessment should be carried out to identify any remedial actions, including possible disinfection of the system. Retesting should take place three days following systemic chemical or thermal disinfection and at frequent intervals thereafter until a satisfactory level of control is achieved as agreed by the WSG. <b>As per procedures outlet will be resampled until 3 not detected.</b><br><br>Discuss results with ICD and agree actions and any closure of area. . Use of POU's should be discussed with ICD or taking outlets out of use.   |

### Communication pathway for out of spec results from water samples:

Water samples are sent to; UKASS-accredited laboratories which provide this service for NHS and other organisations that manage buildings. Reports will come back initially to the estates department.

Negative water samples are recorded as part of the documentation of Legionella control. If they are related to investigation of an "incident" such as a clinical case or a previous positive sample then these results are communicated to those managing that incident.

The information on the report which needs to be communicated is:

- Date of sampling
- Location and type of water outlet
- Identification of the organism, (Legionella pneumophila with serogroup, or Legionella species other than L pneumophila.)
- Count of organisms per Litre.

Estates will

- Inspect the system and take further action in accordance with HSE guidance and locally agreed procedures.
- Inform Charge Nurse and or Clinical Nurse Manager of the Clinical Area concerned if appropriate of any control measures being taken/required
- Inform Responsible person for the Sector if appropriate.

The results of this initial risk assessment must be communicated to all those noted above and also to the Estates RP for water.

The Infection Control Manager for Infection Prevention and Control will inform NHS GG&C

If there is impact on patient care then an Incident Management Team (IMT) may be convened to assess the risk and further actions.

**Refer to WQS – 017 for out of spec procedure**

**See table in Appendix 2**



## 5.7 Infrequent or infrequently use of outlets

If after investigation the taps or appliances identified within the reviewed list, to be updated on a quarterly basis, is deemed not necessary wherever possible the supply pipe work shall be cut back as close to the main circulating line as practicable to ensure that any dead leg formed is minimised and the appliance is removed from the water system.

In circumstances where there has been a lapse in the flushing regime, the stagnant and potentially contaminated water from within the shower or tap and associated dead leg should be purged to drain without discharge of aerosols before the appliance is used.

Where a ward or department is closed or taken out-of-use for an extended period of time e.g.: pending refurbishment, change in-use or other reason, arrangements shall be put in place to ensure the regular flushing and recording of water outlets within such areas. If such closures are considered to be long term or permanent consideration should be given to the disconnection of all water services to the affected areas.

## 5.8 Emergency repairs

Emergency repairs may be required at any time and should be undertaken by trained and competent personnel. Such repairs can vary from a simple repair to a section of pipework, replacement of a component or major burst or loss of service. In all such cases the integrity and safety of the water distribution system must be maintained at all times.

## 5.9 Disinfection of outlets or components

There are a number of different chemical and thermal disinfection methods available ALL of which shall be undertaken by trained and competent personnel in strict accordance with all Statutory Requirements, Safety Precautions and Manufacturers Instructions.

Agreed methodologies for the above must be agreed prior to works being carried out and signed of the Water AP.

**Disinfection** – is the process of destroying or inactivating Pathogenic organisms and is generally applied to the water supply.

**Sterilisation** – is the process of destroying or inactivating all Organic Life Forms and is generally applied to all systems of transmission and storage materials. However this is not achievable in water system.

In ALL instances no matter what disinfection method is employed, due regard shall be taken of patient groups, specialist equipment and processes which may be sensitive to the disinfection process being used – eg Renal Dialysis patients **must not** be exposed to Silver Hydrogen Peroxide chemicals as such the RO Water Treatment Plant and Dialysis Machines must be disconnected from the water system until the disinfection process is completed.

Silver Hydrogen Peroxide should NOT be used for a period of 90 days or longer, as required by the Drinking Water Inspectorate.

**Thermal disinfection** – This can be carried out by NHS CP's or approved service providers (CP's) following agreed procedures. Procedure is Water Teams folder. This involves drawing the hot water through an outlet including straight hot or mixer taps.

**Chemical disinfection of outlet** – Spray disinfection should follow agreed procedures in Water Teams folder. This normally involves spraying outlets and components with approved disinfection.

**In line chemical disinfection** – Will be carried out by approved water service providers (CP's) and RAMS should be provided. This normally involves isolating a system, installation of injection points, filling system with chemicals for a specific time, holding this in the system, running through all outlets and confirming by testing at outlets that the chemicals have been removed prior to handover.

Reasons why disinfection may be carried out in the following situations:

|                         |   |
|-------------------------|---|
| OUT OF SPECS AT OUTLETS | A number of options are available and would be agreed prior to commencement. Thermal disinfection by utilising the hot water to disinfection the outlet. Spray disinfection. In line disinfection with chlorine, silver hydrogen peroxide or peracetic acid.  |
| REPAIRS                 | Repair fittings and exposed pipe ends should be clean and disinfected before use. Such items should be sprayed with a suitable disinfection solution such as a Sodium Hypochlorite @ a strength of 1000 mg/l (1000ppm) with a minimum contact time of 5 minutes or equal and approved.  |
| MINOR ALTERATIONS       | Pipework should be cleaned internally by spraying with a suitable disinfection solution such as a Sodium Hypochlorite @ a strength of 1000 mg/l (1000ppm) or where pipes are long and internal surfaces cannot be reached with sprays then a swab soaked in a solution of 50mg/l (50ppm) with a contact time of one hour or equal and approved. |
| NEW SUPPLY PIPEWORK     | Pipes are filled with a solution such as a Sodium Hypochlorite @ a strength of 20 mg/l (20ppm) with a contact time of 24 hours.<br>Or<br>Sodium Hypochlorite and water at a strength of 50mg/l (50ppm) for a contact period of one hour. Minimum free chlorine after one hour – 30mg/l (30ppm) or equal and approved                            |
| SYSTEM DISINFECTION     | This will include water storage tanks and possibly the water distribution system. The advice and use of Legionella Control Association (LCA) approved contractors will be used for this purpose   |

## NOTE:

**Appropriate Method Statements and Risk Assessments will be compiled and obtained prior to any disinfection process commencing. Water Disinfection Risk Based Assessment Form (024) should be completed prior to any disinfection process being carried out.** (*SHTM 04-01 Part G (V1 July 2015) Page 38 para 5.9*)

An alternative to chemical disinfection is to pasteurise the system. This involves increasing the temperature to greater than 60°C by increasing the thermostat setting at the calorifier or boiler and recirculation as necessary to maintain this temperature throughout for at least one hour. This should effectively sterilise the calorifier, and kill any *Legionella* organisms present.

The water should be flushed through the system more than once. It is important that all taps are run for at least 5 minutes (preferably longer) at full temperature to ensure that the complete system is pasteurised and that the hot water has reached all parts of the system.

## 5.10 Pseudomonas Risk Assessments and SOP

Standard Operating Procedure for minimising the risk of Pseudomonas

Site Wide Risk Assessment is in place and available in the Water Team Folder. Each clinical area identified on this risk assessment also has risk assessments in place taking into consideration:-

- Current measure
- Clinical
- Use of water
- Engineering assessment
- Cleaning
- Flushing
- Sampling

Over and above this there is an SOP which provides direction and guidance for ward based staff to meet their responsibilities as stated in *HPS(2013) Guidance for neonatal units (NNUs) (levels 1,2&3), adult and paediatric intensive care units (ICUs) in Scotland to minimise the risk of Pseudomonas aeruginosa infection from water*. This document refers to critical control points 2 – 4 (inclusive) only. (Critical points 1, 5 and 6 are considered in the NHSGGC Water Safety Policy).

\*High Dependency Units (HDUs) which are adjoining/ integrated with an ICU should be included in this guidance.

### Responsibilities:

#### Senior Charge Nurses (SCNs) must:

- Follow this SOP.
- Ensure that they are aware of access issues to wash hand basins. Where access is an issue they must arrange for flushing to occur and document this.
- Keep records of daily flushing for at least one month within the Facilities Folder.
- Inform a member of the local Estates Team if this SOP cannot be followed in relation to flushing water outlets.
- Inform a member of the local Estates Team of infrequently used outlets which could be removed.
- Allow members of the local Estates Team access to complete maintenance as appropriate.

#### Estates must:

- Undertake actions deemed the responsibility of the local Estates Department as per the Water Safety Policy.

- Keep a record of outlets reported that are deemed to be infrequently used and actions taken by them to remove this risk.
- Provide a report of maintenance actions and issues/ anomalies to the Sector Water Safety Group.
- Support staff locally to undertake their responsibilities in terms of reducing risk associated with pseudomonas.

#### **Domestic Services must:**

- Ensure that water outlets are flushed at full flow for 1 minute (not causing splashing) as part of the cleaning process and to ensure for Mixer taps that this ensures an equal mix of cold and hot. If full flow cannot be achieved taps should be flushed for a longer period following assessment.
- Ensure this is the first task completed of the day.
- Record this in the Domestic services Compliance Checklist “Water Outlets”
- Ensure the Checklist is retained within the facilities Folder at ward level for one month.
- Send a copy of flushing records to Water AP and to ensure any rooms/areas which were not flushed are identified.
- Domestic Services Supervisors and Managers must also notify Estates LAP, if they identify any unused areas or outlets as per SHTM04-01 Part G Section 8.3.

#### **Managers must:**

- Make this SOP available to their staff.
- Support SCNs in following this SOP.

#### **Water Systems Group must:**

- Keep this SOP up-to-date.
- Audit compliance with this SOP.
- Provide guidance via the Water Systems Policy.

## **5.11 Flushing of water outlets**

Flushing of water outlets is necessary to control the build-up of biofilm in water systems to reduce the risk of transmission of pathogens via the environment and equipment to patients.

The Senior Charge Nurse (SCN) in each unit has responsibility (under current guidance) to ensure that the following recommendations are complied with in their area. The SCN should ensure that:

All INFREQUENTLY USED outlets that are not used at least twice weekly in general areas and daily on high risk area identified on WS01a form. These must be flushed at full flow (but not so that splashing goes beyond the basin. However if taps cannot be flushed on full flow they should be flushed for longer based on specific assessment. The manager responsible for the ward or department must put systems in place for the outlet to be flushed to waste for 3 minutes as per SHTM04-01 Part G Page 111.

Where the outlet may be used by high-risk patients, more frequent flushing may be needed and the frequency should be determined following a risk assessment.

Additionally high high-risk environments (adult, paediatric and Neonatal ICUs and associated HDU's), flushed daily, first thing in am for 1 minute at full flow (but not so that splashing goes beyond the basin). However if taps cannot be flushed on full flow they should be flushed for longer based on specific assessment.

Additionally Facilities (Domestic Services) to ensure that all water outlets are flushed daily where access is available and all outlets flushed for 1 minute at full flow (but not so that splashing goes beyond the basin). However if taps cannot be flushed on full flow they should be flushed for longer based on specific assessment. Records must reflect where access is not available or outlets not able to flush e.g. rooms/areas under Estates, Minor Works, Capital or no access at the weekend.

Domestic Services Supervisors and Managers will also notify Estates if they identify any unused areas or outlets or outlets not able to flush as per requirements of *SHTM04-01 Part G Section 8.3*.

These should be reflected on the department flushing records.

These must be reviewed on a daily basis by the SCN and appropriate action taken when this is identified as not having been completed.

Any problems or concerns relating to the safety, maintenance, reduced usage, any changes in use and cleanliness of all water outlets are identified and reported to the ICT, Facilities and Estates Department as relevant.

See next pages :-

1. Summary of references and responsibilities from SHTM04-01.
2. Flushing responsibilities for all areas.
3. Flushing process.

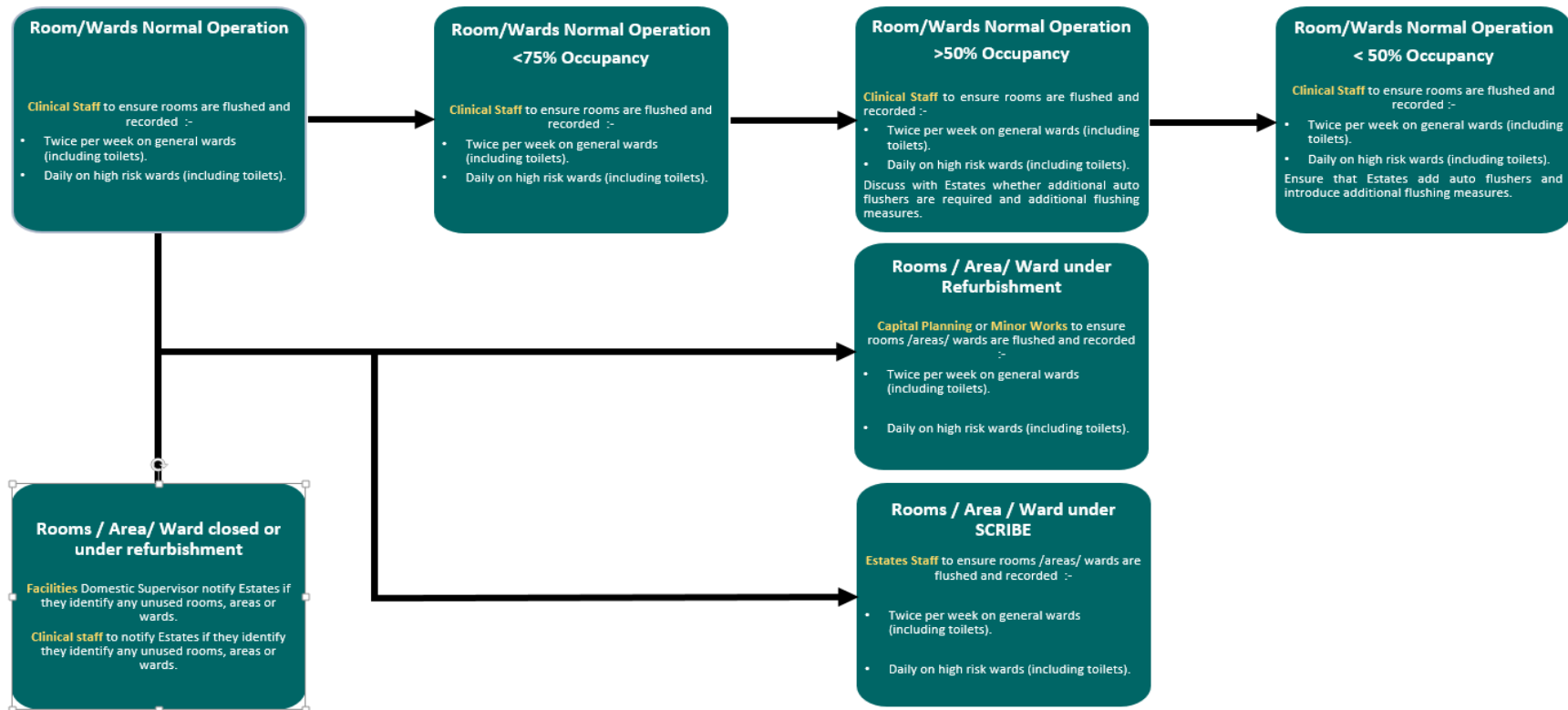
## Flushing responsibilities from SHTM04-01

| SHTM Reference                                 | SHTM wording  | Responsibility  |
|--|---|---|
| SHTM04-01 Part B<br>Page 66<br>Table 4         | <i>"Risk assessment may indicate the need for more frequent flushing of outlets. It is preferable that this form part of the daily cleaning routine."</i>   | Domestic Staff – <b>Agreed areas for running taps</b>   |
| SHTM04-01 Part B<br>Page 27<br>Paragraph 5.7   | <i>"During temporary closure of wards or departments {or rooms}, a procedure for flushing the hot and cold water service systems should be instituted. This should include opening all taps and showers for a period of three minutes and flushing cisterns etc on a twice-weekly cycle."</i>   | Departmental Managers – <b>Non clinical</b><br>Senior Charge Nurse – <b>Clinical</b><br>Domestic Supervisor & Manager – <b>All areas</b><br><b>Note</b> : This is to ensure that a flushing regime with Estates, Minor Works or Capital is implemented. |
| SHTM04-01 Part G<br>Page 56<br>Paragraph 13.1  | <i>"Showers and other water outlets which are rarely used should preferably be removed or, if retained, flushed to waste at intervals for a 3 minute period. The interval should be at least twice-weekly. Where the outlet may be used by high risk patients, more frequent flushing will be needed and the increased frequency should be determined following risk assessment. In ICUs little-used outlets should be flushed daily at the start of each day."</i>   | Departmental Managers – <b>Non clinical</b><br>Senior Charge Nurse – <b>Clinical</b>  |
| SHTM04-01 Part G<br>Page 62<br>Paragraph 17.4  | Individual hot, mixer and cold water outlet flushing<br><i>"flushing of all hand wash stations and sinks can be performed for 1 minute daily, at the maximum flow rate that this does not give rise to any splashing beyond the sink, e.g. on the floors."</i>  | Departmental Managers – <b>Non clinical</b><br>Senior Charge Nurse – <b>Clinical</b><br>Domestic Staff – <b>Agreed areas for running taps</b><br><b>Note</b> : This implies required increase the time to flush to avoid splashing.                     |
| SHTM04-01 Part G<br>Page 102<br>Paragraph 6.36 | <i>"twice-weekly flushing, of all INFREQUENTLY USED water outlets except in ICUs where daily flushing is required at the start of each day."</i>  | Departmental Managers – <b>Non clinical</b><br>Senior Charge Nurse – <b>Clinical</b>  |
| SHTM04-01 Part G<br>Page 110<br>Paragraph 8.3  | <i>"Domestic Services Supervisors and Managers will also notify the Maintenance Department if they identify any unused areas or outlets."</i>   | Domestic Supervisors and Managers – <b>All areas</b>  |
| SHTM04-01 Part G<br>Page 111<br>Paragraph 9.3  | <b>"Unused or Redundant System Outlets</b> – outlets deemed unused or redundant (and associated supply pipework at showers, taps in basins & baths, etc) must be reported by the manager responsible for the ward or department to the Estates Department to be taken out of service and for removal, to eliminate the risk.<br><br><i>The manager responsible for the ward or department must put systems in place for the outlet to be flushed to waste for 3 minutes, at least twice weekly, by ward or department staff".</i> | Departmental Managers – <b>Non clinical</b><br>Senior Charge Nurse – <b>Clinical</b><br><br><b>Note</b> : This this until the outlet can be removed by Estates.   |
| SHTM04-01 Part G<br>page 111<br>Paragraph 9.4  | <i>"INFREQUENTLY USED System Outlets - (i.e. outlets that are not used at least twice weekly). The manager responsible for the ward or department must put systems in place for the outlet to be flushed to waste for 3 minutes, at least twice weekly, by ward or department staff..... Where the outlet may be used by high-risk patients, more frequent flushing may be needed and the frequency should be determined following a risk assessment."</i>  | Departmental Managers – <b>Non clinical</b><br>Senior Charge Nurse – <b>Clinical</b><br>Operational Estates – <b>In agreed areas</b><br>Minor Works – <b>In agreed areas</b><br>Capital – <b>In agreed areas</b>  |

### Flushing responsibilities (All areas)

|   | Outlets identified in risk assessment  | Unused areas or outlets identified                                      | Reduced use areas identified  | Rooms under SCRIBE   | Areas under refurbishment                                  | Clinical - High Risk area   | Clinical - General areas  | Specific outlets within Clinical Environment  | INFREQUENTLY USED outlets where identified and recorded on WS01                                   |
|---|--|---|---|--|--|---|---|---|---|
| <b>Clinical</b>   |  | <b>Yes</b><br>Ensure Estates are informed to arrange flushing or repair |   |  |  | <b>Yes</b><br>Daily flushing of all outlets   | <b>Yes</b><br>Twice weekly flushing of all outlets  |   | <b>Yes</b><br>Daily flushing – High Risk<br>Twice Weekly - General                                |
| <b>Estates</b>  | <b>Yes</b><br>Ensure flushing regime in responsible areas identified via risk assessment | <b>Yes</b><br>Implement a flushing regime and or repair when informed   |   | <b>Yes</b><br>Ensure flushing regime in responsible areas. |  |   |   |   |   |
| <b>Minor Works</b>                                      |  |   |   | <b>Yes</b><br>Ensure flushing regime in responsible areas. | <b>Yes</b><br>Ensure flushing regime in responsible areas. |   |   |   |   |
| <b>Capital</b>  |  |   |   | <b>Yes</b><br>Ensure flushing regime in responsible areas. | <b>Yes</b><br>Ensure flushing regime in responsible areas. |   |   |   |   |
| <b>Facilities</b>                                       |  | <b>Yes</b><br>Ensure Estates are informed to arrange flushing or repair | <b>Yes</b><br>Ensure Estates are informed discuss/arrange additional flushing |  |  | <b>Yes</b><br>Carry out running of taps for agreed outlets as part of daily cleaning routine. | <b>Yes</b><br>Carry out running of taps for agreed outlets as part of daily cleaning routine. | <b>Yes</b><br>Carry out running of taps for agreed outlets as part of daily cleaning routine. | <b>Yes</b><br>Twice Weekly – General (within areas of responsibility e.g. common areas, DSR etc.) |
| <b>Local Managers (including non-clinical Managers)</b> |  | <b>Yes</b><br>Ensure Estates are informed to arrange flushing or repair | <b>Yes</b><br>Ensure Estates are informed discuss/arrange additional flushing |  |  |   |   | <b>Yes</b><br>Twice Weekly - General  | <b>Yes</b><br>Daily flushing – High Risk<br>Twice Weekly - General                                |

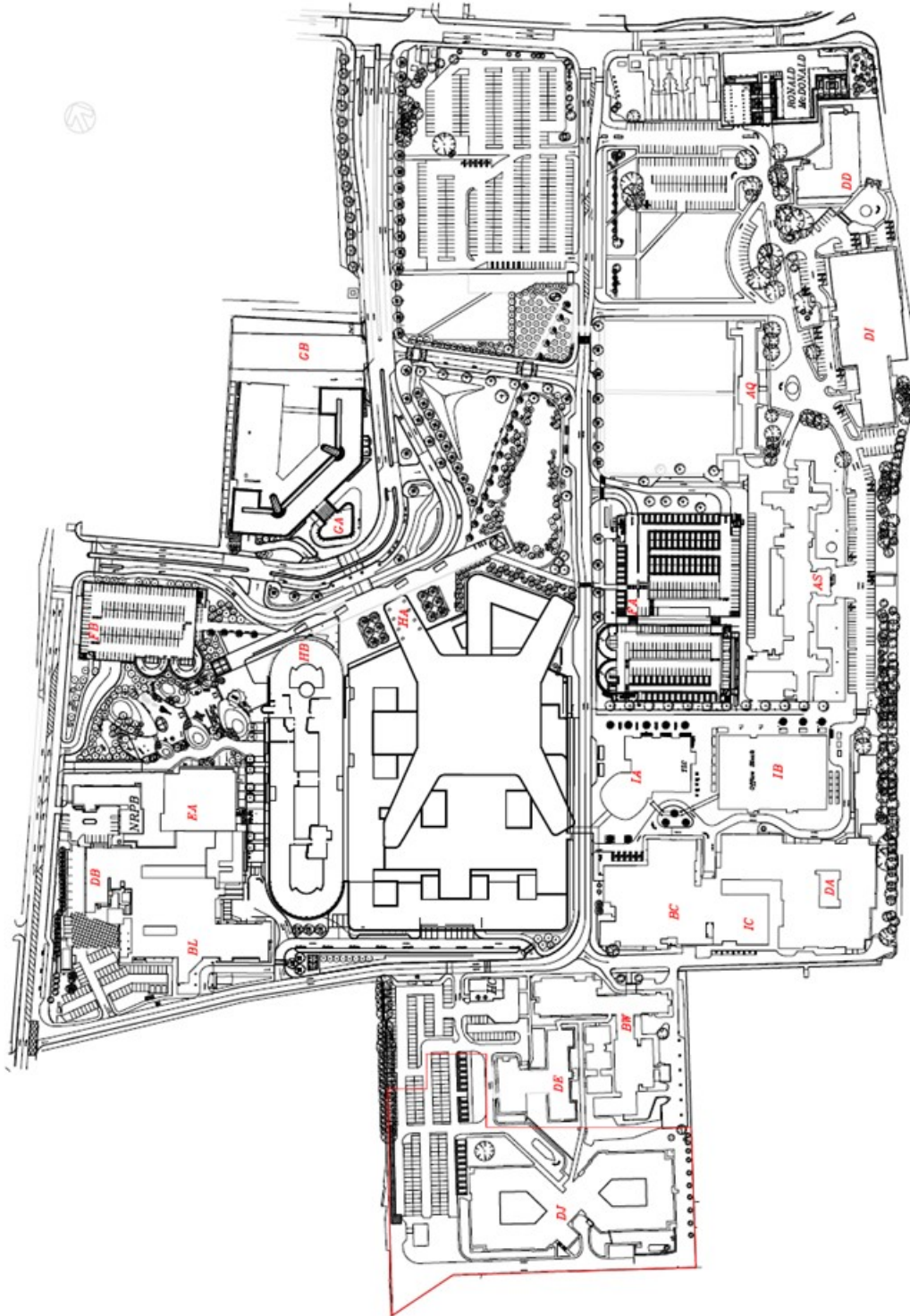
# Water Flushing Process SHTM 04-01





# Appendix 1

## Site Plan with Block Codes



Queen Elizabeth University Hospital

## Appendix 2

Procedures in the event of out of specification sample for Legionella, Pseudomonas and other monitored bacteria, fungi, moulds, yeasts etc.

There is an agreed sampling protocol at the QEUH and guideline in absence of extant guidelines. Sampling is carried out until 3 not detected for out of specs. Actions are recorder as incidents.

1. A spreadsheet is sent to the NHS from the Water Service Provider (**WSP**) highlighting all of the results and any out of spec results. This will be sent as soon as practicable on discovery of out of spec results. In the event of any serious issues the **WSP** would make contact with the Lead Authorised Person (**LAP**) immediately on any serious issues e.g. LP1.
2. A **Microbiologist** at GRI Labs or other Labs should also contact the **LAP** immediately based on any serious issues e.g. Legionella LP1 / Pseudomonas in high risk areas and agree to take immediate action e.g. outlet out of use. **Microbiologist** will also discuss with **Infection Control** on whether patients should be moved and outlets put out of use.
3. If any results are found to be out of spec an SHTM Compliant Incident Report form (004) **Appendix 1** is completed and recorded on the Incident Log by the **LAP**. The incident report lists the issue (work request number) and on completion is signed off by the allocated resource and **LAP**.
4. The **LAP** will then extract the information to the out of spec summary spreadsheet which list the same information from the analysis from the **WSP** however also lists all actions taken and history of that specific outlet.
5. The Water Competent Person (**CP**) allocated the work request will investigate engineering control and rectify where appropriate. This may also include disinfection and full maintenance of outlets, identification and removal of any dead legs and complete the job on their PDA. The **LAP** will then update the out of spec summary sheet with any actions and date that the work request was completed.
6. In specific circumstances the **LAP** may discuss with :-
  - a. **Infection Control**, regarding operating protocols and including but not limited to the cleaning and flushing regime or adding to the Wards INFREQUENTLY USED outlet and flushing regime and to review with Wards.
  - b. **Facilities** to review cleaning and flushing regimes.
  - c. **Microbiology** to review any other any necessary actions.
7. Additionally in some cases the **LAP** may request the approved **CP** or **WSP** to add additional flushing.
8. Monthly minuted meetings are also carried out by Estates and Microbiology to review out of spec, discuss actions, risks and which may also visits to areas.

### Resampling

1. When out of spec results are identified, **CP** or **WSP** will carry out sampling of that outlet until a minimum of 3 not detected are obtained.
2. After further re-sampling additional information will be added to the out of spec summary and on receiving a 'not detected' or 'within parameters' result the record will be moved to the second tab on the spreadsheet which lists all previous 'not detected/within parameters' results.
3. If however further results are found to be out of spec the record is extracted and placed in the 'out of spec' tab.
4. Guidance also indicates that legionella samples <100 cfu/L **must** be investigated and resampled.
5. The spreadsheet is then uploaded to a team folder regularly for access by Estates Management, Infection Control and Microbiology. However a short summary of current out of specs should be sent regularly by the **LAP** summarising current out of specs.
6. Results are presented in a form of report to the Water Safety Group and through appropriate governance (Sector Facilities/Infection Control Group Meetings).

### Out of Specification on Point of use filters

1. When out of spec results are identified on Point of use filters, **WSP** will automatically change the filters and re-sample as above.

### Various work to be carried out

These can include but are not limited to (and will depend on analysis by the AP and in some cases together with Microbiology) to

#### Clinical

- Use of outlet and flushing – Clinical by Infection Control.

#### Facilities Domestics

- Cleaning and flushing – Facilities Domestics.

#### Engineering

- Check temperature of mains of hot water flow/return and cold temperature.
- Check for deadlegs and remove

Table below indicates sampling type and permissible sample result

| Type             | Permissible sample result |
|------------------|---------------------------|
| TVC@37°C         | Cfu/ml                    |
| TVC@22°C         | Cfu/ml                    |
| Coliform         | Cfu/100ml                 |
| E.coli           | Cfu/100ml                 |
| Legionella cfu/L | Cfu/l                     |
| Pseudomonas      | Cfu/100ml                 |
| SAB@30c          | Cfu/ml                    |
| Mould@25c        | Cfu/ml                    |
| SAB@22c          | Cfu/ml                    |
| Yeast@25c        | Cfu/ml                    |
| Cuprivadis       | Cfu/100ml                 |
| AMS              | Cfu/100ml                 |
| GNB              | Cfu/100ml                 |

### Water Sampling Out of specification definition

Water supplied by Scottish Water to must meet the wholesomeness standards outlined in The Public Water Supplies (Scotland) Regulations 20141.

Water must not contain :-

- (i) Any micro-organism,
- (ii) Any substance, or
- (iii) Any parasite at a concentration or value which would (whether in conjunction with another parameter in the water or otherwise) constitute a potential danger to human health'

Public water supplies undergo routine testing for total viable counts at 22 and 37°C, which give an indication of overall microbial load but do not have pre-defined thresholds that must be met.

However supplied water has more specific tests carried out to indicate faecal contamination :-

- Coliforms
- Escherichia coli
- Clostridium perfringens

These tests have strict thresholds (zero counts per 100ml) that must be met for the water to be considered wholesome.

Taking this into consideration Microbiology and Operational Estates agreed the following definitions for water monitoring at the QEUH and this is reflected on the sample results to highlight out of specs.

| Type        | Permissible sample result  | Comment  |
|-------------|--|--|
| TVC@37c     | Acceptable levels out with high risk areas are < 100 Cfu/ml:                                   | If levels are >100 CFU/ml, lab should identify the recurring bacteria. In the event of patient infections with suspected links to water ICD may request identification at levels <100 CFU/ml.  |
| TVC@37c     | In high risk areas as defined by NHSGGC Pseudomonas risk assessment TVCs should be <10 Cfu /ml | If >10 CFU/ml Lab should identify the recurring bacteria. In the event of patient infections with suspected links to water ICD may request identification at levels <10 CFU/ml via PAG/IMT.  |
| TVC @ 22°C  | Acceptable levels out with high risk areas are < 100 Cfu /ml:                                  | If levels are >100 CFU/ml, lab should identify the recurring bacteria. In the event of patient infections with suspected links to water ICD may request identification at levels <100 CFU/ml.  |
| TVC @ 22°C  | In high risk areas as defined by NHSGGC Pseudomonas risk assessment TVCs should be <10 Cfu /ml | If >10 CFU/ml Lab should identify the recurring bacteria. In the event of patient infections with suspected links to water ICD may request identification at levels <10 CFU/ml via PAG/IMT.  |
| Coliform    | Zero Cfu /100ml  | As per Scottish Water Guidance   |
| E.coli      | Zero Cfu /100ml  | As per Scottish Water Guidance   |
| Legionella  | <50 Cfu /l   | Any legionella positives as an out of spec from all serogroups (1 – Pneumophila) and (2-14 – Other) regardless of CFU.   |
| Pseudomonas | < 10 Cfu /100ml in general areas   | As per Pseudomonas Guidance  |
| Pseudomonas | Zero Cfu/100ml in Augmented care   | Bone Marrow Transplant Units, Haemato-Oncology and Neonatal Units, and any other care areas where patients are severely immunosuppressed through disease or treatment. Critical and intensive care units (neonatal, paediatric and adult), renal units, and respiratory units (including Cystic Fibrosis patient care units). Burns units and other care areas where patients have extensive breaches in their dermal integrity. |
| SAB@30c     | <10 Cfu/100ml  | Treated as an out of spec in the absence of any National guidance.   |
| Mould@25c   | <10 Cfu/100ml  | Treated as an out of spec in the absence of any National guidance.   |
| SAB@22c     | <10Cfu/100ml   | Treated as an out of spec in the absence of any National guidance.   |
| Yeast@25c   | <10 Cfu/100ml  | Treated as an out of spec in the absence of any National guidance.   |
| Cuprivadis  | Zero Cfu/100ml   | Treated as an out of spec in the absence of any National guidance.   |
| AMS         | Zero Cfu/100ml   | Any found in any area are treated as an out of spec in the absence of any National guidance.   |
| GNB         | Zero Cfu/100ml   | Any found in any area are treated as an out of spec in the absence of any National guidance.   |

| Site | Area  | Frequency | Number of samples  | Processing Site | Analysis  | Water Service Provider (WSP) | Distribution List for results                               |
|------|---|-----------|--|-----------------|---|------------------------------|---|
| RHC  | Ward 1D PICU  | Weekly    | <i>¼ of outlets sampled weekly on rotational basis<br/>Approximately 12 Samples</i>  | GRI             | Potable, Pseudomonas, GNB AMS on ¼ of samples each month (rotating) Water Temperature & CLO2 level. | DMA                          | Operational Estates<br>Medicine Diagnostics<br>Microbiology |
| RHC  | Hydrotherapy Pool   | Weekly    | <i>1 Sample weekly. Pool sampled daily for chlorine, temperature and pH</i>  | GRI             | <b>Pool Water</b> - TVC, E-Coli, Coliform, Pseudomonas, Temperature, PH, Free Chlorine              | Physio-therapist             | Physiotherapists  |
| QEUH | <b>Critical Care Areas</b><br>(Adults 1 <sup>st</sup> HDU, CCW, 4A, 4B, 4C, 4D, 7A, 7D) | Monthly   | <i>Approximately 74 Samples</i>  | GRI             | Legionella, TVC, E-Coli, Coliform, Pseudomonas Water Temperature, CLO2 level.                       | DMA                          | Operational Estates<br>Medicine Diagnostics<br>Microbiology |
| QEUH | A&C CWSTs & Filter Units  | Monthly   | <i>Samples taken from Dips &amp; Drains from 4 off raw tanks, 3 Filtration units x 3 sample points and 4 off bulk filtrate tank Dips and Drains<br/>Approximately 38 Samples</i> | GRI             | Legionella, TVC, E-Coli, Coliform, Pseudomonas GNB SAB, Temperature, CL02                           | DMA                          | Operational Estates<br>Medicine Diagnostics<br>Microbiology |

| Site     | Area   | Frequency | Number of samples  | Processing Site | Analysis  | Water Service Provider (WSP) | Distribution List for results                               |
|----------|--|-----------|--|-----------------|---|------------------------------|---|
| QEUH/RHC | Sentinel Outlets (Basement, Adult Ground Floor A&E, OPD, Acute 1 <sup>st</sup> Floor Critical Care, 2 <sup>nd</sup> Floor Theatres, 2 <sup>nd</sup> Floor Endoscopy, 2 <sup>nd</sup> Floor Medical Physics, 5A,5B,5C,5D, 6C, 8A, 8B, 8D, 9C, 11A, 11B,11C,11D. RHC Ground Floor Concourse, CDU, Theatres, 1C,1E, 2C,3A,3B,3C,3D) | Monthly   | <i>Approximately 142 Samples</i>   | Intertek        | Legionella, TVC, E-Coli, Coliform, Pseudomonas, SAB Water Temperature (for CL02) & CLO2 level.                    | DMA                          | Operational Estates<br>Medicine Diagnostics<br>Microbiology |
| RHC      | Clinic 1 & 2 RHC   | Monthly   | <i>Approximately 50 Samples</i>  | GRI             | Legionella, TVC, E-Coli, Coliform, Pseudomonas, GNB, SAB, AMS Water Temperature (for CL02) & CLO2 level.          | DMA                          | Operational Estates<br>Medicine Diagnostics<br>Microbiology |
| RHC      | Ward 2A & 2B   | Weekly    | ¼ of outlets sampled weekly on rotational basis <i>Approximately 140 Samples</i> | GRI             | TVC, E-Coli, Coliform, Pseudomonas, GNB AMS on ¼ of samples each month (rotating) Water Temperature & CLO2 level. | DMA                          | Operational Estates<br>Medicine Diagnostics<br>Microbiology |
| QEUH     | Neurosurgery   | Quarterly | <i>Approximately 40 Legionella &amp; 10 Potable Samples</i>                      | GRI             | Legionella, TVC, E-Coli, Coliform, temperature, CLO2 level.   | DMA                          | Operational Estates<br>Medicine Diagnostics<br>Microbiology |
| QEUH     | Neurosurgery   | 6 Monthly | <i>Approximately 8 Pseudomonas Samples</i>                                       | GRI             | Pseudomonas, temperature, CLO2 level.   | DMA                          | Operational Estates<br>Medicine Diagnostics<br>Microbiology |

| Site | Area                      | Frequency | Permissible sample result                                   | Processing Site | Analysis   | Water Service Provider (WSP) | Distribution List for results                               |
|------|---------------------------|-----------|---|-----------------|--|------------------------------|---|
| QEUH | Neurology                 | Quarterly | <i>Approximately 20 Legionella &amp; 6 Potable Samples</i>  | GRI             | Legionella, TVC, E-Coli, Coliform, temperature, CLO2 level.        | DMA                          | Operational Estates<br>Medicine Diagnostics<br>Microbiology |
| QEUH | Maternity                 | Quarterly | <i>Approximately 40 Legionella &amp; 10 Potable Samples</i> | GRI             | Legionella, TVC, E-Coli, Coliform, temperature, CLO2 level.        | DMA                          | Operational Estates<br>Medicine Diagnostics<br>Microbiology |
| QEUH | Neo-Natal (New Maternity) | Quarterly | <i>Approximately 22 Legionella &amp; 8 Potable Samples</i>  | GRI             | Legionella TVC, E-Coli, Coliform, temperature & Pseudomonas        | DMA                          | Operational Estates<br>Medicine Diagnostics<br>Microbiology |
| QEUH | PDRU                      | Quarterly | <i>Approximately 12 Legionella &amp; 6 Potable Samples</i>  | GRI             | Legionella TVC, E-Coli, Coliform, temperature                      | DMA                          | Operational Estates<br>Medicine Diagnostics<br>Microbiology |
| QEUH | Spinal                    | Quarterly | <i>Approximately 20 Legionella &amp; 8 Potable Samples</i>  | GRI             | Legionella, TVC, E-Coli, Coliform, temperature                     | DMA                          | Operational Estates<br>Medicine Diagnostics<br>Microbiology |
| QEUH | Spinal                    | 6 Monthly | <i>Approximately 8 Pseudomonas Samples</i>                  | GRI             | Pseudomonas, temperature.  | DMA                          | Operational Estates<br>Medicine Diagnostics<br>Microbiology |
| QEUH | Spinal Hydrotherapy Pool  | Weekly    | <i>1 Potable Sample and 1 Pseudomonas</i>                   | GRI             | TVC, E-Coli, Coliform, Pseudomonas, Temperature, PH, Free Chlorine | DMA                          | Operational Estates<br>Medicine Diagnostics<br>Microbiology |
| QEUH | Westmarc                  | Quarterly | <i>Approximately 12 Legionella &amp; 6 Potable Samples</i>  | GRI             | Legionella, TVC, E-Coli, Coliform, temperature                     | DMA                          | Operational Estates<br>Medicine Diagnostics<br>Microbiology |

| Site  | Area                  | Frequency | Permissible sample result  | Processing Site | Analysis  | Water Service Provider (WSP) | Distribution List for results                               |
|-------|-----------------------|-----------|--|-----------------|---|------------------------------|---|
| QEUEH | Podiatry              | Quarterly | <i>Approximately 10 Legionella &amp; 6 Potable Samples</i>   | GRI             | Legionella, TVC, E-Coli, Coliform, temperature              | DMA                          | Operational Estates<br>Medicine Diagnostics<br>Microbiology |
| QEUEH | ICE Building          | Quarterly | <i>Approximately 79 Legionella &amp; 7 Potable Samples</i>   | GRI             | Legionella, TVC, E-Coli, Coliform, temperature, CL02 level. | DMA                          | Operational Estates<br>Medicine Diagnostics<br>Microbiology |
| QEUEH | Office Block          | Quarterly | <i>Approximately 15 Legionella &amp; 7 Potable Samples</i>   | GRI             | Legionella, TVC, E-Coli, Coliform, temperature              | DMA                          | Operational Estates<br>Medicine Diagnostics<br>Microbiology |
| QEUEH | Teaching and Learning | Quarterly | <i>Approximately 19 Legionella &amp; 6 Potable Samples</i>   | GRI             | Legionella, TVC, E-Coli, Coliform, temperature              | DMA                          | Operational Estates<br>Medicine Diagnostics<br>Microbiology |
| QEUEH | NICU                  | Monthly   | <i>Approximately 4 Legionella, 4 Pseudomonas &amp; 4 Potable Samples from Belfast sinks (pre POU filter)</i> | GRI             | Legionella, Potable, Pseudomonas, Water temperature         | DMA                          | Operational Estates<br>Medicine Diagnostics<br>Microbiology |
| QEUEH | CMB                   | Quarterly | <i>Approximately 10 Legionella &amp; 2 Potable Samples</i>   | GRI             | Legionella, Potable, Water temperature                      | DMA                          | Operational Estates<br>Medicine Diagnostics<br>Microbiology |
| QEUEH | MIU                   | Quarterly | <i>Approximately 8 Legionella, 8 Pseudomonas &amp; 8 Potable Samples</i>                                     | GRI             | Legionella, Potable, Pseudomonas, Water temperature         | DMA                          | Operational Estates<br>Medicine Diagnostics<br>Microbiology |



## Appendix 3

### Risk Assessment Review Guidance

#### Summary of L8 Management Tasks Required for L8 and SHTM 04-01 Compliance

|  | Guidance Documents               | Allocated to |
|--|----------------------------------|--------------|
| <b>Regular</b> check to ensure that legislation and guidance has not changed   | L8<br>HSG 274 Pt 2<br>SHTM 04-01 |              |
| <b>Regular</b> review of all policies relating to legionella control (e.g. Maintenance, Water Treatment, Water Management, Energy) to ensure still valid and correct   | L8<br>HSG 274 Pt 2<br>SHTM 04-01 |              |
| <b>Regular</b> review of L8 Management Structure to ensure up-to-date and accurate   | L8<br>HSG 274 Pt 2<br>SHTM 04-01 |              |
| <b>Regular</b> review of communication lines to ensure still accurate and correct  | L8<br>HSG 274 Pt 2<br>SHTM 04-01 |              |
| <b>Regular</b> review of escalation & emergency procedures to ensure still valid and correct   | L8<br>HSG 274 Pt 2<br>SHTM 04-01 |              |
| <b>Regular</b> review of duties allocated to site staff and ensure accurate and recorded   | L8<br>HSG 274 Pt 2<br>SHTM 04-01 |              |
| <b>Regular</b> review of duties of sub-contractors and ensure accurate and recorded and contractors are suitably qualified/competent for tasks assigned to them (e.g. Water Hygiene contractors should be LCA Approved, Plumbing contractors should be SNIPEF and Water Safe Registered) | L8<br>HSG 274 Pt 2<br>SHTM 04-01 |              |
| <b>Regular</b> review of staff training requirements and update training matrix  | L8<br>HSG 274 Pt 2<br>SHTM 04-01 |              |
| <b>Regular</b> review of method statements and risk assessments to ensure still valid and correct  | L8<br>HSG 274 Pt 2<br>SHTM 04-01 |              |
| <b>Regular</b> review of site documentation to ensure all records up to date and present   | L8<br>HSG 274 Pt 2<br>SHTM 04-01 |              |
| <b>Regular</b> update of "Patient Risk Rating" register for all areas of hospital.   | SHTM 04-01<br>Part B             |              |
| <b>Regular</b> review of sentinel outlet locations register.   | SHTM 04-01<br>Part B             |              |
| <b>Regular</b> review of primary, sub-ordinate and tertiary hot flow and return loops to reflect any system alterations.   | HSG 274 Pt 2                     |              |
| <b>Regular</b> review of plant and equipment maintenance schedules.  | Manufacturer's<br>Instructions   |              |
| <b>Regular</b> review of BEMS temperature sensor locations to reflect any system alterations   | HSG 274 Pt 2                     |              |
| <b>Regular</b> review of schematic/as-fitted drawings to ensure up-to-date and accurate  | L8<br>HSG 274 Pt 2<br>SHTM 04-01 |              |
| <b>Regular</b> review of L8 risk assessment with a maximum period of two years between updates.<br>(e.g. if change of use or changes in legislation or any other factor which could affect validity of current assessment)   | L8<br>SHTM 04-01                 |              |

## Appendix 4

### HAISCRIBE Risk Assessments

All relevant HAISCRIBE risk assessments produced and approved for Water Systems related tasks are stored on the QEUH Shared Drive within the folder path “

HAI SCRIBE

6 Southill Business Park, Cornbury Park  
 Charlbury, Oxfordshire, OX7 3EW  
 office@waterhygienecentre.com  
 www.waterhygienecentre.com  
 01993 840400

|                      |  |                             |                             |
|----------------------|--|-----------------------------|-----------------------------|
| <b>Report Title:</b> | <b><u>ASSURANCE APPRAISAL ON WATER SAFETY MANAGEMENT AT QEUH</u></b> |                             |                             |
| <b>Auditor:</b>      | Daniel Pitcher   | <b>Client Contact:</b>      | Prof. Tom Steele            |
| <b>Organisation:</b> | Water Hygiene Centre   | <b>Client Organisation:</b> | NHS Greater Glasgow & Clyde |
| <b>Audit Date:</b>   | 25 & 26 April, 14 to 16 May 2024                                     | <b>Report Issue Date:</b>   | 24 May 20204                |

**Regional Offices:** Nottingham

**Registered Office:** 3 The Old Estate Yard, High Street, East Hendred, OX12 8JY

**Company Number:** 6813146 **VAT No:** 948 3743 82

**Directors:** D.F. Pitcher BSc (Hons) CMIOSH, FIHEEM, J.A. Leach, P. Tyson BSc (Hons)



| <b>ASSURANCE APPRAISAL ON WATER SAFETY MANAGEMENT AT QUEH</b>  |                             |
|--|-----------------------------|
| <b>Dates:</b>  | <b>Report Issue Date:</b>   |
| 25 & 26 April, 14 to 16 May 2024   | 24 May 20204                |
| <b>Author:</b>   | <b>Organisation:</b>        |
| Daniel Pitcher   | Water Hygiene Centre        |
| <b>Client Contact:</b>   | <b>Client Organisation:</b> |
| Prof. Tom Steele   | NHS Greater Glasgow & Clyde |
| <b>Interviewees:</b>   | <b>Client Organisation:</b> |
| Kerr Clarkson  | NHS Greater Glasgow & Clyde |
| Matthew Feeney   | NHS Greater Glasgow & Clyde |
| <b>Methodology:</b>  |                             |
| <p>The author requested copies of all water safety management documentation for QUEH i.e. Water Safety Plans, Writtens Schemes of Control and Risk Assessments. These documents are the basis for a desk based review of the current written arrangements.</p> <p>A site visit was completed with the support of Kerr Clarkson to review the planned maintenance arrangements on the CAFM and the associated record keeping.</p> <p>The evidence provided through out the assurance appraisal was reviewed against the enclosed checklists which in turn in based on published guidance relating to water safety. Where improvements were observed by the author a it was RAG rated [as detailed on the 'assurance statement' and then recommendation written to help improve water safety management.</p> |                             |
| Inspections of Records and Documents - detailed in the audit report  |                             |
| Interviews of Relevant Personnel - detailed above  |                             |
| Site / System Inspections - detailed in the audit report [where applicable]  |                             |
| <b>Audit Scope:</b>  |                             |
| "Water Safety" in this context means microbiological water quality and scalding risk from domestic water systems.  |                             |
| <b>Audit Objective:</b>  |                             |
| <p>To review adequacy of the current management arrangements against the requirements of the technical guidance documents:</p> <p>HSG274 Part 1 "Legionnaires' Disease. The Control of Legionella Bacteria in evaporative cooling systems" (2013)*</p> <p>HSG274 Part 2 - "Legionnaires' Disease. The Control of Legionella Bacteria in Hot &amp; Cold Water Systems" (2014) - Appendix 2.2 Legionella Written Control Scheme.</p> <p>SHTM04:01 and HTM04:01</p>   |                             |
| <b>Nature of Auditing - Caveats:</b>   |                             |
| <p>Auditing is a sampling process, in the sense that it does not attempt to examine every aspect of the management of water safety risks. It necessarily cannot identify all of the hazards and/or deficiencies which might exist across all sites or within the buildings. It is up to those persons who have responsibility for the various aspects of the management system to identify and eliminate/control the deficiencies/hazards which may exist.</p>   |                             |
| <p>Although conducted in a positive spirit, audit necessarily focuses on the shortcomings of the management system, rather than its examples of good practice. It highlights deficiencies in order to facilitate the improvement process.</p>  |                             |
| <i>NB: This report is designed to be printed in A4 landscape.</i>  |                             |

**EXECUTIVE SUMMARY**

**OPENING COMMENTARY:**

There is a very engaged culture for Water Safety within QUEH. **Move from bottom of document - Overall assurance on water safety is fair to good**, there are opportunities for improvement which will help provide a more efficient approach to water management. As part of this appraisal time was spent **Change with the Site Manager Operational Estates and Compliance Manager** who assisted with evidencing documents and data, time was also spent with other members of the estates team, it was very obvious this team have an appetite and willingness to delivery excellent water safety management for the QUEH. This positive culture is often lacking from organisations.

The appraisal focused on four key areas of waters safety [see below] as they are keystones in a Water Safety Plan.

Governance arrangements are detailed in the Policy document and the control measures for QUEH are detailed in the Written Scheme of Control document. These documents have been developed over the years, it obvious their initial focus when first drafted is 'legionella'. In the last eight years things have moved on from 'legionella' and the term 'water safety' is now used. This development over time across the Policy & Written Scheme of Control documents has created a blurring of their focus with terms such as 'legionella and other pathogens' or 'legionella and pseudomonas'. The appraisers review of these documents recorded 130 comments for the policy and 289 comments for the written scheme of control. There is currently no Water Safety Plan [WSP] for the Board although, the Policy and Written Scheme of Control documents are essential existing components of a WSP, it was noted there is development work for a WSP within the Partnerships sector, which will spread Board wide.

A well prepared Water Safety Plan following BS8680 will include a 'water hazards' analysis matrix for biological, physical, chemical and radiological water hazards. Despite the lack of this matrix some risk have been assessed, there are risk assessments for *legionella* and *Pseudomonas aeruginosa* which are routinely reviewed and updated.

*Legionella* risk assessments for QUEH A&C were complete in 2023. This risk assessment was undertaken by the incumbent contractor. These reports are very detailed in their recommendations from system inspections [which should be applauded]. The report does not appear to include an assessment of management arrangements, with limited assessment of monitoring arrangements\*\*. There are categories of risk applied to the cold water tanks although no category of risk applied to the hot water generators. The report details one cold water tanks as a 'high risk' coupled with 180 approx. recommendations yet the overall category of risk for A&C is 'low'. The report does not include an explanation of their risk scoring applied. The Written Scheme of Control for QUEH details risk assessments to follow the requirements of BS8580 part 1 2020, although the 2023 risk assessment does not actually reach this standard. It should be noted, when reviewing another contractor's legionella risk assessment for another NHS property this report did align with the requirements of BS8580 part 1 2020.

\*\*the same contractor who completed the risk assessments for QUEH also provides monitoring services and remedial works i.e. tank cleaning for the QUEH, there is a lack of impartiality and independence with this arrangement.

*Pseudomonas aeruginosa* risk assessments were completed in 2024, is the clinical assessment identifying this pathogen as a water hazard within the QUEH and the areas where patient groups most susceptible / at highest risk of infection are located. There is no specific *Pseudomonas aeruginosa* risk assessment for these identified areas, such a risk assessment needs to comply BS8580 part 2 2022.

An example of a 'physical' water hazard would be scalding. Despite the lack of a scald risk assessment for QUEH, outlets are protected with TMTs / TMVs. Although, change can occur with rooms and their use, as such outlet use and need may have changed i.e. Outlets in rooms may or may not require TMTs / TMVs as a result of the change.

Records exist in several locations and formats. As part of the appraisal process several key documents were requested, these were shared and reviewed. Working with Kerr and Matthew through the appraisal it came to light that there were more recent versions for some documents or further supporting documents available - which was great supporting evidence! Albeit these versions / documents were held in various other locations [sources identified: Teams Water Channels / Smartsheet's / SCART sheet / Estates shared drive / local PCs]. An abundance of records held in to many locations. A side to the assurance appraisal there was discussions on how a water management document library might look / be structured... By the end of the appraisal process a structure had been defined, established on Teams and records relocated accordingly. Demonstration of the willingness and appetite for excellent water management.

Monitoring & maintenance is completed by a blend of NHS property estates staff or contractors. These tasks are driven from two sources FM First and Contractors QUEH Planner V8 2024. Not all of the assets are on FM First i.e. cold-water tanks, hence the existence of the Contractors Planner. Monitoring tasks are issued via a PDA [at best the PDA is a scheduling tool] although the task detail and findings are captured on paper records, which are scanned and saved on to the Teams Channel. Suffice to say there is a 'huge' volume of monitoring records - 1000s of sheets of paper now documents which are named with a date and area. These records need to be reviewed manually to provide assurance on water system performance as well as identify any issues / problems for fixing as well as confirming water system performance is compliant for Water Safety Groups. It was identified some task frequencies are excessive i.e. cold-water tank inspections, guidance [HSG274 part 2] details an annual inspection, albeit cold-water tank inspections are completed quarterly which exceeds guidance requirements. A defined document system and an automated / electronic monitoring system for data capture will provide greater transparency and efficient data recall / review.

With thanks to **Change** with the Site Manager Operational Estates and Compliance Manager for their time and input to assist with this assurance appraisal.

| ASSURANCE APPRAISAL ELEMENTS    | ASSURANCE RATING & SUMMARY  |
|---------------------------------|---|
| Part 1: Governance Arrangements | Partially assured:<br>- Policy: Very detailed, at times to detailed with duplication. |

| <b>EXECUTIVE SUMMARY</b>  |  |  |
|---|--|--|
| Part 2: Risk Assessment / Risk Minimisation Scheme / Schematics   | Not assured:<br>- Legionella risk assessments and Pseudomonas aeruginosa risk assessments exist albeit improved standards of risk assessment required.<br>- Water Hazards matrix is not defined as other water hazards not know.   |  |
| Part 3: Control Measures & Support Schemes  | Partially assured:<br>- Written Schemes of Control exist. Very detailed, at times to detailed with duplication   |  |
| Part 4: Records: Management & Operational Performance   | Partially assured - [but not for lack of records!]:<br><br>1) Continued refinement of records in to the agreed water management file structure on Teams Channel.<br><br>2) Monitoring records are paper based, for NHSGGC estates task the records are filed in folders and for contractors the paper records are scanned and saved to various folders on Teams. With considerable effort it was possible to start piece together a picture of water system performance i.e. task / records / quality of data. There is no easy or efficient way to generate performance reports for water systems to share at Water Safety Groups i.e. a quarterly performance report on water system to provide assurance.<br><br>3) PPM Tasks: Two source FM First and Contractors Delivery Spreadsheet. FM First only details the task and frequency, this is issued on PDA to NHSGGC CPs, who compete the task on paperwork and close down the task on FM First. Not all risk systems are on FM First such as tanks. Reporting at Water Safety Groups on the number of PPMs completed is not the correct assurance data as this not assurance on water system performance. For Contractors who complete monitoring work there is a Contracts Delivery Spreadsheet that details the tasks and frequency and what is required, paper records generated for the task and scanned and saved to Teams. |  |
| <b>+ Assured</b>  | <b>+/- Partially Assured</b>   | <b>- Not Assured</b>   |
| Management system element is in place and is effective.   | Management system element is in place, is working although improvements exist.   | Management system element is missing or is ineffective. Immediate efforts needed to establish / correct element. |
| <b>Executive Recommendations:</b><br><br>1) Prepare a Water Safety Plan [aligned with BS8680] – many elements of a Water Safety Plan exist within current policy / written scheme documents, albeit these documents need to be refined and updated. A WSP gap analysis matrix to be developed to help steer what needs to be prepared taking existing documents and identifying where new documents are needed. [It is noted that within the Partnership Sector the development of a WSP has commenced and has been a topic of discussion as part of this appraisal process and will be raised at the next Board Water Safety Group]. <b>Suggested Deadline:3-6 months</b><br><br>2) Risk assessments to reviewed and updated – the need to define a water hazards matrix to identify what water hazards need to be risk assessed. Those risk assessments to be suitable and sufficient i.e. following appropriate guidance and standards [i.e. BS8580 parts 1 and part 2] and completed by competent persons i.e. at times more than one person is needed to complete a risk assessment. <b>Suggested Deadline: within 3-6 months</b><br><br>3) Records Management improvement – a document map prepared, structure to be adhered to so there is only one agreed location for the records to be kept. Continued migration of records into this file structure. <b>Suggested Deadline: within 1 months</b><br><br>4) Deploy electronic data capture system for water system performance monitoring – each risk system and asset to be identified on a new electronic data capture system with monitoring data captured against each asset. This will provide real time reporting on out of specification systems as well as generate compliance reports on water system performance to provide assurance to Water Safety Groups. [It is noted that discussions on possible providers / solutions are progressing with one company being identified as a firm favourite]. <b>Suggested Deadline:12 months</b><br><br>Over the following sheets there are more detailed recommendations that will help shape these Executive Recommendations. |  |  |
| <i>NB: This report is designed to be printed in A4 landscape.</i>   |  |  |

**Part 1: Governance Arrangements**

DATE APPRAISED: 24/05/2024      CONSULTANT: Daniel Pitcher      CLIENT CONTACT / INTERVIEWEES: Kerr Clarkson

**Observations / Notes:**  
As part of the appraisal process the Policy [Water Systems Safety Policy V4 Final] and Written Scheme of Control [Written Scheme QUEH CAMPUS-2024 Rev I Final] was reviewed.

The consultant is broadly assured on defined management processes relating to water safety, although, there needs to be improvements in defined process to provide greater clarity and less confusion. The recommendations below represent improvements coupled with the 130x observations / feedback notes detailed in GGCAU40936C01 - assurance appraisal review comments on Policy 20240425 will help with that distilled clarity needed in the Policy.

| Ref | SCART ref | Aspect  | Relevant Document / Record  | Observation / Detail  | Recommendation   | Status Update   | Who  | Proposed Completion                    | Complete |
|-----|-----------|---|---|---|--|---|--|--|----------|
| 1.0 |           | Has a Water Safety Plan [WSP] been defined?   | Water Systems Safety Policy V4 Final  | 1) There is no reference to a WSP in the Policy.<br>2) There is reference to Written Schemes / Procedures / Operational Procedures / SOPs - although clarity on these documents titles.<br>3) It is recognised these existing documents will feature as part of a WSP.  | R1.01_ Complete a GAP analysis for a WSP using BS8680 GAP analysis tool.<br>R1.02_ Establish a WSP structure and review existing documents and start to align these the WSP sections - including appropriate naming / referencing.<br>R1.03_ Where there are GAPS in the WSP content the WSG should assign to a member of the group to develop and share the content for WSG approval.                                   | Compliance to arrange GAP analysis<br>Completed added to teams folder<br>Compliance to arrange GAP analysis   | A.Gallacher / M Feeney<br>K.Clarkson<br>A.Gallacher / M Feeney | 29/05/2024                             |          |
| 1.1 | 17        | Does the Water Safety Plan section on Governance Arrangements define a scope and purpose?<br>Is it current and up to date?  | Water Systems Safety Policy V4 Final  | 1_The Policy lacks 'scope' & 'purpose' these are key terms and criteria detailed in HSG274 part 2 in the preparation of management documentation.<br>2) The Policy does include Application - this could be taken to mean 'scope'. Application broadly outlines water systems across the NHSGGC estate.<br>3) The Policy does include Objective - this could be taken to mean 'purpose'. Objective references risk from waterborne pathogens.   | R1.04_ Update Policy using 'Scope' to replace 'application'.<br>R1.05_ Update Policy using 'purpose' to replace 'objective'.<br>R1.06_ Update Objective to include 'water safety hazards' and replace 'waterborne pathogens'. Additional detail needs to be included on who is being protected i.e. patients, staff, visitors, contractors etc.  | Completed<br>Completed<br>Completed   | K.Clarkson<br>K.Clarkson<br>K.Clarkson                         | 29/05/2024<br>29/05/2024<br>29/05/2024 |          |
| 1.2 | 6 / 67    | Roles & responsibilities defined for all involved in the control regime?<br>Have these been reviewed within the last 3 years?   | Water Systems Safety Policy V4 Final  | 1) Appendix 2 outlines 'roles and responsibilities'.<br>2) There are 14x roles outlined:<br>- Chief Executive<br>- Board Corporate Management Team<br>- Director of Estates & Facilities<br>- Infection Control Director<br>- Assistant Director of Operational Estates<br>- Head of Corporate Estates<br>- Assistant Head of Operation Estates<br>- Authorising Engineer Water<br>- Assistant Director of Infrastructure, Planning, Delivery / Head of Capital Projects<br>- Site Manager Operational Estates<br>- Acute Services Directors / HSCP Directors / Corporate Division Directors<br>- Heads of Services / Dept. Managers / Clinical Managers / SCN<br>- Technical Lead Projects<br>- Authorised Persons<br><br>The roles defined are exceptionally confusing to read, there is lots of duplication and wording / terminology is not very clear or helpful. It would read as though the Directors / Snr Mgt have the most detail around their roles, with less detail as the roles move further down the organisation. To the point that, essential roles at grass roots are not included or defined in the Policy i.e.<br>- Health & Safety Lead / Representation<br>- Compliance Manager<br>- Competent Person - those work monitor or work on water systems.<br>- Domestic / Cleaners - those who can impact on water fitting cleanliness and use.<br>- Contractors - those who work for the Board on water systems or components.<br><br>NB - within the Written Scheme of Control [WSC] there is a small inclusion for the following roles and their responsibilities:<br>- Legionella Risk Assessor<br>- Competent Person [Water]<br>- Contractor<br>3) The Policy was reviewed and dated March2024. | R1.07_ WSG to review all current defined roles and revise them so they are written in 'Plain English' - see link below, i.e. remove duplication, unnecessary wording, clarity on what is required.<br>- https://www.plainenglish.co.uk/<br>R1.08_ The WSG to identify those involved in water safety and prepare a defined responsibility, this role and responsibility to be included in the revised Governance Policy. | Compliance to review and modify together with AE. Underway.<br>Compliance to review and modify.   | A.Gallacher / M Feeney<br>K.Clarkson                           | 29/05/2024                             |          |
| 1.3 |           | Communication pathways defined for all involved in the control regime?  | Water Systems Safety Policy V4 Final<br>Written Scheme QUEH CAMPUS-2024 Rev I Final | 1) Appendix 4 - Governance Structure [by designation]<br>2) Appendix 5 - Governance Structure [by Governance Groups].<br>3) Within WSC section 3.2 includes 'management organogram' for QUEH. The term 'organogram' is outdated and not used by the HSE since 2013.<br>4) There is no use of the term 'communications pathway' which is a term used by the HSE in HSG274 part 2.  | R1.09_ WSG to review the current structures & organogram to confirm all involved in water safety are recognised.<br>R1.10_ Within the Policy include a reference to the WSC document for detail on 'communications pathways relating to site estates staffing'.<br>R1.11_ In the WSC replace 'organogram' with 'Communications Pathway'.   | Completed and changed<br>Completed and changed<br>Completed and changed   | K Clarkson<br>K Clarkson<br>K Clarkson                         | 29/05/2024<br>29/05/2024<br>29/05/2024 |          |
| 1.4 | 19        | Evidence of appropriate training [Training Needs Analysis document] for those involved in the control regime [i.e. RP = mgt training, AP = tech training / WSP, CPs = use of thermometers / health screen / implications of getting wrong]?<br>Is this training up to date? | QUEH water systems compliance tool / Water Training and Appointments Register       | 1) Smartsheet spreadsheet that identifies roles AE / RP / AP / CP.<br>2) For each person listed details latest training course date attended and if still in date, along with status of appraisal and if still in date.   | R1.12_ Review those with training need and appointment i.e. expired, and deliver training and complete appointments.   | Appointment Letters have been issued to outstanding staff members requiring appointment.<br>PO Raised to cover training for staff that are out of date and will take place later this year. | A.Gallacher / M Feeney   |  |          |
| 1.5 |           | Evidence of competency having been assessed [i.e. appraisals of persons, review of their work / output]?  | QUEH water systems compliance tool / Water Training and Appointments Register       | 1) Smartsheet spreadsheet details appointments made although no detail on the scope of the appraisal i.e. details on what was appraised.  | R1.13_ Evidence the location of appraisal documentation and reference where these are held.  | Certificate of Appraisals will be attached with Appointment letters on training register within smartsheet.   | A.Gallacher / M Feeney   |  |          |

| Part 1: Governance Arrangements  |           |   |  |  |  |  |            |                          |          |
|--|-----------|---|--|--|--|--|------------|--------------------------|----------|
| DATE APPRAISED: 24/05/2024   |           | CONSULTANT: Daniel Pitcher  |  | CLIENT CONTACT / INTERVIEWEES: Kerr Clarkson   |  |  |            |                          |          |
| Observations / Notes:  |           |   |  |  |  |  |            |                          |          |
| As part of the appraisal process the Policy [Water Systems Safety Policy V4 Final] and Written Scheme of Control [Written Scheme QUEH CAMPUS-2024 Rev I Final] was reviewed.   |           |   |  |  |  |  |            |                          |          |
| The consultant is broadly assured on defined management processes relating to water safety, although, there needs to be improvements in defined process to provide greater clarity and less confusion. The recommendations below represent improvements coupled with the 130x observations / feedback notes detailed in GGCAU40936C01 - assurance appraisal review comments on Policy 20240425 will help with that distilled clarity needed in the Policy. |           |   |  |  |  |  |            |                          |          |
| Ref  | SCART ref | Aspect  | Relevant Document / Record   | Observation / Detail   | Recommendation   | Status Update  | Who        | Proposed Completion      | Complete |
| 1.6  | 5 / 18    | Written appointments:<br>1) SOM;<br>2) RP;<br>3) DRP / AP;<br>4) CP;<br>5) AE[W].   | QUEH water systems compliance tool / Water Training and Appointments Register<br><br>Teams Channel | 1) The following appointment letters are held on the Teams Channel...<br>1.1 Prof Tom Steele as Designated Person, signed 12/03/24<br>1.2 Alan Gallagher as Deputy Designated Person [Corporate], signed 25/04/24<br>1.3 Mark Riddle as Deputy Designated Person [Operational], signed 25/04/24<br><br>2) Smartsheet's QUEH Compliance details appointments for Responsible Person, Authorised Persons or Competent Persons - albeit the CP appointments are out of date.<br><br><b>NOTE1</b> - the appointment letters for the RP / APs / CPs were moved from Smartsheet's to Teams Channel during the appraisal period.<br><br><b>NOTE2</b> - by the end of the assurance appraisal process a new water safety file management system had been created on Teams Channel. | R1.14. Finalise the water safety file structure with document migration in to the new structure from existing sources.   | Completed and changed  | K.Clarkson | 22/05/2024               |          |
| 1.7  | 20        | Are the contact details of those involved in the control regime readily available in the event of an emergency [i.e. failure in control strategy [no DHW], +ve water samples, suspected cases of LD]?   | Water Systems Safety Policy V4 Final<br><br>Written Scheme QUEH CAMPUS-2024 Rev I Final            | 1) Within WSC section 3.2 includes 'management organogram' for QUEH.<br><br>2) WSC details failures in control i.e. temperatures and sample results these are reported immediately to the AP for actioning.  | No recommendations.  |  |            |                          |          |
| 1.8  |           | External contractors, if used, are their roles and responsibilities defined in writing?   | Written Scheme QUEH CAMPUS-2024 Rev I Final  | 1) Within the WSC there is a small inclusion for contractors roles and their responsibilities. This is very limited. There is no reference to contracts and scopes of service.<br><br>2) DMA Canyon are the appointed contractors who complete legionella risk assessments along with monitoring services and remedial work. (There is a lack of impartiality and independence with this arrangement).   | R1.15. Update the responsibility for contractors to include reference to their specific contractors for detail on scope of service / remit of duties.  | Written scheme updated to include site contractors   | K.Clarkson | 30/05/2024               |          |
| 1.9  |           | a) External contractors, if used, have their standards of service been reviewed [i.e. LCA / UKAS / WaterSafe]?  | Water Systems Safety Policy V4 Final   | 1) The entry for contractors only details membership to the Legionella Control Association [LCA].<br><br>2) Within the DMA Canyon LRA report for Adults and Childrens Hospitals June23 their LCA certificate is included. This detailed LRA and Monitoring services.   | R1.16. Update the responsibility for contractors to include membership to WaterSafe.   | Completed added to policy  | K.Clarkson | 30/05/2024               |          |
|  |           | b) Has the contractor provided evidence of staff training for the tasks they perform?   | Water Systems Safety Policy V4 Final   | 1) The entry for contractors details the service provider must provide evidence of specific training completed.<br><br>2) There is no detail on the need for contractors to complete training specific to the Board i.e. Covering roles, responsibility, water safety arrangements, good practices with water systems.<br><br>3) Teams Channel includes a folder for DMA staff and their individual training certificates - a summary of training completed by DMA staff was provided by DMA through the assurance appraisal process.  | R1.17. Update the responsibility for contractors to include specific Board contractor training relating to water safety i.e. Board arrangements, roles, good practices and personal and tool hygiene.<br><br>No recommendations.   | Section A2.15. Contractors must complete and demonstrated competency and completed a specific City and Guilds CP(W) training course and complete an approval course by Water AP before being signed off for working on a water system.   | K.Clarkson | 30/05/2024               |          |
|  |           | c) Has the contractor provided evidence of staff competency (i.e. internal audits / work place inspections)?  | Water Systems Safety Policy V4 Final   | 1) The entry for contractors fails to include the need for service providers to provide evidence of competency checks.<br><br>2) LCA guide to service providers outlines the need for completing competency checks on staff and their delivery of duties, this evidence of competency checks should then be provided to service providers clients.<br><br>3) Teams Channel for DMA staff training does not include competency evidence.  | R1.18. WSC section 3.12 includes a section Contractor Competency, this should be included in the Policy and updated detailing the responsibility of contractors to include evidence of competency checks of their staff.<br><br>R1.19. Request from contractors evidence of competency checks for all staff. | Detailed in section A2.15. They will have completed and demonstrated competency and completed a specific City and Guilds CP(W) training course. They would work under the direction of an AP(W) or TLP(W) for projects in accordance with operating procedures, policies and standards of the service.<br>Completed - Competency Evidence uploaded to teams folder | K.Clarkson | 30/05/2024<br>22/05/2024 |          |
| 1.10   |           | Where 3rd parties [landlords / tenants / co-occupants] provide services such as buildings used / occupied by the Organisation has assurance been sought from the 3rd party of their water safety management systems i.e. RA / Compliance Reports? | Water Systems Safety Policy V4 Final<br><br>Written Scheme QUEH CAMPUS-2024 Rev I Final            | 1) There is no reference to 3rd parties [landlords / tenants / co-occupants] in the Policy.<br><br>2) In the WSC section 1.3 details the existence of 3rd party landlord.  | R1.20. WSG to update Policy to include the need for Duty of Care and evidence to be sought by the WSG for 3rd parties i.e. landlords / service providers.  | Section 3.3 updated on policy  | K.Clarkson | 30/05/2024               |          |



| Part 1: Governance Arrangements  |             |  |  |   |  |  |            |                     |          |
|--|-------------|--|--|---|--|--|------------|---------------------|----------|
| DATE APPRAISED: 24/05/2024   |             | CONSULTANT: Daniel Pitcher   |  | CLIENT CONTACT / INTERVIEWEES: Kerr Clarkson  |  |  |            |                     |          |
| <p><b>Observations / Notes:</b><br/>As part of the appraisal process the Policy [Water Systems Safety Policy V4 Final] and Written Scheme of Control [Written Scheme QUEH CAMPUS-2024 Rev I Final] was reviewed.</p> <p>The consultant is broadly assured on defined management processes relating to water safety, although, there needs to be improvements in defined process to provide greater clarity and less confusion. The recommendations below represent improvements coupled with the 130x observations / feedback notes detailed in GGCAU40936C01 - assurance appraisal review comments on Policy 20240425 will help with that distilled clarity needed in the Policy.</p> |             |  |  |   |  |  |            |                     |          |
| Ref  | SCART ref   | Aspect   | Relevant Document / Record   | Observation / Detail  | Recommendation   | Status Update  | Who        | Proposed Completion | Complete |
| 1.11   |             | Auditing process established to determine the effectiveness of the management water safety?                                  | Water Systems Safety Policy V4 Final<br>Written Scheme QUEH CAMPUS-2024 Rev I Final  | 1) Section 11 of the Policy details Audit, although it only details monitoring the effectiveness of the Policy only by the Health & Safety Dept (NB no role or responsibility defined).<br>2) Under the role and responsibility for the Head of Corporate Estates there is a list of 'compliance audit duties', which lacks detail on how or who else is involved.<br>3) Under the role and responsibility for Authorising Engineer Water there is requirement for an annual L8 audit at acute sites annually. L8 is specifically related to Legionella, as such this entry is very limiting, given the title of the Policy is Water Safety. There is no detail on the scope or approach for auditing.<br>4) WSC section 3.8 details 'auditing' this section is very helpful and provides a good level of detail around auditing and outputs including who is involved and frequency. | R1.21_Update the Policy section 11 with WSC section 3.8.   | Section 11 modified to reflect accuracy  |            |                     |          |
| 1.12   |             | AE annual audit issued to the Designated Person?   | Water Systems Safety Policy V4 Final   | 1) Section A2.8 details the role of the Authorising Engineer Water, this includes monitoring performance and annual L8 audit report.<br>2) SHTM04 is very explicit in the requirement of AEW audit... <i>monitoring the performance of the service and providing an annual audit to the NHS Board's Designated Person.</i> The Policy fails to include this requirement of the SHTM04.  | R1.22_Section A2.8 to be updated to include:<br><i>monitoring the performance of the service and providing an annual audit to the NHS Board's Designated Person.</i>   | Added to section 11.1  | K Clarkson | 30/05/2024          |          |
| 1.13   |             | Evidence that audit recommendations are being proactively managed by the WSG to bring about an effective solution?           | Water Systems Safety Policy V4 Final   | 1) It is not very clear from the Policy document if audit recommendations are brought to WSG meetings for effective management and mitigation.<br><b>NB</b> - experience of the consultant with auditing for the Partnership estate, audits are reported via Smartsheet's, at Sector WSG meetings 'AE Audit' is an agenda item where updates are issued by APS.   | R1.23_Policy to be updated defining Board and Sector WSG to agree / define within the ToR and agenda for meeting the status of audit recommendations, i.e. who assigned and their status of completion.  | Added to section 11.1  | K Clarkson | 30/05/2024          |          |
| 1.14   | 6 / 66 / 67 | Evidence of proactive management of water safety...<br>1) Terms of References [ToR] for WSG and this aligns with S/HTM04?    | Water Systems Safety Policy V4 Final<br>TOR - NHSGGC Water Safety Group - agreed<br>Written Scheme QUEH CAMPUS-2024 Rev I Final                      | 1) The Policy or WSC does not include a ToR for Board or Sector WSG or an agenda.<br>2) ToR is a separate document - last reviewed in 2019.<br>3) ToR does not explicitly outline the duties of the WSG merely referencing SHMT04. This is insufficient.  | R1.24_Review and update ToR include:<br>- duties of WSG detail to align with SHTM04<br>- quoracy<br>- reference their reporting routes [governance structure]<br>- standing agenda.  | 2024 TOR in place and was submitted to May 24 BWSG for final approval. (Updated to include SHTM04-01 and responsibilities and to review minutes and actions. | K Clarkson | 28/05/2024          |          |
|  | 6 / 66 / 67 | 2) WSG - quorate / frequency / minutes / actions logged / roles & appointments reviewed / hazards identified and assessed;   | Water Systems Safety Policy V4 Final   | <b>NB - WSG minutes and actions not appraised.</b>  | Policy to either be update to cross reference to ToR document OR ToR is included within the Policy.  | 2024 TOR in place and was submitted to May 24 BWSG for final approval. (Updated to include SHTM04-01 and responsibilities and to review minutes and actions. | K Clarkson | 28/05/2024          |          |
|  | 7           | 3) Operational Water Groups [OWG] - frequency / review of performance data / RA & RM actions reviewed;                       | Water Systems Safety Policy V4 Final   | 1) OWGs are broadly looking at the day to day operation and performance of water systems around an estate. The Policy details the existence of Sector Water Systems Safety Groups these would represent an OWG, although they are not defined in the Policy i.e. ToR and agenda.<br><b>NB - WSG minutes and actions not appraised.</b>  | R1.25_WSG to define OWG ToR and agenda and include in the Policy.  | Added to Section 5.2 of the policy that minutes are sent to Board Meetings.  | K Clarkson | 30/05/2024          |          |
|  | 7           | 4) Work groups - periodic groups established for WSP / Audits reviews and updates;   | Water Systems Safety Policy V4 Final   | 1) Periodic working groups are not defined in the Policy.<br><b>NB</b> - experience of the consultant with the Partnership estate, a working group has been established for the review of the WSC template and pilot of a new format before rolling out across the wider estate.  | R1.26_WSG to define periodic working groups and include within the Policy.   | Added to TOR and Policy  | K Clarkson | 30/05/2024          |          |
|  | 7           | 5) Extraordinary WSG / Incident groups - periodic special group meetings in response to issues i.e. sample data / cases.     | Water Systems Safety Policy V4 Final   | 1) The Policy section A3.2 details IMT = Incident Management Team.<br>2) The Policy does outline when an IMT will be called:<br>- Clinical case potentially linked to water quality.<br>- A single hospital healthcare care associated case.<br>- Where water quality is confirmed as single case source.<br>2) Section A3.1.12 Incident Management Process exists this provides a framework on how the incident should be managed.   | No recommendations.  |  |            |                     |          |
| 1.15   | 4           | Record keeping system defined with records [i.e. Mgt docs, PPMs, commissioning data] filed accordingly and being accessible? | Water Systems Safety Policy V4 Final<br>Written Scheme QUEH CAMPUS-2024 Rev I Final<br>Teams Channel - Water<br>Smartsheet 'Water Compliance - QUEH' | 1) The Policy makes continual reference to:<br>- efficient and formal records being kept and kept up to date<br>- Boards CAFM system  | [see R1.14]<br>R1.27_WSG to define in Policy a section a Record Keeping - outlining what records are kept where and in what format. This should cover everything to do with Water Safety from WSG minutes / actions, training & appointments, risk assessments, wsc and the associated monitoring records, mitigation action / evidence etc. This should also include retention and archive framework. |  |            |                     |          |
|  |             |  |  | 2) The Policy Section A3.1.6 Facilities Folder - hold documentary evidence and record of procedures at ward / dept level. It is unclear if there is a structure to the folder now what records are included.<br>3) WSC section 2 Recording - this outlines broadly where records are kept, although the level of detail on what types of records and where is very brief.<br>4) Teams Channel filing - at the start of the assurance appraisal process the Teams water folders were not structured in a proactive and efficient manner - folders with documents with overlap and no date ordering and no defined 'document map'. Through the appraisal process there discussion around a suitable and sufficient folder structure. By the end of the appraisal process a structure had been defined, established on Teams and records relocated accordingly.                          | R1.28_WSC section 2 to be revised to provide greater clarity on the records associated with a property i.e. risk assessments, log books, monitoring records, mitigation action / evidence - including locations and formats.   |  |            |                     |          |

| Part 1: Governance Arrangements  |           |                            |                            |  |  |               |            |                     |          |
|--|-----------|----------------------------|----------------------------|--|--|---------------|------------|---------------------|----------|
| DATE APPRAISED: 24/05/2024   |           | CONSULTANT: Daniel Pitcher |                            |  | CLIENT CONTACT / INTERVIEWEES: Kerr Clarkson   |               |            |                     |          |
| <p><b>Observations / Notes:</b><br/>As part of the appraisal process the Policy [Water Systems Safety Policy V4 Final] and Written Scheme of Control [Written Scheme QUEH CAMPUS-2024 Rev I Final] was reviewed.</p> <p>The consultant is broadly assured on defined management processes relating to water safety, although, there needs to be improvements in defined process to provide greater clarity and less confusion. The recommendations below represent improvements coupled with the 130x observations / feedback notes detailed in GGCAU40936C01 - assurance appraisal review comments on Policy 20240425 will help with that distilled clarity needed in the Policy.</p> |           |                            |                            |  |  |               |            |                     |          |
| Ref  | SCART ref | Aspect                     | Relevant Document / Record | Observation / Detail   | Recommendation   | Status Update | Who        | Proposed Completion | Complete |
|  |           |                            |                            | 5) Smartsheet offers a form a structure i.e. compliance lead, although there is duplication in places. | R1.29_ Water Safety folder structure on Teams to be further refined and documents filed accordingly, a map to be prepared for all to follow. | Completed     | K Clarkson | 22/05/2024          |          |

| Part 2: Risk Assessment / Risk Minimisation / Schematics   |           |  |  |   |   |  |                        |                     |          |
|--|-----------|--|--|---|---|--|------------------------|---------------------|----------|
| DATE APPRAISED: 14/05/2024   |           | CONSULTANT: Daniel Pitcher   |  | CLIENT CONTACT / INTERVIEWEES: Kerr Clarkson / Matthew Feeney   |   |  |                        |                     |          |
| <p><b>Observations / Notes:</b><br/>As part of the appraisal process the current risk assessments relating to water safety were provided and reviewed.</p> <p>The consultant is not assured on risk assessment processes for several reasons...</p> <p>1) the lack of a defined WSP relating to risk assessment need and a water hazards matrix.<br/>2) the 2023 <i>legionella</i> risk assessment report does not align with BS8580 part 1, a requirement defined in the WSC.<br/>3) a lack of area / ward specific <i>Pseudomonas aeruginosa</i> risk assessments.</p> |           |  |  |   |   |  |                        |                     |          |
| Ref  | SCART ref | Aspect   | Relevant Document / Record   | Observation / Detail  | Recommendation  | Status Update  | Who                    | Proposed Completion | Complete |
| 2.1  |           | Have the hazards identified by the WSG been risk assessed?<br>Have clinical risk assessments been completed where required?  | RA Pseudomonas 2023  | 1) Water Hazards have not been defined.<br>2) The RA Pseudomonas 2023 risk assessment essentially represents the clinical assessment for identification of those areas within A&C where susceptible people are located.<br><br><b>NOTE</b> - a suggested water hazards matrix was provided by the consultant through the assurance appraisal process to help with understanding.  | <b>R2.01</b> Develop a Water Safety Plan [aligning with BS8680] which includes a section risk assessment need with a 'water hazards' matrix defined and those hazards are then assessed.  | Water Hazards matrix defined and added to policy and written scheme  | K Clarkson             | 30/05/2024          |          |
| 2.2  | 9         | Evidence that all properties in the portfolio have been considered for risk assessment [i.e. risk screen]?   | Smartsheet's / Water Compliance QUEH   | 1) There is no definitive list of the site buildings / systems outlining their risk assessment need [hazard analysis].<br>2) Smartsheet's does contain a folder of the buildings and their most current LRA actions.<br>3) Within the quarterly compliance report prepared by Matthew Feeney there 'section 3 water risk assessment program summary' which lists the buildings, date of risk assessment and renewal date. Although, Lab / Office / T&L blks have 'TBC' for risk assessment date, although the last recorded risk assessment for office blk was 14/12/15.  | <b>R2.02</b> Update the 'section 3 water risk assessment program summary' to include all dates and all the systems within the buildings detailing their hazards and associated risk assessment dates and reviews. Those buildings where risk assessments are overdue or triggered for assessment should be completed. | Quarterly Compliance reports going forward will mention all dates and systems within that particular building. Of the 3 risk assessments outstanding email confirmation from the risk assessor states 2 are complete and one is close to completion. RA reports will be issued in coming days for completed works. | A.Gallacher / M Feeney |                     |          |
| 2.3  |           | If there are more than 5 employees did you record the risk assessment [i.e. written RA document]?  | QUEH A&C RA Complete 2023<br>RA Pseudomonas 2023                                 | 1) Those risk assessment reports shared and reviewed are written documents.   | No recommendations.   |  |                        |                     |          |
| 2.4  | 10        | Was the person completing the assessment competent to do so [i.e. internal = suitably trained in RA, External = LCA / UKAS accredited]?                                | QUEH A&C RA Complete 2023  | 1) <i>Legionella</i> risk assessment completed by DMA Canyon, their LRA membership certificate is included in the report.<br>2) There are no details on the training or competency of the risk assessors included in the report. Training certificates have been issued by the contractor.<br><br><b>NOTE</b> - through the assurance appraisal process DMA provided a summary of staff training details.   | <b>R2.03</b> Risk assessment reports to include training and competency summary of the risk assessor/s.   | DMA have been emailed to include Training documentation on RA report within new draft that will be issued.   | A.Gallacher / M Feeney |                     |          |
| 2.5  | 10        | Has <i>Legionella</i> risk been assessed?  | QUEH A&C RA Complete 2023  | 1) <i>Legionella</i> risk assessments are completed for QUEH.   | No recommendations.   |  |                        |                     |          |
| 2.6  | 10        | Does the <i>Legionella</i> risk assessment [LRA] meet BS8580-part 1 [i.e. susceptibility, ALARP, scoring defined, inherent risk, actual risk and elimination of risk]? | QUEH A&C RA Complete 2023<br>Office Block L8 RA Complete 2016                    | 1) The LRA reports do not make reference to BS8580 part 1.<br>2) The LRA reports do not include reference to ALARP, inherent or actual risk.<br>3) Susceptibility isn't truly assessed - in the Risk Assessment Summary it details 'at risk groups' and states those with medical conditions - not all medical conditions are the same. NOTE - the table has a spello 'susceptibly'. The report 'summary' section details some systems used by persons with increased susceptibility - this is also the case of the 'office blk' report which is staff only.<br>4) Risk isn't truly assessed..<br>4.1 - there is no explanation of risk scoring or a matrix... The report details one cold water tanks as a 'high risk' coupled with 180 approx. recommendations yet the overall category of risk for A&C is 'low'. The report does not include an explanation of their risk scoring applied.<br>4.2 - there is a 'remedial works action' category, which is essentially a priority order - albeit this is colour coded. This is colour coding is not an assessment of risk.<br>5) The WSC details LRA to complete in a manner consistent with BS8580-2010 - the risk assessment is not consistent with the standard. | <b>R2.04</b> Risk assessments to comply with BS8580 part 1 for legionella risk assessment, which requires scoring system for risk, consideration of susceptibility, ALARP, inherent and actual risk and elimination of risk.  | DMA currently working on yet still to send through report.   | A.Gallacher / M Feeney |                     |          |
| 2.7  | 10        | Has <i>Pseudomonas aeruginosa</i> risk been assessed?  | Smartsheet's / Pseudomonas risk assessment<br>Smartsheet's / RA Pseudomonas 2023 | 1) The Smartsheet location detailing 'Pseudomonas risk assessment' doesn't actually contain the risk assessment, it holds the guidance document only.<br>2) A risk assessment was reviewed in 2023, confirming the patients at a higher risk from pseudomonas and related infections.<br>3) The risk assessment details Intensive Care and Transplant units across NHS GGC are automatically classed as right risk.<br>4) The precautions details following the policy and WSC.   | No recommendations.   |  |                        |                     |          |
| 2.8  | 10        | Does the <i>Pseudomonas aeruginosa</i> risk assessment meet BS8580-part 2?   | Smartsheet's / Pseudomonas risk assessment                                       | 1) There is no detailed risk assessment for <i>Pseudomonas aeruginosa</i> in the Intensive Care or Transplant areas.  | <b>R2.05</b> Risk assessments to comply with BS8580 part 2 for <i>Pseudomonas aeruginosa</i> risk assessment, which requires scoring system for risk, consideration of susceptibility, ALARP, inherent and actual risk and elimination of risk.   | Local risk assessments in draft  | Infection Control      | Jun-24              |          |

| Part 2: Risk Assessment / Risk Minimisation / Schematics   |                        |   |  |   |  |  |  |                      |          |
|--|------------------------|---|--|---|--|--|--|----------------------|----------|
| DATE APPRAISED: 14/05/2024   |                        | CONSULTANT: Daniel Pitcher  |  | CLIENT CONTACT / INTERVIEWEES: Kerr Clarkson / Matthew Feeney   |  |  |  |                      |          |
| <p><b>Observations / Notes:</b><br/>As part of the appraisal process the current risk assessments relating to water safety were provided and reviewed.</p> <p>The consultant is not assured on risk assessment processes for several reasons...</p> <p>1) the lack of a defined WSP relating to risk assessment need and a water hazards matrix.<br/>2) the 2023 <i>legionella</i> risk assessment report does not align with BS8580 part 1, a requirement defined in the WSC.<br/>3) a lack of area / ward specific <i>Pseudomonas aeruginosa</i> risk assessments.</p> |                        |   |  |   |  |  |  |                      |          |
| Ref  | SCART ref              | Aspect  | Relevant Document / Record   | Observation / Detail  | Recommendation   | Status Update  | Who  | Proposed Completion  | Complete |
| 2.9  | 4                      | Has scald risk been assessed?   | None seen  | 1) Confirmation from KC & MF no scald risk assessments have been completed.   | R2.06_ Commission a scald risk assessment.   | Draft scald risk assessment with H&S fro review  | H&S  | Jun-24               |          |
| 2.10   | 11 / 12 / 14 / 15 / 16 | Are there an agreed action plan/s for the risk assessments, are these real time and on schedule?  | Smartsheet's / Risk assessment action plans<br><br>Smartsheet's / QEUH risk assessment action plan summary<br><br>Teams Channel / Office Block L8 RA Complete 2016 | 1) Located on Smartsheet's are the action plans from the risk assessment reports. Copies of the historic risk assessment reports are held on the Teams Channel.<br><br>2) The risk assessment report has 'recommended remedial action timescale', which includes<br>1) immediately<br>2) as soon as reasonably practical<br>3) within 3 months<br>4) at first available opportunity within 12 months.<br><br>Given susceptibility is not truly considered the recommended priority for actions remains the same across all buildings i.e. healthcare or none.<br><br>3) The action plans have a 'field' to record a 'target date' for completion of the actions, which is not completed.<br><br>4) QEUH Adults and Children's Hospitals 2023 action plan details 180 actions, 4 not started, 58 in progress and 118 completed.<br><br>5) Although the WSG have not agreed or assigned deadlines it is not possible to determine if they are on schedule.<br><br>6) The summary sheet outlines risk assessments from 2022 with actions still open. | R2.07_ Deadlines for each risk assessment and the associated actions need to be agreed and then defined in the action plan sheets.                         | Timelines have been included within the QEUH A&C action plan on smartsheet in line with the scoring matrix provided. All other sites will have time frame added. | A.Gallacher / M Feeney                               |                      |          |
| 2.11   |                        | Is there an asset list of all risk systems identified within the risk assessment?   | QEUH A&C RA Complete 2023<br><br>Teams Channel/ QEUH Assets  | 1) The LRA states asset lists have not been produced as part of the risk assessment.<br><br>2) There are separate asset lists held for each plant room with A&C.  | R2.08_ RA reports include a 'sign posting' to where asset lists are held / located.<br><br>R.2.09_ Establish a process for asset list review and updating. | Emailed DMA to add location<br><br>Emailed DMA to add location   | A.Gallacher / M Feeney<br><br>A.Gallacher / M Feeney | Jun-24<br><br>Jun-24 |          |
| 2.12   |                        | Have you identified the circumstances which would require a review of the assessment?   | Written Scheme QEUH CAMPUS-2024 Rev 1 Final<br><br>QEUH A&C RA Complete 2023   | 1) WSC section 3.6 Water Risk Assessment Review Schedule broadly details the change criteria from ACOP L8 para 47.<br><br>2) WSC section 3 details no more than 2 years between risk assessment reviews.<br><br>3) LRA detailed 2 year review frequency.  | No recommendations.  |  |  |                      |          |
| 2.13   |                        | Is there evidence that the circumstance which would require a review being implemented [i.e. risk assessment review process in place]?                            | Written Scheme QEUH CAMPUS-2024 Rev 1 Final  | 1) There is no evidence of the change criteria having ben reviewed, it appears to be the case the 2 year frequency is used.   | R2.10_ Establish a risk assessment review mechanism which aligns with the change criteria detailed in the WSC.   | Agreed every 2 years. For specific changed separate risk asesements are completed like 2A/2B or Thrombectomy or Ward 61. As per section 6.1 of policy.           | Kerr Clarkson  |                      |          |
| 2.14   | 23                     | Up to date schematic plan showing - the layout of the system(s) and its location within and around the premises?<br><br>Is a schematic located in the plant room? | Basement Plant Room<br><br>QEUH A&C RA Complete 2023   | 1) There is schematic in the basement plant room located near the booster pump sets. The schematic is incomplete as it shows the 3rd filtration set although not connected to the original filtration units x2.<br><br>2) The risk assessment does not include schematics although it shows the plantrooms on each floor detailing the DHW generators within and a demarcated area that it serves on the floor - a really helpful visualisation of what is served by a system.<br><br>3) As part of the site walk over in plant room 31 there was a new temporary connection installed to provide water to the project area outside replacing the chillers - it was suspected by Kerr this re-connection has not been included on the drawings.<br><br><b>NB - schematics were not reviewed as part of this assurance appraisal.</b>  | R2.11_ Establish a schematic review mechanism to ensure they remain updated and correct.   | Annual Schematic review mechanism already in place. Annually every February  | Kerr Clarkson  |                      |          |

| Part 3: Scheme of Control Measures & Support Schemes   |           |  |   |  |  |  |             |                     |          |
|--|-----------|--|---|--|--|--|-------------|---------------------|----------|
| DATE APPRAISED: 26/04/2024   |           | CONSULTANT: Daniel Pitcher   |   | CLIENT CONTACT / INTERVIEWEES: Kerr Clarkson   |  |  |             |                     |          |
| Observations / Notes:  |           |  |   |  |  |  |             |                     |          |
| As part of the appraisal process the current Written Scheme of Control [WSC] for QUEH was provided and reviewed.   |           |  |   |  |  |  |             |                     |          |
| The consultant is broadly assured on existence of control measures and monitoring [aka the scheme of control] relating to water safety, although, there needs to be improvements to processes to remove duplication and separation of some parts [aligning to a Water Safety Plan] so the document is more practical and less cumbersome. The recommendations below coupled with the 289x observations / feedback notes detailed in 'GGCAU40936C02 - assurance appraisal review comments on WSC QUEH'24 20240426' will assist with the document improvement. |           |  |   |  |  |  |             |                     |          |
| Ref  | SCART ref | Aspect   | Relevant Document / Record  | Observation / Detail   | Recommendation   | Status Update  | Who         | Proposed Completion | Complete |
| Section 3.1: Correct & Safe Operation  |           |  |   |  |  |  |             |                     |          |
| 3.1.1  | 3         | Has a written scheme [WSP: Control Measures & Support Schemes] been defined? Is it current and up to date?   | Written Scheme QUEH CAMPUS-2024 Rev I Final   | 1_WSC control for QUEH exists, dated 2024.   | No recommendations.  | -  | -           | -                   | -        |
| 3.1.2  | 40        | If the water supplied to your building is not mains supply, has the water been pre-treated to make sure it is of the same quality as the mains?  | Written Scheme QUEH CAMPUS-2024 Rev I Final   | 1_WSC makes reference to mains cold water although does not define the supply of mains cold water to the QUEH nor the fact there are two separate supplies.  | R3.01_WSC to be updated to define water sources & control strategies.  | Section 4.1.3 modified in written scheme   | K Clarkson  | 30/05/2024          | -        |
| 3.1.3  | 48        | Has a treatment programme for controlling water safety been recorded?  | Written Scheme QUEH CAMPUS-2024 Rev I Final   | 1_WSC makes reference to hot and cold water although does not detail control strategies for water safety i.e. temperature.   | [See R3.01].   | -  | -           | -                   | -        |
| 3.1.4  | 24        | Is there a maintenance control system [i.e. PPM] in place and does it include all the risk systems identified from the risk assessment?<br><br>Records reviewed and signed by appropriate persons? | Written Scheme QUEH CAMPUS-2024 Rev I Final<br><br>FMFirst<br><br>QUEH (All) Planner 2024 Rev 8 | 1_Maintenance control exists in two systems FM Frist and the QUEH Planner 2024.  | R3.02a_Great transparency is required on all asset within a single PPM system. A solution should also be able to generate compliance reports and visibility of system performance.   | Cold Water tanks are on FM First. As part of new water service provider contract there is a requirement to provide an online portal.   | Procurement | Sep-24              | -        |
|  |           |  |   | 2_FM First has some systems i.e. cold water tanks are not included, tasks from FM first are for NHSGGC estates staff to complete.  | R3.02b_Records are to be named and signed by those completing the work. Records also need to be reviewed by supervisors and signed.  | Supervisors emailed to ensure all records are signed. Facilities Administrators also requested of check before scanning into teams folder.   | K Clarkson  | 30/05/2024          | -        |
|  |           |  |   | 3_QUEH Planner exists for tasks completed by the contractor.<br><br>4_Records issued by FMFirst and completed by NHSGGC staff are not named, signed or reviewed.<br><br>5_Records issued by contractor [DMA] for monitoring works are named and signed. Although no evidence of review and sign off by NHSGGC staff, it is reported that any non compliances are communicated verbally.  | R3.02c_A more formal process is required for notification of non compliant occurrences found through routine monitoring along with tickets to be raised for each non compliant occurrence so there is an evidence trail of action taken. | DMA informally liaise with AP's on site for issues and used to provide a Traffic light report. DMA have indicated that these will restart. This was send to LAP who would then issue this with Work requests to be actioned by Water CP's.   | K Clarkson  | 30/05/2024          | -        |
| 3.1.5  | 22 / 48   | Is temperature used as a control method and defined within the written scheme including where it is applied?   | Written Scheme QUEH CAMPUS-2024 Rev I Final   | 1_WSC makes reference to hot and cold water although does not detail this as a control strategy for water safety i.e. temperature.   | [See R3.01].   | Section 4.1.2 and 4.1.3 has been modified to reflect that temperature control forms part of strategy.  | K Clarkson  | 30/05/2024          | -        |
| 3.1.6  | 50        | Is there evidence that temperature control is being monitored and is effective?  | See Part 4 for detail.  | See Part 4 for detail.   | [See R3.09 / R3.10 / R3.11]  | -  | -           | -                   | -        |
| 3.1.7  | 22 / 48   | Are biocides used as a control method and defined within the written scheme including where it is applied?   | Written Scheme QUEH CAMPUS-2024 Rev I Final   | 1_WSC makes reference to ClO2 although does not detail this as control strategy for water safety i.e. supplementary control.   | [See R3.01].   | New section added to written schemes 4.1.5 and 4.1.6   | K Clarkson  | 30/05/2024          | -        |
| 3.1.8  | 50        | Is there evidence that biocide control is being monitored and is effective?  | See Part 4 for detail.  | See Part 4 for detail.   | See Part 4   | -  | -           | -                   | -        |
| 3.1.9  | 43        | Are there arrangements to incorporate standby equipment into routine use [i.e. pumps = weekly, calorifiers = procedure]?   | Written Scheme QUEH CAMPUS-2024 Rev I Final<br><br>QUEH A&C RA Complete 2023                    | 1_There is no detail on standby equipment within the LRA, although WSC section 4.45 details rotation of duty / stand-by pumps as weekly task.  | No recommendations.  | -  | -           | -                   | -        |
| 3.1.10   |           | Infrequently used outlets safe purge procedure?  | Written Scheme QUEH CAMPUS-2024 Rev I Final   | 1_Safe purging of outlets is not explicitly defined / detailed in the WSC.<br><br>[see additional comments in GGCAU40936C02].  | R3.03_WSC to be updated detailing 'safe purge' of outlets.   | Section added to 4.41 and 4.42 that if outlets are found to have had lapse of flushing then this must be discussed with Estates Water AP and Infection control before initiating a flushing regime for risk to be assessed.  | K Clarkson  | 30/05/2024          | -        |
| 3.1.11   | 42 / 44   | Management of infrequently used outlets defined [i.e. remove / flushing programme - weekly / 2x weekly - flush outlet until temperature stabilises comparable to supply of water?]                 | Written Scheme QUEH CAMPUS-2024 Rev I Final   | 1_Infrequently used outlets is the term used by the HSE within HSG274 part 2. The WSC refers to little used outlets / intermittently or infrequently used outlets.   | R3.04_WSC to be updated with correct and consistent referencing for 'infrequently' used outlets.   | Written scheme modified  | K Clarkson  | 30/05/2024          | -        |
|  |           |  |   | 2_WSC details the need for:<br>- quarterly reviews of returned flushing lists<br>- monthly submission of flushing lists<br>- assessment of outlets and the usage status<br>- the need to inform estates when outlet can be removed<br>- flushing of outlets by domestic, clinical, estates staff.<br><br>3_Flushing is detailed as a run time of 3 minutes. This does not align with HSG274 part 2 which details outlets should be run until the temperature stabilises with the temperature of the main run.<br><br>[see additional comments in GGCAU40936C02]. | R3.05_Review the approach of a run time detailed and that approach detailed in HSG274 part 2 requiring the temperature to stabilise with the main run.   | How are domestics or clinical staff whilst flushing little used outlets in wards to know what the incoming temperature is of the main run and is it realistic to expect clinical staff and domestics to use a thermometer for every outlet. However DMA. Section 13.1 of SHTM04-01 indicates flushed to waste at intervals for a 3 minute period. The interval should be at least twice-weekly. Where the outlet may be used by high risk patients, more frequent flushing will be needed and the increased frequency should be determined following risk assessment. In ICUs little-used outlets should be flushed daily at the start of each day. However DMA for any little used outlets do comply with HSG274. | K Clarkson  | 30/05/2024          | -        |
| Section 3.2: Monitor & Inspect - Temperature   |           |  |   |  |  |  |             |                     |          |

| Part 3: Scheme of Control Measures & Support Schemes   |              |   |   |   |   |  |               |                     |          |
|--|--------------|---|---|---|---|--|---------------|---------------------|----------|
| DATE APPRAISED: 26/04/2024   |              | CONSULTANT: Daniel Pitcher  |   | CLIENT CONTACT / INTERVIEWEES: Kerr Clarkson  |   |  |               |                     |          |
| Observations / Notes:  |              |   |   |   |   |  |               |                     |          |
| As part of the appraisal process the current Written Scheme of Control [WSC] for QUEH was provided and reviewed.   |              |   |   |   |   |  |               |                     |          |
| The consultant is broadly assured on existence of control measures and monitoring [aka the scheme of control] relating to water safety, although, there needs to be improvements to processes to remove duplication and separation of some parts [aligning to a Water Safety Plan] so the document is more practical and less cumbersome. The recommendations below coupled with the 289x observations / feedback notes detailed in 'GGCAU40936C02 - assurance appraisal review comments on WSC QUEH'24 20240426' will assist with the document improvement. |              |   |   |   |   |  |               |                     |          |
| Ref  | SCART ref    | Aspect  | Relevant Document / Record                  | Observation / Detail  | Recommendation  | Status Update  | Who           | Proposed Completion | Complete |
| 3.2.1  |              | Calorifiers - Annually - internal inspection, drain, cleaned subject to findings?                                   | Written Scheme QUEH CAMPUS-2024 Rev I Final | 1_WSC section 4.81 details annual maintenance requirements. Although the temperatures detailed are confusing i.e. raise the HDW generator to 60Deg.C - this is the minimum operating temperature.<br><br>2_Process detailed hosing out expansion vessels with no detail on how to complete.<br><br>[see additional comments in GGCAU40936C02].  | R3.06_Review annual process to provide correct temperatures and detail on how to complete all parts of the process.   | Page 104 indicates raise temperature to 70c. Section 4.81 changed to read 70c.   | K Clarkson    | 30/05/2024          |          |
| 3.2.2  |              | Calorifiers - Quarterly for healthcare - drain flush sample for clarity, quantity of debris & temperature checked?  | Written Scheme QUEH CAMPUS-2024 Rev I Final | 1_WSC section 4.51 details drain blow down on a monthly basis for 3 minutes. There is no detail on checking for debris / condition or taking temperatures.<br><br>[see additional comments in GGCAU40936C02].   | R3.07_Update process to include debris / condition and temperature check being completed. The frequency could be adjusted to quarterly with evidence that drain water quality is clear. | 4.51 indicates that MANUALLY CHECK and record the flow and return temperatures on the domestic hot water system as defined on Record Form (005), Check for debris and colour of water e.g. clear and record added to WSC.                      | K Clarkson    | 30/05/2024          |          |
| 3.2.3  | 34 / 37 / 52 | Calorifiers - Monthly - Flow temperature @ 60Deg.C. Return temperature @ 50Deg.C.?                                  | Written Scheme QUEH CAMPUS-2024 Rev I Final | 1_WSC section 4.52 details monthly flow and return temperature checks. Flow temperature being at least 60Deg.C and return temperature being at least 55Deg.C. HSG274 part 2 only requires 50Deg.C. for a minimum return temperature.<br><br>[see additional comments in GGCAU40936C02].   | R3.08_Consider updating the return temperature to 50Deg.C.  | All calorifiers at the QUEH are set at 65c so that this means that at the furthest outlet it will be definitely more than 55c and at the calorifier at 50c. Appreciates this uses more energy  | K Clarkson    | 30/05/2024          |          |
| 3.2.4  | 36 / 51      | DHW System - Monthly - sentinel [nearest & furthest outlets on non circulating systems] @ 50/55Deg.C. within 1 min? | Written Scheme QUEH CAMPUS-2024 Rev I Final | 1_WSC section 4.51 details sentinel outlet temperature checks on a monthly basis. Cold water temperatures should not be above 20Deg.C after 2 mins and hot water does not drop below 55Deg.C after 1 minute.<br><br>[see additional comments in GGCAU40936C02].   | No recommendations.   | -  | -             | -                   | -        |
| 3.2.5  | 36 / 51      | DHW System - Monthly - Return legs of principal loops [sentinel points] @ 50/55Deg.C. within 1 min?                 | Written Scheme QUEH CAMPUS-2024 Rev I Final | 1_WSC fails to include return legs of principal or subordinate loops [sentinel points] as a monitoring task.<br><br>2_WSC does include end of line [EOL] BMS sensors - albeit not to routinely review or record them.<br><br>3_It is noted from Kerr that return loops exist behind IPS panels in each room and it is not possible to open these due to contamination risk.<br><br>[see additional comments in GGCAU40936C02].  | R3.09_Return loop monitoring to be established through stand alone remote monitoring system / solution.   | EOL Sensors are monitored once per shift and detailed on shift report. Updated now on written scheme to reflect this. BMS section was in written scheme daily however now modified to indicate that this is recorded on shift report.          | K Clarkson    | 30/05/2024          |          |
| 3.2.6  | 36 / 51      | DHW System - Quarterly - Return legs of subordinate loops [sentinel points] @ 50/55Deg.C. within 1 min?             | Written Scheme QUEH CAMPUS-2024 Rev I Final | [see additional comments in GGCAU40936C02].   | [see R3.09]   | Lead AP to look at remote monitoring solution . Returns are 2m up and not accessible (except 2A where this was repiped). Site visit early June for potential solution. Meeting on 04/06/24 with Plexus and system will be tested in two areas. | Mel MacMillan | Sep-24              |          |
| 3.2.7  |              | DHW System - Representative selection of other points [tertiary loops / outlets] @ 50/55Deg.C. within 1 min?        | Written Scheme QUEH CAMPUS-2024 Rev I Final | 1_WSC section 4.53 details representative outlet temperature monitoring on a monthly basis. Cold water temperatures should not be above 20Deg.C after 2 mins and hot water does not drop below 55Deg.C after 1 minute.<br><br>2_It is noted from Kerr the contractor who completes this monitoring has monitoring sheets established for monthly outlet temperature monitoring and each monthly list there are a selection of other outlets added.<br><br>3_WSC section 4.83 details representative outlet temperature monitoring on an annual basis as part of the TMV / TMT maintenance checks. Cold water temperatures should not be above 20Deg.C after 2 mins and hot water does not drop below 55Deg.C after 1 minute.<br><br>[see additional comments in GGCAU40936C02]. | R3.10_Confirm all outlets have been included in the monthly schedules.  | A representation of all zones is included in monthly checks and all temperatures are checked annually as part of TMT checks.   | K Clarkson    | 31/05/2024          |          |
| 3.2.8  |              | POU water heaters [< 15L] - monthly / 6m- temperatures operate 50-60/55-60Deg.C.                                    | Written Scheme QUEH CAMPUS-2024 Rev I Final | 1_WSC does not appear to include a reference to point of use water heaters, although these exist across the estate i.e. T&L and office block.<br><br>2_Records indicate these are monitored on the monthly temperature form.<br><br>[see additional comments in GGCAU40936C02].   | R3.11_WSC to be updated to include reference to point of use water heaters and the need to monitor their temperatures.  | Added to new section of written scheme   | K Clarkson    | 30/05/2024          |          |

**Part 3: Scheme of Control Measures & Support Schemes**

DATE APPRAISED: 26/04/2024      CONSULTANT: Daniel Pitcher      CLIENT CONTACT / INTERVIEWEES: Kerr Clarkson

**Observations / Notes:**  
As part of the appraisal process the current Written Scheme of Control [WSC] for QUEH was provided and reviewed.

The consultant is broadly assured on existence of control measures and monitoring [aka the scheme of control] relating to water safety, although, there needs to be improvements to processes to remove duplication and separation of some parts [aligning to a Water Safety Plan] so the document is more practical and less cumbersome. The recommendations below coupled with the 289x observations / feedback notes detailed in 'GGCAU40936C02 - assurance appraisal review comments on WSC QUEH'24 20240426' will assist with the document improvement.

| Ref    | SCART ref | Aspect  | Relevant Document / Record   | Observation / Detail   | Recommendation   | Status Update   | Who        | Proposed Completion | Complete |
|--------|-----------|---|--|--|--|---|------------|---------------------|----------|
| 3.2.9  |           | Combination WH - Annually - Inspect cold tank & actions for DHW venting back?   | N/A  | 1_It is noted by Kerr no such devices exist.   | N/A  | N/A   | N/A        | N/A                 | N/A      |
| 3.2.10 |           | Combination WH - Monthly - temperatures operate 50-60/55-60Deg.C.?  | N/A  | 1_It is noted by Kerr no such devices exist.   | N/A  | N/A   | N/A        | N/A                 | N/A      |
| 3.2.11 |           | Cold Water Tanks - Annually - Inspect and complete remedial works where necessary?  | Written Scheme QUEH CAMPUS-2024 Rev I Final                              | 1_WSC sections 4.1.3 and 4.72 details summer and winter inspection of cold water tanks and cleaned on an annual basis as required. HSG274 part 2 details one check to limit potential contamination, to be completed in the summer.<br><br>2_Section 4.88 details annual clean and disinfection of cold water tank - it doesn't detail 'as required'.<br><br>[see additional comments in GGCAU40936C02]. | R3.12_Update frequency to annual in the summer for cold water tank/cistern inspections.  | Updated Section 4.1.3 and 4.88  | K Clarkson | 30/05/2024          |          |
| 3.2.12 |           | Cold Water Tanks - Annually - check tank water temperature remote of ball valve & MCW?  | Written Scheme QUEH CAMPUS-2024 Rev I Final                              | 1_WSC section 4.72 details the need to check incoming water and tank water temperatures.<br><br>[see additional comments in GGCAU40936C02].  | No recommendations.  | -   | -          | -                   | -        |
| 3.2.13 | 51        | CW System - Monthly - Sentinel points [nearest & furthest outlets] <20Deg.C. within 2 mins?   | Written Scheme QUEH CAMPUS-2024 Rev I Final                              | See 3.2.4<br><br>[see additional comments in GGCAU40936C02].   | No recommendations.  | -   | -          | -                   | -        |
| 3.2.14 | 54        | CW System - Representative selection of other points <20Deg.C. within 2 mins?   | Written Scheme QUEH CAMPUS-2024 Rev I Final                              | See 3.2.7<br><br>[see additional comments in GGCAU40936C02].   | [See R3.10]  | A representation of all zones is included in monthly checks and all temperatures are checked annually as part of TMT checks.  | K Clarkson | 31/05/2024          | -        |
| 3.2.15 | 29        | CW System - Annually - Check thermal insulation [intact & weather proofing]?  | Written Scheme QUEH CAMPUS-2024 Rev I Final                              | 1_WSC section 4.72 details need to check insulation.<br><br>[see additional comments in GGCAU40936C02].  | No recommendations.  | -   | -          | -                   | -        |
| 3.2.16 |           | Showers & Spray Taps - Quarterly [or as indicated by rate of fouling] - Dismantle, clean, descale [all parts, heads, roses, hoses]? | Written Scheme QUEH CAMPUS-2024 Rev I Final                              | 1_WSC does not appear to mention / include any reference to spray taps.<br><br>2_WSC section 4.61 details quarterly change of shower head and flexible hose.<br><br>[see additional comments in GGCAU40936C02].  | R3.13_Confirm there are no spray taps on across the estate. If they exist then quarterly clean and descale of spray tap / emergency shower heads needs to be defined in WSC. | Emergency shower heads flushed weekly as indicated in 4.46 and disinfected or replaced every 3 months as per 4.61 by DMA. No spray taps. Note added to written scheme 4.1.10 on spray taps. | K Clarkson | 30/05/2024          |          |
| 3.2.17 |           | POU Filters - Temporary control measure - record service start date and expiry date / replace filter date?                          | Written Scheme QUEH CAMPUS-2024 Rev I Final                              | 1_WSC section 4.65 details the use of POUF and their replacement either 31 days or 62 days.<br><br>2_There is no reference to recording locations or reference / serial numbers for POUF installed.<br><br>[see additional comments in GGCAU40936C02].   | R3.14_Update WSC to include the need to record locations and a process for referencing POUF installed.   | Changed to refer that DMA upload records to teams folder and record barcode information of previous and new filter.   | K Clarkson | 30/05/2024          |          |
| 3.2.18 |           | Base exchange softeners / Reverse Osmosis [RO] - Weekly - visual check of salt levels & hardness check?                             | Written Scheme QUEH CAMPUS-2024 Rev I Final<br>QUEH A&C RA Complete 2023 | 1_LRA details none identified.   | No recommendations.  | -   | -          | -                   | -        |
| 3.2.19 |           | Base exchange softeners / Reverse Osmosis [RO] - Annually - servicer and disinfect?   | N/A  | N/A  | N/A  | N/A   | N/A        | N/A                 | N/A      |
| 3.2.20 |           | Multiple use filters - backwash & regeneration as detailed by manufacturer?   | Written Scheme QUEH CAMPUS-2024 Rev I Final                              | 1_WSC section 3.3 details mains cold water filtration with the filters checked twice daily [section 4.33] with maintenance completed by contractor every 6 months [section 4.73].<br><br>2_It is noted by Kerr the filters on the backwash every 3 hours.<br><br>[see additional comments in GGCAU40936C02].   | R3.15_Update WSC to note the automated backwash frequency of the filters.  | Backwash information added to section 4.1.6   | K Clarkson | 30/05/2024          |          |
| 3.2.21 | 72        | Dead ends / cut off ends / redundant supplies - defined process outlining the need for removal with no T ends left in place.        | Written Scheme QUEH CAMPUS-2024 Rev I Final                              | 1_WSC does not appear to mention / include any dead ends / cut off ends / redundant supplies.<br><br>[see additional comments in GGCAU40936C02].   | R3.16_Update WSC outline how dead ends / cut off ends / redundant supplies shall be managed.   | Deadleg/dead end information added to 4.1.11 in essence these are added to a flushing regime until these can be removed.  | K Clarkson | 30/05/2024          |          |
| 3.2.22 |           | Flow Straighteners - Monthly / 6 M clean & disinfection / replacement?  | Written Scheme QUEH CAMPUS-2024 Rev I Final                              | 1_WSC section 4.62 details the replacement of Horne tap flow restrictors on a quarterly basis.<br><br>[see additional comments in GGCAU40936C02].  | R3.17_Confirm flow restrictors is the right component, suspect this should be flow straighteners. If flow straighteners then update the WSC with correct terminology.        | This has been changed to say flow straightener  | K Clarkson | 30/05/2024          |          |

| Part 3: Scheme of Control Measures & Support Schemes   |           |   |  |   |  |   |                     |                          |          |
|--|-----------|---|--|---|--|---|---------------------|--------------------------|----------|
| DATE APPRAISED: 26/04/2024   |           | CONSULTANT: Daniel Pitcher  |  | CLIENT CONTACT / INTERVIEWEES: Kerr Clarkson  |  |   |                     |                          |          |
| Observations / Notes:  |           |   |  |   |  |   |                     |                          |          |
| As part of the appraisal process the current Written Scheme of Control [WSC] for QUEH was provided and reviewed.   |           |   |  |   |  |   |                     |                          |          |
| The consultant is broadly assured on existence of control measures and monitoring [aka the scheme of control] relating to water safety, although, there needs to be improvements to processes to remove duplication and separation of some parts [aligning to a Water Safety Plan] so the document is more practical and less cumbersome. The recommendations below coupled with the 289x observations / feedback notes detailed in 'GGCAU40936C02 - assurance appraisal review comments on WSC QUEH'24 20240426' will assist with the document improvement. |           |   |  |   |  |   |                     |                          |          |
| Ref  | SCART ref | Aspect  | Relevant Document / Record   | Observation / Detail  | Recommendation   | Status Update   | Who                 | Proposed Completion      | Complete |
| 3.2.23   |           | Inline Filters - Monthly / 6 M clean & disinfection / replacement?  | Written Scheme QUEH CAMPUS-2024 Rev I Final<br>QUEH A&C RA Complete 2023 | 1_No such filters detailed in the LRA and no detail in the WSC.   | N/A  | N/A   | N/A                 | N/A                      | N/A      |
| 3.2.24   |           | TMVS - Annually - RA need for TMV?  | Written Scheme QUEH CAMPUS-2024 Rev I Final                              | 1_Scald risk assessment not completed.<br><br>2_WSC fails to detail the need for annual review of TMV need.<br><br>[see additional comments in GGCAU40936C02].  | R3.18_ An assessment of TMV need can be completed as part of the annual maintenance task, update the task to detail this assessment of whether the TMV is still needed at the outlet.        | Draft Scald risk assessment with H&S.<br>4.87 modified to include this for TMV review.  | H&S.<br>K. Clarkson | 24/05/2024<br>31/05/2024 |          |
| 3.2.25   | 46        | TMVS - Review TMV assets list for maintenance to ensure all are included?                                       | Written Scheme QUEH CAMPUS-2024 Rev I Final                              | 1_WSC fails to include an annual review of all TMV assets to confirm they are all included.<br><br>[see additional comments in GGCAU40936C02].  | R3.19_WSC to be updated to include an annual review of all TMV assets to ensure they are all included i.e. those removed in the year are not on the list and any new locations are included. | Section 4.89. added to written scheme   | K Clarkson          | 31/05/2024               |          |
| 3.2.26   | 58 / 59   | TMVs - 6M / Annually - inspect, clean, descales, disinfect device and strainers, check temperatures & failsafe? | Written Scheme QUEH CAMPUS-2024 Rev I Final                              | 1_WSC section 4.71 details 6 monthly failsafe test, including temperature checks and clean if scale build up.<br><br>2_WSC section 4.87 details an annual inspection of strainers / filters, clean and thermal disinfection.<br><br>[see additional comments in GGCAU40936C02].   | No recommendations.  | -   | -                   | -                        | -        |
| 3.2.27   |           | Expansion Vessels - Monthly / 6 M - Flush and purge to drain?   | Written Scheme QUEH CAMPUS-2024 Rev I Final                              | 1_WSC section 4.52 details monthly flush of the expansion vessel associated with DHW generators.<br><br>2_WSC section 4.81 details annual drain with hose of the expansion vessel and inspect internally, although no detail on how to complete these tasks.<br><br>3_WSC fails to detail any other type of expansion vessel associated with water systems i.e. cold water booster sets.<br><br>[see additional comments in GGCAU40936C02].   | R3.20_WSC to be updated with flush requirement for expansion vessels associated with other water systems.  | Added new section 4.46 to written scheme  | K Clarkson          | 31/05/2024               |          |
| 3.2.28   |           | Expansion Vessels - Bladders changed according to manufacturers detail.   | Written Scheme QUEH CAMPUS-2024 Rev I Final                              | 1_WSC does not detail bladder changes.<br><br>[see additional comments in GGCAU40936C02].   | R3.21_Confirm with expansion vessel manufactures if bladder changes are required and update the WSC accordingly.   | All expansion vessels except for new ones installed in Adults and Childrens are non maintainable and you only know these have failed when pressure guage reads low or where fitted rupture guage reads low. 4.52 updated to check rupture indicators. | K Clarkson          | 31/05/2024               |          |
| 3.2.29   |           | Calibration defined [digital thermometers / BMS sensors]?   | Written Scheme QUEH CAMPUS-2024 Rev I Final                              | 1_Section 2.5 details the need for calibration for all equipment used for temperature monitoring. It does not detail to what standard the calibration should be completed too, HSG274 part 2 details UKAS lab certified for calibration.<br><br>2_WSC section 4.74 details the need for calibration of ClO2 plant probes.<br><br>3_WSC section 4.85 details the need for annual calibration of all BMS sensors. It does not detail how this task is completed.<br><br>[see additional comments in GGCAU40936C02]. | R3.22_Update WSC with calibration standards and processes for completing calibration checks [BMS].   | Speak to both MCE and Schneider to provide details on this. Section modified to incate using UKAS lab certified equipment.  | C.McKechnie         | Jun-24                   |          |
| 3.2.30   |           |   | Written Scheme QUEH CAMPUS-2024 Rev I Final                              | 1_WSC details where BMS sensors are located, noting end of line locations, although these are not listed.<br><br>2_BMS system identifies the location of end of line locations.<br><br>[see additional comments in GGCAU40936C02].  | R3.23_Update the WSC with details of each building and the location of BMS sensors within each - this could be a list in the WSC or cross reference to another source.                       | Speak to both MCE and Schneider to provide details on this.   | C.McKechnie         | Jun-24                   |          |
| Section 3.3: Monitor & Inspect - Biocides  |           |   |  |   |  |   |                     |                          |          |



| Part 3: Scheme of Control Measures & Support Schemes   |           |   |   |   |  |  |            |                     |          |
|--|-----------|---|---|---|--|--|------------|---------------------|----------|
| DATE APPRAISED: 26/04/2024   |           | CONSULTANT: Daniel Pitcher  |   | CLIENT CONTACT / INTERVIEWEES: Kerr Clarkson  |  |  |            |                     |          |
| Observations / Notes:  |           |   |   |   |  |  |            |                     |          |
| As part of the appraisal process the current Written Scheme of Control [WSC] for QUEH was provided and reviewed.   |           |   |   |   |  |  |            |                     |          |
| The consultant is broadly assured on existence of control measures and monitoring [aka the scheme of control] relating to water safety, although, there needs to be improvements to processes to remove duplication and separation of some parts [aligning to a Water Safety Plan] so the document is more practical and less cumbersome. The recommendations below coupled with the 289x observations / feedback notes detailed in 'GGCAU40936C02 - assurance appraisal review comments on WSC QUEH'24 20240426' will assist with the document improvement. |           |   |   |   |  |  |            |                     |          |
| Ref  | SCART ref | Aspect  | Relevant Document / Record                  | Observation / Detail  | Recommendation   | Status Update  | Who        | Proposed Completion | Complete |
| 3.3.1  |           | Is the control level required known and recorded in the operations manual?                  | Written Scheme QUEH CAMPUS-2024 Rev I Final | 1_WSC details the use of ClO2 across some buildings. Although there is no description of the ClO2 systems installed, outlining the type / size / location of the systems. The control criteria of what is a minimum and maximum concentration are not detailed.<br><br>2_There is no reference to an operations manual to assist with this information.<br><br>[see additional comments in GGCAU40936C02].  | R3.24_WSC to be updated with specific details on the use, operation, maintenance, plant arrangement and control criteria for the ClO2 dosing plants. | Information added to section 4.1.5 on installation, monitoring arrangements and maintenance and O&M's. | K Clarkson | 31/05/2024          |          |
| 3.3.2  |           | Is the rate of release/rate of addition of biocide known and recorded?                      | Written Scheme QUEH CAMPUS-2024 Rev I Final | 1_WSC section 4.53 details monthly checks on ClO2 plant and representative outlets - NB two separate tasks with the same reference detail.<br><br>2_It is noted that Kerr detailed the ClO2 dosing plants are remotely monitored by the appointed contractor.<br><br>[see additional comments in GGCAU40936C02].  |  | Information added to section 4.1.5 on installation, monitoring arrangements and maintenance and O&M's. | K Clarkson | 31/05/2024          |          |
| 3.3.3  |           | Is the concentration of the biocide at sentinel outlets checked on a monthly basis?         | Written Scheme QUEH CAMPUS-2024 Rev I Final | 1_WSC section 4.51 details monthly check of ClO concentrations at outlets to be completed, although control criteria of what is a minimum and maximum concentration are not detailed.<br><br>[see additional comments in GGCAU40936C02].  | R3.25_WSC tasks to be updated with control criteria of what is a minimum and maximum concentration for outlets.                                      | Added information to 4.51 and made reference to thresholds in 4.1.5. and DMA procedures.               | K Clarkson | 31/05/2024          |          |
| 3.3.4  |           | Is the concentration of the biocide checked at representative outlets on an annual basis?   | Written Scheme QUEH CAMPUS-2024 Rev I Final | 1_WSC section 4.53 details check of ClO concentrations at representative other outlets to be completed, although control criteria of what is a minimum and maximum concentration are not detailed.<br><br>[see additional comments in GGCAU40936C02].   |  | Added information to 4.51 and made reference to thresholds in 4.1.5. and DMA procedures.               | K Clarkson |                     |          |
| Section 3.4: Monitor & Inspect - Other Risk Systems  |           |   |   |   |  |  |            |                     |          |
| 3.4.1  |           | Are other risk systems identified with detail on their required monitoring and maintenance. | Written Scheme QUEH CAMPUS-2024 Rev I Final | 1_WSC section 1.2 details other risk systems identified as part of risk assessments. The risk systems recorded being:<br>Ear irrigator,<br>Nebulisers,<br>Humidified Oxygen,<br>Optiflow Humidification for Mechanical Ventilators,<br>Flushing NG Tubes,<br>Rapid Infuser,<br>Home suction machine for palliative care,<br>Gastrostomy water/ACE device,<br>Continual nebuliser,<br>Humidified Oxygen,<br>Humidifier for NIV,<br>Pneumotach,<br>pH studies,<br>Liva Nova heater coolers,<br>ECMO heaters,<br>Rectal Irrigation<br>Arjo Baths,<br>Emergency Showers,<br>Irrigation Systems,<br>Emergency Cooling (MRI Chiller),<br>Closed Heating Systems,<br>Closed Chilled Systems,<br>Steam Humidification,<br>Air Conditioning/Ventilation<br>Decorative Bubble lamps<br>Hydrotherapy pools | R3.26_WSC of control to be updated with references / links to the maintenance process / manuals for these other risk systems.                        | Information added page 7 of written scheme and referencing SCART22 folder and water teams folder.      | K Clarkson | 31/05/2024          |          |
| Section 3.5: Sampling & Testing of Domestic Hot and Cold Water Systems   |           |   |   |   |  |  |            |                     |          |
| 3.5.1  |           | Defined circumstances when general microbiological sampling is required?                    | Written Scheme QUEH CAMPUS-2024 Rev I Final | 1_WSC section 4.1.6 details sampling and broadly outlines when samples should be taken.<br><br>[see additional comments in GGCAU40936C02].  | No recommendations.  |  |            |                     |          |

| Part 3: Scheme of Control Measures & Support Schemes   |           |   |   |   |   |  |                   |                     |          |
|--|-----------|---|---|---|---|--|-------------------|---------------------|----------|
| DATE APPRAISED: 26/04/2024   |           | CONSULTANT: Daniel Pitcher  |   | CLIENT CONTACT / INTERVIEWEES: Kerr Clarkson  |   |  |                   |                     |          |
| Observations / Notes:  |           |   |   |   |   |  |                   |                     |          |
| As part of the appraisal process the current Written Scheme of Control [WSC] for QUEH was provided and reviewed.   |           |   |   |   |   |  |                   |                     |          |
| The consultant is broadly assured on existence of control measures and monitoring [aka the scheme of control] relating to water safety, although, there needs to be improvements to processes to remove duplication and separation of some parts [aligning to a Water Safety Plan] so the document is more practical and less cumbersome. The recommendations below coupled with the 289x observations / feedback notes detailed in 'GGCAU40936C02 - assurance appraisal review comments on WSC QUEH'24 20240426' will assist with the document improvement. |           |   |   |   |   |  |                   |                     |          |
| Ref  | SCART ref | Aspect  | Relevant Document / Record                  | Observation / Detail  | Recommendation  | Status Update  | Who               | Proposed Completion | Complete |
| 3.5.2  |           | Defined procedures for the sampling process, handling and transportation of TVC samples and the subsequent reporting of TVC results?                        | Written Scheme QUEH CAMPUS-2024 Rev I Final | 1_A process on how to take a water sample does not appear to be present in the WSC. Samples are taken by the contractor.<br><br>[see additional comments in GGCAU40936C02].   | R3.27_WSC to be updated with SOP on sampling processes - how to take a sample, handling, storage, delivery.   | Reference added to 4.1.8 to agreed sampling protocols and RAMS   | K Clarkson        | 31/05/2024          |          |
| 3.5.3  |           | Is there a defined TVC sampling plan and is the plan on schedule?   | Water Mgt Rept Feb24                        | 1_Kerr shared an example of the monthly water management report [Feb24] and detailed the sampling plan each month and results and actions taken.<br><br>[see additional comments in GGCAU40936C02].   | R3.28_WSC to reference the sampling plan.   | Reference to sampling Plan (Appendix 2) added at section 4.1.8 sampling  | K Clarkson        | 31/05/2024          |          |
| 3.5.4  |           | Defined action levels for TVC sample results and appropriate recommended actions?   | Written Scheme QUEH CAMPUS-2024 Rev I Final | 1_WSC Appendix 2 details count ranges and limits. The term 'sample size' is used the sample result.<br><br>[see additional comments in GGCAU40936C02].  | R3.29_Consider changing the 'sample size' to 'Permissible Sample Result' in appendix 2.   | Wording changed  | K Clarkson        | 31/05/2024          |          |
| 3.5.5  | 55        | Defined circumstances when Legionella sampling is required?   | Written Scheme QUEH CAMPUS-2024 Rev I Final | 1_WSC section 4.1.6 details sampling and broadly outlines when samples should be taken.<br><br>[see additional comments in GGCAU40936C02].  | No recommendations.   | -  | -                 | -                   | -        |
| 3.5.6  | 55        | Defined procedures for the sampling process, handling and transportation of Legionella samples [BS7592] and the subsequent reporting of Legionella results? | Written Scheme QUEH CAMPUS-2024 Rev I Final | 1_A process on how to take a water sample does not appear to be present in the WSC. Samples are taken by the contractor.<br><br>[see additional comments in GGCAU40936C02].   | [See R3.27]   | Reference added to 4.1.8 to agreed sampling protocols and RAMS   | K Clarkson        | 31/05/2024          |          |
| 3.5.7  | 56        | Is there a defined Legionella sampling plan and is the plan on schedule?  | Water Mgt Rept Feb24                        | 1_Kerr shared an example of the monthly water management report [Feb24] and detailed the sampling plan each month and results and actions taken.<br><br>[see additional comments in GGCAU40936C02].   | [See R3.28].  | -  | -                 | -                   | -        |
| 3.5.8  | 56 / 57 / | Defined action levels for Legionella sample results and appropriate recommended actions?  | Written Scheme QUEH CAMPUS-2024 Rev I Final | 1_WSC section 5.4 details positive legionella test results.<br><br>2_This section details when legionella samples are to be taken, the locations and action required.<br><br>3_The table of actions is taken from HSG274 part 2 and is very limited in detail on actions to take when compared with the HTM04-01 part B table for actions with legionella samples.<br><br>[see additional comments in GGCAU40936C02]. | R3.30_Consider the use of the legionella action table and high repeat counts flow chart from HTM04-01 part B which is far more detailed and helpful with greater count ranges and actions for pre and post samples. | Table changed  | K Clarkson        | 31/05/2024          |          |
| 3.5.9  | 65        | Defined processes for augmented care [inc. neonatal / ICU / Burns / Renal] to minimise risk to patients.  | Written Scheme QUEH CAMPUS-2024 Rev I Final | 1_WSC section 5.8 Pseudomonas SOP is noted a procedure for minimising the risk to patients. The SOP does not provide any practical guidance or strategies on how to protect patients, the SOP merely details flushing of outlets and keeping records.<br><br>[see additional comments in GGCAU40936C02].  | R3.31_WSC to be updated to be updated with practical guidance on how to minimise the risk to patients and practical approaches to resolving positive water sample results i.e. see HTM04-01 Part C.                 | Clinical Assessment SOP already in place. Draft risk assessment in place for local areas. Require confirmation of review of outlets. | Infection Control | Jun-24              |          |
| 3.5.10   |           | Defined circumstances when PSA sampling is required?  | Written Scheme QUEH CAMPUS-2024 Rev I Final | 1_WSC section 4.1.6 details sampling and broadly outlines when samples should be taken - although this does not explicitly state requirement for PSA.<br><br>Appendix 2 details areas where PSA samples should be taken, although no detail on sampling need i.e. a frequency.<br><br>[see additional comments in GGCAU40936C02].   | R3.32_WSC to be updated to include detail on sampling plan and criteria for PSA samples to be taken.  | Frequency is in table for all samples is within Appendix 2 and further details of sampling added to 4.1.8.                           | K Clarkson        | 31/05/2024          |          |

| Part 3: Scheme of Control Measures & Support Schemes   |           |  |   |  |  |  |            |                     |          |
|--|-----------|--|---|--|--|--|------------|---------------------|----------|
| DATE APPRAISED: 26/04/2024   |           | CONSULTANT: Daniel Pitcher   |   | CLIENT CONTACT / INTERVIEWEES: Kerr Clarkson   |  |  |            |                     |          |
| Observations / Notes:  |           |  |   |  |  |  |            |                     |          |
| As part of the appraisal process the current Written Scheme of Control [WSC] for QUEH was provided and reviewed.   |           |  |   |  |  |  |            |                     |          |
| The consultant is broadly assured on existence of control measures and monitoring [aka the scheme of control] relating to water safety, although, there needs to be improvements to processes to remove duplication and separation of some parts [aligning to a Water Safety Plan] so the document is more practical and less cumbersome. The recommendations below coupled with the 289x observations / feedback notes detailed in 'GGCAU40936C02 - assurance appraisal review comments on WSC QUEH'24 20240426' will assist with the document improvement. |           |  |   |  |  |  |            |                     |          |
| Ref  | SCART ref | Aspect   | Relevant Document / Record                  | Observation / Detail   | Recommendation   | Status Update  | Who        | Proposed Completion | Complete |
| 3.5.11   |           | Defined procedures for the sampling process, handling and transportation of <i>Pseudomonas aeruginosa</i> samples and the subsequent reporting of <i>Pseudomonas aeruginosa</i> results? | Written Scheme QUEH CAMPUS-2024 Rev I Final | 1_A process on how to take a water sample does not appear to be present in the WSC. Samples are taken by the contractor.<br><br>[see additional comments in GGCAU40936C02].  | [See R3.27]  | 4.1.8 now makes reference to the RAMS for these which is within SCART22 and Teams folder.  | K Clarkson | 31/05/2024          |          |
| 3.5.12   |           | Is there a defined <i>Pseudomonas aeruginosa</i> sampling plan and is the plan on schedule?  | Water Mgt Rept Feb24                        | 1_Kerr shared an example of the monthly water management report [Feb24] and detailed the sampling plan each month and results and actions taken.<br><br>[see additional comments in GGCAU40936C02].  | [See R3.28].   |  |            |                     |          |
| 3.5.13   |           | Defined action levels for <i>Pseudomonas aeruginosa</i> sample results and appropriate recommended actions?  | Written Scheme QUEH CAMPUS-2024 Rev I Final | 1_WSC Appendix 2 details limits for a permissible sample result, although there is no practical guidance on how to investigate / remedy positive results, other than flushing - WSC note 'refer to Pseudomonas guidance' although no detail on what or where this guidance is.<br><br>[see additional comments in GGCAU40936C02].  | [See R3.31].   | Appendix 2 now modified to clarify that Engineering aspects will be assessed and rectified where possible. This may include full maintenance and disinfection of outlets including identification and removal of outlets. Procedure did indicate a. Infection Control, regarding operating protocols and including but not limited to the cleaning and flushing regime or adding to the Wards little used outlet and flushing regime and to review with Wards. b. Facilities to review cleaning and flushing regimes. c. Microbiology to review any other any necessary actions. | K Clarkson | 05/06/2024          |          |
| Section 3.6: Remedial action when scheme is shown not to be effective  |           |  |   |  |  |  |            |                     |          |
| 3.6.1  | 57        | Have the circumstances when the cleaning and disinfection of a water system would be appropriate been identified?  | Written Scheme QUEH CAMPUS-2024 Rev I Final | 1_WSC section 5.7 details disinfection of water systems and components.<br><br>2_Chemical and thermal disinfection are noted as options, although, the actual 'how to' is not defined.<br><br>3_Terminology includes 'sterilisation' with an explanation - not possible to make water system sterile.  | R3.33_WSC to be updated with SOPs for chemical and thermal disinfection methods that align with BS PD855468.   | Added - Agreed methodologies for the above must be agreed prior to works being carried out and signed of the Water AP.<br>Added - Clarification that sterilisation is not possible. Added to table out of spec at outlets over and above repairs, minor alterations, new supply pipework, system disinfection. Added a paragraph to include thermal, chemical spray and in line disinfection of outlets.   | K Clarkson | 05/06/2024          |          |
| 3.6.2  | 48 /      | Where thermal disinfection is defined is there a procedure detailed?   |   | 4_Reasons why disinfections to be completed is list along with a brief overview of the method.   |  |  |            |                     |          |
| 3.6.3  | 48 /      | Where chemical disinfection is defined is there a procedure detailed?  |   | [see additional comments in GGCAU40936C02].  |  |  |            |                     |          |
| 3.6.4  |           | Have POU filters been defined as a remedial action, does this method detail their use and recording of start date and replacement?   | Written Scheme QUEH CAMPUS-2024 Rev I Final | 1_WSC section 1.3 details where POU Filters are installed - there is no explanation on why they are fitted.<br><br>2_WSC section 4.65 details the use of POUF and their replacement either 31 days or 62 days.<br><br>3_There is no reference to recording locations or reference / serial numbers for POUF installed.<br><br>4_WSC appendix 2 details when water samples return out of specification results a POUF is installed. The step down procedure detailing when to remove a POUF is located at the start of the Appendix section and not next to the section detailing when to install.<br><br>[see additional comments in GGCAU40936C02]. | [See R3.11]  | Added information to section 4.1.6 indicating use of filters and why and referencing location of RAMS for swapping filters. Also added information to 4.65.  | K Clarkson | 31/05/2024          |          |
| Section 3.7: H&S Information & Incident Planning   |           |  |   |  |  |  |            |                     |          |
| 3.7.1  | 57 / 63   | Major plant failure, e.g. chemical system failure or power failure or water supply quality/quantity failure?   | Written Scheme QUEH CAMPUS-2024 Rev I Final | 1_WSC section 5.0 Incidents & Emergency Procedures outlines failure in control measures including failure in temperature control, positive legionella result.<br><br>2_WSC does not detail a loss in mains cold water supply nor does it detail the loss of control of the ClO2. These may be supplementary documents / SOPs?  | R3.34_Confirmation that additional SOPs exist for the loss of mains cold water and loss of control of ClO2, if they are then these need to be referenced in the WSC. | Added reference to Section 5 for loss of water and ClO2 and reference to emergency plan with Scottish water (in teams folder) and contacts for Scotmas for ClO2.   | K Clarkson | 31/05/2024          |          |
| 3.7.2  | 57        | Very high levels or repeat positive water analyses for Legionella?   | Written Scheme QUEH CAMPUS-2024 Rev I Final | 1_WSC does not detail a process for very high levels or repeat positive counts of legionella.  | [See R3.30].   | Modified to follow HTM04-01 table  | K Clarkson | 31/05/2024          |          |

| Part 3: Scheme of Control Measures & Support Schemes   |           |  |   |  |  |   |            |                     |          |
|--|-----------|--|---|--|--|---|------------|---------------------|----------|
| DATE APPRAISED: 26/04/2024   |           | CONSULTANT: Daniel Pitcher   |   |  | CLIENT CONTACT / INTERVIEWEES: Kerr Clarkson                           |   |            |                     |          |
| <p><b>Observations / Notes:</b><br/>As part of the appraisal process the current Written Scheme of Control [WSC] for QEUH was provided and reviewed.</p> <p>The consultant is broadly assured on existence of control measures and monitoring [aka the scheme of control] relating to water safety, although, there needs to be improvements to processes to remove duplication and separation of some parts [aligning to a Water Safety Plan] so the document is more practical and less cumbersome. The recommendations below coupled with the 289x observations / feedback notes detailed in 'GGCAU40936C02 - assurance appraisal review comments on WSC QEUH'24 20240426' will assist with the document improvement.</p> |           |  |   |  |  |   |            |                     |          |
| Ref  | SCART ref | Aspect   | Relevant Document / Record                  | Observation / Detail   | Recommendation   | Status Update   | Who        | Proposed Completion | Complete |
| 3.7.3  | 57        | An outbreak of legionellosis, suspected or confirmed as being centred at the site?   | Written Scheme QEUH CAMPUS-2024 Rev I Final |  |  | Added information pertaining to PAG and IMT and reporting governance. | K Clarkson | 05/06/2024          |          |
| 3.7.4  | 57        | An outbreak of legionellosis, the exact source of which has yet to be confirmed, but which is believed to be centred in an area which includes the site? | Written Scheme QEUH CAMPUS-2024 Rev I Final | 1_WSC does not detail a outbreak actions for legionella. This may be supplementary documents / SOPs? | R3.36_Confirmation that additional SOPs exist for outbreak situations. | Added information pertaining to PAG and IMT and reporting governance. | K Clarkson | 05/06/2024          |          |

| Part 4: Operational & Performance Records                               |              |   |   |  |   |   |                        |                     |          |
|---|--------------|---|---|--|---|---|------------------------|---------------------|----------|
| DATE APPRAISED: 16/05/2024  |              | CONSULTANT: Daniel Pitcher  |   |  | CLIENT CONTACT / INTERVIEWEES: Kerr Clarkson / Matthew Feeney   |   |                        |                     |          |
| Ref   | SCART ref    | Aspect  | QUEH - Adults<br>32Cal01/02/03 - 6th flr  | QUEH - T&L<br>Cal04.04 - Asset ID 1452   | Recommendation  | Status Update   | Who                    | Proposed Completion | Complete |
| <b>Section 4.1: Domestic Hot &amp; Cold Water Systems - Temperature</b> |              |   |   |  |   |   |                        |                     |          |
| 4.1.1   |              | Calorifiers - Annually - internal inspection, drain, cleaned subject to findings?                                   | Estates CPs<br>Scheduled annually on FM First Dec 21/22/23<br>Not completed in Dec23 - email thread relating to previous inspections ID no issues there RA to adjust frequency out to a longer time.  | Estates CP<br>Nov23 - overdue / not done - no drain valves<br>Nov22 - completed.   | R4.01_Frequency of inspections for internal inspections & drain valve flushing to be reviewed and updated to a new frequency.<br><br>R4.02_Monitoring forms to be specific to each system i.e. if no drain valves then do not include drain valve flush on form or a note detailing not to include. | The calorifiers within Teaching and Learning do not have the capability to drain. Team requested to note this on checksheets  | K. Clarkson            | 31/05/2024          |          |
| 4.1.2   |              | Calorifiers - Quarterly for healthcare - drain flush sample for clarity, quantity of debris & temperature checked?  | Estates CPs<br>Drain valve flush completed as part of the monthly temperature monitoring. Completed forms reviewed ID flush completed.  | Estates CP<br>Drain valves are flushed with the monthly flow and return - form includes task for flush - although on the records reviewed the flush was not completed.                         | [See R4.01].  | The calorifiers within Teaching and Learning do not have the capability to drain. Team requested to note this on checksheets  | K. Clarkson            | 31/05/2024          |          |
|   |              |   |   | DMA<br>Monthly monitoring completed by DMA who report there is 'no drain valve' on the base of the cal.  | -   | -   | -                      | -                   | -        |
| 4.1.3   | 34 / 37 / 52 | Calorifiers - Monthly - Flow temperature @ 60Deg.C. Return temperature @ 50Deg.C.?                                  | Estates CPs<br>Records for Aug - Mar on file BUT Oct / Dec / Jan / Mar missing<br>Temps listed are ok.  | Estates CP<br>New folder set up for 2024 - 4 sheets - not dated, no name, not signed, not reviewed.<br><br>Flow and return temps taken - these are compliant.                                  | [See R3.02b]<br><br>R4.03_Missing records to be found and stored.   | Team requested to upload records  | K. Clarkson            | 06/06/2024          |          |
|   |              |   |   | DMA<br>Monthly records for Jan24 - Apr24 reviewed.<br>Jan F 57 / Feb R 49 / Mar F 59 R 54 / Apr R 54.<br><br>BMS check " 1352hrs = F 61 / R 56 - review of last 24hrs shows seesaw 61-59Deg.C. | -   | These are stap sensors. Schneider requested to check sensors  | K. Clarkson            | 06/06/2024          |          |
| 4.1.4   | 36 / 51      | DHW System - Monthly - sentinel [nearest & furthest outlets on non circulating systems] @ 55/50Deg.C. within 1 min? | DMA complete<br>Jan - May spreadsheets - would appear that the tests are done several times in the month, reportedly the nos of locations to be checked means the checks completed are spread over several weeks.<br>Includes cold / hot / mixed / CIO2 - it is not possible to open the IPS panel to take the return temp as such another outlet is checked [unblended].<br>The sheet highlights non compliant temps - there is no formal reporting - only verbal communication to Supervisor.<br>Original Sentinel list IDs approx. 170 sentinel locations - which are split into 3 batches to be completed each week - the unblended outlets are the representative and the BMS EOL readings - these can be viewed online and the system saves a temperature every 1 hour. | DMA<br>Jan - low DHW temps<br>Feb - good temps<br>Mar - 3rd flr low DHW temps<br>Apr - low DHW temps<br><br>No evidence of escalation for the low temps.                                       | [See R3.02c].   | DMA have been requested to restart the provision of the traffic light report to be sent to the Lead AP so that actions are formally recorded  | K. Clarkson            | 31/05/2024          |          |
| 4.1.5   | 36 / 51      | DHW System - Monthly - Return legs of principal loops [sentinel points] @ 50/55Deg.C. within 1 min?                 | Loops not monitored   | Loops not monitored  | [See R3.09]   | Primary cold and primary hot flow and return monitored via BMS for both Adults and TLC. Secondary cold and secondary flow monitored in Adults. It is not possible to access tertiary loops as behind panels and above ceilings. Trialing software and remote sensors in two areas in July 2024. | M.MacMillan            | 31/07/2024          |          |
| 4.1.6   | 36 / 51      | DHW System - Quarterly - Return legs of subordinate loops [sentinel points] @ 50/55Deg.C. within 1 min?             | Loops not monitored   | Loops not monitored  | [See R3.09]   | Primary cold and primary hot flow and return monitored via BMS for both Adults and TLC. Secondary cold and secondary flow monitored in Adults. It is not possible to access tertiary loops as behind panels and above ceilings. Trialing software and remote sensors in two areas in July 2024. | M.MacMillan            | 31/07/2024          |          |
| 4.1.7   |              | DHW System - Representative selection of other points [tertiary loops / outlets] @ 50/55Deg.C. within 1 min?        | It is reported that DMA complete a selection of additional temperatures   | It is reported by DMA that sentinel locations are not known. They report to complete all outlets once in the year.<br><br>There is no current risk assessment or schematic.                    | [See R2.02]   | Risk Assessment for TLC was last carried out in 2018 and due in 2024, schematic will be provided as part of requirements.   | A.Gallacher / M Feeney | 31/08/2024          |          |
| 4.1.8   |              | POU water heaters [< 15L] - monthly / 6m - temperatures operate 50-60/55-60Deg.C.                                   | N/A - reported not to be used KC.   | DMA monthly records show POU WH as some of the outlets. No definitive asset list of all POU WH.<br>3rd flr - instantaneous WH in disabled WCs.   | [See R2.08 & R2.09].  | POU filter records inclding swap out barcodes is uploaded to water teams folder by DMA and has been for number of years including locations.  | Kerr Clarkson          | 31/05/2024          |          |
| 4.1.9   |              | Combination WH - Annually - Inspect cold tank & actions for DHW venting back?                                       | N/A - reported not to be used KC.   | N/A - reported not to be used KC.  | N/A   | N/A   | N/A                    | N/A                 | N/A      |
| 4.1.10  |              | Combination WH - Monthly - temperatures operate 50-60/55-60Deg.C.?  | N/A - reported not to be used KC.   | N/A - reported not to be used KC.  | N/A   | N/A   | N/A                    | N/A                 | N/A      |

| Part 4: Operational & Performance Records                 |           |  |   |   |                |   |               |                     |          |
|---|-----------|--|---|---|----------------|---|---------------|---------------------|----------|
| DATE APPRAISED: 16/05/2024                                |           | CONSULTANT: Daniel Pitcher   |   | CLIENT CONTACT / INTERVIEWEES: Kerr Clarkson / Matthew Feeney   |                |   |               |                     |          |
| Ref   | SCART ref | Aspect   | QUEH - Adults<br>32Cal01/02/03 - 6th flr  | QUEH - T&L<br>Cal04.04 - Asset ID 1452  | Recommendation | Status Update   | Who           | Proposed Completion | Complete |
| 4.1.11  |           | Cold Water Tanks - Annually - Inspect and complete remedial works where necessary?   | Completed by DMA - no asset IDs no PPMs - separate Service Delivery Planner controlled. Completed every 3 months. | Completed by DMA - no asset IDs no PPMs - separate Service Delivery Planner controlled. Completed every 3 months.<br>4x tanks T&L. 2x Cat5 and 2x Domestic. One of each type is off line.<br>28/03/24 inspected.<br>03/02/24 C&D completed - annual regardless.<br><br>30/03/23 & 30/06/23 & 28/09/23 & 15/12/23- inspected<br>29/06/23 C&D completed - | [See R3.12]    |   |               |                     |          |
| 4.1.12  |           | Cold Water Tanks - Annually - check tank water temperature remote of ball valve & MCW?   | Make up temp and stored temps recorded and compliant.   | Make up temp and stored temps recorded and compliant.   | -              | -   | -             | -                   | -        |
| 4.1.13  | 51        | CW System - sentinel [nearest & furthest outlets] <20Deg.C. within 2 mins?   | see 4.1.4   | see 4.1.4   | -              | -   | -             | -                   | -        |
| 4.1.14  | 54        | CW System - Representative selection of other points <20Deg.C. within 2 mins?  | see 4.1.7   | see 4.1.7   | -              | -   | -             | -                   | -        |
| 4.1.15  | 29        | CW System - Annually - Check thermal insulation [intact & weather proofing]?   | Ins checks part of tank inspection  | Ins checks part of tank inspection  | -              | -   | -             | -                   | -        |
| 4.1.16  |           | Showers & Spray Taps - Quarterly [or as indicated by rate of fouling] - Dismantle, clean, descale [all parts, heads, roses, hoses]?            | Not appraised.  | No asset list to confirm - had to check floor plan drawings to confirm if showers were on site.<br>No showers on site - although an emergency eye wash unit was found - it is reported this enclosed device does have rose head inside.   | [See R3.13]    | Asset list does exist in water teams folder however this does not include all assets such as taps and showers. Asset list will be provided when move to online software | Kerr Clarkson | 30/09/2024          |          |
| 4.1.17  |           | POU Filters - Temporary control measure - record service start date and expiry date / replace filter date?                                     | KC detailed DMA records detail POU change.  | N/A - reported not to be used KC.   | [See3.14]      | POU filter records inclding swap out barcodes is uploaded to water teams folder by DMA  | Kerr Clarkson | 31/05/2024          | -        |
| 4.1.18  |           | Base exchange softeners / Reverse Osmosis [RO] - Weekly - visual check of salt levels & hardness check?  | N/A - reported not to be used KC.   | N/A - reported not to be used KC.   | N/A            | N/A   | N/A           | N/A                 | N/A      |
| 4.1.19  |           | Base exchange softeners / Reverse Osmosis [RO] - Annually - servicer and disinfect?  | N/A - reported not to be used KC.   | N/A - reported not to be used KC.   | N/A            | N/A   | N/A           | N/A                 | N/A      |
| 4.1.20  |           | Multiple use filters - backwash & regeneration as detailed by manufacturer?  | KC detailed backwash is automated every 3 hrs.  | MCW is not filtered in to T&L.  | -              | -   | -             | -                   | -        |
| 4.1.21  | 45 / 70   | Infrequently Used Outlets - is there a schedule of such outlets and is this reviewed by the OWG / WSG to ensure accuracy and required actions? | Not appraised.  | Completed by DMA. Bid signing in book shows DMA staff signing in. Records show outlets on the 3rd flr flushed twice weekly - 100+ returned flushing records from Jan - May24.   | -              | -   | -             | -                   | -        |
| 4.1.22  | 44 / 71   | Infrequently Used Outlets - daily [aug care] / weekly / 2x weekly - flush outlet until temperature stabilises comparable to supply of water?   | Not appraised.  | Completed by DMA. Bid signing in book shows DMA staff signing in. Records show outlets on the 3rd flr flushed twice weekly - 100+ returned flushing records from Jan - May24.   | -              | -   | -             | -                   | -        |
| 4.1.23  |           | Flow Straighteners - Monthly / 6 M clean & disinfection / replacement?   | Not appraised.  | Not appraised.  | -              | -   | -             | -                   | -        |
| 4.1.24  |           | Inline Filters - Monthly / 6 M clean & disinfection / replacement?   | N/A - reported not to be used KC.   | N/A - reported not to be used KC.   | N/A            | N/A   | N/A           | N/A                 | N/A      |
| 4.1.25  |           | TMVS - Annually - RA need for TMV?   | Not risk assessed annually.   | Not risk assessed annually.   | [SR3.18].      | 4.87 modified to include this for TMV review.   | Kerr Clarkson | 31/05/2024          |          |
| 4.1.26  | 58 / 59   | TMVs - 6M / Annually - inspect, clean, descales, disinfect device and strainers, check temperatures & failsafe?                                | Not appraised.  | Not appraised.  | -              | -   | -             | -                   | -        |
| 4.1.27  |           | Expansion Vessels - Monthly / 6 M - Flush and purge to drain?  | Not appraised.  | Not appraised.  | [See 3.20].    |   |               |                     |          |
| 4.1.28  |           | Expansion Vessels - Bladders changed according to manufacturers detail?  | Not appraised.  | Not appraised.  | [See 3.21].    |   |               |                     |          |
| Section 4.2: Domestic Hot & Cold Water Systems - Biocides |           |  |   |   |                |   |               |                     |          |
| 4.2.1   |           | Is the control level required known and recorded in the operations manual?   | KC detailed completed contractor Scotmas. The dosing systems are remotely monitored as well.                      | N/A - Kerr details not used in T&L.   | -              | -   | -             | -                   | -        |
| 4.2.2   |           | Is the rate of release/rate of addition of biocide known and recorded?   | KC detailed completed contractor Scotmas. The dosing systems are remotely monitored as well.                      | N/A - Kerr details not used in T&L.   | -              | -   | -             | -                   | -        |
| 4.2.3   |           | Is the concentration of the biocide at sentinel outlets checked on a monthly basis?  | Not appraised.  | N/A - Kerr details not used in T&L.   | [See R3.25]    |   |               |                     |          |
| 4.2.4   |           | Is the concentration of the biocide checked at representative outlets on an annual basis?  | Not appraised.  | N/A - Kerr details not used in T&L.   | [See R3.25]    |   |               |                     |          |

## EXECUTIVE SUMMARY

### **OPENING COMMENTARY:**

There is a very engaged culture for Water Safety within QEUH. As part of this appraisal time was spent several members of the Estates and Compliance team who assisted with evidencing documents and data, it was very obvious this team have an appetite and willingness to delivery excellent water safety management for the QEUH. This positive culture is often lacking from organisations.

The appraisal focused on four key areas of waters safety [see below] as they are keystones in a Water Safety Plan.

### **Governance:**

Governance arrangements are detailed in the Policy document and the control measures for QEUH are detailed in the Written Scheme of Control document. These documents have been developed over the years, where such documents had an initial focus when first drafted on 'legionella'. In the last eight years there has been the move from '*legionella*' to a more wider term 'water safety'. As part of the pre-appraisal review of these documents recorded 130 comments for the policy and 289 comments for the written scheme of control and no Water Safety Plan [WSP]. As part of the verification appraisal for the Board the Policy and Written Scheme of Control documents have been refined and improved, there is a WSP in development pulling together many of the existing water safety documents, processes and procedures under the 'wing' of a WSP.

### **Risk:**

*A well prepared Water Safety Plan following BS8680 will include a 'water hazards' analysis matrix for biological, physical, chemical and radiological water hazards. A hazards matrix exists, hazards identified and risk assessments in place for most, although four hazards are still to be risk assessed as site specific level.*

*Legionella* risk assessments for QEUH A&C were complete in 2023. This risk assessment was undertaken by the incumbent contractor. These reports are very detailed in their recommendations from system inspections [which should be applauded]. The report does not appear to include an assessment of management arrangements, with limited assessment of monitoring arrangements [the same contractor who completed the risk assessments for QEUH also provides monitoring services and remedial works i.e. tank cleaning for the QEUH, there is a lack of impartiality and independence with this arrangement].

*Pseudomonas aeruginosa* risk assessments were completed in 2018, updated in 2023 and 2024, is the clinical assessment identifying this pathogen as a water hazard within the QEUH and the areas where patient groups most susceptible / at highest risk of infection are located. There is no site specific *Pseudomonas aeruginosa* risk assessment for these identified areas, there is a clinical operational assessment tool defined which needs to be completed to inform this overall assessment of risk, along with the need for an engineering assessment of the outlets in these areas to also inform this overall assessment of risk.

Scalding is one example of a 'physical' water hazard. Despite the lack of a scald risk assessment for QEUH, outlets are protected with TMTs / TMVs. Although, change can occur with rooms and their use, as such outlet use and need may have changed i.e. Outlets in rooms may or may not require TMTs / TMVs as a result of the change. A scalding risk assessment risk is required to provide an informed status of the actual risk.

### **Records:**

Records are one of the most important piece of evidence to provide assurance! There are an abundance of records relating to water safety!! The 'Water Safety' Teams Channel which has been created now pools records that previously existed in several locations [Teams Channels / Smartsheet's / SCART sheet / Estates shared drive / local PCs]. The 'Water Safety' Teams Channel is supported by a document map, it follows the structure for the WSP and very intuitive to work through to find appiccate records. The development to such a repository by members of the team truly demonstration a willingness and appetite for excellent water management.

### **Monitoring & Maintenance:**

These activities are completed by a blend of NHSGGC estates staff or contractors. These tasks are driven from two sources FM First and Contractors QEUH Planner V8 2024. Not all of the assets are on FM First i.e. cold-water tanks, hence the existence of the Contractors Planner. Monitoring tasks are issued via a PDA [at best the PDA is a scheduling tool] although the task detail and findings are captured on paper records, which are scanned and saved on to the 'Water Safety' Teams Channel. Suffice to say there is a 'huge' volume of monitoring records - 1000s of sheets of paper now documents which are named with a date and area. The manual review of these records to establish assurance on water system performance as well as identify any issues / problems for fixing is an exceptionally time consuming ongoing task, with room for some human error i.e. a missed non compliant occurrence. Updates provided through the verification appraisal confirmed that 'ZetaSafe' which is automated / electronic monitoring system for data capture has been procure and will provide greater transparency and efficient data recall / review.

Overall assurance on water safety is 'good', there are opportunities for improvement with risk assessments [which are a work in progress].

| <b>EXECUTIVE SUMMARY</b>  |  |  |
|---|--|--|
| <b>ASSURANCE APPRAISAL ELEMENTS</b>                             | <b>ASSURANCE RATING &amp; SUMMARY</b>  |  |
| Part 1: Governance Arrangements                                 | <b>Assured:</b><br>- Policy: Current draft 'V5' is very detailed and comprehensive. Pending approval by Board WSG later in July!!  |  |
| Part 2: Risk Assessment / Risk Minimisation Scheme / Schematics | <b>Not assured:</b><br>- Water Hazards matrix defined, hazards assessed. Most hazards identified have been risk assessed, four hazards their risk assessments are to be progressed, two of those include...<br>- Pseudomonas aeruginosa risk assessments - a generic assessment of risk has been completed in 2018 and updated in 2023. Although a dept / ward site specific risk assessment still to be completed, which has been prepared although this needs to be informed through the completion of the clinical practices assessment tool and engineering assessment of the outlets.<br>- Scald risk assessment - a generic scald risk assessment available, although no site specific risk assessment exist. It is recognised that site specific risk assessments need to be completed by those in charge of areas.   |  |
| Part 3: Control Measures & Support Schemes                      | <b>Assured:</b><br>- Written Schemes of Control: Current draft 'K' is detailed and comprehensive, the core elements of water safety management are defined and covered. There are several areas which are under review to help enhance water safety management. There is work in the background with a Water Safety Plan which the WSC would be part of and ultimately would see a more dynamic output - an exciting development!  |  |
| Part 4: Records: Management & Operational Performance           | <b>Partially assured - [but not for lack of records]:</b><br><br>1) 'Water Safety' Teams Channel is well defined and structured. This acts as a central repository for all information and data relating to water safety [sign posts with links to source of data such as Smartsheet's. Still being developed and with time will include evidence and records relating to more sites.<br><br>2) Monitoring records are paper based, for NHSGGC estates task the records are filed in folders and for contractors the paper records are scanned and saved to appropriate folders within the 'Water Safety' Teams Channel. The available sources of data being paper records or electronic records requires some effort to piece together a picture of water system performance, which is achieved through periodic reports prepared members of the team to inform Water Safety Groups members and provide assurance.<br><br>3) PPM Tasks: Two source FM First and Contractors Delivery Spreadsheet. FM First only details the task and frequency, this is issued on PDA to NHSGGC CPs, who complete the task on paperwork and close down the task on FM First. Not all risk systems are on FM First such as tanks. Reporting at Water Safety Groups on the number of PPMs completed is not the correct assurance data as this not assurance on water system performance. For Contractors who complete monitoring work there is a Contracts Delivery Spreadsheet that details the tasks and frequency and what is required, paper records generated for the task and scanned and saved to the 'Water Safety' Teams Channel. There two very proactive projects in development, 1) remote water monitoring system for sentinel points and 2) electronic data capture for routine maintenance tasks. Both of these systems will provide live data more efficiently! |  |
| <b>+ Assured</b>  | <b>+/- Partially Assured</b>   | <b>- Not Assured</b>   |
| Management system element is in place and is effective.         | Management system element is in place, is working although improvements exist.   | Management system element is missing or is ineffective. Immediate efforts needed to establish / correct element. |



**EXECUTIVE SUMMARY**

**Executive Recommendations:**

- 1) Completion of the Water Safety Plan [WSP] [aligned with BS8680] – many elements of a WSP exist albeit these documents need to be refined and updated. A WSP gap analysis matrix has been developed to help steer what still needs to be prepared taking account of existing documents. [It is noted WSP is an agenda item for the Board WSG in September providing an overview and update on status]. **Suggested Deadline:3-6 months**
- 2) Risk assessments – water hazards matrix to be kept under review and updated at WSG. Completion of outstanding risk assessments - as noted above site specific risk assessments for Pseudomonas aeruginosa and scalding . **Suggested Deadline: within 3-6 months**
- 3) Records Management – Continued migration of records into 'Water Safety' Teams Channel with wider role out to other involved in water safety management across the estate. **Suggested Deadline: On-going.**
- 4) Deploy electronic data capture system for water system performance monitoring – Establish a mobilisation plan for ZetaSafe. As well as the identification of asset with barcodes for the system, establishing KPIs and reports, along with training in the system to for all those involved. **Suggested Deadline:6-12 months**

Over the following sheets there are more detailed recommendations that will help shape these Executive Recommendations.

*NB: This report is designed to be printed in A4 landscape.*

**NHS Greater Glasgow & Clyde  
Board Water Safety Group Meeting  
Tuesday 29<sup>th</sup> November 2022 at 2pm  
Via Microsoft Teams**

|                            |  |
|----------------------------|--|
| <b>Present:</b>            |  |
| Alexandra Marek (AM)       | Consultant Microbiologist for Infection Control          |
| Alan Gallacher (AG)        | Head of Corporate Estates                                |
| Linda Bagrade (LB)         | Consultant Medical Microbiologist                        |
| Lynn Pritchard (LP)        | Acting Nurse Consultant - Infection Control              |
| Sandra Devine (SD)         | Director of Infection Control                            |
| James Huddleston (JH)      | Assistant Head of Capital Planning                       |
| Chris Haddow (CH)          | Assistant Head of Estates (North /East/West Sector)      |
| Ian Kennedy (IK)           | Public Health Consultant                                 |
| Dennis Kelly (DK)          | NHSGG&C Authorising Engineer – Water                     |
| Jack Cairns (JC)           | Assistant Head of Estates Partnerships                   |
| Colin Purdon (CP)          | Assistant Head of Estates Clyde                          |
| Kerr Clarkson (KC) (Chair) | Site Manager – Operational Estates                       |
| Euan Smith (ES)            | Assistant Head of Estates (South)                        |
| Mark Riddell (MR)          | Assistant Director of Estates Operations                 |
| Helen Gemmell (HG)         | Assistant Director – Facilities and Production           |
| <b>In Attendance:</b>      |  |
| Allyson Barclay            | PA E&F   |
| <b>Apologies:</b>          |  |
| Natalia Hedo (NH)          | Business Manager – Infection Control                     |
| Billy Hunter (BH)          | Deputy Director Facilities and Corporate                 |
| Catriona Riddell (CR)      | Lead Nurse – Children’s Hospital                         |
| David Jordan (DJ)          | Quality, Health and Safety & Training Compliance Manager |
| Karina Correia (KC)        | Clinical Services Manager for Women and Children         |
| James Shepherd (JS)        | Microbiologist   |
| Sandra Higgins (SH)        | Service Manager – Microbiology                           |
| Freddie Warnock (FW)       | Head of Health and Safety                                |
| Allan Hughes (AH)          | Deputy Head of Health and Safety                         |
| Alistair Leanord (AL)      | Consultant Microbiologist                                |
| Mathew Feeney (MF)         | Trainee Compliance Manager                               |

| 1. | Apologies   | Action |
|----|---|--------|
|    | As noted above  |        |
| 2. | Previous Minute 27 <sup>th</sup> September 2022   |        |
|    | The minutes were agreed as an accurate record of the meeting.   | AB     |
| 3. | Rolling Action List/Matters Arising   |        |
|    | <p><b>Responsible Person for Water</b> – Agreed that the structure should align itself to SHTM. This will be structured on how we manage our sectors – MF/AG will prepare the information including the current policy and the wording. This would most likely be MR as Assistant Director.</p> <p><b>POUF Removal</b> – this to be updated to reflect KC responsible. Previously submitted for mass removal of these when these are previously fitted as a precaution and not due to any issue. SHTM only gives guidance on single filter removal following an outbreak and indicates filter can be removed after disinfection. As the guidelines indicate no mention of further sampling. If we were to follow the agreed procedure for a single POU removal this would generate 100+ samples per week to the labs for months and is unrealistic. The proposal is to sample from nearest, furthest and middle from the sentinel points for 3 occasions and if found to be clear then all POU can be removed with approval from IC. DK noted this is a common issue within other Board and that HPS or HFS may need to input to this but there is no harm in progressing ourselves at this time. Given the manpower and financial impact of having these POUF in areas that are of low patient risk that are not required given the information we have on water quality. This was agreed for low risk patient groups but for high risk patient groups would need further consideration and input from IC. IK asked that if the rationale was due to water issues or if it was issues with the taps should also be</p> | MR/AG  |

|    |   |                     |
|----|---|---------------------|
|    | <p>considered in the removal process – agreed. KC noted this would affect all areas of the Board. Agreed that for some areas there will be a need to continue to the process of sampling behind the filters where the filters were added for specific reasons. Suggested that a separate working group would be beneficial. AM noted sensible opinions given. A proper RA required and a review of the patient cohort ie 2A in RHC – sample every tap but in a general ward the beginning, middle and end option was appropriate but with evidence that the water in the hospital was good. Agreed that removal of POUF will still have samples taken but on an agreed basis.</p> <p><b>Water Fill Points</b> – RAH production of SBAR to be completed – CP to take forward Gartnavel – bid made for these and costs provided and should be forwarded for discussion at PASG for approval to proceed.</p> <p><b>Agreement on Taps</b> – KC reported that Delabie taps are currently going to being tested at QEUH. Once installed these will be removed after a number of months and sent to TWafter to analyse chlorine impact on these. The taps will be fitted to selected DSR areas out with clinical areas and it is known that these will have good water flow through. These will then be removed and analysed for any chemical attached and report back to this group. JC noted that Parkhead Hub are considering using these taps as well with samples being provided for review prior to decision. KC noted that during the selection process for the Marwick 21+ the Delabie was a close second although previously discounted for use due to the diffuser make up. KC indicated that the use of a TMT/TMV tap with a POU water heater would result in a potential dead leg from the Cold. Precaution is also required to ensure that there is sufficient time for heating based on footfall. Concerns on the use of these to ensure the tap is approved by the water heater company and that the Board approves these. DK suggested a quicker method of checking is to ask for a sample tap from a hospital which uses CL02 ensuring similar CL02 levels and time tap was in use. KC agreed to look into this as a possible option.</p> <p>CP raised SCART question – do these taps allow POUF and to consider the splashing issue. Are these questions answerable within SCART. AG noted that there will be taps within the Board that cannot take POUF so therefore we can only respond with what we know currently. When replacement sanitary items are required these are fin design to reduce the splash effects. The expectation is that the whole design process is reviewed for these issues. We have reviewed these matters at different points during renovations and any areas of non-compliance have been worked to rectify over the years.</p> <p>CP noted this would be for new installations only but with finned sinks designed to work with Marwick taps and if we use the Delabie taps it may not hit at the right point – KC confirmed that the centre is exactly the same. Capital Team and compliance have done some considerable work on this to ensure guidance is followed. Susan Lee Report which is being reviewed again questions raised taps are recommended to be demountable which Delabie are so therefore can be easily removed and replaced but noted there are other manufacturers who do similar design.</p> <p>JC noted that he has met recently with anti-ligature group who are reviewing specifications including taps – this spec has not been released and not clear if there have been discussions with Estates. We need to ensure that the BWSG are happy with this spec of tap. AG noted that the Delabie taps are for high risk area. It was noted that the previous reports of Marwick21+ taps showing evidence of chemical attack even in hospitals with no CL02 e.g. Inverclyde and Louisa Jordan. Taps in 2A have been checked and these are in good condition despite having been used with CL02 water. But these are still being reviewed for removal and changed to Delabie tap with a view that this will be the tap of choice for TMT mixer taps in the future for any refurbishment.</p> | <p>CP</p> <p>KC</p> |
| 4. | <b>Compliance</b>   |                     |
|    | <p><b>Water Risk Assessments (WRA)</b> – AG reported that WRA are still in date. But noted RAH is outwith the timeframe but some actions to be undertaken and there will be a round of WRA for site with around 60-65% actions completed. DMA have returned a long timescale for the QEUH completion and are being asked to improve this. GRI action plan in place, IRH 52% complete. GGH January 2020 - this is due another risk assessment. WRA are scheduled every two years within acute. VoL, Gartnavel and RAH will have a new WRA to ensure compliance with policy. AG noted the areas moving into a three year phase – not within acute but the larger hospital sites. Dykebar will have an WRA carried out. CP – WRA for laundry – no change to the system aside from the heat exchanger being installed and required an update to the RA is carried out. MR agreed to take forward. Decontamination site have WRA but AG noted that the report states there are remaining outstanding actions from the AP despite two years since the review. Estates Manager on these sites will be asked to progress and MF will assist in closing down these as necessary.</p>   | <p>MF</p>           |

|    |   |   |
|----|---|---|
|    | <p>AE Audits – DK is involved and is up to date. Most of these are still within their dates. Annual reviews are due to carry these out in the coming months. Dates are in place. DK asked about RA out with acute hospital – no these are carried out but where we are not carrying out WRA is in the health centres. AG clarified that we did carry out audit in all health centres as a base document – outcome of these causing any concern then WRA would be carried out with an AP working through these. It was noted that these are not carried out on the same frequency as Acute sites.</p> <p>Scottish Water Audit – this covers the bylaws from Scottish Water. Fragmented audits carried out across the Board. The last audit was at QEUH and there remains some outstanding actions from this to review and close down – KC to take forward.</p>   | KC                                      |
| 5. | <b>Sampling</b>   |   |
|    | <p>KC and AM met to review sampling procedure with a view to standardising across the Board. This would be for specific requirements for each of the sites and not all sampling for the same issues – KC agreed to circulate the outcome of this to members</p>   | KC                                      |
| 6. | <b>Sector Water Meetings (by exception)</b>   |   |
|    | <p><b>North</b> – out of spec reported at dental hospital – approval for a CL02 plant to be installed. IC doctor has yet to be appointed for the site</p> <p><b>Lightburn</b> – no indicators from recent out of spec for legionella and approve for CL02 plant which the minor works team are taking forward.</p> <p><b>PRM</b> – a number of out of spec – AP in place to resolve. Periodically some outlets out of spec – numbers are reflecting better but as a precaution POUF fitted to showers with on going twice weekly flushing and continual sampling</p> <p><b>Partnerships</b> – Beatson sampling – a programme in place for a number of years for legionella. 40 samples are taken on a quarterly basis – samples taken have all be clear and clarification of the sampling required is needed for this to continue if no longer required. It was thought this was a legacy from issues reported several years ago and these issues are thought to have been resolved. If the initial issues still there or are they now under control? There have been implemented better engineering controls for temp etc. If we do not have clear reason for sampling then what are we sampling for. LB agreed to work with estates to determine if we can reduce this and/or remove. LB suggested a small group meet including those who may remember why it was started and take through the governance groups and stop if found un wanted now.</p> <p><b>AE Audits</b> – a number of audits carried out at HSCP sites – a considerable number of actions and an exercise to be undertaken to reduce these. This has been discussed with compliance and AGA and MF will review with JC</p> <p><b>Fill Points</b> – communal fill point for Gartnavel site – RND facility requesting a fill point or temporary connection to the four hour storage tank. What are the regulations around this, what are the requirements of Scottish Water for this – agreed to discuss out with the meeting</p> <p><b>Clyde - RAH</b> – pseudomonas was found in staff toilet WHB – flushed and disinfected. Clear now and will continue to sample until satisfied clear. Delabie had offered automatic flushing taps but CP questioned the implication of self flushing in the Belfast water issues. DK noted the issues with flushing taps including water pull to the correct temperature. VoL – room 28 POUF installed and flushing undertaken – last 6 samples have been clear and removal of the POUF was reviewed under the recognised process. VoL room 24 positive – not retested and this has been progressed and will be retested. IRH – reported out of specs – staff on site to review. Little used outlets WS01 – reflecting lack of returns – and not improve across the sites.</p> <p><b>Bottled Water Coolers</b> – SLWG in place to replace these – Eden supplied a list with locations but is out of date and information contained within is out of date. IK asked if we are being changed for the machines and the supply of water to these – not clear. WS01 in Clyde has dropped by 5% and this information will be shared with the AICC and then escalated to the BICC and also with ICBEC. DK is carrying out training on 14<sup>th</sup> December for those staff with water responsibility this is to improve understanding of those areas who have responsibility particularly out with Estates e.g. Facilities, Clinical, Infection Control who have responsibilities, including responsibilities for flushing but may not currently fully understood the importance and duties.</p> <p>IK again raised the question of water coolers in hospices which were removed within Covid restrictions – can these be reinstated. National ICBEC have discussed this and noted the policy is</p> | <p>LB</p> <p>AG/MF /JC</p> <p>JC/AG</p> |

|           |   |   |
|-----------|---|---|
|           | <p>causing some confusion and updated guidance will be circulated. Agreed to minimise the installation of these where possible. Potentially a chilled unit could be fitted to tap assuming the water coming in is good. Agreed that SUP05 was not a good document and not clear. Any coolers being installed should have firstly had conversations with estates to ensure that the positioning is appropriate place for incoming feed and that the area/service are responsible for cleaning and maintenance of these and records are maintained. The control of the purchase of these needs to be tightened up to ensure that these are into installed inappropriately.</p> <p><b>South</b> – some legionella Species found in retained site. Gram negatives found on a number of outlets and work is underway to resolve. (although potentially retrograde colonisation). There were a large number of legionella positives in Maternity. However after investigation it appeared to be caused partly due to lack of flushing regime as temperatures were effected. Systems has been disinfected and outlets now clear. Discussion with Clinical and Facilities to ensure adequate flushing regime as per guidelines.</p> |   |
| <b>7.</b> | <b>GRI Environmental</b>  |   |
|           | There was no one in attendance to bring any matters to the meeting  | -                                       |
| <b>8.</b> | <b>AOCB</b>   |   |
|           | <p><b>Board Water Systems Policy</b> - expires in January 2023 – question on who should be reviewing this – MF will forward the updates</p> <p><b>Blue Green Algae</b> – RA – this needs to be carried out and returned to IK. RAH pond and Suds at QEUH are the two identified areas of Boards responsibility – AG will follow up with IK</p> <p><b>Derogation</b> – clarify the NHS Assure definition – betterment on what was specified if less than though and clinical team would need to review and accept the risk. Lesser than SHTM – this would be looked from clinical perspective of the technical then from hard FM and AE to say if this is acceptable equipment and same from clinical perspective if acceptable risk. AG will share the SOP from NHS Assure.</p> <p>HIS Inspection – ToR for water and ventilation group and an action to determine what happens when a member cannot attend then deputy was sent. Agreed a refresh of this as part of the action plan – KC will circulate for information</p>   | <p>MF</p> <p>AG</p> <p>AG</p> <p>KC</p> |
| <b>9.</b> | <b>Date of Next meeting</b>   |   |
|           | Next year's meetings are not yet set up as these need to filter into the AICC/BICC and these are not known at this time   | To note                                 |

**NHS Greater Glasgow & Clyde  
Board Water Safety Group Meeting  
Tuesday 24<sup>th</sup> January 2023 at 2pm  
Via Microsoft Teams**

|                            |  |
|----------------------------|--|
| <b>Present:</b>            |  |
| Alexandra Marek (AM)       | Consultant Microbiologist for Infection Control          |
| Alan Gallacher (AG)        | Head of Corporate Estates                                |
| Gillian Bowskill (GB)      |  |
| Lynn Pritchard (LP)        | Acting Nurse Consultant - Infection Control              |
| James Huddleston (JH)      | Assistant Head of Capital Planning                       |
| Chris Haddow (CH)          | Assistant Head of Estates (North /East/West Sector)      |
| Catriona Riddell (CR)      | Lead Nurse – Children’s Hospital                         |
| Dennis Kelly (DK)          | NHSGG&C Authorising Engineer – Water                     |
| Donald Bain (DB)           | Assistant Head of Estates Partnerships                   |
| Colin Purdon (CP)          | Assistant Head of Estates Clyde                          |
| Kerr Clarkson (KC) (Chair) | Site Manager – Operational Estates                       |
| Euan Smith (ES)            | Assistant Head of Estates (South)                        |
| Mark Riddell (MR)          | Assistant Director of Estates Operations                 |
| Helen Gemmell (HG)         | Assistant Director – Facilities and Production           |
| Mathew Feeney (MF)         | Trainee Compliance Manager                               |
| <b>In Attendance:</b>      |  |
| Allyson Barclay            | PA E&F   |
| <b>Apologies:</b>          |  |
| Natalia Hedo (NH)          | Business Manager – Infection Control                     |
| Billy Hunter (BH)          | Deputy Director Facilities and Corporate                 |
| David Jordan (DJ)          | Quality, Health and Safety & Training Compliance Manager |
| Karina Correia (KC)        | Clinical Services Manager for Women and Children         |
| James Shepherd (JS)        | Microbiologist   |
| Sandra Higgins (SH)        | Service Manager – Microbiology                           |
| Freddie Warnock (FW)       | Head of Health and Safety                                |
| Allan Hughes (AH)          | Deputy Head of Health and Safety                         |
| Alistair Leanord (AL)      | Consultant Microbiologist                                |
| Linda Bagraade (LB)        | Consultant Medical Microbiologist                        |
| Sandra Devine (SD)         | Director of Infection Control                            |
| Ian Kennedy (IK)           | Public Health Consultant                                 |

| 1. | Apologies   | Action   |
|----|---|----------|
|    | As noted above  |          |
| 2. | <b>Previous Minute 29<sup>th</sup> November 2022</b>  |          |
|    | The minutes were agreed as an accurate record of the meeting.   | AB       |
| 3. | <b>Rolling Action List/Matters Arising</b>  |          |
|    | <b>Board Responsible Person for Water</b> – AG reported the updated structure and policy. This will be brought this meeting to endorse the changes and have this updated  | AG       |
|    | <b>POUF Removal</b> – there is a procedure in place to remove these one at a time. Comments and approval required to remove these under a controlled environment and by more than one at a time. Clarification on the wards involved and this information will be shared with the wards and involve discussions with appropriate clinical and IC staff. Suggested a list of areas to be considered. With a clear path if there are any reported sample failures and what to do in the event of. An SOP will be created and circulated to this group for approval and involve NHS Assure for support and thereafter implemented. | KC       |
|    | <b>Water Fill Points</b> – CP noted that and SBar will be created for RAH and funding sought. CP noted there is no risk to site but will carry out this work to make it easier if needed. MR reported there was some funding from slippage and will be used for Gartnavel fill points – code has been issued and Donald Bain will take this forward   | CP<br>DB |
|    | <b>Agreement on Taps</b> – it was previously agreed that Delabie taps would be tested in DSRs in specified areas. Once agreed time has passed these will be removed and sent for testing analysis. Marwick will also be checked and comparisons carried out.  |          |

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|    | <p><b>Water Safety Training</b> – MR reported that this training was completed during December. MR reported that invitations were sent out but the training was poorly attended although there was good attendance from Estates, H&amp;S and Children’s hospital. ICN colleagues noted that there were other work pressures at the time. Agreed that further training would be offered if it was to be better attended. Feedback on this was good although most probably too technical for clinical teams. Agreed to look for further training which would be more targeted to clinical teams around March/April/May. CH asked if this would be rolled out to domestics. HG reported that unfortunately not many domestic supervisors had been able to participate and suggested tailored training for domestics to ensure this is clearly targeted at them. MR noted that the WS01 forms returns have increased in returns from RHC. It was noted that there will be a slight change in the forms to make these more accountable. It is clear that water safety is everyone’s responsibility</p> <p><b>Sampling Procedure</b> – KC noted this has been reviewed with (AM) and KC agreed to complete this by the end of January and circulate to members. This is to create a template which could be adopted across the GG&amp;C.</p> <p><b>RHIGH Literature</b> – Reported that comments have been returned – AM noted this is to be recirculated again but not yet seen the third version of this document.</p> | -<br><br>KC<br><br>- |
| 4. | <b>Compliance</b>  |                      |
|    | <p><b>Water Risk Assessment</b> – the spreadsheet detailing the water safety plan. Acute sites have clarification on the timings of these now being every 2 years. QEUH is currently on going. AG reviewed the document noting the works to be carried out. TSSU – RA in place but noted this was out of date. This will be brought into the 2 year programme. Non Acute sites RAs some were reporting to be outstanding it was noted these have had a review and some critical actions being undertaken with the others being reviewed with the output to reduce the actions significantly.</p> <p><b>Water Audits-</b> Work to ramp these up to fall in line with the policy and to conclude the works associated with action plans.</p> <p><b>Bylaws Conventions</b> – visits by Scottish Water – these are random visits with no schedule. These are not frequent and critical actions acted on immediately and others worked through Emergency Plans – Business Streams are meant to review these regularly. This has unfortunately lapsed and will be picked up. Response to significant water loss is prioritised but noted that we have other supportive areas of service that also need to ensure continual water supply ie TSSU, Laundry</p>   | 3                    |
| 5. | <b>Sampling</b>  |                      |
|    | <p>Discussed in RAL/Matters Arising and AG asked if there was a standardisation across the Board – a working group has been set up and first meeting held. Suggested a document was created for this group to review and AM agreed that an SBar should be provided to the next meeting. Where there was no further requirement these can be stopped. It was noted that extensive testing is carried out within QEUH particularly due to previous concerns with the water but the water quality is now found to be excellent. Are the continuous testing regimens required in all the areas or focus on the high risk areas or to where susceptible patients are located? CH asked about the clinical indicators for moulds in rooms and through to come from taps – and in the last few years and found to be bread mould and not water related.</p>   |                      |
| 6. | <b>Sector Water Meetings (by exception)</b>  |                      |
|    | <p>North CH noted that the last meeting had not progressed due to number of absences. CH highlighted the following –</p> <ul style="list-style-type: none"> <li>- PRM – out of spec returns – initially localised in one area and now spread to further areas. Guidance requested on way forward. DK noted he would respond separately on his advice. Noted this is being found within hot water. Suggested to bring forward the next sector water meeting forward to have full discussion and solution. Birthing Pools – not possible at this time to fit POUF so these have been be put out of use.</li> <li>- CL02 – funding provided for Lightburn, Dental and QED but noting that contractor is awaited for Dental and dental and Lightburn this is causing some concern</li> </ul> <p>Clyde minutes are included but CP noted</p> <ul style="list-style-type: none"> <li>- RAH – pseudomonas found within staff toilet and testing underway</li> <li>- IRH – positives for legionella – noted in action plan and continues to be managed</li> <li>- VoL – Healthcare for the elderly had out of spec results and POUF placed on showers and testing is underway</li> </ul>   |                      |

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|           | <p>South notes provided there were no exceptions to report and noted ES that some of the positives were potentially retrograde colonisation of outlets from external influences and not the system and not the water itself. And it was noted that in these out of spec results these may never be found and then never seen again particularly when found from POU filter samples. There were also a small number of legionella (not LP1) from the retained Estate.</p>   |   |
| <b>7.</b> | <b>GRI Environmental</b>   |   |
|           | There was no one in attendance to bring any matters to the meeting   | - |
| <b>8.</b> | <b>AOCB</b>  |   |
|           | <p><b>Birthing Pools</b> – noted in discussion above but CH noted that policy indicates three clear samples then return to service but what is the actual position – both engineering element and IC element. DK noted the concern is that it might turn up in other areas of the building as it appears to be sporadic. Legionella is potentially fatal to new borns and on this particular occasion we should keep them out of use but agreed this statement is a little woolly but still seeing these in other parts of the building we need to be certain. Suggested an SOP to ensure we act appropriately and agreed by the members to ensure good robust governance around this. CH noted the three clears is not a full proof method and may require further proposals to ie carry out checks again after an agreed period of time. It was agreed that we generally don't carry out three but usually more than this and agreed the 3 samples is arbitrary number and would should continue to check any areas of out of spec. DK noted that there is no science in the three checks and then move on. Likely driven by IC would request assurance for patients are in a low risk situation. Agreed it would be wise to hold off re opening the birthing pools given the situation.</p> <p><b>Contractors legionella training</b> – conflicting advice and needs some consistency across all the sites. Is there guidance or training courses for contractors to undertake? DK noted that there are training plans for plumbers etc – DK noted he provides specific courses and those that he has seen does not comply with requirements for the NHS but there are some out there commercially lead courses. JH noted that there is some broad agreement for our contractors to include within tenders going forward. And it was noted that if this goes to sub companies then we need to make sure this company is also trained to the appropriate levels required for Health water systems. AG noted that the plumbing framework – it was included in the levels of training and work practices for working on health boards water and should be same as our own plumbers and those other staff working within these systems and this should be reflected in all our contractors working within our sites with full sign off from the AE/AP from the Board.</p> <p><b>BS pseudomonas RA</b> – part 2 of the BS on RA – DK noted that all areas are struggling with this as it was a complex document – there are so many people involved in this and difficult to pull together the staffing needed for this. HPS are thought to be preparing a response to this and most Boards are waiting for this response. KC noted he reviewed this document – independent, understanding of engineering, microbiological and clinical examining every possible hazard within the environment and it was agreed not necessarily practical to progress and KC agreed to share the points from his review. AM – are RIHIGH endorsing it – this was an unknown at the moment and requires further clarification. KC uploaded his comments to the Teams Channel. AM – should we liaise with other Boards to determine what their thoughts are – the water systems literature review was part of this review of it. DK noted that Boards appear to be doing their own thing and particular to their own area and patient. KC noted on page 13 – RA for pseudomonas and other water particulates and does not include legionella. All</p> <p>Noted that this document may not be written by someone who manages a hospital water system and it is not clear if the person exists who can carry out these RAs. AM noted that we have triggers that indicate what we should do when we have particular results returned from testing of samples.</p> <p><b>Policy</b> – KC reviewed but not clear on secondary water systems, specialist water systems – this should be included and frequencies for these to be carried out – MF agreed to review and update – some areas carried out for specialised systems but can be updated. It should also be included in this the responsibilities for the people using or managing these areas and the RA would provide some of this. A better understanding of how these specialised water systems manage these – and it was thought that these would have specialised cleaning routines and disinfection protocols. DK noted experience on other dental hospital which included the Board, dental departments and the University training the students – where does the responsibility for these stop – from the mains to the chair and thereafter the area themselves are then responsible and agreed that this needs to be made clear to all involved.</p> |   |



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|    | <p><b>Water Safety Plans</b> - CP – noted from previous sector meetings – cross check on water safety plans being compliant with BS8680. The HSE 274 document defines what should be in these documents and similar to the BS document. Agreed that the water safety plans are not in a good state previously but are not in a good condition with nothing seen that causes any concerns.</p> <p><b>Blue Algae RA</b> – this is related to the SUDs on some of our sites. This water is not linked to our incoming water and is there a need for this RA to be carried out by the Board – is there a risk to patients or our water systems. AM – suggested that this goes back to I Kennedy for more guidance – what should be considered – how would this get to patients. There is an H&amp;S RA carried out on those sites that have SUDS. A paper was submitted to the Group and suggested that this is circulated to the members for their comments on whether an RA is required.</p> <p>MF and AG working to finalise the annual report from last year for delivery to SHTM. This will be signed off by DK and brought back to the next meeting.</p> <p><b>Tap selection for the new Parkhead Project</b> – what is the Board approved tap – and the process for the selection of this. If WRAS approved then should be an approved tap of the Board. Noted taps used more frequently in some areas. Would it be appropriate for this group to select - suggested an SBAR for clinical areas and then another for areas of lower risk clinical areas. Agreed different tap for connection to heater and that connected to a clinical sink – this group would review the SBAR and agreed way forward. This would be relevant to all and any projects and refurbishments across the Board. These types of work usually progressed through the Water Technical Group – is this level of governance required noting that all taps have their pros and cons. The appropriate technical groups can be set up to look at matters as they arise similar to the one set up for Delabie taps.</p> <p>AM suggested that a small group reviews what is available a couple of times a year to determine what the Board approves for use for items such as this. JH noted that there is time pressure for these for the NE Hub as this sits on the critical path – JH will speak to AB the project lead on what time is available. But it was agreed that a more robust process is put in place for tap selection to review these at agreed periods of time. Agreed that the water AE would need to be involved for full review as well as clinical team. Agreed that this should be something that NHS Assure take the lead for. For this particular scenario it is not advisable to install at TMV tap but have one tap for the instant heater and one for the cold feed.</p> |         |
| 9. | <p><b>Date of Next meeting</b><br/>28<sup>th</sup> March 2023</p>   | To note |

**NHS Greater Glasgow & Clyde  
Board Water Safety Group Meeting  
Tuesday 28<sup>th</sup> March 2023 at 2pm  
Via Microsoft Teams**

|                            |  |
|----------------------------|--|
| <b>Present:</b>            |  |
| Alexandra Marek (AM)       | Consultant Microbiologist for Infection Control          |
| Gillian Bowskill (GB)      | Infection Control  |
| Chris Haddow (CH)          | Assistant Head of Estates (North /East/West Sector)      |
| Sandra Higgins (SH)        | Service Manager – Microbiology                           |
| Donald Bain (DB)           | Assistant Head of Estates Partnerships                   |
| Colin Purdon (CP)          | Assistant Head of Estates Clyde                          |
| Kerr Clarkson (KC) (Chair) | Site Manager – Operational Estates                       |
| Mark Riddell (MR)          | Assistant Director of Estates Operations                 |
| Helen Gemmell (HG)         | Assistant Director – Facilities and Production           |
| Mathew Feeney (MF)         | Trainee Compliance Manager                               |
| Linda Bagrade (LB)         | Consultant Medical Microbiologist                        |
| Sandra Devine (SD)         | Director of Infection Control                            |
| Ian Kennedy (IK)           | Public Health Consultant                                 |
| Gayle Brown (GB)           | Site Manager – Facilities                                |
| Helen Gemmell (HG)         | Assistant Director - Facilities                          |
| Jack Cairns (JC)           | Project Manager - Capital                                |
| Catherine Flannigan (CF)   | Intern within Public Health                              |
| <b>Apologies:</b>          |  |
| Natalia Hedo (NH)          | Business Manager – Infection Control                     |
| Billy Hunter (BH)          | Deputy Director Facilities and Corporate                 |
| David Jordan (DJ)          | Quality, Health and Safety & Training Compliance Manager |
| Karina Correia (KC)        | Clinical Services Manager for Women and Children         |
| James Shepherd (JS)        | Microbiologist   |
| Freddie Warnock (FW)       | Head of Health and Safety                                |
| Allan Hughes (AH)          | Deputy Head of Health and Safety                         |
| Alistair Leanord (AL)      | Consultant Microbiologist                                |
| Catriona Riddell (CR)      | Lead Nurse – Children’s Hospital                         |
| Dennis Kelly (DK)          | NHSGG&C Authorising Engineer – Water                     |
| Euan Smith (ES)            | Assistant Head of Estates (South)                        |
| Lynn Pritchard (LP)        | Acting Nurse Consultant - Infection Control              |
| James Huddleston (JH)      | Assistant Head of Capital Planning                       |
| Alan Gallacher (AG)        | Head of Corporate Estates                                |

| 1. | Apologies  | Action |
|----|--|--------|
|    | As noted above   |        |
| 2. | <b>Previous Minute 24<sup>th</sup> January 2023</b>  |        |
|    | The minutes were agreed as an accurate record of the meeting.  |        |
| 3. | <b>Rolling Action List/Matters Arising</b>   |        |
|    | <p><b>Agreement on Taps</b> – Delabie. Further meetings have taken place with the manufacturers to test the taps in a non-clinical environment. Suggested a DSR. Once agreed time has passed these will be removed along with the Marwick and send to TWafer for metallurgy analysis. Previous testing has indicated some derogation within. This was thought to be due to chemical attack. Measured levels of chemicals at IRH and QEUH and found to be 0.8. KC agreed to update when the results are known as well as providing update to NHS Assure.</p> <p><b>Water Safety Training</b> – the first session was carried out in December and reasonably well attended. It is proposed to have another at GRI, QEUH and Clyde sites. Dates will be confirmed and circulated to clinical colleagues. Water management is the responsibility of all and it was hoped this will get that message across.</p> <p><b>Sampling Procedure Review</b> – KC agreed to circulate information to members. The output will create a standard SOP and circulated appropriately for input. KC to circulate after the meeting</p> |        |

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|    | <p><b>ARHAI High Review of Document</b> – AM noted further revision has been created but not yet seen.</p> <p><b>Responsible Person for Water</b> – MF reported that all have been appointed with exception of DBain. Letters are ready to be sent out.</p> <p><b>POUF Removal</b> – procedure written up and circulated for comment. Wards included would be general and not include high risk patient groups. It was noted that most recent guidance did not provide further information. Suggested that 6A adults which has 28 rooms – 5 samples from each room along with all other outlets in the ward would generate 150 samples per week. It was therefore suggested that samples are taken from beginning, middle and end only and have these tested in the Lab to ensure clear results. No comments received on this proposed plan.</p> <p><b>Water Fill Points</b> – Reported that the Gartnavel project is being progressed. A proposal from wave to progress. DB noted that PO has been completed and works will commence shortly. CP noted the situation at RAH – it was not clear that this was required. There are contingencies in place and due to the location of the tanks that a fill point was not required. It was suggested that CP contact the Authorising Engineer to have this confirmed. CP noted that tanker standpoints are already in place.</p> <p><b>Agreement on Taps – Parkhead</b> – JC noted that there would be the use of water heaters rather than calorifiers. It had been suggested to put point of use water heaters on the mixer taps but no taps were available on the market to satisfy this issue and working with BAM and the capital team to find a suitable tap which will then become the tap of choice for the Board for this scenario.</p> |   |
| 4. | <p><b>Compliance</b></p>   |   |
|    | <p><b>Water Risk Assessment</b> – MF confirmed the completion rate for the main sites across the Board. Commencing next month a quick quote will be generated to ensure all sites are update.</p> <p><b>AE Action Plans</b> – Acute sites are completed aside from Stobhill and Leverdale. These will complete next month. Scottish Water Audit – concluding all the actions required on these and it was agreed that progress was good on these.</p> <p>CP asked about RA for RAH and VoL being due to progress – update at the next meeting</p>  |   |
| 5. | <p><b>Sampling</b></p>   |   |
|    | <p>Information has been circulated this week to members.</p>   |   |
| 6. | <p><b>Sector Water Meetings (by exception)</b></p>   |   |
|    | <p><b>Clyde</b> – CP reported persistent Legionella at low level found in the Care for the Elderly building. Mitigations in place and dead legs found and removed – it was anticipated this would resolve the issue.</p> <p><b>North</b> – CH reported significant reduction in the positive samples at PRM. POUF in place and exit strategy in place after hydrogen peroxide dosing system complete.</p> <p><b>WIGACH</b> – unwanted levels found in a sink in a locked office. Worked carried out to improve and clean – results improved</p> <p><b>South</b> – within retained estate 7 legionella out of spec with retained estate. Teams are working to remove this. Within Adult and Children's a number of gram negatives, TVC – 7 in total. 4 were found in a room which is being renovated (under Capital) and requires line disinfections and further sampling before being handed back to Clinical. Additionally use of room including simulating real use is required eg. Daily cleaning and flushing by Facilities and added to Clinical little use outlet flushing regime.</p>   |   |
| 7. | <p><b>GRI Environmental</b></p>  |   |
|    | <p>SH was in attendance to discuss the possibility of reducing the capacity of the labs during specific periods of time over the year. This was due to staffing pressures and would be similar to a Christmas period service level. There will be a SBar produced and with basic testing still being provided. KC noted that for example in the South we can choose the out of spec areas and delay the routine sampling by a number of weeks. No issues considered from the reduction over some periods of time as they are known – noted by the members.</p>   | - |

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| 8.  | <b>AOCB</b> |       |
| <p><b>Birthing Pools</b> – these are considered to be a bath and not similar to a hydro therapy pool and therefore be treated as a bath with no continual water but drained, cleaned and refilled for each patient. It was suggested that a POUF is added for the fill but no suitable type has been found to date. AM shared a document within the chat function on the difference. It was agreed that as this is classified as a bath and therefore should be tested accordingly. CH noted that finding the legionella in the PRMH has put the birthing pools out of use for a long period of time. Agreed that clearer guidance is required on the testing regimen for the birthing pools. It was suggested to sample the water coming into the pools rather than what is in these. HG noted that the work by HFS on birthing pools was being carried out but paused at the moment. Agreed to speak to DK as the AE for some input to resolve this. KC agreed to take forward.</p> |             | KC    |
| <p><b>Wording for Contractor Tenders</b> – Paper 8B submitted to the members. This was for training of contractors on the water services. The members are asked for feedback on the content. It was hoped an approved training course carried out the AE. The information in the report is based on training provided. This will be incorporated into tenders and documentation shared with the contractors to ensure in place prior to works commencing. MF confirmed that this is being discussed with contractors to ensure that this is clarified to ensure that they can access this. Agreed that feedback from compliance team will be added for the record.</p>  |             | MF/AG |
| <p><b>POUF Selection</b> – This discussion was brought to the group to take forward the possibility of changing the POUF supplier. The different POUF are filtered by straws rather than the bed of filtration. The member's discussion the pros and cons of the possibility of a change but there would need to be clear evidence that they provided the same protections. It was noted that the literature by an academic states that they are a higher risk but this is being disputed and challenged by the manufacturer whom provides evidence that it meets all requirements</p>  |             |       |
| <p>CH noted that TSafe are used in GRI with no issues being reported and across the NHS. Noted that there is a good training programme on the install and removal as well as tracking of these which is better than is provided by Pall. Suggested to trial in a low risk area with filters in the first instance. SD cautioned that this might not be the best time to make a change and SD will discuss with her ICD's who are working on the removal where POUF are not required. CP noted that the use of PALL initially went through a process of testing and fitting to ensure an appropriate SOP being created for cleaning etc.</p>   |             |       |
| <p>AM asked what would be the outcome of measures for the trial – we could not validate – would the trial be for user acceptability. It was noted that these are more cost effective than the PALL filters but it was not about the money that could be saved and agreed with SD statement. What we should be looking at is getting the current POUF we have and getting these removed from areas that no longer require them. But on the same hand agree that there are some areas that we need to keep these on based on clinical risk assessment as per SHTM04-01 for high risk patients rather than as a result of out of specs from water.</p>   |             |       |
| <p>It was suggested to set up a SLWG to discuss this further and bring back to this group in summary and recommendations. This would then be taken to CEO level for final approval based on evidence and data. IK asked about the governance on how we take these off and suggested a step back to determine where best to discuss and make suggestions.</p>  |             | AG    |
| <p>KC noted document in place for the removal of POUF in areas as a precaution as there is no evidence of out of spec and for those areas out of spec and these are treated. Agreed this needs Board wide consideration as it is not just within QEUH</p>   |             |       |
| <p><b>WHO 2<sup>nd</sup> Edition – Water Safety Planning</b> – circulated to the members for information and discuss within the Board</p>   |             | KC    |
| <p><b>Blue Green Algae RA</b> – IK asked that a response is provided for the two areas within the Board. This requires a response to be returned to IK and will be noted within the action list</p>   |             | ALL   |
| <p><b>Flushing Requirements</b> – the document was created as a Board wide use document aimed at the clinical and facilities teams. This was taken from the standards and who should be carrying this out. It was hoped to define who is responsible for the flushing requirements. Comments are welcomed and updated can be made. HG noted that comments will likely come back that domestics are responsible but it should be the departmental manager or charge nurse but in communal areas the domestics will be responsible. It was suggested that the clinical teams are responsible for the</p>  |             |       |

|    |   |         |
|----|---|---------|
|    | <p>ward/clinical areas (his is made clear within the document). KC noted however based on risk assessment Facilities do carry out additional flushing of clinical areas in accordance with SHTM04-01.</p> <p>It was agreed that there needs to be better communication between both areas and simplified to ensure that areas are clear on who holds this responsibility. SD suggested to circulate this to nursing to ensure they can feedback. It was noted that domestic staff are likely to rotate within areas and should be a person on the ward/clinical areas who remains. It was agreed that it was positive that this is being discussed but better understanding on who is responsible is needed so there is no misunderstanding.</p> <p><b>Water System Safety Policy</b> – Document circulated for comments to be fed back to KC. SD noted that in 10.6 all incidents reported to RHigh now, HPS and this to be replaced with ARHAI and ICM/BIPC instead.</p> <p><b>R&amp;D Project</b> – JC noted he had discussed with AE on the mains water supply to the building. AE view is that it is not required.</p> <p><b>Tap Selection</b> – Still specifying the Marwick taps at this time but not for high risk areas within capital projects along with checking the Total Chlorine (Chlorine, Cholates, ClO2) are suitable for the taps. Based on information from the supplier the taps were subject to chemical attack on samples provided at QEUH (ClO2), Inverclyde (no ClO2 and Louisa Jordan (no ClO2. However chlorine levels from Scottish Water were found to be just below 1PPM at QEUH and Inverclyde.</p> <p>The taps will require to be replaced at some point but noted no issues currently identified with taps on 2A at QEUH. The tap of choice for the future is still under discussion.</p> <p><b>Standards for Pseudomonas RA</b> – this has been difficult to conclude. Currently awaiting ARHAI guidance but does not cover it as required. There is a level of expertise required and agreed this would be a huge piece of work to ensure we are compliant. SD suggested that policies, this group and others and an RA already in place would this suffice until the works required are completed. KC suggested that this should go to the national group and work plans have been requested.</p> | KC      |
| 9. | <b>Date of Next meeting</b>   |         |
|    | 23 <sup>rd</sup> May 2023   | To note |

**NHS Greater Glasgow & Clyde  
Board Water Safety Group Meeting  
Tuesday 25<sup>th</sup> July 2023 at 2pm  
Via Microsoft Teams**

|                            |  |
|----------------------------|--|
| <b>Present:</b>            |  |
| Alexandra Marek (AM)       | Consultant Microbiologist for Infection Control          |
| Gillian Bowskill (GB)      | Infection Control  |
| Chris Haddow (CH)          | Assistant Head of Estates (North /East/West Sector)      |
| Sandra Higgins (SH)        | Service Manager – Microbiology                           |
| Donald Bain (DB)           | Assistant Head of Estates Partnerships                   |
| Kerr Clarkson (KC) (Chair) | Site Manager – Operational Estates                       |
| Mark Riddell (MR)          | Assistant Director of Estates Operations                 |
| Gayle Brown (GB)           | Site Manager – Facilities                                |
| Sandra Devine (SD)         | Director of Infection Control                            |
| Alan Gallacher (AG)        | Head of Corporate Estates                                |
| Jack Cairns (JC)           | Project Manager - Capital                                |
| Euan Smith (ES)            | Assistant Head of Estates (South)                        |
| Dennis Kelly (DK)          | NHSGG&C Authorising Engineer – Water                     |
| Thomas Mills (TM)          | Assistant Head of Capital Projects                       |
|                            |  |
| <b>Apologies:</b>          |  |
| Natalia Hedo (NH)          | Business Manager – Infection Control                     |
| Billy Hunter (BH)          | Deputy Director Facilities and Corporate                 |
| David Jordan (DJ)          | Quality, Health and Safety & Training Compliance Manager |
| Karina Correia (KC)        | Clinical Services Manager for Women and Children         |
| James Shepherd (JS)        | Microbiologist   |
| Freddie Warnock (FW)       | Head of Health and Safety                                |
| Allan Hughes (AH)          | Deputy Head of Health and Safety                         |
| Alistair Leanord (AL)      | Consultant Microbiologist                                |
| Catriona Riddell (CR)      | Lead Nurse – Children’s Hospital                         |
| Lynn Pritchard (LP)        | Acting Nurse Consultant - Infection Control              |
| James Huddleston (JH)      | Assistant Head of Capital Planning                       |
| Mathew Feeney (MF)         | Trainee Compliance Manager                               |
| Linda Bagrade (LB)         | Consultant Medical Microbiologist                        |
| Ian Kennedy (IK)           | Public Health Consultant                                 |

| 1. | Apologies   | Action                                     |
|----|---|--|
|    | As noted above  |  |
| 2. | <b>Previous Minute 23<sup>rd</sup> May 2023</b>   |  |
|    | The minutes were agreed as an accurate record of the  |  |
| 3. | <b>Rolling Action List/Matters Arising</b>  |  |
|    | <p><b>Board Responsible Person</b> – Each sector has a responsible person – this has been completed along with deputy. The Duty Holder is Jane Grant (by default) and the Designated Person would be Tom Steele. Deputy designated person is Mark Riddell. AG to arrange appointment letters.</p> <p><b>POUF Removal Process</b> – Meetings had been set up but postponed. Rescheduled for 25<sup>th</sup> August. A SLWG set up to take a Board wide approach to POUF removal. GB suggested that Facilities are included in these discussions.</p> <p><b>Water Fill Points</b> – discussions still underway – DB. RAH Water Fill – MR and DK agreed to meet to discuss and update at the next meeting.</p> <p><b>Tap Testing</b> – KC reported no update. Other areas to be included as difficulty getting a location in A&amp;C without having to alter pipework and IPS panels, however will be installed in building with CL02.–</p> <p><b>Water Safety Training</b> – MR noted discussions with DK with 2 further training dates for staff at GRI and QEUH once dates confirmed these will be circulated to staff for information.</p> | <p>AG</p> <p>MK/DK</p> <p>MR</p> <p>KC</p> |

|    |  |  |
|----|--|--|
|    | <p><b>Sampling Procedure</b> – Each sector to complete what is sampled and this will conclude the process – KC to take forward. KC</p> <p><b>ARHIGH Literature</b> – document was circulated to members but no feedback at this time – water systems literature review Version 4 AB</p> <p><b>Blue Green Algae</b> – agreed to remove from the RAL not for this meeting.</p> <p><b>Birthing Pools</b> – national level meeting noted that no one is carrying out regular sampling but only when issues were noted. AG noted specific RA carried out and to be implemented and this may clarify. DK reported that there are some Boards carrying out work and can be dependent on flushing and their individual set ups. AM noted it was reasonable to review national protocols but that a careful RA would be required to ensure we are clear. Guidelines will be shared with AG. AM</p> <p><b>POUF Change of manufacturer</b> – Agreed that different sites are using different manufacturers normally due to which ever one fits their particular tap. It was noted that TSafe are widely used. PALL have recently had some delivery issues and TSafe has a wider range of filters for taps. There is no preference as both do the job required. Costs – TSafe are slightly cheaper per unit and widely used across the NHS. AG asked about obtaining some spec information to standardise the use of either of these as an approve filter. This would be a general document and not naming but providing choice as tried and tested. Agreed to bring this back to the next meeting. AM asked if we carried out a review when using TSafe – KC confirmed that over a protracted period of time we have carried out testing along with evidence from other Boards. What has been used elsewhere and how it has been shown to perform. CH noted he has reviewed the spec and standards by TSafe – these are considerable and notable and agreed to share with the group for their information. AG will pull together some information prior to approaching Procurement to take forward. CH<br/>AG</p> <p><b>Flushing</b> – further information to this group after the meeting planned for August. It was noted that Domestic flush the taps during regular cleaning process but it is the responsibility of the nursing staff for little used outlets in their area. Agreed that as long as it is documented for either but agreed it could be possible to miss sinks or rooms that were not covered by domestics. Agreed that during a clean the tap would be run for around 1 minute where a flush is considered if longer than 3 minutes. We could be open to scrutiny if we don't list the units to be flushed and therefore how do we confirm that they have all been done? Agreed that it take time for national reviews to be delivered and suggested that information is added to the SOP – flushing from clinical perspective and that daily cleaning by domestics can be referred to as a flush. Terminology across the Board rather than cleaning flushing and clinical flushing. Little used outlets should be noted and records kept for those to ensure these are being flushed also. Do we need to acknowledge that every single tap is being flush and how would this be recorded. The Domestic flush would be in their cleaning book and this is reviewed yearly. MR noted that the new task calendar being introduced and asked if this could be added to this and signed off by ward manager or Band 6 to say that the flushing has been carried out and suggested a SLWG to work through this as there is considerable detail to be agreed and differing ways of recording and different sites – this group would clarify the responsibility and when this is takes effect. KC is working with Facilities on a board wide flushing procedure, which highlights responsibilities for all as per SHTM04-01. KC<br/>??</p> <p><b>Pseudomonas RA</b> – circulated and updated – agreed to recirculate to members for their information SD</p> <p><b>SHTM compliant Design Checklist</b> form – circulated to capital and minor works colleagues and have been working with Estates on improving the documents before introduction. This will ensure that all aspects of a water system changes are documented in the one form and signed by relevant parties. Agreed that this form can be used as of the 1<sup>st</sup> August. DK noted that there is more awareness on joining a new project to an existing water supply with concern that microbiology could be introduced into a clean system. JC/JH</p> <p><b>SBar Fungal Testing</b> – stopping mould testing. Suggested this goes to AICC and BICC but SD noted that this may be too technical for this particular group. Suggested that ICBEC reviews then to AICC for information. It needs to be clarified that this is carried out at QEUH and not other hospitals within the Board. AM<br/>SD</p> <p><b>POUF Respiratory Wards</b> – after some discussion it was agreed to review the text in RAL to ensure this is clearer.</p> |  |
| 4. | <b>Compliance</b>  |  |

|           |   |                |
|-----------|---|----------------|
|           | <p><b>Water Risk Assessment</b> – Action Plans updated. AG shared the screen to show. Noted there are a number of actions to be completed. Discussions with the site managers to review and determine why some of the actions are not completed and updated at the next meeting. HSCP – there WRA are being planned and procurement exercise to conclude these and thereafter update the document. It was noted there are several actions to be completed and working with sector lead for Partnerships.</p> <p><b>AE Water Audits</b> – working to improve the position – most are in date and carried out annual on acute sites. Working on the AP to close down the actions of the most recent audits.</p> <p><b>Water Bylaws</b> – Scottish Water Audits – mostly in the acute site.</p> <p><b>Emergency Plans</b> – water failures to ensure emergency plans are in place on sites – determined that these may require some update where these are in place to ensure that any new connections etc are now in place.. MR to speak to Assistant Heads of Estates.</p>   | AG<br>AG<br>MR |
| <b>5.</b> | <b>Sampling</b>   |                |
|           | Reminder to Assistant Heads to complete the documents to show what is sampled where   | KC             |
| <b>6.</b> | <b>Sector Water Meetings (by exception)</b>   |                |
|           | <p><b>Gartnavel/Partnerships</b> – no exceptions to report</p> <p><b>South</b> – A few out of specs in retained and A&amp;C, but actions continue to be implemented to remove.</p> <p><b>North</b> –Lightburn CL02 now active – sampling in place and feedback to local IC and feedback at next meeting</p> <p><b>Clyde</b> – MR noted that legionella Ward 36 and 37 Action Plan created and shared appropriately. Working through the list and around 50% completed. MR will share if members would like to see. Species 2-14 found. MR noted that nothing has been return on flushing in at least 15 months and MR will discuss with the lead nurse. Wards have been vacated so all works will be carried out in the 6 weeks. AM noted two different services including Acute and Mental Health. Was this reported to ARHigh – on reporting tool completed – not HIAT assessed. Formal meeting to agreed testing requirements to readmit the patients and suggested have this around 4 weeks to provide forward planning to readmit the patients. Noted that legionella has seen increased in the last few years and will be discussed at relevant forums nationally and at SETAG. AM noted that unclear on situations we would report to this level – agreed that the stipulations on reporting is not clear and needs to be clarified. Suggested that a whole ward is affected is this when it is reported or when out of spec results are found? SD noted she has discussed and asked for clarity and it was agreed that the current guidance is unclear and unmanageable. It was noted an alternative reporting route may be required – updates as they are known. AM/SD to review reporting requirements.</p> | -<br>AM/SD     |
| <b>7.</b> | <b>GRI Environmental</b>  |                |
|           | Nothing to report. Agreed to reduce the sampling in specified areas when necessary.   | -              |
| <b>8.</b> | <b>AOCB</b>   |                |
|           | <p><b>Training for Contractors</b> – point raised by James Huddleston – adjustments to the paper and information added on specific training courses for contractors – suggested that this should be ratified by the group since the changes have been added. Suggested to circulate to the members and asked for comments prior to the next meeting. A post meeting note will be added.</p> <p><b>Water Policy</b> – final version – KC had updated and circulated to AG and MF and will circulate to the members of this group for any further comments and thereafter will be ready. Post Meeting note further proposed changes with Capital and Microbiology to be reviewed for inclusion.</p> <p><b>Recording of Flushing</b> – KC noted that initial paper has been created to note what is being carried out. Meeting in August – E&amp;F and Partnerships to review the processes that affect the Facilities staff. The list of outlets will be discussed at that meeting. KC noted that the procedure only reflects what is already in the SHTM guidelines. A pre meeting to determine how this is progressed within E&amp;F. SD suggested that nursing are included in the main meeting to ensure they are aware of the issues. Agreed that the staff side meeting will discuss only the Facilities issues and take a further meeting to bring relevant staff to discuss and clarify responsibilities in clinical and E&amp;F.</p>   | JC<br>KC<br>GB |



|           |                                 |         |
|-----------|---------------------------------|---------|
| <b>9.</b> | <b>Date of Next meeting</b>     |         |
|           | 26 <sup>th</sup> September 2023 | To note |

DRAFT TO BE RATIFIED

**NHS Greater Glasgow & Clyde  
Board Water Safety Group Meeting  
Tuesday 28<sup>th</sup> November at 2pm  
Via Microsoft Teams**

|                            |  |
|----------------------------|--|
| <b>Present:</b>            |  |
| Kerr Clarkson (KC) (Chair) | Site Manager – Operational Estates                       |
| Billy Hunter (BH)          | Deputy Director Facilities and Corporate                 |
| Chris Haddow (CH)          | Assistant Head of Estates (North /East/West Sector)      |
| Jayne Jones (JJ)           | Assistant Director Facilities                            |
| Donald Bain (DB)           | Assistant Head of Estates Partnerships                   |
| Dennis Kelly (DK)          | NHSGG&C Authorising Engineer – Water                     |
| Keith Johnson (KJ)         | Assistant Head of Estates (Clyde)                        |
| Gayle Brown (GB)           | Assistant Head of Facilities (North)                     |
| James Huddleston (JH)      | Assistant Head of Capital Planning                       |
| Linda Bagrade (LB)         | Consultant Medical Microbiologist                        |
| Alexandra Marek (AM)       | Consultant Microbiologist for Infection Control          |
| Ian Kennedy (IK)           | Public Health Consultant                                 |
| Mark Riddell (MR)          | Assistant Director of Estates Operations                 |
| Euan Smith (ES)            | Assistant Head of Estates (South)                        |
| Sandra Devine (SD)         | Director of Infection Control                            |
|                            |  |
| <b>Apologies:</b>          |  |
| Natalia Hedo (NH)          | Business Manager – Infection Control                     |
| Alan Gallacher (AG)        | Head of Corporate Estates                                |
| David Jordan (DJ)          | Quality, Health and Safety & Training Compliance Manager |
| Karina Correia (KC)        | Clinical Services Manager for Women and Children         |
| James Shepherd (JS)        | Microbiologist   |
| Freddie Warnock (FW)       | Head of Health and Safety                                |
| Allan Hughes (AH)          | Deputy Head of Health and Safety                         |
| Alistair Leanord (AL)      | Consultant Microbiologist                                |
| Catriona Riddell (CR)      | Lead Nurse – Children’s Hospital                         |
| Lynn Pritchard (LP)        | Acting Nurse Consultant - Infection Control              |
| Thomas Mills (TM)          | Assistant Head of Capital Projects                       |
| Mathew Feeney (MF)         | Trainee Compliance Manager                               |
| Gillian Bowskill (GB)      | Infection Control  |
| Sandra Higgins (SH)        | Service Manager – Microbiology                           |
| Jack Cairns (JC)           | Project Manager – Capital                                |

| 1.        | Apologies   | Action |
|-----------|---|--------|
|           | As noted above  |        |
| <b>2.</b> | <b>Previous Minute 25<sup>th</sup> September 2023</b>   |        |
|           | The minutes were agreed as an accurate record of the  |        |
| <b>3.</b> | <b>Rolling Action List/Matters Arising</b>  |        |
|           | The RAL was extensively updated with the Matters Arising within the meeting   | AB     |
| <b>4.</b> | <b>Sampling</b>   |        |
|           | Hydrotherapy Pools – Agreed to have same protocol across the Board. DK agreed to share protocol for NHS Tayside as a basis                    | DK     |
| <b>4.</b> | <b>Compliance</b>   |        |
|           | AG and MF were both unable to attend the meeting. A post meeting note will be requested to ensure members have an update.                     | KC     |
| <b>5.</b> | <b>Sector Water Meetings (by exception)</b>   |        |
|           | <b>Partnerships</b> – no exceptions to report but noted thanks to the compliance team (MF) for the work on audits and increasing SCART scores |        |

|           |   |         |
|-----------|---|---------|
|           | <p><b>North</b> – CH asked about the sampling times – noting taking 10-14 days for returns from the labs with two samples and one return and asked to move to two weeks for samples. Agreed 4-5 samples to get three clears and noted that fortnight testing in other Boards is common but also depends on clinical and species being found. This will reduce samples being sent to the labs.</p> <p><b>South</b> – 5 out of specs found in 3 occupied areas. Two out of spec in areas where project works are underway</p> <p><b>Clyde</b> – 36 and 37 work is ongoing. VoL and RAH areas noted some out of spec and work ongoing to resolve</p>   |         |
| <b>6.</b> | <b>GRI Environmental</b>  |         |
|           | SLA was submitted for review – feedback from members to Sandra  | -       |
| <b>7.</b> | <b>AOCB</b>   |         |
|           | <p><b>Pseudomonas Aeruginosa SOP</b> – Comments requested – if nothing at this time please forward to SD. Appendix 3 – water used for contact with patients – clarify if all tap outlets (cold/mixed/hot) or just representative outlets are sampled.. Pseudomonas is slightly different as it can be in (or on) the tap and not within the water system. AM agreed to review and feedback to SD with comments. It was agreed to review the number of samples and the areas sampled from. The requirements would multiply up the samples considerably in 000's eg. one room with an Ensuite would be 5 samples. DK noted this is a consideration across all of NHS Scotland and sampling is varied across the country from 6 monthly to quarterly and no clear guidance on sampling requirements. Consideration should be given if there is a requirement to sample if POUF are fitted to wards or to take samples behind a POUF in one or a few locations to gauge system water. This was considered as to why previously for example NICU in QEUH which has POUF to all outlets that system water was sampled from some outlets rather than all outlets.</p> <p><b>Audit Process</b> – DK reported this has commenced and will continue into next year</p> <p><b>Water Policy</b> – this will be reviewed and updated in the next week.</p> <p><b>Thrombectomy</b> – all clear samples and can be reconnected.</p> <p><b>Training</b> – this was found to be helpful and should be provided on a one to one basis.</p> <p>KC noted his thanks to the members for their input to the water policy, but IK noted the legislation links were out of date and needed to be updated. He will share the links with KC to include.</p> <p>MR noted his concern that there were no clinical representatives on this meeting, and it was noted – they are requested to attend when possible.</p> | IK/KC   |
| <b>8.</b> | <b>Date of Next meeting</b>   |         |
|           | 23 <sup>rd</sup> January 2024   | To note |

**NHS Greater Glasgow & Clyde  
South Sector Water Safety Group Meeting  
Wednesday 10 February 2022 at 14.00  
Via MSTeams**

**Present:**

|                         |   |   |
|-------------------------|---|---|
| Euan Smith (Chair) (ES) | – | Assistant Head of Operational Estates, South Sector |
| Kerr Clarkson (KCL)     | – | Site Manager Operational Estates, QEUH              |
| Sharon Johnstone (SJ)   | – | Assistant Head of FM Operations, South Sector       |
| Stuart McNeil (SMcN)    | - | Engie   |
| David Juner (DJ)        | – | Serco   |

|                       |   |                              |
|-----------------------|---|------------------------------|
| Carmel McGeown (CMcG) | - | Personal Assistant - Minutes |
|-----------------------|---|------------------------------|

**Apologies:**

|                       |   |   |
|-----------------------|---|---|
| Gillian Bowskill (GB) | – | Lead IC Nurse, W&C                          |
| Lisa Armitage (LA)    | – | Serco                                       |
| Mel MacMillan (MM)    | – | Estates Manager                             |
| Alison Edwardson      | – | Senior Infection Prevention & Control Nurse |
| Lynn Pritchard (LP)   | – | Lead Infection Prevention & Control Nurse   |
| Robert Sewell (RS)    | - | Engie                                       |

**Action****1. Apologies**

As noted above.

**2. Notes of Previous Meeting (19 August 2021) Matters Arising**

The minute was agreed as an accurate record.

**3. Matters Arising from Previous Meeting****Agenda Item 7**

- Monthly meetings to be arranged KC/MM to review and update audit actions. **KC**

**Agenda Item 8**

- SJ to contact RC and request a SoP for Langlands flushing regime. SJ advised Langlands continuing to carry out flushing every outlet. Current process seems to meet compliance, need confirmation from PU. ES to contact PU for comment. **ES/PU**
- Smartsheet to be implemented, PU to set up brief training session. ES to contact PU to ascertain who will action going forward. **ES**

**4. Written Scheme Update for all Sites**

- KC advised the WS currently under review (name & title amendments required), one WS for entire site KC
- Copy uploaded to Smartsheet.

**5. Risk Assessment Update for all Sites**

- RA's for Retained Estates are overdue. KC to raise with DMA. KC
  - What needs to be completed to ensure these are up to date?
- Require definitive list of RAs for QEUH campus for each building showing completion status for inclusion in minutes. KC to advise current status by next meeting. KC
- Engie
  - RA completed 20 Dec 2020, review due end of March 2022
  - 31 actions, 30 closed.
  - Looking at options to remove extra storage tank, awaiting consultant to submit report.

**6. SCART Update for all Sites (Water Only)**

- KC reported QEUH 99% (Retained 36%, Adult & kids 61%)
- Engie reported 98.18% for NVCH. Undertaking a full SCART review across board shortly, will be completed once IT issues are resolved.
- Langlands reported compliance in high 90's.

**7. AE Audit Update for all Sites**

- AE Audits were completed for each building and a management assessment for all. A large proportion of actions relate to Risk Assessments, which are being arranged between Compliance and DMA. PU has closed off and completed a number of these actions. KC to update where possible. KC
- QEUH/RHC 28 actions, 16 complete.
- Retained sites 141 actions, 51 completed.
- AE Audit summaries attached.
- Engie – AE audits up to date, couple of outstanding issues relating to tank storage.
- Serco – 1 outstanding issue relating to water tank, awaiting confirmation from IC to proceed.

**8. Flushing Regimes Currently being Carried Out**

- No change to current flushing regime within Adults, RHC and Retained sites. SJ sent flushing sheets today.
  - SJ advised any rooms not accessible should be reported to supervisor and recorded on spreadsheet. Weekly reports sent to KC/MM on a weekly basis.
- Engie – carry out flushing and sampling. One issue with fountains, 48 across site. SMCN to forward information to ES to check if these are included in the contract with Eden.

## 9. WS01a Returns

- Q3 return 8.70% for QEUH Campus.
- Mark Riddell has contacted Lead Nurses within the Campus to ensure correct contacts are listed. Contacts have been updated for Q3. Further changes to contacts which will be updated for 2022-2023 Q1.

## 10. Testing Within Sites & Results

- 2 new out of specs in major injuries, fungi indicates low usage and lack of flushing.
- Number of legionella, however low counts in rooms of suspected low use.
- RHC – cluster of AMS results in Ground Floor (janitorial sink and public toilets). Need to review of activities.
- High count of TVC's in Ward 6A during November/December which is unusual, suspect this is environmental.
- KC noted that 6302 water samples have been undertaken to date as per the agreed sampling programme across the QEUH & RHC. From this there were :-

|  | Samples | %      |
|--|---------|--------|
| <b>Total Samples</b>                           | 6302    |        |
| <b>Total Not Detected or within parameters</b> | 5894    | 93.50% |
| <b>Out of spec tank room</b>                   | 158     | 6.47%  |
| <b>Out of spec wards</b>                       | 250     | 3.97%  |

- See attached tables.
- Engie – 63 samples taken, all up to date.
- Langlands – No out of specs recorded.

## 11. SHTM 04-01 Part G Compliance

- No exceptions.
- 92.27% compliance. Dropped slightly due to shift some shift checks being postponed/cancelled.
- TMV checks – DMA carrying out 6 monthly checks. FMFirst schedule incorrect.
- RP/CP/AP – extension letters have been approved and issued. Further training to be carried out in the Spring.
- Engie – PPM's up to date, 97% compliance. No access to 3 sets of TMV's.
- Langlands – PPM's up to date. 1 x RP & 1 x CP.

**12. Safety Action Notices**

- No new SAN's to report

**13. AOCB**

- Nothing to discuss.

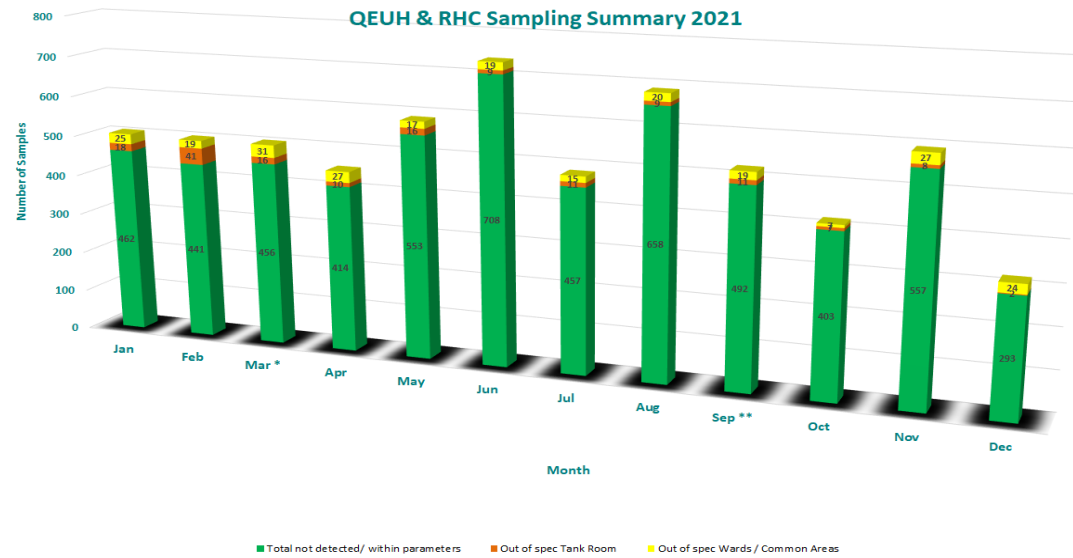
**14. Date & Time of Next Meeting**

The next meeting is scheduled for Thursday 12 May 2022 at 2.00pm via MS Teams.

QEUEH & RHC Sampling Summary 2021



|              | Total samples | Total not detected/ within parameters | Out of spec Tank Room | Out of spec Wards / Common Areas | Number of out of specs which were from PAL filters | % in spec     | % Out of spec | Total out of specs for wards / Common Areas | % out of spec for Wards / Common Areas excl PAL filters | % out of spec for Wards / Common Areas - PAL filters | % out of spec -Tank Room |
|--------------|---------------|---------------------------------------|-----------------------|----------------------------------|--|---------------|---------------|---|---|--|--------------------------|
| Jan          | 505           | 462                                   | 18                    | 25                               | 4  | 91.49%        | 8.51%         | 4.95%                                       | 4.16%   | 0.79%  | 3.56%                    |
| Feb          | 501           | 441                                   | 41                    | 19                               | 1  | 88.02%        | 11.98%        | 3.79%                                       | 3.59%   | 0.20%  | 8.18%                    |
| Mar *        | 503           | 456                                   | 16                    | 31                               | 7  | 90.66%        | 9.34%         | 6.16%                                       | 4.77%   | 1.39%  | 3.18%                    |
| Apr          | 451           | 414                                   | 10                    | 27                               | 8  | 91.80%        | 8.20%         | 5.99%                                       | 4.21%   | 1.77%  | 2.22%                    |
| May          | 586           | 553                                   | 16                    | 17                               | 3  | 94.37%        | 5.63%         | 2.90%                                       | 2.39%   | 0.51%  | 2.73%                    |
| Jun          | 736           | 708                                   | 9                     | 19                               | 6  | 96.20%        | 3.80%         | 2.58%                                       | 1.77%   | 0.82%  | 1.22%                    |
| Jul          | 483           | 457                                   | 11                    | 15                               | 2  | 94.62%        | 5.38%         | 3.11%                                       | 2.69%   | 0.41%  | 2.28%                    |
| Aug          | 687           | 658                                   | 9                     | 20                               | 6  | 95.78%        | 4.22%         | 2.91%                                       | 2.04%   | 0.87%  | 1.31%                    |
| Sep **       | 522           | 492                                   | 11                    | 19                               | 1  | 94.25%        | 5.75%         | 3.64%                                       | 3.45%   | 0.19%  | 2.11%                    |
| Oct          | 417           | 403                                   | 7                     | 7                                | 2  | 96.64%        | 3.36%         | 1.68%                                       | 1.20%   | 0.48%  | 1.68%                    |
| Nov          | 592           | 557                                   | 8                     | 27                               | 11   | 94.09%        | 5.91%         | 4.56%                                       | 2.70%   | 1.86%  | 1.35%                    |
| Dec          | 319           | 293                                   | 2                     | 24                               | 8  | 91.85%        | 8.15%         | 7.52%                                       | 5.02%   | 2.51%  | 0.63%                    |
| <b>Total</b> | <b>6302</b>   | <b>5894</b>                           | <b>158</b>            | <b>250</b>                       | <b>59</b>  | <b>93.53%</b> | <b>6.47%</b>  | <b>3.97%</b>                                | <b>3.03%</b>  | <b>0.94%</b>   | <b>2.51%</b>             |



Comments : \* - Awaiting further sample results which may change figures above  
 - Feb 21 Additional sampling would be carried out in the tank room for filtration units following increasing CL02  
 - Sep 21 Issues with labs and no access to wards accounts for reduction in samples



Out of spec Summary as of 09/02/22 (excluding Tank Room)

| New Out of Specs     |                           |                               |                                   |                     |                    |              |                              |                      |  |
|----------------------|---------------------------|-------------------------------|-----------------------------------|---------------------|--------------------|--------------|------------------------------|----------------------|--|
| Building             | Area                      | Unique ID                     | Sampling point                    | Type                | (Hot/ Cold/ Mixed) | Filtered Tap | Counts                       | Bacteria             | Comment  |
| Minor Injuries Unit  | Ground Floor              | 0                             | Cleaners Cupboard SSS             | Tap                 | Cold               | No           | 1                            | Fungi                | Incident - 22/12/21 - Facilities requested to review flushing and cleaning regime as tap temperature (pre) indicates high temperatures. Estates to arrange with Vanguard to carry out full maintenance of tap.   |
| Minor Injuries Unit  | Ground Floor              | 0                             | Cleaners Cupboard SSS             | Tap                 | Hot                | No           | 2                            | Fungi (Exophiala)    | Incident - 22/12/21 - Facilities requested to review flushing and cleaning regime as tap temperature (pre) indicates high temperatures. Estates to arrange with Vanguard to carry out full maintenance of tap.   |
| Current Out of Specs |                           |                               |                                   |                     |                    |              |                              |                      |  |
| Building             | Area                      | Unique ID                     | Sampling point                    | Type                | (Hot/ Cold/ Mixed) | Filtered Tap | Counts                       | Bacteria             | Comment  |
| ICE Building         | 3rd Floor I. Caird        | L3.06                         | New WHB                           | Tap                 | Mixed              | No           | TVC                          | TVC                  | TVC@37c 90 TVC@22c 104   |
| Spinal               | Ground                    | L0/124                        | Clean Utility                     | Tap                 | Cold               | No           | 150                          | Legionella Species 4 | Ongoing out of specs since 17/05/21 although counts are now low with some not detected results. Feb 2022 - Further disinfections to be carried out and Facilities to review flushing regime.   |
| Spinal               | Ground                    | L0/128                        | Kitchen SSS                       | Tap                 | Hot                | No           | 50                           | Legionella Species   | Ongoing out of specs since 17/05/21 although counts are now low. Feb 2022 - Further disinfections to be carried out and Facilities/Ward to review flushing regime.   |
| Spinal               | Philiphill Ground Floor   | L0/82                         | Laundry SSS                       | Tap                 | Hot                | No           | 50                           | Legionella Species   | Ongoing out of specs since 17/05/21 although counts are now low with some not detected results. Feb 2022 - Further disinfections to be carried out and Facilities to review flushing regime.   |
| Neurosurgery         | 5th Floor                 | L5/29                         | Advanced Procedure Room WHB       | Tap                 | Cold               | No           | 100                          | Legionella Species   | Ongoing out of specs since 29/09/21 although counts are now low. Feb 2022 - Further disinfections to be carried out and Facilities/Ward to review flushing regime.   |
| Neurosurgery         | 5th Floor                 | L5/29                         | Advanced Procedure Room WHB       | Tap                 | Mixed              | No           | 50                           | Legionella Species   | Ongoing out of specs since 29/09/21 although counts are now low with some not detected results. Feb 2022 - Further disinfections to be carried out and Facilities/Ward to review flushing regime.  |
| Neurosurgery         | 4th Floor Ward 65         | L4/54                         | Procedure Room WHB                | Tap                 | Cold               | No           | 100                          | Legionella Species   | Ongoing out of specs since 29/09/21 although counts are now low with one not detected results. Feb 2022 - Further disinfections to be carried out and Facilities/Ward to review flushing regime.   |
| Neurosurgery         | 4th Floor Ward 65         | L4/54                         | Procedure Room WHB                | Tap                 | Mixed              | No           | 50                           | Legionella Species   | Ongoing out of specs since 29/09/21 although counts are now low with some not detected results. Feb 2022 - Further disinfections to be carried out and Facilities/Ward to review flushing regime.  |
| Podiatry             | Ground Floor              | L0/24                         | Student Change Room LHS WHB       | Tap                 | Cold               | No           | 100                          | Legionella Species   | Ongoing out of specs since 20/08/21 although counts are now low one with not detected result. Feb 2022 - Further disinfections to be carried out and Facilities/Ward to review flushing regime.  |
| Podiatry             | Ground Floor              | L0/17                         | Staff Room SSS                    | Tap                 | Cold               | No           | 200                          | Legionella Species   | Ongoing out of specs since 29/04/21 although counts are now low with one not detected result. Feb 2022 - Further disinfections to be carried out and Facilities/Ward to review flushing regime.  |
| Podiatry             | Ground Floor              | L0/35                         | Podiatry Clinic Chair 12 WHB      | Tap                 | Mixed              | No           | 150                          | Legionella Species   | Ongoing out of specs since 29/04/21 although counts remain low. Feb 2022 - Further disinfections to be carried out and Facilities/Ward to review flushing regime.  |
| Old Maternity        | 3rd Floor                 | L2/36                         | Ward 48 Room 8 WHB                | Tap                 | Cold               | No           | 50                           | Legionella Species   | Ongoing out of specs since 10/09/21 although most are not detected and out of specs remain low. Feb 2022 - Further disinfections to be carried out and Facilities/Ward to review flushing regime.  |
| Old Maternity        | Ground Floor              | FM D.36                       | Scanning Room 7 WHB               | Tap                 | Cold               | No           | 50                           | Legionella Species   | Ongoing out of specs since 25/05/21 although some are not detected and out of specs remain low. Feb 2022 - Further disinfections to be carried out and Facilities/Ward to review flushing regime.  |
| RHC                  | Ground Floor Clinic 1     | OPD 026                       | Facilities                        | Janitorial Sink     | Cold               | No           | TVC@37c 1 AMS 9              | Other                | Ongoing since Jan 21 with a number of not detected, however mostly low values. Number of maintenance activities have been carried out and Facilities asked to review cleaning, flushing and activities in the room. Further maintenance to be carried out. |
| RHC                  | Ground Floor Clinic 1     | OPD 026                       | Facilities                        | Janitorial Sink SSS | Cold               | No           | TVC@37c 1 AMS 13             | Other                | Ongoing since Jan 21 with a number of not detected, however mostly low values. Number of maintenance activities have been carried out and Facilities asked to review cleaning, flushing and activities in the room. Further maintenance to be carried out. |
| RHC                  | Ground Floor Clinic 1 & 2 | OPD 026                       | Clinic 1 - Facilities             | Optitherm           | Mixed              | No           | Sphingomonas Paucimobilis 12 | Other                | Dec 21 Carry out disinfection of tap   |
| RHC                  | Ground Floor Clinic 1 & 2 | OPD 028                       | Clinic 1 - WC Public              | Contour             | Mixed              | No           | AMS 15                       | Other                | Ongoing since Aug 21, however 2 not detected during this time as above maintenance has been carried out and Facilities asked to review cleaning and flushing. This will be carried out again.  |
| RHC                  | Ground Floor Clinic 1     | OPD 009                       | Public WC                         | Contour             | Mixed              | No           | AMS 41                       | Other                | Ongoing since July 21, however 10 not detected during this time as above maintenance has been carried out and Facilities asked to review cleaning and flushing. This will be carried out again.  |
| RHC                  | Ground Floor Clinic 2     | Clean Utility                 | OPD-162                           | SSS                 | Cold               | No           | AMS 2                        | Other                | Ongoing since Jun 21, as above maintenance has been carried out and Facilities asked to review cleaning and flushing. This will be carried out again.  |
| RHC                  | Ground Floor Clinic 1 & 2 | Clinic 2 - Facilities         | OPD 173                           | SSS                 | Cold               | No           | Blastomonas Ursincola 107    | Other                | Dec 21 Carry out disinfection of tap   |
| Adults               | 9th Floor Ward C          | Bedroom 71                    | GENW15-033                        | Optitherm           | Cold               | No           | -                            | Other                | Lab contamination so awaiting re-sample result may be OK   |
| RHC                  | 1st Floor Ward 1D PICU    | CCW-118                       | Facilities Mop Sink (With Filter) | Swan Neck           | Hot                | Yes          |                              | Other                | Incident 19/11/21 Replace filter DMA changed already   |
| RHC                  | 1st Floor Ward 1D PICU    | CCW-118                       | Facilities SSS (With Filter)      | Swan Neck           | Cold               | Yes          |                              | Other                | Incident 19/11/21 Replace filter DMA changed already   |
| RHC                  | 1st Floor Ward 1D PICU    | CCW-059                       | Staff Kitchen (With Filter)       | Swan Neck           | Cold               | Yes          |                              | Other                | Incident 19/11/21 Replace filter DMA changed already   |
| RHC                  | 1st Floor Ward 1D PICU    | CCW-059                       | Staff Kitchen (With Filter)       | Swan Neck           | Hot                | Yes          |                              | Other                | Incident 19/11/21 Replace filter DMA changed already   |
| RHC                  | Ground Floor Clinic 1 & 2 | Clinic 2 - WC Staff           | Clinic 2 - WC Staff               | Contour             | Mixed              | Yes          |                              | Other                | Incident 24/01/22 Replace filter DMA changed already   |
| RHC                  | Ground Floor Clinic 1 & 2 | Clinic 2 - Consulting Room 11 | Clinic 2 - Consulting Room 11     | Optitherm           | Mixed              | Yes          |                              | Other                | Incident 24/01/22 Replace filter DMA changed already   |

| Not Detected after works |                           |                             |                                |           |                    |              |        |                    |  |  |  |  |  |  |  |
|--------------------------|---------------------------|-----------------------------|--------------------------------|-----------|--------------------|--------------|--------|--------------------|--|--|--|--|--|--|--|
| Building                 | Area                      | Unique ID                   | Sampling point                 | Type      | (Hot/ Cold/ Mixed) | Filtered Tap | Counts | Bacteria           | Comment  |  |  |  |  |  |  |
| Spinal                   | Ground                    | L0/128                      | Kitchen WHB                    | Tap       | Cold               | No           |        | Legionella Species | Incident - 23/08/21 - Maintenance to be carried out on tap Temperature on the tap as of 10/06 was 23.2c 23/08/21 - Requested AP and L8 Team review 10/09/21 - Lead AP to further review  |  |  |  |  |  |  |
| Neurology                | 2nd Floor                 | L2/30                       | Multipurpose Room WHB          | Tap       | Mixed              | No           |        | Legionella Species | Incident - 05/07/21 - Carry out full maintenance and disinfection of tap. Spoken to facilities and ward to review cleaning and flushing regime. 23/08/21 - Requested AP and L8 Team review again   |  |  |  |  |  |  |
| Podiatry                 | Ground Floor              | L0/35                       | Chair 24 WHB                   | Tap       | Mixed              | No           |        | Legionella Species | Incident - 20/08/21 - Full system in Podiatry to be disinfected 21/08/21 . 14/09/21 - Requested review again by Water AP. 30/09/21 - Emailed DMA to consider second system disinfecton.  |  |  |  |  |  |  |
| Neurosurgery             | 4th Floor Ward 65         | L4/09                       | Room 6                         | Tap       | Mixed              | No           |        | Legionella Species | Incident - 29/03/21 - Carry out full maintenance and disinfection of tap. Spoken to facilities and ward to review cleaning and flushing regime 19/04/21 Cleaned and serviced. 04/06/21 L8 team to review again and carry out full maintenance. 23/08/21 - Requested AP and L8 Team review again 23/08/21 - Requested AP and L8 Team review again |  |  |  |  |  |  |
| Neurosurgery             | 2nd Floor Ward 62         | L2/23                       | Room 1 WHB                     | Tap       | Mixed              | No           |        | Legionella Species | Incident - 29/09/21 - Maintenance to be carried out on tap   |  |  |  |  |  |  |
| Neurosurgery             | Basement Plantroom        | 0                           | Pre-filter CWST (RHS)          | CWST      | Mixed              | No           |        | Legionella Species | Incident - Monitor and resample  |  |  |  |  |  |  |
| Spinal                   | Philipshill Ground Floor  | L0/125                      | Disposal WHB                   | Tap       | Mixed              | No           |        | Legionella Species | Incident - 17/05/21 - Maintenance to be carried out on tap 06/07/21 - Carry out further maintenance and disinfection on tap  |  |  |  |  |  |  |
| Spinal                   | Ground Floor              | L0/67                       | Philipshill Room 6 WHB         | Tap       | Mixed              | No           |        | Legionella Species | Incident - 17/11/21 - Maintenance to be carried out on tap. Facilities to review flushing regime   |  |  |  |  |  |  |
| Spinal                   | Ground Floor              | L0/67                       | Edenhall Bed 3 WHB             | Tap       | Cold               | No           |        | Legionella Species | Incident - 17/11/21 - Maintenance to be carried out on tap. Facilities to review flushing regime   |  |  |  |  |  |  |
| Spinal                   | Ground Floor              | L0/77                       | Philipshill Kitchen LHS SSS    | Tap       | Hot                | No           |        | Legionella Species | Incident - 17/11/21 - Maintenance to be carried out on tap. Facilities to review flushing regime   |  |  |  |  |  |  |
| Spinal                   | Ground Floor              | L0/77                       | Philipshill Kitchen LHS SSS    | Tap       | Cold               | No           |        | Legionella Species | Incident - 17/11/21 - Maintenance to be carried out on tap. Facilities to review flushing regime   |  |  |  |  |  |  |
| Neurosurgery             | 2nd Floor CNS Office      | L2/71                       | WC WHB                         | Tap       | Mixed              | No           |        | Legionella Species | Incident - 04/06/21 - Maintenance to be carried out on tap 23/08/21 - Requested AP and L8 Team review again  |  |  |  |  |  |  |
| Minor Injuries Unit      | Ground Floor              | 0                           | Sluice Room WHB                | Tap       | Cold               | No           |        | Legionella Species | Incident - 22/12/21 - Facilities requested to review flushing and cleaning regime as tap temperature (pre) indicates high temperatures. Estates to arrange with Vanguard to carry out full   |  |  |  |  |  |  |
| Minor Injuries Unit      | Ground Floor              | 0                           | Sluice Room WHB                | Tap       | Mixed              | No           |        | Legionella Species | Incident - 22/12/21 - Facilities requested to review flushing and cleaning regime . Estates to arrange with Vanguard to carry out full maintenance of tap.   |  |  |  |  |  |  |
| Old Maternity            | Ground Floor              | L0/164                      | Theatre 2 Dirty Utility SSS    | Tap       | Mixed              | No           |        | Legionella Species | Incident - 08/12/21 - Carry out full maintenance discuss with Facilities and Theatres staff about flushing regime  |  |  |  |  |  |  |
| Old Maternity            | Ground Floor              | L0/164                      | Theatre 2 Dirty Utility WHB    | Tap       | Mixed              | No           |        | Legionella Species | Incident - 08/12/21 - Carry out full maintenance discuss with Facilities and Theatres staff about flushing regime  |  |  |  |  |  |  |
| Adults                   | 2nd Floor                 | THE139                      | Theatre 9/10 Prep Room         | Optitherm | Cold               | No           |        | Other              | Various GNB since Jan 21 mostly counts of Cuprivadis   |  |  |  |  |  |  |
| Adults                   | 11th Floor Ward D         | GENW22-066                  | Facilities                     | Hot Tap   | Hot                | No           |        | Other              | Coliforms once and TVC once  |  |  |  |  |  |  |
| Adults                   | 5th Floor Ward C          | GENWC-066                   | Facilities                     | Hot Tap   | Hot                | No           |        | Other              | Coliforms once and TVC once  |  |  |  |  |  |  |
| Childrens                | 6th Floor Ward 6A         | GENW1-030                   | Room 13 En-Suite (With Filter) | Shower    | Mixed              | Yes          |        | Other              | Blastomonas Ursincola once Filter changed & Facilities review flushing and cleaning regime   |  |  |  |  |  |  |
| Childrens                | 6th Floor Ward 6A         | GENW1-057                   | Room 15 WHB (With Filter)      | Optitherm | Mixed              | Yes          |        | Other              | TVC & GNB Filter changed & Facilities review flushing and cleaning regime  |  |  |  |  |  |  |
| Childrens                | GENW1-057                 | Room 24 WHB (With Filter)   | Optitherm                      | Optitherm | Mixed              | Yes          |        | Other              | Sphingomonas Paucimobilis 1 AMS 6 Filter changed & Facilities review flushing and cleaning regime  |  |  |  |  |  |  |
| Childrens                | 6th Floor Ward 6A         | GENW1-035                   | Room 15 WHB (With Filter)      | Optitherm | Mixed              | Yes          |        | Other              | TVC@22c 13 GNB 16 Sphingomonas Paucimobilis Filter changed   |  |  |  |  |  |  |
| Childrens                | 6th Floor Ward 6A         | GENW1-020                   | Room 8 En-Suite (With Filter)  | Shower    | Mixed              | Yes          |        | Other              | TVC@37c 346 TVC@22c 436 Acintobacter Baumanii Filter changed & Facilities review flushing and cleaning regime  |  |  |  |  |  |  |
| Childrens                | 6th Floor Ward 6A         | GENW1-083                   | Staff WC WHB (With Filter)     | Contour   | Mixed              | Yes          |        | Other              | Unidentified GNB Filter changed & Facilities review flushing and cleaning regime   |  |  |  |  |  |  |
| Childrens                | 6th Floor Ward 6A         | GENW1-029                   | Room 12 En-Suite (With Filter) | Shower    | Mixed              | Yes          |        | Other              | Pseudomonas Oryzihabitanis 1, TVC@37c 27 TVC@22c 20 and followed by TVC@37c 4300 TVC@22c 3325 Filter changed & Facilities review flushing and cleaning regime  |  |  |  |  |  |  |
| Childrens                | 6th Floor Ward 6A         | GENW1-050                   | Room 21 En-Suite (With Filter) | Contour   | Mixed              | Yes          |        | Other              | Roseomonas Mucosa 1 followed by TVC@37c 4300 TVC@22c 3325 Filter changed & Facilities review flushing and cleaning regime  |  |  |  |  |  |  |
| Childrens                | 6th Floor Ward 6A         | GENW1-046                   | Room 20 En-Suite (With Filter) | Shower    | Mixed              | Yes          |        | Other              | Chrysobacterium Gleum 2, Roseomonas Mucosa. Filter changed & Facilities review flushing and cleaning regime  |  |  |  |  |  |  |
| Childrens                | 6th Floor Ward 6A         | GENW1-034                   | Room 14 En-Suite (With Filter) | Contour   | Mixed              | Yes          |        | Other              | Roseomonas Mucosa 1 and the TVC of 1. Filter changed & Facilities review flushing and cleaning regime  |  |  |  |  |  |  |
| Childrens                | 6th Floor Ward 6A         | GENW1-066                   | Facilities WHB (With Filter)   | Optitherm | Mixed              | Yes          |        | Other              | TVC@37c 25. Filter changed & Facilities review flushing and cleaning regime  |  |  |  |  |  |  |
| Childrens                | 6th Floor Ward 6A         | GENW1-066                   | Facilities SSS (With Filter)   | Tap       | Hot                | Yes          |        | Other              | TVC@37c 1050 TVC@22c 570. Filter changed & Facilities review flushing and cleaning regime  |  |  |  |  |  |  |
| Childrens                | 6th Floor Ward 6A         | GENW1-049                   | Room 21 WHB (With Filter)      | Optitherm | Mixed              | Yes          |        | Other              | TVC@37c 575 TVC@22c 180. Filter changed & Facilities review flushing and cleaning regime   |  |  |  |  |  |  |
| Childrens                | 6th Floor Ward 6A         | GENW1-050                   | Room 21 En-Suite (With Filter) | Contour   | Mixed              | Yes          |        | Other              | TVC@37c 575 TVC@22c 260 followed by TVC@37 1. Filter changed & Facilities review flushing and cleaning regime  |  |  |  |  |  |  |
| Childrens                | Ground Floor Clinic 1 & 2 | Clinic 1 - Treatment Room A | OPD 031                        | Optitherm | Mixed              | No           |        | Other              | Ongoing since Aug 21. A number of Brevundimonas found and Not detected.  |  |  |  |  |  |  |
| Childrens                | 6th Floor Ward 6A         | GENW1-046                   | Room 20 En-Suite (With Filter) | Shower    | Mixed              | Yes          |        | Other              | 30/11/21 - Chysoeobacterium Gleum 2 , 15/12/21 - Roseomonas Mucosa, 11/01/22 - Not Detected. Filter changed & Facilities review flushing and cleaning regime   |  |  |  |  |  |  |

QEUEH - Tank Room Monitoring

| Raw Tanks                        | Status  | Date     |
|----------------------------------|---|----------|
| RAW Tank 1A – Dip                | Within Parameters SAB@22c 12  | 28/10/21 |
| RAW Tank 1A – Drain              | Within Parameters TVC@37c 1 SAB@22c 5 Exophiala Species -- Hyaline Hyphomycete  | 25/11/21 |
| RAW Tank 1B - Dip                | SAB@30c 1 SAB@22c 2 - Within Parameters Dematiaceous Hyphomycete, Hyaline Hyphomycete Exophiala Species                                 | 28/10/21 |
| RAW Tank 1B - Drain              | SAB@30c 3 SAB@22c 32  | 28/10/21 |
| RAW Tank 2A – Dip                | Within Parameters SAB@22c 2 TVC@22c 2 SAB@22c 1 Aspergillus Sp  | 25/11/21 |
| RAW Tank 2A – Drain              | Within Parameters TVC@22c 1 SAB@22c 8 Acremonium SP   | 25/11/21 |
| RAW Tank 2B - Dip                | Within Parameters TVC@37c 3 TVC@22c 3 SAB@30c 1 SAB@22c 4 Penicillium Sp, Dematiaceous Hyphomycete, Hyaline Hyphomycete Cladosporium Sp | 25/11/21 |
| RAW Tank 2B – Drain              | Within Parameters TVC@22c 1 SAB@22c 6 Dematiaceous Hyphomycete Exophiala Sp 25/11/21  | 25/11/21 |
| Filtration Units                 | Status  | Date     |
| Filtration Unit 1 Sample Point 5 | TVC@37c 220 TVC@22c 276   | 25/11/21 |
| Filtration Unit 1 Sample Point 7 | Within parameters SAB@30c 1 Exophiala Sp  | 25/11/21 |
| Filtration Unit 1 Sample Point 9 | TVC:37c 34 TVC@:22c 86 SAB@30c 3 SAB@22c 7 Exophiala Species , Paecilomyces Species   | 25/11/21 |
| Filtration Unit 2 Sample Point 5 | Within parameters TVC@22c 70 SAB@30c 1 SAB@22c 2 Exophiala Sp   | 25/11/21 |
| Filtration Unit 2 Sample Point 7 | TVC:22c 261   | 25/11/21 |
| Filtration Unit 2 Sample Point 9 | TVC@37c 1 TVC@22c 62 SAB@30c SAB@22c 2  | 25/11/21 |
| Filtration Unit 3 Sample Point 5 | TVC@37c 47c TVC@22c 164 SAB@30c 3 SAB@:30c 3 Hyaline Hyphomycete Paecilomyces Sp  | 25/11/21 |
| Filtration Unit 3 Sample Point 7 | TVC@37c 220 TVC@22 164 SAB@30c 25 SAB@22c 90 Dematiaceous Hypomycete Exophiala Sp   | 25/11/21 |
| Filtration Unit 3 Sample Point 9 | SAB@22c 1 Exophiala Sp  | 25/11/21 |

QEUH - Tank Room Monitoring (cont.)

| Bulk Filter Tanks           | Status  | Date     |
|-----------------------------|---|----------|
| Bulk filter Tank 1A – Dip   | Within parameters SAB@30c 1 SAB@22c 2 Paecilyces Sp   | 25/11/22 |
| Bulk filter Tank 1A – Drain | Within parameters SAB@22c 2 Apspergillus  | 25/11/22 |
| Bulk filer Tank 1B - Dip    | Within parameters SAB@30c 14SAB@22c 2 Paecilyces Sp   | 25/11/22 |
| Bulk filer Tank 1B – Drain  | Not Detected  | 25/11/22 |
| Bulk filer Tank 2A – Dip    | Within parameters TVC@22c 2 SAB@30x 1 Apergillus Sp   | 25/11/22 |
| Bulk filer Tank 2A – Drain  | Within parameters TVC@37c 1   | 25/11/22 |
| Bulk filer Tank 2B – Dip    | Within Parameters SAB@30c 2 SAB@22c 1 Rhodotorula Species, Penicillium Species Mycelia Sterilia | 25/11/22 |
| Bulk filer Tank 2B - Drain  | Not Detected  | 25/11/22 |



**NHS Greater Glasgow & Clyde  
South Sector Water Safety Group Meeting  
Thursday 12 May 2022 at 14.00  
Via MSTeams**

**Present:**

|                         |   |   |
|-------------------------|---|---|
| Euan Smith (Chair) (ES) | - | Assistant Head of Operational Estates, South Sector |
| Kerr Clarkson (KCL)     | - | Site Manager Operational Estates, QEUH              |
| Pat Coyne               | - | Professional Lead Domestic                          |
| James Huddleston        | - | Assistant Head of Capital Planning                  |
| Lynn Pritchard (LP)     | - | Lead Infection Prevention & Control Nurse           |
| Angela Johnston         | - | Infection Prevention & Control Nurse                |
| Abhijit Bal             | - | Consultant Microbiologist                           |
| Robert Sewell (RS)      | - | Engie   |
| Stuart McNeil (SMcN)    | - | Engie   |
| David Juner (DJ)        | - | Serco   |

Carmel McGeown (CMcG) - Personal Assistant - Minutes

**Apologies:**

|                       |   |   |
|-----------------------|---|---|
| Gillian Bowskill (GB) | - | Lead IC Nurse, W&C                            |
| Mel MacMillan (MM)    | - | Estates Manager                               |
| Alison Edwardson      | - | Senior Infection Prevention & Control Nurse   |
| Sharon Johnstone (SJ) | - | Assistant Head of FM Operations, South Sector |

**Action****1. Apologies**

As noted above.

**2. Notes of Previous Meeting (19 August 2021) Matters Arising**

The minute was agreed as an accurate record.

**3. Matters Arising from Previous Meeting****Agenda Item 7**

- Monthly meetings to be arranged KC/MM to review and update audit actions.

**KC**

**Agenda Item 8**

- SJ to contact RC and request a SoP for Langlands flushing regime. SJ advised Langlands continuing to carry out flushing every outlet. Current process seems to meet compliance, need confirmation from PU. ES to contact Matt Feeney (new Compliance Manager) for comment.
- Smartsheet to be implemented for WS01a returns, KC/MF to pick this up going forward.

**ES/MF**

**KC/MF**

- 4. Written Scheme Update for all Sites**
- KC/ES reviewed WS, minor changes to be made, smartsheet to be updated. **KC**
- 5. Risk Assessment Update for all Sites**
- RA's for Retained Estates are overdue, should be carried out every 2years. **KC**
  - Require definitive list of RAs for QEUH campus for each building showing completion status for inclusion in minutes. KC to advise current status by next meeting. **KC**
- 6. SCART Update for all Sites (Water Only)**
- KC reported QEUH 99% (Retained 36%, Adult & kids 61%)
  - Engie reported some access issues due to merge with Equans and will update when resolved. **SMcN**
  - Langlands reported compliance in high 90's. DJ to provide specific percentage figure. **DJ**
- 7. AE Audit Update for all Sites**
- New Compliance Manager, Matthew Feeney now in post.
  - AE Audit carried out last month. Number of actions to be updated on smartsheet. Will work through list with MF.
  - QEUH/RHC number of actions and percentage complete to follow. **KC**
  - Engie – AE audits up to date, all actions complete and signed off.
  - Serco – 1 outstanding issue relating to water tank, awaiting confirmation from IC to proceed.
- 8. Flushing Regimes Currently being Carried Out**
- No change to current flushing regime within Adults, RHC and Retained sites. Clinical colleagues have been advised to make Estates & IC aware if no access to rooms/wards as per SHTM requirements.
  - Engie – continuing with flushing and sampling. 63 samples taken, some issues with temperatures and will report findings at next meeting.
  - Serco – no changes, no issues.
- 9. WS01a Returns**
- Q4 return 14% for QEUH Campus.
  - Engie – carrying out regular flushing.
  - Serco – carrying out regular flushing.
- 10. Testing Within Sites & Results**
- In relation to size of Campus, out of specs are nominal.

- High number of GNB's found when sampling prior to Ward2A/2B opening. Unsure why this occurred. Taps changed and disinfections carried out.
- AMS takes eight weeks for results. AB investigating risk rates/levels.
- KC noted that 1649 water samples have been undertaken to date as per the agreed sampling programme across the QEUH & RHC. From this there were :-

|  | Samples | %      |
|--|---------|--------|
| <b>Total Samples</b>                           | 1649    |        |
| <b>Total Not Detected or within parameters</b> | 15764   | 95.57% |
| <b>Out of spec tank room</b>                   | 28      | 1.70%  |
| <b>Out of spec wards</b>                       | 45      | 2.73%  |

- See attached tables.
- Engie – 63 samples taken, some issues with temperatures. SMcN to report cause at next meeting following investigation.
- Langlands – No out of specs recorded.

#### 11. SHTM 04-01 Part G Compliance

- No exceptions.
- TMV checks – high risk areas have been completed. FM First schedule needs amended as this is incorrect.
- RP/CP/AP –Further RP training carried out along with AP refresher training.
- Engie – PPM's up to date, only 1 x RP for site at the moment, should be resolved in June.
- Serco – PPM's up to date. 1 x RP & 1 x CP.

#### 12. Safety Action Notices

- No new SAN's to report

#### 13. AOCB

- Expansion vessels – 2 require replacement. Estates to agree schedule of to check for residue.
- Watercoolers – in line filters have been fitted. Eden have potentially installed Pall filters. DMA to provide report.

#### 14. Date & Time of Next Meeting

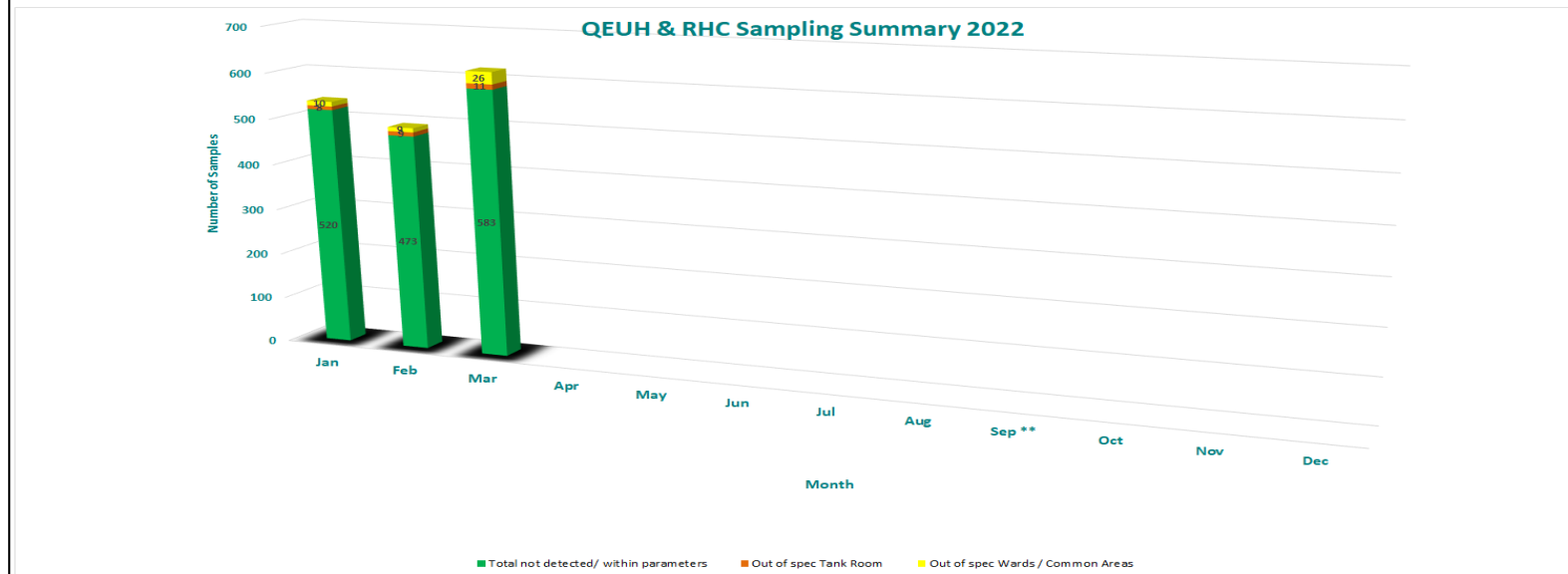
The next meeting is scheduled for Thursday 11 August 2022 at 2.00pm via MS Teams.



Out of spec Summary 2022 Adults and RHC (All including 2A-RHC 6A- Adults and PICU)

QEUH & RHC Sampling Summary 2022

|              | Total samples | Total not detected/ within parameters | Out of spec Tank Room | Out of spec Wards / Common Areas | Number of out of specs which were from PAL filters | % in spec     | % Out of spec | Total out of specs for wards / Common Areas | % out of spec for Wards / Common Areas excl PAL filters | % out of spec for Wards / Common Areas - PAL filters | % out of spec -Tank Room |
|--------------|---------------|---------------------------------------|-----------------------|----------------------------------|--|---------------|---------------|---|---|--|--------------------------|
| Jan          | 538           | 520                                   | 8                     | 10                               | 2  | 96.65%        | 3.35%         | 1.86%                                       | 1.49%   |  | 1.49%                    |
| Feb          | 491           | 473                                   | 9                     | 9                                | 0  | 96.33%        | 3.67%         | 1.83%                                       | 1.83%   |  | 1.83%                    |
| Mar          | 620           | 583                                   | 11                    | 26                               | 12   | 94.03%        | 5.97%         | 4.19%                                       | 2.26%   |  | 1.77%                    |
| Apr          |               |                                       |                       |                                  |  | #DIV/0!       | #DIV/0!       | #DIV/0!                                     | #DIV/0!   |  | #DIV/0!                  |
| May          |               |                                       |                       |                                  |  | #DIV/0!       | #DIV/0!       | #DIV/0!                                     | #DIV/0!   |  | #DIV/0!                  |
| Jun          |               |                                       |                       |                                  |  | #DIV/0!       | #DIV/0!       | #DIV/0!                                     | #DIV/0!   |  | #DIV/0!                  |
| Jul          |               |                                       |                       |                                  |  | #DIV/0!       | #DIV/0!       | #DIV/0!                                     | #DIV/0!   |  | #DIV/0!                  |
| Aug          |               |                                       |                       |                                  |  | #DIV/0!       | #DIV/0!       | #DIV/0!                                     | #DIV/0!   |  | #DIV/0!                  |
| Sep **       |               |                                       |                       |                                  |  | #DIV/0!       | #DIV/0!       | #DIV/0!                                     | #DIV/0!   |  | #DIV/0!                  |
| Oct          |               |                                       |                       |                                  |  | #DIV/0!       | #DIV/0!       | #DIV/0!                                     | #DIV/0!   |  | #DIV/0!                  |
| Nov          |               |                                       |                       |                                  |  | #DIV/0!       | #DIV/0!       | #DIV/0!                                     | #DIV/0!   |  | #DIV/0!                  |
| Dec          |               |                                       |                       |                                  |  | #DIV/0!       | #DIV/0!       | #DIV/0!                                     | #DIV/0!   |  | #DIV/0!                  |
| <b>Total</b> | <b>1649</b>   | <b>1576</b>                           | <b>28</b>             | <b>45</b>                        | <b>14</b>  | <b>95.57%</b> | <b>4.43%</b>  | <b>2.73%</b>                                | <b>1.88%</b>  |  | <b>0.85%</b>             |



Out of spec Summary – 2A/6A

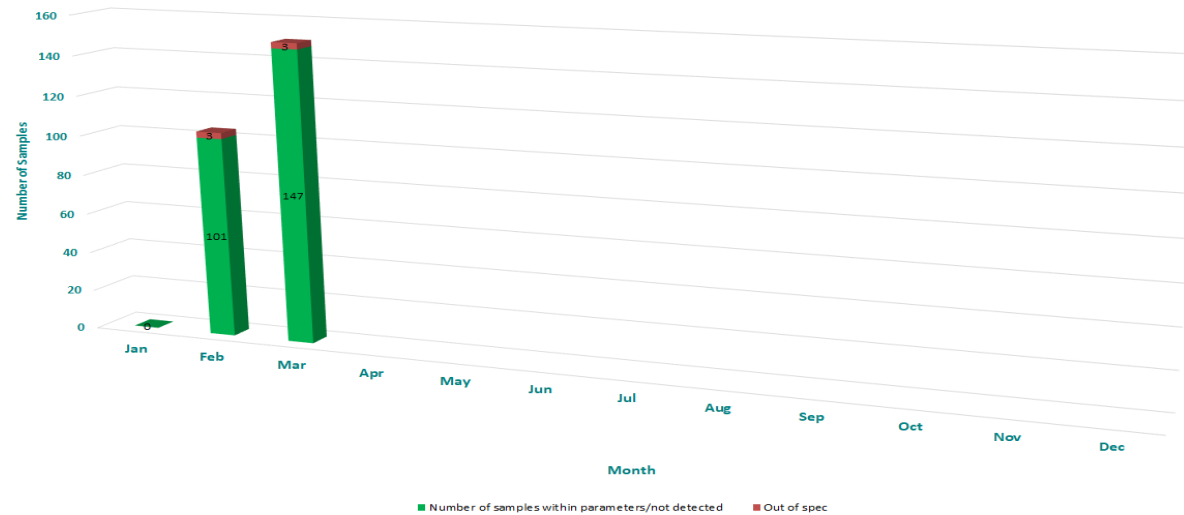
QEUEH 6A/2A Summary 2022 - PAL Filtered Ward to 0.2 microns



|               | Total Samples | Number of samples within parameters/not detected | Out of spec | Within spec % | Out of spec % |
|---------------|---------------|--|-------------|---------------|---------------|
| Jan           | 161           | 0  |             | 0.00%         | 0.00%         |
| Feb           | 104           | 101  | 3           | 97.12%        | 2.88%         |
| Mar           | 150           | 147  | 3           | 98.00%        | 2.00%         |
| Apr           |               |  |             | #DIV/0!       | #DIV/0!       |
| May           |               |  |             | #DIV/0!       | #DIV/0!       |
| Jun           |               |  |             | #DIV/0!       | #DIV/0!       |
| Jul           |               |  |             | #DIV/0!       | #DIV/0!       |
| Aug           |               |  |             | #DIV/0!       | #DIV/0!       |
| Sep           |               |  |             | #DIV/0!       | #DIV/0!       |
| Oct           |               |  |             | #DIV/0!       | #DIV/0!       |
| Nov           |               |  |             | #DIV/0!       | #DIV/0!       |
| Dec           |               |  |             | #DIV/0!       | #DIV/0!       |
| <b>Totals</b> | <b>415</b>    | <b>248</b>                                       | <b>6</b>    | <b>60%</b>    | <b>1.45%</b>  |

95 samples from 2A 55 from 6A

QEUEH 2A/6A Summary 2022



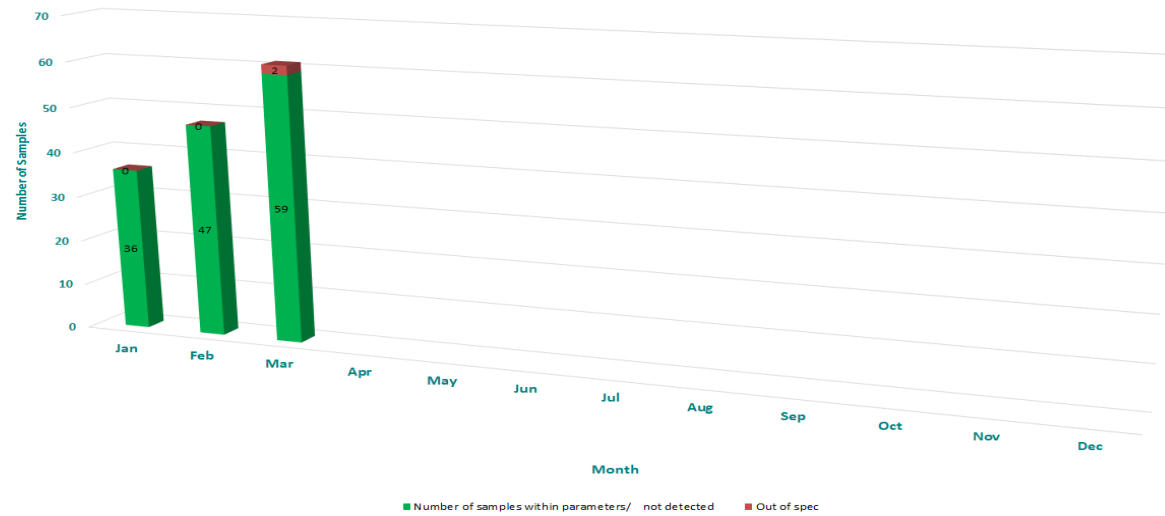
### Out of spec Summary – PICU 2022

QEUEH PICU Summary 2022 - PAL Filtered Ward to 0.2 microns



|               | Total Samples | Number of samples within parameters/ not detected | Out of spec | Within spec % | Out of spec % |
|---------------|---------------|---|-------------|---------------|---------------|
| Jan           | 36            | 36  | 0           | 100.00%       | 0.00%         |
| Feb           | 47            | 47  | 0           | 100.00%       | 0.00%         |
| Mar           | 61            | 59  | 2           | 96.72%        | 3.28%         |
| Apr           |               |   |             | #DIV/0!       | #DIV/0!       |
| May           |               |   |             | #DIV/0!       | #DIV/0!       |
| Jun           |               |   |             | #DIV/0!       | #DIV/0!       |
| Jul           |               |   |             | #DIV/0!       | #DIV/0!       |
| Aug           |               |   |             | #DIV/0!       | #DIV/0!       |
| Sep           |               |   |             | #DIV/0!       | #DIV/0!       |
| Oct           |               |   |             | #DIV/0!       | #DIV/0!       |
| Nov           |               |   |             | #DIV/0!       | #DIV/0!       |
| Dec           |               |   |             | #DIV/0!       | #DIV/0!       |
| <b>Totals</b> | <b>144</b>    | <b>142</b>  | <b>2</b>    | <b>99%</b>    | <b>1.39%</b>  |

QEUEH PICU Summary 2022



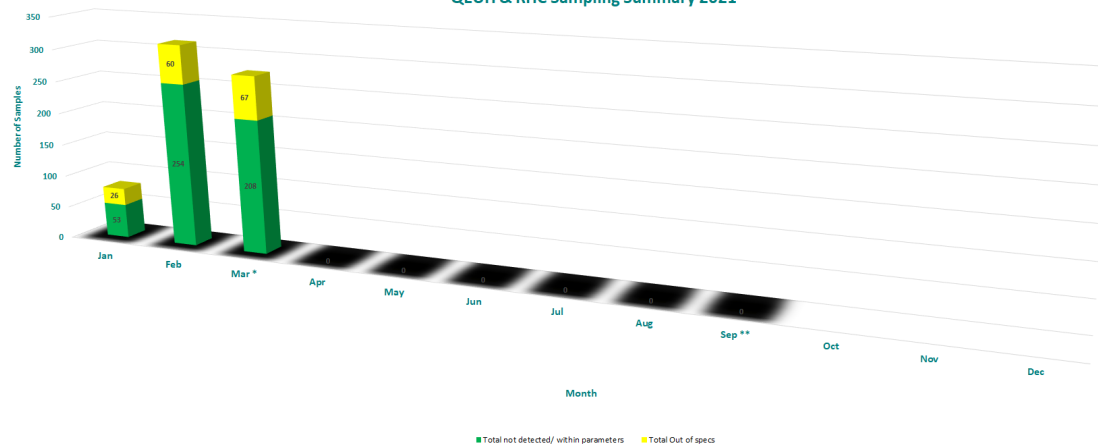
### Out of spec Summary – Retained 2022

QEUH Retained Estate Sampling Summary 2022



|               | Total samples | Total not detected/ within parameters | Total Out of specs | Total out of spec % | CMB         |             | ICE         |             | INS         |             | Labs        |             | Office Block |             | Neurology   |             | NICU        |             | Neo-Natal   |             | Old Maternity |             | MIU         |             | Podiatry    |             | PDRU        |             | Spinal      |             | TLC         |             | WestMarc    |             |  |
|---------------|---------------|---------------------------------------|--------------------|---------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|---------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--|
|               |               |                                       |                    |                     | Within Spec | Out of Spec | Within Spec | Out of Spec | Within Spec | Out of Spec | Within Spec | Out of Spec | Within Spec  | Out of Spec | Within Spec | Out of Spec | Within Spec | Out of Spec | Within Spec | Out of Spec | Within Spec   | Out of Spec | Within Spec | Out of Spec | Within Spec | Out of Spec | Within Spec | Out of Spec | Within Spec | Out of Spec | Within Spec | Out of Spec | Within Spec | Out of Spec |  |
| Jan           | 79            | 52                                    | 26                 | 33%                 | 0           | 0           | 0           | 0           | 17          | 10          | 0           | 0           | 0            | 0           | 0           | 0           | 9           | 0           | 0           | 0           | 16            | 4           | 2           | 0           | 4           | 5           | 0           | 0           | 14          | 7           | 0           | 0           | 0           | 0           |  |
| Feb           | 314           | 254                                   | 60                 | 19%                 | 0           | 0           | 27          | 0           | 58          | 28          | 0           | 0           | 0            | 0           | 33          | 0           | 8           | 0           | 29          | 3           | 62            | 4           | 0           | 0           | 14          | 12          | 0           | 0           | 31          | 13          | 0           | 0           | 16          | 0           |  |
| Mar           | 275           | 208                                   | 67                 | 24%                 | 10          | 0           | 0           | 0           | 68          | 23          | 61          | 4           | 15           | 0           | 28          | 0           | 8           | 0           | 12          | 2           | 5             | 9           | 12          | 0           | 2           | 13          | 18          | 0           | 14          | 19          | 24          | 1           | 0           | 0           |  |
| Apr           | 0             | 0                                     | 0                  | #DIV/0!             |             |             |             |             |             |             |             |             |              |             |             |             |             |             |             |             |               |             |             |             |             |             |             |             |             |             |             |             |             |             |  |
| May           | 0             | 0                                     | 0                  | #DIV/0!             |             |             |             |             |             |             |             |             |              |             |             |             |             |             |             |             |               |             |             |             |             |             |             |             |             |             |             |             |             |             |  |
| Jun           | 0             | 0                                     | 0                  | #DIV/0!             |             |             |             |             |             |             |             |             |              |             |             |             |             |             |             |             |               |             |             |             |             |             |             |             |             |             |             |             |             |             |  |
| Jul           | 0             | 0                                     | 0                  | #DIV/0!             |             |             |             |             |             |             |             |             |              |             |             |             |             |             |             |             |               |             |             |             |             |             |             |             |             |             |             |             |             |             |  |
| Aug           | 0             | 0                                     | 0                  | #DIV/0!             |             |             |             |             |             |             |             |             |              |             |             |             |             |             |             |             |               |             |             |             |             |             |             |             |             |             |             |             |             |             |  |
| Sep           | 0             | 0                                     | 0                  | #DIV/0!             |             |             |             |             |             |             |             |             |              |             |             |             |             |             |             |             |               |             |             |             |             |             |             |             |             |             |             |             |             |             |  |
| Oct           |               |                                       |                    |                     |             |             |             |             |             |             |             |             |              |             |             |             |             |             |             |             |               |             |             |             |             |             |             |             |             |             |             |             |             |             |  |
| Nov           |               |                                       |                    |                     |             |             |             |             |             |             |             |             |              |             |             |             |             |             |             |             |               |             |             |             |             |             |             |             |             |             |             |             |             |             |  |
| Dec           |               |                                       |                    |                     |             |             |             |             |             |             |             |             |              |             |             |             |             |             |             |             |               |             |             |             |             |             |             |             |             |             |             |             |             |             |  |
| <b>Totals</b> | <b>668</b>    | <b>515</b>                            | <b>153</b>         | <b>23%</b>          | <b>10</b>   | <b>0</b>    | <b>27</b>   | <b>0</b>    | <b>143</b>  | <b>61</b>   | <b>61</b>   | <b>4</b>    | <b>15</b>    | <b>0</b>    | <b>61</b>   | <b>0</b>    | <b>24</b>   | <b>0</b>    | <b>41</b>   | <b>5</b>    | <b>83</b>     | <b>17</b>   | <b>14</b>   | <b>0</b>    | <b>20</b>   | <b>30</b>   | <b>18</b>   | <b>0</b>    | <b>59</b>   | <b>39</b>   | <b>24</b>   | <b>1</b>    | <b>16</b>   | <b>0</b>    |  |

QEUH & RHC Sampling Summary 2021



All out of specs are Legionella Species 2-14 except :-

- TLC - Out of spec Potable from one outlet
- Spinal - Hydrotherapy pool TVC and Pseudomonas
- Old Maternity - Two TVC's out of spec for two outlets
- Labs - TVC and coliform on filtration tank 1. TVC on washdown water tank on four occasions.

### Out of spec Summary as of 10/05/22 (excluding Tank Room)

| Current Out of Specs        |                          |                   |                              |                   |                    |             |               |                    |                  |  |           |
|-----------------------------|--------------------------|-------------------|------------------------------|-------------------|--------------------|-------------|---------------|--------------------|------------------|--|-----------|
| Building                    | Area                     | Unique ID         | Sampling point               | Type              | (Hot/ Cold/ Mixed) | Filtred Tap | Counts        | Bacteria           | First occurrence | Comments                               | Action by |
| Spinal                      | Ground                   | L0/124            | Clean Utility                | Tap               | Cold               | No          | 100           | Legionella 2-14    | 13/01/2021       | 11 Not Detected since Jan 21           | NHS       |
| Spinal                      | Ground                   | L0/128            | Kitchen SSS                  | Tap               | Hot                | No          | 1500          | Legionella Species | 29/04/2021       |  | NHS       |
| Spinal                      | Ground Floor             | L0/130            | Staff Room SSS               | Tap               | Cold               | No          | 50            | Legionella 2-14    | 22/02/2022       |  | NHS       |
| Neurosurgery                | 5th Floor                | L5/29             | Advanced Procedure Room WHB  | Tap               | Cold               | No          | 200           | Legionella Species | 15/09/2022       |  | NHS       |
| Neurosurgery                | 4th Floor Ward 65        | L4/54             | Procedure Room WHB           | Tap               | Cold               | No          | 100           | Legionella Species | 15/09/2022       |  | NHS       |
| Neurosurgery                | 5th Floor                | L5/11             | Ultrasound Room              | Tap               | Cold               | No          | 100           | Legionella Species | 22/03/2022       |  | NHS       |
| Neurosurgery                | 5th Floor                | L5/11             | Ultrasound Room              | Tap               | Mixed              | No          | 250           | Legionella Species | 22/03/2022       |  | NHS       |
| Neurosurgery                | 2nd Floor                | L2/31             | CDU Dispatch RHS WHB         | Tap               | Cold               | No          | 100           | Legionella Species | 01/02/2022       |  | NHS       |
| Podiatry                    | Ground Floor             | L0/24             | Student Change Room LHS WHB  | Tap               | Cold               | No          | 550           | Legionella Species | 12/08/2021       | 2 not detected since Aug 21            | NHS       |
| Podiatry                    | Ground Floor             | L0/17             | Staff Room SSS               | Tap               | Cold               | No          | 250           | Legionella Species | 21/04/2021       | 3 not detected since Apr 21            | NHS       |
| Podiatry                    | Ground Floor             | L0/35             | Chair 24 WHB                 | Tap               | Mixed              | No          | 450           | Legionella Species | 21/04/2021       | 2 not detected since Apr 21            | NHS       |
| Old Maternity               | 2nd Floor Ward 47        | L2/17             | Sluice                       | Tap               | Cold               | No          | 800           | Legionella Species | 04/04/2022       |  | NHS       |
| Old Maternity               | 2nd Floor Ward 47        | L2/17             | Sluice                       | Tap               | Mixed              | No          | 150           | Legionella Species | 04/04/2022       |  | NHS       |
| Old Maternity               | Ground Floor             | FM D.20           | Ultrasound Lab SSS           | Tap               | Mixed              | No          | 100 / 50      | Legionella Species | 23/02/2022       |  | NHS       |
| Old Maternity               | Ground Floor             | FM/D 36           | Scanning Room 7 WHB          | Tap               | Cold               | No          | 50            | Legionella Species | 25/05/2021       | 14 not detected since May 21           | NHS       |
| Royal Hospital for Children | Ground Floor             | OPD 026           | Facilities                   | Janitorial Sink   | Cold               | No          | 2             | AMS                | 18/02/2021       | Replacing taps May 2022                | NHS       |
| Royal Hospital for Children | Ground Floor             | OPD 028           | Clinic 1 - WC Public         | Contour           | Mixed              | No          | 6             | AMS                | 11/08/2021       | Replacing taps May 2022                | NHS       |
| Royal Hospital for Children | Ground Floor             | OPD 009           | Public WC                    | Contour           | Mixed              | No          | 2             | AMS                | 11/08/2021       | Replacing taps May 2022                | NHS       |
| Royal Hospital for Children | Ground Floor Clinic 2    | OPD-162           | Clean utility                | SSS               | Cold               | No          | 3             | AMS                | 21/06/2021       | Replacing taps May 2022                | NHS       |
| Royal Hospital for Children | Adults                   | 11th Floor Ward B | Bedroom 85                   | Optitherm         | Mixed              | No          | 15            | Mould              | 28/03/2022       |  | NHS       |
| Royal Hospital for Children | Ground Floor - Concourse | ENT-036           | DSR Facilities               | Optitherm         | Mixed              | No          | 77            | GNB                | 23/03/2022       |  | DMA       |
| Royal Hospital for Children | Ward 1C                  | MDU-009           | Multi-bed Room               | Optitherm (Front) | Cold               | No          | 37 / 17       | GNB                | 23/03/2022       |  | DMA       |
| Royal Hospital for Children | Ward 1C                  | MDU-009           | Multi-bed Room               | Optitherm (RHS)   | Cold               | No          | 15            | GNB                | 23/03/2022       |  | DMA       |
| Royal Hospital for Children | Ground Floor - Concourse | ENT-036           | DSR Facilities               | Optitherm         | Mixed              | No          | 37 / 17       | GNB                | 23/03/2022       |  | DMA       |
| Royal Hospital for Children | Ground Floor - Concourse | ENT-036           | DSR Facilities               | Pillar Tap        | Cold               | No          | 4             | GNB                | 23/03/2022       |  | DMA       |
| Royal Hospital for Children | Ground Floor - Concourse | ENT-048           | Infant Feeding               | Optitherm         | Mixed              | No          | 31            | GNB                | 23/03/2022       |  | DMA       |
| Royal Hospital for Children | Ground Floor - Concourse | ENT-048           | Infant Feeding               | Optitherm         | Cold               | No          | 82            | GNB                | 23/03/2022       |  | DMA       |
| Royal Hospital for Children | Ground Floor - Concourse | ENT-048           | Teddy Hospital SSS           | Pillar Tap        | Cold               | No          | 6 & 12        | Mould              | 23/03/2022       |  | DMA       |
| Royal Hospital for Children | Zone 12                  | No Code           | Kitchen                      | Pillar Tap        | Hot                | No          | 8             | GNB                | 23/03/2022       |  | DMA       |
| Royal Hospital for Children | 1st Floor Ward 1D PICU   | CCW-118           | Facilities SSS (With Filter) | Swan Neck         | Cold               | Yes         | 1             | GNB                | 04/04/2022       |  | DMA       |
| Royal Hospital for Children | 1st Floor Ward 1D PICU   | CCW-051           | Bathroom (With Filter)       | Contour           | Mixed              | Yes         |               | TVC                | 11/04/2022       |  | DMA       |
| Royal Hospital for Children | 2nd Floor Ward 2A        | SCH-062           | Play Room                    | Swan Neck Tap     | Cold               | No*         | TVC 58 AMS 34 | AMS                | 23/03/2022       |  | DMA       |
| Royal Hospital for Children | GROUND FLOOR CDU         | ROOM 19           | 0                            | Shower            | Mixed              | Yes         | 43/42         | Mould              | 01/04/2022       |  | DMA       |
| Royal Hospital for Children | Ward 3A                  | GW3-069           | Room 10                      | Optitherm         | Mixed              | No          | 38            | GNB                | 23/03/2022       |  | DMA       |
| Lab Building                | Ground Floor             | 0                 | CWST                         | Washdown          | Cold               | No          | TVC 22c 624   | TVC                | 09/03/2022       | 2 not detected and 1 within paramaters | DMA       |

\* - sample taken behind filter and replaced

| Not Detected after works    |                          |            |                                   |                     |                    |              |                           |                    |                  |                                   |      |  |
|-----------------------------|--------------------------|------------|-----------------------------------|---------------------|--------------------|--------------|---------------------------|--------------------|------------------|-----------------------------------|------|--|
| Building                    | Area                     | Unique ID  | Sampling point                    | Type                | (Hot/ Cold/ Mixed) | Filtered Tap | Comment                   | Bacteria           | First occurrence | Not Detected or within parameters | Days |  |
| Adults                      | 6th Floor Ward 6A        | GENW1-046  | Room 20 En-Suite (With Filter)    | Shower              | Mixed              | Yes          |                           | GNB                | 30/11/2021       | 11/01/2022                        | 42   |  |
| Adults                      | 6th Floor Ward 6A        | GENW1-046  | Room 20 En-Suite (With Filter)    | Shower              | Mixed              | Yes          |                           | GNB                | 07/12/2021       | 11/01/2022                        | 35   |  |
| Adults                      | 6th Floor Ward 6A        | GENW1-034  | Room 14 En-Suite (With Filter)    | Contour             | Mixed              | Yes          |                           | TVC                | 21/12/2021       | 12/01/2022                        | 22   |  |
| Adults                      | 6th Floor Ward 6A        | GENW1-066  | Facilities WHB (With Filter)      | Optitherm           | Mixed              | Yes          |                           | TVC                | 21/12/2021       | 12/01/2022                        | 22   |  |
| Adults                      | 6th Floor Ward 6A        | GENW1-066  | Facilities SSS (With Filter)      | Tap                 | Hot                | Yes          |                           | TVC                | 21/12/2021       | 12/01/2022                        | 22   |  |
| Adults                      | 6th Floor Ward 6A        | GENW1-049  | Room 21 WHB (With Filter)         | Optitherm           | Mixed              | Yes          |                           | TVC                | 21/12/2021       | 12/01/2022                        | 22   |  |
| Adults                      | 6th Floor Ward 6A        | GENW1-050  | Room 21 En-Suite (With Filter)    | Contour             | Mixed              | Yes          |                           | TVC                | 21/12/2021       | 12/01/2022                        | 22   |  |
| Royal Hospital for Children | Ground Floor             | OPD 031    | Clinic 1 - Treatment Room A       | Optitherm           | Mixed              | No           | 6 not Detected since Aug  | GNB                | 09/08/2021       | 10/01/2022                        | 154  |  |
| Royal Hospital for Children | Ground Floor             | OPD 170    | Clinic 2 - WC Staff               | Contour             | Mixed              | Yes          |                           | GNB                | 10/01/2022       | 19/01/2022                        | 9    |  |
| Royal Hospital for Children | Ground Floor             | OPD 167    | Clinic 2 - Consulting Room 11     | Optitherm           | Mixed              | Yes          |                           | GNB                | 10/01/2022       | 19/01/2022                        | 9    |  |
| Royal Hospital for Children | Ground Floor             | OPD 026    | Facilities                        | Janitorial Sink SSS | Cold               | No           |                           | AMS                | 14/01/2021       | 02/02/2022                        | 384  |  |
| Royal Hospital for Children | Ground Floor             | OPD 026    | Clinic 1 - Facilities             | Optitherm           | Mixed              | No           |                           | Mould              | 20/12/2021       | 28/02/2022                        | 70   |  |
| Royal Hospital for Children | Ground Floor             | OPD 173    | Clinic 2 - Facilities             | SSS                 | Cold               | No           |                           | GNB                | 20/12/2021       | 06/04/2022                        | 107  |  |
| Adults                      | 9th Floor Ward C         | GENW15-033 | Bedroom 71                        | Optitherm           | Cold               | No           | Lab issue but resampled   |                    |                  |                                   | 0    |  |
| Royal Hospital for Children | 1st Floor Ward 1D PICU   | CCW-118    | Facilities Mop Sink (With Filter) | Swan Neck           | Hot                | Yes          |                           | TVC                | 09/11/2021       | 10/01/2022                        | 62   |  |
| Royal Hospital for Children | 1st Floor Ward 1D PICU   | CCW-118    | Facilities SSS (With Filter)      | Swan Neck           | Cold               | Yes          |                           | TVC                | 09/11/2021       | 10/01/2022                        | 62   |  |
| Royal Hospital for Children | 1st Floor Ward 1D PICU   | CCW-059    | Staff Kitchen (With Filter)       | Swan Neck           | Cold               | Yes          |                           | TVC                | 09/11/2021       | 10/01/2022                        | 62   |  |
| Royal Hospital for Children | 1st Floor Ward 1D PICU   | CCW-059    | Staff Kitchen (With Filter)       | Swan Neck           | Hot                | Yes          |                           | TVC                | 09/11/2021       | 10/01/2022                        | 62   |  |
| Adults                      | 2nd Floor Adult Theatres | THE-091    | Dirty Utility 2                   | Optitherm           | Mixed              | No           |                           | TVC                | 17/02/2022       | 06/04/2022                        | 48   |  |
| Adults                      | 11th Floor Ward A        | Bedroom 15 | GENW21-033                        | Optitherm           | Cold               | No           |                           | TVC                | 26/01/2022       | 09/03/2022                        | 42   |  |
| Royal Hospital for Children | Ward 1E                  | CAR-048    | Bathroom                          | Contour             | Cold               | No           |                           | Mould              | 23/03/2022       | 20/04/2022                        | 28   |  |
| Royal Hospital for Children | Ground Floor - Concourse | ENT-036    | DSR Facilities                    | Optitherm           | Cold               | No           |                           | GNB                | 23/03/2022       | 30/03/2022                        | 7    |  |
| Royal Hospital for Children | Ward 1A                  | 23HU-033   | ROOM 3 ENSUITE                    | SHOWER              | Mixed              | No           |                           | TVC                | 23/03/2022       | 06/04/2022                        | 14   |  |
| Royal Hospital for Children | Ward 1A                  | 23HU-033   | ROOM 3 ENSUITE                    | CONTOUR             | Mixed              | No           |                           | Mould              | 23/03/2022       | 30/03/2022                        | 7    |  |
| Royal Hospital for Children | Ward 1C                  | MDU-024    | Consultants Room 3                | Optitherm           | Cold               | No           |                           | GNB                | 23/03/2022       | 20/04/2022                        | 28   |  |
| Royal Hospital for Children | Ward 1C                  | MDU-009    | Multi-bed Room                    | Optitherm (Front)   | Cold               | No           |                           | GNB                | 23/03/2022       | 06/04/2022                        | 14   |  |
| Royal Hospital for Children | Ward 1C                  | MDU-009    | Multi-bed Room                    | Optitherm (RHS)     | Cold               | No           |                           | GNB                | 23/03/2022       | 06/04/2022                        | 14   |  |
| Royal Hospital for Children | Ward 3A                  | GW3-027    | ROOM 24                           | OFTI                | Cold               | No           |                           | GNB                | 23/03/2022       | 06/04/2022                        | 14   |  |
| Royal Hospital for Children | Ward 3A                  | GW3-027    | ROOM 24                           | OPTI                | Mixed              | No           |                           | GNB                | 23/03/2022       | 30/03/2022                        | 7    |  |
| Royal Hospital for Children | Ground Floor             | OPD 027    | Clinic 1 - WC Staff               | Contour             | Mixed              | No           |                           | GNB                | 04/04/2022       | 12/04/2022                        | 8    |  |
| Royal Hospital for Children | Ward 1C                  | MDU-005    | Toilet                            | Contour             | Cold               | Yes          |                           | Mould              | 23/03/2022       | 12/04/2022                        | 20   |  |
| Royal Hospital for Children | Ward 1E                  | CAR-048    | Bathroom                          | Contour             | Mixed              | No           |                           | Mould              | 23/03/2022       | 12/04/2022                        | 20   |  |
| Royal Hospital for Children | Ward 3A                  | GW3-       | Room 10                           | CONTOUR             | Mixed              | No           |                           | GNB                | 06/04/2022       | 12/04/2022                        | 6    |  |
| Royal Hospital for Children | Ward 3A                  | GW3-       | Room 10                           | SHOWER              | Mixed              | No           |                           | GNB                | 06/04/2022       | 12/04/2022                        | 6    |  |
| Royal Hospital for Children | Ward 3A                  | GW3-008    | Room 7                            | SHOWER              | Mixed              | No           |                           | TVC                | 06/04/2022       | 12/04/2022                        | 6    |  |
| Royal Hospital for Children | GROUND FLOOR CDU         | 0          | ROOM 19 ENSUITE                   | TAP                 | Mixed              | Yes          | Under Capital works       | TVC                | 01/04/2022       | 12/04/2022                        | 11   |  |
| Royal Hospital for Children | 2nd Floor Ward 2A        | SCH-066    | Room 17 Main                      | Markwick 21+        | Mixed              | Yes          |                           | GNB                | 15/03/2022       | 23/03/2022                        | 8    |  |
| Royal Hospital for Children | 2nd Floor Ward 2A        | SCH-070    | Room 19 En-suite                  | Horne Shower        | Mixed              | Yes          |                           | TVC                | 29/03/2022       | 06/04/2022                        | 8    |  |
| Royal Hospital for Children | 2nd Floor Ward 2A        | SCH-011    | Room 23 Main                      | Markwick 21+        | Mixed              | Yes          |                           | TVC                | 29/03/2022       | 06/04/2022                        | 8    |  |
| Old Maternity               | 3rd Floor                | L2/36      | Ward 48 Room 8 WHB                | Tap                 | Cold               | No           | 11 Not detected since Aug | Legionella Species | 10/08/2021       | 13/01/2022                        | 156  |  |
| Spinal                      | Philipshill Ground Floor | L0/82      | Laundry SSS                       | Tap                 | Hot                | No           | 9 Not detected since Apr  | Legionella Species | 21/04/2021       | 13/04/2022                        | 357  |  |
| Spinal                      | Ground Floor             | L0/77      | Philipshill Kitchen LHS SSS       | Tap                 | Hot                | No           | 5 Not detected since Nov  | Legionella Species | 02/11/2021       | 03/03/2022                        | 121  |  |
| Spinal                      | Ground Floor             | L0/77      | Philipshill Kitchen LHS SSS       | Tap                 | Cold               | No           | 6 Not detected since Nov  | Legionella Species | 02/11/2021       | 03/03/2022                        | 121  |  |
| Minor Injuries Unit         | Ground Floor             | 0          | Cleaners Cupboard SSS             | Tap                 | Cold               | No           |                           | Mould              | 24/11/2021       | 10/03/2022                        | 106  |  |
| Minor Injuries Unit         | Ground Floor             | 0          | Cleaners Cupboard SSS             | Tap                 | Hot                | No           |                           | Mould              | 24/11/2021       | 10/03/2022                        | 106  |  |
| Old Maternity               | Ground Floor             | L0/164     | Theatre 2 Dirty Utility SSS       | Tap                 | Mixed              | No           |                           | TVC                | 30/11/2021       | 09/12/2021                        | 9    |  |
| Old Maternity               | Ground Floor             | L0/164     | Theatre 2 Dirty Utility WHB       | Tap                 | Mixed              | No           |                           | TVC                | 30/11/2021       | 09/12/2021                        | 9    |  |
| Old Maternity               | Ground Floor             | L0/168     | Theatre 2 LHS Scrub Sink          | Tap                 | Hot                | No           |                           | TVC                | 20/01/2022       | 27/01/2022                        | 7    |  |
| Old Maternity               | Ground Floor             | FM D.20    | Old NICU Kitchen SSS              | Tap                 | Mixed              | No           |                           | Legionella Species | 23/02/2022       | 10/03/2022                        | 15   |  |
| New Maternity               | Ground Floor             | A0.69a     | Delivery Room 10 WHB              | Tap                 | Cold               | No           |                           | Legionella Species | 22/02/2022       | 10/03/2022                        | 16   |  |
| New Maternity               | Ground Floor             | A0.69a     | Delivery Room 10 WHB              | Tap                 | Mixed              | No           |                           | Legionella Species | 22/02/2022       | 10/03/2022                        | 16   |  |
| New Maternity               | Ground Floor             | A0.42a     | Kitchen SSS                       | Tap                 | Cold               | No           |                           | Legionella Species | 22/02/2022       | 03/03/2022                        | 9    |  |
| Spinal                      | Ground Floor             | 0          | Hydrotherapy Pool                 | Pool                | Cold               | No           |                           | TVC/Pseudomonas    | 17/03/2022       | 24/03/2022                        | 7    |  |
| Neurosurgery                | 5th Floor                | L5/29      | Advanced Procedure Room WHB       | Tap                 | Mixed              | No           | 6 Not detected since Oct  | Legionella Species | 15/09/2021       | 13/01/2022                        | 120  |  |
| Neurosurgery                | 4th Floor Ward 65        | L4/54      | Procedure Room WHB                | Tap                 | Mixed              | No           | 4 Not detected since Sep  | Legionella Species | 15/09/2021       | 13/04/2022                        | 210  |  |
| Neurosurgery                | 1st Floor                | 0          | HDU Bed 6 WHB                     | Tap                 | Cold               | No           |                           | Legionella Species | 22/03/2022       | 13/04/2022                        | 22   |  |
| Neurosurgery                | Ground Floor             | 0          | Theatres Ladies Change LHS WHB    | Tap                 | Hot                | No           | 1 Not detected since Feb  | Legionella Species | 01/02/2022       | 24/03/2022                        | 51   |  |
| Neurosurgery                | 5th Floor                | L5/31      | Treatment Room En-Suite           | Shower              | Mixed              | No           |                           | Legionella Species | 01/02/2022       | 24/02/2022                        | 23   |  |
| Neurosurgery                | Ground Floor             | 0          | Theatre Gents Change RHS Shower   | Shower              | Mixed              | No           |                           | Legionella Species | 01/02/2022       | 24/02/2022                        | 23   |  |
| Neurosurgery                | 1st Floor                | L1/24      | Theatre Kitchen SSS               | Tap                 | Mixed              | No           |                           | Legionella Species | 01/02/2022       | 17/02/2022                        | 16   |  |
| Neurosurgery                | 3rd Floor                | L3/57      | Ward 64 Kitchen SSS               | Tap                 | Mixed              | No           |                           | Legionella Species | 01/02/2022       | 17/02/2022                        | 16   |  |
| Neurosurgery                | 5th Floor                | L5/07      | Consult Room 3 WHB                | Tap                 | Cold               | No           |                           | Legionella Species | 20/01/2022       | 17/02/2022                        | 28   |  |
| Labs Building               | Ground Floor             | 0          | Filtration Tank 2                 | CWST                | Cold               | No           | Enterobacter Hormaechei   | TVC & Coliform     | 09/03/2022       | 17/03/2022                        | 8    |  |

QEUH - Tank Room Monitoring

| Raw Tanks                                       | Species Detected   | Status            |
|---|--|-------------------|
| RAW Tank 1A – Dip 24/04/22                      | SAB@30c 1 SAB@22c 10 Rhodotorula Speciesm, Exophiala Species, Dematiaceous Hyphomycete | Out of spec       |
| RAW Tank 1A – Drain 30/03/22 Mould 12/04/22 AMS | SAB@30c 58 SAB@22c 8 Exophiala Species, Dematiaceous Hyphomycete, AMS 11               | Out of spec       |
| RAW Tank 1B – Dip 30/03/22                      | SAB@30c Expophiala 54  | Out of spec       |
| RAW Tank 1B – Drain 30/03/22                    | SAB@30c 1 SAB@22c 2 Dematiaceous Hyphomycete, Exophiala Species                        | Within Parameters |
| RAW Tank 2A – Dip 30/03/22                      | SAB@30c 1 SAB@22c 8 Dematiaceous Hyphomycete, Exophiala Species, Hyaline Hyphomycete   | Within Parameters |
| RAW Tank 2A – Drain 30/03/22                    | SAB@30c 2 SAB@22c 8 Exophiala Species, Hyaline Hyphomycete                             | Within Parameters |
| RAW Tank 2B – Dip 30/03/22                      | SAB@30c 1 SAB@22c 2 Dematiaceous Hyphomycete, Exophiala Species, Hyaline Hyphomycete   | Within Parameters |
| RAW Tank 2B – Drain                             | SAB@22c 3 Exophiala Species, Hyaline Hyphomycete                                       | Within Parameters |

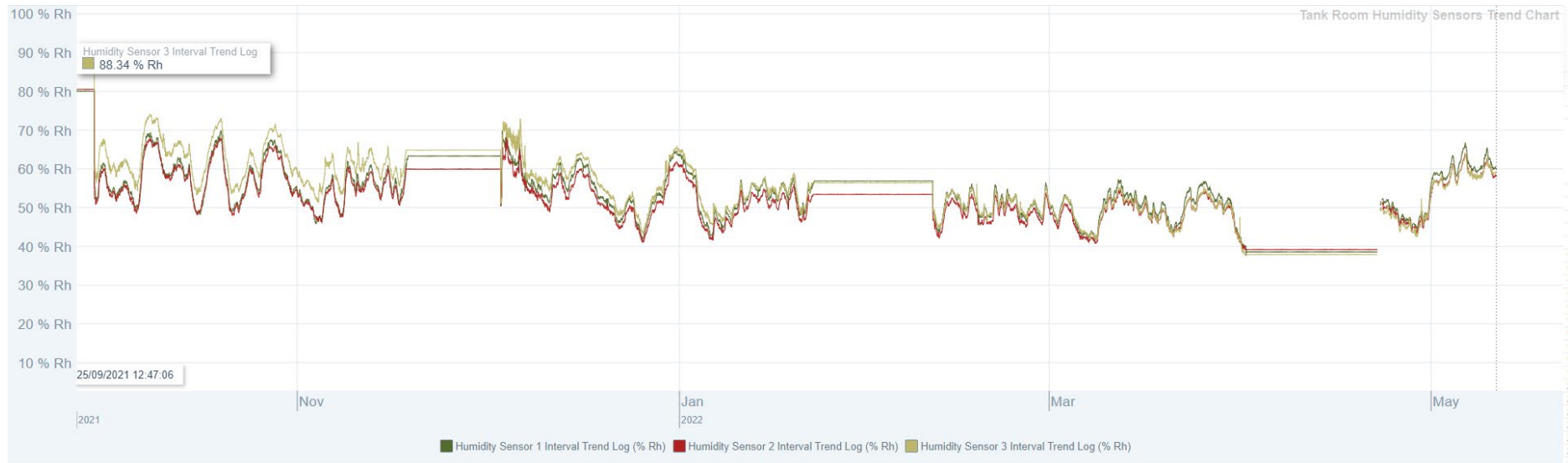
| Filtration Units                            | Species Detected  | Status            |
|---|---|-------------------|
| Filtration Unit 1 Sample Point 5 – 30/03/22 | TVC@22c 25 SAB@30c 1 Exophiala Species                                      | Within Parameters |
| Filtration Unit 1 Sample Point 7 – 30/03/22 | SAB@30c 4 Exophiala Species   | Within Parameters |
| Filtration Unit 1 Sample Point 9 – 30/03/22 | TVC@22c 2 SAB@30c 1 SAB@22c 1 Exophiala Species                             | Within Parameters |
| Filtration Unit 2 Sample Point 5 – 30/03/22 | TVC@22c 390 SAB@30c 94 SAB@22c 93 Exophiala Species                         | Out of spec       |
| Filtration Unit 2 Sample Point 7 – 30/03/22 | TVC@22c 48 SAB@30c 39 SAB@22c 38 Dematiaceous Hyphmccete, Exophiala Species | Out of spec       |
| Filtration Unit 2 Sample Point 9 – 30/03/22 | TVC@37c 1 TVC@22c 34 SAB@30c 17 SAB@22c 17 Exophiala Species                | Out of spec       |
| Filtration Unit 3 Sample Point 5 – 30/03/22 | TVC@37c 30 TV C@22c 246   | Out of spec       |
| Filtration Unit 3 Sample Point 7 – 30/03/22 | SAB@22c 1 Dematiaceous Hyphmccete   | Within Parameters |
| Filtration Unit 3 Sample Point 9 – 30/03/22 | SAB@30c 5 SAB@22c 14 Exophiala Species, Hyaline Hyphomycete                 | Out of spec       |

QEUEH - Tank Room Monitoring (cont.)

| Bulk Filter Tanks           | Status              | Date              |
|-----------------------------|---------------------|-------------------|
| Bulk filter Tank 1A – Dip   |                     | Not Detected      |
| Bulk filter Tank 1A – Drain |                     | Not Detected      |
| Bulk filter Tank 1B - Dip   |                     | Not Detected      |
| Bulk filter Tank 1B – Drain | TVC@22c 1           | Within Parameters |
| Bulk filter Tank 2A – Dip   | TVC@37c 3 SAB@30c 1 | Within Parameters |
| Bulk filter Tank 2A – Drain | SAB@@30c 1          | Within Parameters |
| Bulk filter Tank 2B – Dip   |                     | Not Detected      |
| Bulk filter Tank 2B - Drain |                     | Not Detected      |



**Humidity Monitoring – QEUH Tank Room Oct 2021 – May 2022**



PPM Update

| 2020/21 Water PPM's  |                         |             |                       |                       |                         | 2021/22 Water PPM's  |                         |             |                       |                       |                         |
|----------------------|-------------------------|-------------|-----------------------|-----------------------|-------------------------|----------------------|-------------------------|-------------|-----------------------|-----------------------|-------------------------|
| Month                | Water PPM's Completed % | Total PPM's | Water PPM's Completed | Water PPM's cancelled | Water PPM's Outstanding | Month                | Water PPM's Completed % | Total PPM's | Water PPM's Completed | Water PPM's cancelled | Water PPM's Outstanding |
| April                | 100.00%                 | 432         | 432                   |                       | 0                       | April                | 98.01%                  | 603         | 591                   | 11                    | 1                       |
| May                  | 100.00%                 | 620         | 620                   |                       | 0                       | May                  | 90.26%                  | 626         | 565                   | 37                    | 24                      |
| June                 | 100.00%                 | 547         | 547                   |                       | 0                       | June                 | 97.89%                  | 665         | 651                   | 7                     | 7                       |
| July                 | 100.00%                 | 871         | 871                   |                       | 0                       | July                 | 93.97%                  | 614         | 577                   | 28                    | 9                       |
| August               | 100.00%                 | 262         | 262                   |                       | 0                       | August               | 95.71%                  | 629         | 602                   | 16                    | 11                      |
| September            | 100.00%                 | 521         | 521                   |                       | 0                       | September            | 82.92%                  | 650         | 539                   | 110                   | 1                       |
| October              | 99.84%                  | 622         | 621                   |                       | 1                       | October              | 89.72%                  | 428         | 384                   | 41                    | 3                       |
| November             | 100.00%                 | 1477        | 1477                  |                       | 0                       | November             | 92.26%                  | 439         | 405                   | 18                    | 16                      |
| December             | 98.94%                  | 658         | 651                   |                       | 7                       | December             | 89.26%                  | 652         | 582                   | 69                    | 1                       |
| January              | 100.00%                 | 582         | 582                   |                       | 14                      | January              | 84.64%                  | 638         | 540                   | 80                    | 18                      |
| February             | 94.48%                  | 562         | 531                   | 5                     | 26                      | February             | 89.45%                  | 616         | 551                   | 13                    | 52                      |
| March                | 83.69%                  | 754         | 631                   | 116                   | 7                       | March                | 82.06%                  | 680         | 558                   | 14                    | 108                     |
| <b>Total 2020/21</b> | <b>97.95%</b>           | <b>7908</b> | <b>7746</b>           | <b>121</b>            | <b>55</b>               | <b>Total 2021/22</b> | <b>90.40%</b>           | <b>7240</b> | <b>6545</b>           | <b>444</b>            | <b>251</b>              |

|  |   |
|--|---|
| <b>Note</b>  | <b>Note</b>   |
| Feb 20 - 5 cancelled were for annual TMV's awaiting procurement to issued tender   | April 21 - 4 cancelled for monthly checks on DHW 7 cancelled for filtration plant daily checks. 1 outstanding annual on tanks.  |
| Mar 20 - 116 cancelled were for annual TMV's awaiting procurement to issued tender | May 21 - 35 cancelled for shift checks of filtration plant and 2 for weekly rotation of pumps. Outstanding are for annuals on calorifiers although dates being clarified  |
|  | Jun 21 - 7 cancelled for shift checks of filtration plant. 3 cancelled for monthly checks on calorifiers not issued. Outstanding and annuals on calorifiers. Dates to be checked  |
|  | Jul 21 - 28 cancelled for shift checks of filtration plant. 1 cancelled for checks of fire hydrants. 6 Outstanding for annuals on calorifiers. Dates to be checked 2 monthly on Calorifier.   |
|  | Aug 21 - 14 cancelled for shift checks of filtration plant and 2 for weekly rotation of pumps. 6 Outstanding for annuals on calorifiers and 5 for six monthly on TMV's.   |
|  | Sep 21 - 110 cancelled - (77 for daily shift checks of filtration plant, 12 calorifier monthly cancelled due to resourcing, 5 for annuals on calorifiers due to wrong date, 12 TMV wrong date, 4 Shower hose replacement although actually completed, 1 Issued for annual on calorifier for Spinal. |
|  | Oct 21 - 41 cancelled - (27 for daily shift checks of filtration plant, 14 calorifier monthly cancelled due to resourcing) 3 On hold for Maternity annuals on calorifiers for Maternity due to inability to isolate.  |
|  | Nov 21 - 18 cancelled - (18 for daily shift checks of filtration plant), 16 calorifier on hold for annual on calorifiers TLC & Labs   |
|  | Dec 21 - 63 cancelled - (63 for daily shift checks of filtration plant), 1 on hold Fire Hydrants, 6 were rejected for rotation of duty pumps.   |
|  | Jan 22 - 35 Daily filtration plant checks, 20 - Sentinel outlet flushing, 1 - ICE water outlet flushing, 20 Rejected for weekly rotation of pumps, 4 noted as rejected by service provider but completed, 18 PPM run for dates in the past FM team investigating                                    |
|  | Feb 22 - 7 Daily filtration plant checks, 4 - Sentinel outlet flushing, 3 SUDS checks cancelled. 32 at issued for CLO2 plant checks but actually completed, 6 Cals Annuals/5 Cals Monthly not completed, 5 annual TMT not completed see programme, 3 PPM run for dates in the past.                 |
|  | Mar 22 - 14 Daily filtration plant checks, 66 TMT as PPM does not reflect programme as concentrating on high risk area and access is a problem in general, 23 CLO2 plant checks actually completed but not updated in FM First. 14 Filtration checks not issued and 4 SUDS checks not issued        |

Discussion with Supervisors have taken place to ensure that PPM's for water **MUST** be completed and to ensure resource (with back up from External framework contractors) is available.

## Risk Assessment & AE Audit

### Risk Assessment

95% - 10 Outstanding Actions for QEUH/RHC Risk Assessment

- **6 –In Progress** - Potential dosing of CL02 in Fire Suppression system – Awaiting installation of power supply above fire tank in 12<sup>th</sup> floor to allow submersible pump to circulate CL02 tablets.
- **1 – In Progress** - Leaks in Fire suppression Tank. - Confirmation required that this has been repaired.
- **1 – In Progress** - Emergency cooling supply for MRI Chiller Flushing Regime – DMA have confirmed that this is part of their flushing regime.
- **2 – Not Started** - Renal Tank and or pipework to be Tank and/or pipework should be reconfigured to accomodate thie installation of a suitably sized spill slot/weir to provide CAT 5 protection.

### 2020 AE Audit - Actions

AE Audit **91%**– 133 Actions – 122 complete.

**3 In Progress** – In relation to modifying drawings for changes to water system.

**1 In Progress** – In relation to maintenance of single entry flushing of expansion vessels (2 off in basement – These have no flushing point and cannot be made flow through). Looking at possible flushing valve.

**2 In Progress** – In relation to CL02 monitoring in discussion with CL02 provider.

2021 AE Audit – Actions

**QEUH/RHC**

AE Audit **57%**– 28 Actions – 16 complete.

**6 In Progress** - Outstanding for new risk assessment requirements – **Compliance Manager arranging.**

**1 In Progress** - outstanding for new build and capital projects. **Compliance Manager discussing with Capital/Minor Works.**

**3 in Progress** - Weekly checks of chlorine Dioxide generators and check and record feedstock chemicals. **SMOE in discussion as most system in monitored remotely.**

**2 in Progress** - Monthly records missing for hot and cold for March and October 20. **Lead AP – To check for records.**

**QEUH/RHC Retained**

AE Audit **36%**– 141 Actions – 51 complete.

**21 Not stated** – Recommendation that schematic drawings are produced for water system with each of the retained buildings. This is over 16 buildings – **Lead AP with CAD Tech. to review.**

**35 In Progress** – These are in relation to need for new risk assessments for each building. This is over 14 buildings – **Compliance Manager arranging.**

**5 In progress** – Internal records to be checked. This is over 4 Buildings. **Lead AP.**

**4 In Progress** – External records Check for records. This is over 3 Buildings. **Lead AP.**

**1 In Progress** – in relation to chlorite readings. **SMOE requested information from Water Service Provider.**

SCART Score

Currently **98.96%**.

### Capital Projects

**Capital Project 2A/2B** - New taps fitted sampling process underway.

**Capital Project INS Upgrade of CL02/Tanks, filtration** – Now operational. Capital arranging for old systems to be removed.

**Capital Project** – Ward 63 upgrade issues in supplying temporary water supply requires Asbestos survey

**Capital Project** – Replacement of Labs specific filtration plant. (floor loading to be confirmed before system is made operational).

Note :

Looking to replace tanks in INS due to age of these and being oversized. Quick quote being arranged.

Modifications of Mortuary tanks due to non compliance with Scottish Water Regulations PO being raised.

Podiatry Replacement of Water Heaters to improve capacity. PO raised.

**NHS Greater Glasgow & Clyde  
South Sector Water Safety Group Meeting  
Thursday 11 August 2022 at 14.00  
Via MSTeams**

**Present:**

|                       |   |   |
|-----------------------|---|---|
| Kerr Clarkson (KCL)   | - | Site Manager Operational Estates, QEUH        |
| Sharon Johnstone (SJ) | - | Assistant Head of FM Operations, South Sector |
| James Huddleston      | - | Assistant Head of Capital Planning            |
| Lynn Pritchard (LP)   | - | Lead Infection Prevention & Control Nurse     |
| Gillian Bowskill (GB) | - | Lead IC Nurse, W&C                            |
| Abhijit Bal           | - | Consultant Microbiologist                     |
| Stuart McNeil (SMcN)  | - | Equans  |

Carmel McGeown (CMcG) - Personal Assistant - Minutes

**Apologies:**

|                         |   |   |
|-------------------------|---|---|
| Mel MacMillan (MM)      | - | Estates Manager                                     |
| Alison Edwardson        | - | Senior Infection Prevention & Control Nurse         |
| Euan Smith (Chair) (ES) | - | Assistant Head of Operational Estates, South Sector |
| Pat Coyne               | - | Professional Lead Domestic                          |
| Angela Johnston         | - | Infection Prevention & Control Nurse                |
| Robert Sewell (RS)      | - | Equans  |
| David Juner (DJ)        | - | Serco   |
| Matthew Feeney (MF)     | - | Trainee Compliance Manager, Water                   |

**Action****1. Apologies**

As noted above.

**2. Notes of Previous Meeting (12 May 2022) Matters Arising**

The minute was agreed as an accurate record.

**3. Matters Arising from Previous Meeting****Agenda Item 7**

- Monthly meetings to be arranged KC/MM to review and update audit actions. Working with the Compliance team to risk assess 15 buildings on campus.

KC

**Agenda Item 8**

- SJ to contact RC and request a SoP for Langlands flushing regime. SJ advised Langlands continuing to carry out flushing every outlet. Current process seems to meet compliance, need confirmation from MF. ES to contact Matt Feeney (new Compliance Manager) for comment.
- Smartsheet to be implemented for WS01a returns, KC/MF to pick this up going forward. KC to contact MF for update and progression.

ES/MF

KC/MF

**4. Written Scheme Update for all Sites**

- KC/ES reviewed WS, minor changes to be made, smartsheet to be updated. **KC**

**5. Risk Assessment Update for all Sites**

- RA's for Retained Estates are overdue, should be carried out every 2years. Given the size of the campus it's estimated this could take 6 months. **KC**
- Require definitive list of RAs for QEUH campus for each building showing completion status for inclusion in minutes. KC to advise current status by next meeting. **KC**

**6. SCART Update for all Sites (Water Only)**

- KC reported QEUH 99% (Retained 36%, Adult & kids 61%)
- SMcN reported 98.3% at NVH and 96.7% at SHH.
- Langlands – no information available.

**7. AE Audit Update for all Sites**

- QEUH/RHC 28 actions, 22 for Operational Estates complete – 79%. 6 actions ongoing in relation to risk assessment and risk assessment process. **MF**
- Retained Estate 141 actions with 75 complete – 53%.
  - 35 In Progress – For 15 Buildings - Need for new risk assessments for each building and agree risk assessment processes and for specialist systems. **MF**
  - 8 in Progress – For 5 Buildings. Estates reviewing records, comments to be added if records are or were not available. **MM**
  - 1 In Progress – For 1 Building- Chlorite/chlorine dioxide conversion levels as per HSG274 paragraph 2.100. DMA are now taking CL02 levels within INS/Neuro/ICE although require confirmation they are taking chlorite levels. KC following up. **KC**
  - 22 not started - For 15 Buildings- Need for schematic drawings for each building. CAD tech has started these although need update on progress and some can be completed. KC following up. DMA also providing information as part of risk assessments. **KC & DMA**
- Equans – AE audits up to date, all actions complete and signed off.
- Serco – no information available.

**8. Flushing Regimes Currently being Carried Out**

- No change to current flushing regime within Adults, RHC and Retained sites. Clinical colleagues have been advised to make Estates & IC aware if no access to rooms/wards as per SHTM requirements.
- Equans continuing with flushing and sampling. 63 samples taken, no issues with returns.
- Serco – no information available.

## 9. WS01a Returns

- Huge improvement Q1 77.56% for QEUH Campus compared to 14% for previous return.
- Equans – carrying out regular flushing.
- Serco – no information available.

## 10. Testing Within Sites & Results

- Concerns of high legionella results in Old Maternity. KC certain regular flushing has not been carried out. DMA to undertake daily flushing.
  - SJ to check both cold and hot taps are flushed.
  - DMA to sample all outlets in Ultrasound department and carry out TMT servicing.
  - KC meeting with Maternity after this meeting and will share results.
  - Following investigation disinfection of system line will be carried out.
- AMS found on filter in 2A.
- KC noted that 4187 water samples have been undertaken to date (22 August 2022) as per the agreed sampling programme across the QEUH & RHC. From this there were :-

|  | Samples | %      |
|--|---------|--------|
| <b>Total Samples</b>                           | 1649    |        |
| <b>Total Not Detected or within parameters</b> | 3899    | 93.12% |
| <b>Out of spec tank room</b>                   | 78      | 1.86%  |
| <b>Out of spec wards</b>                       | 210     | 5.02%  |

- See attached table.
- Equans – 63 samples taken, no issues with results, however some issues with temperature SMcN advised looking at re-balancing the system.
- Langlands – No information available.

## 11. SHTM 04-01 Part G Compliance

- No exceptions.
- RP/CP/AP –Further RP training carried out along with AP refresher training. MF to provide CP/RP/AP numbers at next meeting.
- Equans – PPM's up to date, only 1 x RP for site at the moment, arranging training for 2<sup>nd</sup> AP should be in place before December 2022.
- Serco – No update available.

MF



**12. Safety Action Notices**

- No new SAN's to report

**13. AOCB**

- Ice machines – LP advised 2 x machines with Maternity. Estates do not carry out any maintenance. LP advised these will not be replaced.  
*Post minute note – The renal unit are the only area permitted to have ice machines.*

**14. Date & Time of Next Meeting**

The next meeting is scheduled for Thursday 10 November 2022 at 2.00pm via MS Teams.

QEUH Water Report August 2022

Current Out of Specs

| Building      | Area                     | Unique ID | Sampling point              | Type   | Hot/<br>Cold/<br>Mixed | Filtred<br>Tap | Counts     | Bacteria                   | Temp/ClO2           | First<br>occurrence | Last occurrence | Comments  |
|---------------|--------------------------|-----------|-----------------------------|--------|------------------------|----------------|------------|----------------------------|---------------------|---------------------|-----------------|---|
| Neurosurgery  | 5th Floor                | L5/29     | Advanced Procedure Room WHB | Tap    | Cold                   | No             | 700        | Legionella Species         | Temp 20.9 ClO2 0.14 | 15/09/2021          | 04/08/2022      | Carry out further investigation, maintenance, disinfect                   |
| Neurosurgery  | 5th Floor                | L5/11     | Ultrasound Room             | Tap    | Cold                   | No             | 250        | Legionella Species         | Temp 20.3 ClO2 0.16 | 22/03/2022          | 04/08/2022      | Carry out further investigation, maintenance, disinfect                   |
| Neurosurgery  | 2nd Floor                | L2/31     | CDU Dispatch RHS WHB        | Tap    | Cold                   | No             | 350        | Legionella Species         | Temp 26.6 ClO2 0.02 | 01/02/2022          | 04/08/2022      | Carry out further investigation, maintenance, disinfect                   |
| Neurosurgery  | 1st Floor                | L1/55     | Recovery CSSD LHS WHB       | Tap    | Cold                   | No             | 500        | Legionella Species         | Temp 20.3 ClO2 0.16 | 29/06/2022          | 04/08/2022      | Carry out further investigation, maintenance, disinfect                   |
| Spinal        | Philipshill Ground Floor | L0/128    | Kitchen SSS                 | Tap    | Hot                    | No             | 900        | 4                          | Temp 56.8           | 29/04/2021          | 04/08/2022      | Update required following DMA report, investigate further, maint. And dis |
| Spinal        | Philipshill              | L0/124    | Clean Utility               | Tap    | Cold                   | No             | 750        | 4                          | Temp 22.2           | 13/01/2021          | 04/08/2022      | Update required following DMA report, investigate further, maint. And dis |
| Podiatry      | Ground Floor             | L0/17     | Staff Room SSS              | Tap    | Cold                   | No             | 50         | Legionella Species         | Temp 19.9           | 21/04/2021          | 04/08/2022      | Update required following DMA report, investigate further, maint. And dis |
| Podiatry      | Ground Floor             | L0/24     | Student Change Room LHS WHB | Tap    | Cold                   | No             | 3000       | Legionella Species         | Temp 22.1           | 12/08/2021          | 04/08/2022      | Update required following DMA report, investigate further, maint. And dis |
| Podiatry      | Ground Floor             | L0/35     | Chair 24 WHB                | Tap    | Mixed                  | No             | 450        | Legionella Species         | Temp 43.6           | 13/01/2021          | 04/08/2022      | Update required following DMA report, investigate further                 |
| Old Maternity | Ground Floor Ultrasound  | FM D.31   | Scanning Room 10            | Tap    | Cold                   | No             | 50         | Legionella Species         | Temp 27.6 ClO2 0.02 | 22/06/2022          | 04/08/2022      | Carry out further investigation, maintenance, disinfect                   |
| Old Maternity | Ground Floor Ultrasound  | FM D.39   | Scanning Room 5             | Tap    | Mixed                  | No             | 200        | Legionella Species         | Temp 40.0 ClO2 0.02 | 22/06/2022          | 04/08/2022      | Carry out further investigation, maintenance, disinfect                   |
| Old Maternity | Ground Floor             | FM D.20   | Ultrasound Lab SSS          | Tap    | Mixed                  | No             | 2950/100   | 2-14 / Legionella Species  | Temp 29.7 ClO2 0.02 | 23/02/2022          | 04/08/2022      | Carry out further investigation, maintenance, disinfect                   |
| Old Maternity | Ground Floor             | FM/D.36   | Scanning Room 7 WHB         | Tap    | Mixed                  | No             | 150        | Legionella Species         | Temp 40.0 ClO2 0.02 | 25/05/2021          | 04/08/2022      | Carry out further investigation, maintenance, disinfect                   |
| RHC           | Ground Floor             | OPD 028   | Clinc 1 - WC Public         | Conto  | Mixed                  | No             | 7          | AMS                        |                     | 09/08/2021          | 03/08/2022      | check if tap was replaced (7- Not Detected since Feb 22)                  |
| RHC           | Ground Floor - Concourse | ENT-048   | Infant Feeding              | Optith | Cold                   | No             | >100       | Blastomona Ursincola       |                     | 23/03/2022          | 03/08/2022      |   |
| RHC           | Ground Floor - Concourse | ENT-048   | Infant Feeding              | Optith | Mixed                  | No             | >100       | Blastomona Ursincola       |                     | 23/03/2022          | 03/08/2022      |   |
| RHC           | Ground Floor - Concourse | ENT-014   | Teddy Hospital SSS          | Pillar | Cold                   | No             | 20         | Mould                      |                     | 20/01/2022          | 10/08/2022      | 9- Not Detected since Mar 22  |
| RHC           | 3A                       | GW3-069   | Room 10                     | OPTI   | Cold                   | No             | 40         | Blastomona Ursincola       |                     | 23/03/2022          | 10/08/2022      | 5- Not Detected since Apr 22  |
| RHC           | 3A                       | GW3-069   | Room 10                     | OPTI   | Mixed                  | No             | 9          | Blastomona Ursincola       |                     | 23/03/2022          | 10/08/2022      | 9- Not Detected since Mar 22  |
| RHC           | 1C                       | MDU-009   | Mult-bed Room               | Optith | Cold                   | No             | 3          | Spingomonas Thappophilum   |                     | 23/03/2022          | 10/08/2022      | 11- Not Detected since Apr 22   |
| RHC           | 1C                       | MDU-024   | Consultants Room 3          | Optith | Cold                   | No             | 23 & 8     | Sphing Pauc, Brevun D/Vesi |                     | 23/03/2022          | 10/08/2022      | 8- Not Detected since Apr 22  |
| RHC           | Ground Floor - Concourse | ENT-036   | DSR Facilities              | Optith | Mixed                  | No             | 50         | Blastomona Ursincola       |                     | 23/03/2022          | 10/08/2022      | 6- Not Detected since Mar 22  |
| RHC           | Ground Floor Clinic 2    | OPD-162   | Clean Utility               | SSS    | Cold                   | No             | >100       | Acido.Temp/Spingh.Pauc     |                     | 11/07/2022          |                 | Carry out further investigation, maintenance, disinfect                   |
| RHC           | 2nd Floor Ward 2A        | SCH065    | Room 17 En-suite            | Markw  | Mixed                  | Yes            | 1          | AMS                        |                     | 02/08/2022          |                 |   |
| RHC           | 2nd Floor Ward 2A        | SCH-033   | Room 2                      | Markw  | Mixed                  | Yes            | 1          | Burholderia Cantaminias    |                     | 09/08/2022          |                 |   |
| RHC           | 2nd Floor Ward 2A        | SCH-032   | Room 2 En-suite             | Markw  | Mixed                  | Yes            | 21         | TVC                        |                     | 09/08/2022          |                 |   |
| RHC           | 2nd Floor Ward 2A        | SCH-069   | Room 18 En-suite            | Horne  | Mixed                  | Yes            | 1          | Burholderia Cantaminias    |                     | 09/08/2022          |                 |   |
| RHC           | 1st Floor Ward 1D PICU   | CCW-085   | Bed 6 (With Filter)         | Optith | Mixed                  | Yes            | 1          | Burholderia Cantaminias    |                     | 08/08/2022          |                 |   |
| CMB           | 1st Floor                | L1/13     | Kitchen SSS                 | Tap    | Hot                    | No             | 270 / 1260 | TVC                        |                     | 17/08/2022          |                 | This is unoccupied area under control of Minor Works                      |

\* - sample taken behind filter and replaced

**NHS Greater Glasgow & Clyde  
South Sector Water Safety Group Meeting  
Thursday 17 November 2022 at 14.00  
Via MS Teams**

**Present:**

|                       |   |   |
|-----------------------|---|---|
| Kerr Clarkson (KCL)   | - | Site Manager Operational Estates, QEUH        |
| Sharon Johnstone (SJ) | - | Assistant Head of FM Operations, South Sector |
| Ian Doherty (ID)      | - | Senior Project Manager                        |
| Matthew Feeney (MF)   | - | Trainee Compliance Manager, Water             |
| Abhijit Bal           | - | Consultant Microbiologist                     |
| Allana Kelly (AK)     | - | Lead Nurse, Infection Prevention & Control    |
| Kathryn Anderson (KA) | - | Infection Prevention and Control              |
| Gerald McCarron (GMC) | - | Equans  |
| Stuart McNeil (SMcN)  | - | Equans  |
| David Juner (DJ)      | - | Serco   |

Carmel McGeown (CMcG) - Personal Assistant - Minutes

**Apologies:**

|                         |   |   |
|-------------------------|---|---|
| Mel MacMillan (MM)      | - | Estates Manager                                     |
| Alison Edwardson        | - | Senior Infection Prevention & Control Nurse         |
| Euan Smith (Chair) (ES) | - | Assistant Head of Operational Estates, South Sector |
| Pat Coyne               | - | Professional Lead Domestic                          |
| Angela Johnston         | - | Infection Prevention & Control Nurse                |
| James Huddleston        | - | Assistant Head of Capital Planning                  |
| Kate Hamilton (KH)      | - | Lead Nurse, IPC South Paediatrics                   |

**Action****1. Apologies**

As noted above.

**2. Notes of Previous Meeting (11 August 2022) Matters Arising**

The minute was agreed as an accurate record.

**3. Matters Arising from Previous Meeting****Agenda Item 7**

- Monthly meetings to be arranged KC/MM to review and update audit actions. Working with the Compliance team to risk assess 15 buildings on campus. **Meetings arranged, this item is now closed, no further action required and can be removed.**

**Agenda Item 8**

- SJ to contact RC and request a SoP for Langlands flushing regime. SJ advised Langlands continuing to carry out flushing every outlet. Current process seems to meet compliance, need confirmation from MF. ES to

contact Matt Feeney (new Compliance Manager) for comment. **Confirmed current flushing regime is compliant with SHTM. No further action required, this point can be removed.**

- Smartsheet to be implemented for WS01a returns, MF to pick this up going forward. MF to contact Phyllis Urquhart (PU) to look to now progress this. PU created in essence a 'beta' test site with specific people and this went well. This requires to be finalised and second test carried out before agreement for full role out. The benefit this has is that it is automatic, sends emails to each person, and reminders and can escalate if no response. MF

#### 4. Written Scheme Update for all Sites

- KC/ES reviewed WS, minor changes to be made, smartsheet to be updated. **Smartsheet updated. No further action required, this point is now closed and can be removed.** KC

#### 5. Risk Assessment Update for all Sites

- RA's for Retained Estates are overdue, should be carried out every 2years. Given the size of the campus it's estimated this could take 10 - 12 months.
- Require definitive list of RAs for QEUH campus for each building showing completion status for inclusion in minutes. Current status is available in the monthly report.
- Equans – lining up to complete RA's.
- Serco – written scheme audit due for renewal in April 2023 along with RA's.

#### 6. SCART Update for all Sites (Water Only)

- KC reported QEUH 98.96%
- Equans reported 98.3% at NVH and 96.7% at SHH.
- Serco reported 99.5% one outstanding item information available.

#### 7. AE Audit Update for all Sites

- **2021 Audit status**  
QEUH Retained 141 actions, 104 complete - 74%. 28 actions over 15 buildings in relation to need for new risk assessments.  
QEUH A&C 11 actions, 21 Complete - 79%. 6 actions in relation to need for new risk assessments.
- **2022 Audit Status**  
QEUH retained 15 actions –, 3 Complete 20% Complete. 6 actions in relation to need for new risk assessments.  
QEUH A&C 11 actions, 5 Complete – 64% Complete. 6 actions in relation to need for new risk assessments.
- QEUH CL02 contract to be put out to tender and will include a number of items from audit.
- Technical Officer working on schematic drawings together with DMA (as part of new risk assessments).

- Equans – During a recent AE visit, we inspected the tanks and filmed the proceeds. The tanks were found to be in good order. No Biofilm noted and very limited fouling. That said there was some evidence of rust on some of the bolts on the roof of the split RAW water tanks. We are having this investigated by Enviroliance with a view to rectification early next.
- Serco – no information available.

## 8. Flushing Regimes Currently being Carried Out

- No change to current flushing regime within Adults, RHC and Retained sites. Clinical colleagues have been advised to make Estates & IC aware if no access to rooms/wards as per SHTM requirements. **Confirmed current flushing regime is compliant with SHTM, no further action required. This point can be removed.**
- Equans continuing with flushing and sampling. 63 samples taken, 10 were taken from Renal, this has been placed on a rolling programme to capture all outlets over a period of 12 months. All samples were returned with nothing found.
- Serco – All little used outlets have been flushed twice weekly during the reporting period, in line with SHTM 04-01 requirements. All other outlets are being flushed daily in line with the flushing regime carried out by the NHS at the main hospital.

### WS01a Returns

- 9.
- Q2 results QEUH - 37.24%, RHC - 47.62%. Further improvement on RHC Q1 results.
  - Equans – carrying out regular flushing as per SHTM.
  - Serco – carrying out regular flushing as per SHTM.

## 10. Testing Within Sites & Results

- Monthly report circulated to ICPT. MS Teams folder “QEUH Water Results” created and members added.
- A number of out of specs returned – please see table below.  
No standard to sample for Gram Negatives or AMS, although a regime in place for QEUH.  
KC noted that 6137 water samples have been undertaken to date (11 October 2022) as per the agreed sampling programme across the QEUH & RHC. From this there were :-

|  | Samples | %      |
|--|---------|--------|
| <b>Total Samples</b>                           | 1609    |        |
| <b>Total Not Detected or within parameters</b> | 1574    | 97.82% |
| <b>Out of spec wards</b>                       | 2.18    | 2.18%  |

- Equans – do not sample for Pseudomonas only Legionella.

- Serco – No additional information.

#### 11. SHTM 04-01 Part G Compliance

- No exceptions.
- RP/CP/AP –MF advised CP sessions (training & refresher) arranged for 2023.
- Currently 4 water AP's appointed with an additional 2 for 2023.
- Equans – Rolling PPM's 80% complete. One RP currently on site, however second potential identified and training will be undertaken January 2023.
- Serco – Rolling PPM's 100% complete.

#### 12. Safety Action Notices

- No new SAN's to report

#### 13. AOCB

- Water Cooler POU filter removal – Eden Water Coolers have an integrated POU, however an additional POU has been fitted. Group need to agree a way forward.
- POU Filters – 6A/2A no longer high risk areas
  - No National Guidance around mass removal of filters.
  - DMA have prepared removal proposal document which will be circulated for review and comment.
- Water Management Sessions 14 December 2022
  - Two sessions will be carried out in the Teaching and Learning Lecture Theatre. Morning session is 09.30 to 12.00 and the afternoon session 13.30 to 16.00.
  - CMcG will circulate email to meeting attendees, please cascade to staff and follow email instructions for session sign up.

KC

CMcG

#### 14. Date & Time of Next Meeting

The next meeting is scheduled for Thursday 9 February 2023 at 2.00pm via MS Teams.

Current out of spec Summary (excluding tank room) as of 09/11/22

| Current Out of Specs |                               |           |                             |                 |                   |              |           |                               |           |                  |                   |  |
|----------------------|-------------------------------|-----------|-----------------------------|-----------------|-------------------|--------------|-----------|-------------------------------|-----------|------------------|-------------------|--|
| Building             | Area                          | Unique ID | Sampling point              | Type            | (Hot/ Cold/ Mixe) | Filtered Tap | Counts    | Bacteria                      | Temp/Cl02 | First occurrence | Latest occurrence | Comments   |
| Adult                | Ground Floor Acute Assessment | AAW-024   | Room 108                    | Optitherm       | Mixed             | No           | 90        | Mould SAB@22c                 | 42.8 0.15 | 20/10/2022       |                   | NEW  |
| CMB                  | Ground Floor                  | L1/13     | Kitchen SSS                 | Tap             | Hot               | No           | 580/815   | TVC@37c/22c                   | -         | 17/08/2022       | 08/09/2022        |  |
| Neurosurgery         | 5th Floor                     | L5/29     | Advanced Procedure Room WHB | Tap             | Cold              | No           | 350       | Legionella Species            | 20.1 0.29 | 15/09/2021       | 13/10/2022        | 2 Not Detected since Sept 21   |
| Neurosurgery         | 2nd Floor                     | L2/31     | CDU Dispatch RHS WHB        | Tap             | Cold              | No           | 50        | Legionella Species            | 27.1 0.02 | 01/02/2022       | 13/10/2022        |  |
| Neurosurgery         | 4th Floor Ward 65             | L4/54     | Procedure Room WHB          | Tap             | Cold              | No           | 100       | Legionella Species            | 19.2 0.33 | 15/09/2022       | 13/10/2022        |  |
| Neurosurgery         | 5th Floor                     | L5/11     | Ultrasound Room             | Tap             | Cold              | No           | 250       | Legionella Species            | 20.1 0.15 | 23/03/2022       | 06/10/2022        |  |
| Neurosurgery         | 5th Floor                     | L5/05     | Consult Room 1              | Tap             | Cold              | No           | 300       | Legionella Species            | 20.5 0.02 | 27/09/2022       | 13/10/2022        | NEW  |
| Neurosurgery         | 5th Floor                     | L5/60     | Male WC                     | Tap             | Cold              | No           | 50        | Legionella Species            | 22.7 0.23 | 04/10/2022       |                   | NEW  |
| Neurosurgery         | 2nd (Ward 62)                 | L2/54     | Sluice (SSS)                | Tap             | Hot               | No           | 50        | Legionella Species            | 42.2 0.12 | 04/10/2022       |                   | NEW  |
| Old Maternity        | 3rd Floor (Ward 49)           | L3/05     | Bay 3                       | Tap             | Cold              | No           | 50        | Legionella Species            | 17.1 0.32 | 03/10/2022       |                   | NEW  |
| Old Maternity        | Ground Floor (Pre Admissions) | L0/123    | Sluice (SSS)                | Tap             | Cold              | No           | 50        | Legionella Species            | 25.9 0.02 | 03/10/2022       |                   | NEW  |
| PDRU                 | Ground Floor                  | No Code   | Main Kitchen LHS SSS        | Tap             | Hot               | No           | 1318      | TVC@37c                       | 45.3      | 12/10/2022       |                   | NEW  |
| Podiatry             | Ground Floor                  | L0/17     | Staff Room SSS              | Tap             | Cold              | 15.1         | 100       | Legionella Species            | 15.1      | 21/04/2021       | 13/10/2022        | 9 Not Detected since Apr 21 Disinfection of entire system carried out 04/11/22 |
| Podiatry             | Ground Floor                  | L0/35     | Chair 15 WHB                | Tap             | Cold              | No           | 200       | Legionella Species            | 22.3      | 17/08/2022       | 13/10/2022        | Disinfection of entire system carried out 04/11/22                             |
| Podiatry             | Ground Floor                  | L0/26     | Scrub Sink RHS Outlet       | Tap             | Cold              | No           | 50        | Legionella Species            | 19.7      | 17/08/2022       | 13/10/2022        | Disinfection of entire system carried out 04/11/22                             |
| RHC                  | Ground Floor Clinic 2         | OPD-162   | Clean Utility               | SSS             | Cold              | No           |           | Acid. Temp/Sphing Pauc        | 22.5 0.18 | 06/06/2022       | 19/10/2022        |  |
| RHC                  | Ground Floor Clinic 1 & 2     | OPD 028   | Clinic 1 - WC Public        | Contour         | Mixed             | No           | 289       | TVC@22c                       | 41.1 0.1  | 09/08/2021       | 17/10/2022        |  |
| RHC                  | Ground Floor - Concourse      | ENT-014   | Teddy Hospital SSS          | Pillar Tap      | Cold              | No           | 14        | Mould SAB@22c                 | 14.4 0.32 | 20/01/2022       | 19/10/2022        | 3 Not Detected since January   |
| RHC                  | Ward 3A                       | GW3-069   | Room 10                     | Optitherm       | Mixed             | No           | 17        | Deffitia Acidovorans          | 40.5 0.14 | 20/01/2022       | 19/10/2022        | 3 Not Detected in July, 1 Not Detected in Aug, 3 Not Detected in September     |
| RHC                  | Ground Floor - Concourse      | ENT-036   | DSR Facilities              | Optitherm       | Mixed             | No           | 65        | Blastomonas Ursincola         | 40.8 0.13 | 23/03/2022       | 19/10/2022        | 3 Not Detected in July, 3 Not Detected in September                            |
| RHC                  | Ground Floor Clinic 2         | OPD-173   | Facilities                  | SSS             | Mixed             | Yes          | >100 22   | TVC/AMS                       | 22.2 0.21 | 10/10/2022       | 19/10/2022        | NEW  |
| RHC                  | Ground Floor Clinic 2         | OPD 173   | Facilities                  | Janitorial Sink | Mixed             | No           | 1 4       | TVC/AMS/Blastomonas Ursincola | 13.6 0.29 | 10/10/2022       | 19/10/2022        | NEW  |
| RHC                  | 2nd Floor Ward 2A             | SCH-056   | Room 13 En-suite            | Markwick 21+    | Mixed             | Yes          | 11        | TVC                           | 40.3 0.11 | 25/10/2022       |                   | NEW  |
| RHC                  | 2nd Floor Ward 2A             | SCH-062   | Play Room                   | Swan Neck       | Cold              | No           | 13        | AMS                           | 18.9 0.33 | 04/10/2022       |                   | NEW (SAMPLE PRE-FILTER) FILTER REPLACED AFTER SAMPLE                           |
| Spinal               | Ground                        | L0/124    | Clean Utility               | Tap             | Cold              | No           | 350       | Legionella 4                  | 22.1      | 13/01/2021       | 20/10/2022        | 15 Not Detected since Jan21  |
| Spinal               | Phillipshill Ward             | L0/77     | Regen Kitchen (RHS)         | Tap             | Hot               | No           | 100       | Legionella 4                  | 33.8      | 11/10/2022       |                   | NEW  |
| Spinal               | Phillipshill Ward             | L0/77     | Regen Kitchen (RHS)         | Tap             | Cold              | No           | 100       | Legionella 4                  | 21.7      | 11/10/2022       |                   | NEW  |
| Spinal               | Edenhall Ward                 | L0/109    | Staff Kitchen (WHB)         | Tap             | Cold              | No           | 50        | Legionella 4                  | 22.3      | 11/10/2022       |                   | NEW  |
| Spinal               | Edenhall Ward                 | L0/109    | Staff Kitchen (WHB)         | Tap             | Mixed             | No           | 50 / 3450 | Legionella 4 & Species        | 40.1      | 11/10/2022       | 20/10/2022        | NEW  |
| Teaching & Learning  | Ground Floor                  | No Code   | LHS CWST                    | CWST            | Cold              | No           | 169       | TVC@22c                       | -         | 15/09/2022       |                   |  |

**NHS Greater Glasgow & Clyde  
South Sector Water Safety Group Meeting  
Thursday 10 August 2023 at 14.00  
Via MS Teams**

**Present:**

|                         |   |   |
|-------------------------|---|---|
| Euan Smith (Chair) (ES) | - | Assistant Head of Operational Estates, South Sector |
| Kerr Clarkson (KCL)     | - | Site Manager Operational Estates, QEUH              |
| Allana Kelly (AK)       | - | Lead Nurse, Infection Prevention & Control          |
| Anne Gallacher (AG)     | - | Lead Nurse, IPC South Paediatrics                   |
| Matthew Feeney (MF)     | - | Trainee Compliance Manager, Water                   |

|                       |   |                              |
|-----------------------|---|------------------------------|
| Carmel McGeown (CMcG) | - | Personal Assistant - Minutes |
|-----------------------|---|------------------------------|

**Apologies:**

|                       |   |   |
|-----------------------|---|---|
| Mel MacMillan (MM)    | - | Estates Manager                               |
| Abhijit Bal (AB)      | - | Consultant Microbiologist                     |
| Alison Edwardson (AE) | - | Senior Infection Prevention & Control Nurse   |
| Pat Coyne (PC)        | - | Professional Lead Domestic                    |
| Angela Johnston (AJ)  | - | Infection Prevention & Control Nurse          |
| Kathryn Anderson (KA) | - | Infection Prevention and Control              |
| Ian Doherty (ID)      | - | Senior Project Manager                        |
| Kathryn Anderson (KA) | - | Infection Prevention and Control              |
| Gerald McCarron (GMC) | - | Equans  |
| Stuart McNeil (SMcN)  | - | Equans  |
| David Juner (DJ)      | - | Serco   |
| Sharon Johnstone (SJ) | - | Assistant Head of FM Operations, South Sector |

**Action****1. Apologies**

As noted above.

**2. Notes of Previous Meeting (10 March 2023) Matters Arising**

The minute was agreed as an accurate record.

**3. Matters Arising from Previous Meeting****Agenda Item 8**

- Smartsheet to be implemented for WS01a returns, MF to pick this up going forward. MF to contact Phyllis Urquhart (PU) to look to how progress this. PU created in essence a 'beta' test site with specific people and this went well. This requires to be finalised and second test carried out before agreement for full role out. The benefit this has is that it is automatic, sends emails to each person, and reminders and can escalate if no response.
- As various sites report WS01a in different formats it was suggested a SLWG is set up to discuss the way forward.
- Trialling a Regional Services Directorate return for Q1 alongside a Sector

**MF****KC/MF**



return. Q1 trial gave a 100% return, given many contacts are located in QEUH this improved the South Sector return percentage.

#### 4. **Written Scheme Update for all Sites**

- Draft upgraded version to be issued to group.

#### 5. **Risk Assessment Update for all Sites**

- The undertaking of risk assessments for the Retained Estates, is at 50% complete, and have been uploaded to Smartsheet. Adults & RHC risk assessment has been completed although review to be carried out.. L8 Team working through any actions raised. Outstanding areas are detailed in South Sector Water Report – August 2023.
- INS, Neuro & Maternity have most significant issues. ES advised to concentrate on red risks. Certain activities will be reviewed by Minor Works.
- Any works that won't make this year's timeframe to be added to Risk Register.
- Significant budget pressures across the Board.
- MF to arrange meeting with DMA.
- Equans – no update available.
- Serco – no update available.

MF

#### 6. **SCART Update for all Sites (Water Only)**

- KC reported QEUH 99.31%
- Equans – no information available.
- Serco - no information available.

#### 7. **AE Audit Update for all Sites**

##### **2023 Audit Status**

- Audit complete and actions added to Smartsheet. QEUH- 100% Complete.
- Retained Estate – 58%, making good progress.
- Equans – no update available.
- Serco – no update available.

#### 8. **Flushing Regimes Currently being Carried Out**

- Areas within campus will be spot checked and monitored.
- KC drafting an SOP for a Boardwide Flushing Regime.
- Facilities & DMA carry out flushing and records are updated and added to teams folder.
- TLC – KC advised this building to be handed back in approx. 4 weeks. Some TVC's and Legionella results, however prior to hand over Project Team to carry out a full building system disinfection.
- Equans – no update available.
- Serco – no update available.

9.

**WS01a Returns**

- Q1 results QEUH – 51.05%, RHC – 70.00%. Further improvement on QEUH Q4 results.
- Equans – no update available.
- Serco – no update available.

**10. Testing Within Sites & Results**

- Monthly report circulated to ICPT. MS Teams folder “QEUH Water Results” created and members added.
- A number of out of specs returned – please see table below.  
KC noted that 3491 water samples have been undertaken to date (31 July 2023) as per the agreed sampling programme across the QEUH & RHC. From this there were :-

|  | Samples | %      |
|--|---------|--------|
| <b>Total Samples</b>                           | 3491    |        |
| <b>Total Not Detected or within parameters</b> | 3212    | 92.01% |
| <b>Out of spec tank room</b>                   | 112     | 3.21%  |
| <b>Out of spec wards</b>                       | 167     | 4.78%  |

- Equans – no information available.
- Serco – no information available.

**11. SHTM 04-01 Part G Compliance**

- RP/CP/AP –Euan Smith is RP for the Sector. MF advised CP’s refresher training will be carried out end of August 2023. 6/7 staff attending.
- Currently 4 water AP’s appointed with an additional 3 for 2023.
- ES advised there are formal record of the Designated Person and Deputy Designated Person. MF to discuss with AG.
- QEUH PPM’s 85.57%. This may increase once PDA’s and been updated and PPM’s uploaded.
- Equans – no update available.
- Serco – no update available.

**MF****12. Safety Action Notices**

- No new SAN’s to report

**13. AOCB**

- Water Cooler POU filter removal – Eden Water Coolers have an integrated POU, however an additional external POU has been fitted. KC to collate a list of where these units are. KC & MM to contact IPC and Microbiology for discussion on way forward in the meantime DMA continue to change filters. Site Technical Officer updating site drawings to identify water cooler locations and serial numbers of units on site. Once identified the Board Water Group to agree the removal of filters from high risk areas. KC  
KC/MM
- POU Filters – 6A/2A no longer high risk areas
  - No National Guidance around mass removal of filters.
  - DMA have prepared removal proposal document which will be circulated for review and comment.
  - No comments raised at this meeting to be taken to next Board meeting for discussion.
- INS – KC reported INS use clinical software to record flushing. KC to find out type of software and if this could be used across all sectors. KC
- Drinking Fountains – SMCN asked if these are still required. Staff are carrying out flushing. KC advised current guidance has been removed and any request must be directed to ICPT team. Plan of locations being drawn up for QEUH, concerns of stagnant water and cleaning regime as Clinical dept's are responsible for these units.
- Design form to be implemented for all new projects – rebuilds, refurbishes etc. KC to send updated form to JHuddleston & ABaillie for review and comment. Feedback received & form updated and distributed for further comment. Form 209 – Capital colleagues reviewing KC's suggested updates. KC
- Following completion of post filtration tank SBAR, Jack Cairns to take forward to rectifications as a priority. Works will ensure compliance of SHTM 04-01

**14. Date & Time of Next Meeting**

The next meeting is scheduled for Thursday 9 November 2023 at 2.00pm via MS Teams.



**Action List****Gram Negative Bacteraemia (GNB) and *Mycobacterium chelonae* Incident Management Team**

| <b>Date Agreed Action</b> | <b>Action</b>   | <b>Responsible Person/s</b> | <b>Expected Completion date</b> | <b>Status</b> |
|---------------------------|---|-----------------------------|---------------------------------|---------------|
| 19/6/19                   | Compile Timeline of M.chelonae case (SJK)   | Susie Dodd                  | 20/06/19                        | In progress   |
| 19/6/19                   | Apply POUFs to theatre outlets  | Colin Purdon                | 21/06/19                        | In progress   |
| 19/6/19                   | Check water cooler removed from 6A staff room   | Colin Purdon                | 20/06/19                        | In progress   |
| 19/6/19                   | Carry out water testing in ward 6A pre and post POUFs (incl showers) and in theatres pre POUF application.      | Colin Purdon                | 24/06/19                        | In progress   |
| 19/6/19                   | Water testing to be undertaken on outlets identified from timeline which currently have no filters.             | Colin Purdon                | 24/06/19                        | In progress   |
| 19/06/19                  | Obtain Information from PAL to ensure that POUF are effective against Mycobacteria.                             | Colin Puirdon               | 24/06/19                        | In progress   |
| 19/6/19                   | Compile report of water sampling results across RHC site to establish extent of M.chelonae within water supply. | Colin Purdon                | 24/06/19                        | In Progress   |
| 19/6/19                   | Situation update report for clinical staff  | Dr Chaudhury                | 20/06/19                        | In progress   |
| 19/6/19                   | Prepare holding press statement   | Mark Dell/Dr Inkster        | 20/06/19                        | In progress   |
| 19/6/19                   | Provide email update to senior management teams   | Dr Teresa Inkster           | 19/06/19                        | Complete      |



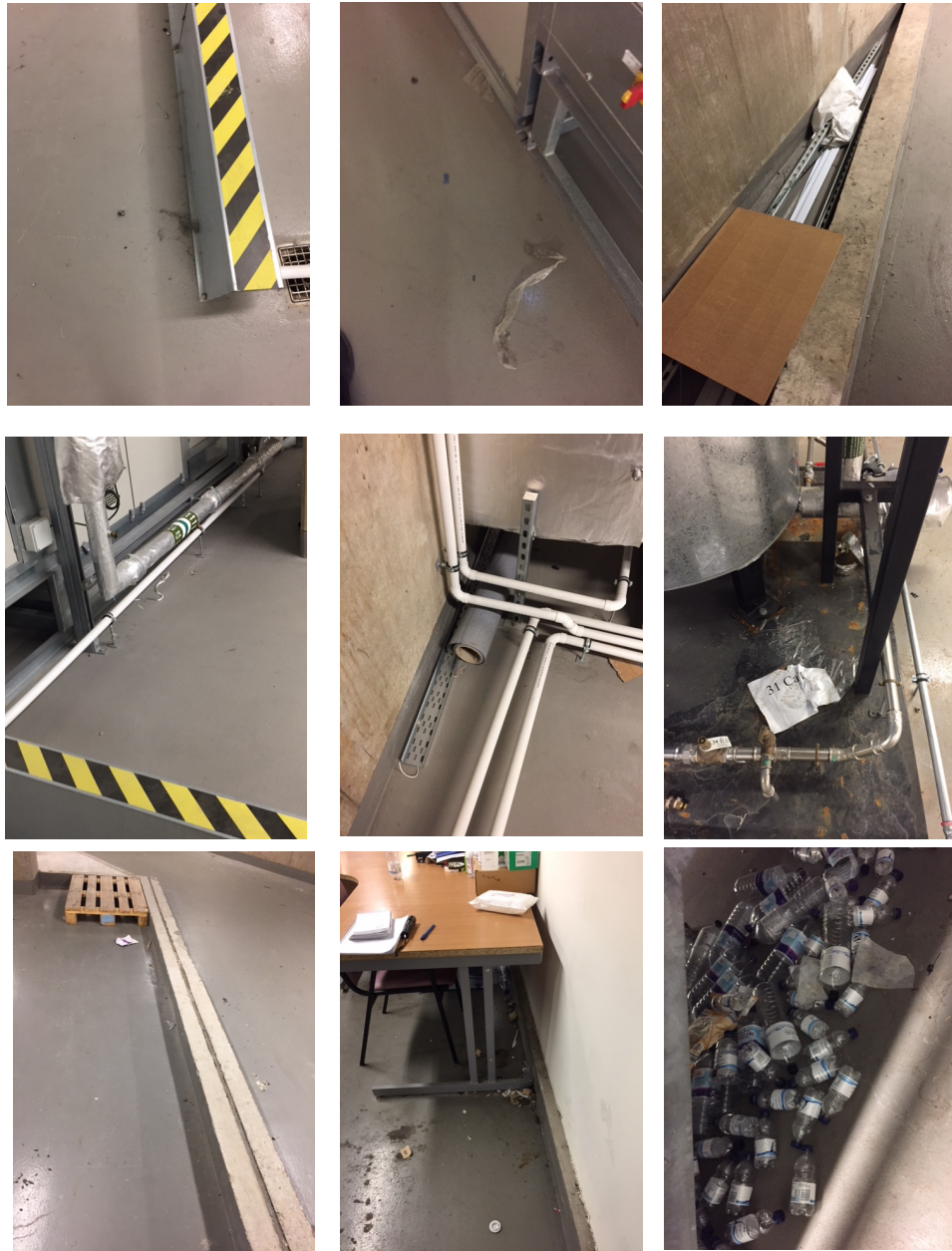
|                           |                         |                         |  |
|---------------------------|-------------------------|-------------------------|--|
| <b>Customer</b>           | NHS GG&C                | <b>Site Address</b>     | QEUH                                     |
| <b>Works Requested by</b> | Colin Purden            | <b>Area of Works</b>    | Pest Control and Housekeeping Inspection |
| <b>Contact No.</b>        | ██████████              | <b>Site Contact</b>     | Colin Purden                             |
| <b>Date</b>               | 24.12.2018              | <b>Site Contact No.</b> | ██████████                               |
| <b>Email</b>              | colin.purdon@██████████ | <b>GP Surveyor</b>      | A Bryden                                 |

**Ref – Pest Control and Housekeeping Inspection of Various Plantrooms (31, 32, 33, 21, 22, 41 and 41A at QEUH, Glasgow**

Dear Colin,



Further to my telephone conversation with Scott on the morning of Saturday 22.12.2018 I submit below our findings on and inspection carried out on 23.12.2018

| <b><u>Plantroom</u></b> | <b><u>Findings/Photographs</u></b>   | <b><u>Recommendation</u></b>  |
|-------------------------|--|---|
| 31                      | <p>No pest activity noted during the inspection. Housekeeping very poor with a build up of debris around all wall to floor edges and below units and stairs. Old pigeon dropping infrequently near fire exit door to roof. Many cardboard boxes of dirty/used air handling filters removed from the Plantroom and taken to waste disposal</p> <p>See Photographs:-</p> | Intensive deep clean of floor, wall/floor edges and discarded waste build up should be implemented immediately. Following the in-depth clean a Planned Cleaning/Inspection Programme should be installed. |





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Tel: 0845 310 5506 Fax: 0845 310 5507

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|           |   |   |
|-----------|---|---|
|           |   |   |
| <p>32</p> | <p>No pest activity noted with no previous activity recorded. Housekeeping of a poor standard with considerable debris around wall/floor edges. Hole in fabric of building poses a pest bird ingress risk. Significant number of cardboard boxes containing used filters removed.</p> <p>See Photographs: -</p>  | <p>Intensive Deep Clean of floor, wall/floor edges with discarded waste removal. Regular inspections and cleaning maintenance of area required.</p> |



|           |  |   |
|-----------|--|---|
|           |    |   |
| <p>33</p> | <p>No pest activity noted during inspection. No past evidence of pests noted. Housekeeping and general cleanliness of a poor standard. Many dirty filters and old filter boxes cleared from area.</p> <p>See photographs:-</p>  | <p>Intensive Deep Clean of floor, wall/floor edges and discarded waste. Regular inspections and cleaning maintenance of areas required.</p> |



22

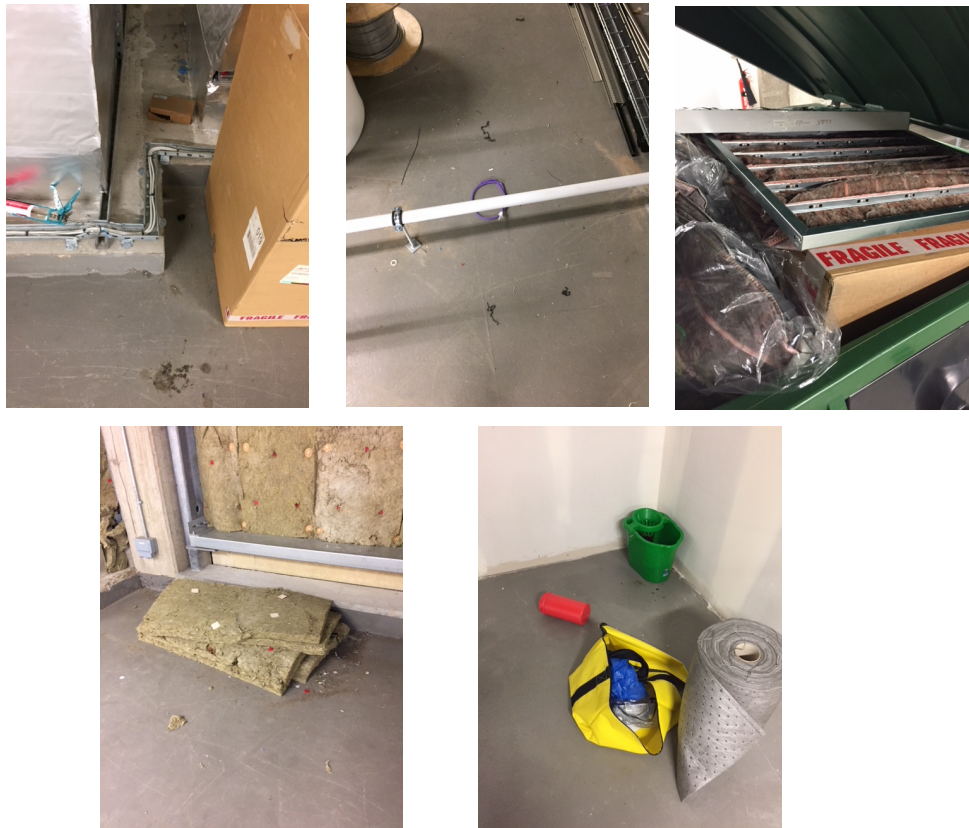
No pest activity noted during inspection.  
 Again a significant number of used filters and old filter boxes throughout the area. These items have been removed to waste disposal. Waste disposal bins (green) were found to be full of used filters also.  
 Insulation strewn on floor could provide pest harbourage.

See photographs:-



Deep clean of floor, wall/floor edge and removal of discarded waste.

Regular inspection and cleaning maintenance required.



21

No pest activity noted during inspection.  
 Waster bins and edges full of old and very dirty used filters.  
 Housekeeping of a very poor standard.  
 Disused and dirty filters removed to waste disposal.

See photographs:-

Deep Clean of floor, wall/floor edges and removal of discarded waste.  
 Regular emptying of green bins.  
 Regular inspection and cleaning maintenance required.

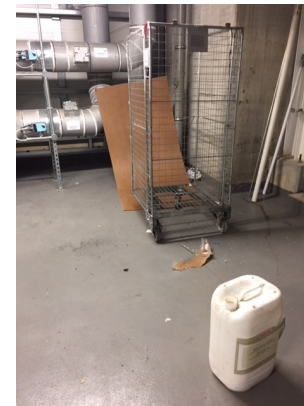


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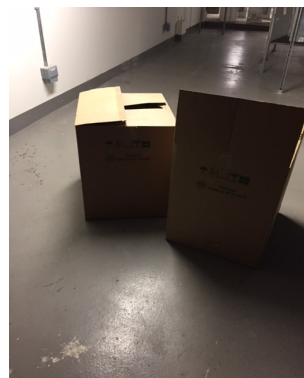
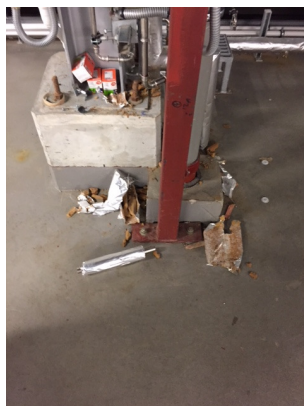
41

No pest issues noted during inspection. Some old pigeon droppings (small amount, very limited). No fresh evidence of pest activity. Used dirty filters found across the plant room. Some stored next to clean filter and filter boxes. Old contaminated filters removed along with disused boxes to waste disposal.

See photographs:-



Deep clean of floor, wall floor edges and removal of discarded waste. Regular inspection and cleaning maintenance required.

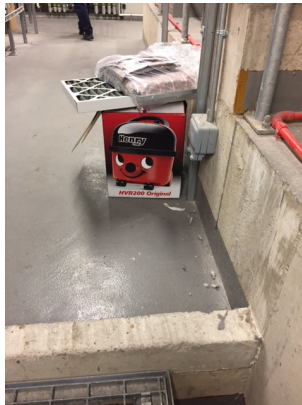


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41A

No fresh evidence of pest activity noted on inspection.  
Old bird droppings (small number) noted at exit door to roof. Sanitised in past works.  
General house keeping of a poor standard.  
Old dirty filters removed from area.  
Some old packaging also removed to waste disposal.

See photographs:-



Deep clean of floor, walls floor edges and removal of discarded waste.  
Regular inspection and cleaning maintenance required.

|   |   |  |
|---|---|--|
|   |    |  |
| <p>Level 12 –<br/>Plantrooms 121-<br/>124</p> | <p>Plant room 123 has been deep cleaned, sanitised and bird proofed where access points have been identified. Pigeons gained access through what appears to be weather damaged cladding and have been using the pipes and high beams as a roosting point. The roosting areas were mainly at the roof access point below the large roof overhang. Following the works carried out in plant room 123 a general deep clean and sanitisation was performed on Plant room 123 as this is directly attached to 123. Plant rooms 121 and 124 were given a general clean with used duct filters cleaned from all the plant rooms.</p> | <p>Following the intensive deep clean and sanitisation of plant rooms 123/122, and a general clean and waste clearance (including used filters) of Plant room 121 and 124, GP Environmental recommend the actioned noted below. Regular inspection (from a pest control perspective as well as a housekeeping one) and subsequent cleaning actions as required. As a minimum, plant room inspection audits</p> |



|  |  |  |
|--|--|--|
|  | These works took place over several days with <u>daily reports</u> being left with Estates Dept. | every two (2) weeks to ensure that pest birds are not given the opportunity to become established. |
|--|--|--|

I hope the above meets with your requirements, however should you require any further information please do not hesitate to contact me on [REDACTED].

Best regards,

Allan Bryden B.Sc.  
Operations Director  
GP Environmental Ltd



## Queen Elizabeth University Hospital, Glasgow

### Manual v automatic flushing of taps

**Dr T Makin**  
**1<sup>st</sup> July 2018**

#### **Legionella**

The risk from legionella growing in peripheral parts of the domestic water system, such as dead legs off the recirculating hot water system, may be minimised by regular use of associated outlets. When outlets are not in regular use, the HSE ACoP and Guidance (HSG 274) advocates that weekly flushing of these devices for several minutes can significantly reduce the risk of legionella proliferation in the system.

This guidance emphasises that once flushing is implemented as a control measure it has to be sustained and logged, as lapses can result in a critical increase in legionella at the un-flushed outlet.

In each case, before a flushing programme is implemented, consideration should first be given to removing infrequently used showers and taps. SHTM 04-01 specifies that showers should be removed if they are used less than once a week.

Where outlets are removed, the redundant supply pipework should be cut back, as close as possible, to a common supply, e.g. to the recirculating pipework or the pipework supplying a more frequently used upstream fitting.

In healthcare premises where there are susceptible patients, HSE guidance states that more frequent flushing may be required, i.e. twice weekly. It further proposes that water draw off should form part of the daily cleaning process to achieve temperature control for both hot and cold water and for distribution of continuously dosed biocides to outlets. Similarly, SHTM 04-01 states water draw-off should form part of the daily cleaning process and the procedure for

such practice should be fully documented and covered by training.

Twice weekly flushing for Legionella control is supported in HTM 04-01, and in SHTM 04-01 it advises that taps and showers should be flushed every three days for 1 minute for hot and cold supplies.

SHTM 04-01 also states that during temporary closure of wards or departments, a procedure for flushing the hot and cold water service systems should be instituted. This should include opening all taps and showers for a period of three minutes and flushing WC cisterns etc on a twice-weekly cycle. Taps that include flow regulation may need to be flushed for longer than three minutes.

### **Sensor taps**

To assist in flushing of underused outlets, HSE guidance states that consideration should be given to self-flushing fittings which are validated to show they are effective and do not introduce any additional risks. HTM 04 01 supports this, but notes that such self-flushing systems should be activated only where required and that automatic flushing devices should not be located in accommodation used by patients who may become distressed by the noise.

SHTM 04 01 advises that consideration should be given to installing taps with automated programmable flushing facilities that can be monitored by an Intelligent Water Management System or hand-held computer.

HTM 04-01 highlights that the requirement for sensor operated taps have led to a more complicated internal tap design which may increase the need for additional routine maintenance (including decontamination) to mitigate the risk of contamination. Similarly SHTM 04-01 recognises that non-touch / infrared / sensor taps have a greater risk of their complex internal surfaces becoming contaminated with micro-organisms and biofilms.

TM supports this view but is aware of an ICU fitted with sensor taps operated by simple solenoid valves and these were rarely contaminated with *Legionella* or *Pseudomonas*.

SHTM 04-01 notes that part of the operational management of water systems will necessitate “flushing” of outlets. Such flushing can be time-consuming and is not facilitated by automatic taps that require a continual presence. This guidance stresses that the flushing of seldom used taps must be recorded.

### **Pseudomonas**

It is well recognised in both Scottish and English versions of HTM 04-01 that under-use of taps also encourages colonisation with other microorganisms including *Pseudomonas aeruginosa*.

*Pseudomonas aeruginosa* are common in the environment and therefore can seed untreated water systems during construction and subsequent use.

Contamination of water systems by microorganisms particularly *P. aeruginosa*, can also be introduced during refurbishment, repair and alteration, or during routine inspection and sampling. Retrograde contamination of outlets with *Pseudomonas* is also likely to occur through backsplashing from washbasins/drains, from patients/staff hands during hand washing, and from inappropriate use of washbasins for disposal of clinical material.

*Pseudomonas aeruginosa* is regarded as an opportunistic pathogen, and in healthcare premises, contamination of water systems with this bacterium is only considered a threat for certain patients, notably those who are identified as receiving augmented care.

HTM 04-01 recommends that all taps that are used infrequently on augmented care units should be flushed regularly (at least daily in the morning for one minute) and a record should be kept confirming they were flushed. Where taps

can be programmed to flush automatically, such flushing may be recorded through the building management system.

SHTM 04-01 does not specify daily flushing for the control of *P. aeruginosa* in augmented care units, but it does record that water draw-off should form part of the daily cleaning process and that the procedure for such practice should be fully documented and covered by written instruction.

### **Queen Elizabeth University Hospital, Glasgow – proposed procedure for flushing outlets**

With regard to the flushing of outlets at QEUH, it would not be necessary to fit sensor taps to carry out automatic flushing if the cleaning protocol includes that taps are flushed for at least one minute. Manual flushing of outlets also avoids the risk of a possible increased likelihood of contamination of sensor taps and showers which can result from their more complex design, and is referred to in the guidance.

The guidance clearly states that if manual flushing of outlets is implemented, it needs to be recorded. It may not be necessary for cleaners in augmented care units to individually record that they have flushed each tap, daily. But it would be appropriate for the taps covered by a cleaner to be listed, and for the cleaner to sign each day that all of these taps have been flushed for 1 minute during the daily cleaning process. These records should be retained on the unit. Where access was not permitted for the purpose of flushing outlets, this should be recorded.

It is necessary to ensure that cleaning staff, including managers, receive training and regular update training on the appropriate procedure for cleaning outlets, and particularly the correct order of cleaning (clean to dirty with outlets always being cleaned first). The training would emphasise the importance of flushing outlets.

Written instruction on the correct cleaning procedures should be posted on each augmented care unit and cleaning managers should periodically carry out audits of cleaning procedures and check that in accordance with the guidance flushing is carried out and flushing records are maintained.

**Dr T Makin**

**7<sup>th</sup> July 2018**

Agenda Item 3

## **An assessment of the suitability of Cloriox2 for the treatment of hot and cold potable water systems in Queen Elizabeth University Hospital, Glasgow**

**Report produced by Dr T Makin**

**30<sup>th</sup> June 2018**

### **Introduction**

Following the identification of hospital acquired infection with *Cupriavidus pauculus* and *Stenotrophomonas* spp. at the Queen Elizabeth Hospital, Glasgow, and the detection of these bacteria in various parts of the hospital's hot and cold water systems, it is considered necessary to treat these water systems with a residual biocide. Cloriox2, a chlorine dioxide based biocide, has been proposed and is considered for this purpose.

### **Background**

Brenntag manufacture "Cloriox2\_care" (Cloriox2), which is a chlorine dioxide based biocide solution that is widely used in horticulture and animal husbandry. Cloriox2 has approval from the Drinking Water Inspectorate (DWI) for use in public water supplies in England and Wales. Approval was granted in October 2015 and is due to be renewed in October 2020.

The DWI informs the Scottish government of chemicals that it has approved for use in England and Wales, but separate approval arrangements apply in Scotland under Regulation 33a of the Public Water Supplies (Scotland) Regulations 2014.

On request, Brenntag provided a copy of the letter issued by the Scottish Ministers, which approved Cloriox2 for use in Scotland for drinking, washing, cooking or food production purposes. Approval was granted on 30<sup>th</sup> November 2015.

Chlorine dioxide (ClO<sub>2</sub>) is a gas that is a powerful oxidising biocide when dissolved in water. It is explosive at concentrations of 10% in air and so is normally generated on site as a gas dissolved in water. However it can be provided as a stabilised solution that can be transported and stored for extended periods, as in the case of Clorious2.

Certain conditions can induce ClO<sub>2</sub> to come out of solution and accumulate as a gas (e.g. temperatures exceeding 27°C) so it is important that plant rooms are cool and well ventilated wherever ClO<sub>2</sub> is generated or where stabilised solutions of ClO<sub>2</sub> are used and stored. ClO<sub>2</sub> gas detectors should be installed in these locations. ClO<sub>2</sub> is denatured by light and so it should be kept in opaque vessels.

Normally, solutions of ClO<sub>2</sub> are produced by reacting sodium chlorite (NaClO<sub>2</sub>) with an oxidising chemical such as sodium hypochlorite (bleach), or with a strong acid such as hydrochloric or sulphuric acid.

Complete conversion of sodium chlorite to ClO<sub>2</sub> using oxidising chemicals or strong acids is difficult to achieve, consequently sodium chlorite and sodium chlorate are usually present to some extent in solutions of ClO<sub>2</sub>. The amount of these by-products present largely depends on the efficiency of reaction of the precursor chemicals.

In order to minimise the presence of chlorite and chlorate in treated water, HSE guidance on the control of Legionella bacteria in water systems (HSG 274) recommends at least an 80% reaction efficiency in the generation of ClO<sub>2</sub> from precursor chemicals. HTM 04-01 states that ClO<sub>2</sub>-generating equipment should be selected to ensure product efficacy of greater than 90% to provide the optimum performance for the minimisation of total oxidants.

The Scottish Health Technical Memorandum SHTM 04-01 notes that ClO<sub>2</sub> and its breakdown products, chlorite and chlorate, can be deleterious to neonates and renal dialysis patients, and should not be present in water supplies to these

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units.

In the UK, national conditions of use require that the combined concentration of ClO<sub>2</sub>, chlorite and chlorate in potable water systems does not exceed 0.5 ppm as ClO<sub>2</sub>. Where this level is exceeded then the guidance states that the treated water should be regarded as unsuitable for drinking and should be labelled as such.

ClO<sub>2</sub> can be used as a shock treatment at high concentrations to remove biofilms or may be applied continuously in lower concentrations. It is common in water systems contaminated with established biofilm to commence treatment with a high level shock dose of ClO<sub>2</sub> (normally 30 to 50ppm), which is maintained for a period of 1 hour. If lower levels of ClO<sub>2</sub> are used during shock treatment to prevent oxidative damage to pipework and other parts of the water system, then contact times need to be increased proportionately (BS 8558 and PD 855468).

After shock dosing, ClO<sub>2</sub> levels can be held at levels up to 0.5ppm (total oxidants). Establishing and maintaining an effective ClO<sub>2</sub> residual of 0.1– 0.5 ppm (total oxidants) at an outlet is usually sufficient to help control legionella and most other waterborne pathogens present in water systems. However, it is recognised in HSG 274 that higher residuals of ClO<sub>2</sub> may be necessary in heavily colonised water systems.

Established biofilm will have a significant ClO<sub>2</sub> demand, so it can take many months before a stable ClO<sub>2</sub> residual is established at the extremities of heavily colonised systems.

In hot water distribution systems with calorifiers/water heaters operating at temperatures recommended in HSE and DH guidance (60 °C and above), there will be a tendency for some of the ClO<sub>2</sub> to be lost by 'gassing off', particularly if the retention time in a vented calorifier/water heater is prolonged.

Where ClO<sub>2</sub> treated cold water is supplied to calorifiers/hot water heaters, some

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level of total oxidant should be found in the hot water, although the level of ClO<sub>2</sub> detected in hot water is normally less than half that detected in the cold water supplied to the calorifier/water heater.

The control of microbial contamination such as Legionella, Pseudomonas and other waterborne opportunist pathogens present in hot water systems, should be achieved primarily through thermal inactivation, by maintaining calorifier/water heater output at no less than 60°C, and achieving 55°C in all parts of distribution pipework and at outlets.

### **Clorious2**

Clorious2 is a relatively novel form of ClO<sub>2</sub> as sodium peroxodisulfate (Na<sub>2</sub>S<sub>2</sub>O<sub>8</sub>) rather than sodium hypochlorite or strong acid is used in the reaction with sodium chlorite (NaClO<sub>2</sub>) to generate ClO<sub>2</sub>. Brenntag claim that this reaction produces a stable solution of ClO<sub>2</sub> which needs no further activation, and achieves 100 % conversion of chlorite to ClO<sub>2</sub> with negligible chlorite, chlorate and chlorine by-products.

Brenntag state that in a 0.2ppm solution of ClO<sub>2</sub> (Clorious2) the calculated concentration of chlorite and chlorate is negligible at 0.006 ppm. This is calculated from stoichiometry rather than measured directly. However, this calculation is supported by independent analysis carried out by a German analytical laboratory using accredited methods (DIN EN 12671 and DIN EN ISO 10304).

A 0.6% (6000ppm) solution of Clorious2, that was just over 4 months old, was analysed by UV/Vis spectroscopy, IR spectroscopy and by iodometric titration. It contained just 181ppm of sodium chlorite and 174ppm of sodium chlorate, and ClO<sub>2</sub> represented 92% of the solution.

At a maximum concentration of 0.5ppm ClO<sub>2</sub> dosed into potable water, the results of this analysis would indicate that Clorious2 will contribute just

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0.015ppm of sodium chlorite and chlorate respectively. There is no prescribed limit for sodium chlorite and chlorate in drinking water in the UK, but the World Health Organisation recommends that neither parameter should exceed 0.7ppm.

The claim by Brenntag that Clorious2 contains negligible chlorite and chlorate and does not degrade on long-term storage (up to 6 months) is supported by the analysis carried out by the independent laboratory. Brenntag assert that extended stability of Clorious2 results from it having a low vapour pressure.

The following reaction is described in the Brenntag literature for the production of Clorious2.



The substance reacting with sodium chlorite ( $\text{NaClO}_2$ ) in the above reaction is sodium peroxyhydrogendisulfate ( $\text{NaHS}_2\text{O}_8$ ), rather than sodium peroxodisulfate ( $\text{Na}_2\text{S}_2\text{O}_8$ ) which Brenntag claim they use to produce Clorious2. The Brenntag representative (Patrick McTurk) explained this apparent anomaly by stating that when sodium peroxodisulfate is in solution it changes into sodium peroxyhydrogen disulphate. (*The services of a suitably qualified chemist will be required if this declaration by Brenntag needs to be corroborated*).

Brenntag supply Clorious2 in two different strengths: 2000ppm and 6000ppm, which they state are pure and stable solutions of  $\text{ClO}_2$  that have a stable shelf life of 6 months. The stability curve provided by Brenntag for Clorious2 shows less than 2% denaturation takes place after 180 days storage in recommended conditions. Information provided by Brenntag indicates that 92% of a 6000ppm solution of Clorious 2 is  $\text{ClO}_2$ , i.e. contains 5,520ppm of  $\text{ClO}_2$ .

### **Compatibility of Cloriox2 with metals and plastics**

Brenntag claim that diluted Cloriox2 does not contribute to higher corrosion rates, even at higher dosages, and it apparently exhibits a lower corrosion tendency towards e.g. brass and copper, than chlorine dioxide generated by reacting strong acid with sodium chlorite.

Undiluted, Cloriox2 is corrosive to metals such as stainless steel, aluminum, brass, bronze, copper, iron and zinc, and in this form it is also incompatible with many plastics and elastomers. Many standard polymers (including PVC, CPVC, and HDPE) become brittle over time as a result of oxidative chain degradation.

Generally, fluoropolymers, such as PVDF/Kynar™ and fluorinated elastomers, such as FKM/Viton™ and PTFE/Teflon™ are largely unaffected by undiluted solutions of ClO<sub>2</sub>. This is also compatible with vinyl ester-FRP materials.

To ensure reliability during dosing of concentrated solutions of ClO<sub>2</sub>, all wetted parts of the pump head should be PTFE/Teflon™ (diaphragm, gasket), PVC (pump head), and ceramic (valve ball). Seals and o-rings should be made of fluorinated elastomers, such as FKM/Viton™ or PTFE/Teflon™. Tubing used in dosing lines should be flexible PTFE/Teflon™ and need to be replaced every 12 months.

Cloriox2 is dosed into water at the supplied concentration (2000 or 6000ppm) by means of a metering pump. The dosing point should be well beneath the water surface in order to prevent the ClO<sub>2</sub> from gassing off.

### **Antibacterial activity of Cloriox2**

Brenntag provided some data on biocide efficiency testing of Cloriox2.

One assessment was carried out in a commercial laboratory located in Belgrade, Serbia. The laboratory does not appear to be UKAS accredited as neither a UKAS

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logo or registration number was displayed, and from the information provided it is not clear if the analysis was carried out using accredited methods. The results of this study show that a range of microorganisms, including *Pseudomonas aeruginosa* and *E coli*, were not inactivated by **0.12ppm** ClO<sub>2</sub> (provided as Clorious2) after the maximum contact time of 20 minutes.

Inactivation of the test organisms, with the exception of *Bacillus cereus*, which produces spores and is generally more resilient to biocides, first occurs at **0.24ppm** ClO<sub>2</sub>. *Bacillus cereus* is eventually inactivated at **0.6ppm** ClO<sub>2</sub> after a contact time of 10minutes. *Legionella* bacteria were not included amongst the test microorganisms.

Information was also provided by Brenntag on a further study determining the effect of a stabilised solution of ClO<sub>2</sub> (Clorious2) on cell multiplication in *Pseudomonas putida*. This assessment was carried out using the accredited method EN ISO 10712:1995 . The lab undertaking the analysis (LPT) was based in Hamburg, Germany.

In summary, this study showed that after 16 hours contact time with a range of concentrations of the stabilised solution of ClO<sub>2</sub>, the EC<sub>50</sub> for *Pseudomonas putida* was reported as **1.06ppm** (EC<sub>50</sub> is the dose at which 50% of the maximum effect of a biocide is produced, or the concentration of a biocide at which it achieves half of its maximum effectiveness).

The results of this study further show that **3ppm** of stabilised ClO<sub>2</sub> is required to achieve a 3 log inhibition (99.9%) of cell multiplication in *Pseudomonas putida*. It is significant that the maximum amount of ClO<sub>2</sub> allowed in hot and cold potable water systems is 0.5ppm (as total oxidant).

Brenntag provided a further laboratory report where an accredited method (DIN EN 13623) was used to assess the bactericidal activity of 0.6% Clorious2 against *Legionella pneumophila* (ATCC 33152). This is a particularly relevant assay when considering the use of this biocide in healthcare premises.

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Clorious2 was tested at final concentrations of 0.17 % / 0.83 % / 1.67 % and 4.17% (v/v).

The report concludes that 60 minutes contact with a **1.67%** solution of Clorious2 (98ppm ClO<sub>2</sub>) produced a  $\geq 4$  log reduction (>99.99%) in the test organism *Legionella pneumophila*. A significant reduction in Legionella could not be confirmed with the lower concentrations of Clorious2 (e.g. 0.83% Clorious2, or 49ppm of ClO<sub>2</sub>)

It is worthy of note that the antibacterial effect of biocides can be reduced by 100 to 1000 fold in the presence of biofilm in contaminated water systems.

### **Conclusion and recommendation**

Clorious2, a chlorine dioxide (ClO<sub>2</sub>) based biocide, is generated by a relatively novel reaction that produces a stabilised solution of ClO<sub>2</sub> in a high efficiency reaction that generates few impurities, notably chlorites and chlorates.

It is approved for use as a disinfectant in drinking water in Scotland and elsewhere in the UK. Independent analysis supports the claim by the manufacturer Brenntag that Clorious2 is a stable solution of ClO<sub>2</sub> with a good shelf life (6 months), and little residual precursor chemical sodium chlorite, or chlorate, which can be harmful to neonates and renal dialysis patients.

Further data provided by Brenntag from independent analysis of Cloricide2 shows it has antibacterial activity against a range of microorganisms including Legionella and Pseudomonas. However, some of these assessments appear to indicate that in order to achieve a significant reduction in test bacteria (>3 log) a level of Clorious2 is required that exceeds the level of ClO<sub>2</sub> permitted in drinking water in the UK. This needs to be further discussed with the manufacturer.

In response to a request for information on locations where Cloricide2 is used in potable hot and cold water in healthcare premises, Brenntag confirmed that it is currently dosed into potable hot and cold water systems in only one healthcare establishment in the UK, a small healthcare facility in the north of England. It is also used in four hospitals and an administrative centre in the Czech Republic.

There have apparently been no reports produced on the efficacy of Cloricide2 in controlling microorganisms in healthcare premises. Conversely, there have been many peer reviewed papers published on the effectiveness of ClO<sub>2</sub> produced through conventional on-site generation.

Cloricide2 has some advantages over on-site generation of ClO<sub>2</sub> but it has not yet been fully evaluated as a biocide to control waterborne opportunistic pathogens such as *Legionella* and *Pseudomonas* in potable water systems, and its effectiveness against *Cupriavidus pauculus* and *Stenotrophomonas* spp., which are of particular interest at the Queen Elizabeth Hospital (QEH), has not been assessed.

Therefore, in my opinion, whilst Cloricide2 would appear to have potential, it would not be appropriate at this stage to use it to attempt to control waterborne microorganisms in the potable hot and cold water systems at the QEH. This should be reviewed if robust supportive evidence from properly controlled trials is produced.

**Dr T Makin**

**30<sup>th</sup> June 2018**

### Documents provided by Brenntag and reviewed by TM for this report

- Analysis of the bactericidal activity of Clorious2 against *Legionella pneumophila*  
Biotecon Diagnostics GmbH
- Biocide efficiency testing of Clorious2, Institut Za Javno, Belgrade, Serbia
- Examination and assessment of sodium chlorite and sodium peroxodisulfate for compliance with the purity criteria of the respective product standards
- Examination and assessment of sodium chlorite and sodium peroxodisulfate for compliance with the purity criteria of the respective product standards. IWW Rheinisch-Westfälisches Institut für Wasser Beratungs- und Entwicklungsgesellschaft mbH
- European patent application EP 0 985 664 A2
- Acute toxicity of 0.6% aqueous chlorine dioxide solution, inherently stabilized, in *Pseudomonas putida* (Pseudomonas cell inhibition test)
- Drinking Water Inspectorate, approval confirmation and covering letter
- DWI application form: chemicals for use with drinking water
- Approval for use of Cloricide2 in public water supplies in Scotland
- Substance Characterisation Report for Clorious2 – 0,6%ige Chlordioxidlösung report 13020603S001 LAUS GmbH
- Clorious2 care Instructions for use in the treatment of water intended for human consumption. Brenntag UK & Ireland
- Delivering Clean Water, Safely Occupational Health and Safety Aspects – Brenntag
- Chlorine dioxide in horticulture. Brenntag
- Specific product details for Clorious2 Care. Brenntag
- Clorious2 – hot and cold water disinfection. Brenntag
- Clorious2 Care – Technical data sheet. Brenntag
- Clorious2 Care – Safety Data Sheet according to Regulation (EC) No. 1907/2006
- Connecting chemistry – what Brenntag can do for you

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**BACKGROUND:** This study was conducted in a multi-hospital medical center. The patient population is similar in three sites, however one site's patient population is primarily geriatric. This site had a higher incidence of nosocomial *Clostridium difficile* Toxin (CDT). The Infectious Diseases Department implemented a strong antibiotic control policy, which restricted access to class three antibiotics unless they were approved by Infectious Diseases. The infection control practitioners assisted by supplying nosocomial rates to the infection control committee and conducting education sessions for staff. **METHOD:** A retrospective review at the four sites was conducted over a 6-year period. Patients with CDT were identified through review of infection control logs and microbiology reports of stool specimen for CDT culture and assay. Patients' charts were reviewed to confirm the case definition of CDAD and to assess the risk factors for the infection. Overexposure to antibiotic was cited as the primary risk. These data were retrieved by review of our pharmacy database. **RESULTS:** In 1993, the mean aggregate incidence was 14.2. By Dec of 1998, the mean decreased to 3.4. The geriatric facility showed a greater reduction of CDT than did the acute care teaching facilities. **CONCLUSION:** The ICP's involvement in physician education and rapid feedback on problems identified through surveillance, improved the knowledge of direct care givers and ancillary staff. The medical center's antibiotic control policy is also considered a primary factor in our successful control of CDT.

**WHY SEMMELWEIS "FAILED": VALUABLE LESSONS FOR HOSPITAL EPIDEMIOLOGISTS OF THE NEW MILLENNIUM.** Haley RW. Univ of Texas Southwestern Med Center, Dallas, TX.

Ignaz Phillip Semmelweis is widely known as the "father of handwashing." A closer reading of history, however, reveals a far more sweeping discovery of the array of epidemiologic and infection control practices we use today, as well as a transient victory over hospital contagion that ended in bitter failure and resurgence of the epidemic for 75 more years! As a young assistant professor at the Vienna Lying-In Hosp in 1846, Semmelweis questioned the view of his esteemed medical professors that the high rate of maternal death from puerperal sepsis (childbed fever) in their charity patients had always been so and was the inevitable consequence of the victims' fallen moral state. With Pasteur's discovery of the streptococcal etiology of the disease more than 30 years in the future, Semmelweis performed the first hospital epidemiologic study by tabulating the maternal mortality rate by year from 1785 to 1846 and demonstrating the pivotal risk factors for the epidemic. First, he discovered that the epidemic had begun in the early 1820s coincident with the introduction of technology into obstetrics and of the use of autopsy examination in teaching medical students. Second, he discovered a much higher attack rate in the second obstetrical division which employed medical students than in the first division which employed midwife students. Concluding that infection was being transmitted from infected cadavers to women in labor on the unwashed hands of the medical students, he instituted two control measures still at the center of infection control today: antiseptic handwashing before entering the labor room and isolation of infected patients. Immediately, the postpartum mortality rate in the second division dropped to below that in the first division. After brief acclaim for reducing the mortality rate, Semmelweis came under bitter criticism by prominent experts of his day who "disproved" his "outrageous theory" and thoroughly discredited him. Within two years he was dismissed from his academic position, his successor abolished the control measures, and the high maternal mortality rates returned, prevailing well into the 1930s! Simultaneously, in the United States Dr. Oliver Wendell Holmes, apparently unaware of Semmelweis, reached the same conclusion about the etiology and control of the problem, but was denounced by prominent advocates of the established anticontagionist viewpoint. In my presentation, I will discuss Semmelweis' epidemiologic approach and attempts to influence his colleagues, and I will explain why he failed and how we can do better.

**A SURVEY ON HANDWASHING PRACTICES AND OPINIONS OF HEALTHCARE WORKERS IN TWO BOSTON HOSPITALS.** Harris AD,\* Samore MH, Nafziger R, DiRosario K, Roghmann MC, Carmeli Y. Univ of Maryland; Univ of Utah; Beth Israel Deaconess Med Ctr.

**BACKGROUND:** Handwashing is considered as an essential procedure for prevention of nosocomial infection. Yet studies have consistently demonstrated rates of handwashing compliance at less than 50%. **METHODS:** A 73-question survey was administered to healthcare workers in two tertiary care hospitals. The objective of this study was to gain information about the following domains of handwashing: self-reported compliance, attitudes towards handwashing in different patient settings, and attitudes towards interventions aimed at increasing compliance. **RESULTS:** 199 healthcare workers completed the survey. 59% of the respondents were nurses and 16% physicians. 89% felt that handwashing is an important means of preventing infection. 64% believed that they washed their hands as often as peers. Only 2% believed that they washed less often than peers. Patients with diarrhea, AIDS, or patients on antibiotics led to increased handwashing. Relative to potential interventions, 76% felt that rewards for handwashing would have no effect; 73% felt that punishment would have no effect; 81% would not prefer wearing gloves over handwashing; and 80% felt that easy access to sinks and easy availability of washing needs would lead to increased compliance. **CONCLUSIONS:** The survey outlines that healthcare workers understand the importance of handwashing but likely overestimate their own compliance. Healthcare workers are not in favor of interventions involving rewards and punishments but are more favorable to interventions that make handwashing an easier process.

**SIX YEARS' EXPERIENCE WITH CHLORINE DIOXIDE IN THE CONTROL OF LEGIONELLA PNEUMOPHILA IN THE POTABLE WATER SUPPLY OF GLASGOW ROYAL INFIRMARY.** Hood J, Cheape G, Mead A, Curran E. Glasgow Royal Infirmary, Glasgow, Scotland, UK.

The cold water supply of the GRI Old Hosp (Med/Centre [MCB] & Surgical Blocks [SB]) is large, old, and complicated. It was continuously hyperchlorinated (3 ppm) from 1990 after found to be heavily colonized with *Legionella pneumophila* serogroup 1 (Lp1), and 3 nosocomially acquired cases of Lp1 infections (2 fatal) occurred. In Aug 1992 "adequate" hyperchlorination did not control Lp1 in MCB ward water due to the

high pH (8.5) of the incoming water and the presence of biofilm. A further case of nosocomial legionellosis was identified. Continuous chlorine dioxide (ClO<sub>2</sub>) at 0.3 ppm commenced in Jul 1993 in the MCB and in Feb 1995 in the SB. Our results show that over a 6-year period, in a cold water distribution system, where the water is soft and of high pH, that continuous dosing with chlorine dioxide (up to 0.5 ppm) is extremely effective in controlling planktonic Lp1. Lp1 continued to be isolated for up to 6 weeks but after this there have been no further isolations in 1003 x 5 L water surveillance cultures taken from specific outlets, with no further cases of legionellosis. ClO<sub>2</sub> will not prevent the growth of planktonic *L. anisa* if significant engineering problems exist, eg, long unlagged pipe-runs or stagnant dead-legs. The consistent presence of *L. anisa* and/or low ClO<sub>2</sub> levels and/or high total viable counts indicates an engineering problem that requires investigation and a specific engineering solution. We have had no problems with corrosion failure and ClO<sub>2</sub> is much better tolerated than 3 ppm chlorine by both staff and patients. This work confirms the recent findings in a laboratory test rig which showed that ClO<sub>2</sub> is an effective method of controlling planktonic legionella in cold water systems (Pavey & Roper, 1998, BSRIA Technical Note T/N 2/98, Chlorine dioxide water treatment D for hot and cold water services).

**IMPORTANCE OF PATIENT COHORTING AND HANDWASHING IN PREVENTING METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS IN THE INTENSIVE CARE UNIT.** Jeong JS, Choi JS, Kim MN, Woo JH, Ryu JS, Pai CH. Asan Med Ctr, Seoul, Korea.

**BACKGROUND:** Cohorting and the barrier precautions including handwashing, gowning are highly recommended for the prevention and control of MRSA infections and colonization, but they are difficult to be practiced in an under-staffed ICU where MRSA is endemic. We compared the effect of a different combination of the control measures on the prevention of MRSA infections. **PATIENTS AND METHODS:** Asan Med Ctr is a 2200-bed university hospital with 7 ICUs including MICU, SICU, NSICU, and NICU. In 1996, new MRSA control measures were instituted in the latter 3 ICUs including the cohorting of patients infected or colonized with MRSA along with nursing staff, handwashing, and gowning, whereas only handwashing was practiced in MICU. MRSA infection rates per 1000 patient-days were compared before and after the institution of the new control measures in each ICU. **RESULTS:** MRSA infection rates in MICU increased from 3.8 to 5.5 per 1000 patient-days, whereas the rates decreased significantly from 4.9-2.8 ( $P = .001$ ) in NICU. The rates were unchanged in SICU (from 6.1-6.1) and only slightly decreased in NSICU (from 7.4-6.1). There were no significant changes in staffing in each ICU during the study period; however, the medical and nursing staff in NICU were found washing hands more frequently (44.6% vs 13.4%;  $P < .001$ ) before and after each patient contact than those in the adult ICUs. **CONCLUSION:** The prevention and control of MRSA infections is a difficult task, particularly in the ICUs where MRSA is endemic. Patient and staff cohorting and the barrier precautions do not appear to be effective in the control of MRSA infections, unless accompanied by stringent handwashing program.

**CONTROLLING C DIFFICILE ENTERITIS: AN ONCOLOGY CENTER'S EXPERIENCE.** Johnson NE, H Lee Moffitt Cancer Ctr and Research Institute, Tampa, FL.

*C. difficile*, the most common enteric nosocomial infection, remains a major cause of prolonged hospitalization and morbidity. At our 162-bed NCI designated cancer center, patients with various malignancies are at increased risk for *C. difficile* colitis due to exposure to multiple antibiotics for prophylaxis and empiric therapy for febrile neutropenia. In May of 1997, an increase in (cases of) *C. difficile* colitis was observed. A different test for the *C. difficile* toxin had just been implemented and an outbreak investigation was unable to identify any common elements among the patients. In Jul and Aug of 1998 the CDC's new isolation guidelines were implemented. All patients with *C. difficile* colitis were placed on Contact Precautions with strict adherence to wearing of gown and gloves while in the patient's room. This change in isolation policy resulted in a statistically significant decrease in the rate of *C. difficile* from 3/1000 patient days to 1.4/1000 patient days with a  $P$  value of .0001 and an odds ratio of .498. Despite some initial resistance, a motivated nursing and medical staff complied with the recommendations with resultant savings to the center of \$11,800.00 in treatment with Metronidazole and Vancomycin. In addition, there would be a reduction in patient days related to the decrease in morbidity from the disease and treatment, along with reduced pressure for developing Vancomycin-Resistant Enterococci.

**EDUCATIONAL INTERVENTION IMPROVES COMPLIANCE WITH UNIVERSAL PRECAUTIONS IN THE OPERATING ROOM FOR TWO YEARS AFTER TRAINING.** Kim LE, Freeman B, Jeffe DB, Evanoff BA, Fraser VJ. Washington Univ Med School, St Louis, MO.

We designed and implemented an educational intervention including a hands-on clinical procedure training program aimed at reducing exposures to bloodborne pathogens in the operating room (OR). Healthcare workers (HCWs) in 4 surgical specialties: cardiothoracic (CT), general (Gen), gynecology (Gyn), and orthopedic (Ortho) at Barnes-Jewish Hosp, a 1000-bed tertiary care hospital, participated from 6/96 through 8/98. At baseline, and at 1 and 2 years after an educational intervention, observers recorded information about personal protective equipment (PPE), sharps transfers, and blood and body fluid exposures in the OR. Use of PPE increased significantly 1 year after training and was sustained at 2 years for all specialties and staff subgroups. Use of proper eye protection by HCWs improved from (baseline 322/597 [54%] vs 1 year 516/783 [66%],  $P < .001$ ) and was sustained at 2 years after training (337/502 [67%],  $P < .001$ ). Ortho 97/124 (78%) and medical students 22/30 (73%) were most compliant, while CT 48/83 (58%) and surgeons 33/71 (46%) were least compliant with protective eyewear use at 2 years. Use of double gloves by HCWs improved from (baseline 97/344 [28%] vs 1 year 250/477 [52%],  $P < .001$ ) and was sustained at 2 years after training (185/311 [60%],  $P < .001$ ). For double gloving, Ortho 61/79 (77%) was most compliant and CT 13/49 (27%) was least compliant at 2 years, while General surgery improved most from (baseline 9/97 [9%] vs 2 years 50/87 [58%],  $P < .001$ ). Surgeon's use of double gloves improved

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**Client Details**

The Queen Elizabeth University Hospital

**Report By**

D. Holloway BSc (Hons) MRSPH  
Water Microbiology Manager  
Intertek  
The Old Mill  
Oxford Road  
Stoke On Trent  
England  
ST6 6QP

[Dominic.Holloway](#)

**Date Work Commenced**

22/06/2018

**Date Of Report**

11/07/2018 – continuing work will be reported separately at a later date

**Signed By:**

D. Holloway BSc (Hons) MRSPH





### Purpose of Work Undertaken

Investigation into contamination of flow Straighteners.

#### *Analysis method*

An initial visual inspection of each flow straightener was performed looking for presence of soiling and potential contamination of the flow straightener. A rating was given to each flow straightener to reflect the level of soiling

#### Soiling assessment.

**No**= no visible soiling all holes appear clear with no ingress.

**Light**= some visible soiling no detachment during washing, >70% of holes appear clear with no ingress.

**Moderate**= Visible soiling, some detachment during washing, no more than 50% of holes showing indication of ingress.

**Heavy**= heavy visible soiling, large fragments detached during washing, all holes show significant ingress or blockage.

#### *Microbiological Analysis*

A modified Bio-Burden test was used to analyse the flow straighteners.

- a. 200ml of sterilised deionised water (SDW) was added to the bag containing the flow straightener and the bag was agitated for 30 seconds. The 200ml of liquid was then classed as the sample.
- b. 1ml of the sample is used to create a serial dilution. Neat and 1 dilution was tested for total viable count (TVC)
- c. 100ml of sample was filtered and the filter transferred to a TVC plate
- d. 100ml of sample was filtered and transferred to a Pseudomonas aeruginosa specific plate
- e. All plates were incubated at 35oC for 48 hours to stimulate bacterial growth.
- f. After the incubation period all visible colonies were counted and recorded (any unusual growth types on the P. aeruginosa plates was recorded as non-typical (NT#)

#### *Bioburden assessment*

For the assessment of bioburden, a specialist product (Biofinder™) was used

Biofinder™ is a transparent yellow liquid which when sprayed onto a surface reacts with the protein structure to produce a catalase reaction.

Assessment of the levels of biofilm was made based on the strength and speed of the reaction

Biofilm assessed on a score 0-5.

0= No reaction. No biofilm presence

5= strong instant reaction large biofilm presence/ mature biofilm

| sample number | location  | asset number | date stamp on sample | 200ml SDW added | tvc 1ml | tvc1ml -1 | tvc100ml  | Pseud 100ml | Estimate total count per Item (cfu/straightener) | soiling visual |  | biofilm |
|---------------|---|--------------|----------------------|-----------------|---------|-----------|-----------|-------------|--|----------------|--|---------|
| 1             | Ward 9A Room 2                                  | GENW13-004   | 07/06/2018           | yes             | >1000   | >1000     | >1000     | >1000       | >2000000   | HEAVY          |  | 5       |
| 2             | HDU3 Bay 29                                     | CCW-106      | 21/06/2018           | yes             | >1000   | >1000     | >1000     | >1000 NT#   | >2000000   | NO             |  | 1       |
| 3             | Ward 9B Room 95 WHB                             | GEN16-040    |                      | yes             | >1000   | >1000     | >1000     | >1000 NT#   | >2000000   | HEAVY          |  | 5       |
| 4             | Ward 9C Clean Utility WHB                       | GEN15-081    |                      | yes             | >1000   | >1000     | >1000     | >1000 NT#   | >2000000   | NO             |  | 2       |
| 5             | Ward 8A Room 1                                  | GENW9-001    | 11/06/2018           | yes             | >1000   | >1000     | >1000     | >1000       | >2000000   | HEAVY          |  | 5       |
| 6             | Ward 8B Bed 107 WHB                             | GENW13-13    |                      | yes             | >1000   | >1000     | >1000     | >1000 NT#   | >2000000   | HEAVY          |  | 5       |
| 7             | Ward 5C Bed 66 WHB                              | GENW2-022    | 14/06/2018           | yes             | >1000   | >1000     | >1000     | >1000 NT#   | >2000000   | HEAVY          |  | 5       |
| 8             | Ward 8D Bed 29                                  | GENW10-065   | 11/06/2018           | yes             | >1000   | >1000     | >1000     | >1000 NT#   | >2000000   | LIGHT          |  | 5       |
| 9             | Ward 6B Bed101 WHB                              | GENW4-023    | 12/06/2018           | yes             | >1000   | >1000     | >1000     | >1000 NT#   | >2000000   | NO             |  | 5       |
| 10            | Ward6D Bed53                                    | GENW2-006    | 13/06/2018           | yes             | >1000   | >1000     | >1000     | >1000 NT#   | >2000000   | HEAVY          |  | 5       |
|               | due to excessive counts dilution of TVC changed |              |                      | 200ml SDW added | TVC 1ml | TVC 1ml-1 | TVC 1ml-2 | Pseud 100ml |  |                |  |         |
| 11            | HDU2 Bed11                                      | CCW-051      | 19/06/2018           | yes             | >1000   | >1000     | 350       | >1000       | 7000000  | NO             |  | 1       |
| 12            | HDU1 Bay7                                       | CCW-033      | 19/06/2018           | yes             | >1000   | >1000     | 250       | >1000       | 5000000  | NO             |  | 3       |
| 13            | Ward6C Bed73 WYB                                | GENW3- 040   | 12/06/2018           | yes             | >1000   | 200       | 600       | >1000       | 12000000   | Moderate       |  | 5       |
| 14            | HDU4 Bay35                                      | CCW-085      | 21/06/2018           | yes             | >1000   | >1000     | 20        | 400         | 400000   | NO             |  | 2       |
| 15            | Ward6A Bed2                                     | GENW1-006    | 12/06/2018           | yes             | >1000   | >1000     | >1000     | >1000       | 20000000   | HEAVY          |  | 5       |
| 16            | Ward 5B Bed85                                   | GENWD-065    | 13/06/2018           | yes             | >1000   | >1000     | >1000     | >1000       | 20000000   | HEAVY          |  | 5       |
| 17            | Ward5A Bed16                                    | GENWA-035    | 13/06/2018           | yes             | >1000   | >1000     | 900       | >1000       | 18000000   | HEAVY          |  | 5       |

Several colonies were identified from the original flow straightener analysis were selected and were sent to a specialist laboratory for further identification.

These consisted of colonies from 7 of the TVC analysis of the flow straighteners to represent the colony morphologies most dominant on the plates. An isolate from the *P. aeruginosa* analysis was also sent for further identification because in the opinion of the analyst the growth was not typical of *P. aeruginosa*. This could be due to the growth being a closely related species or that the *P. aeruginosa* bacteria present are conditioned to growth in a biofilm environment which may cause them to exhibit different characteristics when grown under laboratory conditions.

Photographs of Flow straighteners during testing supplied in supplemental report ITSS-0718-0001W(A)



## Flow Straighteners In Use for 1 Week

| sample number | location           | asset number | 200ml SDW added | tvc 1ml | tvc1ml -1 | tvc100ml | Pseud 100ml | Estimate total count per Item (cfu/straightener) | soiling visual |  | biofilm |
|---------------|--------------------|--------------|-----------------|---------|-----------|----------|-------------|--|----------------|--|---------|
| 1             | HDU4 BAY35         | CCW-085      | yes             | 280     |           | 2500     | 0           | 5000   | NO             |  | 0       |
| 2             | HDU4 BAY39         | CCW-090      | yes             | >300    |           | >3000    | 0           | >30000   | NO             |  | 0       |
| 3             | HDU5 DIRTY UTILITY | CCW-148      | yes             | 219     |           | 2500     | 0           | 5000   | NO             |  | 0       |
| 4             | HDU1 LAB           | CCW-066      | yes             | 234     |           | 2500     | 0           | 5000   | NO             |  | 0       |
| 5             | HDU1 BAY01         | CCW-036      | yes             | 0       |           | 0        | 0           | 0  | NO             |  | 0       |
| 6             | HDU2 CLEAN UTILITY | CCW-075      | yes             | 219     |           | 2000     | 0           | 4000   | NO             |  | 0       |
| 7             | UNUSED             | UNUSED       | yes             | 0       |           | 120      | 8           | 240  | NO             |  | 0       |
| 8             | HDU3 BAY25         | CCW-110      | yes             | 0       |           | 221      | 0           | 450  | NO             |  | 0       |
| 9             | HDU8 BAY53         | CCW-171      | yes             | 0       |           | 58       | 0           | 110  | NO             |  | 0       |
| 10            | HDU3 BAY30         | CCW-105      | yes             | 173     |           | 2000     | 0           | 4000   | NO             |  | 0       |

Morphology of organisms detected is that of common environmental organisms see frequently in water samples in the lab





## Flow Straighteners 1 month of use

| sample number | location              | asset number | 200ml SDW added | tvc 1ml -1 | tvc1ml -2 | Pseud 100ml | Estimate total count per Item (cfu/straightener) | soiling visual |  | biofilm | Identification from Pseudomonas plates |
|---------------|-----------------------|--------------|-----------------|------------|-----------|-------------|--|----------------|--|---------|--|
| 1             | Ward 8A Bed 12        | GENW9-026    | Yes             | >1000      | 350       | >1000 #NT   | 7000000  | Non            |  | 1       |  |
| 2             | Ward 8A Bed 6         | GENW9-013    | Yes             | >1000      | 220       | >1000 #NT   | 4400000  | Non            |  | 3       | Blastomonas ursincola                  |
| 3             | Ward 8A Bed 24        | GENW9-053    | Yes             | >1000      | >1000     | >1000 #NT   | >20000000  | Non            |  | 1       |  |
| 4             | Ward 8D Bed 38        | GENW10-043   | Yes             | >1000      | >1000     | >1000 #NT   | >20000000  | Non            |  | 0       |  |
| 5             | Ward 8D Room 29       | GENW10-056   | Yes             | >1000      | >1000     | >1000 #NT   | >20000000  | Non            |  | 0       | Cupriavidus pauculus                   |
| 6             | Ward 8B Room 104      | GENW12-019   | Yes             | >1000      | 470       | >1000 #NT   | 9400000  | Non            |  | 4       | Cupriavidus pauculus                   |
| 7             | Ward 8B Room 95       | GENW12-040   | Yes             | >1000      | 210       | >1000 #NT   | 4200000  | Non            |  | 5       |  |
| 8             | Ward 8D Clean Utility | GENW10-081   | Yes             | >1000      | >1000     | >1000 #NT   | >20000000  | Non            |  | 0       | Blastomonas ursincola                  |
| 9             | Ward 8B Room 85       | GENW12-065   | Yes             | >1000      | >1000     | >1000 #NT   | >20000000  | Non            |  | 0       | Chryseobacterium spp                   |
| 10            | Ward 8D Room 43       | GENW10-031   | Yes             | >1000      | 100       | >1000 #NT   | 2000000  | Non            |  | 0       |  |



The morphology of the organisms found on the plates is significantly different from those found on the flow straighteners used for 1 week. Overall counts have increased and the presence of biofilm has been found on 50% of the flow straighteners.

Flow straighteners 2 month of use

| sample number | location        | asset number | 200ml SDW added | tvc 100ml | tvc1ml -1 | Pseud 100ml | Estimate total count per Item (cfu/straightener) | soiling visual |  | biofilm |
|---------------|-----------------|--------------|-----------------|-----------|-----------|-------------|--|----------------|--|---------|
| 1             | control         |              | YES             | 0         | 0         | 0           | 0  | 0              |  | NA      |
| 2             | Bed 28 Ward 8A  | GENW09-065   | YES             | >1000     | 950       | >1000 #NT   | 19000000   | 0              |  | 1       |
| 3             | Bed 112 Ward 8B | GENW12-001   | YES             | >1000     | >1000     | >1000 #NT   | >20000000  | 0              |  | 5       |
| 4             | Bed91 Ward 8B   | GENW12-049   | YES             | >1000     | 550       | >1000 #NT   | 11000000   | 0              |  | 0       |
| 5             | Bed102 Ward 8B  | GENW12-023   | YES             | >1000     | 700       | >1000 #NT   | 14000000   | 0              |  | 3       |
| 6             | Ward 8D         | GEN10-31     | YES             | >1000     | 900       | >1000 #NT   | 18000000   | 0              |  | 0       |

The organism levels have increased overall on the flow straighteners. Biofilm is now present on the majority of the flow straighteners tested after 2 months of use.





## Flow Straighteners Unused (as supplied)

| sample number | location    | asset number | 200ml SDW added | tvc 100ml | tvc1ml -1 | Pseud 100ml | Estimate total count per Item (cfu/straightener) | soiling visual |  | biofilm |
|---------------|-------------|--------------|-----------------|-----------|-----------|-------------|--|----------------|--|---------|
|               | Bag A 1     | N/A          | YES             | 250       | 0         |             | 500  | 0              |  | 0       |
|               | Bag A 2     | N/A          |                 | 200       | 0         |             | 400  | 0              |  | 0       |
|               | Bag A 3     | N/A          |                 | 360       | 0         |             | 720  | 0              |  | 0       |
|               | Bag A 4     | N/A          |                 | 470       | 7         |             | 1400   | 0              |  | 0       |
|               | Bag A 5     | N/A          |                 | 40        | 2         |             | 80   | 0              |  | 0       |
|               | Bag B 1     | N/A          |                 | 7         |           |             | 14   | 0              |  | 0       |
|               | Bag B 2     | N/A          |                 | 12        |           |             | 24   | 0              |  | 0       |
|               | Bag B 3     | N/A          |                 | 54        |           |             | 108  | 0              |  | 0       |
|               | Bag B 4     | N/A          |                 | 10        |           |             | 20   | 0              |  | 0       |
|               | Bag B 5     | N/A          |                 | 7         |           |             | 14   | 0              |  | 0       |
|               | Bag C 1     | N/A          |                 | 58        |           |             | 116  | 0              |  | 0       |
|               | Bag C 2     | N/A          |                 | 0         |           |             | 0  | 0              |  | 0       |
|               | Bag C 3     | N/A          |                 | 40        |           |             | 80   | 0              |  | 0       |
|               | Bag C 4     | N/A          |                 | 210       |           |             | 420  | 0              |  | 0       |
|               | Bag C 5     | N/A          |                 | 15        |           |             | 30   | 0              |  | 0       |
|               | Bag D1      | N/A          |                 | 0         |           |             | 0  | 0              |  | 0       |
|               | Bag D2      | N/A          |                 | 70        |           |             | 140  | 0              |  | 0       |
|               | Bag D3      | N/A          |                 | 210       |           |             | 420  | 0              |  | 0       |
|               | Bag D4      | N/A          |                 | 104       |           |             | 208  | 0              |  | 0       |
|               | Bag D5      | N/A          |                 | 75        |           |             | 150  | 0              |  | 0       |
|               | B960859AA-1 | N/A          |                 | 1         |           |             | 2  | 0              |  | 0       |
|               | B960859AA-2 | N/A          |                 | 0         |           |             | 0  | 0              |  | 0       |
|               | B960859AA-3 | N/A          |                 | 10        |           |             | 20   | 0              |  | 0       |
|               | B960859AA-4 | N/A          |                 | 7         |           |             | 14   | 0              |  | 0       |
|               | Cashe Key   | N/A          |                 | 350       |           |             | 700  | 0              |  | 0       |



A total of 25 unused flow straighteners were tested for overall microbial load and biofilm. No presence of biofilm was found on any of the flow straighteners. The total microbial load of the flow straighteners was very low compared to the results of those tested after being used. As the flow straighteners are not produced or supplied in a sterile environment this level of microbial load would not be considered high. There was a significantly lowered level of organisms detected on the flow straighteners prefixed B96 it was also noted that these flow straighteners were supplied individually packaged as opposed to the other flow straighteners which were supplied bulk packed.

#### Data analysis

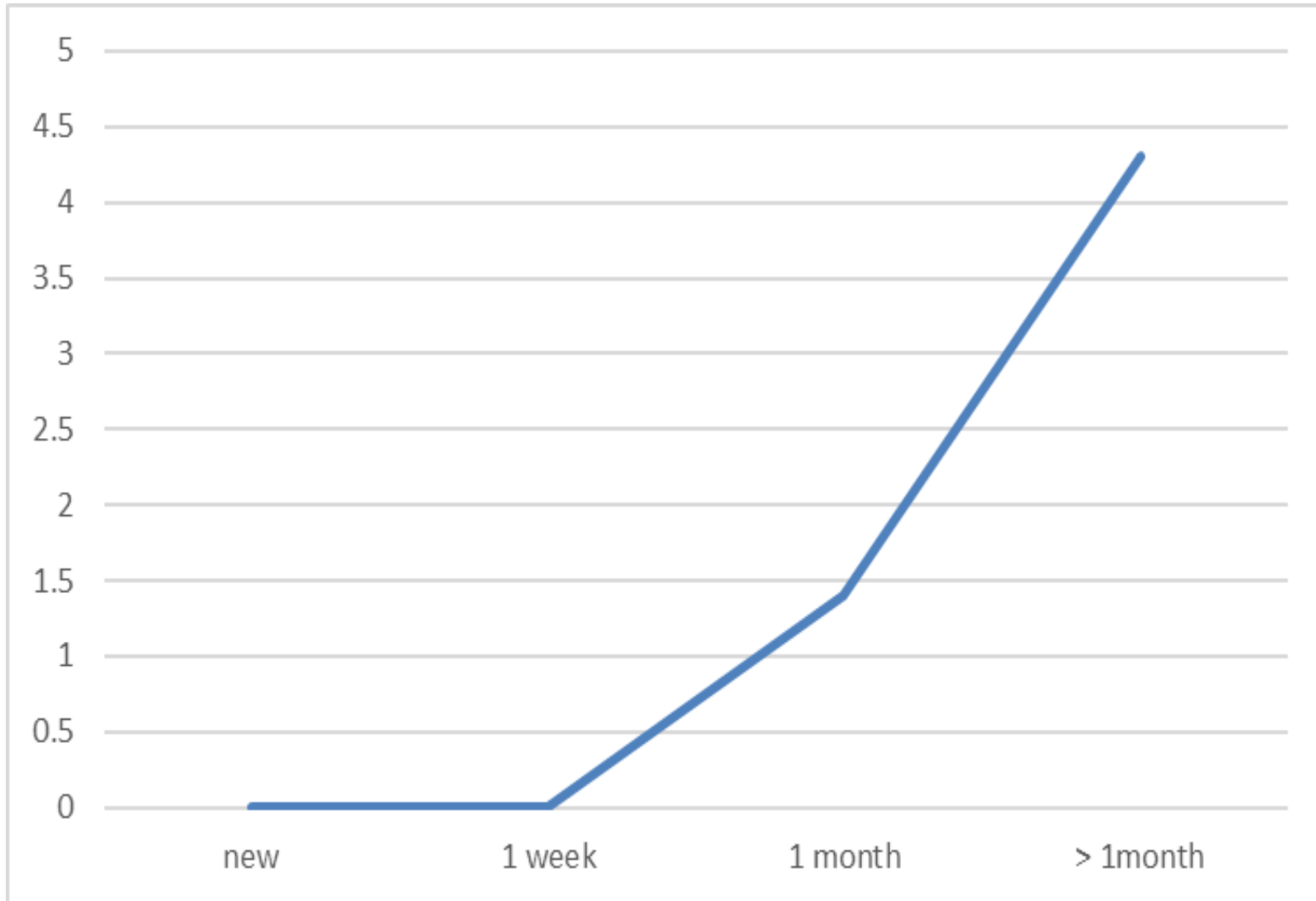
To better understand the rate of contamination and biofilm build up on the flow straighteners. To achieve this an average result has been calculated for each batch of flow straighteners and plotted onto a graph

#### Biofilm Assessment

The results for the biofilm assessment have been plotted onto a graph to show the levels of biofilm and its build up over time. (fig1)

During the testing no biofilm has been detected on any of the unused flow straighteners (25 tested in total from 5 different batches). Tests were run on flow straighteners after 1 week of use. These showed that no biofilm formation had occurred at this point. Tests were run on flow straighteners tested after 1 month of use. Five of the 10 (50%) of the flow straighteners tested after 1 month of use showed some degree of biofilm contamination. There was variation in the levels of biofilm detected (see test method for assessment criteria). A set of flow straighteners tested with over 1 month of use, the exact length of time these had been in use has not been determined. A total of 17 flow straighteners were tested in this batch. All these flow straighteners showed biofilm contamination with 12 of the 17 (71%) showing heavy contamination.

Fig1





## Microbial Load

The results for Microbial load have been plotted onto a graph to show the levels of bacterial contamination of flow straighteners over time in use (fig 2)

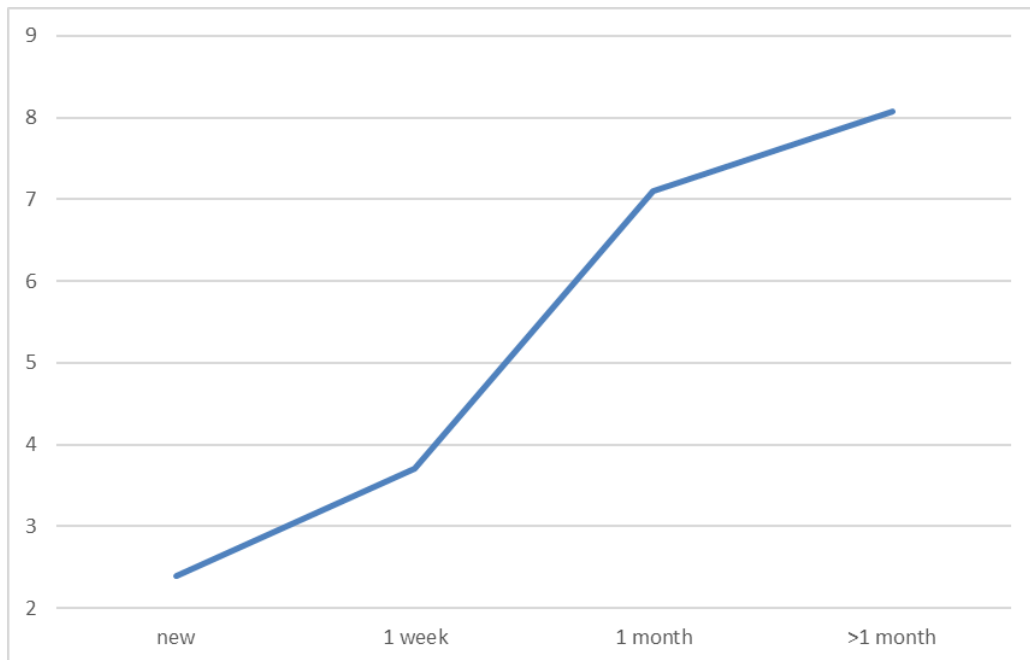
A selection of flow straighteners which were unused were tested. These flow straighteners showed low levels of bacteria present. The levels detected would not be considered unreasonable in a product of this nature which is not produced as sterile or sterilised prior to use the average organism level, calculated from all the obtained results was just 242 cfu/straightener.

A batch of flow straighteners tested after 1 week of use showed 20 fold increase in the levels of organisms detected on the flow straighteners

A batch of flow straighteners tested after 1 month of use showed a >2000 increase in the level of organisms compared to the flow straighteners used for 1 week and a 50,000 fold increase when compared to unused.

A batch of flow straighteners tested after > 1 month of use showed a 10 fold increase compared to the flow straighteners used for 1 month, a >20,000 increase when compared to the flow straighteners used for 1 week and a 500,000 fold increase from the unused flow straighteners.

Fig 2 (log<sub>10</sub> scale)



Looking at these results and considering the type and use of the product the level and speed on the increase in microbial load is significantly more than would be expected to maintain suitable water conditions for this type of location.

Drain Traps

| Ward    | GW1-044 | visual   |  |                                      |                 |  |  |  |  | swab        | Estimated count per swab (CFU/SWAB) |   |
|---------|---------|--|--|--------------------------------------|-----------------|--|--|--|--|-------------|-------------------------------------|---|
| Ward 3c | GW1-044 | visual   |  |                                      |                 |  |  |  |  |             |                                     |   |
|         |         | rubber seal showed evidence of significant decomposition. Heavy biofilm presence | large piece of clear plastic (50mmX40mm) | large clumps of tangled hair present | bulb trap clear | gap between down pipe and bulb trap heavily soiled to 10mm depth |  |  |  | X6 dilution | 210X10 <sup>6</sup>                 | swab taken as dab from steal conector area(1cmX1cm) |

| Ward    | GWS-004 | Visual                              |  |   |  |  |  |  |  | Swab        | Estimated count per swab (CFU/SWAB) |   |
|---------|---------|-------------------------------------|--|---|--|--|--|--|--|-------------|-------------------------------------|---|
| Ward 3A | GWS-004 | Visual                              |  |   |  |  |  |  |  |             |                                     |   |
|         |         | light staining inside the bulb trap | single piece of physical debris present in the trap (5p piece) | seal between metal fixing appeared sound and intact | no soiling between down pipe and bulb trap |  |  |  |  | X5 dilution | 115X10 <sup>5</sup>                 | swab taken from bulb trap circle around the internal side of the trap |





## Isolate Identification

| Sample ID | Sample discription        | Additional information  | Isolate ID | Isolate type                       | Identification               |
|-----------|---------------------------|---|------------|------------------------------------|------------------------------|
| 6         | Ward 8A Room 1            | piece of bifilm removed from sample 6                                 | Solid B    | solid fragment from washing        | Sphingomonas paucimobils     |
| 1         | Ward 9A Room 2            | piece of bifilm removed from sample 1                                 | Solid 1    | solid fragment from washing        | Micobacterium laevaniformans |
| 16        | Ward 5B Bed85             | Isolate Taken from PCN plate non typical morphology for P. aeruginosa | PCN16      | suspect P. aeruginosa              | Stenotrophomonas multophilia |
| 2         | HDU3 Bay 29               | taken at highest dilution with good colony seperation                 | TVC 2 (1)  | Dominant morphology from TVC plate | Acidovorax temperans         |
| 2         | HDU3 Bay 29               | Taken from crowded plate at lower dilution                            | TVC2 (2)   | Dominant morphology from TVC plate | Acidovorax temperans         |
| 15        | Ward6A Bed2               |   | TVC15      | Dominant morphology from TVC plate | Chryseobacterium spp         |
| 4         | Ward 9C Clean Utility WHB | taken at highest dilution with good colony seperation                 | TVC D-4    | Dominant morphology from TVC plate | Stenotrophomonas multophilia |
| 12        | HDU1 Bay7                 | taken at highest dilution with good colony seperation                 | TVC15      | Dominant morphology from TVC plate | Caulobacter                  |



## Drain

| Ward | GW1-044 | visual   |  |                                      |                 |  | swab        |              |   |
|------|---------|--|--|--------------------------------------|-----------------|--|-------------|--------------|---|
|      |         | rubber seal showed evidence of significant decomposition. Heavy biofilm presence | large piece of clear plastic (50mmX40mm) | large clumps of tangled hair present | bulb trap clear |  | X6 dilution | 210 cfu/swab | swab taken as dab from steal conector area(1cmX1cm) |

| Ward | GWS-004 | Visual                              |  |   |                                       |  | Swab        |             |   |
|------|---------|-------------------------------------|--|---|---------------------------------------|--|-------------|-------------|---|
|      |         | light staining inside the bulb trap | single piece of physical debris present in the trap (5p piece) | seal between metal fixing appeared sound and intact | no soiling between pipe and bulb trap |  | X5 dilution | 115cfu/swab | swab taken from bulb trap circle around the internal side of the trap |



### Identified Organisms

#### **Spingomonas paucimobils**

*S. paucimobilis* is a frequently encountered organism in the environment. It contaminates water supplies and hospital equipment. In addition to the occasional propensity to cause human disease, it is implicated in microbial influenced corrosion of water pipes. Because of their ability to accumulate copper in their cell walls, *Sphingomonas* spp. can bind to copper in the copper containing water pipes, facilitating an anodic reaction and corrosion of copper. Heating the water to 64°C decreases these reactions and microbial growth, as does low concentrations of antibiotics like cefoxitin, in the circulating water.

*Sphingomonas* spp. show antagonism to some plant pathogens, such as the fungus *Verticillium dahliae*, which affects several commercial plant species. Several *Sphingomonas* species have been recovered from sub-surface tunnels, where they may account for up to 11% of the culturable bacteria. Many species (though not *S. paucimobilis*) can degrade toluene, naphthalene, benzoate and other refractory environmental contaminants, suggesting a potential role in ecological clearance of such materials, including use for oil spills. More research is needed to determine how much of a threat *S. paucimobilis* can be clinical (<http://www.antimicrobe.org/b232.asp>)

#### **Micobacterium laevaniformans**

*M. lacticum* has been isolated from milk or dairy sources after laboratory pasteurization or from dairy products that have been heat treated. This species may form a considerable part of the thermotolerant bacterial flora of raw and pasteurized milk, powdered milk, cheese and dairy equipment.

*M. laevaniformans* is reported to occur in raw sewage and in activated sludge. *M. imperiale* was isolated originally from the alimentary canal of the Imperial moth *Eacles imperialis*. Bacteria resembling microbacteria have been reported to occur in fresh beef, poultry giblets and raw and pasteurized egg fluid.

#### **Stenotrophomonas maltophilia**

*Stenotrophomonas maltophilia* is a Gram-negative bacterium found in a variety of environments including soil, water, and plants. It also occurs in the hospital environment and may cause bloodstream infections, respiratory infections, urinary infections and surgical-site infections.

Clinically-significant infections usually only occur in those with significantly impaired immune defences, such as severely immuno-compromised patients. Infections in previously healthy patients are unusual. Risk factors pre-disposing a hospitalised patient towards infection include prior exposure to antimicrobials (especially broad-spectrum antibiotics), mechanical ventilation, and prolonged hospitalisation. It may also affect the lungs of patients with cystic fibrosis.

*S. maltophilia* does not readily spread between patients and is not a common cause of healthcare-associated infection. Hospital outbreaks for many pathogens, like *Acinetobacter baumannii*, are usually caused by a single strain. Apparent outbreaks attributed to *S. maltophilia* are frequently caused by multiple strains, implying acquisition from environmental sources as opposed to inter-patient spread.

(<https://www.gov.uk/guidance/stenotrophomonas-maltophilia>)





### Chryseobacterium spp

The newly classified and renamed *Elizabethkingia*, *Chryseobacterium* and *Myroides* genera were originally included among the different species that belong to the genus *Flavobacterium*. The genus *Flavobacterium* was created in 1923 for a group of non-spore forming, aerobic gram- negative rods, with the ability to produce yellow pigmented colonies . Based on this broad characterization many species were added to the *Flavobacterium* genus including *F. meningosepticum*, *F. indologenes* and *F. odoratum*, well known today as human pathogens. Further studies showed that many of these species were not truly related, and the genus underwent a series of reclassifications. More recently, new data on genotypic, chemotaxonomic and phenotypic analysis allowed regrouping of these species into four separate genus, *Chryseobacterium* spp., *Flavobacterium* spp., and *Myroides* spp. All belong to the family Flavobacteriaceae .

Ubiquitous in nature, *Chryseobacterium* species are found primarily in soil and water. Environmental studies have revealed that these organisms can survive in chlorine-treated municipal water supplies, often colonizing sink basins and taps and creating potential reservoirs for infections inside hospital environments. Colonization of patients via contaminated medical devices involving fluids (respirators, intubation tubes, mist tents, humidifiers, incubators for newborns, ice chests, syringes, etc.) has been documented (8, 12). Contaminated surgically implanted devices such as intravascular catheters and prosthetic valves have also been reported (18). In other clinical settings, chryseobacteria have been described as etiological agents of meningitis, bacteremia, pneumonia, endocarditis, infections of skin and soft tissue, ocular infections, and other infections (6). Primarily opportunistic pathogens, they infect mainly newborns and immunocompromised hosts from all age groups.

(<http://www.antimicrobe.org/b94.asp>)

### Caulobacter

*Caulobacter crescentus* has a dimorphic life cycle composed of a motile stage and a sessile stage. In the sessile stage, *C. crescentus* is often found tightly attached to a surface through its adhesive holdfast. In this study, we examined the contribution of growth and external structures to the attachment of *C. crescentus* to abiotic surfaces. We show that the holdfast is essential but not sufficient for optimal attachment. Rather, adhesion in *C. crescentus* is a complex developmental process. We found that the attachment of *C. crescentus* to surfaces is cell cycle regulated and that growth or energy or both are essential for this process. The initial stage of attachment occurs in swarmer cells and is facilitated by flagellar motility and pili. Our results suggest that strong attachment is mediated by the synthesis of a holdfast as the swarmer cell differentiates into a stalked cell.

(<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC344395/>)

### Discussion

The flow straighteners provided for the first round of sampling all showed significant levels of biofilm contamination. The levels were consistent throughout the sampling indicating that this is not an localised

issue but effecting all flow straighteners. Work is continuing analysing flow straighteners which have been connected to the system for different lengths of time to attempt to establish how quickly the biofilm is attaching to the flow straighteners in an attempt to offer some insight into reasonable service time for the flow straighteners.

### Biofilm formation and significance

When looking at biofilm formation in complex water systems there are a number of common factors which should be considered.

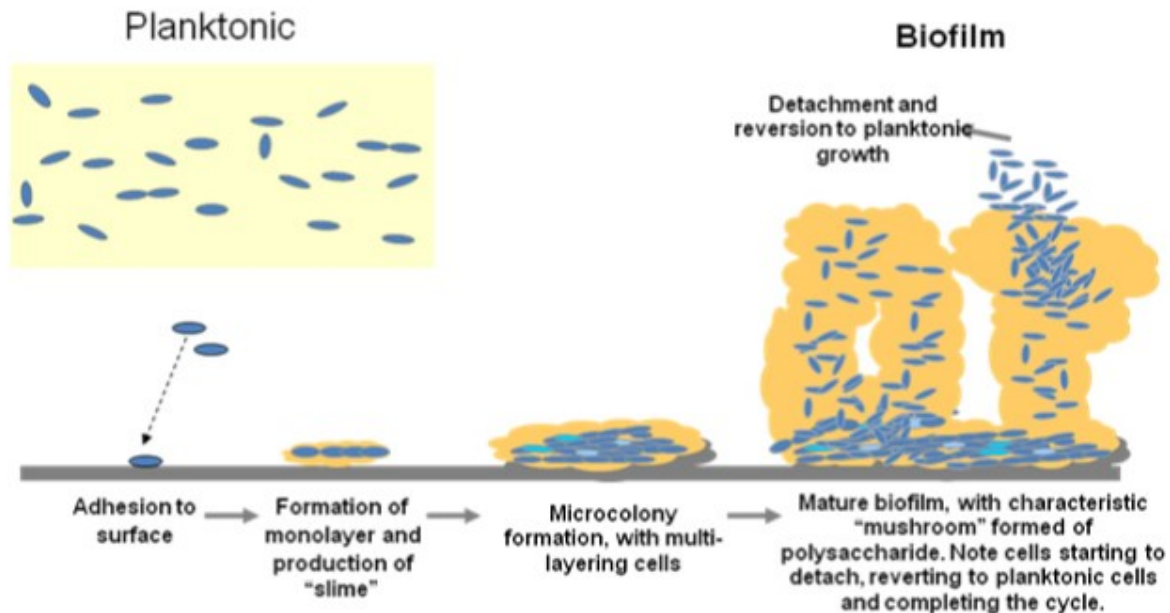
Any part of the system where the flow rate is slowed increases the chance of a biofilm forming as organisms are more likely to be able to attach to the surface.

Increased surface area gives more opportunity for organisms to attach and a biofilm to form.

Materials used in the construction of the water system have the potential to provide nutrients potentially increasing the natural fauna in the water.

Temperature ambient temperature water offers better conditions for organisms to develop in higher concentrations- there are exceptions to this and an example of this is *Chryseobacterium* spp which was detected in this project is resilient to low temperatures and higher acidity levels

the maturity of a biofilm also impacts on the levels of organisms released into the water



Source- <http://medcraveonline.com/JMEN/JMEN-01-00014.php>

A biofilm also supplies a degree of protection to the organisms living in it. The extracellular polymers secreted by the organisms and used as the building structure for the biofilm form a protective layer which provides more resistance to physical and chemical treatment than the organisms would have in their

planktonic state. It is not unusual in biofilms to find a low number of dominant species although the total number of species could in reality be significantly higher.

A large number of microbial cells are generally counted on surfaces in contact with drinking water (in the order of  $10^6$  to  $10^8$  cells per  $\text{cm}^2$ ) (Donlan and Pipes 1988; Pedersen 1990; Lévi et al. 1992; Mathieu et al. 1992). This biomass represents only 0.1 to 20 micrograms of organic carbon per  $\text{cm}^2$  (Niquette et al. 2000; Fass et al. 2003).

Of the total cell count of a water system biofilm it has been estimated that only 0.1-1% (WHO) is made up of clinically significant organisms with the rest being not clinically significant but the significance of this number varies dependant on the location of the water system, the maturity of the biofilm and the susceptibility of the people coming into contact with the water.

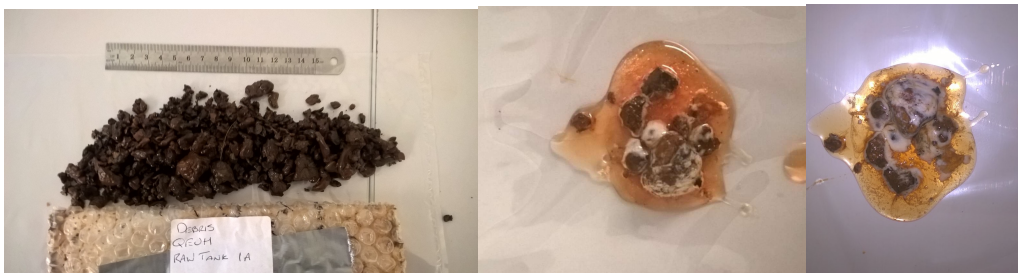
The organisms identified in this project do have some clinical significance although the level is variable and, in some cases, relatively unknown. The organisms that were identified all have proven ability to produce and sustain themselves in a biofilm and *Caulobacter* being specifically adapted to adhere to surfaces.

A comparison was made in the morphology of the organisms grown from the flow straighteners to that of organisms recovered from flow straighteners that had been in place for 1 week. There was significant difference in the morphology of the colonies on the plates with the morphology of the colonies that were chosen from the original samples for identification were not present in the 1-week old flow straightener samples. This indicates that although these organisms are present in low concentrations, as would be expected for these type of environmental organisms, once a biofilm has become established these specialised organisms are becoming dominant.

The level of contamination identified on the flow straighteners does indicate that they are a factor in the forming of the biofilm (as visible evidence of biofilm contamination was observed during testing) although the exact reason for this can not be concluded from this study. It can only be speculated that the design or construction materials may play a part although the more significant part in the biofilm formation is likely to be the whole water system condition.

Debris from the raw water tank.

Tests were done on debris recovered from the base of the raw water tank. Part of the sample was sent to an Intertek sister lab for composition analysis. A biofilm test was done on part of the remaining sample which showed a strong reaction indicating a large biofilm presence on the debris



Test run for 20 seconds

Drains.

2 drain traps were received into the lab for analysis

1/ Ward 3C GW1-044

(fig1-6)



This drain showed significant evidence of solid contamination. The bulb drain was clear of any debris but the space between the down pipe and bulb trap showed 10mm of debris build up. The debris was removed and examined to attempt to determine the contents to possibly give an indication of the potential source.

A large piece of plastic film (fig6) measuring 50mmx40mm was imbedded in the debris.

Clumps of hair was identified mixed into the debris (fig7) shown protruding from the pipe and the side of the debris.

The remaining debris consisted of decaying organic matter. Microbiological assessment of this debris was not deemed possible due to the expected high levels it would not be possible to obtain a dilution high enough to produce a workable result and when dealing with waste water systems with high levels of contamination the associated risk to the lab from potential virus contamination would be to great.

The metal fitting at the base of the trap showed significant levels of corrosion to the surface. A rubber seal attached to the fitting was split and showed high levels of decay throughout the seal. It is the opinion of the analyst that this seal would not be water tight in this condition.

Biofilm test was performed on the seal to determine the level of contamination (fig8). The biofilm indicator showed a very strong instant reaction indicating the presence of a large mature biofilm.

Due to the level of contamination a traditional swabbing method of the drain was not seen as practical. On assessment it was decided that due to the seal being in a failed condition that a swab would be taken from the metal fitting where the seal attaches. The tip of a swab was dabbed onto an area of 10mm<sup>2</sup> to perform the test. The result for the swab test gave a result of 210cfu at 6 dilutions. This would give an estimated total organism count of 210x10<sup>6</sup>/cm<sup>2</sup> of the metal fitting.

Fig7



fig8



2/ Ward 3A GWS-004

Fig9-13



The drain showed little or no evidence of contamination. All seals were intact and sound although the seal fitted to the metal fitting appeared to be fixed using an adhesive. All the channels in the drain were clear



and no debris was found in the trap. A single foreign body was found in the drain and this was identified as a 5p piece.

A swab was taken from a sweep of the inside of the bowl trap the result for the swab test gave a result of 115cfu at 5 dilutions giving an estimated total count of  $115 \times 10^5$

At this point it is worth noting the difference in organism levels between the two drain swab samples. The 2<sup>nd</sup> drain swab was taken by wiping the inside area of the bowl trap where as the first swab was taken by a single dab of the tip of the swab on the surface of the metal plate.

### Sponges

2 sponges were supplied to the laboratory (fig14&15). These sponges had been discovered in the cold-water storage tank. It is estimated that the sponges had been in the tank for a period exceeding 2 years although the time period can not be verified at the time of this report.



Due to the porous nature of sponge 2 portions of the sponge were chosen to be tested for the presence of biofilm. From this both the presence of biofilm and the depth of penetration could be determined

1/ a slice of sponge taken from the surface (fig15)

2/ a core sample taken from the centre of the sponge (fig 16)

Fig15

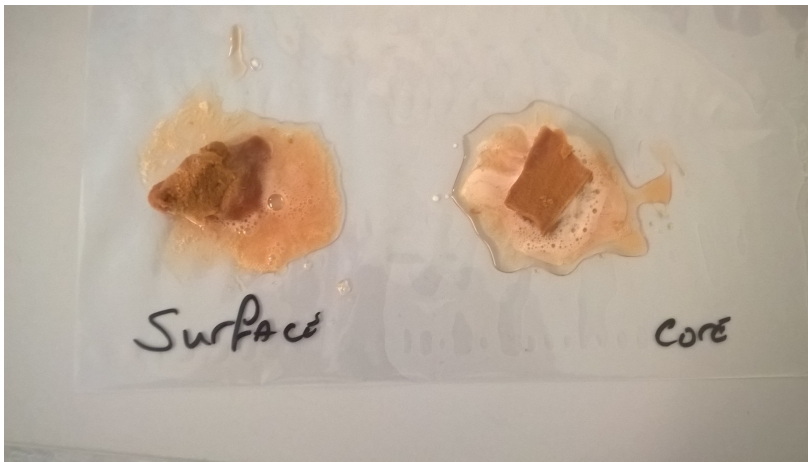


fig 16



When tested both samples showed a reaction indicating the presence of biofilm (fig 17). There was some delay in the reaction. It is unclear why the delay in reaction occurred, due to the porous nature of the sponge the possibility that the Biofinder™ was absorbed into the sponge and this delayed the visible reaction.

Fig 17







## Results supplied by Queen Elizabeth Hospital

Water samples have been taken by the hospital. These results have been passed over for the purposes of a review. As the testing primarily focused on the detection of *Cuprivadus* a full assessment of the water quality can not be performed. As most of the organisms isolated during this testing would be considered as common environmental organisms, normally these organisms would be counted in the total viable count (TVC) plates. It is possible to look at the location of the positive results in an attempt to locate any trends or areas of potential concern. To aid in this the data has been separated into individual floors and where possible areas.

During the first part of the assessment results have been treated as either positive or negative specific organisms and values have not been included. This part of the assessment looks at the distribution of the contamination and looks for any areas of potentially heavier contamination.

Each floor was assessed individually, and a percentage of positive samples calculated against the total number of samples taken.

| Floor         | total samples taken | total positive samples | % positive samples |
|---------------|---------------------|------------------------|--------------------|
| 1st floor     | 236                 | 87                     | 36.9               |
| 2nd floor     | 369                 | 73                     | 19.8               |
| 3rd floor     | 144                 | 50                     | 34.7               |
| 4th floor     | 216                 | 68                     | 31.5               |
| 5th floor     | 38                  | 23                     | 60.5               |
| 6th floor     | 27                  | 9                      | 33.3               |
| 7th floor     | 41                  | 18                     | 43.9               |
| 8th floor     | 11                  | 4                      | 36.4               |
| 9th floor     | 82                  | 37                     | 45.1               |
| 10th floor    | 11                  | 4                      | 36.4               |
| 11th floor    | 10                  | 4                      | 40.0               |
| basement      | 132                 | 32                     | 24.2               |
| basement tank | 94                  | 51                     | 54.3               |
| ground        | 88                  | 33                     | 37.5               |

\*blue highlight = low sample number data may not be fully representative

With the exception of floor 5 the level of positive results is consistent throughout the floors. The data for floor 5 may not be true due to the low number of samples so this data should be viewed with caution.

The second part of the assessment focuses on areas of concern or high risk trying to identify any individual areas where accumulation of organisms may have occurred



During the assessment the significant equipment parts were considered independently as these areas supply the water to the whole hospital so have the potential to cause significant contamination throughout the hospital.

60 samples taken from the cold-water storage tanks showed only 5 positive samples (8%). Three of these samples did show positive for *Cupriavidus* spp which indicates the organism is present at the entrance to the water system.

The expansion vessels testing showed that out of 16 samples taken only four did not report a positive result (see below chart). This indicates a high level of contamination to this type of water system part. It should be considered that these vessels have a high potential to contaminate the water system.

| DMA Sample Number | Floor     | Ward/Dept/Riser | Outlet Type (Tap Shower, CWST) | Analysis Required       | Description                          | Sample (Pre/Post or Filter) | Hot, Cold, Mixed (TMV) | Cupriavidus (cfu/100ml) | Species                    | Other Comments         |
|-------------------|-----------|-----------------|--------------------------------|-------------------------|--------------------------------------|-----------------------------|------------------------|-------------------------|----------------------------|------------------------|
| RHC/0358          | 4th Floor | Plantroom 41    | Expansion Vessel Drain         | Cupriavidus (cfu/100ml) | Expansion Vessel at Calorifier 78343 | Pre                         | Hot                    | 4                       | Cupriavidis gilardii       |                        |
| RHC/0359          | 4th Floor | Plantroom 41    | Expansion Vessel Drain         | Cupriavidus (cfu/100ml) | Expansion Vessel at Calorifier 78343 | Post                        | Hot                    | 12                      | Cupriavidis gilardii       |                        |
| RHC/0362          | 4th Floor | Plantroom 41    | Expansion Vessel Drain         | Cupriavidus (cfu/100ml) | Expansion vessel at Calorifier 78344 | Pre                         | Hot                    | >100                    | Cupriavidis gilardii       |                        |
| RHC/0363          | 4th Floor | Plantroom 41    | Expansion Vessel Drain         | Cupriavidus (cfu/100ml) | Expansion vessel at Calorifier 78344 | Post                        | Hot                    | 10                      | Cupriavidis gilardii       |                        |
| RHC/0366          | 4th Floor | Plantroom 41    | Expansion Vessel Drain         | Cupriavidus (cfu/100ml) | Expansion Vessel at Calorifier 78345 | Pre                         | Hot                    | 23                      | Cupriavidis gilardii       |                        |
| RHC/0367          | 4th Floor | Plantroom 41    | Expansion Vessel Drain         | Cupriavidus (cfu/100ml) | Expansion Vessel at Calorifier 78345 | Post                        | Hot                    | 17                      | Cupriavidis gilardii       |                        |
| RHC/1424          |           | Plant Room 31   | Expansion Vessel Drain         | Cupriavidus (cfu/100ml) | Cal 4 Expansion Vessel               | Pre                         | Hot                    | 0                       | no Cupriavidus             | 8 fungi saprophytic    |
| RHC/1425          |           | Plant Room 31   | Expansion Vessel Drain         | Cupriavidus (cfu/100ml) | Cal 4 Expansion Vessel               | Post                        | Hot                    | 0                       | no Cupriavidus             | 8 fungi saprophytic    |
| RHC/1432          |           | Plant Room 31   | Expansion Vessel Drain         | Cupriavidus (cfu/100ml) | Cal 6 Expansion Vessel               | Pre                         | Hot                    | >100                    | Cupriavidis pauculus       | >100 Fungi saprophytic |
| RHC/1433          |           | Plant Room 31   | Expansion Vessel Drain         | Cupriavidus (cfu/100ml) | Cal 6 Expansion Vessel               | Post                        | Hot                    | >100                    | Cupriavidis pauculus       | 8 Fungi saprophytic    |
| RHC/1496          | 3rd Floor | Plant Room 33   | Expansion Vessel Drain         | Cupriavidus (cfu/100ml) | Cal 1 Expansion Vessel               | Pre                         | Hot                    | 0                       | Delftia acidovorans (>100) | 24 Fungi               |
| RHC/1497          | 3rd Floor | Plant Room 33   | Expansion Vessel Drain         | Cupriavidus (cfu/100ml) | Cal 1 Expansion Vessel               | Post                        | Hot                    | 0                       | Delftia acidovorans (>100) | 54 fungi               |
| RHC/1500          | 3rd Floor | Plant Room 33   | Expansion Vessel Drain         | Cupriavidus (cfu/100ml) | Cal 2 Expansion Vessel               | Pre                         | Hot                    | >100                    | Cupriavidis gilardii       | No fungi               |
| RHC/1501          | 3rd Floor | Plant Room 33   | Expansion Vessel Drain         | Cupriavidus (cfu/100ml) | Cal 2 Drain                          | Post                        | Hot                    | >100                    | Cupriavidis pauculus       | No fungi               |
| RHC/1504          | 3rd Floor | Plant Room 33   | Expansion Vessel Drain         | Cupriavidus (cfu/100ml) | Cal 3 Expansion Vessel               | Pre                         | Hot                    | >100                    | Cupriavidis pauculus       | 7 fungi                |
| RHC/1505          | 3rd Floor | Plant Room 33   | Expansion Vessel Drain         | Cupriavidus (cfu/100ml) | Cal 3 Expansion Vessel               | Post                        | Hot                    | >100                    | Cupriavidis pauculus       | 8 Fungi                |

Even though the depth of data available is limited this should be considered a high risk for contamination.

Where pre and post have been specified in the data these were looked at to see if there was any significant difference in the level of positive results. If a significant difference does occur this may indicate that the contamination is either systemic in the system or is more localised towards the outlet.



Pre flush samples.

377 samples were identified as pre-flush. 125 of these samples showed a positive result (33.2%)

Post Flush samples

253 samples were identified as post flush. 112 of these samples showed a positive result (44.2%)

The results show that there is a higher level of positive samples in the post flush samples. This would seem to indicate that the contamination is not localised but is widespread through the system. Although further analysis of the data would be required to be sure of this.

(breakdown of data supplied in accompanying spreadsheets Floor by Floor Data).

**From:** [White C \(Craig\)](#)  
**To:** [Campariol-Scott C \(Carole\)](#); [Overton G \(Gillian\)](#); [Allan L \(Lara\)](#); [Lewis J \(John\)](#); [Birch J \(Jason\)](#)  
**Cc:** [Carson C \(Catherine\)](#); [Sharp G \(Gary\)](#); [Roberts A \(Anncris\)](#); [Shepherd L \(Lesley\)](#)  
**Subject:** RE: URGENT - Submission on aspergillus in the QEUH - Response from [REDACTED] - draft reply - this by lunchtime please  
**Date:** 30 November 2021 12:08:00  
**Attachments:** [image003.png](#)  
[image004.jpg](#)  
[image005.jpg](#)  
[image001.jpg](#)

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Hi

Widening to include Anncris and Lesley who have been involved in dialogue recently in respect of organisational duty of candour and HAI.

The organisational duty of candour provisions only apply if an NHS Board decides to activate the procedure having taken a decision that an unexpected or unintended incident has occurred that resulted or could result in death or harm.

In respect of [REDACTED] care, this could be relevant in respect of Covid 19 and Aspergillus infection. In that regard, nosocomial Covid-19 infection can occur despite good infection prevention and control practice, then it may be reasonable to determine that such infections are not regarded as unexpected, though this there is a consequent need to be clear on the review and decision-making process in determining whether having reviewed the infection prevention and control dimensions of individual instances of infection whether it is expected or unexpected that instances of infection have occurred. In respect of Aspergillus I would have thought that consideration of relevant HAI-SCRIBE assessments would also be relevant to decision making about individual circumstances and whether this would fall within the scope of the organisational duty of candour provisions.

In making such a judgement an NHS Board might decide to activate the organisational duty of candour procedure, with the local review of IPC procedure implementation being the review required by the legislation and one of the organisational requirements of activation of the procedure (acknowledging that this might be a review of a number of instances of nosocomial infection in an operational area, with the individual communication and engagement being with the relevant person as per the duty of candour procedure).

If there was a decision not to activate the organisational duty of candour procedure then there are of course still obligations in respect of accountability for transparent, person-centred and supportive communication and engagement informed by reviews, questions and concerns expressed by [REDACTED], accountabilities that relate to the Board's statutory duty of quality and the various responsibilities of accountable officer in respect of clinical and care governance apply.

In respect of Gillian's reflections on reference to the mediation network, my own view is that while this could of course be a helpful development if all agree it perhaps suggests that communication, engagement, review and support from the Board is not likely to be effective – which given all the prior actions described to make changes and implement learning from the Oversight Board report would be unfortunate.

I would expect NHSGGC's review and response to the questions they are considering to cover these issues.

Hope helpful,

Craig

Professor Craig White

Deputy Director

DG Health and Social Care | Scottish Government | [REDACTED]



**From:** Campariol-Scott C (Carole) [REDACTED]  
**Sent:** 30 November 2021 10:34  
**To:** Overton G (Gillian) <Gillian.Overton [REDACTED]>; Allan L (Lara) <Lara.Allan [REDACTED]>; Lewis J (John) <John.Lewis [REDACTED]>; Birch J (Jason) <Jason.Birch [REDACTED]>; White C (Craig) <Craig.White [REDACTED]>  
**Cc:** Carson C (Catherine) <Catherine.Carson [REDACTED]> Sharp G (Gary) <Gary.Sharp [REDACTED]>  
**Subject:** FW: URGENT - Submission on aspergillus in the QEUH - Response from [REDACTED] - draft reply - this by lunchtime please  
**Importance:** High

Good morning Gillian,  
 Lara and her team are leading on this story and have provided lines and a separate briefing to FM on this, for Duty of Candour I have **added Craig** here who can also advise.

Happy to be kept copied in as I will need to add anything new on this case to the FMQ brief for the QEUH which I am currently coordinating, **Lara** grateful if you could please alert me when updated lines to be included in the FMQ brief are ready.

Many thanks  
 Carole

**Carole Campariol-Scott**

**Response Team Manager, Scottish Hospitals Public Inquiry SG Response Team I Chief Nursing Officer Directorate**

Area 2-ER | St Andrews House | Edinburgh | EH1 3DG | [REDACTED]  
 4 [REDACTED] | Email: [Carole.Campariol-Scott \[REDACTED\]](mailto:Carole.Campariol-Scott [REDACTED])

**Working days: Mondays, Tuesdays am (alternative Tuesdays pm), Wednesdays and Fridays.**

**From:** Overton G (Gillian) <[Gillian.Overton \[REDACTED\]](mailto:Gillian.Overton [REDACTED])>  
**Sent:** 30 November 2021 10:29  
**To:** Campariol-Scott C (Carole) <[Carole.Campariol-Scott \[REDACTED\]](mailto:Carole.Campariol-Scott [REDACTED])>  
**Cc:** Carson C (Catherine) <[Catherine.Carson \[REDACTED\]](mailto:Catherine.Carson [REDACTED])>  
**Subject:** URGENT - Submission on aspergillus in the QEUH - Response from [REDACTED] - draft reply - this by lunchtime please

Hi Carole

I think you will be aware that [REDACTED] has written to FM about the [REDACTED] [REDACTED] received at QEUH – see attached. She has asked that GG& C is held accountable for its actions. Would you be able to provide some lines on this in terms of the Public Inquiry? A very rough first draft of a reply is below and I have included below some info I got from Louise Kay about Duty of Candour but I don't think that it will be enough. With apologies for the short timescale could I get something by lunchtime please?

**Draft Reply to [REDACTED]**

Dear [REDACTED],

Thank you for your email of 25 November setting out the action you would like to be taken at Queen Elizabeth University Hospital (QEUH).

With regard to your request that NHS GG&C is held accountable for its actions. I recognise that if things go wrong during the provision of treatment or care, openness and transparency is essential. NHS Boards have a statutory

responsibility under the organisational Duty of Candour regulations to provide that transparency. Fundamental to that is personal contact and engagement with those affected, such as yourself, even if a review is ongoing and even if definitive answers cannot be provided. That is why we have asked NHS GG&C to ensure that you have a named person that you can contact when you are ready and able to do so. I expect the Board to use their engagement with you and others affected to learn and to improve their services.

With regard to your suggestion that haemo-oncology paediatric and adult patients currently being treated at the QEUH should be transferred to Edinburgh Sick Childrens Hospital and Beatson West of Scotland Cancer Centre. I can understand fully your reasons for asking for this to be done, however this is a decision for NHS GG&C. I can reassure you that we are testing more patients in hospital for COVID-19 enabling us to identify more asymptomatic positive cases. This ensures that we can provide the right care and treatment for patients whilst utilising enhanced infection prevention and control measures to reduce the opportunity for further transmission. I know we cannot be complacent and we must continue to ensure that all infection prevention precautions are strictly adhered to. We have been working with health boards, including NHS GG&C to manage and reduce the number of hospital-onset cases of COVID-19 and the implement robust Infection Prevention and Control (IPC) measures.

As outlined in my letter to you of [REDACTED] November, we will keep you updated as the reviews of care at QEUH proceed. [If you would find it helpful, the Scottish Mediation Network may provide a route for you to discuss these matters with the Board, using an independent source. [DN – not sure about including this line as it might be a bit patronising – see what others think ]

Once again, please accept my sincere condolences to you and your family on the loss of [REDACTED]. I appreciate that this is a very difficult time for you all and my thoughts are with you all.

**Best wishes**

*Gillian*

Gillian Overton (She/Her) | Ministerial Correspondence Team | Chief Nursing Officer Directorate | The Scottish Government | 2ER | St Andrews House | Regent Road | Edinburgh | EH1 3DG

I am working from home at [gillian.overton](mailto:gillian.overton) [REDACTED]

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**From:** Carson C (Catherine) <[Catherine.Carson](mailto:Catherine.Carson)> [REDACTED]

**Sent:** 30 November 2021 08:30

**To:** Overton G (Gillian) <[Gillian.Overton](mailto:Gillian.Overton)> [REDACTED]

**Subject:** FW: Submission on aspergillus in the QEUH - Response from [REDACTED]

FYI

**Catherine Carson**

**Business Support Team Leader | Chief Nursing Officer's Directorate |**

**Scottish Government | Telephone [REDACTED]**

**<mailto:Catherine.Carson> [REDACTED]**

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**From:** Carson C (Catherine)

**Sent:** 29 November 2021 16:40

**To:** Kay L (Louise) <[Louise.Kay](mailto:Louise.Kay)> [REDACTED]; Roberts A (Anncris) <[Anncris.Roberts](mailto:Anncris.Roberts)> [REDACTED]

**Subject:** FW: Submission on aspergillus in the QEUH - Response from [REDACTED]

Good afternoon Louise, Anncris,

Linda Pollock suggested I contact you both for some input to a response needed for the FM.

Earlier today the FM received an email from [REDACTED] and I have attached to this email, CNO has suggested that we need a wider clinical response. The case has been assigned to me on Micasa for control and to ensure we have all the contributions before a final reply is sent.

Grateful if you could provide me with some lines for inclusion in respect to your policy areas.

You will be aware that there has been lots of media and political interest around this today and it is likely to be raised at FM question time this week, with that in mind could I have your contributions as soon as possible.

Please get in touch if you need any further information.

**Catherine Carson**

**Business Support Team Leader | Chief Nursing Officer's Directorate|**

**Scottish Government | Telephone [REDACTED]**

**<mailto:Catherine.Carson>** [REDACTED]

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**From:** McMahon A (Alex) <[Alex.McMahon](mailto:Alex.McMahon)> [REDACTED]

**Sent:** 26 November 2021 07:56

**To:** Lamb C (Caroline) <[Caroline.Lamb](mailto:Caroline.Lamb)> [REDACTED]; Chief Medical Officer <[CMO](mailto:CMO)> [REDACTED]  
Smith G (Gregor) <[Gregor.Smith](mailto:Gregor.Smith)> [REDACTED]; Leitch J (Jason) <[Jason.Leitch](mailto:Jason.Leitch)> [REDACTED]; Burns J (John) <[John.Burns](mailto:John.Burns)> [REDACTED]; Ellis G (Graham) <[Graham.Ellis](mailto:Graham.Ellis)> [REDACTED]; DG Health & Social Care <[DGHSC](mailto:DGHSC)> [REDACTED]

**Cc:** Ward C (Christine) <[Christine.Ward](mailto:Christine.Ward)> [REDACTED]; Birch J (Jason) <[Jason.Birch](mailto:Jason.Birch)> [REDACTED]; Barkby I (Irene) <[Irene.Barkby](mailto:Irene.Barkby)> [REDACTED]; Shepherd L (Lesley) <[Lesley.Shepherd](mailto:Lesley.Shepherd)> [REDACTED]; Ross E (Elaine) <[Elaine.Ross](mailto:Elaine.Ross)> [REDACTED]; Allan L (Lara) <[Lara.Allan](mailto:Lara.Allan)> [REDACTED]; Chief Nursing Officer <[CNO](mailto:CNO)> [REDACTED]

**Subject:** FW: Submission on aspergillus in the QEUH - Response from [REDACTED]

Colleagues

This response from [REDACTED] to the First Minister, I think requires wider clinical and performance thought before we reply. I also think that there is a need for engagement with the Cabinet Secretary and SPADs potentially to before we reply. But I would welcome thoughts on how to handle this, this morning, although I appreciate many colleagues are on leave today but I do think there would be merit in a meeting to discuss how we frame the advice that goes back.

Welcome thoughts.

Alex

Professor Alex McMahon  
Interim Chief Nursing Officer  
Scottish Government  
St Andrews House  
Edinburgh  
EH1 3DG

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**From:** Dow L (Lynne) <[Lynne.Dow](mailto:Lynne.Dow)> [REDACTED] **On Behalf Of** First Minister

**Sent:** 25 November 2021 22:31

**To:** Kay L (Louise) <[Louise.Kay](mailto:Louise.Kay)> [REDACTED]; Birch J (Jason) <[Jason.Birch](mailto:Jason.Birch)> [REDACTED]; Hutchison D (David) (Special Adviser) <[David.Hutchison](mailto:David.Hutchison)> [REDACTED]

**Cc:** White C (Craig) <[Craig.White](mailto:Craig.White)> [REDACTED]; McMahon A (Alex) <[Alex.McMahon](mailto:Alex.McMahon)> [REDACTED]; Allan L (Lara) <[Lara.Allan](mailto:Lara.Allan)> [REDACTED]; McKerron R (Rosie) <[Rosie.McKerron](mailto:Rosie.McKerron)> [REDACTED]; Fallis R (Russell) <[Russell.Fallis](mailto:Russell.Fallis)> [REDACTED]; First Minister <[firstminister](mailto:firstminister)> [REDACTED]; Chief Nursing Officer <[CNO](mailto:CNO)> [REDACTED]; Cabinet Secretary for Health and Social Care <[CabSecHSC](mailto:CabSecHSC)> [REDACTED]; Minister for Public Health, Women's Health & Sport <[MinisterPHWHS](mailto:MinisterPHWHS)> [REDACTED]; Minister for

Mental Wellbeing & Social Care <[MinisterMWSC](#)>; FM Policy Team Mailbox <[fmpolicyteam](#)>; DG Health & Social Care <[DGHSC](#)>; Smith G (Gregor) <[Gregor.Smith](#)> Chief Medical Officer <[CMO](#)> Leitch J (Jason) <[Jason.Leitch](#)> Bain MB (Marion) <[Marion.Bain](#)> Armstrong A (Anne) (Health) <[Anne.Armstrong](#)>; Burns J (John) <[John.Burns](#)>; Barkby I (Irene) <[Irene.Barkby](#)>; Ward C (Christine) <[Christine.Ward](#)>; Ross E (Elaine) <[Elaine.Ross](#)> Hamilton E (Emma) <[Emma.Hamilton](#)> Shepherd L (Lesley) <[Lesley.Shepherd](#)>; Taylor M (Mark) <[Mark.Taylor](#)>; Aitken L (Louise) <[Louise.Aitken](#)>; Paterson M (Matt) <[Matt.Paterson](#)>; Powell L (Lisa) <[Lisa.Powell](#)>; Kerbalai S (Syed) <[Syed.Kerbalai](#)>; McPherson G (Grant) <[Grant.McPherson](#)>; Wilson L (Lee-Ann) <[Lee-ann.Wilson](#)> Graves-Morris C (Charlotte) <[Charlotte.Graves-morris](#)> Nurse M (Molly) <[Molly.Nurse](#)>; Communications Health & Social Care <[CommunicationsHealth&SocialCare](#)>; McAllister C (Colin) <[Colin.McAllister](#)> Gregg N (Naomi) <[Naomi.Gregg](#)> Raghavan S (Shalinay) <[Shalinay.Raghavan](#)> Campariol-Scott C (Carole) <[Carole.Campariol-Scott](#)>; Sharp G (Gary) <[Gary.Sharp](#)> Hegarty L (Lee) <[Lee.Hegarty](#)>; First Minister FMQs <[FirstMinisterFMQs](#)>; Chief Nursing Officer <[CNO](#)> Bain MB (Marion) <[Marion.Bain](#)>; Barkby I (Irene) <[Irene.Barkby](#)>; Shepherd L (Lesley) <[Lesley.Shepherd](#)>

**Subject:** RE: Submission on aspergillus in the QEUH - Response from <[REDACTED]>

All

We have received the attached response from <[REDACTED]> this evening following the First Minister's letter sent earlier today.

Grateful for advice in the morning as to how this should be taken forward.

I have made the First Minister aware.

Thanks

Lynne

Lynne Dow

Deputy Private Secretary

Private Office to the First Minister | 5th Floor| St Andrew's House | Regent Road | Edinburgh |EH1 3DG



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**From:** Kay L (Louise) <[Louise.Kay](#)>

**Sent:** 25 November 2021 10:32

**To:** Birch J (Jason) <[Jason.Birch](#)>; Hutchison D (David) (Special Adviser) <[David.Hutchison](#)>

**Cc:** White C (Craig) <[Craig.White](#)>; McMahon A (Alex) <[Alex.McMahon](#)>; Allan L (Lara) <[Lara.Allan](#)>; McKerron R (Rosie) <[Rosie.McKerron](#)>; Fallis R (Russell) <[Russell.Fallis](#)> First Minister <[firstminister](#)>; Chief Nursing Officer <[CNO](#)>; Cabinet Secretary for Health and Social Care <[CabSecHSC](#)>; Minister for Public Health, Women's Health & Sport <[MinisterPHWHS](#)>; Minister for Mental Wellbeing & Social Care <[MinisterMWSC](#)> FM Policy Team Mailbox



<[fmpolicyteam](#) [REDACTED] DG Health & Social Care <[DGHSC](#) [REDACTED]; Smith G (Gregor) <[Gregor.Smith](#) [REDACTED] Chief Medical Officer <[CMO](#) [REDACTED] Leitch J (Jason) <[Jason.Leitch](#) [REDACTED] Bain MB (Marion) <[Marion.Bain](#) [REDACTED] Armstrong A (Anne) (Health) <[Anne.Armstrong](#) [REDACTED] Burns J (John) <[John.Burns](#) [REDACTED] Barkby I (Irene) <[Irene.Barkby](#) [REDACTED] Ward C (Christine) <[Christine.Ward](#) [REDACTED] Ross E (Elaine) <[Elaine.Ross](#) [REDACTED]; Hamilton E (Emma) <[Emma.Hamilton](#) [REDACTED]; Shepherd L (Lesley) <[Lesley.Shepherd](#) [REDACTED] Taylor M (Mark) <[Mark.Taylor](#) [REDACTED]; Aitken L (Louise) <[Louise.Aitken](#) [REDACTED]; Paterson M (Matt) <[Matt.Paterson](#) [REDACTED] Powell L (Lisa) <[Lisa.Powell](#) [REDACTED] Kerbalai S (Syed) <[Syed.Kerbalai](#) [REDACTED]; McPherson G (Grant) <[Grant.McPherson](#) [REDACTED]; Wilson L (Lee-Ann) <[Lee-ann.Wilson](#) [REDACTED]; Graves-Morris C (Charlotte) <[Charlotte.Graves-morris](#) [REDACTED]; Nurse M (Molly) <[Molly.Nurse](#) [REDACTED]; Communications Health & Social Care <[CommunicationsHealth&SocialCare](#) [REDACTED] McAllister C (Colin) <[Colin.McAllister](#) [REDACTED]; Gregg N (Naomi) <[Naomi.Gregg](#) [REDACTED] Raghavan S (Shalinay) <[Shalinay.Raghavan](#) [REDACTED]; Campariol-Scott C (Carole) <[Carole.Campariol-Scott](#) [REDACTED] Sharp G (Gary) <[Gary.Sharp](#) [REDACTED] Hegarty L (Lee) <[Lee.Hegarty](#) [REDACTED] First Minister FMQs <[FirstMinisterFMQs](#) [REDACTED]; Chief Nursing Officer <[CNO](#) [REDACTED]; Bain MB (Marion) <[Marion.Bain](#) [REDACTED] Barkby I (Irene) <[Irene.Barkby](#) [REDACTED]; Shepherd L (Lesley) <[Lesley.Shepherd](#) [REDACTED]

**Subject:** RE: Submission on aspergillus in the QEUH

**Davie, as discussed, further tweak on HIS. If you are happy with this we will include in the letter and FMQ**

**In addition, we have tasked Healthcare Improvement Scotland (HIS) to assess and determine if there are any broader concerns in the Queen Elizabeth University Hospital requiring action based on their review of data on aspergillus.**

Louise Kay




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**From:** Birch J (Jason) <[Jason.Birch](#) [REDACTED]  
**Sent:** Thursday, 25 November 2021 10:20  
**To:** Hutchison D (David) (Special Adviser) <[David.Hutchison](#) [REDACTED]  
**Cc:** White C (Craig) <[Craig.White](#) [REDACTED]; McMahon A (Alex) <[Alex.McMahon](#) [REDACTED] Allan L (Lara) <[Lara.Allan](#) [REDACTED]; McKerron R (Rosie) <[Rosie.McKerron](#) [REDACTED]; Birch J (Jason) <[Jason.Birch](#) [REDACTED]; Fallis R (Russell) <[Russell.Fallis](#) [REDACTED]; First Minister <[firstminister](#) [REDACTED] Chief Nursing Officer <[CNO](#) [REDACTED]; Cabinet Secretary for Health and Social Care <[CabSecHSC](#) [REDACTED] Minister for Public Health, Women's Health & Sport <[MinisterPHWHS](#) [REDACTED]; Minister for Mental Wellbeing & Social Care <[MinisterMWSOC](#) [REDACTED]; FM Policy Team Mailbox <[fmpolicyteam](#) [REDACTED]; DG Health & Social Care <[DGHSC](#) [REDACTED]; Smith G (Gregor) <[Gregor.Smith](#) [REDACTED]; Chief Medical Officer <[CMO](#) [REDACTED] Leitch J (Jason) <[Jason.Leitch](#) [REDACTED] Bain MB (Marion) <[Marion.Bain](#) [REDACTED] Armstrong A (Anne) (Health) <[Anne.Armstrong](#) [REDACTED]; Burns J (John) <[John.Burns](#) [REDACTED] Barkby I (Irene) <[Irene.Barkby](#) [REDACTED]; Ward C (Christine) <[Christine.Ward](#) [REDACTED] Ross E (Elaine) <[Elaine.Ross](#) [REDACTED]; Hamilton E (Emma) <[Emma.Hamilton](#) [REDACTED] Shepherd L (Lesley) <[Lesley.Shepherd](#) [REDACTED]; Taylor M (Mark) <[Mark.Taylor](#) [REDACTED] Aitken L (Louise) <[Louise.Aitken](#) [REDACTED]; Paterson M (Matt) <[Matt.Paterson](#) [REDACTED]; Powell L (Lisa) <[Lisa.Powell](#) [REDACTED]; Kerbalai S (Syed) <[Syed.Kerbalai](#) [REDACTED]; McPherson G (Grant) <[Grant.McPherson](#) [REDACTED]; Wilson L (Lee-Ann) <[Lee-ann.Wilson](#) [REDACTED] Graves-Morris C (Charlotte) <[Charlotte.Graves-morris](#) [REDACTED] Nurse M (Molly) <[Molly.Nurse](#) [REDACTED]; Communications Health & Social Care <[CommunicationsHealth&SocialCare](#) [REDACTED] McAllister C (Colin) <[Colin.McAllister](#) [REDACTED]; Kay L (Louise) <[Louise.Kay](#) [REDACTED]; Gregg N (Naomi)

<Naomi.Gregg [REDACTED]>; Raghavan S (Shalinay) <Shalinay.Raghavar [REDACTED]>; Campariol-Scott C (Carole) <Carole.Campariol-Scott [REDACTED]>; Sharp G (Gary) <Gary.Sharp [REDACTED]>; Hegarty L (Lee) <Lee.Hegarty [REDACTED]>; First Minister FMQs <FirstMinisterFMQs [REDACTED]>; Chief Nursing Officer <CNO [REDACTED]>; Bain MB (Marion) <Marion.Bain [REDACTED]>; Barkby I (Irene) <Irene.Barkby [REDACTED]>; Shepherd L (Lesley) <Lesley.Shepherd [REDACTED]>

**Subject:** FW: Submission on aspergillus in the QEUH

Thanks – slight tweak.

Jason

**Jason Birch** | Unit Head | Directorate for Chief Nursing Officer | Scottish Government | St Andrew's House | Regent Road | Edinburgh | EH1 3DG | [REDACTED]

**From:** Hutchison D (David) (Special Adviser) <David.Hutchison [REDACTED]>

**Sent:** 25 November 2021 10:14

**To:** White C (Craig) <Craig.White [REDACTED]>; McMahon A (Alex) <Alex.McMahon [REDACTED]>; Allan L (Lara) <Lara.Allan [REDACTED]>; McKerron R (Rosie) <Rosie.McKerron [REDACTED]>; Birch J (Jason) <Jason.Birch [REDACTED]>; Fallis R (Russell) <Russell.Fallis [REDACTED]>; First Minister <firstminister [REDACTED]>; Chief Nursing Officer <CNO [REDACTED]>; Cabinet Secretary for Health and Social Care <CabSecHSC [REDACTED]>; Minister for Public Health, Women's Health & Sport <MinisterPHWHS [REDACTED]>; Minister for Mental Wellbeing & Social Care <MinisterMWSC [REDACTED]>

**Cc:** FM Policy Team Mailbox <fmpolicyteam [REDACTED]>; DG Health & Social Care <DGHSC [REDACTED]>; Smith G (Gregor) <Gregor.Smith [REDACTED]>; Chief Medical Officer <CMO [REDACTED]>; Leitch J (Jason) <Jason.Leitch [REDACTED]>; Bain MB (Marion) <Marion.Bain [REDACTED]>; Armstrong A (Anne) (Health) <Anne.Armstrong [REDACTED]>; Burns J (John) <John.Burns [REDACTED]>; Barkby I (Irene) <Irene.Barkby [REDACTED]>; Ward C (Christine) <Christine.Ward [REDACTED]>; Ross E (Elaine) <Elaine.Ross [REDACTED]>; Hamilton E (Emma) <Emma.Hamilton [REDACTED]>; Shepherd L (Lesley) <Lesley.Shepherd [REDACTED]>; Taylor M (Mark) <Mark.Taylor [REDACTED]>; Aitken L (Louise) <Louise.Aitken [REDACTED]>; Paterson M (Matt) <Matt.Paterson [REDACTED]>; Powell L (Lisa) <Lisa.Powel [REDACTED]>; Kerbalai S (Syed) <Syed.Kerbalai [REDACTED]>; McPherson G (Grant) <Grant.McPherson [REDACTED]>; Wilson L (Lee-Ann) <Lee-ann.Wilson [REDACTED]>; Graves-Morris C (Charlotte) <Charlotte [REDACTED]>; [REDACTED] Nurse M (Molly) <Molly.Nurse [REDACTED]>; Communications Health & Social Care <CommunicationsHealth&SocialCare@[REDACTED]>; McAllister C (Colin) <Colin.McAllister [REDACTED]>; Kay L (Louise) <Louise.Kay [REDACTED]>; Gregg N (Naomi) <Naomi.Gregg [REDACTED]>; Raghavan S (Shalinay) <Shalinay.Raghavar [REDACTED]>; Campariol-Scott C (Carole) <Carole.Campariol-Scott [REDACTED]>; Sharp G (Gary) <Gary.Sharp [REDACTED]>; Hegarty L (Lee) <Lee.Hegarty [REDACTED]>; First Minister FMQs <FirstMinisterFMQs [REDACTED]>; Chief Nursing Officer <CNO [REDACTED]>; Bain MB (Marion) <Marion.Bain [REDACTED]>; Barkby I (Irene) <Irene.Barkby [REDACTED]>; Shepherd L (Lesley) <Lesley.Shepherd@[REDACTED]>

**Subject:** RE: Submission on aspergillus in the QEUH

Revised letter. We'll need to get this to FM within next 10 minutes so if there are any substantive changes needed pleas let us know.

Dear [REDACTED]

I cannot begin to imagine the grief that you and your family have endured in the last year since [REDACTED] death. While I know there are not words I can express that can help ease that pain, I hope you know that you have my heartfelt condolences.

[REDACTED] and I can't tell you how much we miss him.

I want to set out some of the actions we have instructed to try and get the

questions you have answered.

Our Interim Chief Nursing Officer, Professor Alex McMahon, has commissioned the Medical Director of NHS Lothian to provide an external review of [REDACTED] care and treatment and the communication of his care with your family. This is distinct from any internal process being carried out by NHS Greater Glasgow and Clyde. Both the external and internal case note review will be reported directly to professor McMahon and will, of course, be shared with you..

In addition, we have tasked Healthcare Improvement Scotland (HIS) to use data on aspergillus in the Queen Elizabeth University Hospital to assess and determine if there are any broader concerns requiring action.

We will of course keep you updated as these reviews proceed and I understand that Professor McMahon has asked NHS Lothian to undertake their part of the review as a matter of urgency. Should you have any further questions, please do not hesitate to get in touch.

I know that none of the steps outlined above will, of themselves, immediately resolve the issues you have raised - but I hope and believe that the action that will flow from this work can make a difference.

---

**From:** White C (Craig) <[Craig.White@nhs.uk](mailto:Craig.White@nhs.uk)>

**Sent:** 25 November 2021 10:03

**To:** McMahon A (Alex) <[Alex.McMahon@nhs.uk](mailto:Alex.McMahon@nhs.uk)>; Allan L (Lara) <[Lara.Allan@nhs.uk](mailto:Lara.Allan@nhs.uk)>; McKerron R (Rosie) <[Rosie.McKerron@nhs.uk](mailto:Rosie.McKerron@nhs.uk)>; Birch J (Jason) <[Jason.Birch@nhs.uk](mailto:Jason.Birch@nhs.uk)>; Fallis R (Russell) <[Russell.Fallis@nhs.uk](mailto:Russell.Fallis@nhs.uk)>; First Minister <[firstminister@nhs.uk](mailto:firstminister@nhs.uk)>; Chief Nursing Officer <[CNO@nhs.uk](mailto:CNO@nhs.uk)>; Cabinet Secretary for Health and Social Care <[CabSecHSC@nhs.uk](mailto:CabSecHSC@nhs.uk)>; Minister for Public Health, Women's Health & Sport <[MinisterPHWHS@nhs.uk](mailto:MinisterPHWHS@nhs.uk)>; Minister for Mental Wellbeing & Social Care <[MinisterMWSC@nhs.uk](mailto:MinisterMWSC@nhs.uk)>

**Cc:** FM Policy Team Mailbox <[fmpolicyteam@nhs.uk](mailto:fmpolicyteam@nhs.uk)>; DG Health & Social Care <[DGHSC@nhs.uk](mailto:DGHSC@nhs.uk)>; Smith G (Gregor) <[Gregor.Smith@nhs.uk](mailto:Gregor.Smith@nhs.uk)>; Chief Medical Officer <[CMO@nhs.uk](mailto:CMO@nhs.uk)>; Leitch J (Jason) <[Jason.Leitch@nhs.uk](mailto:Jason.Leitch@nhs.uk)>; Bain MB (Marion) <[Marion.Bain@nhs.uk](mailto:Marion.Bain@nhs.uk)>; Armstrong A (Anne) (Health) <[Anne.Armstrong@nhs.uk](mailto:Anne.Armstrong@nhs.uk)>; Burns J (John) <[John.Burns@nhs.uk](mailto:John.Burns@nhs.uk)>; Barkby I (Irene) <[Irene.Barkby@nhs.uk](mailto:Irene.Barkby@nhs.uk)>; Ward C (Christine) <[Christine.Ward@nhs.uk](mailto:Christine.Ward@nhs.uk)>; Ross E (Elaine) <[Elaine@nhs.uk](mailto:Elaine@nhs.uk)>; Hutchison D (David) (Special Adviser) <[David.Hutchison@nhs.uk](mailto:David.Hutchison@nhs.uk)>; Hamilton E (Emma) <[Emma.Hamilton@nhs.uk](mailto:Emma.Hamilton@nhs.uk)>; Shepherd L (Lesley) <[Lesley.Shepherd@nhs.uk](mailto:Lesley.Shepherd@nhs.uk)>; Taylor M (Mark) <[Mark.Taylor@nhs.uk](mailto:Mark.Taylor@nhs.uk)>; Aitken L (Louise) <[Louise.Aitken@nhs.uk](mailto:Louise.Aitken@nhs.uk)>; Paterson M (Matt) <[Matt.Paterson@nhs.uk](mailto:Matt.Paterson@nhs.uk)>; Powell L (Lisa) <[Lisa.Powell@nhs.uk](mailto:Lisa.Powell@nhs.uk)>; Kerbalai S (Syed) <[Syed.Kerbalai@nhs.uk](mailto:Syed.Kerbalai@nhs.uk)>; McPherson G (Grant) <[Grant.McPherson@nhs.uk](mailto:Grant.McPherson@nhs.uk)>; Wilson L (Lee-Ann) <[Lee-ann.Wilson@nhs.uk](mailto:Lee-ann.Wilson@nhs.uk)>; Graves-Morris C (Charlotte) <[Charlotte.Graves-morris@nhs.uk](mailto:Charlotte.Graves-morris@nhs.uk)>; Nurse M (Molly) <[Molly.Nurse@nhs.uk](mailto:Molly.Nurse@nhs.uk)>; Communications Health & Social Care <[CommunicationsHealth&SocialCare@nhs.uk](mailto:CommunicationsHealth&SocialCare@nhs.uk)>; McAllister C (Colin) <[Colin.McAllister@nhs.uk](mailto:Colin.McAllister@nhs.uk)>; Kay L (Louise) <[Louise.Kay@nhs.uk](mailto:Louise.Kay@nhs.uk)>; Gregg N (Naomi) <[Naomi.Gregg@nhs.uk](mailto:Naomi.Gregg@nhs.uk)>; Raghavan S (Shalinay) <[Shalinay.Raghavan@nhs.uk](mailto:Shalinay.Raghavan@nhs.uk)>; Campariol-Scott C (Carole) <[Carole.Campariol-Scott@nhs.uk](mailto:Carole.Campariol-Scott@nhs.uk)>; Sharp G (Gary) <[Gary.Sharp@nhs.uk](mailto:Gary.Sharp@nhs.uk)>; Hegarty L (Lee) <[Lee.Hegarty@nhs.uk](mailto:Lee.Hegarty@nhs.uk)>; First Minister FMQs <[FirstMinisterFMQs@nhs.uk](mailto:FirstMinisterFMQs@nhs.uk)>; Chief Nursing Officer <[CNO@nhs.uk](mailto:CNO@nhs.uk)>; Bain MB (Marion) <[Marion.Bain@nhs.uk](mailto:Marion.Bain@nhs.uk)>; Barkby I (Irene) <[Irene.Barkby@nhs.uk](mailto:Irene.Barkby@nhs.uk)>; Shepherd L (Lesley) <[Lesley.Shepherd@nhs.uk](mailto:Lesley.Shepherd@nhs.uk)>

**Subject:** RE: Submission on aspergillus in the QEUH

Thanks Alex, it was the draft FM letter I was commenting on. I noted Mags' engagement and the proposal re the mediation network, it was the former I thought might be helpful to refer to in

the FM's letter though given they have now spoken by telephone that's probably not essential to include.

Best wishes,

Craig

Professor Craig White

Deputy Director

DG Health and Social Care | Scottish Government | M: [REDACTED]

|Twitter: [REDACTED]



**From:** McMahon A (Alex) <[Alex.McMahon](mailto:Alex.McMahon)> [REDACTED]

**Sent:** 25 November 2021 09:59

**To:** White C (Craig) <[Craig.White](mailto:Craig.White)> [REDACTED]; Allan L (Lara) <[Lara.Allan](mailto:Lara.Allan)> [REDACTED]; McKerron R (Rosie) <[Rosie.McKerron](mailto:Rosie.McKerron)> [REDACTED]; Birch J (Jason) <[Jason.Birch](mailto:Jason.Birch)> [REDACTED] Fallis R (Russell) <[Russell.Fallis](mailto:Russell.Fallis)> [REDACTED] First Minister <[firstminister](mailto:firstminister)> [REDACTED]; Chief Nursing Officer <[CNO](mailto:CNO)> [REDACTED]; Cabinet Secretary for Health and Social Care <[CabSecHSC](mailto:CabSecHSC)> [REDACTED] Minister for Public Health, Women's Health & Sport <[MinisterPHWHS](mailto:MinisterPHWHS)> [REDACTED] Minister for Mental Wellbeing & Social Care <[MinisterMWSC](mailto:MinisterMWSC)> [REDACTED]

**Cc:** FM Policy Team Mailbox <[fmpolicyteam](mailto:fmpolicyteam)> [REDACTED]; DG Health & Social Care <[DGHSC](mailto:DGHSC)> [REDACTED]; Smith G (Gregor) <[Gregor.Smith](mailto:Gregor.Smith)> [REDACTED] Chief Medical Officer <[CMO](mailto:CMO)> [REDACTED] Leitch J (Jason) <[Jason.Leitch](mailto:Jason.Leitch)> [REDACTED]; Bain MB (Marion) <[Marion.Bain](mailto:Marion.Bain)> [REDACTED]; Armstrong A (Anne) (Health) <[Anne.Armstrong](mailto:Anne.Armstrong)> [REDACTED] Burns J (John) <[John.Burns](mailto:John.Burns)> [REDACTED]; Barkby I (Irene) <[Irene.Barkby](mailto:Irene.Barkby)> [REDACTED]; Ward C (Christine) <[Christine.Ward](mailto:Christine.Ward)> [REDACTED]; Ross E (Elaine) <[Elaine.Ross](mailto:Elaine.Ross)> [REDACTED]; Hutchison D (David) (Special Adviser) <[David.Hutchison](mailto:David.Hutchison)> [REDACTED]; Hamilton E (Emma) <[Emma.Hamilton](mailto:Emma.Hamilton)> [REDACTED] Shepherd L (Lesley) <[Lesley.Shepherd](mailto:Lesley.Shepherd)> [REDACTED] Taylor M (Mark) <[Mark.Taylor](mailto:Mark.Taylor)> [REDACTED]; Aitken L (Louise) <[Louise.Aitken](mailto:Louise.Aitken)> [REDACTED]; Paterson M (Matt) <[Matt.Paterson](mailto:Matt.Paterson)> [REDACTED]; Powell L (Lisa) <[Lisa.Powell](mailto:Lisa.Powell)> [REDACTED]; Kerbalai S (Syed) <[Syed.Kerbalai](mailto:Syed.Kerbalai)> [REDACTED]; McPherson G (Grant) <[Grant.McPherson](mailto:Grant.McPherson)> [REDACTED]; Wilson L (Lee-Ann) <[Lee-ann.Wilson](mailto:Lee-ann.Wilson)> [REDACTED]; Graves-Morris C (Charlotte) <[Charlotte.Graves-morris](mailto:Charlotte.Graves-morris)> [REDACTED]; Nurse M (Molly) <[Molly.Nurse](mailto:Molly.Nurse)> [REDACTED]; Communications Health & Social Care <[CommunicationsHealth&SocialCare](mailto:CommunicationsHealth&SocialCare)> [REDACTED]; McAllister C (Colin) <[Colin.McAllister](mailto:Colin.McAllister)> [REDACTED]; Kay L (Louise) <[Louise.Kay](mailto:Louise.Kay)> [REDACTED]; Gregg N (Naomi) <[Naomi.Gregg](mailto:Naomi.Gregg)> [REDACTED]; Raghavan S (Shalinay) <[Shalinay.Raghavan](mailto:Shalinay.Raghavan)> [REDACTED]; Campariol-Scott C (Carole) <[Carole.Campariol-Scott](mailto:Carole.Campariol-Scott)> [REDACTED]; Sharp G (Gary) <[Gary.Sharp](mailto:Gary.Sharp)> [REDACTED]; Hegarty L (Lee) <[Lee.Hegarty](mailto:Lee.Hegarty)> [REDACTED]; First Minister FMQs <[FirstMinisterFMQs](mailto:FirstMinisterFMQs)> [REDACTED]; Chief Nursing Officer <[CNO](mailto:CNO)> [REDACTED]; Bain MB (Marion) <[Marion.Bain](mailto:Marion.Bain)> [REDACTED]; Barkby I (Irene) <[Irene.Barkby](mailto:Irene.Barkby)> [REDACTED]; Shepherd L (Lesley) <[Lesley.Shepherd](mailto:Lesley.Shepherd)> [REDACTED]

**Subject:** RE: Submission on aspergillus in the QEUH

Margaret McGuire has written to [REDACTED] and offer to meet with [REDACTED], and that was followed up with a contact yesterday by phone. [REDACTED] has stated that [REDACTED] wished to take some time to consider the offer of meeting. We should respect. We have also written to Jane Grant to say that when she does reach out to make contact the use of the Scottish Mediation Network might be very helpful for both parties. The FM is also writing to [REDACTED].

Thanks

Alex

Professor Alex McMahon

Interim Chief Nursing Officer  
 Scottish Government  
 St Andrews House  
 Edinburgh  
 EH1 3DG

**From:** White C (Craig) <[Craig.White](mailto:Craig.White)>

**Sent:** 25 November 2021 09:54

**To:** Allan L (Lara) <[Lara.Allan](mailto:Lara.Allan)>; McKerron R (Rosie) <[Rosie.McKerron](mailto:Rosie.McKerron)>; Birch J (Jason) <[Jason.Birch](mailto:Jason.Birch)>; Fallis R (Russell) <[Russell.Fallis](mailto:Russell.Fallis)>; First Minister <[firstminister](mailto:firstminister)>; Chief Nursing Officer <[CNO](mailto:CNO)>; Cabinet Secretary for Health and Social Care <[CabSecHSC](mailto:CabSecHSC)>; Minister for Public Health, Women's Health & Sport <[MinisterPHWS](mailto:MinisterPHWS)>; Minister for Mental Wellbeing & Social Care <[MinisterMWSC](mailto:MinisterMWSC)>

**Cc:** FM Policy Team Mailbox <[fmpolicyteam](mailto:fmpolicyteam)>; DG Health & Social Care <[DGHSC](mailto:DGHSC)>; McMahon A (Alex) <[Alex.McMahon](mailto:Alex.McMahon)>; Smith G (Gregor) <[Gregor.Smith](mailto:Gregor.Smith)>; Chief Medical Officer <[CMO](mailto:CMO)>; Leitch J (Jason) <[Jason.Leitch](mailto:Jason.Leitch)>; Bain MB (Marion) <[Marion.Bain](mailto:Marion.Bain)>; Armstrong A (Anne) (Health) <[Anne.Armstrong](mailto:Anne.Armstrong)>; Burns J (John) <[John.Burns](mailto:John.Burns)>; Barkby I (Irene) <[Irene.Barkby](mailto:Irene.Barkby)>; Ward C (Christine) <[Christine.Ward](mailto:Christine.Ward)>; Ross E (Elaine) <[Elaine.Ross](mailto:Elaine.Ross)>; Hutchison D (David) (Special Adviser) <[David.Hutchison](mailto:David.Hutchison)>; Hamilton E (Emma) <[Emma.Hamilton](mailto:Emma.Hamilton)>; Shepherd L (Lesley) <[Lesley.Shepherd](mailto:Lesley.Shepherd)>; Taylor M (Mark) <[Mark.Taylor](mailto:Mark.Taylor)>; Aitken L (Louise) <[Louise.Aitken](mailto:Louise.Aitken)>; Paterson M (Matt) <[Matt.Paterson](mailto:Matt.Paterson)>; Powell L (Lisa) <[Lisa.Powell](mailto:Lisa.Powell)>; Kerbalai S (Syed) <[Syed](mailto:Syed)>; McPherson G (Grant) <[Grant.McPherson](mailto:Grant.McPherson)>; Wilson L (Lee-Ann) <[Lee-ann.Wilson](mailto:Lee-ann.Wilson)>; Graves-Morris C (Charlotte) <[Charlotte.Graves-morris](mailto:Charlotte.Graves-morris)>; Nurse M (Molly) <[Molly.Nurse](mailto:Molly.Nurse)>; Communications Health & Social Care <[CommunicationsHealth&SocialCare](mailto:CommunicationsHealth&SocialCare)>; McAllister C (Colin) <[Colin.McAllister](mailto:Colin.McAllister)>; Kay L (Louise) <[Louise.Kay](mailto:Louise.Kay)>; Gregg N (Naomi) <[Naomi.Gregg](mailto:Naomi.Gregg)>; Raghavan S (Shalinay) <[Shalinay.Raghavan](mailto:Shalinay.Raghavan)>; Campariol-Scott C (Carole) <[Carole.Campariol-Scott](mailto:Carole.Campariol-Scott)>; Sharp G (Gary) <[Gary.Sharp](mailto:Gary.Sharp)>; Hegarty L (Lee) <[Lee.Hegarty](mailto:Lee.Hegarty)>; First Minister FMQs <[FirstMinisterFMQs](mailto:FirstMinisterFMQs)>; Chief Nursing Officer <[CNO](mailto:CNO)>; Bain MB (Marion) <[Marion.Bain](mailto:Marion.Bain)>; Barkby I (Irene) <[Irene.Barkby](mailto:Irene.Barkby)>; Shepherd L (Lesley) <[Lesley.Shepherd](mailto:Lesley.Shepherd)>

**Subject:** RE: Submission on aspergillus in the QEUH

Morning Lara

Does [REDACTED] now have a dedicated point of contact at NHSGGC for ongoing support and communication? If so, should this be cross-referenced in this latter. As you know, this was one of the improvements that the Oversight Board Communication and Engagement Sub-Group encouraged NHSGGC to prioritise as part of their actions to deliver on the changes recommended by the Oversight Board.

Best wishes, .

Craig

Professor Craig White

Deputy Director

DG Health and Social Care | Scottish Government | [REDACTED]

|Twitter: [REDACTED]

**From:** Allan L (Lara) <[Lara.Allan](mailto:Lara.Allan)>

**Sent:** 25 November 2021 09:19

**To:** McKerron R (Rosie) <[Rosie.McKerron](mailto:Rosie.McKerron)>; Birch J (Jason) <[Jason.Birch](mailto:Jason.Birch)>; Fallis R (Russell) <[Russell.Fallis](mailto:Russell.Fallis)>; First Minister <[firstminister](mailto:firstminister)>; Chief Nursing Officer <[CNO](mailto:CNO)>; Cabinet Secretary for Health and Social Care <[CabSecHSC](mailto:CabSecHSC)>; Minister for Public Health, Women's Health & Sport <[MinisterPHWHS](mailto:MinisterPHWHS)>; Minister for Mental Wellbeing & Social Care <[MinisterMWSC](mailto:MinisterMWSC)>

**Cc:** FM Policy Team Mailbox <[fmpolicyteam](mailto:fmpolicyteam)>; DG Health & Social Care <[DGHSC](mailto:DGHSC)>; McMahon A (Alex) <[Alex.McMahon](mailto:Alex.McMahon)>; Smith G (Gregor) <[Gregor.Smith](mailto:Gregor.Smith)>; Chief Medical Officer <[CMO](mailto:CMO)>; Leitch J (Jason) <[Jason.Leitch](mailto:Jason.Leitch)>; Bain MB (Marion) <[Marion.Bain](mailto:Marion.Bain)>; Armstrong A (Anne) (Health) <[Anne.Armstrong](mailto:Anne.Armstrong)>; Burns J (John) <[John.Burns](mailto:John.Burns)>; Barkby I (Irene) <[Irene.Barkby](mailto:Irene.Barkby)>; Ward C (Christine) <[Christine.Ward](mailto:Christine.Ward)>; Ross E (Elaine) <[Elaine.Ross](mailto:Elaine.Ross)>; Hutchison D (David) (Special Adviser) <[David.Hutchison](mailto:David.Hutchison)>; Hamilton E (Emma) <[Emma.Hamilton](mailto:Emma.Hamilton)>; Shepherd L (Lesley) <[Lesley.Shepherd](mailto:Lesley.Shepherd)>; White C (Craig) <[Craig.White](mailto:Craig.White)>; Taylor M (Mark) <[Mark.Taylor](mailto:Mark.Taylor)>; Aitken L (Louise) <[Louise.Aitken](mailto:Louise.Aitken)>; Paterson M (Matt) <[Matt.Paterson](mailto:Matt.Paterson)>; Powell L (Lisa) <[Lisa.Powell](mailto:Lisa.Powell)>; Kerbalai S (Syed) <[Syed.Kerbalai](mailto:Syed.Kerbalai)>; McPherson G (Grant) <[Grant.McPherson](mailto:Grant.McPherson)>; Wilson L (Lee-Ann) <[Lee-ann.Wilson](mailto:Lee-ann.Wilson)>; Graves-Morris C (Charlotte) <[Charlotte.Graves-morris](mailto:Charlotte.Graves-morris)>; Nurse M (Molly) <[Molly.Nurse](mailto:Molly.Nurse)>; Communications Health & Social Care <[CommunicationsHealth&SocialCare](mailto:CommunicationsHealth&SocialCare)>; McAllister C (Colin) <[Colin.McAllister](mailto:Colin.McAllister)>; Kay L (Louise) <[Louise.Kay](mailto:Louise.Kay)>; Gregg N (Naomi) <[Naomi.Gregg](mailto:Naomi.Gregg)>; Raghavan S (Shalinay) <[Shalinay.Raghavan](mailto:Shalinay.Raghavan)>; Campariol-Scott C (Carole) <[Carole.Campariol-Scott](mailto:Carole.Campariol-Scott)>; Sharp G (Gary) <[Gary.Sharp](mailto:Gary.Sharp)>; Hegarty L (Lee) <[Lee.Hegarty](mailto:Lee.Hegarty)>; First Minister FMQs <[FirstMinisterFMQs](mailto:FirstMinisterFMQs)>; Chief Nursing Officer <[CNO](mailto:CNO)>; Bain MB (Marion) <[Marion.Bain](mailto:Marion.Bain)>; Barkby I (Irene) <[Irene.Barkby](mailto:Irene.Barkby)>; Shepherd L (Lesley) <[Lesley.Shepherd](mailto:Lesley.Shepherd)>

**Subject:** RE: Submission on aspergillus in the QEUH

Hi Rosie

Please see updated letter below.

\*\*

**Suggested draft letter from the First Minister to**

**Dear**

**I am writing to you to once more offer my heartfelt condolences on the loss of , at this especially difficult time in the lead up to the first anniversary of death.**

**I wanted to tell you that NHS Greater Glasgow & Clyde are in the process of undertaking an internal review of care and treatment and their communications through a case note review. The outcome of this review will be reported to the Interim Chief Nursing Officer, Professor Alex McMahon. Professor McMahon has also commissioned a process of external assurance in relation to care and treatment and how the details were communicated to you. This independent external peer review will be led by NHS Lothian's Medical Director and will provide further reporting**

directly to Professor McMahon.

I can also confirm that the Cabinet Secretary for Health and Sport has asked Healthcare Improvement Scotland (HIS) to carry out a review of aspergillus in the Queen Elizabeth University Hospital to determine if there are any broader concerns that can and should be addressed.

Following the outcomes of the independent expert review of [REDACTED] case and the work of HIS, these will help me assess if further external assessment of the wider infection prevention and control measures in place in NHS Greater Glasgow & Clyde are required.

I will of course keep you updated as these reviews proceed and I understand that Professor McMahon has asked NHS Lothian to undertake their part of the review as a matter of urgency. Should you have any further questions, please do not hesitate to get in touch.

Kind regards

Lara

**Lara Allan** | Team Lead | HAI Policy and Strategy Unit | Chief Nursing Officer's Directorate  
Scottish Government

Email: [lara.allan@nhs.uk](mailto:lara.allan@nhs.uk)

Tel: [REDACTED]

---

**From:** McKerron R (Rosie) <[Rosie.McKerron@nhs.uk](mailto:Rosie.McKerron@nhs.uk)>

**Sent:** 25 November 2021 08:48

**To:** Birch J (Jason) <[Jason.Birch@nhs.uk](mailto:Jason.Birch@nhs.uk)>; Fallis R (Russell) <[Russell.Fallis@nhs.uk](mailto:Russell.Fallis@nhs.uk)>; First Minister <[firstminister@nhs.uk](mailto:firstminister@nhs.uk)>; Chief Nursing Officer <[CNO@nhs.uk](mailto:CNO@nhs.uk)>; Cabinet Secretary for Health and Social Care <[CabSecHSC@nhs.uk](mailto:CabSecHSC@nhs.uk)>; Minister for Public Health, Women's Health & Sport <[MinisterPHWHS@nhs.uk](mailto:MinisterPHWHS@nhs.uk)>; Minister for Mental Wellbeing & Social Care <[MinisterMWSC@nhs.uk](mailto:MinisterMWSC@nhs.uk)>

**Cc:** FM Policy Team Mailbox <[fmpolicyteam@nhs.uk](mailto:fmpolicyteam@nhs.uk)>; DG Health & Social Care <[DGHSC@nhs.uk](mailto:DGHSC@nhs.uk)>; McMahon A (Alex) <[Alex.McMahon@nhs.uk](mailto:Alex.McMahon@nhs.uk)>; Smith G (Gregor) <[Gregor.Smith@nhs.uk](mailto:Gregor.Smith@nhs.uk)>; Chief Medical Officer <[CMO@nhs.uk](mailto:CMO@nhs.uk)>; Leitch J (Jason) <[Jason.Leitch@nhs.uk](mailto:Jason.Leitch@nhs.uk)>; Bain MB (Marion) <[Marion.Bain@nhs.uk](mailto:Marion.Bain@nhs.uk)>; Armstrong A (Anne) (Health) <[Anne.Armstrong@nhs.uk](mailto:Anne.Armstrong@nhs.uk)>; Burns J (John) <[John.Burns@nhs.uk](mailto:John.Burns@nhs.uk)>; Barkby I (Irene) <[Irene.Barkby@nhs.uk](mailto:Irene.Barkby@nhs.uk)>; Ward C (Christine) <[Christine.Ward@nhs.uk](mailto:Christine.Ward@nhs.uk)>; Ross E (Elaine) <[Elaine.Ross@nhs.uk](mailto:Elaine.Ross@nhs.uk)>; Allan L (Lara) <[Lara.Allan@nhs.uk](mailto:Lara.Allan@nhs.uk)>; Hutchison D (David) (Special Adviser) <[David.Hutchison@nhs.uk](mailto:David.Hutchison@nhs.uk)>; Hamilton E (Emma) <[Emma.Hamilton@nhs.uk](mailto:Emma.Hamilton@nhs.uk)>; Shepherd L (Lesley) <[Lesley.Shepherd@nhs.uk](mailto:Lesley.Shepherd@nhs.uk)>; White C (Craig) <[Craig.White@nhs.uk](mailto:Craig.White@nhs.uk)>; Taylor M (Mark) <[Mark.Taylor@nhs.uk](mailto:Mark.Taylor@nhs.uk)>; Aitken L (Louise) <[Louise.Aitken@nhs.uk](mailto:Louise.Aitken@nhs.uk)>; Paterson M (Matt) <[Matt.Paterson@nhs.uk](mailto:Matt.Paterson@nhs.uk)>; Powell L (Lisa) <[Lisa.Powell@nhs.uk](mailto:Lisa.Powell@nhs.uk)>; Kerbalai S (Syed) <[Syed.Kerbalai@nhs.uk](mailto:Syed.Kerbalai@nhs.uk)>; McPherson G (Grant) <[Grant.McPherson@nhs.uk](mailto:Grant.McPherson@nhs.uk)>; Wilson L (Lee-Ann) <[Lee-ann.Wilson@nhs.uk](mailto:Lee-ann.Wilson@nhs.uk)>; Graves-Morris C (Charlotte) <[Charlotte.Graves-morris@nhs.uk](mailto:Charlotte.Graves-morris@nhs.uk)>; Nurse M (Molly) <[Molly.Nurse@nhs.uk](mailto:Molly.Nurse@nhs.uk)>; Communications Health & Social Care <[CommunicationsHealth&SocialCare@nhs.uk](mailto:CommunicationsHealth&SocialCare@nhs.uk)>; McAllister C (Colin) <[Colin.McAllister@nhs.uk](mailto:Colin.McAllister@nhs.uk)>; Kay L (Louise) <[Louise.Kay@nhs.uk](mailto:Louise.Kay@nhs.uk)>; Gregg N (Naomi) <[Naomi.Gregg@nhs.uk](mailto:Naomi.Gregg@nhs.uk)>; Raghavan S (Shalinay) <[Shalinay.Raghavan@nhs.uk](mailto:Shalinay.Raghavan@nhs.uk)>; Campariol-Scott C (Carole) <[Carole.Campariol-Scott@nhs.uk](mailto:Carole.Campariol-Scott@nhs.uk)>; Sharp G (Gary) <[Gary.Sharp@nhs.uk](mailto:Gary.Sharp@nhs.uk)>; Hegarty L (Lee) <[Lee.Hegarty@nhs.uk](mailto:Lee.Hegarty@nhs.uk)>; First Minister FMQs <[FirstMinisterFMQs@nhs.uk](mailto:FirstMinisterFMQs@nhs.uk)>; Chief Nursing Officer <[CNO@nhs.uk](mailto:CNO@nhs.uk)>; Bain MB (Marion) <[Marion.Bain@nhs.uk](mailto:Marion.Bain@nhs.uk)>; Barkby I (Irene) <[Irene.Barkby@nhs.uk](mailto:Irene.Barkby@nhs.uk)>; Shepherd L (Lesley) <[Lesley.Shepherd@nhs.uk](mailto:Lesley.Shepherd@nhs.uk)>; Allan L (Lara) <[Lara.Allan@nhs.uk](mailto:Lara.Allan@nhs.uk)>

**Subject:** RE: Submission on aspergillus in the QEUH

Morning all

Davie made some edits to this – see attached (this is now with FM). The main change is that the Health Secretary has asked HIS to look at data on aspergillus in QEUH – rather than waiting for outcome of the case note review of [REDACTED] case.

**CabSec Health PO** – tba.

**Jason** – on the letter, could you update this based on latest in brief and send on asap pls? Spads keen to see so it can issue pre-FMQs.

Thanks

Rosie

---

**From:** McKerron R (Rosie)

**Sent:** 24 November 2021 23:42

**To:** Birch J (Jason) <[Jason.Birch@nhs.uk](mailto:Jason.Birch@nhs.uk)>; Fallis R (Russell) <[Russell.Fallis@nhs.uk](mailto:Russell.Fallis@nhs.uk)>; First Minister <[firstminister@nhs.uk](mailto:firstminister@nhs.uk)>; Chief Nursing Officer <[CNO@nhs.uk](mailto:CNO@nhs.uk)>; Cabinet Secretary for Health and Social Care <[CabSecHSC@nhs.uk](mailto:CabSecHSC@nhs.uk)>; Minister for Public Health, Women's Health & Sport <[MinisterPHWHS@nhs.uk](mailto:MinisterPHWHS@nhs.uk)>; Minister for Mental Wellbeing & Social Care <[MinisterMWSC@nhs.uk](mailto:MinisterMWSC@nhs.uk)>

**Cc:** FM Policy Team Mailbox <[fmpolicyteam@nhs.uk](mailto:fmpolicyteam@nhs.uk)> DG Health & Social Care <[DGHSC@nhs.uk](mailto:DGHSC@nhs.uk)>; McMahon A (Alex) <[Alex.McMahon@nhs.uk](mailto:Alex.McMahon@nhs.uk)>; Smith G (Gregor) <[Gregor.Smith@nhs.uk](mailto:Gregor.Smith@nhs.uk)>; Chief Medical Officer <[CMO@nhs.uk](mailto:CMO@nhs.uk)> Leitch J (Jason) <[Jason.Leitch@nhs.uk](mailto:Jason.Leitch@nhs.uk)>; Bain MB (Marion) <[Marion.Bain@nhs.uk](mailto:Marion.Bain@nhs.uk)>; Armstrong A (Anne) (Health) <[Anne.Armstrong@nhs.uk](mailto:Anne.Armstrong@nhs.uk)>; Burns J (John) <[John.Burns@nhs.uk](mailto:John.Burns@nhs.uk)>; Barkby I (Irene) <[Irene.Barkby@nhs.uk](mailto:Irene.Barkby@nhs.uk)>; Ward C (Christine) <[Christine.Ward@nhs.uk](mailto:Christine.Ward@nhs.uk)>; Ross E (Elaine) <[Elaine.Ross@nhs.uk](mailto:Elaine.Ross@nhs.uk)>; Allan L (Lara) <[Lara.Allan@nhs.uk](mailto:Lara.Allan@nhs.uk)>; Hutchison D (David) (Special Adviser) <[David.Hutchison@nhs.uk](mailto:David.Hutchison@nhs.uk)>; Hamilton E (Emma) <[Emma.Hamilton@nhs.uk](mailto:Emma.Hamilton@nhs.uk)>; Shepherd L (Lesley) <[Lesley.Shepherd@nhs.uk](mailto:Lesley.Shepherd@nhs.uk)>; White C (Craig) <[Craig.White@nhs.uk](mailto:Craig.White@nhs.uk)>; Taylor M (Mark) <[Mark.Taylor@nhs.uk](mailto:Mark.Taylor@nhs.uk)>; Aitken L (Louise) <[Louise.Aitken@nhs.uk](mailto:Louise.Aitken@nhs.uk)>; Paterson M (Matt) <[Matt.Paterson@nhs.uk](mailto:Matt.Paterson@nhs.uk)>; Powell L (Lisa) <[Lisa.Powell@nhs.uk](mailto:Lisa.Powell@nhs.uk)>; Kerbalai S (Syed) <[Syed.Kerbalai@nhs.uk](mailto:Syed.Kerbalai@nhs.uk)>; McPherson G (Grant) <[Grant@nhs.uk](mailto:Grant@nhs.uk)>; Wilson L (Lee-Ann) <[Lee-ann.Wilson@nhs.uk](mailto:Lee-ann.Wilson@nhs.uk)>; Graves-Morris C (Charlotte) <[Charlotte.Graves-morris@nhs.uk](mailto:Charlotte.Graves-morris@nhs.uk)>; Nurse M (Molly) <[Molly.Nurse@nhs.uk](mailto:Molly.Nurse@nhs.uk)>; Communications Health & Social Care <[CommunicationsHealth&SocialCare@nhs.uk](mailto:CommunicationsHealth&SocialCare@nhs.uk)>; McAllister C (Colin) <[Colin.McAllister@nhs.uk](mailto:Colin.McAllister@nhs.uk)>; Kay L (Louise) <[Louise.Kay@nhs.uk](mailto:Louise.Kay@nhs.uk)>; Gregg N (Naomi) <[Naomi.Gregg@nhs.uk](mailto:Naomi.Gregg@nhs.uk)>; Raghavan S (Shalinay) <[Shalinay.Raghavan@nhs.uk](mailto:Shalinay.Raghavan@nhs.uk)>; Campariol-Scott C (Carole) <[Carole.Campariol-Scott@nhs.uk](mailto:Carole.Campariol-Scott@nhs.uk)>; Sharp G (Gary) <[Gary.Sharp@nhs.uk](mailto:Gary.Sharp@nhs.uk)>; Hegarty L (Lee) <[Lee.Hegarty@nhs.uk](mailto:Lee.Hegarty@nhs.uk)> First Minister FMQs <[FirstMinisterFMQs@nhs.uk](mailto:FirstMinisterFMQs@nhs.uk)>; Chief Nursing Officer <[CNO@nhs.uk](mailto:CNO@nhs.uk)>; Bain MB (Marion) <[Marion.Bain@nhs.uk](mailto:Marion.Bain@nhs.uk)>; Barkby I (Irene) <[Irene.Barkby@nhs.uk](mailto:Irene.Barkby@nhs.uk)>; Shepherd L (Lesley) <[Lesley.Shepherd@nhs.uk](mailto:Lesley.Shepherd@nhs.uk)>; Allan L (Lara) <[Lara.Allan@nhs.uk](mailto:Lara.Allan@nhs.uk)>

**Subject:** RE: Submission on aspergillus in the QEUH

Jason, colleagues

Many thanks for the work on this especially given the lateness of the hour. Having discussed with Jason, I have sought to restructure some of this into lines for FM to deploy.

**Davie** – grateful for your views on the attached. I took some of the material from the timeline in the original FMQ (which FM has in her overnight pack – attached) to create the lines on pre-NHSGGC entering special measures. I'm not sure we need Annex B but will leave you to confirm.

As you know FM, wanted this info asap so I'm planning to have it on her desk by 8.30 tomorrow, so very grateful for views before then. I understand Christine will be online early tomorrow to pick up any further requests.



Thanks

Rosie

**From:** Birch J (Jason) <[Jason.Birch](mailto:Jason.Birch)>

**Sent:** 24 November 2021 22:42

**To:** Fallis R (Russell) <[Russell.Fallis](mailto:Russell.Fallis)>; First Minister <[firstminister](mailto:firstminister)>; Chief Nursing Officer <[CNO](mailto:CNO)>; Cabinet Secretary for Health and Social Care <[CabSecHSC](mailto:CabSecHSC)>; Minister for Public Health, Women's Health & Sport <[MinisterPHWHS](mailto:MinisterPHWHS)>; Minister for Mental Wellbeing & Social Care <[MinisterMWSC](mailto:MinisterMWSC)>

**Cc:** FM Policy Team Mailbox <[fmpolicyteam](mailto:fmpolicyteam)>; DG Health & Social Care <[DGHSC](mailto:DGHSC)>; McMahon A (Alex) <[Alex.McMahon](mailto:Alex.McMahon)>; Smith G (Gregor) <[Gregor.Smith](mailto:Gregor.Smith)>; Chief Medical Officer <[CMO](mailto:CMO)>; Leitch J (Jason) <[Jason.Leitch](mailto:Jason.Leitch)>; Bain MB (Marion) <[Marion](mailto:Marion)>; Armstrong A (Anne) (Health) <[Anne.Armstrong](mailto:Anne.Armstrong)>; Burns J (John) <[John.Burns](mailto:John.Burns)>; Barkby I (Irene) <[Irene.Barkby](mailto:Irene.Barkby)>; Ward C (Christine) <[Christine.Ward](mailto:Christine.Ward)>; Ross E (Elaine) <[Elaine.Ross](mailto:Elaine.Ross)>; Allan L (Lara) <[Lara.Allan](mailto:Lara.Allan)>; Hutchison D (David) (Special Adviser) <[David.Hutchison](mailto:David.Hutchison)>; Hamilton E (Emma) <[Emma.Hamilton](mailto:Emma.Hamilton)>; Shepherd L (Lesley) <[Lesley.Shepherd](mailto:Lesley.Shepherd)>; White C (Craig) <[Craig.White](mailto:Craig.White)>; Taylor M (Mark) <[Mark.Taylor](mailto:Mark.Taylor)>; Aitken L (Louise) <[Louise.Aitken](mailto:Louise.Aitken)>; Paterson M (Matt) <[Matt.Paterson](mailto:Matt.Paterson)>; Powell L (Lisa) <[Lisa.Powell](mailto:Lisa.Powell)>; Kerbalai S (Syed) <[Syed.Kerbalai](mailto:Syed.Kerbalai)>; McPherson G (Grant) <[Grant.McPherson](mailto:Grant.McPherson)>; Wilson L (Lee-Ann) <[Lee-ann.Wilson](mailto:Lee-ann.Wilson)>; Graves-Morris C (Charlotte) <[Charlotte.Graves-morris](mailto:Charlotte.Graves-morris)>; Nurse M (Molly) <[Molly.Nurse](mailto:Molly.Nurse)>; Communications Health & Social Care <[CommunicationsHealth&SocialCare](mailto:CommunicationsHealth&SocialCare)>; McAllister C (Colin) <[Colin.McAllister](mailto:Colin.McAllister)>; Kay L (Louise) <[Louise.Kay](mailto:Louise.Kay)>; Gregg N (Naomi) <[Naomi.Gregg](mailto:Naomi.Gregg)>; Raghavan S (Shalinay) <[Shalinay.Raghavan](mailto:Shalinay.Raghavan)>; Campariol-Scott C (Carole) <[Carole.Campariol-Scott](mailto:Carole.Campariol-Scott)>; Sharp G (Gary) <[Gary.Sharp](mailto:Gary.Sharp)>; Hegarty L (Lee) <[Lee.Hegarty](mailto:Lee.Hegarty)>; First Minister FMQs <[FirstMinisterFMQs](mailto:FirstMinisterFMQs)>; Chief Nursing Officer <[CNO](mailto:CNO)>; Bain MB (Marion) <[Marion.Bain](mailto:Marion.Bain)>; McKerron R (Rosie) <[Rosie.McKerron](mailto:Rosie.McKerron)>

**Subject:** RE: Submission on aspergillus in the QEUH

Rosie, Russell,

Further to the above, pleas find attached a separate FMQ as requested.

Regards

Jason

**Jason Birch** | Unit Head | Directorate for Chief Nursing Officer | Scottish Government | St Andrew's House | Regent Road | Edinburgh | EH1 3DG |

**From:** Fallis R (Russell) <[Russell.Fallis](mailto:Russell.Fallis)>

**Sent:** 24 November 2021 19:59

**To:** Birch J (Jason) <[Jason.Birch](mailto:Jason.Birch)>; First Minister <[firstminister](mailto:firstminister)>; Chief Nursing Officer <[CNO](mailto:CNO)>; Cabinet Secretary for Health and Social Care <[CabSecHSC](mailto:CabSecHSC)>; Minister for Public Health, Women's Health & Sport <[MinisterPHWHS](mailto:MinisterPHWHS)>; Minister for Mental Wellbeing & Social Care <[MinisterMWSC](mailto:MinisterMWSC)>

**Cc:** FM Policy Team Mailbox <[fmpolicyteam](mailto:fmpolicyteam)>; DG Health & Social Care <[DGHSC](mailto:DGHSC)>; McMahon A (Alex) <[Alex.McMahon](mailto:Alex.McMahon)>; Smith G (Gregor) <[Gregor.Smith](mailto:Gregor.Smith)>; Chief Medical Officer <[CMO](mailto:CMO)>; Leitch J (Jason) <[Jason.Leitch](mailto:Jason.Leitch)>; Bain MB (Marion) <[Marion.Bain](mailto:Marion.Bain)>; Armstrong A (Anne) (Health) <[Anne.Armstrong](mailto:Anne.Armstrong)>; Burns J (John) <[John.Burns](mailto:John.Burns)>; Barkby I (Irene)

<[Irene.Barkby](#)>; Ward C (Christine) <[Christine.Ward](#)>; Ross E (Elaine) <[Elaine.Ross](#)>; Allan L (Lara) <[Lara.Allan](#)>; Hutchison D (David) (Special Adviser) <[David.Hutchison](#)>; Hamilton E (Emma) <[Emma](#)>; Shepherd L (Lesley) <[Lesley.Shepherd](#)>; White C (Craig) <[Craig.White](#)>; Taylor M (Mark) <[Mark.Taylor](#)>; Aitken L (Louise) <[Louise.Aitken](#)>; Paterson M (Matt) <[Matt.Paterson](#)>; Powell L (Lisa) <[Lisa.Powell](#)>; Kerbalai S (Syed) <[Syed.Kerbalai](#)>; McPherson G (Grant) <[Grant.McPherson](#)>; Wilson L (Lee-Ann) <[Lee-ann.Wilson](#)>; Graves-Morris C (Charlotte) <[Charlotte.Graves-morris](#)> Nurse M (Molly) <[Molly.Nurse](#)>; Communications Health & Social Care <[CommunicationsHealth&SocialCare](#)>; McAllister C (Colin) <[Colin.McAllister](#)>; Kay L (Louise) <[Louise.Kay](#)>; Gregg N (Naomi) <[Naomi.Gregg](#)>; Raghavan S (Shalinay) <[Shalinay.Raghavan](#)>; Campariol-Scott C (Carole) <[Carole.Campariol-Scott](#)>; Sharp G (Gary) <[Gary.Sharp](#)>; Hegarty L (Lee) <[Lee.Hegarty](#)>; First Minister FMQs <[FirstMinisterFMQs](#)>; Chief Nursing Officer <[CNO](#)>; Bain MB (Marion) <[Marion.Bain](#)>; McKerron R (Rosie) <[Rosie.McKerron](#)>

**Subject:** RE: Submission on aspergillus in the QEUH

Jason

You spoke with my colleague Rosie on the FM's further asks on QEUH which she would like back later this evening – **ideally by 9.30pm.**

In a separate FMQ note (don't update the existing FMQ on QEUH as FM has this with her this evening), please can you include background and lines for FM to deploy on:

- 1) What we've instructed on the [REDACTED] case – so, narrative of the information you've listed below but also including who in NHS Lothian has been instructed to take forward the external review and the timeframe attached.
- 2) A list of actions on infection prevention and control in NHSGGC/QEUH since:
  - (i) NHS GGC was escalated to stage 4 for infection control etc (examples of improvements that have been made)
  - (ii) a list of actions taken prior to that point in the preceding 12 months
  - (iii) what scrutiny measures HIS are taking in relation to cases of aspergillus (external review of cases etc)

I will need all of the above in one FMQ with clear separation of background material (if sensitive and for FM info only) and then lines to take so FM is able to narrate SG and HS action taken.

I understand Spads will feedback separately on the letter tomorrow.

Thanks

Rosie

---

**Russell Fallis** | Head of FMQ Team, Scottish Government | [REDACTED]

----- Find out more on [Preparing First Minister's Questions \(FMQs\)](#) -----

**From:** Birch J (Jason) <[Jason.Birch](#)>

**Sent:** 24 November 2021 19:05

**To:** First Minister <[firstminister](#)>; Chief Nursing Officer <[CNO](#)>; Cabinet Secretary for Health and Social Care <[CabSecHSC](#)>; Minister for Public Health, Women's Health & Sport <[MinisterPHWHS](#)>; Minister for Mental Wellbeing & Social Care <[MinisterMWSC](#)>

**Cc:** FM Policy Team Mailbox <[fmpolicyteam](#)>; DG Health & Social Care <[DGHSC](#)>; McMahon A (Alex) <[Alex.McMahon](#)>; Smith G (Gregor) <[Gregor.Smith](#)>; Chief Medical Officer <[CMO](#)>; Leitch J (Jason)

<[Jason.Leitch](#) [REDACTED]; Bain MB (Marion) <[Marion.Bain](#) [REDACTED]; Armstrong A (Anne) (Health) <[Anne.Armstrong](#) [REDACTED]>; Burns J (John) <[John.Burns](#) [REDACTED]>; Barkby I (Irene) <[Irene.Barkby](#) [REDACTED]; Ward C (Christine) <[Christine.Ward](#) [REDACTED]>; Ross E (Elaine) <[Elaine.Ross](#) [REDACTED]>; Allan L (Lara) <[Lara.Allan](#) [REDACTED]>; Hutchison D (David) (Special Adviser) <[David.Hutchison](#) [REDACTED]; Hamilton E (Emma) <[Emma.Hamilton](#) [REDACTED]>; Shepherd L (Lesley) <[Lesley.Shepherd](#) [REDACTED]; White C (Craig) <[Craig.White](#) [REDACTED]; Taylor M (Mark) <[Mark.Taylor](#) [REDACTED]; Aitken L (Louise) <[Louise.Aitken](#) [REDACTED]; Paterson M (Matt) <[Matt.Paterson](#) [REDACTED]; Powell L (Lisa) <[Lisa.Powell](#) [REDACTED]; Kerbalai S (Syed) <[Syed.Kerbalai](#) [REDACTED]; McPherson G (Grant) <[Grant.McPherson](#) [REDACTED]; Wilson L (Lee-Ann) <[Lee-ann.Wilson](#) [REDACTED]; Graves-Morris C (Charlotte) <[Charlotte.Graves-morris@](#) [REDACTED]>; Nurse M (Molly) <[Molly.Nurse](#) [REDACTED]; Communications Health & Social Care <[CommunicationsHealth&SocialCare](#) [REDACTED]; McAllister C (Colin) <[Colin.McAllister](#) [REDACTED]; Kay L (Louise) <[Louise.Kay](#) [REDACTED]; Gregg N (Naomi) <[Naomi.Gregg](#) [REDACTED]; Raghavan S (Shalinay) <[Shalinay.Raghavan](#) [REDACTED]; Campariol-Scott C (Carole) <[Carole.Campariol-Scott](#) [REDACTED]; Sharp G (Gary) <[Gary.Sharp](#) [REDACTED]; Hegarty L (Lee) <[Lee.Hegarty](#) [REDACTED]; First Minister FMQs <[FirstMinisterFMQs](#) [REDACTED]; Fallis R (Russell) <[Russell.Fallis](#) [REDACTED]

**Subject:** RE: Submission on aspergillus in the QEUH

Patrick,

Thank you for the message. In terms of the First Minister's points:

Professor McMahon has today written to NHS GG&C to confirm that there will be an external review of [REDACTED] case notes by NHS Lothian. The Interim CNO has also written to NHS Lothian to request that this external assurance is carried out as a matter of urgency.

I have included draft text below for a letter to be sent to [REDACTED] from the First Minister and I understand that you will have the contact details and therefore be able to confirm the message has been received by [REDACTED].

The independent external peer review of the case notes will consider the care and treatment including what and how this has been communicated with the patient and the family. In particular it will consider and seek assurance of the following areas which are covered by NHS GG&C's internal review:

- Pre-ICU Care summary
- ICU Care summary
- Patient journey through the Queen Elizabeth University Hospital
- Acquisition of COVID-19 by [REDACTED]
- Infection assessment
- Treatment given to [REDACTED] in relation to:

i. Covid-19

ii. Anti-fungal

iii. Communication with patient

In relation to the HIS inspections, there is an unannounced inspection of the QEUH in the upcoming HIS inspection schedule. We have also requested advice from NHS Antimicrobial Resistance and Healthcare Associated Infection (ARHAI) in relation to data and evidence available on cases of Aspergillus.

I hope that this is helpful.

Kind regards

Jason

**Suggested draft letter from the First Minister to [REDACTED]**

Dear [REDACTED],

I am writing to you to once more offer my heartfelt condolences on the loss of [REDACTED], at this especially difficult time in the lead up to the [REDACTED] of [REDACTED] death.

I wanted to tell you that NHS Greater Glasgow & Clyde are in the process of undertaking an internal review of [REDACTED] care and treatment and their communications through a case note review. The outcome of this review will be reported to the Interim Chief Nursing Officer, Professor Alex McMahon.

Professor McMahon has also commissioned a process of external assurance in relation to [REDACTED] care and treatment and how the details were communicated to you. This independent external peer review will be led by NHS Lothian's Medical Director and will provide further reporting directly to Professor McMahon.

I will of course keep you updated as these reviews proceed and I understand that Professor McMahon has asked NHS Lothian to undertake their part of the review as a matter of urgency. Should you have any further questions, please do not hesitate to get in touch.

Yours sincerely

**Jason Birch** | Unit Head | Directorate for Chief Nursing Officer | Scottish Government | St Andrew's House | Regent Road | Edinburgh | EH1 3DG | [REDACTED]

**From:** Crolla P (Patrick) <[Patrick.Crolla@nhs.uk](mailto:Patrick.Crolla@nhs.uk)> On Behalf Of First Minister

**Sent:** 24 November 2021 17:35

**To:** Chief Nursing Officer <[CNO@nhs.uk](mailto:CNO@nhs.uk)> Cabinet Secretary for Health and Social Care <[CabSecHSC@nhs.uk](mailto:CabSecHSC@nhs.uk)> Minister for Public Health, Women's Health & Sport <[MinisterPHWHS@nhs.uk](mailto:MinisterPHWHS@nhs.uk)>; Minister for Mental Wellbeing & Social Care <[MinisterMWSC@nhs.uk](mailto:MinisterMWSC@nhs.uk)>; First Minister <[REDACTED]>

**Cc:** FM Policy Team Mailbox <[fmpolicyteam@nhs.uk](mailto:fmpolicyteam@nhs.uk)>; DG Health & Social Care <[DGHSC@nhs.uk](mailto:DGHSC@nhs.uk)>; McMahon A (Alex) <[Alex.McMahon@nhs.uk](mailto:Alex.McMahon@nhs.uk)> Smith G (Gregor) <[Gregor.Smith@nhs.uk](mailto:Gregor.Smith@nhs.uk)>; Chief Medical Officer <[CMO@nhs.uk](mailto:CMO@nhs.uk)>; Leitch J (Jason) <[Jason.Leitch@nhs.uk](mailto:Jason.Leitch@nhs.uk)>; Bain MB (Marion) <[Marion.Bain@nhs.uk](mailto:Marion.Bain@nhs.uk)>; Armstrong A (Anne) (Health) <[Anne.Armstrong@nhs.uk](mailto:Anne.Armstrong@nhs.uk)>; Burns J (John) <[John.Burns@nhs.uk](mailto:John.Burns@nhs.uk)>; Barkby I (Irene) <[Irene.Barkby@nhs.uk](mailto:Irene.Barkby@nhs.uk)>; Ward C (Christine) <[Christine.Ward@nhs.uk](mailto:Christine.Ward@nhs.uk)>; Birch J (Jason) <[Jason.Birch@nhs.uk](mailto:Jason.Birch@nhs.uk)>; Ross E (Elaine) <[Elaine.Ross@nhs.uk](mailto:Elaine.Ross@nhs.uk)>; Allan L (Lara) <[Lara.Allan@nhs.uk](mailto:Lara.Allan@nhs.uk)>; Hutchison D (David) (Special Adviser) <[David.Hutchison@nhs.uk](mailto:David.Hutchison@nhs.uk)>; Hamilton E (Emma) <[Emma.Hamilton@nhs.uk](mailto:Emma.Hamilton@nhs.uk)>; Shepherd L (Lesley) <[Lesley.Shepherd@nhs.uk](mailto:Lesley.Shepherd@nhs.uk)>; White C (Craig) <[Craig.White@nhs.uk](mailto:Craig.White@nhs.uk)>; Taylor M (Mark) <[Mark.Taylor@nhs.uk](mailto:Mark.Taylor@nhs.uk)>; Aitken L (Louise) <[Louise.Aitken@nhs.uk](mailto:Louise.Aitken@nhs.uk)>; Paterson M (Matt) <[Matt.Paterson@nhs.uk](mailto:Matt.Paterson@nhs.uk)>; Powell L (Lisa) <[Lisa.Powell@nhs.uk](mailto:Lisa.Powell@nhs.uk)>; Kerbalai S (Syed) <[Syed.Kerbalai@nhs.uk](mailto:Syed.Kerbalai@nhs.uk)>; McPherson G (Grant) <[Grant.McPherson@nhs.uk](mailto:Grant.McPherson@nhs.uk)>; Wilson L (Lee-Ann) <[Lee-ann.Wilson@nhs.uk](mailto:Lee-ann.Wilson@nhs.uk)>; Graves-Morris C (Charlotte) <[Charlotte.Graves-morris@nhs.uk](mailto:Charlotte.Graves-morris@nhs.uk)> Nurse M (Molly) <[Molly.Nurse@nhs.uk](mailto:Molly.Nurse@nhs.uk)>; Communications Health & Social Care <[CommunicationsHealth&SocialCare@nhs.uk](mailto:CommunicationsHealth&SocialCare@nhs.uk)>; McAllister C (Colin) <[Colin.McAllister@nhs.uk](mailto:Colin.McAllister@nhs.uk)>; Kay L (Louise) <[Louise.Kay@nhs.uk](mailto:Louise.Kay@nhs.uk)>; Gregg N (Naomi) <[Naomi.Gregg@nhs.uk](mailto:Naomi.Gregg@nhs.uk)>; Raghavan S (Shalinay) <[Shalinay.Raghavan@nhs.uk](mailto:Shalinay.Raghavan@nhs.uk)>; Campariol-Scott C (Carole) <[Carole.Campariol-Scott@nhs.uk](mailto:Carole.Campariol-Scott@nhs.uk)>; Sharp G (Gary) <[Gary.Sharp@nhs.uk](mailto:Gary.Sharp@nhs.uk)>; Hegarty L (Lee) <[Lee.Hegarty@nhs.uk](mailto:Lee.Hegarty@nhs.uk)>; First Minister FMQs <[FirstMinisterFMQs@nhs.uk](mailto:FirstMinisterFMQs@nhs.uk)>; Fallis R (Russell) <[Russell.Fallis@nhs.uk](mailto:Russell.Fallis@nhs.uk)>

**Subject:** RE: Submission on aspergillus in the QEUH

Gayle,

The First Minister was grateful for the submission.

She wishes this issue to be progressed as follows:

- In relation to the question of a case note review of [REDACTED] specific case:
  - There should be a case notes review and it should be externally assured (external, that is, to GCC).
  - It would be preferable for this review to be initiated by the SG (presumably by the CNO).
  - We should communicate this news to [REDACTED] in the course of tomorrow morning. Her view is that this is best done by a letter from the FM to [REDACTED] and she would be grateful if this can be prepared as a matter of urgency.
  - She would wish to have confirmation by 1130 that this letter has been successfully received by [REDACTED].
  - She will require briefing on the review, it's process, who is conducting it etc that she can use at FMQ's. She will need this as soon as possible tomorrow and no later than 1000.
- In relation to a more general review of instances of aspergillus that [REDACTED] [REDACTED] has called for, the FM would like further clarity on what can be said on this point. For example, can she say that HIS will conduct a round of inspections as discussed at paras 11 and 12? If not, she is minded to confirm that we are considering a wider review. Again, she will need this as soon as possible tomorrow and no later than 1000.

Many thanks,

Pat

**Patrick Crolla**

**Deputy Private Secretary**

**Office of the First Minister**

5<sup>th</sup> Floor | St Andrews House | Regent Road | Edinburgh | EH1 3DG | [REDACTED] | [REDACTED]

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**From:** Williamson G (Gaye) <[Gaye.Williamson@scotland.nhs.uk](mailto:Gaye.Williamson@scotland.nhs.uk)> **On Behalf Of** Chief Nursing Officer

**Sent:** 24 November 2021 13:53

**To:** Cabinet Secretary for Health and Social Care <[CabSecHSC@scotland.nhs.uk](mailto:CabSecHSC@scotland.nhs.uk)>; Minister for Public Health, Women's Health & Sport <[MinisterPHWHS@scotland.nhs.uk](mailto:MinisterPHWHS@scotland.nhs.uk)>; Minister for Mental Wellbeing & Social Care <[MinisterMWSC@scotland.nhs.uk](mailto:MinisterMWSC@scotland.nhs.uk)>; First Minister <[firstminister@scotland.nhs.uk](mailto:firstminister@scotland.nhs.uk)>

**Cc:** FM Policy Team Mailbox <[fmpolicyteam@scotland.nhs.uk](mailto:fmpolicyteam@scotland.nhs.uk)>; DG Health & Social Care <[DGHSC@scotland.nhs.uk](mailto:DGHSC@scotland.nhs.uk)>; McMahon A (Alex) <[Alex.McMahon@scotland.nhs.uk](mailto:Alex.McMahon@scotland.nhs.uk)>; Chief Nursing Officer <[CNO@scotland.nhs.uk](mailto:CNO@scotland.nhs.uk)>; Smith G (Gregor) <[Gregor.Smith@scotland.nhs.uk](mailto:Gregor.Smith@scotland.nhs.uk)>; Chief Medical Officer <[CMO@scotland.nhs.uk](mailto:CMO@scotland.nhs.uk)>; Leitch J (Jason) <[Jason.Leitch@scotland.nhs.uk](mailto:Jason.Leitch@scotland.nhs.uk)>; Bain MB (Marion) <[Marion.Bain@scotland.nhs.uk](mailto:Marion.Bain@scotland.nhs.uk)>; Armstrong A (Anne) (Health) <[Anne.Armstrong@scotland.nhs.uk](mailto:Anne.Armstrong@scotland.nhs.uk)>; Burns J (John) <[John.Burns@scotland.nhs.uk](mailto:John.Burns@scotland.nhs.uk)>; Barkby I (Irene) <[Irene.Barkby@scotland.nhs.uk](mailto:Irene.Barkby@scotland.nhs.uk)>; Ward C (Christine)

<[Christine.Ward](#)>; Birch J (Jason) <[Jason.Birch](#)>; Ross E (Elaine) <[Elaine.Ross](#)>; Allan L (Lara) <[Lara.Allan](#)>; Hutchison D (David) (Special Adviser) <[David.Hutchison](#)>; Hamilton E (Emma) <[Emma.Hamilton](#)>; Shepherd L (Lesley) <[Lesley.Shepherd](#)>; White C (Craig) <[Craig.White](#)>; Taylor M (Mark) <[Mark.Taylor](#)>; Aitken L (Louise) <[Louise.Aitken](#)>; Paterson M (Matt) <[Matt.Paterson](#)>; Powell L (Lisa) <[Lisa.Powell](#)>; Kerbalai S (Syed) <[Syed.Kerbalai](#)>; McPherson G (Grant) <[Grant.McPherson@](#)>; Wilson L (Lee-Ann) <[Lee-ann.Wilson@](#)>; Graves-Morris C (Charlotte) <[Charlotte.Graves-morris@](#)>; Nurse M (Molly) <[Molly.Nurse](#)>; Communications Health & Social Care <[CommunicationsHealth&SocialCare](#)>; McAllister C (Colin) <[Colin.McAllister](#)>; Kay L (Louise) <[Louise.Kay](#)>; Gregg N (Naomi) <[Naomi.Gregg](#)>; Raghavan S (Shalinay) <[Shalinay.Raghavan](#)>; Campariol-Scott C (Carole) <[Carole.Campariol-Scott](#)>; Sharp G (Gary) <[Gary.Sharp](#)>; Hegarty L (Lee) <[Lee.Hegarty](#)>

**Subject:** Submission on aspergillus in the QEUH

**SENT ON BEHALF OF THE INTERIM CHIEF NURSING OFFICER**

**PS/Cabinet Secretary Health and Social Care**

Please find attached a submission which provides an update on the issues connected with aspergillus at the QEUH, NHS GGC, for the Cabinet Secretary's urgent attention.

Kind regards

Gaye

**Gaye Williamson** (*she/her*) | Private Secretary to Chief Nursing Officer | Chief Nursing Officers Directorate | Scottish Government | [Teams](#) |

I am working from home

**NHS Greater Glasgow & Clyde  
Chlorine Dioxide ClO<sub>2</sub> Water Treatment Project Pre-start Meeting  
Wednesday 5<sup>th</sup> September 2018 at 12noon  
Facilities Meeting Room 5, Ground Floor, Laboratory Medicine Building, QEUH**

**Present:**

|                         |   |  |
|-------------------------|---|--|
| Ian Powrie (Chair) (IP) | - | Deputy General Manager Estates, NHSGG&C, QEUH    |
| Steve Allan (SA)        | - | Commercial Manager, Scotmas                      |
| Gary Callaghan (GC)     | - | Engineering Manager, Scotmas                     |
| David Carmichael (DC)   | - | Project Manager, Morris & Spottiswood, (M&S)     |
| Ewen Forsyth (EF)       | - | Commodity Manager, NHSGG&C                       |
| Mel MacMillan (MMacM)   | - | Estates Officer, NHSGG&C, QEUH                   |
| Ross Miller (RM)        | - | Quantity Surveyor, Morris & Spottiswood, (M&S)   |
| Lochie Morris (LM)      | - | Project Manager, Morris & Spottiswood, (M&S)     |
| Colin Purdon (CP)       | - | Site Estates Manager, NHSGG&C, QEUH              |
| Steve Russell (SR)      | - | Principal Project Manager, NHSGG&C               |
| Andy Russell (AR)       | - | Operations Director, Morris & Spottiswood, (M&S) |
| Tim Wafer (TW)          | - | Consultant, Water Solutions                      |
| Andy Wilson (AW)        | - | Sector Estates Manager, NHSGG&C, QEUH            |

**Action****1. Welcome/Introductions**

IP welcomed everyone to the pre-start meeting and introductions were made.

IP is the Technical Lead for the project and SR is the budget holder.

**2. Letter of Appointment**

SR noted that the Letter of Appointment has been issued, AR and DC from Morris & Spottiswood (M&S) confirmed receipt of the letter.

**3. Contract Particulars****a. Contract Sum**

SR noted there is a variation to the Letter of Appointment, the contract value is £614,015.08 + VAT, to cover the capital element of the project with the Managed Service contract element. SR will distribute a breakdown of the funding.

**SR****b. Contractors Insurance**

Contractors and sub-contractors to forward copies of their insurance certificates to SR and copy to IP.

**M&S/Scotmas****c. Commencement & Completion Dates**

SR sought clarification if a program of works has been developed. RM tabled a program. DC noted the completion of the project is approximately mid December 2018. DC noted the timescale of the Procurement lead time of 6 weeks for the delivery of equipment.

IP sought clarification on the timescale for the expansion vessels, DC confirmed is 3 weeks for flow through vessels. TW sought clarification on the lead time for the chlorine dioxide to be onsite, SA confirmed 6 weeks for the arrival of the equipment with 2 weeks for set up, in total 8 weeks. TW noted will be November 2018 to commence the first installation of the chlorine dioxide plant, SA noted can commence prior to pipework modification. SA noted there will be 3 filtration units, 2 bulk storage and 4 boosted cold water lines. SA to revise the program due to the go live week, in order for IP to feedback to the Board Water Safety Group. TW sought clarification if there will be monitors within Renal.

**SA**

IP issued a revised priority schedule of installation, IP noted that £10K has been included in the contract for temporary set up costs. IP noted for the internal purposes of the construction of the chemical store, a Risk Assessment & Method Statement (RAMS) is required.

**M&S/Scotmas**

SR advised that invoicing will be on a monthly basis from commencement date. AR noted of an upfront cost for equipment, IP noted that a waiver was completed. EF noted the waiver is currently with Mark White, Director of Finance for approval, SR advised normally no costs are paid until contractors are onsite, IP noted the upfront costs were built into the waiver of £80K, there is a 4 week timescale to organise, prior to the first installation.

d. **Programme**

Discussed within item C.

e. **Technical Clarifications**

IP noted that copies of LCA and WRAS approved contractors Accreditation are required to be forwarded to IP and MMacM. TW sought clarification from SA regarding the LCA renewal, SA confirmed the renewal is August 2019. IP noted that risk assessments and method statements are required to be approved, before works commence onsite.

M&S/Scotmas

CP sought clarification if the contractors onsite are CP trained, NHSGG&C may require to assess, IP requested confirmation that the existing system would meet WRAS requirements against Category 3 Protection. TW noted that a statement is required to meet the requirements for Category 3 from Scotmas. SA sought clarification if NHSGG&C have applied to Scottish Water for consent for the water treatment. IP confirmed an application was submitted and will forward the copy of written approval.

SA/GC  
IP

IP tabled a document, Pre-start Technical Clarifications, noting the key points as follows:

**Review Installation Plant**

IP requested review of the schematic plans with respect to renal Dialysis, relating to the requirement to relocate the supply take off points to before ClO<sub>2</sub> plant. For clarity IP noted that Renal Dialysis 2 will not be supplied from is not from local dosing units but from the central dosing plant in the water tank room.

The central treatment plant will be configured to trip on high level if the residual level exceeds 1.00PPM, in order to protect the Renal RO plant.

SA noted there will be automatic monitoring points installed one and post Carbon filter. TW advised that 3 probes are required, one pre filter and one post for each carbon filter unit.

IP noted that one pipe work modification Post filter was required and would be commissioned via Veolia.

EF

TW requested confirmation of the sensor probe resolution?  
GC noted 0.01 – 2PPM

IP advised that MMacM is the point of contact for site survey support.

MMacM

**Expansion Vessels**

DC to issue copy of data sheet to IP, EF noted data sheet has been circulated.

DC

**Heat Station**

IP noted once treatment plant is installed, calorifiers will be cleaned and pasteurised prior to going live.

IP noted that a service interruption plan is required for co-ordination with the service users prior to final approval.

IP noted that the RHC treatment implementation and calorifiers clean\pasteurisation to be executed at a weekend Friday\Saturday to minimise disruption. DC noted pipework modifications will be undertaken on a nightshift, DC noted every plantroom will require a short isolation for break-ins.

MMacM noted that the calorifiers are due to be serviced, IP advised to escalate this programme to align with the installation schedule. DC noted to agree on dates for every plantroom, MMacM noted to do one calorifier at a time, IP advised that this would not be possible as it could lead to recontamination of the system and RAMS would be

MMacM



### **CIO2 Treatment Strategy**

#### **Dosing Levels Hot & Cold Water**

IP noted the cold water to start at 1PPM escalation to a maximum of 2PPM continual dosing and the hot water to start at 2PPM escalation to a maximum of 4PPM as per the Water Treatment Plan.

GC noted if we reach to 4PPM could cause issues with the rubber gaskets, TW noted will be dosing at 4PPM to achieve a residual of no more than 2PPM.

IP noted of the risk of Stress Crack Corrosion, IP noted the requirement for In house Estates Management Team to monitor condition of pipework for signs of pin holing, over time during these high dosing levels.

IP

IP noted the hot water feeds Mixing taps used for Drinking water, where warning signage to be fitted advising "water is not suitable for drinking".

DC sought clarification if the proposed residual chemical will damage taps, shower & fittings?

IP noted that Horne recommend that chemicals are not used on their TMT's, however the Board have accepted this is acceptable risk.

#### **Escalation/De-escalation Plan.**

IP will share the escalation/de-escalation plan with group members, once ratified.

IP

IP noted water tank room fail safe plant trip setting to be 1.0PPM. Failsafe for local treatment plant to be revised in line with escalation/de-escalation plan.

DC/MMacM

GC to forward the strategy to IP.

GC

SA noted the requirements to set thresholds, settings to be included within the strategy.

SA

IP advised the requirement to tie in with the BMS System.

IP sought clarification from Scotmas of the onsite support that will be provided within the contract for the bedding in period of 3-6 months,

SA confirmed that support will be available and due to the complexity of the System to deal only with Scotmas, weekly visits to be undertaken. TW noted that a low setting long term with fixed alarm is required

#### **Plant Safety Shutdown per Location**

IP noted of remote monitors on locations, discussion is required, safety cut out at point 5, SA noted if reaching 0.5 PPM will stop dosing,

IP to identifying near sentinel points for remote automatic monitoring locations.

IP

GC noted if sensors see low flow conditions they can lose calibration.

IP advised that the DSR's would be a suitable option to provide constant flow conditions on both hot & cold services.

IP noted for drawings to include the locations of the DSR's, SA to arrange for a list of the DSR room numbers,

SA

#### **Trade Effluent Consent Application Issued**

IP to forward to group members, prior to water treatment commencement.

IP

#### **Water Bylaws**

Discussed in agenda item 3e.

**Engagement with Veolia**

IP requested that Scotmas liaise with Veolia on an agreed methodology for ClO2 injection into backwash Tank.

**Filtration Unit**

IP confirmed that the order has been placed, is a 10 week lead time and provides a 7 week commission period.

**Initial Site Survey, Supported Visits**

Discussed within agenda item 3e.

IP noted that MMacM is the contact for site survey support.

DC advised it will take 3 days to undertake the surveys, DC and MMacM agreed to undertake the surveys week commencing 10 September 2018.

**4. The Site****Contractors Working Area**

AR noted that an office is required 2 containers and would double as the site for the concurrent Ventilation project works.

IP noted the water tank storage room may be available for plant storage, this room leads to the duct, IP noted the plantrooms on level 3 can be utilised for storage or switch room, MMacM noted to ensure that the plantroom is locked, M&S will retain responsibility for the equipment onsite.

IP noted that M&S have also been contracted to undertake the ventilation work. IP noted to bring the equipment via the labs building into the basement and distribute from the basement, bulk deliveries to be co-ordinated via Billy MacDonald, Transport & Logistics Manager

**M&S****Security**

It was agreed for contractors to sign in on a weekly basis, IP noted arrangements will be made for authorised access to areas.

M&S will provide details of the individuals training & competency to work on water systems to MMacM.

**M&S**

IP noted there are no parking facilities available, on site but there is a private pay as you go parking facility on Hardgate Road.

IP advised that operational estates will co-ordinate any shutdowns with the service users affected.

IP noted that HEI scribe Risk Assessments will be required for all works in clinical wards department and approved by the ICT.

IP noted downtime on plant to undertake testing can be co-ordinated nearer the time.

IP noted that contact numbers will be issued with the minutes.

**EMcN**

IP referred to the no smoking onsite, need to go off site.

**5. Health & Safety****H&S Plan**

IP noted for the H&S plan to be available with initial drawings first week in October 2018, method statements to the same timescale.

**M&S/Scotmas**

Proformas and permits will be required for shutdown and breakdowns, MMacM requires Electricians certification.

**M&S/Scotmas**

IP noted if work is required in plantrooms the fire alarm may be required to be isolated in these areas, MMacM requires to sign off hot work permit of consent. DC noted for

IP referred to the Health & Safety Plan, DC noted will be available first week in October 2018. DC

IP advised that there is no asbestos within the building, IP noted that there is a risk that pipe gaskets have been identified as being asbestos material, although not on this site as detailed in the tender specification.

**6. Site Meetings**

It was agreed to schedule a follow up meeting for 3<sup>rd</sup> October 2018 at 10.00am and thereafter weekly meetings held on a Wednesday once commencement onsite.

**7. Communications**

IP requested that a manufacturing visit be arranged to review the quality and commissioning procedures. Week commencing 8<sup>th</sup> October 2018.

IP advised any request to stop activity should be treated sensitively and escalated immediately to MMacM in the first instance.

**8. AOCB**

AW sought clarification if there are service restrictions if loosing hot water supply, TW noted the requirement to define within the plan regarding break-ins/shutdowns of water supply.

**9. Date & Time of Next Meeting**

The next meeting is scheduled for Wednesday 3<sup>rd</sup> October 2018 at 10.00am in Facilities Meeting Room 5, Ground Floor, Labs Building, QEUH.

**NHS Greater Glasgow & Clyde  
Chlorine Dioxide ClO<sub>2</sub> Water Treatment Project Progress Meeting  
Thursday 11<sup>th</sup> October 2018 at 10am  
Central Medical Block, QEUE**

**Present:**

|                            |   |  |
|----------------------------|---|--|
| Steve Russell (Chair) (SR) | - | Principal Project Manager, Capital Planning, NHSGG&C |
| Ian Powrie (IP)            | - | Deputy General Manager Estates, NHSGG&C, QEUE        |
| Andy Wilson (AW)           | - | Sector Estates Manager, NHSGG&C, QEUE                |
| James Huddleston (JH)      | - | Senior Project Manager, Capital Planning, NHSGG&C    |
| Gary Callaghan (GC)        | - | Engineering Manager, Scotmas                         |
| Scott Thompson (ST)        | - | Scotmas (on-site lead)                               |
| Ben Faulkner (BF)          | - | Scotmas  |
| David Carmichael (DC)      | - | Project Manager, Morris & Spottiswood, (M&S)         |
| Tim Wafer (TW)             | - | Consultant, Water Solutions                          |
| Chris Russell (CR)         | - | Veolia   |
| Douglas Macallistar (DM)   | - | Veloia   |
| Richard Beattie (RB)       | - | Aecom  |

**Apologies:**

|                       |   |                                |
|-----------------------|---|--------------------------------|
| Mel MacMillan (MMacM) | - | Estates Officer, NHSGG&C, QEUE |
|-----------------------|---|--------------------------------|

- |           |   | <b>Action</b>         |
|-----------|---|-----------------------|
| <b>1.</b> | <b>Welcome/Introductions</b>  |                       |
|           | SR welcomed everyone to the meeting and introductions were made.  |                       |
|           | IP is the Technical Lead for the project and SR is the budget holder and will also be chairing meetings going forward.  |                       |
| <b>2.</b> | <b>Contract Award</b>   |                       |
|           | SR confirmed that the Letter of Appointment and Purchase Orders has been issued to all parties.   |                       |
|           | The additional works to Wards 2A and 2B to be instructed as a variation to contract. M&S has submitted costs for these works and SR/IP are working through internal approvals process. M&S confirmed they can only place orders for these works upon formal written instruction to proceed with this variation. IP has confirmed that this instruction will be issued to M&S by close of play Fri 12 <sup>th</sup> Oct. | <b>SR/IP</b>          |
|           | SR queried the status of the requested Bond to cover the agreed advanced payment. SR to take this up with Ross from M&S outside the meeting.  | <b>SR</b>             |
|           | SR noted that Aecom have been appointed as Cost Advisors and will undertake the contract valuations as well as assist in cost tracking for the NHS.   |                       |
| <b>3.</b> | <b>Contract Particulars</b>   |                       |
| <b>a.</b> | <b>Commencement &amp; Completion Dates</b>  |                       |
|           | Subject to instruction, works to Wards 2a and 2b to commence from 15 <sup>th</sup> October. Indicative finish date of all works, Jan-end 2019.  |                       |
| <b>b.</b> | <b>Programme</b>  |                       |
|           | M&S confirmed that a contact programme will be issued by close of play Monday 15 <sup>th</sup> October. It was noted that Practical Completion will be defined as when all systems are installed and usable with TWs sign off. To include a two week verification period.   | <b>M&amp;S</b>        |
|           | It was noted that the Veolia programme needs to be incorporated and aligned with the M&S programme. Both teams have agreed to liaise to ensure this.  | <b>M&amp;S/Veolia</b> |

|    |   |                            |
|----|---|----------------------------|
|    | <b>Treatment Plant Installation Plan</b>  |                            |
|    | Treatment plant installation plan should already be issued, M&S to be issue by close of play Fri 12 <sup>th</sup> Oct.  | <b>M&amp;S</b>             |
|    | <b>CIO2 Monitoring Installation Plan</b>  |                            |
|    | TW and Scotmas confirmed that they are still working up the CIO2 monitoring installation plan. This will require sign off and on site assessment to determine how it can be installed. To be issued by Fri 19 <sup>th</sup> October.  | <b>TW/Scotmas</b>          |
|    | <b>Go Live Plan</b>   |                            |
|    | Go live plan to be prepared by Scotmas and issued by Fri 19 <sup>th</sup> October. This is to include dosing programme, monitoring requirements, etc until desired outcome is reached as covered under first year support contract.   | <b>Scotmas</b>             |
|    | <b>Monitoring &amp; Test Training Plan</b>  |                            |
|    | M&S confirmed that they need to know roughly what number of people they will need to allow for training. IP indicated roughly 35-40 people. It is anticipated that groups of around 5 people can be trained at one time in 2-3 hour sessions.                                       | <b>M&amp;S</b>             |
|    | SR requested that the training be filmed so it was be reviewed at a later date as a refresher for new staff. M&S to provide a quote for this. SR will also liaise with NHS Medical Illustrations to see if this is something that they can assist with                              | <b>M&amp;S/SR</b>          |
| c. | <b>Technical Clarifications</b>   |                            |
|    | It was agreed that IP will lead on separate technical meetings that will be arranged ad-hoc with the relevant parties separately from weekly progress meetings  | <b>IP</b>                  |
|    | Veolia to prepare and issue methodology for the plant that needs installed. Veolia and Scotmas to review requirements together and agree dosing point.  | <b>Veolia/<br/>Scotmas</b> |
|    | There was an issue noted with the hydraulic tank balance and the flow between the two. A technical review to be set up between Schieder, Veolia and M&S is required, IP to lead. This meeting has been provisionally agreed for the 24 <sup>th</sup> Oct at 2pm.                    | <b>IP</b>                  |
| 4. | <b>The Site</b>   |                            |
|    | IP noted that the contractors are to share the compound area with that already occupied by Brookfield. Post meeting, IP to show M&S the location.   | <b>IP</b>                  |
|    | It was agreed for contractors to sign in on a weekly basis, IP noted arrangements will be made for authorised access to areas.  |                            |
|    | It was noted that it may be possible to store some materials in the basement tank room, however this would be for contractors storage only and not signed over to the NHS.  |                            |
| 5. | <b>Health &amp; Safety</b>  |                            |
|    | <b>H&amp;S Plan</b>   |                            |
|    | Principal Designer under CDM Regs confirmed as M&S. DC confirmed that they may look to delegate this role to Atkins. JH to issue letter formally appointing M&S as Principal Designer to discharge client duties. This letter will also discharge the duty to issue the F10 to M&S. | <b>JH</b>                  |
|    | NHS Contractors Information Pack to be issued to M&S  | <b>JH</b>                  |
|    | Health & Safety Plan plus all risk assessment and Method Statements to be issued by M&S in advance of works, allowing adequate time for review.   | <b>M&amp;S</b>             |
|    | A minor works plan to be issued in advance of the H&S plan to cover the additional variation works to Wards 2a and 2b. MMacM to review.   | <b>M&amp;S</b>             |
|    | A HAI Scribe review it to be set up with the Infection Control team for week commencing 15 <sup>th</sup> Oct to include MMacM and M&S.  | <b>JH</b>                  |

**6. Site Meetings**

It was agreed that weekly progress meetings should be scheduled for Thursday mornings at 10.00am.

**7. AOCB**

SR noted that a derogation schedule should be prepared by M&S noting where the design derogates from the specification or any relevant standard. TW to prepare a schedule of compliance requirements to assist.

**M&S/TW**

SR noted that a Risk Register for the project should be prepared and act as a live document throughout. JH to bring a template document to begin populating at the next progress meeting and add risk register review as an agenda item.

**JH**

M&S noted that CAD format drawings have yet to be provided. IP to action.

**IP**

SR confirmed that Aecom have been appointed as a Supervisor to assist the NHS in the checking of works on site, and general compliance with spec. This is a more overarching role than that being undertaken by TW as a technical adviser.

**8. Date & Time of Next Meeting**

Next meeting on 18th Oct at 10am in the Meeting Hub in the Central Medical Block, QEUH.

**NHS Greater Glasgow & Clyde  
Chlorine Dioxide ClO2 Water Treatment Project Progress Meeting  
Thursday 18<sup>th</sup> October 2018 at 10am  
Central Medical Block, QEUH**

**Present:**

|                              |   |   |
|------------------------------|---|---|
| James Huddleston (Chair)(JH) | - | Senior Project Manager, Capital Planning, NHSGG&C |
| Ian Powrie (IP)              | - | Deputy General Manager Estates, NHSGG&C, QEUH     |
| Scott Thompson (ST)          | - | Scotmas (on-site lead)                            |
| Ben Faulkner (BF)            | - | Scotmas   |
| Steve Allan (SA)             | - | Scotmas   |
| David Carmichael (DC)        | - | Project Manager, Morris & Spottiswood, (M&S)      |
| Richard Beattie (RB)         | - | Aecom   |
| Craig Patrick                | - | Atkins (Elec)                                     |

**Apologies:**

|                          |   |  |
|--------------------------|---|--|
| Mel MacMillan (MMacM)    | - | Estates Officer, NHSGG&C, QEUH                       |
| Steve Russell (SR)       | - | Principal Project Manager, Capital Planning, NHSGG&C |
| Andy Wilson (AW)         | - | Sector Estates Manager, NHSGG&C, QEUH                |
| Gary Callaghan (GC)      | - | Scotmas  |
| Tim Wafer (TW)           | - | Consultant, Water Solutions                          |
| Chris Russell (CR)       | - | Veolia   |
| Douglas Macallistar (DM) | - | Veloia   |
| Piotr Biskup             | - | Atkins (Mech)  |

**Action****1. Welcome/Introductions**

JH welcomed everyone to the meeting and introductions were made.

IP is the Technical Lead for the project and SR is the budget holder and will also be chairing meetings going forward.

**2. Contract Award**

SR confirmed that the Letter of Appointment and Purchase Orders has been issued to all parties.

Confirmation received that the additional works to Wards 2A and 2B was given formal instruction to proceed on Fri 12<sup>th</sup> Oct as a variation to contract.

Requested Bond to cover the agreed advanced payment still outstanding. Ross Miller from M&S has confirmed via email that this is being taken up with Scotmas.

**M&S**

Aecom have been appointed as Cost Advisors and will undertake the contract valuations as well as assist in cost tracking for the NHS.

**3. Contract Particulars****a. Commencement & Completion Dates**

Works to Wards 2a and 2b have now commenced from 15<sup>th</sup> October. Indicative finish date of this package is 26<sup>th</sup> Oct. All works, scheduled for completion by Jan-end 2019.

**b. Programme**

M&S confirmed that a contract programme is now in draft pending final review from all parties to be undertaken today (18<sup>th</sup> Oct) prior to issue. It was previously noted that Practical Completion will be defined as when all systems are installed and usable with TWs sign off. To include a two week verification period.

**M&S**

A tentative schedule for isolation dates has been prepared which requires clinical buy-in. IP confirmed that the Director for Adult has already been consulted and is due to take to the clinical board. A meeting has been set up for Friday 19<sup>th</sup> to undertake a similar process with the Children's.

**IP**

Veolia have provided their programme and M&S have confirmed that their programme will align are liaising to ensure this. **M&S/Veolia**

#### **Treatment Plant Installation Plan**

Treatment plant installation plan to include drawings, treatment points and break-in points, methodology, risk assessment, etc. This package is to be issued this week to all parties for review. **M&S**

#### **CIO2 Monitoring Installation Plan**

Scotmas confirmed that they are still working up the CIO2 monitoring installation plan. IP had issued a scheduled on monitoring points which still needs final agreement by all parties. There was some clarity required on the remote monitoring aspect within the wards which is still to be agreed with IP. **TW/Scotmas /IP**

#### **Go Live Plan**

Go live plan has now been received and is pending the clinical team feedback. IP to circulate documents to capital. Document should include dosing programme, monitoring requirements, etc until desired outcome is reached as covered under first year support contract. **IP**

#### **Monitoring & Test Training Plan**

M&S confirmed that they need to know roughly what number of people they will need to allow for training. IP indicated roughly 35-40 people. It is anticipated that groups of around 5 people can be trained at one time in 2-3 hour sessions. This will likely take place over a 2 week period from the 25<sup>th</sup> Jan. **M&S**

It was noted that a core team of Estates staff will need to be given high level training (emergency shutdown procedures, etc), following the completion of the 2a and 2b works on the 26<sup>th</sup> Oct. IP to confirm who should attend and Scotmas to arrange. Relevant signage should also be erected, it was noted that this signage should not be erected within public areas and procedures will need to be held by estates with notification of who to call should the alarm go off. **IP/Scotmas**

SR requested that the training be filmed so it was be reviewed at a later date as a refresher for new staff. Scotmas confirmed that may already have some training videos, M&S to provide a quote for this. SR will also liaise with NHS Medical Illustrations to see if this is something that they can assist with **M&S/SR**

#### **c. Technical Clarifications**

It was agreed that IP will lead on separate technical meetings that will be arranged ad-hoc with the relevant parties separately from weekly progress meetings **IP**

Veolia to prepare and issue methodology for the plant that needs installed. Veolia and Scotmas to review requirements together and agree dosing point. **Veolia/ Scotmas**

There was an issue noted with the hydraulic tank balance and the flow between the two. A technical review to be set up between Schnieder, Veolia and M&S is required, IP to lead. This meeting has been provisionally agreed for the 24<sup>th</sup> Oct at 2pm. **IP**

Atkins requested that a further technical meeting me set up to review their package. M&S to coordinate with the relevant parties. **M&S**

#### **4. The Site**

Contractor compound area now agreed as being shared with Brookfield. M&S to liaise direct with Brookfield to coordinate arrival of container. **M&S**

It was agreed for contractors to sign in on a weekly basis, IP noted arrangements will be made for authorised access to areas.

Basement tank room is now being used for storage of materials.



The portering manager had expressed concerns regarding the basement tunnels being used for access and delivery of materials, however IP confirmed that he still believed this to be the best route. The concern relate to clashes with the AGVs (automatic guided vehicles) in operation in the area. M&S have agreed to notify in advance of any large bits of kit being delivered so the facilities team can be notified of this.

M&amp;S

## 5. Health & Safety

### H&S Plan

Principal Designer under CDM Regs confirmed as M&S. DC confirmed that they may look to delegate this role to Atkins. Letter formally appointing M&S as Principal Designer now issued. This letter also discharges the duty to issue the F10 to M&S.

NHS Contractors Information Pack now issued to M&S

Health & Safety Plan plus all risk assessment and Method Statements to be issued by M&S in advance of works, allowing adequate time for review.

M&amp;S

A minor works plan to be issued in advance of the H&S plan to cover the additional variation works to Wards 2a and 2b. MMacM to review.

M&amp;S

A HAI Scribe review has been undertaken and issued for the wards 2a and 2b works. A further HAI Scribe to be set up once there is enough information available on what areas of the hospital will be accessed.

JH/M&amp;S

## 6. Site Meetings

It was agreed that weekly progress meetings should be scheduled for Thursday mornings at 10.00am. JH to issue recurring meeting invite

JH

## 7. AOCB

SR noted that a derogation schedule should be prepared by M&S noting where the design derogates from the specification or any relevant standard. TW to prepare a schedule of compliance requirements to assist.

M&amp;S/TW

SR noted that a Risk Register for the project should be prepared and act as a live document throughout. JH to bring a template document to begin populating at the next progress meeting and add risk register review as an agenda item.

JH

M&S noted that CAD format drawings have yet to be provided. IP to action.

IP

SR confirmed that Aecom have been appointed as a Supervisor to assist the NHS in the checking of works on site, and general compliance with spec. This is a more overarching role than that being undertaken by TW as a technical adviser. Drawings to be circulated to Aecom for review.

IP noted that the managed service contract cost is still to be committed in terms of revenue costs.

Atkins raised a number of technical queries which will be expanded upon in more detail at technical meetings.

## 8. Date & Time of Next Meeting

Next meeting on 25th Oct at 10am at Morris & Spottiswood office, 54 Helen Street, Glasgow.

**NHS Greater Glasgow & Clyde  
Chlorine Dioxide ClO<sub>2</sub> Water Treatment Project Progress Meeting  
Thursday 25<sup>th</sup> October 2018 at 10am  
Morris & Spottiswood Offices**

**Present:**

|                            |   |  |
|----------------------------|---|--|
| Steve Russell (Chair) (SR) | - | Principal Project Manager, Capital Planning, NHSGG&C |
| James Huddleston (JH)      | - | Senior Project Manager, Capital Planning, NHSGG&C    |
| Ian Powrie (IP)            | - | Deputy General Manager Estates, NHSGG&C, QEUH        |
| Andy Wilson (AW)           | - | Sector Estates Manager, NHSGG&C, QEUH                |
| David Carmichael (DC)      | - | Project Manager, Morris & Spottiswood, (M&S)         |
| Scott Thompson (ST)        | - | Scotmas (on-site lead)                               |
| Richard Beattie (RB)       | - | Aecom  |

**Apologies:**

|                          |   |                                |
|--------------------------|---|--------------------------------|
| Mel MacMillan (MMacM)    | - | Estates Officer, NHSGG&C, QEUH |
| Tim Wafer (TW)           | - | Consultant, Water Solutions    |
| Chris Russell (CR)       | - | Veolia                         |
| Douglas Macallistar (DM) | - | Veloia                         |
| Ben Faulkner (BF)        | - | Scotmas                        |
| Steve Allan (SA)         | - | Scotmas                        |
| Gary Callaghan (GC)      | - | Scotmas                        |
| Craig Patrick            | - | Atkins (Elec)                  |
| Piotr Biskup             | - | Atkins (Mech)                  |

**Action****1. Welcome/Introductions**

SR welcomed everyone to the meeting and introductions were made.

IP is the Technical Lead for the project and SR is the budget holder and will also be chairing meetings.

**2. Contract Award**

Letter of Appointments and Purchase Orders are now in place for all parties.

Wards 2A and 2B work have been instructed as a variation to contract and are underway.

Requested Bond to cover the agreed advanced payment no longer required as the materials are now on site, as such a straight forward valuation can be made.

Aecom have been appointed as Cost Advisors and will undertake the contract valuations as well as assist in cost tracking for the NHS.

IP noted that there are a number of items being discussed at technical meetings that will result in contract variations. This includes additional spool pieces, additional pipework to the plant room and additional remote monitoring probes. The costs for these to be submitted to SR as a matter of urgency as we cannot provide a formal instruction to place these orders without approvals. We could provide approvals in principal if required, however this would still in theory be a risk to M&S.

**M&S****3. Contract Particulars****a. Commencement & Completion Dates**

Works to Wards 2a and 2b have now commenced from 15<sup>th</sup> October. All works, scheduled for completion by Jan-end 2019.

**b. Programme**

M&S has now issues a draft programme. It was agreed that this would be updated and formally issues as the contract programme, although isolation dates may still be subject to change. It was previously noted that Practical Completion will be defined as when all

**M&S**

systems are installed and usable with TWs sign off. To include a two week verification period.

IP

A schedule for isolation dates has been prepared which requires clinical buy-in. IP confirmed that the Childrens are comfortable with the proposals however Anne Harkness is still to comment back on the Adult. IP to raise at Water Group.

Veolia have provided their programme and M&S have confirmed that their programmes align.

#### **Treatment Plant Installation Plan**

Installation plan now generally agreed. Package to be pulled together for issue to include drawings, treatment points and break-in points, methodology, risk assessment, etc. SR noted that an overarching project description, functionality, responsibilities and suppliers integration still needs to be prepared by M&S.

M&amp;S

#### **CIO2 Monitoring Installation Plan**

Monitoring locations have been identified and are being surveyed today (25<sup>th</sup> Oct) There is some clarifications required on the remote monitoring aspect within the wards which is still to be agreed with IP.

Scotmas  
/IP

#### **Go Live Plan**

Go live plan has now been received and is pending the clinical team feedback. Document to include dosing programme, monitoring requirements, etc until desired outcome is reached as covered under first year support contract.

IP

#### **Monitoring & Test Training Plan**

IP indicated that roughly 35-40 people will need system training. It is anticipated that groups of around 5 people can be trained at one time in 2-3 hour sessions. This will likely take place over a 2 week period which is now shown on the programme pending agreement from Scotmas.

Scotmas

It was noted that a core team of Estates staff will need to be given high level training (emergency shutdown procedures, etc), following the completion of the 2a and 2b works, Provisional dates 19,20,21 November. AW to confirm who needs the training.

AW

Relevant signage should also be erected, it was noted that this signage should not be erected within public areas and procedures will need to be held by estates with notification of who to call should the alarm go off.

SR requested that the training be filmed so it was be reviewed at a later date or for new staff. Scotmas confirmed that they will be able to provide this. M&S to advise on any related costs.

M&amp;S

#### **c. Technical Clarifications**

It was agreed that IP will lead on separate technical meetings that will be arranged ad-hoc with the relevant parties separately from weekly progress meetings

Veolia to prepare and issue methodology for the plant that needs installed. Veolia and Scotmas to review requirements together and agree dosing point.

There was an issue noted with the hydraulic tank balance and the flow between the two. A meeting has been scheduled for 29<sup>th</sup> Nov to review. Rather than modify pipework it is likely a pilot value solution will be explored.

Issue of M&S/Atkins drawings still outstanding.

M&amp;S

#### **4. The Site**

Contractor compound area now agreed as being shared with Brookfield. M&S to liaise direct with Brookfied to coordinate arrival of container, likely early week commencing 29<sup>th</sup> Nov.

It was agreed for contractors to sign in on a weekly basis, IP noted arrangements will be made for authorised access to areas.

Basement tank room is now being used for storage of materials.

The portering manager had expressed concerns regarding the basement tunnels being used for access and delivery of materials, however IP confirmed that he still believed this to be the best route. The concern relate to clashes with the AGVs (automatic guided vehicles) in operation in the area. M&S have agreed to notify in advance of any large bits of kit, AW and Billy Macdonald to be copied into these notifications.

M&amp;S

## 5. Health & Safety

### H&S Plan

A letter formally appointing M&S as Principal Designer under CDM Regs has now been issued. DC confirmed that they may look to delegate this role to Faithful & Gould. DC to confirm in writing if this is the case. The duty to issue the F10 has also been discharged to M&S, a copy of the F10 to be provided to JH.

M&amp;S

NHS Contractors Information Pack now issued to M&S

The pre-construction Health & Safety Plan plus all risk assessment and Method Statements has now been issued by DC. The Principal Designer is to review the content of this document and confirm back to JH in writing that they are happy with its content.

M&amp;S

A HAI Scribe review has been undertaken and issued for the wards 2a and 2b works. A further HAI Scribe to be set up once there is enough information available on what areas of the hospital will be accessed.

JH/M&amp;S

## 6. Meetings

It was agreed that weekly progress meetings should be scheduled for Thursday mornings at 10.00am. A recurring meeting invite has been issued. Technical meetings are also scheduled weekly on Wednesdays, this is to be reviewed going forward.

## 7. AOCB

A draft derogation schedule is still outstanding noting where the design derogates from the specification or any relevant standard. It was noted that there is already a couple of known derogations emerging. TW to prepare a schedule of compliance requirements to assist.

M&amp;S

A draft generic Risk Register has been circulated which is non-project specific. All parties to review and return comments to JH. A risk register review to take place after the next technical meeting on Wed 31<sup>st</sup> Oct.

All

M&S noted that CAD format drawings have yet to be provided which is giving Atkins problems creating drawings. IP has requested the required drawings and xrefs from Brookfield.

IP

Aecom have been appointed as a Supervisor to assist the NHS in the checking of works on site, and general compliance with spec. This is a more overarching role than that being undertaken by TW as a technical adviser. Drawings to be circulated to Aecom for review.

A purchase order has now been raised to cover the first years managed service contract.

**8. Date & Time of Next Meeting**

Next Technical meeting on 31st Oct at 10am at Central Medical Block, QEUH.

Next Progress meeting on 1<sup>st</sup> Nov at 10am at Morris & Spottiswood office, 54 Helen Street, Glasgow.

**NHS Greater Glasgow & Clyde  
Chlorine Dioxide ClO<sub>2</sub> Water Treatment Project Progress Meeting  
Thursday 1<sup>st</sup> November 2018 at 10am  
Morris & Spottiswood Offices**

**Present:**

|                            |   |  |
|----------------------------|---|--|
| Steve Russell (Chair) (SR) | - | Principal Project Manager, Capital Planning, NHSGG&C |
| James Huddleston (JH)      | - | Senior Project Manager, Capital Planning, NHSGG&C    |
| Ian Powrie (IP)            | - | Deputy General Manager Estates, NHSGG&C, QEUH        |
| Andy Wilson (AW)           | - | Sector Estates Manager, NHSGG&C, QEUH                |
| David Carmichael (DC)      | - | Project Manager, Morris & Spottiswood, (M&S)         |
| Scott Thompson (ST)        | - | Scotmas (on-site lead)                               |
| Richard Beattie (RB)       | - | Aecom  |
| Tim Wafer (TW)             | - | Consultant, Water Solutions                          |
| Stephen Clark (SC)         | - | Atkins   |

**Apologies:**

|                          |   |                                |
|--------------------------|---|--------------------------------|
| Mel MacMillan (MMacM)    | - | Estates Officer, NHSGG&C, QEUH |
| Chris Russell (CR)       | - | Veolia                         |
| Douglas Macallistar (DM) | - | Veolia                         |
| Ben Faulkner (BF)        | - | Scotmas                        |
| Alistair Cameron         | - | Scotmas                        |
| Craig Patrick            | - | Atkins (Elec)                  |
| Piotr Biskup             | - | Atkins (Mech)                  |

**Action****1. Welcome/Introductions**

SR welcomed everyone to the meeting and introductions were made.

IP is the Technical Lead for the project and SR is the budget holder and will also be chairing meetings.

**2. Contract Award**

Letter of Appointments and Purchase Orders are now in place for all parties.

Wards 2A and 2B work have been instructed as a variation to contract and are underway.

Requested Bond to cover the agreed advanced payment no longer required as the materials are now on site, as such a straight forward valuation can be made.

Aecom have been appointed as Cost Advisors and will undertake the contract valuations as well as assist in cost tracking for the NHS.

IP noted that there are a number of items being discussed at technical meetings that will result in contract variations. This includes additional spool pieces, additional pipework to the plant room and additional remote monitoring probes. The costs for these to be submitted by M&S by close of play Friday 2<sup>nd</sup> Nov.

**DC**

A formal instruction cannot be provided to allow orders to be placed for additional items without prior approvals. We could provide approvals in principal if required, however this would still in theory be a risk to M&S.

**3. Contract Particulars****a. Commencement & Completion Dates**

Works to Wards 2a and 2b have now commenced from 15<sup>th</sup> October. All works, scheduled for completion by Jan-end 2019. It was noted that the 2a and 2b works would be completed and in a position to go live by 12<sup>th</sup> Nov.

- b. **Programme** DC  
M&S have now issued a draft programme. Any final comments to be returned to DC by noon on 2<sup>nd</sup> Nov with the construction issue of the programme to be formally issued by close of play on the 2<sup>nd</sup>.
- It was previously noted that Practical Completion will be defined as when all systems are installed and usable with TWs sign off. To include a two week verification period.
- A schedule for isolation dates has been prepared which requires clinical buy-in. IP confirmed that the services have been consulted and is awaiting final approvals. IP
- Veolia have provided their programme and M&S have confirmed that their programmes align.
- Overarching Plan** DC  
An overarching document covering the various 4 plans noted below including project description, functionality, responsibilities and suppliers integration still outstanding. DC to issue by close of play Wednesday 7<sup>th</sup> Nov.
- Treatment Plant Installation Plan**  
Installation plan now generally agreed. Package to be pulled together for issue to include drawings, treatment points and break-in points, methodology, risk assessment, etc.
- CIO2 Monitoring Installation Plan**  
Monitoring locations have been identified and surveyed. There is some clarifications required on the remote monitoring aspect within the wards which is still to be agreed with IP.
- Go Live Plan**  
Go live plan has now been received and is pending the clinical team feedback. Document to include dosing programme, monitoring requirements, etc until desired outcome is reached as covered under first year support contract.
- Monitoring & Test Training Plan**  
IP indicated that roughly 35-40 people will need system training. It is anticipated that groups of around 5 people can be trained at one time in 2-3 hour sessions. This will likely take place over a 2 week period which is now shown on the programme pending agreement from Scotmas.
- It was noted that a core team of Estates staff will need to be given high level training (emergency shutdown procedures, etc), following the completion of the 2a and 2b works, Provisional dates 19,20,21 November. AW to confirm who needs the training. AW
- Relevant signage should also be erected, it was noted that this signage should not be erected within public areas and procedures will need to be held by estates with notification of who to call should the alarm go off.
- SR requested that the training be filmed so it was be reviewed at a later date or for new staff. Scotmas confirmed that they will be able to provide this. M&S to advise on any related costs. DC
- c. **Technical Clarifications**  
It was agreed that IP will lead on separate technical meetings.
- Veolia to prepare and issue methodology for the plant that needs installed. Veolia and Scotmas to review requirements together and agree dosing point.
- There was an issue noted with the hydraulic tank balance and the flow between the two. Rather than modify pipework it is likely a pilot valve solution will be explored.
- Issue of Atkins drawings have now been issued however were unable to be opened. DC to arrange for these to be forwarded to all as a zip file on 1<sup>st</sup> Nov. DC

#### 4. The Site

Contractor compound area now agreed as being shared with Brookfield. M&S to liaise direct with Brookfield to coordinate arrival of container, likely early week commencing 29<sup>th</sup> Nov.

It was agreed for contractors to sign in on a weekly basis, IP noted arrangements will be made for authorised access to areas.

Basement tank room is now being used for storage of materials.

The portering manager had expressed concerns regarding the basement tunnels being used for access and delivery of materials, however IP confirmed that he still believed this to be the best route. The concern relate to clashes with the AGVs (automatic guided vehicles) in operation in the area. M&S have agreed to notify in advance of any large bits of kit, AW and Billy Macdonald to be copied into these notifications. The filtration plant delivery is currently scheduled for 17<sup>th</sup> Dec.

DC

It was noted that a permit for work via MMacM should be in place before any break-ins or isolations are undertaken. In any instance where a specific permit does not exist, the generic template should be used.

#### 5. Health & Safety

##### H&S Plan

A letter formally appointing M&S as Principal Designer under CDM Regs has now been issued. DC confirmed that they have delegated this role to Faithful & Gould. Named person is Derek Ramage, SC to confirm this as an email and forward Dereks details to JH for record.

SC

The duty to issue the F10 has also been discharged to M&S, a copy of the F10 has now been provided.

NHS Contractors Information Pack now issued to M&S

The pre-construction Health & Safety Plan plus all risk assessment and Method Statements has now been issued by DC. The Principal Designer (Derek Ramage) is to review the content of this document and confirm back to JH in writing that they are happy with its content.

DC/  
Derek  
Ramage

A HAI Scribe review has been undertaken and issued for the wards 2a and 2b works. A further HAI Scribe to be set up once a plan has been provided indicating what areas are to be accessed. DC to forward this plan.

DC

#### 6. Meetings

It was agreed that weekly progress meetings will be combined with technical meetings and scheduled for Thursday mornings at 9am. A recurring meeting invite has been issued.

#### 7. AOCB

A draft derogation schedule is still outstanding noting where the design derogates from the specification or any relevant standard. It was noted that there is already a couple of known derogations emerging. TW to prepare a schedule of compliance requirements to assist.

DC/TW

A draft generic Risk Register has been circulated which is non-project specific. All parties to review and return comments to JH by close of play 7<sup>th</sup> Nov.

All



M&S noted that CAD format drawings have yet to be provided which is giving Atkins problems creating drawings. IP has requested the required drawings and xrefs from Brookfield however nothing has yet been provided to him.

IP

Aecom have been appointed as a Supervisor to assist the NHS in the checking of works on site, and general compliance with spec. This is a more overarching role than that being undertaken by TW as a technical adviser. Drawings to be circulated to Aecom for review.

A purchase order has now been raised to cover the first years managed service contract.

A significant issue was raised in relation to the as fitted pipework within the main plant areas. It would appear that what is fitted does not match the as built record information and the pipework is instead a non-standard Italian brand called Italinox. This could mean it is not possible to find fittings to connect to this as the size is non-standard. Urgent further investigation is required into this with any programme implications or otherwise reported asap.

DC/All

#### **8. Date & Time of Next Meeting**

The next meeting will combine both progress and technical reviews and will be on Thursday 8<sup>th</sup> November at 9am at Morris & Spottiswood offices, 54 Helen Street, Glasgow.

**NHS Greater Glasgow & Clyde  
Chlorine Dioxide ClO<sub>2</sub> Water Treatment Project Progress & Technical Meeting  
Thursday 8<sup>th</sup> November 2018 at 9am  
Morris & Spottiswood Offices**

**Present:**

|                            |   |  |
|----------------------------|---|--|
| Steve Russell (Chair) (SR) | - | Principal Project Manager, Capital Planning, NHSGG&C |
| James Huddleston (JH)      | - | Senior Project Manager, Capital Planning, NHSGG&C    |
| Ian Powrie (IP)            | - | Deputy General Manager Estates, NHSGG&C, QEUH        |
| Andy Russell (AR)          | - | Morris & Spottiswood, (M&S)                          |
| Scott Thompson (ST)        | - | Scotmas (on-site lead)                               |
| Alistair Cameron (AC)      | - | Scotmas  |
| Richard Beattie (RB)       | - | Aecom  |
| Alan Cameron (ACam)        | - |  |

**Apologies:**

|                          |   |  |
|--------------------------|---|--|
| Andy Wilson (AW)         | - | Sector Estates Manager, NHSGG&C, QEUH        |
| David Carmichael (DC)    | - | Project Manager, Morris & Spottiswood, (M&S) |
| Tim Wafer (TW)           | - | Consultant, Water Solutions                  |
| Stephen Clark (SC)       | - | Atkins                                       |
| Mel MacMillan (MMacM)    | - | Estates Officer, NHSGG&C, QEUH               |
| Chris Russell (CR)       | - | Veolia                                       |
| Douglas Macallistar (DM) | - | Veolia                                       |
| Ben Faulkner (BF)        | - | Scotmas                                      |
| Craig Patrick            | - | Atkins (Elec)                                |
| Piotr Biskup             | - | Atkins (Mech)                                |

**Action****1. Welcome/Introductions**

SR welcomed everyone to the meeting and introductions were made.

IP is the Technical Lead for the project and SR is the budget holder and will also be chairing meetings.

**2. Contract Award**

Letter of Appointments and Purchase Orders are now in place for all parties.

Wards 2A and 2B work have been instructed as a variation to contract and are underway.

Requested Bond to cover the agreed advanced payment no longer required as the materials are now on site, as such a straight forward valuation can be made.

Aecom have been appointed as Cost Advisors and will undertake the contract valuations as well as assist in cost tracking for the NHS.

IP noted that there are a number of items being discussed at technical meetings that will result in contract variations. This includes additional spool pieces, additional pipework to the plant room and additional remote monitoring probes. Approximate costs for these have now been submitted by M&S, however these still require further review.

**DC/IP**

A formal instruction cannot be provided to allow orders to be placed for additional items without prior approvals. We could provide approvals in principal if required, however this would still in theory be a risk to M&S.

### 3. Contract Particulars

#### a. Commencement & Completion Dates

Works to Wards 2a and 2b have now commenced from 15<sup>th</sup> October. All works, scheduled for completion by Jan-end 2019. It was noted that the 2a and 2b works would be completed and in a position to go live by 12<sup>th</sup> Nov.

#### b. Programme

M&S have now issued a draft programme. No further comments were returned to DC. Formal construction issue of this programme now overdue.

**M&S**

It was previously noted that Practical Completion will be defined as when all systems are installed and usable with TWs sign off. To include a two week verification period.

A schedule for isolation dates has been prepared. IP confirmed that the services have been consulted and he is due to meet with clinical directors to get final buy in as there are significant clinical implications for these isolations. A further walk round was scheduled for after this meeting by AR and he will confirm to IP if he can commit to the isolation dates noted in the schedule immediately following this.

**M&S/IP**

Veolia have provided their programme and M&S have confirmed that their programmes align.

#### Overarching Plan

An overarching document covering the various 4 plans noted below including project description, functionality, responsibilities and suppliers integration still outstanding. This was due to be issued by close of play Wednesday 7<sup>th</sup> Nov and is now overdue. Tim Wafer and David Carmichael to liaise and issue ASAP.

#### Treatment Plant Installation Plan

Installation plan now generally agreed. Package to be pulled together for issue to include drawings, treatment points and break-in points, methodology, risk assessment, etc.

#### CIO2 Monitoring Installation Plan

Monitoring locations have been identified and surveyed. There is some clarifications required on the remote monitoring aspect within the wards which is still to be agreed with IP.

#### Go Live Plan

Go live plan has now been received and is pending the clinical team feedback. Document to include dosing programme, monitoring requirements, etc until desired outcome is reached as covered under first year support contract.

#### Monitoring & Test Training Plan

IP indicated that roughly 35-40 people will need system training. It is anticipated that groups of around 5 people can be trained at one time in 2-3 hour sessions. This will likely take place over a 2 week period which is now shown on the programme pending agreement from Scotmas.

It was noted that a core team of Estates staff will need to be given high level training (emergency shutdown procedures, etc), following the completion of the 2a and 2b works, Provisional dates 19,20,21 November. AW to confirm who needs the training.

**AW**

Relevant signage should also be erected, it was noted that this signage should not be erected within public areas and procedures will need to be held by estates with notification of who to call should the alarm go off.

SR requested that the training be filmed so it was be reviewed at a later date or for new staff. Scotmas confirmed that they will be able to provide this. M&S to advise on any related costs.

**DC**

c. **Technical Clarifications**

It was agreed that IP will lead on separate technical meetings.

Veolia to prepare and issue methodology for the plant that needs installed. Veolia and Scotmas to review requirements together and agree dosing point.

There was an issue noted with the hydraulic tank balance and the flow between the two. Rather than modify pipework it is likely a pilot valve solution will be explored.

Issue of Atkins drawings have now been issued however were unable to be opened. DC to arrange for these to be forwarded to all as a zip file on 1<sup>st</sup> Nov.

*Post meeting note: these drawings have now been circulated in zip file format 08/11/18.*

RB at Aecom has now provided initial commentary based on the circulated drawings. M&S to provide a coordinated response to these queries.

**M&S**

4. **The Site**

Contractor compound area now agreed as being shared with Brookfield. M&S to liaise direct with Brookfield to coordinate arrival of container.

It was agreed for contractors to sign in on a weekly basis, IP noted arrangements will be made for authorised access to areas.

Basement tank room is now being used for storage of materials.

The portering manager had expressed concerns regarding the basement tunnels being used for access and delivery of materials, however IP confirmed that he still believed this to be the best route. The concern relate to clashes with the AGVs (automatic guided vehicles) in operation in the area. M&S have agreed to notify in advance of any large bits of kit, AW and Billy Macdonald to be copied into these notifications. The filtration plant delivery is currently scheduled for 17<sup>th</sup> Dec.

**note**

It was noted that a permit for work via MMacM should be in place before any break-ins or isolations are undertaken. In any instance where a specific permit does not exist, the generic template should be used.

Scotmas raised a concern that they are having difficulty accessing keys to plant areas, risers, etc. IP agreed to issue them additional keys following the meeting.

**IP**

5. **Health & Safety**

**H&S Plan**

A letter formally appointing M&S as Principal Designer under CDM Regs has now been issued. DC confirmed that they have delegated this role to Faithful & Gould. Named person is Derek Ramage.

The duty to issue the F10 has also been discharged to M&S, a copy of the F10 has now been provided.

NHS Contractors Information Pack now issued to M&S

The pre-construction Health & Safety Plan plus all risk assessment and Method Statements has now been issued by DC. The Principal Designer (Derek Ramage) is to review the content of this document and confirm back to JH in writing that they are happy with its content. This is still outstanding.

**DC/DR**

A HAI Scribe review has been undertaken and issued for the wards 2a and 2b works. A further HAI Scribe to be set up once a plan has been provided indicating what clinical areas are to be accessed, primarily for the remote monitoring. DC/IP to forward this plan.

**IP/DC**

**6. Meetings**

It was agreed that weekly technical meetings will be undertaken prior to the weekly progress meeting. These are scheduled for Thursday mornings at 9am. A recurring meeting invite has been issued.

**7. AOCB**

Tim Wafer to issue a schedule of compliances and design standards, this is now overdue. TW agreed to have this issued by close of play Monday 12<sup>th</sup> Nov. **TW**

Upon receipt of the schedule of compliance, M&S to prepare a derogation schedule noting where the design derogates from the specification or any relevant standard. This is a live document and should to be completely separate from cost information. **M&S**

A draft generic Risk Register was circulated and no comments were received back. JH will now update register to include known project risks and allocate risk accordingly prior to reissue. This should be reviewed by all as it requires team buy-in and kept under review at regular intervals. **JH**

M&S noted that CAD format drawings have yet to be provided which is giving Atkins problems creating drawings. IP has requested the required drawings and xrefs from Brookfield and has been told he should receive them on a memory stick this week. **IP**

Aecom have been appointed as a Supervisor to assist the NHS in the checking of works on site, and general compliance with spec. This is a more overarching role than that being undertaken by TW as a technical adviser.

A purchase order has now been raised to cover the first years managed service contract.

A significant issue was raised in relation to the as fitted pipework within the main plant areas. It would appear that what is fitted does not match the as built record information and the pipework is instead a mix of non-standard Italian brand called Italinox and Finnish pipework. It was noted that the Italinox is not WRAS approved.. Works are ongoing to reach a resolution. IP will provide a letter of comfort for the contractors to allow them to connect into this non-standard pipework and the issue will be taken up outside of this project team. **IP**

**8. Date & Time of Next Meeting**

The next meeting will combine both progress and technical reviews and will be on Thursday 15th November at 9am at Morris & Spottiswood offices, 54 Helen Street, Glasgow.

**NHS Greater Glasgow & Clyde  
Chlorine Dioxide ClO<sub>2</sub> Water Treatment Project Progress & Technical Meeting  
Thursday 15<sup>th</sup> November 2018 at 9am  
Morris & Spottiswood Offices  
Revision A**

**Present:**

|                            |   |  |
|----------------------------|---|--|
| Steve Russell (Chair) (SR) | - | Principal Project Manager, Capital Planning, NHSGG&C |
| James Huddleston (JH)      | - | Senior Project Manager, Capital Planning, NHSGG&C    |
| Ian Powrie (IP)            | - | Deputy General Manager Estates, NHSGG&C, QEUH        |
| Andy Wilson (AW)           | - | Sector Estates Manager, NHSGG&C, QEUH                |
| David Carmichael (DC)      | - | Project Manager, Morris & Spottiswood, (M&S)         |
| Tim Wafer (TW)             | - | Consultant, Water Solutions                          |
| Scott Thompson (ST)        | - | Scotmas (on-site lead)                               |
| Richard Beattie (RB)       | - | Aecom  |
| Craig Patrick              | - | Atkins (Elec)  |

**Apologies:**

|                          |   |                                |
|--------------------------|---|--------------------------------|
| Andy Russell (AR)        | - | Morris & Spottiswood, (M&S)    |
| Alistair Cameron (AC)    | - | Scotmas                        |
| Stephen Clark (SC)       | - | Atkins                         |
| Mel MacMillan (MMacM)    | - | Estates Officer, NHSGG&C, QEUH |
| Chris Russell (CR)       | - | Veolia                         |
| Douglas Macallistar (DM) | - | Veolia                         |
| Ben Faulkner (BF)        | - | Scotmas                        |
| Piotr Biskup (PB)        | - | Atkins (Mech)                  |

**Action****1. Welcome/Introductions**

SR welcomed everyone to the meeting and introductions were made.

IP is the Technical Lead for the project and SR is the budget holder and will also be chairing meetings.

**2. Contract Award**

Letter of Appointments and Purchase Orders are now in place for all parties.

Wards 2A and 2B work have been instructed as a variation to contract and are underway.

Requested Bond to cover the agreed advanced payment no longer required as the materials are now on site, as such a straight forward valuation can be made.

Aecom have been appointed as Cost Advisors and will undertake the contract valuations as well as assist in cost tracking for the NHS.

Cost breakdown for all variations now urgently required. The various contract variations have been listed and issued by DC. Provisional costs for these have now been submitted however final costs need to be submitted prior to QS review.

**DC**

A cost breakdown from M&S and Scotmas is required by close of play 15<sup>th</sup> Nov detailing the proposed temporary installation variation. There appears to have been a miscommunication with the NHS expecting a different figure than what has now been presented. The price presented at this progress meeting is £24k and requires urgent review prior to instruction.

**DC/SR**

*Post meeting note: Works now instructed, however full cost breakdown still required for cost advisor review.*

It was stressed again by the NHS that the uncertainty around price is a significant concern as additional board approvals are already being sought.

A formal instruction cannot be provided to allow orders to be placed for additional items without prior approvals. We could provide approvals in principal if required, however this would still in theory be a risk to M&S.

### 3. **Contract Particulars**

#### a. **Commencement & Completion Dates**

Works to Wards 2a and 2b have now commenced from 15<sup>th</sup> October. All works, scheduled for completion by Jan-end 2019.

#### b. **Programme**

M&S have now issued a draft programme. No further comments were returned to DC. Formal construction issue of this programme now overdue. SR stressed the importance of this being issued and DC committed to issuing it by close of play 16<sup>th</sup> Nov. It was noted that some dates, etc are still not fixed, however a revised programme can be issued once these are agreed.

DC

It was previously noted that Practical Completion will be defined as when all systems are installed and usable with TWs sign off. To include a two week verification period.

M&amp;S/IP

A programme showing break in/isolation dates and the proposed go live dates has now been issued and agreed with IP. IP confirmed that the clinical services have been consulted and are cited on these dates.

note

Veolia have provided their programme and M&S have confirmed that their programmes align.

#### **Overarching Plan**

An overarching document covering the various 4 plans noted below including project description, functionality, responsibilities and supplier's integration is now overdue. Tim Wafer committed to issue by close of play 19<sup>th</sup> Nov.

TW

A more robust change control procedure is to be agreed once TW overarching plan received.

#### **Treatment Plant Installation Plan**

Installation plan now generally agreed. Package to be pulled together for issue to include drawings, treatment points and break-in points, methodology, risk assessment, etc.

#### **CIO2 Monitoring Installation Plan**

Monitoring locations have been identified and surveyed. There is some clarifications required on the remote monitoring aspect within the wards which is still to be agreed with IP.

#### **Go Live Plan**

Go live plan has now been programmed and the clinical team are cited. Document to include dosing programme, monitoring requirements, etc until desired outcome is reached as covered under first year support contract. Remote monitoring is not yet shown on go live plan as instruction has not been received.

#### **Monitoring & Test Training Plan**

IP indicated that roughly 35-40 people will need system training. It is anticipated that groups of around 5 people can be trained at one time in 2-3 hour sessions. This will likely take place over a 2 week period which is now shown on the programme pending agreement from Scotmas.

It was noted that a core team of Estates staff will need to be given high level training (emergency shutdown procedures, etc), following the completion of the 2a and 2b works. AW has requested that training be carried out on the 20<sup>th</sup> and 21<sup>st</sup> November, both as day shift training and evening (after 7pm). This will tie in with shift rotations for estates staff. Scotmas have confirmed that this can be accommodated and will arrange accordingly.

ST

Relevant signage should also be erected, it was noted that this signage should not be erected within public areas and procedures will need to be held by estates with notification of who to call should the alarm go off.

SR requested that the training be filmed. Scotmas confirmed that they will be able to provide this. M&S to advise on any related costs.

DC

c. **Technical Clarifications**

It was agreed that IP will lead on separate technical meetings.

Veolia to prepare and issue methodology for the plant that needs installed. Veolia and Scotmas to review requirements together and agree dosing point.

There was an issue noted with the hydraulic tank balance and the flow between the two. A solution for this has now been identified, Atkins to prepare a methodology on the adjustable valve.

CP

Atkins drawings have now been in zip file format 08/11/18. Atkins have confirmed that imminent drawing revisions will be issued in due course.

RB at Aecom has now provided initial commentary based on the circulated drawings. M&S have asked Atkins to collate and return commentary.

CP

It was noted that drawings have yet to be issued covering the temporary installation works. CP confirmed that he will email round confirmation as to when these will be issued.

CP

TW noted that the Renal installation inclusive of BMS linked integrity needs to be completed prior to anything else going live. BMS tie in should be included throughout prior to go live dates.

4. **The Site**

Contractor compound had previously been agreed as being shared with Multiplex. Upon arrival of container, M&S were told they could not use the area. This appears to be a communication issue. Multiplex site manager to have prior notice of the container arriving. A lifting plan/RAMS should be circulated to all (including Multiplex) in advance to cover as part of CDM requirements. M&S to liaise direct with Multiplex to coordinate arrival of container.

DC

Basement tank room is now being used for storage of materials.

The portering manager had expressed concerns regarding the basement tunnels being used for access and delivery of materials, however IP confirmed that he still believed this to be the best route. The concern relate to clashes with the AGVs (automatic guided vehicles) in operation in the area. M&S have agreed to notify in advance of any large bits of kit, AW and Billy Macdonald to be copied into these notifications. The filtration plant delivery is currently scheduled for 17<sup>th</sup> Dec.

It was noted that a permit for work via MMacM should be in place before any break-ins or isolations are undertaken. In any instance where a specific permit does not exist, the generic template should be used.

Scotmas/M&S noted they are still having access difficulties. AW noted that access cards had been cancelled as a security precaution, however new passes can be arranged through AW. DC committed to providing AW with weekly updates on who is holding the access cards.

DC



## 5. Health & Safety

### H&S Plan

A letter formally appointing M&S as Principal Designer under CDM Regs has now been issued. DC confirmed that they have delegated this role to Faithful & Gould. Named person is Derek Ramage.

The duty to issue the F10 has also been discharged to M&S, a copy of the F10 has now been provided.

NHS Contractors Information Pack now issued to M&S

The construction Health & Safety Plan plus all risk assessment and Method Statements has now been issued by DC. The Principal Designer (Derek Ramage) is in the process of reviewing its content and is to confirm back to JH in writing that they are happy with its content. This is still outstanding.

DC/DR

A HAI Scribe review has been undertaken and issued for the wards 2a and 2b works. A further HAI Scribe to be set up once a plan has been provided indicating what clinical areas are to be accessed, primarily for the remote monitoring. IP to forward this plan.

IP

## 6. Meetings

It was agreed that weekly technical meetings will be undertaken prior to the weekly progress meeting. These are scheduled for Thursday mornings at 9am. A recurring meeting invite has been issued.

## 7. Commissioning

It was noted that the required leachate flushing has not been allowed for by M&S as part of the 2A and 2B commissioning. This could have an impact on the go live date as a 9 day programme of leachate flushing should have been allowed for. Concerns were raised as to why this was not considered by M&S and further discussion will be required on this item. Up to 12m of pipework in total is affected.

IP to talk with Authorising Engineer to determine if there is any way we can sign off on the leachate flushing or somehow reduce the 9 day programme to mitigate delay to the 2A and 2B go live date of 19<sup>th</sup> Nov.

IP

It was noted that leachate flushing must be allowed for throughout the project with adequate time identified within the programme. DC to ensure programme inclusion.

DC

Prior to any go live date, all commissioning documentation, pressure testing, etc should be collated and issued to allow review.

DC

## 8. AOCB

Tim Wafer has now issued a schedule of compliances and design standards.

Upon receipt of the schedule of compliance, M&S to prepare a derogation schedule noting where the design derogates from the specification or any relevant standard. This is a live document and should to be completely separate from cost information.

M&S

A draft generic Risk Register was circulated, DC has returned commentary. JH will now update register to include known project risks and allocate risk accordingly prior to reissue. This should be reviewed by all as it requires team buy-in and kept under review at regular intervals.

JH

M&S noted that CAD format drawings have yet to be provided. IP has confirmed that Multiplex has now provided DWGs and XREFs and will arrange for issue.

IP

Aecom have been appointed as a Supervisor to assist the NHS in the checking of works on site, and general compliance with spec. This is a more overarching role than that being undertaken by TW as a technical adviser.

A purchase order has now been raised to cover the first years managed service contract.

Fitted pipework in main plant area does not match the as built record information and is instead a mix of non-standard Italian brand called Italinox and Finnish pipework. It was noted that the Italinox is not WRAS approved. IP has subsequently arranged for the AE to issue a letter of comfort regarding the existing pipework.

IP

DC noted that a number of project related emails have been marked as spam and are not getting through.

note

It was noted that John O'Rourke from the estates team has been put in charge of coordinating works on site from an NHS perspective.

Details of chemical store outhouse to be circulated.

DC

Confirmation required from the designers regarding statutory consent requirements for the outhouse.

DC

#### 9. **Date & Time of Next Meeting**

The next meeting will combine both progress and technical reviews and will be on Thursday 22nd November at 9am at Morris & Spottiswood offices, 54 Helen Street, Glasgow.

**NHS Greater Glasgow & Clyde  
Chlorine Dioxide ClO<sub>2</sub> Water Treatment Project Progress & Technical Meeting  
Thursday 22<sup>nd</sup> November 2018 at 9am  
Morris & Spottiswood Offices**

**Present:**

|                                  |   |  |
|----------------------------------|---|--|
| Steve Russell (Chair) (SR)       | - | Principal Project Manager, Capital Planning, NHSGG&C |
| James Huddleston (JH)            | - | Senior Project Manager, Capital Planning, NHSGG&C    |
| Ian Powrie (IP)                  | - | Deputy General Manager Estates, NHSGG&C, QEUH        |
| Andy Wilson (AW)                 | - | Sector Estates Manager, NHSGG&C, QEUH                |
| David Carmichael (DC)            | - | Project Manager, Morris & Spottiswood, (M&S)         |
| Scott Thompson (ST)              | - | Scotmas (on-site lead)                               |
| Richard Beattie (RB)             | - | Aecom  |
| Craig Patrick (CP)               | - | Atkins (Elec)  |
| Tim Wafer (conference call) (TW) | - | Consultant, Water Solutions                          |

**Apologies:**

|                          |   |                                |
|--------------------------|---|--------------------------------|
| Andy Russell (AR)        | - | Morris & Spottiswood, (M&S)    |
| Alistair Cameron (AC)    | - | Scotmas                        |
| Stephen Clark (SC)       | - | Atkins                         |
| Mel MacMillan (MMacM)    | - | Estates Officer, NHSGG&C, QEUH |
| Chris Russell (CR)       | - | Veolia                         |
| Douglas Macallistar (DM) | - | Veolia                         |
| Ben Faulkner (BF)        | - | Scotmas                        |
| Piotr Biskup (PB)        | - | Atkins (Mech)                  |

**Action****1. Welcome/Introductions**

SR welcomed everyone to the meeting and introductions were made.

IP is the Technical Lead for the project and SR is the budget holder and will also be chairing meetings.

**2. Contract Award**

Letter of Appointments and Purchase Orders are now in place for all parties.

Wards 2A and 2B work have been instructed as a variation to contract and are underway with dosing going live w/c 19<sup>th</sup> Nov.

Requested Bond to cover the agreed advanced payment no longer required.

Provisional costs for the various contract variations have been listed and issued by DC. Final costs outstanding for QS review. DC confirmed these will be issued prior to the next progress meeting on 29<sup>th</sup> Nov.

**DC**

The plant room temporary installation works variation has now been instructed. A full cost breakdown still required for cost advisor review.

**DC**

It was stressed again by the NHS that the uncertainty around price is a significant concern as additional board approvals are already being sought.

A formal instruction cannot be provided to allow orders to be placed for additional items without prior approvals. We could provide approvals in principal if required, however this would still in theory be a risk to M&S.

A quotation has been provided from Veolia to fit the flow meter to the filtration plant. JH to instruct and ensure PO cover.

**JH**

### 3. Contract Particulars

#### a. Commencement & Completion Dates

Works to Wards 2a and 2b commenced 15<sup>th</sup> October with system now live. All works, scheduled for completion by Jan-end 2019.

#### b. Programme

M&S have now issued a draft programme. Formal construction issue of this programme now overdue by some weeks. DC committed to having this programme issued by close of 22<sup>nd</sup> Nov.

DC

It was previously noted that Practical Completion will be defined as when all physical works are completed, working and signed off by TW.

A programme showing break in/isolation dates and the proposed go live dates has now been issued and agreed with IP. IP confirmed that the clinical services have been consulted and are cited on these dates.

Veolia have provided their programme and M&S have confirmed that their programmes align.

#### Overarching Plan

An overarching document has been issued by TW however some key information is missing, IP has subsequently spoken with TW to clarify the requirements of this document. TW committed to issue by close of play 27th Nov.

TW

A more robust change control procedure is to be agreed once TW overarching plan received.

#### Treatment Plant Installation Plan

Installation plan now generally agreed. Package to be pulled together for issue to include drawings, treatment points and break-in points, methodology, risk assessment, etc.

#### CIO2 Monitoring Installation Plan

Remote monitoring locations have now been identified by IP and require to be surveyed with Scotmas to agree.

IP/ST

#### Go Live Plan

Go live plan has now been programmed and the clinical team are cited. Document to include dosing programme, monitoring requirements, etc until desired outcome is reached as covered under first year support contract. Remote monitoring is not yet shown on go live plan as instruction has not been received.

#### Monitoring & Test Training Plan

IP indicated that roughly 35-40 people will need system training. Groups of around 5 people can be trained at one time in 2-3 hour sessions, taking place over a 2 week period which is now shown on the programme.

A core team of Estates staff will need to be given high level training (emergency shutdown procedures, etc), following the completion of the 2a and 2b works. AW has requested that training be carried out on the 20<sup>th</sup> and 21<sup>st</sup> November, both as day shift training and evening (after 7pm). This will tie in with shift rotations for estates staff. Scotmas have confirmed that this can be accommodated and will arrange accordingly.

ST

Relevant signage should also be erected, it was noted that this signage should not be erected within public areas and procedures will need to be held by estates with notification of who to call should the alarm go off.

SR requested that the training be filmed. Scotmas confirmed that they are happy to accommodate however cannot provide the 'film crew'. M&S to advise costs to provide the filming and NHS will speak internally with medical illustration team to determine if they can assist.

DC/SR

c. **Technical Clarifications**

It was agreed that IP will lead on separate technical meetings.

There was an issue with the hydraulic tank balance and the flow between the two. A solution for this has now been identified, Atkins to issue a methodology on the adjustable valve.

CP

Atkins drawings have now been circulated in zip file format 08/11/18. Further drawing revisions have been issued 22/11/18.

RB at Aecom provided initial commentary based on the circulated drawings. Initial responses from Atkins were discussed at the progress meeting with some requiring Scotmas input. Once received, a collated response to be issued by M&S.

DC

Drawings have yet to be issued covering the temporary installation works. CP confirmed that he will email round confirmation as to when these will be issued.

CP

Atkins to update tender issued schematic drawings and issue.

CP

TW noted that the Renal installation inclusive of BMS linked integrity needs to be completed prior to anything else going live. BMS tie in should be included throughout prior to go live dates.

4. **The Site**

Sharing a compound with Multiplex has created considerable logistical hassle and it was agreed that an alternative space to land M&S container should be found (rear of labs). IP to discuss with Karen Connelly and confirm. A lifting plan/RAMS should be circulated to all in advance of container arriving on site.

IP/DC

Basement tank room is now being used for storage of materials.

The portering manager had expressed concerns regarding the basement tunnels being used for access and deliveries due to clashes with the AGVs (automatic guided vehicles). IP confirmed that this is still the preferred route. M&S to notify AW in advance of any large bits of kit arriving. The filtration plant delivery is currently scheduled for 17<sup>th</sup> Dec. Advanced warning for the delivery of the expansion vessels also required.

A permit for work via MMacM should be in place before any break-ins or isolations are undertaken. In any instance where a specific permit does not exist, the generic template should be used.

Scotmas/M&S previously noted access difficulties. New access passes have been arranged through AW. DC committed to providing AW with weekly updates on who is holding the access cards.

5. **Health & Safety**

**H&S Plan**

A letter formally appointing M&S as Principal Designer under CDM Regs has been issued. DC confirmed that they have delegated this role to Faithful & Gould. Named person is Derek Ramage.

The duty to issue the F10 has also been discharged to M&S, a copy of the F10 has now been provided.

NHS Contractors Information Pack now issued to M&S

The construction Health & Safety Plan plus Risk Assessment and Method Statements have now been issued by DC. The Principal Designer (Derek Ramage) has reviewed the document and has confirmed they are happy with its content.

A HAI Scribe review has been undertaken and issued for the wards 2a and 2b works. A further HAI Scribe to be set up once Scotmas and IP have completed their review of remote monitoring locations.

IP/JH

## 6. Meetings

It was agreed that weekly technical meetings will be undertaken prior to the weekly progress meeting. These are scheduled for Thursday mornings at 9am. A recurring meeting invite has been issued.

## 7. Commissioning

It was noted that leachate flushing was not been allowed for by M&S as part of the 2A and 2B commissioning.

IP discussed leachate flushing with the Authorising Engineer. The AE agreed that leachate flushing will not be required due to the short sections of pipework affected. IP to obtain written confirmation of this from the AE and circulate.

IP

Prior to any go live date, all commissioning documentation, pressure testing, etc should be collated and issued to allow review. The commissioning procedure should also include confirmation of why leachate flushing was not undertaken, which will be backed up by the AE agreement.

DC

## 8. AOCB

Tim Wafer has now issued a schedule of compliances and design standards, this requires revision subsequent to RB comments

TW

M&S to prepare a derogation schedule noting where the design derogates from the specification or any relevant standard. This is a live document and should to be completely separate from cost information.

M&amp;S

A revised Risk Register has been circulated taking into account commentary received to date. This should be reviewed by all as it requires team buy-in and kept under review at regular intervals.

All

Existing drawings (DWGs and associated XREFs) have now been provided to M&S.

A purchase order is still outstanding for the first years managed service contract. If approval to place an order is not obtained imminently, the NHS may seek to cover the first batch of chemicals under the capital project – TBC.

IP/SR

Fitted pipework in main plant area does not match the as built record information and is a mix of non-standard Italian brand Italinnox and Finnish pipework. It was noted that the Italinnox is not WRAS approved. IP has subsequently arranged for the AE to issue a letter of comfort to M&S regarding the existing pipework.

M&S has requested that a revised/additional letter of comfort be provided confirming that they cannot be held accountable for any galvanised corrosion on existing pipe work/fittings. This is required by close of play 22<sup>nd</sup> Nov. TW will also provide a statement on the impact on the stainless steel.

IP

DC noted that a number of project related emails have been marked as spam and are not getting through.

It was noted that John O'Rourke from the estates team has been put in charge of coordinating works on site from an NHS perspective.

The chemical storage outhouse may not be required as it would not have storage capacity to be of any value. Scotmas to prepare a risk assessment for the storage of chemicals in the plant rooms, escalation plans plus the management of chemical handling and deliveries. Assessment to be undertaken 27<sup>th</sup> Nov on site.

ST

Upon receipt of the above, NHS to obtain approval from H&S team on strategy before out house can be removed from contract.

IP/SR

M&S to quantify design fees incurred to date and detail and savings from removing the outhouse from contract.

DC

Velioa and Scotmas to tie in with Renal Dialysis team on Sunday 25<sup>th</sup> Nov.

ST

Scotmas flagged a risk to the go live date of the 29<sup>th</sup> Nov due to a delay in 2A & 2B works diverting resource and incorrect probes for Renal being delivered. ST to provide an urgent update by Fri 23<sup>rd</sup> (am).

ST

#### 9. Date & Time of Next Meeting

The next meeting will combine both progress and technical reviews and will be on Thursday 29th November at 9am at Morris & Spottiswood offices, 54 Helen Street, Glasgow.

**NHS Greater Glasgow & Clyde  
Chlorine Dioxide ClO<sub>2</sub> Water Treatment Project Progress & Technical Meeting  
Thursday 29<sup>th</sup> November 2018 at 9am  
Morris & Spottiswood Offices**

**Present:**

|                            |   |  |
|----------------------------|---|--|
| Steve Russell (Chair) (SR) | - | Principal Project Manager, Capital Planning, NHSGG&C |
| James Huddleston (JH)      | - | Senior Project Manager, Capital Planning, NHSGG&C    |
| Ian Powrie (IP)            | - | Deputy General Manager Estates, NHSGG&C, QEUH        |
| Andy Wilson (AW)           | - | Sector Estates Manager, NHSGG&C, QEUH                |
| David Carmichael (DC)      | - | Project Manager, Morris & Spottiswood, (M&S)         |
| Scott Thompson (ST)        | - | Scotmas (on-site lead)                               |
| Richard Beattie (RB)       | - | Aecom  |
| Piotr Biskup (PB)          | - | Atkins (Mech)  |

**Apologies:**

|                                  |   |                                |
|----------------------------------|---|--------------------------------|
| Tim Wafer (conference call) (TW) | - | Consultant, Water Solutions    |
| Andy Russell (AR)                | - | Morris & Spottiswood, (M&S)    |
| Craig Patrick (CP)               | - | Atkins (Elec)                  |
| Alistair Cameron (AC)            | - | Scotmas                        |
| Stephen Clark (SC)               | - | Atkins                         |
| Mel MacMillan (MMacM)            | - | Estates Officer, NHSGG&C, QEUH |
| Chris Russell (CR)               | - | Veolia                         |
| Douglas Macallistar (DM)         | - | Veolia                         |
| Ben Faulkner (BF)                | - | Scotmas                        |

**Action****1. Welcome/Introductions**

SR welcomed everyone to the meeting and introductions were made.

IP is the Technical Lead for the project and SR is the budget holder and will also be chairing meetings.

**2. Contract Award**

Letter of Appointments and Purchase Orders are now in place for all parties.

Wards 2A and 2B work have been instructed as a variation to contract with dosing live from w/c 19<sup>th</sup> Nov.

Requested Bond to cover the agreed advanced payment no longer required.

Provisional costs for the various contract variations have been listed and issued by DC. Final costs outstanding for QS review. DC confirmed these will be issued by Tue 4<sup>th</sup> Dec.

**DC**

The plant room temporary installation works variation has now been instructed and virtually complete.. A full cost breakdown still required for cost advisor review.

**DC**

It was stressed again by the NHS that the uncertainty around price is a significant concern as additional board approvals are already being sought.

A formal instruction cannot be provided to allow orders to be placed for additional items without prior approvals. We could provide approvals in principal if required, however this would still in theory be a risk to M&S.

An instruction has been issued for Veolia to fit the flow meter to the filtration plant.



### 3. Contract Particulars

#### a. Commencement & Completion Dates

Works to Wards 2a and 2b commenced 15<sup>th</sup> October with system now live. All works, scheduled for completion by Jan-end 2019.

#### b. Programme

M&S have now issued a formal construction programme. A revision issue of this programme is now required to reflect agreed date changes. DC to plot progress against programme.

DC

It was previously noted that Practical Completion will be defined as when all physical works are completed, working and signed off by TW.

A programme showing break in/isolation dates and the proposed go live dates has now been issued and agreed with IP. IP confirmed that the clinical services have been consulted and are cited on these dates.

Veolia have provided their programme and M&S have confirmed that their programmes align.

#### Overarching Plan

TW/IP

An overarching document has been issued by TW however some key information is missing. TW subsequently issued further documentation to IP which is to be reviewed Mon 3<sup>rd</sup> Dec prior to issue.

A more robust change control procedure is to be agreed once TW overarching plan received.

#### Treatment Plant Installation Plan

Installation plan now generally agreed. Package to be pulled together for issue to include drawings, treatment points and break-in points, methodology, risk assessment, etc.

#### CIO2 Monitoring Installation Plan

DC/IP/ST

Remote monitoring locations have now been identified by IP and require to be surveyed with Scotmas to agree, to be undertaken Mon 3<sup>rd</sup> PM. IP noted concern about relying on manual monitoring and ideally wants remote monitoring in place at the go live date. Costs to be finalised by DC and issued to allow instruction.

ST

Scotmas to provide illustration of proposed remote monitoring installation points and circulate for agreement.

#### Go Live Plan

Go live plan has now been programmed and the clinical team are cited. Document to include dosing programme, monitoring requirements, etc until desired outcome is reached as covered under first year support contract. Remote monitoring is not yet shown on go live plan as instruction has not been received.

#### Monitoring & Test Training Plan

IP indicated that roughly 35-40 people will need system training. Groups of around 5 people can be trained at one time in 2-3 hour sessions, taking place over a 2 week period which is now shown on the programme.

A core team of Estates staff have now been given high level awareness training following the completion of the 2a and 2b works.

Relevant signage should also be erected, it was noted that this signage should not be erected within public areas and procedures will need to be held by estates with notification of who to call should the alarm go off.

DC/SR

SR requested that the training be filmed. Scotmas confirmed that they are happy to accommodate however cannot provide the 'film crew'. M&S to advise costs to provide the filming and NHS will speak internally with medical illustration team to determine if they can assist.

c. **Technical Clarifications**

It was agreed that IP will lead on separate technical meetings.

There was an issue with the hydraulic tank balance and the flow between the two. A solution for this has now been identified, Atkins to issue a methodology on the adjustable valve.

CP

Atkins drawings have now been circulated in zip file format 08/11/18. Further drawing revisions have been issued 22/11/18.

RB at Aecom has revised his commentary on the circulated drawings. Initial responses from Atkins were discussed with some requiring Scotmas input. A collated response to be issued by M&S.

DC

Drawings have yet to be issued covering the temporary 4 tank generators.

CP

Atkins to update tender issued schematic drawings and issue.

CP

TW noted that the Renal installation inclusive of BMS linked integrity needs to be completed prior to anything else going live. BMS tie in should be included throughout prior to go live dates.

4. **The Site**

Sharing a compound with Multiplex has created considerable logistical hassle and it was agreed that an alternative space to land M&S container should be found (rear of labs). AW to discuss with Facilities to confirm. A lifting plan/RAMS should be circulated to all in advance of container arriving on site.

AW/DC

Basement tank room is now being used for storage of materials.

The portering manager had expressed concerns regarding the basement tunnels being used for access and deliveries due to clashes with the AGVs (automatic guided vehicles). IP confirmed that this is still the preferred route. M&S to notify AW in advance of any large bits of kit arriving. The filtration plant delivery is currently scheduled for 17<sup>th</sup> Dec. Advanced warning for the delivery of the expansion vessels also required.

A permit for work via MMacM should be in place before any break-ins or isolations are undertaken. In any instance where a specific permit does not exist, the generic template should be used.

Scotmas/M&S previously noted access difficulties. New access passes have been arranged through AW. DC committed to providing AW with weekly updates on who is holding the access cards.

5. **Health & Safety**

**H&S Plan**

A letter formally appointing M&S as Principal Designer under CDM Regs has been issued. DC confirmed that they have delegated this role to Faithful & Gould. Named person is Derek Ramage.

The duty to issue the F10 has also been discharged to M&S, a copy of the F10 has now

been provided.

NHS Contractors Information Pack now issued to M&S

The construction Health & Safety Plan plus Risk Assessment and Method Statements have now been issued by DC. The Principal Designer (Derek Ramage) has reviewed the document and has confirmed they are happy with its content.

A HAI Scribe review has been undertaken and issued for the wards 2a and 2b works. A further HAI Scribe to be set up on Tue 4<sup>th</sup> Dec. Scotmas and IP to agree remote monitoring locations in advance. JH to send out invite.

**JH**

## **6. Meetings**

It was agreed that weekly technical meetings will be undertaken prior to the weekly progress meeting. These are scheduled for Thursday mornings at 9am. A recurring meeting invite has been issued.

## **7. Commissioning**

It was noted that leachate flushing was not been allowed for by M&S as part of the 2A and 2B commissioning.

IP discussed leachate flushing with the Authorising Engineer. The AE agreed that leachate flushing will not be required due to the short sections of pipework affected. IP to obtain written confirmation of this from the AE and circulate.

**IP**

Prior to any go live date, all commissioning documentation, pressure testing, etc should be collated and issued to allow review. The commissioning procedure should also include confirmation of why leachate flushing was not undertaken, which will be backed up by the AE agreement.

**DC**

## **8. AOCB**

Tim Wafer has now issued a schedule of compliances and design standards, this requires revision subsequent to RB comments

**TW**

M&S to prepare a derogation schedule noting where the design derogates from the specification or any relevant standard. This is a live document and should to be completely separate from cost information.

**M&S**

A revised Risk Register has been circulated taking into account commentary received to date. This should be reviewed by all as it requires team buy-in and kept under review at regular intervals.

**All**

Existing drawings (DWGs and associated XREFs) have now been provided to M&S.

A purchase order is still outstanding for the first years managed service contract. If approval to place an order is not obtained imminently, the NHS may seek to cover the first batch of chemicals under the capital project – TBC.

**IP/SR**

Fitted pipework in main plant area does not match the as built record information and is a mix of non-standard Italian brand Italinox and Finnish pipework. It was noted that the Italinox is not WRAS approved. IP has subsequently arranged for the AE to issue a letter of comfort to M&S regarding the existing pipework.

A revised letter of comfort has been provided to M&S confirming that they cannot be held accountable for any galvanised corrosion on existing pipe work/fittings.

DC noted that a number of project related emails have been marked as spam and are not getting through.

It was noted that John O'Rourke from the estates team has been put in charge of coordinating works on site from an NHS perspective.

The chemical storage outhouse may not be required as it would not have storage capacity to be of any value. Scotmas to prepare a risk assessment for the storage of chemicals in the plant rooms, escalation plans plus the management of chemical handling and deliveries. Assessment ongoing, TW and ST to put forward a recommendation wk commencing 3<sup>rd</sup> Dec.

**ST/TW**

Upon receipt of the above, NHS to obtain approval from H&S team on strategy before out house can be removed from contract.

**IP/SR**

M&S to quantify design fees incurred to date and detail and savings from removing the outhouse from contract.

**DC**

A full review of all go live and commissioning tasks to be undertaken with TW eaely week commencing 3<sup>rd</sup> Dec. IP to coordinate and circulate specific points for discussion and agreement.

**AII/IP**

Scotmas to provide emergency procedure protocol for the 2 week Christmas holiday period. Plan involves dropping dosing levels over the break to mitigate risk.

**ST**

#### **9. Date & Time of Next Meeting**

The next progress meeting will be on Tuesday 11th November at 9am at Morris & Spottiswood offices, 54 Helen Street, Glasgow.

A technical review will be held on Wed 5<sup>th</sup> at 9am  
combine both progress and technical reviews

**NHS Greater Glasgow & Clyde  
Chlorine Dioxide ClO<sub>2</sub> Water Treatment Project Progress & Technical Meeting  
Tuesday 11<sup>th</sup> December 2018 at 11am  
Morris & Spottiswood Offices**

**Present:**

|                            |   |  |
|----------------------------|---|--|
| Steve Russell (Chair) (SR) | - | Principal Project Manager, Capital Planning, NHSGG&C |
| James Huddleston (JH)      | - | Senior Project Manager, Capital Planning, NHSGG&C    |
| Ian Powrie (IP)            | - | Deputy General Manager Estates, NHSGG&C, QEUH        |
| David Carmichael (DC)      | - | Project Manager, Morris & Spottiswood, (M&S)         |
| Richard Beattie (RB)       | - | Aecom  |
| Tim Wafer (TW)             | - | Consultant, Water Solutions                          |

**Apologies:**

|                          |   |                                       |
|--------------------------|---|---------------------------------------|
| Scott Thompson (ST)      | - | Scotmas (on-site lead)                |
| Andy Wilson (AW)         | - | Sector Estates Manager, NHSGG&C, QEUH |
| Andy Russell (AR)        | - | Morris & Spottiswood, (M&S)           |
| Craig Patrick (CP)       | - | Atkins (Elec)                         |
| Alistair Cameron (AC)    | - | Scotmas                               |
| Stephen Clark (SC)       | - | Atkins                                |
| Piotr Biskup (PB)        | - | Atkins (Mech)                         |
| Mel MacMillan (MMacM)    | - | Estates Officer, NHSGG&C, QEUH        |
| Chris Russell (CR)       | - | Veolia                                |
| Douglas Macallistar (DM) | - | Veolia                                |
| Ben Faulkner (BF)        | - | Scotmas                               |

**Action****1. Welcome/Introductions**

SR welcomed everyone to the meeting and introductions were made.

IP is the Technical Lead for the project and SR is the budget holder and will also be chairing meetings.

**2. Contract Award**

Letter of Appointments and Purchase Orders are now in place for all parties.

Wards 2A and 2B work have been instructed as a variation to contract with dosing live from w/c 19<sup>th</sup> Nov.

Provisional costs for the various contract variations have been listed and issued by DC. Final costs for QS review now overdue. DC to provide an update.

**DC**

The plant room temporary installation works variation has now been instructed and virtually complete. A cost breakdown has been provided and costs advisors have confirmed their acceptance of the value.

It was stressed again by the NHS that the uncertainty around price is a significant concern as additional board approvals are already being sought. A formal instruction for variations cannot be provided without prior approvals.

**3. Contract Particulars****a. Commencement & Completion Dates**

Works to Wards 2a and 2b commenced 15<sup>th</sup> October with system now live. All works, scheduled for completion by Jan-end 2019.

**b. Programme**

M&S have now issued a formal construction programme. A revision issue of this programme is now required to reflect agreed date changes. DC to plot progress against programme. Now outstanding. A full review to be undertaken with IP/TW/DC.

**DC**

It was previously noted that Practical Completion will be defined as when all physical works are completed, working and signed off by TW.

Veolia have provided their programme and M&S have confirmed that their programmes align.

#### **Overarching Plan**

An overarching document has been issued by TW however some key information is missing. TW subsequently issued further documentation which required review from IP and DC.

TW/IP

#### **Treatment Plant Installation Plan**

Installation plan now generally agreed. Package to be pulled together for issue to include drawings, treatment points and break-in points, methodology, risk assessment, etc.

#### **CIO2 Monitoring Installation Plan**

Remote monitoring locations have now been identified by IP and agreed following survey on site. IP to circulate updated schedule of monitoring locations.

DC

Control board arriving 12<sup>th</sup> Dec, commence install Monday 17<sup>th</sup> Dec. One install per night over 3 nights.

Scotmas to provide illustration of proposed remote monitoring installation points and circulate for agreement.

ST

#### **Go Live Plan**

Go live plan has now been programmed and the clinical team are cited. Document to include dosing programme, monitoring requirements, etc until desired outcome is reached as covered under first year support contract. Remote monitoring is not yet shown on go live plan as instruction has not been received.

#### **Monitoring & Test Training Plan**

IP indicated that roughly 35-40 people will need system training. Groups of around 5 people can be trained at one time in 2-3 hour sessions, taking place over a 2 week period which is now shown on the programme.

A core team of Estates staff have now been given high level awareness training following the completion of the 2a and 2b works.

Relevant signage should also be erected, it was noted that this signage should not be erected within public areas and procedures will need to be held by estates with notification of who to call should the alarm go off.

SR requested that the training be filmed. M&S to advise costs to provide the filming and NHS will speak internally with medical illustration team to determine if they can assist.

DC/SR

#### c. **Technical Clarifications**

It was agreed that IP will lead on separate technical meetings.

There was an issue with the hydraulic tank balance and the flow between the two. A solution for this has now been identified, Atkins to issue a methodology on the adjustable valve. Now overdue.

CP

RB at Aecom has revised his commentary on the circulated drawings. Initial responses from Atkins were discussed with some requiring Scotmas input. A collated response to be issued by M&S. Now overdue.

DC

Drawings have yet to be issued covering the temporary 4 tank generators. Now overdue.

CP

Atkins to update tender issued schematic drawings and issue. Now overdue.

CP

TW noted that the Renal installation inclusive of BMS linked integrity needs to be completed prior to anything else going live. BMS tie in should be included throughout prior to go live dates.

#### 4. The Site

Sharing a compound with Multiplex has created considerable logistical hassle and it was agreed that an alternative space to land M&S container should be found (rear of labs). AW to discuss with Facilities to confirm. A lifting plan/RAMS should be circulated to all in advance of container arriving on site.

AW/DC

Basement tank room is now being used for storage of materials.

The portering manager had expressed concerns regarding the basement tunnels being used for access and deliveries due to clashes with the AGVs (automatic guided vehicles). IP confirmed that this is still the preferred route. M&S to notify AW in advance of any large bits of kit arriving. The filtration plant delivery is currently scheduled for 17<sup>th</sup> Dec. Advanced warning for the delivery of the expansion vessels also required.

A permit for work via MMacM should be in place before any break-ins or isolations are undertaken. In any instance where a specific permit does not exist, the generic template should be used.

Scotmas/M&S previously noted access difficulties. New access passes have been arranged through AW. DC committed to providing AW with weekly updates on who is holding the access cards.

#### 5. Health & Safety

##### H&S Plan

A letter formally appointing M&S as Principal Designer under CDM Regs has been issued. DC confirmed that they have delegated this role to Faithful & Gould. Named person is Derek Ramage.

The duty to issue the F10 has also been discharged to M&S, a copy of the F10 has now been provided.

NHS Contractors Information Pack now issued to M&S

The construction Health & Safety Plan plus Risk Assessment and Method Statements have now been issued by DC. The Principal Designer (Derek Ramage) has reviewed the document and has confirmed they are happy with its content.

A HAI Scribe review has now been undertaken with Infection Control which covers the remote monitoring locations.

#### 6. Meetings

It was agreed that weekly technical meetings will be undertaken prior to the weekly progress meeting. A recurring meeting invite has been issued.

#### 7. Commissioning

IP discussed leachate flushing with the Authorising Engineer. The AE agreed that leachate flushing will not be required due to the short sections of pipework affected. IP to obtain written confirmation of this from the AE and circulate.

IP

Prior to any go live date, all commissioning documentation, pressure testing, etc should be collated and issued to allow review. The commissioning procedure should also include confirmation of why leachate flushing was not undertaken, which will be backed up by the AE agreement. **DC/TW**

## 8. **AOCB**

Tim Wafer has now issued a schedule of compliances and design standards, this requires revision subsequent to RB comments. Now outstanding. **TW**

M&S to prepare a derogation schedule noting where the design derogates from the specification or any relevant standard. This is a live document and should be reviewed by all. **All**

A revised Risk Register has been circulated taking into account commentary received to date. Any comments to be forwarded to JH for revision and re-issue. **JH**

A purchase order has now been raised for the first years managed service contract

Fitted pipework in main plant area does not match the as built record information and is a mix of non-standard Italian brand Italinox and Finnish pipework. It was noted that the Italinox is not WRAS approved. IP has subsequently arranged for the AE to issue a letter of comfort to M&S regarding the existing pipework.

A revised letter of comfort has been provided to M&S confirming that they cannot be held accountable for any galvanised corrosion on existing pipe work/fittings.

The chemical storage outhouse likely not required as it would not have storage capacity to be of any value. Scotmas to prepare a risk assessment for the storage of chemicals in the plant rooms, escalation plans plus the management of chemical handling and deliveries. Assessment ongoing, TW and ST to put forward a recommendation wk commencing 3<sup>rd</sup> Dec. Now outstanding. **ST/TW**

There was a suggestion that a specialist might be required to review extract volumes. **tbc**

Upon receipt of the above, NHS to obtain approval from H&S team on strategy before out house can be removed from contract. **IP/SR**

M&S to quantify design fees incurred to date and detail and savings from removing the outhouse from contract. **DC**

Scotmas to provide emergency procedure protocol for the 2 week Christmas holiday period. Plan involves dropping dosing levels over the break to mitigate risk. **ST**

## 9. **Date & Time of Next Meeting**

The next progress meeting will be on Thursday 20th December at 9am. A site walk round will take place first followed by progress meeting held at the reception in the main hospital.



**NHS Greater Glasgow & Clyde  
Chlorine Dioxide ClO<sub>2</sub> Water Treatment Project Progress & Site Walkround  
Thursday 20<sup>th</sup> December 2018 at 9am  
QEUH Site**

**Present:**

|                            |   |  |
|----------------------------|---|--|
| Steve Russell (Chair) (SR) | - | Principal Project Manager, Capital Planning, NHSGG&C |
| James Huddleston (JH)      | - | Senior Project Manager, Capital Planning, NHSGG&C    |
| Ian Powrie (IP)            | - | Deputy General Manager Estates, NHSGG&C, QEUH        |
| David Carmichael (DC)      | - | Project Manager, Morris & Spottiswood, (M&S)         |
| Richard Beattie (RB)       | - | Aecom  |
| Andy Hewitt (AH)           | - | Aecom  |
| Piotr Biskup (PB)          | - | Atkins (Mech)  |
| Craig Patrick (CP)         | - | Atkins (Elec)  |

**Apologies:**

|                          |   |                                |
|--------------------------|---|--------------------------------|
| Tim Wafer (TW)           | - | Consultant, Water Solutions    |
| Scott Thompson (ST)      | - | Scotmas (on-site lead)         |
| Andy Russell (AR)        | - | Morris & Spottiswood, (M&S)    |
| Alistair Cameron (AC)    | - | Scotmas                        |
| Stephen Clark (SC)       | - | Atkins                         |
| Mel MacMillan (MMacM)    | - | Estates Officer, NHSGG&C, QEUH |
| Chris Russell (CR)       | - | Veolia                         |
| Douglas Macallistar (DM) | - | Veolia                         |
| Ben Faulkner (BF)        | - | Scotmas                        |

**Action****1. Welcome/Introductions**

SR welcomed everyone to the meeting and introductions were made.

IP is the Technical Lead for the project and SR is the budget holder and will also be chairing meetings.

**2. Contract Award**

Letter of Appointments and Purchase Orders are now in place for all parties.

Wards 2A and 2B work have been instructed as a variation to contract with dosing live from w/c 19<sup>th</sup> Nov.

Costs for the various contract variations have now been issued. AH requested that further detailed breakdown of the costs be provided to him to allow cost advisor review.

**DC/AH**

The plant room temporary installation works variation has now been instructed and virtually complete. A cost breakdown has been provided and costs advisors have confirmed their acceptance of the value.

Potential further variations include Expansion Vessels, a Ventilation Solution and Enclosure of the open sump in the plantroom. All currently being explored.

**3. Contract Particulars****a. Commencement & Completion Dates**

Works to Wards 2a and 2b commenced 15<sup>th</sup> October with system now live. All works, scheduled for completion by Early-Feb 2019.

**b. Programme**

M&S have now issued a formal construction programme. DC to issue a revised programme by close of play Thu 20<sup>th</sup> Dec. Programme to plot progress against programme. A full review to be undertaken with IP/TW/DC.

**DC**

Scotmas are now reporting a 3 week delay and a formal retrospective Extension of

**DC**

Time to be issued, this will be reflected in the revised programme. DC confirmed that there will be no cost implication to this delay and IP confirmed he has had sight of the revised dates.

It was previously noted that Practical Completion will be defined as when all physical works are completed, working and signed off by TW.

#### **Overarching Plan**

An overarching document has been issued by TW however some key information is missing. TW subsequently issued further documentation which required review from IP and DC. In the absence of this document being finalised, Aecom have also produced a document highlighting their take on the works package. IP currently reviewing.

TW/IP

#### **Treatment Plant Installation Plan**

Installation plan now generally agreed. Package to be pulled together for issue to include drawings, treatment points and break-in points, methodology, risk assessment, etc.

#### **CIO2 Monitoring Installation Plan**

Remote monitoring locations have now been identified by IP and agreed following survey on site. IP subsequently circulated updated schedule of monitoring locations.

Scotmas to provide illustration of proposed remote monitoring installation points and circulate for agreement.

ST

#### **Go Live Plan**

Go live plan has now been programmed and the clinical team are cited. Document to include dosing programme, monitoring requirements, etc until desired outcome is reached as covered under first year support contract.

#### **Monitoring & Test Training Plan**

IP indicated that roughly 35-40 people will need system training. Groups of around 5 people can be trained at one time in 2-3 hour sessions, taking place over a 2 week period which is now shown on the programme.

A core team of Estates staff have now been given high level awareness training following the completion of the 2a and 2b works.

Following the site visit there was a concern raised about the signage fitted to the plant access doors. It was felt that additional, larger and clearer signage should be added to ensure no one enters the room in the event of an alarm. Scotmas/M&S to review and propose a solution.

DC

SR requested that the training be filmed. M&S to advise costs to provide the filming and NHS will speak internally with medical illustration team to determine if they can assist.

DC/SR

#### c. **Technical Clarifications**

It was agreed that IP will lead on separate technical meetings.

There was an issue with the hydraulic tank balance and the flow between the two. A solution for this has now been identified.

RB at Aecom has revised his commentary on the circulated drawings. Initial responses from Atkins were discussed with some requiring Scotmas input. A collated response to be issued by M&S. Now overdue.

DC

Drawings have yet to be issued by Atkins covering the temporary 4 tank generators. These may become permanent. Now overdue.

PB/CP

Atkins to update tender issued schematic drawings and issue. These will be required to be posted on the wall of the plantroom upon completion. Now overdue.

PB/CP

TW noted that the Renal installation inclusive of BMS linked integrity needs to be

completed prior to anything else going live. BMS tie in should be included throughout prior to go live dates.

#### 4. **The Site**

DC confirmed that a site compound is no longer required as office space on site can be provided.

The portering manager had expressed concerns regarding the basement tunnels being used for access and deliveries due to clashes with the AGVs (automatic guided vehicles). IP confirmed that this is still the preferred route. M&S to notify Estates in advance of any large bits of kit arriving.

A permit for work via MMacM should be in place before any break-ins or isolations are undertaken. In any instance where a specific permit does not exist, the generic template should be used.

DC committed to providing AW with weekly updates on who is holding the access cards.

#### 5. **Health & Safety**

##### **H&S Plan**

A letter formally appointing M&S as Principal Designer under CDM Regs has been issued. DC confirmed that they have delegated this role to Faithful & Gould. Named person is Derek Ramage.

The duty to issue the F10 has also been discharged to M&S, a copy of the F10 has now been provided.

NHS Contractors Information Pack now issued to M&S

The construction Health & Safety Plan plus Risk Assessment and Method Statements have now been issued by DC. The Principal Designer (Derek Ramage) has reviewed the document and has confirmed they are happy with its content.

A HAI Scribe review has now been undertaken with Infection Control which covers the remote monitoring locations.

#### 6. **Meetings**

It was agreed that weekly technical meetings will be undertaken prior to the weekly progress meeting. A recurring meeting invite has been issued.

#### 7. **Commissioning**

The AE agreed that leachate flushing will not be required due to the short sections of pipework affected. IP has now forwarded written confirmation of this from the AE.

Prior to any go live date, all commissioning documentation, pressure testing, etc should be collated and issued to allow review. The commissioning procedure should also include confirmation of why leachate flushing was not undertaken, which will be backed up by the AE agreement.

DC/TW

#### 8. **AOCB**

Tim Wafer has now issued a schedule of compliances and design standards, this requires revision subsequent to RB comments. Now overdue.

TW

M&S to prepare a derogation schedule noting where the design derogates from the specification or any relevant standard. This is a live document and should be reviewed by all.

DC

A revised Risk Register has been circulated taking into account commentary received to date. Any comments to be forwarded to JH for revision and re-issue.

JH

A purchase order has now been raised for the first years managed service contract which will commence upon practical completion. Scotmas have committed to providing a minimum of 2 weeks presence on site following PC for monitoring and stabilisation.

Fitted pipework in main plant area does not match the as built record information and is a mix of non-standard Italian brand Italinox and Finnish pipework. It was noted that the Italinox is not WRAS approved. IP has subsequently arranged for the AE to issue a letter of comfort to M&S regarding the existing pipework.

A revised letter of comfort has been provided to M&S confirming that they cannot be held accountable for any galvanised corrosion on existing pipe work/fittings.

The chemical storage outhouse likely not required as it would not have storage capacity to be of any value. Scotmas to prepare a risk assessment for the storage of chemicals in the plant rooms, escalation plans plus the management of chemical handling and deliveries. Assessment has now been undertaken, no outhouse assumed pending H&S and ventilation review.

Scotmas  
Atkins

There is a concern regarding the ventilation in the plantrooms, in particular what the HSE guidance recommends vs. what Scotmas have advised. Clarity of this is required ASAP.

Scotmas  
Atkins

Upon receipt of the above, NHS to obtain approval from H&S team on strategy before out house can be removed from contract. Potential costs savings for removing the outhouse now received.

IP/SR

Scotmas has now provided their emergency procedure protocol for the 2 week Christmas holiday period. This will be issued along with this minute.

## 9. Date & Time of Next Meeting

The next progress meeting will be held on Thursday 10th January 2019 at 9am in Morris & Spottiswood offices, 54 Helen Street, Glasgow.

**NHS Greater Glasgow & Clyde**  
**Chlorine Dioxide ClO<sub>2</sub> Water Treatment Project Progress & Site Walkround**  
**Thursday 11<sup>th</sup> December 2019 at 9am**  
**QEUH Site**

**Present:**

|                            |   |  |
|----------------------------|---|--|
| Steve Russell (Chair) (SR) | - | Principal Project Manager, Capital Planning, NHSGG&C |
| James Huddleston (JH)      | - | Senior Project Manager, Capital Planning, NHSGG&C    |
| Ian Powrie (IP)            | - | Deputy General Manager Estates, NHSGG&C, QEUH        |
| David Carmichael (DC)      | - | Project Manager, Morris & Spottiswood, (M&S)         |
| Tim Wafer (TW)             | - | Consultant, Water Solutions                          |
| Alistair Cameron (AC)      | - | Scotmas  |
| Piotr Biskup (PB)          | - | Atkins (Mech)  |

**Apologies:**

|                          |   |                                |
|--------------------------|---|--------------------------------|
| Richard Beattie (RB)     | - | Aecom                          |
| Andy Hewitt (AH)         | - | Aecom                          |
| Craig Patrick (CP)       | - | Atkins (Elec)                  |
| Scott Thompson (ST)      | - | Scotmas (on-site lead)         |
| Andy Russell (AR)        | - | Morris & Spottiswood, (M&S)    |
| Stephen Clark (SC)       | - | Atkins                         |
| Mel MacMillan (MMacM)    | - | Estates Officer, NHSGG&C, QEUH |
| Chris Russell (CR)       | - | Veolia                         |
| Douglas Macallistar (DM) | - | Veolia                         |
| Ben Faulkner (BF)        | - | Scotmas                        |

**Action****1. Welcome/Introductions**

SR welcomed everyone to the meeting and introductions were made.

IP is the Technical Lead for the project and SR is the budget holder and will also be chairing meetings.

**2. Contract Award**

Letter of Appointments and Purchase Orders are now in place for all parties.

Costs for the various contract variations have now been issued. Aecom undertaking cost advisor review. Board funding approval has been received and formal instruction now required for variations.

**AH/SR**

Potential further variations include Expansion Vessels, a Ventilation Solution and Enclosure of the open sump in the plantroom. All currently being explored.

**Contract Particulars****a. Commencement & Completion Dates**

Works to Wards 2a and 2b commenced 15<sup>th</sup> October with system now live. All works, scheduled for completion by Early-Feb 2019.

**b. Programme**

M&S have now issued a revised construction programme however further revision now required following discussion. It was discussed that the priority was getting the hot water dosing in place in the first instance.

**DC**

The revised programme now shows that Scotmas are in a 3 week delay. DC confirmed that there will be no cost implication to this. DC/Scotmas to confirm reasoning for delay to allow NHS to report back.

**DC/  
Scotmas**

It was previously noted that Practical Completion will be defined as when all physical works are completed, working and signed off by TW.

**Overarching Plan**

An overarching document has been issued by TW however some key information is missing. Aecom subsequently produced a document highlighting their take on the works package. TW and IP to review, make alterations to reflect his understanding and highlight any changes. Revisions to be reissued by Mon 14<sup>th</sup> Jan

TW/IP

**Treatment Plant Installation Plan**

Installation plan now generally agreed. Package to be pulled together for issue to include drawings, treatment points and break-in points, methodology, risk assessment, etc.

**CIO2 Monitoring Installation Plan**

Remote monitoring locations have now been identified by IP and agreed following survey on site. IP subsequently circulated updated schedule of monitoring locations.

Scotmas to provide illustration of proposed remote monitoring installation points and circulate for agreement. AC to circulate.

AC

**Go Live Plan**

Go live plan has now been programmed and the clinical team are cited. Document to include dosing programme, monitoring requirements, etc until desired outcome is reached as covered under first year support contract.

**Monitoring & Test Training Plan**

IP indicated that roughly 35-40 people will need system training. Groups of around 5 people can be trained at one time in 2-3 hour sessions, taking place over a 2 week period which is now shown on the programme.

A core team of Estates staff have now been given high level awareness training following the completion of the 2a and 2b works.

Following the site visit there was a concern raised about the signage fitted to the plant access doors. Scotmas have confirmed that they will provide additional 'do not enter' signage with a note to contact the facilitate helpdesk on 5555.

AC

SR requested that the training be filmed. M&S to advise costs to provide the filming. A separate day for filming to be added to the programme.

DC

c. **Technical Clarifications**

It was agreed that IP will lead on separate technical meetings.

There was an issue with the hydraulic tank balance and the flow between the two. A solution for this has now been identified.

RB at Aecom has revised his commentary on the circulated drawings. Initial responses from Atkins were discussed with some requiring Scotmas input. A collated response to be issued by M&S. Scotmas committed to having their response through by early wk commencing 14<sup>th</sup> Jan.

DC/AC

Drawings have yet to be issued by Atkins covering the temporary 4 tank generators. These may become permanent. Atkins require info from Scotmas and will issue info wk commencing 21<sup>st</sup> Jan.

PB/AC

Atkins to update tender issued schematic drawings and issue. These will be required to be posted on the wall of the plantroom upon completion. Atkins committed to issue prior to next progress meeting on the 17<sup>th</sup> Jan.

PB/CP

TW noted that the Renal installation inclusive of BMS linked integrity needs to be completed prior to anything else going live. BMS tie in should be included throughout prior to go live dates.

Scotmas and TW to prepare documentation detailing the rationale behind the decision to retain the in tank monitoring by next progress meeting on the 17<sup>th</sup> Jan. Scotmas noted that they would want to add their own level sensor to the in-tank dosing system to auto switch off in the event of the water level getting too low.

AC/TW

#### 4. The Site

DC confirmed that a site compound is no longer required as office space on site can be provided.

The portering manager had expressed concerns regarding the basement tunnels being used for access and deliveries due to clashes with the AGVs (automatic guided vehicles). IP confirmed that this is still the preferred route. M&S to notify Estates in advance of any large bits of kit arriving.

A permit for work via MMacM should be in place before any break-ins or isolations are undertaken. In any instance where a specific permit does not exist, the generic template should be used.

DC committed to providing AW with weekly updates on who is holding the access cards.

#### 5. Health & Safety

##### H&S Plan

A letter formally appointing M&S as Principal Designer under CDM Regs has been issued. DC confirmed that they have delegated this role to Faithful & Gould. Named person is Derek Ramage.

The duty to issue the F10 has also been discharged to M&S, a copy of the F10 has now been provided.

NHS Contractors Information Pack now issued to M&S

The construction Health & Safety Plan plus Risk Assessment and Method Statements have now been issued by DC. The Principal Designer (Derek Ramage) has reviewed the document and has confirmed they are happy with its content.

A HAI Scribe review has now been undertaken with Infection Control which covers the remote monitoring locations. Revised sensor locations to be forwarded to IC along with updated scribe covering critical care install.

JH/SR

DC to confirm remote monitor install dates, indentifying exact rooms so facilities can be notified in advance to clear area.

DC

#### 6. Meetings

It was agreed that weekly technical meetings will be undertaken prior to the weekly progress meeting. A recurring meeting invite has been issued.

#### 7. Commissioning

The AE agreed that leachate flushing will not be required due to the short sections of pipework affected. IP has now forwarded written confirmation of this from the AE.

Prior to any go live date, all commissioning documentation, pressure testing, etc should be collated and issued to allow review. TW is witnessing go live pre-and post checks, IP to witness is TW not available.

DC/TW

**8. AOCB**

Tim Wafer has now issued a schedule of compliances and design standards, this requires revision subsequent to RB comments. Now overdue.

TW

M&S to prepare a derogation schedule noting where the design derogates from the specification or any relevant standard. This is a live document and should be reviewed by all.

DC

A revised Risk Register has been circulated taking into account commentary received to date. Any comments to be forwarded to JH for revision and re-issue.

JH

A purchase order has now been raised for the first years managed service contract which will commence upon practical completion. Scotmas have committed to providing a minimum of 2 weeks presence on site following PC for monitoring and stabilisation.

Fitted pipework in main plant area does not match the as built record information and is a mix of non-standard Italian brand Italinix and Finnish pipework. It was noted that the Italinix is not WRAS approved. IP has subsequently arranged for the AE to issue a letter of comfort to M&S regarding the existing pipework.

A revised letter of comfort has been provided to M&S confirming that they cannot be held accountable for any galvanised corrosion on existing pipe work/fittings.

It has been agreed that the additional sockets required within the DSR rooms for the remote monitors can be taken from the cleaners socket loop.

**Chemical Storage & Safety**

Scotmas to prepare a risk assessment for the storage and use of chemicals in the plant rooms, emergency procedures, escalation plans plus the management of chemical handling and deliveries. Assessment to reference any relevant industry best practice guidelines. This will help inform the level of risk and what mitigation measures may need to be in place (see below).

Scotmas

Solutions and mitigation measures which were discussed and need clarification include;

- Confirmation that an outhouse is no longer required (as currently assumed).
- Confirmation of what ventilation alterations/modifications are required if any.
- Confirmation if localised cage/perspex shielding is required

M&S/  
Scotmas  
/Atkins

IP/SR

Upon receipt of the above, NHS to obtain approval from H&S and Fire teams. Potential costs savings for removing the outhouse now received.

**9. Date & Time of Next Meeting**

The next technical meeting will be held on Thursday 17th January 2019 at 9am in Morris & Spottiswood offices, 54 Helen Street, Glasgow.

The next progress meeting will be held on Thursday 17th January 2019 at 10:30am in Morris & Spottiswood offices, 54 Helen Street, Glasgow.



**NHS Greater Glasgow & Clyde**  
**Chlorine Dioxide ClO<sub>2</sub> Water Treatment Project Progress**  
**Thursday 17<sup>th</sup> January 2019 at 10:30am**  
**QEUH Site**

**Present:**

|                            |   |  |
|----------------------------|---|--|
| Steve Russell (Chair) (SR) | - | Principal Project Manager, Capital Planning, NHSGG&C |
| James Huddleston (JH)      | - | Senior Project Manager, Capital Planning, NHSGG&C    |
| David Carmichael (DC)      | - | Project Manager, Morris & Spottiswood, (M&S)         |
| Alistair Cameron (AC)      | - | Scotmas  |
| Richard Beattie (RB)       | - | Aecom  |

**Apologies:**

|                       |   |   |
|-----------------------|---|---|
| Ian Powrie (IP)       | - | Deputy General Manager Estates, NHSGG&C, QEUH |
| Tim Wafer (TW)        | - | Consultant, Water Solutions                   |
| Piotr Biskup (PB)     | - | Atkins (Mech)                                 |
| Andy Hewitt (AH)      | - | Aecom   |
| Craig Patrick (CP)    | - | Atkins (Elec)                                 |
| Scott Thompson (ST)   | - | Scotmas (on-site lead)                        |
| Andy Russell (AR)     | - | Morris & Spottiswood, (M&S)                   |
| Stephen Clark (SC)    | - | Atkins  |
| Mel MacMillan (MMacM) | - | Estates Officer, NHSGG&C, QEUH                |
| Ben Faulkner (BF)     | - | Scotmas                                       |

**Action****1. Welcome/Introductions**

SR welcomed everyone to the meeting and introductions were made.

IP is the Technical Lead for the project and SR is the budget holder and will also be chairing meetings.

**2. Contract Award**

Letter of Appointments and Purchase Orders are now in place for all parties.

Costs for various contract variations have now been issued and Aecom are undertaking cost advisor review. Formal instruction has been give to proceed with variations 01, 03, 04, 05 and 06.

**AH**

Further anticipated variations include extract to the plantroom, enclosure of the open sump, level sensors and a perspex screen/cage around the plant installation. Costs for these required ASAP.

**DC****Contract Particulars****a. Commencement & Completion Dates**

Works to Wards 2a and 2b commenced 15<sup>th</sup> October with system now live. All works, scheduled for completion by Early-Feb 2019.

**b. Programme**

M&S have issued a revised construction programme however further revision required following discussion.

**DC**

The revised programme now shows that Scotmas are in a 3 week delay. DC confirmed that there will be no cost implication to this. DC/Scotmas to confirm reasoning for delay to allow NHS to report back.

**DC/  
Scotmas**

M&S are reporting programme issues in relation to getting sufficient residual in the system. Scotmas are now seeking authorisation to raise the dosing level to 2/3ppm to mitigate. Scotmas/ M&S to obtain approval from Ian Powrie/Tim Wafer before raising the level

**DC/  
Scotmass**

M&S advised that this delay is likely to create a further 4 week delay, pushing the handover date to approx 15<sup>th</sup> March. Programme to be re-cast and circulated ASAP.

DC

It was previously noted that Practical Completion will be defined as when all physical works are completed, working and signed off by TW.

### **Overarching Plan**

An overarching document has been issued by TW however some key information is missing. Aecom subsequently produced a document highlighting their take on the works package. TW and IP to review, make alterations to reflect his understanding and highlight any changes. Revisions to be reissued by Mon 14<sup>th</sup> Jan – **now overdue**.

TW/IP

### **Treatment Plant Installation Plan**

Installation plan now generally agreed. Package to be pulled together for issue to include drawings, treatment points and break-in points, methodology, risk assessment, etc.

### **CIO2 Monitoring Installation Plan**

Remote monitoring locations have now been identified by IP and agreed following survey on site. IP subsequently circulated updated schedule of monitoring locations.

### **Go Live Plan**

Go live plan has now been programmed and the clinical team are cited. Document to include dosing programme, monitoring requirements, etc until desired outcome is reached as covered under first year support contract.

### **Monitoring & Test Training Plan**

IP indicated that roughly 35-40 people will need system training. Groups of around 5 people can be trained at one time in 2-3 hour sessions, taking place over a 2 week period which is now shown on the programme.

A core team of Estates staff have now been given high level awareness training following the completion of the 2a and 2b works.

Following the site visit there was a concern raised about the signage fitted to the plant access doors. Scotmas have confirmed that they will provide additional 'do not enter' signage with a note to contact the facilitate helpdesk on 5555 – IP has now signed off the proposed signage.

SR requested that the training be filmed. M&S to advise costs to provide the filming. A separate day for filming to be added to the programme. Scotmas confirmed that the training dates do not need to move as a result of the overall programme delay.

DC

### c. **Technical Clarifications**

It was agreed that IP will lead on separate technical meetings.

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RB at Aecom has revised his commentary on the circulated drawings. Initial responses have been received however some requiring Scotmas input required. A collated response to be issued by M&S. Scotmas committed to having their response through by early wk commencing 14<sup>th</sup> Jan. **Now overdue – copy of comments recirculated with minutes.**

DC/AC

Various Atkins drawings have been requested, some of which are now overdue including;

- Atkins drawings covering the 4 tank generators which have now become permanent. Atkins require info from Scotmas and committed to issue info wk commencing 21<sup>st</sup> Jan.

PB

- Atkins to update tender issued schematic drawings and issue. These will be required to be posted on the wall of the plantroom upon completion. Atkins committed to issue prior to next progress meeting on the 17<sup>th</sup> Jan. **Now overdue.** PB
- Atkins to prepare drawings for extract ventilation o plantroom, these drawings are critical as enclosure cannot be built until these are issued. PB

TW noted that the Renal installation inclusive of BMS linked integrity needs to be completed prior to anything else going live. BMS tie in should be included throughout prior to go live dates.

Scotmas and TW to prepare documentation detailing the rationale behind the decision to retain the in tank monitoring by next progress meeting on the 17<sup>th</sup> Jan. **Now overdue.** Scotmas noted that they would want to add their own level sensor to the in-tank dosing system to auto switch off in the event of the water level getting too low. AC/TW

#### 4. The Site

DC confirmed that a site compound is no longer required as office space on site can be provided.

The portering manager had expressed concerns regarding the basement tunnels being used for access and deliveries due to clashes with the AGVs (automatic guided vehicles). IP confirmed that this is still the preferred route. M&S to notify Estates in advance of any large bits of kit arriving.

A permit for work via MMacM should be in place before any break-ins or isolations are undertaken. In any instance where a specific permit does not exist, the generic template should be used.

DC committed to providing AW with weekly updates on who is holding the access cards.

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The duty to issue the F10 has also been discharged to M&S, a copy of the F10 has now been provided.

NHS Contractors Information Pack now issued to M&S

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A HAI Scribe review has now been undertaken with Infection Control which covers the remote monitoring locations. Revised sensor locations has been forwarded to IC for comment.

#### 6. Meetings

It was agreed that weekly technical meetings will be undertaken prior to the weekly progress meeting. A recurring meeting invite has been issued.

#### 7. Commissioning

The AE agreed that leachate flushing will not be required due to the short sections of pipework affected. IP has now forwarded written confirmation of this from the AE.

Prior to any go live date, all commissioning documentation, pressure testing, etc should be collated and issued to allow review. TW is witnessing go live pre-and post checks, IP to witness is TW not available.

## 8. AOCB

Tim Wafer has now issued a schedule of compliances and design standards, this requires revision subsequent to RB comments. **Now overdue.**

**TW**

M&S in conjunction with TW to prepare a derogation schedule noting where the design derogates from the specification or any relevant standard. This is a live document and should be reviewed by all. **Now overdue.**

**TW/DC**

A revised Risk Register has been circulated taking into account commentary received to date. Any comments to be forwarded to JH for revision and re-issue.

A purchase order has now been raised for the first years managed service contract which will commence upon practical completion. Scotmas have committed to providing a minimum of 2 weeks presence on site following PC for monitoring and stabilisation.

Fitted pipework in main plant area does not match the as built record information and is a mix of non-standard Italian brand Italinox and Finnish pipework. It was noted that the Italinox is not WRAS approved. IP has subsequently arranged for the AE to issue a letter of comfort to M&S regarding the existing pipework.

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It has been agreed that the additional sockets required within the DSR rooms for the remote monitors can be taken from the cleaners socket loop.

### Chemical Storage & Safety

Scotmas to prepare a risk assessment for the storage and use of chemicals in the plant rooms, emergency procedures, escalation plans plus the management of chemical handling and deliveries. Assessment to reference any relevant industry best practice guidelines. This will help inform the level of risk and what mitigation measures may need to be in place (see below).

**Scotmas**

Solutions and mitigation measures which were discussed and need clarification include;

- Confirmation that an outhouse is no longer required (as currently assumed).
- Confirmation of what ventilation alterations/modifications are required if any.
- Confirmation if localised cage/perspex shielding is required

**M&S/  
Scotmas  
/Atkins**

Upon receipt of the above, NHS to obtain approval from H&S and Fire teams. Potential costs savings for removing the outhouse now received.

**IP/SR**

## 9. Date & Time of Next Meeting

Next technical meeting will be held on Thursday 24th January 2019 at 9am.

Next progress meeting will be held on Thursday 24th January 2019 at 10:00am.

Both in Morris & Spottiswood offices, 54 Helen Street, Glasgow.

A site walk round will follow the progress meeting.

**NHS Greater Glasgow & Clyde**  
**Chlorine Dioxide ClO<sub>2</sub> Water Treatment Project Progress**  
**Thursday 24<sup>th</sup> January 2019 at 10:00am**  
**QEUH Site**

**Present:**

|                            |   |  |
|----------------------------|---|--|
| Steve Russell (Chair) (SR) | - | Principal Project Manager, Capital Planning, NHSGG&C |
| Ian Powrie (IP)            | - | Deputy General Manager Estates, NHSGG&C, QEUH        |
| James Huddleston (JH)      | - | Senior Project Manager, Capital Planning, NHSGG&C    |
| David Carmichael (DC)      | - | Project Manager, Morris & Spottiswood, (M&S)         |
| Richard Beattie (RB)       | - | Aecom  |
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**Apologies:**

|                       |   |                                |
|-----------------------|---|--------------------------------|
| Alistair Cameron (AC) | - | Scotmas                        |
| Tim Wafer (TW)        | - | Consultant, Water Solutions    |
| Andy Hewitt (AH)      | - | Aecom                          |
| Craig Patrick (CP)    | - | Atkins (Elec)                  |
| Scott Thompson (ST)   | - | Scotmas (on-site lead)         |
| Andy Russell (AR)     | - | Morris & Spottiswood, (M&S)    |
| Stephen Clark (SC)    | - | Atkins                         |
| Mel MacMillan (MMacM) | - | Estates Officer, NHSGG&C, QEUH |

**Action****1. Welcome/Introductions**

IP is the Technical Lead for the project and SR is the budget holder and will also be chairing meetings.

**2. Contract Award**

Letter of Appointments and Purchase Orders are now in place for all parties.

Formal instruction has been give to proceed with variations 01, 03, 04, 05 and 06.

Further anticipated variations include extract to the plantroom, enclosure of the open sump, level sensors, video training, and a perspex screen/cage around the plant installation. DC confirmed that costs for these will be submitted prior to the next progress meeting.

**DC****Contract Particulars****a. Commencement & Completion Dates**

Works to Wards 2a and 2b commenced 15<sup>th</sup> October with system now live. All works, scheduled for completion by Mid March 2019.

**b. Programme**

Revised go live dates were presented at the meeting. This creates a 4 week delay, pushing the handover date to approx 15<sup>th</sup> March. Programme to be re-cast and circulated ASAP. There has been a concern raised about Scotmas ability to meet their provided programmes.

**DC**

A previous 3 week Scotmas delay was previously agreed and DC confirmed that there will be no cost implication to this.

Programme delays occurred in relation to getting sufficient residual in the system. Scotmas sought authorisation to raise the dosing level to 2/3ppm to mitigate from Ian Powrie/Tim Wafer before raising the level.

It was previously noted that Practical Completion will be defined as when all physical works are completed, working and signed off by TW.

**Overarching Plan**

Aecom produced a document highlighting their take on the works package. TW and IP to review, make alterations to reflect his understanding and highlight any changes. Revisions to be reissued by Mon 14<sup>th</sup> Jan – **now overdue, document attached to mins for review.**

TW/IP

**Treatment Plant Installation Plan**

Installation plan now generally agreed. Package to be pulled together for issue to include drawings, treatment points and break-in points, methodology, risk assessment, etc.

**CIO2 Monitoring Installation Plan**

Remote monitoring locations have now been identified by IP and agreed following survey on site. IP subsequently circulated updated schedule of monitoring locations.

**Go Live Plan**

Go live plan has now been programmed and the clinical team are cited. Document to include dosing programme, monitoring requirements, etc until desired outcome is reached as covered under first year support contract.

**Monitoring & Test Training Plan**

IP indicated that roughly 35-40 people will need system training. Groups of around 5 people can be trained at one time in 2-3 hour sessions, taking place over a 2 week period which is now shown on the programme.

A core team of Estates staff have now been given high level awareness training following the completion of the 2a and 2b works.

Scotmas proposed additional 'do not enter' signage with a note to contact the facilitate helpdesk on 5555 – IP has now signed off the proposed wording. IP noted that the signage locations and warning beacons still need to be agreed on site (in relation to 10m exclusion zones). It was also noted that the tone of the alarm should differ from the Fire Alarm sounded.

DC/  
Scotmas

SR requested that the training be filmed. M&S to advise costs to provide the filming. A separate day for filming to be added to the programme. Scotmas confirmed that the training dates do not need to move as a result of the overall programme delay.

DC

c. **Technical Clarifications**

It was agreed that IP will lead on separate technical meetings.

RB at Aecom has revised his commentary on the circulated drawings. Initial responses have been received however some requiring Scotmas input required. A collated response to be issued by M&S. Scotmas committed to having their response through by early wk commencing 14<sup>th</sup> Jan. **Now overdue – copy of comments recirculated with minutes.**

DC/AC

Various Atkins drawings were issued 24.01.19 including;

- Atkins drawings covering the 4 tank generators which have now become permanent. Atkins require info from Scotmas.
- Atkins schematic drawings. These will be required to be posted on the wall of the plantroom upon completion.
- Atkins to prepare drawings for extract ventilation to plantroom, these drawings are critical for costing. **Outstanding.**

PB

TW noted that the Renal installation inclusive of BMS linked integrity needs to be completed prior to anything else going live. BMS tie in should be included throughout prior to go live dates.

Documentation now provided by TW detailing the rationale behind the decision to retain the in tank monitoring. Scotmas noted that they would want to add their own level sensor to the in-tank dosing system to auto switch off in the event of the water level getting too low.

#### **4. The Site**

DC confirmed that a site compound is no longer required as office space on site can be provided.

The portering manager had expressed concerns regarding the basement tunnels being used for access and deliveries due to clashes with the AGVs (automatic guided vehicles). IP confirmed that this is still the preferred route. M&S to notify Estates in advance of any large bits of kit arriving.

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#### **5. Health & Safety**

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The duty to issue the F10 has also been discharged to M&S, a copy of the F10 has now been provided.

NHS Contractors Information Pack now issued to M&S

The construction Health & Safety Plan plus Risk Assessment and Method Statements have now been issued by DC. The Principal Designer (Derek Ramage) has reviewed the document and has confirmed they are happy with its content.

A HAI Scribe review has now been undertaken with Infection Control which covers the remote monitoring locations. Revised sensor locations has been forwarded to IC for comment.

#### **6. Meetings**

It was agreed that weekly technical meetings will be undertaken prior to the weekly progress meeting. A recurring meeting invite has been issued.

#### **7. Commissioning**

The AE agreed that leachate flushing will not be required due to the short sections of pipework affected. IP has now forwarded written confirmation of this from the AE. Prior to any go live date, all commissioning documentation, pressure testing, etc should be collated and issued to allow review. TW is witnessing go live pre-and post checks, IP to witness is TW not available.

8. **AOCB**

Tim Wafer has now issued a schedule of compliances and design standards, this requires revision subsequent to RB comments. **Now overdue.**

TW

TW has now prepared a derogation schedule noting where the design derogates from the specification or any relevant standard. To be reviewed by Aecom.

RB

A revised Risk Register has been circulated taking into account commentary received to date. Any comments to be forwarded to JH for revision and re-issue.

A purchase order has now been raised for the first years managed service contract which will commence upon practical completion. Scotmas have committed to providing a minimum of 2 weeks presence on site following PC for monitoring and stabilisation.

Fitted pipework in main plant area does not match the as built record information and is a mix of non-standard Italian brand Italinox and Finnish pipework. It was noted that the Italinox is not WRAS approved. IP has subsequently arranged for the AE to issue a letter of comfort to M&S regarding the existing pipework.

A revised letter of comfort has been provided to M&S confirming that they cannot be held accountable for any galvanised corrosion on existing pipe work/fittings.

It has been agreed that the additional sockets required within the DSR rooms for the remote monitors can be taken from the cleaners socket loop.

Atkins raised a concern that the air changes within the current plant room may not meet standards. PB to highlight concerns in a report.

PB

It was noted that dwg versions of any created drawings will be required at the end of the project as part of the O&M issue. One hard copy and 2 disc copies of the O&Ms will be required as well as full size printed schematics for installing within the plant room.

Note

**Chemical Storage & Safety**

Scotmas to prepare a risk assessment for the storage and use of chemicals in the plant rooms, emergency procedures, escalation plans plus the management of chemical handling and deliveries. Assessment to reference any relevant industry best practice guidelines. This will help inform the level of risk and what mitigation measures may need to be in place (see below). **This now not critical, due by next progress meeting.**

Scotmas

Solutions and mitigation measures which were discussed and need clarification include;

- Confirmation that an outhouse is no longer required (as currently assumed).
- Confirmation of what ventilation alterations/modifications are required if any.
- Confirmation if localised cage/perspex shielding is required

Upon receipt of the above, NHS to obtain approval from H&S and Fire teams. Potential costs savings for removing the outhouse now received.

IP/SR

9. **Date & Time of Next Meeting**

Next technical meeting will be held on Thursday 31st January 2019 at 9am.  
Next progress meeting will be held on Thursday 31st January 2019 at 10am.

Both in Morris & Spottiswood offices, 54 Helen Street, Glasgow.



**NHS Greater Glasgow & Clyde  
Chlorine Dioxide ClO<sub>2</sub> Water Treatment Project Progress  
Thursday 31<sup>st</sup> January 2019 at 9am  
QEUEH Site**

**Present:**

|                            |   |  |
|----------------------------|---|--|
| Steve Russell (Chair) (SR) | - | Principal Project Manager, Capital Planning, NHSGG&C |
| Ian Powrie (IP)            | - | Deputy General Manager Estates, NHSGG&C, QEUEH       |
| James Huddleston (JH)      | - | Senior Project Manager, Capital Planning, NHSGG&C    |
| David Carmichael (DC)      | - | Project Manager, Morris & Spottiswood, (M&S)         |
| Richard Beattie (RB)       | - | Aecom  |
| Piotr Biskup (PB)          | - | Atkins (Mech)  |
| Alistair Cameron (AC)      | - | Scotmas  |
| Tim Wafer (TW)             | - | Consultant, Water Solutions                          |

**Apologies:**

|                       |   |                                 |
|-----------------------|---|---------------------------------|
| Andy Hewitt (AH)      | - | Aecom                           |
| Craig Patrick (CP)    | - | Atkins (Elec)                   |
| Scott Thompson (ST)   | - | Scotmas (on-site lead)          |
| Andy Russell (AR)     | - | Morris & Spottiswood, (M&S)     |
| Stephen Clark (SC)    | - | Atkins                          |
| Mel MacMillan (MMacM) | - | Estates Officer, NHSGG&C, QEUEH |

**Action****1. Welcome/Introductions**

IP is the Technical Lead for the project and SR is the budget holder and will also be chairing meetings.

**2. Contract Award**

Letter of Appointments and Purchase Orders are now in place for all parties.

Formal instruction has been give to proceed with variations 01, 03, 04, 05 and 06.

Further anticipated variations include extract to the plantroom, enclosure of the open sump, level sensors, video training, and a perspex screen/cage around the plant installation. **Now overdue, DC confirmed these will be issued prior to the next progress meeting.**

**DC****Contract Particulars****a. Commencement & Completion Dates**

Works to Wards 2a and 2b commenced 15<sup>th</sup> October with system now live. All works, scheduled for completion by Mid March 2019.

**b. Programme**

Revised programme was presented at the meeting, DC to circulate via email, some dates have moved however no slippage reported on handover date of 15<sup>th</sup> March. IP required dates to align with Veolia works.

**DC**

A total of 7 week delay has now been reflected into the programme. Scotmas/DC to forward summary email to IP confirming reasoning behind delay to allow reporting prior to Fri 1st Feb.

**DC/AC**

Programme delays occurred in relation to getting sufficient residual in the system. Scotmas sought authorisation to raise the dosing level to 2/3ppm to mitigate from Ian Powrie/Tim Wafer before raising the level.

It was previously noted that Practical Completion will be defined as when all physical works are completed, working and signed off by TW.

**Overarching Plan**

Aecom produced a document highlighting their take on the works package. TW and IP to review, make alterations to reflect his understanding and highlight any changes. **Now overdue, TW committed to have this issued by close of play Tuesday 5<sup>th</sup> Feb.**

TW/IP

**Treatment Plant Installation Plan**

Installation plan now generally agreed. Package to be pulled together for issue to include drawings, treatment points and break-in points, methodology, risk assessment, etc.

**CIO2 Monitoring Installation Plan**

Remote monitoring locations have now been identified by IP and agreed following survey on site. IP subsequently circulated updated schedule of monitoring locations.

**Go Live Plan**

Go live plan has now been programmed and the clinical team are cited. Document to include dosing programme, monitoring requirements, etc until desired outcome is reached as covered under first year support contract.

**Monitoring & Test Training Plan**

IP indicated that roughly 35-40 people will need system training. Groups of around 10 people can be trained at one time in 2-3 hour sessions, taking place over a 2 week period which is now shown on the programme.

A core team of Estates staff have now been given high level awareness training following the completion of the 2a and 2b works.

Scotmas proposed additional 'do not enter' signage with a note to contact the facilitate helpdesk on 5555 – IP has now signed off the proposed wording. IP noted that the signage locations and warning beacons still need to be agreed on site (in relation to exclusion zones, all to be agreed in risk assessment). It was also noted that the tone of the alarm should differ from the Fire Alarm sounded.

DC/AC

SR requested that the training be filmed. Scotmas confirmed that the training dates do not need to move as a result of the overall programme delay. M&S to advise costs to provide the filming. **Now overdue.**

DC

c. **Technical Clarifications**

It was agreed that IP will lead on separate technical meetings.

RB at Aecom has revised his commentary on the recently circulated drawings. A collated response to be issued by M&S. **Now overdue – copy of comments recirculated with minutes.**

DC/AC

Various Atkins drawings were issued 24.01.19 including;

- Atkins drawings covering the 4 tank generators which have now become permanent. Atkins require info from Scotmas.
- Atkins schematic drawings. These will be required to be posted on the wall of the plantroom upon completion.
- Atkins have now issues drawings for extract ventilation to plantroom. Aecom have subsequently provided commentary and a revision is required. Details of cown required including vermin screen.

PB

TW noted that the Renal installation inclusive of BMS linked integrity needs to be completed prior to anything else going live. BMS tie in should be included throughout prior to go live dates.

Documentation now provided by TW detailing the rationale behind the decision to retain the in tank monitoring.

IP noted that as part of the shutdown protocol there will be a requirement to ensure that mobile phone alerts are set up for the Renal tea. IP, DC, Veolia and the Renal team, to meet and agree.

#### 4. The Site

DC confirmed that a site compound is no longer required as office space on site can be provided.

The portering manager had expressed concerns regarding the basement tunnels being used for access and deliveries due to clashes with the AGVs (automatic guided vehicles). IP confirmed that this is still the preferred route. M&S to notify Estates in advance of any large bits of kit arriving.

A permit for work via MMacM should be in place before any break-ins or isolations are undertaken. In any instance where a specific permit does not exist, the generic template should be used.

DC committed to providing AW with weekly updates on who is holding the access cards.

#### 5. Health & Safety

##### H&S Plan

A letter formally appointing M&S as Principal Designer under CDM Regs has been issued. DC confirmed that they have delegated this role to Faithful & Gould. Named person is Derek Ramage.

The duty to issue the F10 has also been discharged to M&S, a copy of the F10 has now been provided.

NHS Contractors Information Pack now issued to M&S

The construction Health & Safety Plan plus Risk Assessment and Method Statements have now been issued by DC. The Principal Designer (Derek Ramage) has reviewed the document and has confirmed they are happy with its content.

A HAI Scribe review has now been undertaken with Infection Control which covers the remote monitoring locations. Revised sensor locations have been forwarded to IC for comment.

#### 6. Meetings

It was agreed that weekly technical meetings will be undertaken prior to the weekly progress meeting. A recurring meeting invite has been issued.

#### 7. Commissioning

The AE agreed that leachate flushing will not be required due to the short sections of pipework affected. IP has now forwarded written confirmation of this from the AE. Prior to any go live date, all commissioning documentation, pressure testing, etc should be collated and issued to allow review. TW is witnessing go live pre-and post checks, IP to witness is TW not available.

## 8. AOCB

TW has now issued a schedule of compliances and design standards, this requires revision subsequent to RB comments and will be covered under overarching plan.

TWs derogation schedule noting where the design derogates from the specification or any relevant standard to be included as an appendix to the Overarching Plan.

TW

A revised Risk Register has been circulated taking into account commentary received to date. Any comments to be forwarded to JH for revision and re-issue.

A purchase order has now been raised for the first years managed service contract which will commence upon practical completion. Scotmas have committed to providing a minimum of 2 weeks presence on site following PC for monitoring and stabilisation.

Fitted pipework in main plant area does not match the as built record information and is a mix of non-standard Italian brand Italinox and Finnish pipework. Italinox is not WRAS approved. The AE has issued a letter of comfort regarding the existing pipework.

A revised letter of comfort has been provided to M&S confirming that they cannot be held accountable for any galvanised corrosion on existing pipe work/fittings.

It has been agreed that the additional sockets required within the DSR rooms for the remote monitors can be taken from the cleaners socket loop.

Dwg versions of any created drawings will be required at the end of the project as part of the O&M issue. One hard copy and 2 disc copies of the O&Ms will be required as well as full size printed schematics for installing within the plant room.

### Chemical Storage & Safety

Scotmas to prepare a risk assessment for the storage and use of chemicals in the plant rooms, emergency procedures, escalation plans plus the management of chemical handling and deliveris. Assessment to reference any relevant industry best practice guidelines. **Any aspects of the risk assessment which require NHS input (site specific) to be highlighted. This exercise is to be completed within the next 2 weeks. IP to set up a meeting with H&S reps on the 20th Feb to review**

AC/DC/IP

Solutions and mitigation measures which were discussed and need clarification include;

- Confirmation that an outhouse is no longer required (as currently assumed).
- Confirmation of what ventilation alterations/modifications are required if any.
- Confirmation if localised cage/perspex shielding is required

Upon receipt of the above, NHS to obtain approval from H&S and Fire teams. Potential costs savings for removing the outhouse now received.

M&S were reminded to keep a clear working area and ensure that any waste is taken away at the earliest.

Note

TW noted that a couple of bladders from the replaced expansion vessels should be retained to allow sampling.

DC

IP requested confirmation of the ongoing monitoring that will be covered by Scotmas under the managed contract. The managed service regime is required so IP can identify what additional monitoring the NHS needs to undertake.

AC

## 9. Date & Time of Next Meeting

Next progress meeting will be held on Thursday 7<sup>th</sup> February 9am in the CMB Building, QEUH. A site walk round will follow.

**NHS Greater Glasgow & Clyde  
Chlorine Dioxide ClO<sub>2</sub> Water Treatment - Project Progress Meeting  
Thursday 7<sup>th</sup> February 2019 at 9am  
QEUEH Central Medical Block**

**Present:**

|                            |   |  |
|----------------------------|---|--|
| Steve Russell (Chair) (SR) | - | Principal Project Manager, Capital Planning, NHSGG&C |
| Ian Powrie (IP)            | - | Deputy General Manager Estates, NHSGG&C, QEUEH       |
| James Huddleston (JH)      | - | Senior Project Manager, Capital Planning, NHSGG&C    |
| David Carmichael (DC)      | - | Project Manager, Morris & Spottiswood, (M&S)         |
| Richard Beattie (RB)       | - | Aecom  |
| Piotr Biskup (PB)          | - | Atkins (Mech)  |
| Tim Wafer (TW)             | - | Consultant, Water Solutions                          |
| Mark Riddell (MR)          | - | Estates Manager, NHSGG&C                             |

**Apologies:**

|                       |   |                                 |
|-----------------------|---|---------------------------------|
| Alistair Cameron (AC) | - | Scotmas                         |
| Andy Hewitt (AH)      | - | Aecom                           |
| Craig Patrick (CP)    | - | Atkins (Elec)                   |
| Scott Thompson (ST)   | - | Scotmas (on-site lead)          |
| Andy Russell (AR)     | - | Morris & Spottiswood, (M&S)     |
| Stephen Clark (SC)    | - | Atkins                          |
| Mel MacMillan (MMacM) | - | Estates Officer, NHSGG&C, QEUEH |

**Action****1. Welcome/Introductions**

IP is the Technical Lead for the project and SR is the budget holder and will also be chairing meetings.

**2. Contract Award**

Letter of Appointments and Purchase Orders are now in place for all parties.

Formal instruction has been give to proceed with variations 01, 03, 04, 05 and 06. Instruction to proceed with variation 8, cage enclosures to be given.

**JH**

Further anticipated variations include extract to the plantroom, enclosure of the open sump, level sensors and video training. **Now overdue, DC confirmed these will be issued prior to the next progress meeting.**

**DC****Contract Particulars****a. Commencement & Completion Dates**

Works to Wards 2a and 2b commenced 15<sup>th</sup> October with system now live. All works, scheduled for completion by Mid March 2019.

**b. Programme**

DC to circulate revised programme via email, some dates have moved however no slippage reported on handover date of 15<sup>th</sup> March.

**DC**

A total of 7 week delay has now been reflected into the programme. Scotmas have forwarded summary email to IP confirming reasoning behind delay, this also to be forwarded to JH/SR.

**DC/AC**

Programme delays occurred in relation to getting sufficient residual in the system. Scotmas sought authorisation to raise the dosing level to 2/3ppm to mitigate from Ian Powrie/Tim Wafer before raising the level.

It was previously noted that Practical Completion will be defined as when all physical works are completed, working and signed off by TW.

**Overarching Plan**

Aecom produced a document highlighting their take on the works package. TW and IP reviewed and prepared plan. Aecom have subsequently provided commentary for update. **Document circulated with minutes, TW to review and revise accordingly.**

TW

**Treatment Plant Installation Plan**

Installation plan now generally agreed. Package to be pulled together for issue to include drawings, treatment points and break-in points, methodology, risk assessment, etc.

**CIO2 Monitoring Installation Plan**

Remote monitoring locations have now been identified by IP and agreed following survey on site. IP subsequently circulated updated schedule of monitoring locations.

**Go Live Plan**

Go live plan has now been programmed and the clinical team are cited. Document to include dosing programme, monitoring requirements, etc until desired outcome is reached as covered under first year support contract.

**Monitoring & Test Training Plan**

IP indicated that roughly 35-40 people will need system training. Groups of around 10 people can be trained at one time in 2-3 hour sessions, taking place over a 2 week period which is now shown on the programme.

A core team of Estates staff have now been given high level awareness training following the completion of the 2a and 2b works.

Scotmas proposed additional 'do not enter' signage with a note to contact the facilitate helpdesk on 5555 – IP has now signed off the proposed wording. IP noted that the signage locations and warning beacons still need to be agreed on site (in relation to exclusion zones, all to be agreed in risk assessment). It was also noted that the tone of the alarm should differ from the Fire Alarm sounded. Exclusion zone to be shown on a drawing.

AC

SR requested that the training be filmed. Scotmas confirmed that the training dates do not need to move as a result of the overall programme delay. M&S to advise costs to provide the filming. **Now overdue.**

DC

c. **Technical Clarifications**

It was agreed that IP will lead on separate technical meetings.

RB at Aecom has revised his commentary on the recently circulated drawings. A collated response to be issued by M&S. **Now overdue – copy of comments recirculated with minutes.**

DC/AC

Various Atkins drawings were issued 24.01.19 including;

- Atkins drawings covering the 4 tank generators which have now become permanent. Atkins require info from Scotmas.
- Atkins schematic drawings. These will be required to be posted on the wall of the plantroom upon completion.
- Atkins have now issues drawings for extract ventilation to plantroom. Further discussion was had in relation to the cowl details and vermin screen, drawing to be updated.

PB

TW noted that the Renal installation inclusive of BMS linked integrity needs to be completed prior to anything else going live. BMS tie in should be included throughout prior to go live dates.

Documentation now provided by TW detailing the rationale behind the decision to retain the in tank monitoring.

IP noted that as part of the shutdown protocol there will be a requirement to ensure that mobile phone alerts are set up for the Renal, etc. Subsequent discussions indicate an email alert may be in place instead, alarm schedule to be produced so IP can determine what alarm criteria make it to an email alert.

#### 4. The Site

DC confirmed that a site compound is no longer required as office space on site can be provided.

The portering manager had expressed concerns regarding the basement tunnels being used for access and deliveries due to clashes with the AGVs (automatic guided vehicles). IP confirmed that this is still the preferred route. M&S to notify Estates in advance of any large bits of kit arriving.

A permit for work via MMacM should be in place before any break-ins or isolations are undertaken. In any instance where a specific permit does not exist, the generic template should be used.

DC committed to providing AW with weekly updates on who is holding the access cards.

#### 5. Health & Safety

##### H&S Plan

A letter formally appointing M&S as Principal Designer under CDM Regs has been issued. DC confirmed that they have delegated this role to Faithful & Gould. Named person is Derek Ramage.

The duty to issue the F10 has also been discharged to M&S, a copy of the F10 has now been provided.

NHS Contractors Information Pack now issued to M&S

The construction Health & Safety Plan plus Risk Assessment and Method Statements have now been issued by DC. The Principal Designer (Derek Ramage) has reviewed the document and has confirmed they are happy with its content.

A HAI Scribe review has now been undertaken with Infection Control which covers the remote monitoring locations. Revised sensor locations have been forwarded to IC for comment.

#### 6. Meetings

It was agreed that weekly technical meetings will be undertaken prior to the weekly progress meeting. A recurring meeting invite has been issued.

#### 7. Commissioning

The AE agreed that leachate flushing will not be required due to the short sections of pipework affected. IP has now forwarded written confirmation of this from the AE. Prior to any go live date, all commissioning documentation, pressure testing, etc should be collated and issued to allow review. TW is witnessing go live pre-and post checks, IP to witness is TW not available.

## 8. AOCB

TW has now issued a schedule of compliances and design standards, this requires revision subsequent to RB comments and will be covered under overarching plan.

Derogation schedule noting where the design derogates from the specification or any relevant standard to be included as an appendix to the Overarching Plan. **Outstanding.**

TW

A revised Risk Register has been circulated taking into account commentary received to date. Any comments to be forwarded to JH for revision and re-issue.

A purchase order has now been raised for the first years managed service contract which will commence upon practical completion. Scotmas have committed to providing a minimum of 2 weeks presence on site following PC for monitoring and stabilisation.

Fitted pipework in main plant area does not match the as built record information and is a mix of non-standard Italian brand Italinox and Finnish pipework. Italinox is not WRAS approved. The AE has issued a letter of comfort regarding the existing pipework.

A revised letter of comfort has been provided to M&S confirming that they cannot be held accountable for any galvanised corrosion on existing pipe work/fittings.

It has been agreed that the additional sockets required within the DSR rooms for the remote monitors can be taken from the cleaners socket loop.

Dwg versions of any created drawings will be required at the end of the project as part of the O&M issue. One hard copy and 2 disc copies of the O&Ms will be required as well as full size printed schematics for installing within the plant room.

### **Chemical Storage & Safety**

Scotmas to prepare a risk assessment for the storage and use of chemicals in the plant rooms, emergency procedures, escalation plans plus the management of chemical handling and deliveries. Assessment to reference any relevant industry best practice guidelines. **Any aspects of the risk assessment which require NHS input (site specific) to be highlighted. This exercise is now overdue. IP to set up a meeting with H&S reps on the 20th Feb to review. IP to forward NHS template to assist.**

AC/DC/IP

Solutions and mitigation measures which were discussed and need clarification include;

- Confirmation that an outhouse is no longer required (as currently assumed).
- Confirmation of what ventilation alterations/modifications are required if any.
- Confirmation if localised cage/perspex shielding is required

Upon receipt of the above, NHS to obtain approval from H&S and Fire teams. Potential costs savings for removing the outhouse now received.

M&S were reminded to keep a clear working area and ensure that any waste is taken away at the earliest.

Note

TW noted that a couple of bladders from the replaced expansion vessels should be retained to allow sampling.

DC

IP requested confirmation of the ongoing monitoring that will be covered by Scotmas under the managed contract. The managed service regime is required so IP can identify what additional monitoring the NHS needs to undertake.

AC

## 9. Date & Time of Next Meeting

Next progress meeting will be held on Wednesday 13<sup>th</sup> February 1pm in the CMB Building, QEUH, meeting room 1.



**NHS Greater Glasgow & Clyde**  
**Chlorine Dioxide ClO<sub>2</sub> Water Treatment - Project Progress Meeting**  
**Wednesday 13<sup>th</sup> February 2019 at 1pm**  
**QEUH Central Medical Block**

**Present:**

|                            |   |  |
|----------------------------|---|--|
| Steve Russell (Chair) (SR) | - | Principal Project Manager, Capital Planning, NHSGG&C |
| Ian Powrie (IP)            | - | Deputy General Manager Estates, NHSGG&C, QEUH        |
| James Huddleston (JH)      | - | Senior Project Manager, Capital Planning, NHSGG&C    |
| David Carmichael (DC)      | - | Project Manager, Morris & Spottiswood, (M&S)         |
| Richard Beattie (RB)       | - | Aecom  |
| Piotr Biskup (PB)          | - | Atkins (Mech)  |
| Mark Riddell (MR)          | - | Estates Manager, NHSGG&C                             |

**Apologies:**

|                       |   |                                |
|-----------------------|---|--------------------------------|
| Tim Wafer (TW)        | - | Consultant, Water Solutions    |
| Alistair Cameron (AC) | - | Scotmas                        |
| Andy Hewitt (AH)      | - | Aecom                          |
| Craig Patrick (CP)    | - | Atkins (Elec)                  |
| Scott Thompson (ST)   | - | Scotmas (on-site lead)         |
| Andy Russell (AR)     | - | Morris & Spottiswood, (M&S)    |
| Stephen Clark (SC)    | - | Atkins                         |
| Mel MacMillan (MMacM) | - | Estates Officer, NHSGG&C, QEUH |

- Action**
1. **Welcome/Introductions**

IP is the Technical Lead for the project and SR is the budget holder and will also be chairing meetings.
  2. **Contract Award**

Letter of Appointments and Purchase Orders are now in place for all parties.

Formal instruction has been give to proceed with variations 01, 03, 04, 05, 06 and 08.

Costs now received for the following variations. Aecom cost advisor to review costs and JH to formally instruct once AH confirmed review. **AH/JH**

    - Omission of Outhouse and associated BMS Monitoring (VAR 7)
    - Upgrade of Temp Stations to Permanent (VAR 7)
    - PH Monitoring (VAR 9)
    - Video for Estates Staff (VAR 10)

Further outstanding variations include sump pits, return sensor pipework, costs for flow meters. **DC**

**Contract Particulars**

    - a. **Commencement & Completion Dates**

Works to Wards 2a and 2b commenced 15<sup>th</sup> October with system now live. All works, scheduled for completion by Mid March 2019.
    - b. **Programme**

DC to circulate revised programme and go live dates via email. **DC**

There was some concern about Scotmas falling behind programme and a risk reduction meeting was called the morning of 13<sup>th</sup> Feb. Both Scotmas and DC confirmed that the final completion date of 15<sup>th</sup> March can still be achieved. Scotmas/DC to provide commentary on what mitigation measures have been put in place to ensure programme is met. **DC/AC**

A total of 7 week delay has now been reflected into the programme. Programme delays occurred in relation to getting sufficient residual in the system.

It was previously noted that Practical Completion will be defined as when all physical works are completed, working and signed off by TW.

It was noted that the final account must be submitted for cost approval two weeks prior to financial year end to allow processing time before payment.

DC

#### **Overarching Plan**

Aecom produced a document highlighting their take on the works package. TW and IP reviewed and prepared plan. Aecom have subsequently provided commentary for update. **TW to review and revise accordingly – now outstanding.**

TW

#### **Treatment Plant Installation Plan**

Installation plan now generally agreed. Package to be pulled together for issue to include drawings, treatment points and break-in points, methodology, risk assessment, etc.

#### **CIO2 Monitoring Installation Plan**

Remote monitoring locations have now been identified by IP and agreed following survey on site. IP subsequently circulated updated schedule of monitoring locations.

#### **Go Live Plan**

Go live plan has now been programmed and the clinical team are cited. Document to include dosing programme, monitoring requirements, etc until desired outcome is reached as covered under first year support contract.

#### **Monitoring & Test Training Plan**

IP indicated that roughly 35-40 people will need system training. Groups of around 10 people can be trained at one time in 2-3 hour sessions, taking place over a 2 week period which is now shown on the programme.

A core team of Estates staff have now been given high level awareness training following the completion of the 2a and 2b works.

Scotmas proposed additional 'do not enter' signage with a note to contact the facilitate helpdesk on 5555 – IP has now signed off the proposed wording. IP noted that the signage locations and warning beacons still need to be agreed on site (in relation to exclusion zones, all to be agreed in risk assessment). It was also noted that the tone of the alarm should differ from the Fire Alarm sounded. Exclusion zone to be included on as fitted drawings.

AC

SR requested that the training be filmed. Scotmas confirmed that the training dates do not need to move as a result of the overall programme delay.

#### c. **Technical Clarifications**

It was agreed that IP will lead on separate technical meetings.

RB at Aecom has further revised his commentary on the recently circulated drawings. A collated response to be issued by M&S. **Copy of comments re-circulated with minutes, DC/TW to collate response.**

DC/AC/TW

Various Atkins drawings were issued 24.01.19 including;

- Atkins drawings covering the 4 tank generators which have now become permanent. Atkins require info from Scotmas.
- Atkins schematic drawings. These will be required to be posted on the wall of the plantroom upon completion.
- Atkins have now issued drawings for extract ventilation to plant room. Further revision now required following discussion including, galvanising to avoid coating (allowing for shorter lead in), cowl to be finished to match cladding colour and be angled more towards the ground.

PB

TW noted that the Renal installation inclusive of BMS linked integrity needs to be completed prior to anything else going live. BMS tie in should be included throughout prior to go live dates.

Documentation now provided by TW detailing the rationale behind the decision to retain the in tank monitoring.

IP noted that as part of the shutdown protocol there will be a requirement to ensure that mobile phone alerts are set up for the Renal, etc. Subsequent discussions indicate an email alert may be in place instead, alarm schedule to be produced so IP can determine what alarm criteria make it to an email alert and provide email addresses.

IP/DC

#### 4. **The Site**

DC confirmed that a site compound is no longer required as office space on site can be provided.

The portering manager had expressed concerns regarding the basement tunnels being used for access and deliveries due to clashes with the AGVs (automatic guided vehicles). IP confirmed that this is still the preferred route. M&S to notify Estates in advance of any large bits of kit arriving.

A permit for work via MMacM should be in place before any break-ins or isolations are undertaken. In any instance where a specific permit does not exist, the generic template should be used.

DC committed to providing AW with weekly updates on who is holding the access cards.

#### 5. **Health & Safety**

##### **H&S Plan**

A letter formally appointing M&S as Principal Designer under CDM Regs has been issued. DC confirmed that they have delegated this role to Faithful & Gould. Named person is Derek Ramage.

The duty to issue the F10 has also been discharged to M&S, a copy of the F10 has now been provided.

NHS Contractors Information Pack now issued to M&S

The construction Health & Safety Plan plus Risk Assessment and Method Statements have now been issued by DC. The Principal Designer (Derek Ramage) has reviewed the document and has confirmed they are happy with its content.

A HAI Scribe review has now been undertaken with Infection Control which covers the remote monitoring locations. Revised sensor locations have been forwarded to IC for comment.

#### 6. **Meetings**

It was agreed that weekly technical meetings will be undertaken prior to the weekly progress meeting. A recurring meeting invite has been issued.

#### 7. **Commissioning**

The AE agreed that leachate flushing will not be required due to the short sections of pipework affected. IP has now forwarded written confirmation of this from the AE.

Prior to any go live date, all commissioning documentation, pressure testing, etc should be collated and issued to allow review. TW is witnessing go live pre-and post checks, IP to witness is TW not available.

8. **AOCB**

TW has now issued a schedule of compliances and design standards, this requires revision subsequent to RB comments and will be covered under overarching plan.

Derogation schedule noting where the design derogates from the specification or any relevant standard to be included as an appendix to the Overarching Plan. **Outstanding.**

TW

A revised Risk Register has been circulated taking into account commentary received to date. Any comments to be forwarded to JH for revision and re-issue.

A purchase order has now been raised for the first years managed service contract which will commence upon practical completion. Scotmas have committed to providing a minimum of 2 weeks presence on site following PC for monitoring and stabilisation.

Fitted pipework in main plant area does not match the as built record information and is a mix of non-standard Italian brand Italinox and Finnish pipework. Italinox is not WRAS approved. The AE has issued a letter of comfort regarding the existing pipework.

A revised letter of comfort has been provided to M&S confirming that they cannot be held accountable for any galvanised corrosion on existing pipe work/fittings.

It has been agreed that the additional sockets required within the DSR rooms for the remote monitors can be taken from the cleaners socket loop.

Dwg versions of any created drawings will be required at the end of the project as part of the O&M issue. One hard copy and 2 disc copies of the O&Ms will be required as well as full size printed schematics for installing within the plant room.

**Chemical Storage & Safety**

Scotmas to prepare a risk assessment for the storage and use of chemicals in the plant rooms, emergency procedures, escalation plans plus the management of chemical handling and deliveries. Assessment to reference any relevant industry best practice guidelines. Any aspects of the risk assessment which require NHS input (site specific) to be highlighted. **This exercise is now overdue – DC to chase. IP to set up a meeting with H&S reps on the 20th Feb to review.**

AC/DC/IP

Solutions and mitigation measures which were discussed and need clarification include;

- Confirmation that an outhouse is no longer required (as currently assumed).
- Confirmation of what ventilation alterations/modifications are required if any.
- Confirmation if localised cage/perspex shielding is required

Upon receipt of the above, NHS to obtain approval from H&S and Fire teams. Potential costs savings for removing the outhouse now received.

M&S were reminded to keep a clear working area and ensure that any waste is taken away at the earliest.

TW noted that a couple of bladders from the replaced expansion vessels should be retained to allow sampling.

DC

It was requested that the new expansion vessels be insulated, preferably with jackets if possible. Costs were also requested for some additional cold water boosted vessels. PB to design up to allow costing.

PB/DC

IP requested confirmation of the ongoing monitoring that will be covered by Scotmas under the managed contract. The managed service regime is required so IP can identify what additional monitoring the NHS needs to undertake.

AC

An issue has been identified with the flow meters fitted at low flow levels which may be a defect. IP to review with TW and DC to provide a ball park costs for replacing.

DC/IP/TW

**9. Date & Time of Next Meeting**

Next progress meeting will be held on Wednesday 20<sup>th</sup> February at 1pm in the CMB Building, QEUH, meeting room 1. A short site walk round will follow.

A full snagging walk round is scheduled for Fri 22<sup>nd</sup> Feb.

**NHS Greater Glasgow & Clyde  
Chlorine Dioxide ClO<sub>2</sub> Water Treatment - Project Progress Meeting  
Wednesday 20<sup>th</sup> February 2019 at 1pm  
QEUE Central Medical Block**

**Present:**

|                            |   |  |
|----------------------------|---|--|
| Steve Russell (Chair) (SR) | - | Principal Project Manager, Capital Planning, NHSGG&C |
| Ian Powrie (IP)            | - | Deputy General Manager Estates, NHSGG&C, QEUE        |
| James Huddleston (JH)      | - | Senior Project Manager, Capital Planning, NHSGG&C    |
| David Carmichael (DC)      | - | Project Manager, Morris & Spottiswood, (M&S)         |
| Richard Beattie (RB)       | - | Aecom  |
| Piotr Biskup (PB)          | - | Atkins (Mech)  |
| Mark Riddell (MR)          | - | Estates Manager, NHSGG&C                             |
| Tim Wafer (TW)             | - | Consultant, Water Solutions                          |

**Apologies:**

|                       |   |                                |
|-----------------------|---|--------------------------------|
| Alistair Cameron (AC) | - | Scotmas                        |
| Andy Hewitt (AH)      | - | Aecom                          |
| Craig Patrick (CP)    | - | Atkins (Elec)                  |
| Scott Thompson (ST)   | - | Scotmas (on-site lead)         |
| Andy Russell (AR)     | - | Morris & Spottiswood, (M&S)    |
| Stephen Clark (SC)    | - | Atkins                         |
| Mel MacMillan (MMacM) | - | Estates Officer, NHSGG&C, QEUE |

**Action****1. Welcome/Introductions**

IP is the Technical Lead for the project and SR is the budget holder and will also be chairing meetings.

**2. Contract Award**

Letter of Appointments and Purchase Orders are now in place for all parties.

Formal instruction has been give to proceed with variations 01, 03, 04, 05, 06, 07, 08, 09 and 10.

Further outstanding variations include sump pits, ventilation, return sensor pipework, costs for ultrasonic in-line flow meters.

**DC****Contract Particulars****a. Commencement & Completion Dates**

Works to Wards 2a and 2b commenced 15<sup>th</sup> October with system now live. All works, scheduled for completion by 15th March 2019.

**b. Programme**

DC to circulate revised programme and go live dates via email.

**DC**

DC confirmed that the final completion date of 15<sup>th</sup> March can still be achieved however there was further Scotmas slippage reported causing significant concern. DC to seek formal confirmation from Scotmas on what mitigation measures are being put in place to ensure programme is met. **Required by Monday morning 25<sup>th</sup> Feb.**

**DC/AC**

A total of 7 week delay has now been reflected into the programme. Programme delays occurred in relation to getting sufficient residual in the system.

It was noted that the final account must be submitted for cost approval two weeks prior to financial year end to allow processing time before payment.

**DC**

**Overarching Plan**

TW/DC/RB

Aecom produced a document highlighting their take on the works package. TW to provided formal confirmation that this was correct at time of issue.

Plan to also include;

- Revised schedule of compliances and design standards.
- Derogation schedule noting where the design derogates from the specification or any relevant standard.

**TW/DC/RB to review and Aecom will be instructed to revise accordingly to reflect current arrangement. Provisional meeting scheduled Fri 22<sup>nd</sup>.**

**Treatment Plant Installation Plan**

Installation plan now agreed.

**CIO2 Monitoring Installation Plan**

Remote monitoring locations have now been identified by IP and agreed following survey on site. IP subsequently circulated updated schedule of monitoring locations.

**Go Live Plan**

Go live plan has now been programmed and the clinical team are cited. Document to include dosing programme, monitoring requirements, etc until desired outcome is reached as covered under first year support contract.

**Monitoring & Test Training Plan**

IP indicated that roughly 35-40 people will need system training. Groups of around 10 people can be trained at one time in 2-3 hour sessions, taking place over a 2 week period which is now shown on the programme.

AC

A core team of Estates staff have now been given high level awareness training following the completion of the 2a and 2b works.

IP has now signed off the proposed wording for warning signage. Signage locations and warning beacons still need to be agreed on site (in relation to exclusion zones). It was also noted that the tone of the alarm should differ from the Fire Alarm sounded. Exclusion zone to be included on as fitted drawings. To be covered under Scotmas risk assessment.

Training to be filmed. Scotmas confirmed that the training dates do not need to move as a result of the overall programme delay.

c. **Technical Clarifications**

It was agreed that IP will lead on separate technical meetings.

RB at Aecom has further revised his commentary on the recently circulated drawings. A collated response to be issued by M&S. This will merge with overarching plan.

DC/AC/TW

Various Atkins drawings required;

- Extract ventilation to plant room now issued but some minor revision likely in relation to cowl. Note: guidance on 'chlorine' being used for extract design in the absence of specific guidance.
- Cage drawing to be issued.

PB

TW noted that the Renal installation inclusive of BMS linked integrity needs to be completed and tested prior to anything else going live. Meeting proposed for Monday 25<sup>th</sup> afternoon with KCE/Scotmas/M&S/IP and Renal team.

IP/DC/AC

Documentation now provided by TW detailing the rationale behind the decision to retain the in tank monitoring.

As part of the shutdown protocol there will be a requirement to ensure that mobile phone alerts are set up for the Renal, etc. Alarm schedule to be produced so IP can determine what alarm criteria make it to an email alert and provide email addresses.

IP/DC

An issue has been identified with the flow meters fitted at low flow levels. Report to be prepared on the sensitivity of the in-line ultrasonic meters. TW advised you cannot get higher sensitivity meters on the pipe size.

TW

Ultrasonic strap on meter required to check if all meters are reading properly. DC to provide costs.

DC

#### 4. **The Site**

DC confirmed that a site compound is no longer required as office space on site can be provided.

The portering manager had expressed concerns regarding the basement tunnels being used for access and deliveries due to clashes with the AGVs (automatic guided vehicles). IP confirmed that this is still the preferred route. M&S to notify Estates in advance of any large bits of kit arriving.

A permit for work via MMacM should be in place before any break-ins or isolations are undertaken. In any instance where a specific permit does not exist, the generic template should be used.

DC committed to providing AW with weekly updates on who is holding the access cards.

#### 5. **Health & Safety**

##### **H&S Plan**

A letter formally appointing M&S as Principal Designer under CDM Regs has been issued. DC confirmed that they have delegated this role to Faithful & Gould. Named person is Derek Ramage.

The duty to issue the F10 has also been discharged to M&S, a copy of the F10 has now been provided.

NHS Contractors Information Pack now issued to M&S

The construction Health & Safety Plan plus Risk Assessment and Method Statements have now been issued by DC. The Principal Designer (Derek Ramage) has reviewed the document and has confirmed they are happy with its content.

A HAI Scribe review has now been undertaken with Infection Control which covers the remote monitoring locations.

#### 6. **Meetings**

A recurring meeting invite has been issued.

#### 7. **Commissioning**

The AE agreed in writing that leachate flushing will not be required due to the short sections of pipework affected.

Prior to any go live date, all commissioning documentation, pressure testing, etc should be collated and issued to allow review. TW is witnessing go live pre-and post checks, IP to witness is TW not available.

#### 8. **AOCB**

A revised Risk Register has been circulated taking into account commentary received to date. Any comments to be forwarded to JH for revision and re-issue.

A purchase order has now been raised for the first years managed service contract which will commence upon practical completion. Scotmas have committed to providing a minimum of 2 weeks presence on site following PC for monitoring and stabilisation.



Fitted pipework in main plant area does not match the as built record information and is a mix of non-standard Italian brand Italinox and Finnish pipework. Italinox is not WRAS approved. The AE has issued a letter of comfort regarding the existing pipework.

A revised letter of comfort has been provided to M&S confirming that they cannot be held accountable for any galvanised corrosion on existing pipe work/fittings.

It has been agreed that the additional sockets required within the DSR rooms for the remote monitors can be taken from the cleaners socket loop.

One hard copy and 2 disc copies of the O&Ms will be required as well as full size printed schematics for installing within the plant room & DWG files. Draft O&Ms to be issued by 15<sup>th</sup> March

DC

### **Chemical Storage & Safety**

Scotmas to prepare a risk assessment for the storage and use of chemicals in the plant rooms, emergency procedures, escalation plans plus the management of chemical handling and deliveries. Assessment to reference any relevant industry best practice guidelines. Any aspects of the risk assessment which require NHS input (site specific) to be highlighted. **This exercise is now overdue and critical – DC to request Scotmas forward documentation in whatever state it is currently in.**

AC/DC

Solutions and mitigation measures which were discussed and need clarification include;

- Confirmation that an outhouse is no longer required (as currently assumed).
- Confirmation of what ventilation alterations/modifications are required if any.
- Confirmation if localised cage/perspex shielding is required

Upon receipt of the above, NHS to obtain approval from H&S and Fire teams. Potential costs savings for removing the outhouse now received.

TW noted that a couple of bladders from the replaced expansion vessels should be retained to allow sampling.

It was requested that the new expansion vessels be insulated, preferably with jackets if possible. Costs were also requested for some additional cold water boosted vessels. PB to design up to allow costing.

PB/DC

IP requested confirmation of the ongoing monitoring that will be covered by Scotmas under the managed contract. The managed service regime is required so IP can identify what additional monitoring the NHS needs to undertake.

AC

## **9. Date & Time of Next Meeting**

Next progress meeting will be held on Wednesday 27<sup>th</sup> February at 1pm in the CMB Building, QEUH, meeting room 1.

**NHS Greater Glasgow & Clyde  
Chlorine Dioxide ClO<sub>2</sub> Water Treatment - Project Progress Meeting  
Wednesday 27<sup>th</sup> February 2019 at 1pm  
QEUEH Central Medical Block**

**Present:**

|                            |   |  |
|----------------------------|---|--|
| Steve Russell (Chair) (SR) | - | Principal Project Manager, Capital Planning, NHSGG&C |
| Ian Powrie (IP)            | - | Deputy General Manager Estates, NHSGG&C, QEUEH       |
| James Huddleston (JH)      | - | Senior Project Manager, Capital Planning, NHSGG&C    |
| David Carmichael (DC)      | - | Project Manager, Morris & Spottiswood, (M&S)         |
| Richard Beattie (RB)       | - | Aecom  |

**Apologies:**

|                       |   |                                 |
|-----------------------|---|---------------------------------|
| Mark Riddell (MR)     | - | Estates Manager, NHSGG&C        |
| Tim Wafer (TW)        | - | Consultant, Water Solutions     |
| Alistair Cameron (AC) | - | Scotmas                         |
| Piotr Biskup (PB)     | - | Atkins (Mech)                   |
| Andy Hewitt (AH)      | - | Aecom                           |
| Craig Patrick (CP)    | - | Atkins (Elec)                   |
| Scott Thompson (ST)   | - | Scotmas (on-site lead)          |
| Andy Russell (AR)     | - | Morris & Spottiswood, (M&S)     |
| Stephen Clark (SC)    | - | Atkins                          |
| Mel MacMillan (MMacM) | - | Estates Officer, NHSGG&C, QEUEH |

**Action****1. Welcome/Introductions**

IP is the Technical Lead for the project and SR is the budget holder and will also be chairing meetings.

**2. Contract Award**

Letter of Appointments and Purchase Orders are now in place for all parties.

Formal instruction has been give to proceed with variations 01, 03, 04, 05, 06, 07, 08, 09 and 10.

Further outstanding variations include;

- Ventilation – *due imminently*
- Return sensor pipework – *due imminently*
- Ultrasonic in-line flow meters – *high level indicative cost only required, unlikely to be instructed.*
- Ultrasonic strap on meter (buy or rent) - *outstanding*
- Sump pits – *further design work required from Atkins to produce a solution*
- Additional cold water boosted vessels - *outstanding*

**DC****Contract Particulars****a. Commencement & Completion Dates**

Works to Wards 2a and 2b commenced 15<sup>th</sup> October with system now live. All works, scheduled for completion by 15th March 2019.

**b. Programme**

DC has circulated simplified programme, full contractual programme now to be issued. In-depth Scotmas programme also to be circulated.

**DC**

DC confirmed that the final completion date of 15<sup>th</sup> March can still be achieved however there was further Scotmas slippage reported causing significant concern. DC confirmed that Scotmas was give na 7 day notice and have since provided assurances that the programme will be met. DC to chase AC for full update of status.

**DC/AC**

A total of 7 week delay has now been reflected into the programme. Programme delays occurred in relation to getting sufficient residual in the system.

It was noted that the final account must be submitted for cost approval two weeks prior to financial year end to allow processing time before payment.

DC

### Overarching Plan

TW has now signed off Aecom's overarching understanding of the works package as being correct at time of issue. RB has since revised this to incorporate any changes and will be issued shortly. This will require further review and sig off from TW.

TW/RB

TW to revise and include the following appendix documents to the Overarching Plan document;

TW

- Variations List
- Derogations List
- Standards List

### Treatment Plant Installation Plan

Installation plan now agreed.

### CIO2 Monitoring Installation Plan

Remote monitoring locations have now been identified by IP and agreed following survey on site. IP subsequently circulated updated schedule of monitoring locations.

### Go Live Plan

Go live plan has now been programmed and the clinical team are cited. Document to include dosing programme, monitoring requirements, etc until desired outcome is reached as covered under first year support contract.

### Monitoring & Test Training Plan

IP indicated that roughly 35-40 people will need system training. Groups of around 10 people can be trained at one time in 2-3 hour sessions, taking place over a 2 week period which is now shown on the programme.

A core team of Estates staff have now been given high level awareness training following the completion of the 2a and 2b works.

Training to be filmed. Scotmas confirmed that the training dates do not need to move as a result of the overall programme delay. IP requested that the process for flushing the taps also be filmed. IP to issue a descriptor of what he wants to be videoed.

IP

### c. Technical Clarifications

It was agreed that IP will lead on separate technical meetings.

RB at Aecom has further revised his commentary on the recently circulated drawings. A collated response to be issued by M&S. This will merge with overarching plan.

DC/AC/TW

Various Atkins drawings required;

- Extract ventilation now received, RB to make comment. Note: guidance on 'chlorine' being used for extract design in the absence of specific guidance.
- Cage drawing to be issued.
- Sump pit design solution to be explored.

PB

Renal installation inclusive of BMS linked integrity needs to be completed and tested prior to anything else going live. Proposed meeting on Monday 25<sup>th</sup> afternoon with KCE/Scotmas/M&S/IP and Renal team did not go ahead. DC to liaise with IP to coordinate.

IP/DC

Documentation now provided by TW detailing the rationale behind the decision to retain the in tank monitoring.

As part of the shutdown protocol there will be a requirement to ensure that mobile phone alerts are set up for Renal, etc. Alarm schedule to be produced so IP can determine what alarm criteria make it to an email alert and provide email addresses.

IP/DC

An issue has been identified with the flow meters fitted at low flow levels. Report to be prepared on the sensitivity of the in-line ultrasonic meters. TW advised you cannot get higher sensitivity meters on the pipe size.

TW

Ultrasonic strap on meter required to check if all meters are reading properly.

DC

Investigation still ongoing in relation to the hydraulic imbalance between the tanks. IP to issue methodology from O&Ms indicating how the system should operate.

IP/All

#### 4. **The Site**

DC confirmed that a site compound is no longer required as office space on site can be provided.

The portering manager had expressed concerns regarding the basement tunnels being used for access and deliveries due to clashes with the AGVs (automatic guided vehicles). IP confirmed that this is still the preferred route. M&S to notify Estates in advance of any large bits of kit arriving.

A permit for work via MMacM should be in place before any break-ins or isolations are undertaken. In any instance where a specific permit does not exist, the generic template should be used.

DC committed to providing AW with weekly updates on who is holding the access cards.

#### 5. **Health & Safety**

##### **H&S Plan**

A letter formally appointing M&S as Principal Designer under CDM Regs has been issued. DC confirmed that they have delegated this role to Faithful & Gould. Named person is Derek Ramage.

The duty to issue the F10 has also been discharged to M&S, a copy of the F10 has now been provided.

NHS Contractors Information Pack now issued to M&S

The construction Health & Safety Plan plus Risk Assessment and Method Statements have now been issued by DC. The Principal Designer (Derek Ramage) has reviewed the document and has confirmed they are happy with its content.

A HAI Scribe review has now been undertaken with Infection Control which covers the remote monitoring locations.

#### 6. **Meetings**

A recurring meeting invite has been issued.

#### 7. **Commissioning**

The AE agreed in writing that leachate flushing will not be required due to the short sections of pipework affected.

Prior to any go live date, all commissioning documentation, pressure testing, etc should be collated and issued to allow review. TW is witnessing go live pre-and post checks, IP to witness is TW not available.

#### 8. **AOCB**

A revised Risk Register has been circulated taking into account commentary received to date. Any comments to be forwarded to JH.

A purchase order has now been raised for the first years managed service contract which will commence upon practical completion. Scotmas have committed to providing a minimum of 2 weeks presence on site following PC for monitoring and stabilisation.

Fitted pipework in main plant area does not match the as built record information and is a mix of non-standard Italian brand Italinox and Finnish pipework. Italinox is not WRAS approved. The AE has issued a letter of comfort regarding the existing pipework.

A revised letter of comfort has been provided to M&S confirming that they cannot be held accountable for any galvanised corrosion on existing pipe work/fittings.

It has been agreed that the additional sockets required within the DSR rooms for the remote monitors can be taken from the cleaners socket loop.

One hard copy and 2 disc copies of the O&Ms will be required as well as full size printed schematics for installing within the plant room & DWG files. Draft O&Ms to be issued by 15<sup>th</sup> March. TW, RB and Estates to review.

DC

### **Chemical Storage & Safety**

Scotmas to prepare a risk assessment for the storage and use of chemicals in the plant rooms, emergency procedures, exclusion zones, escalation plans plus the management of chemical handling and deliveries. Assessment to reference any relevant industry best practice guidelines. Any aspects of the risk assessment which require NHS input (site specific) to be highlighted. **This exercise is now overdue and critical. This should be in place and signed off prior to system being operational – AC to issue suite of documents at the earliest in whatever draft state they may be in.**

AC

Solutions and mitigation measures which were discussed and need clarification include;

- Confirmation that an outhouse is no longer required (as currently assumed).
- Confirmation of what ventilation alterations/modifications are required if any.
- Confirmation if localised cage/perspex shielding is required

Upon receipt of the above, NHS to obtain approval from H&S and Fire teams.

TW noted that a couple of bladders from the replaced expansion vessels should be retained to allow sampling.

DC

DC confirmed that the expansion vessels will be jacket insulated.

IP requested confirmation of the ongoing monitoring that will be covered by Scotmas under the managed contract. The managed service regime is required so IP can identify what additional monitoring the NHS needs to undertake.

AC

Snagging walkround has been undertaken. DC to issue snagging list.

DC

KCE graphics still require submission for approval.

DC

## **9. Date & Time of Next Meeting**

Next progress meeting will be held on Wednesday 6<sup>th</sup> March at 9am in the CMB Building, QEUH, meeting room 1. Site walkround to follow.

**NHS Greater Glasgow & Clyde  
Chlorine Dioxide ClO<sub>2</sub> Water Treatment - Project Progress Meeting  
Wednesday 6<sup>th</sup> March 2019 at 9am  
QEUEH Central Medical Block**

**Present:**

|                            |   |  |
|----------------------------|---|--|
| Steve Russell (Chair) (SR) | - | Principal Project Manager, Capital Planning, NHSGG&C |
| Ian Powrie (IP)            | - | Deputy General Manager Estates, NHSGG&C, QEUEH       |
| James Huddleston (JH)      | - | Senior Project Manager, Capital Planning, NHSGG&C    |
| Mark Riddell (MR)          | - | Estates Manager, NHSGG&C                             |
| David Carmichael (DC)      | - | Project Manager, Morris & Spottiswood, (M&S)         |
| Richard Beattie (RB)       | - | Aecom  |
| Alistair Cameron (AC)      | - | Scotmas  |

**Apologies:**

|                       |   |                                 |
|-----------------------|---|---------------------------------|
| Tim Wafer (TW)        | - | Consultant, Water Solutions     |
| Piotr Biskup (PB)     | - | Atkins (Mech)                   |
| Andy Hewitt (AH)      | - | Aecom                           |
| Craig Patrick (CP)    | - | Atkins (Elec)                   |
| Scott Thompson (ST)   | - | Scotmas (on-site lead)          |
| Andy Russell (AR)     | - | Morris & Spottiswood, (M&S)     |
| Stephen Clark (SC)    | - | Atkins                          |
| Mel MacMillan (MMacM) | - | Estates Officer, NHSGG&C, QEUEH |

**Action****1. Welcome/Introductions**

IP is the Technical Lead for the project and SR is the budget holder and will also be chairing meetings.

**2. Contract Award**

Letter of Appointments and Purchase Orders are now in place for all parties.

Formal instruction has been give to proceed with variations 01, 03, 04, 05, 06, 07, 08, 09 and 10.

Further outstanding variations include;

- Ventilation
- Return sensor pipework
- Ultrasonic strap on meter (buy or rent)
- Sump pits – *provisional sum required*
- Additional cold water boosted vessels

High Level costs for these items are required from M&S by close of play 6<sup>th</sup> March to ensure funding is made available.

**DC****Contract Particulars****a. Commencement & Completion Dates**

Works to Wards 2a and 2b commenced 15<sup>th</sup> October with system now live. All works, scheduled for completion by 15<sup>th</sup> March 2019.

**b. Programme**

DC has circulated simplified programme, full contractual programme to be issued by close of play Fri 8<sup>th</sup> March. **Now outstanding.**

**DC**

DC and AC confirmed that the final completion date of 15<sup>th</sup> March is still on programme

**DC/AC**

A total of 7 week delay has now been reflected into the programme. Programme delays occurred in relation to getting sufficient residual in the system.

It was noted that the final account must be submitted for cost approval two weeks prior to financial year end to allow processing time before payment. **DC**

### Overarching Plan

TW has signed off Aecoms overarching understanding of the works package as being correct at time of issue. **RB has since revised and reissued incorporate the changes made to date. TW to review and provide final sign off prior to the 15<sup>th</sup> March.** **TW**

**TW to revise and reissue the following appendix documents to the Overarching Plan document;** **TW**

- Variations List
- Derogations List
- Standards List

### Treatment Plant Installation Plan

Installation plan now agreed.

### CIO2 Monitoring Installation Plan

Remote monitoring locations have now been identified by IP and agreed following survey on site. IP subsequently circulated updated schedule of monitoring locations.

### Go Live Plan

Go live plan has now been programmed and the clinical team are cited. Document to include dosing programme, monitoring requirements, etc until desired outcome is reached as covered under first year support contract.

### Monitoring & Test Training Plan

IP indicated that roughly 35-40 people will need system training. Groups of around 10 people can be trained at one time in 2-3 hour sessions, taking place over a 2 week period which is now shown on the programme.

A core team of Estates staff have now been given high level awareness training following the completion of the 2a and 2b works.

**Training to be filmed. Scotmas confirmed that the training dates do not need to move as a result of the overall programme delay. IP requested that the process for flushing the taps also be filmed. TW to issue an agreed syllabus to IP/Scotmas prior to 15<sup>th</sup> March.** **TW**

### c. Technical Clarifications

It was agreed that IP will lead on separate technical meetings.

RB at Aecom has further revised his commentary on the recently circulated drawings. A collated response to be issued by M&S and agreed with TW. This will merge with overarching plan. **DC/TW**

Various Atkins drawings required;

- Extract ventilation now received, RB has made further comment. Note: guidance on 'chlorine' being used for extract design in the absence of specific guidance. **PB**
- Cage drawing to be issued.
- Sump pit design solution to be explored.

Renal installation inclusive of BMS linked integrity needs to be completed and tested prior to anything else going live. Proposed meeting on Monday 25<sup>th</sup> afternoon with KCE/Scotmas/M&S/IP and Renal team did not go ahead. DC to liaise with IP to coordinate. **IP/DC**

Documentation now provided by TW detailing the rationale behind the decision to retain the in tank monitoring.

As part of the shutdown protocol there will be a requirement to ensure that mobile phone alerts are set up for Renal, etc. Alarm schedule has been issued, IP to determine what alarm criteria make it to an email alert and provide email addresses. **IP**

An issue has been identified with the flow meters fitted at low flow levels. TW advised you cannot get higher sensitivity meters on the pipe size. AC advised that a software fix will be made available. **Note**

Costs for ultrasonic strap on meter required to check if all meters are reading properly. **DC**

Investigation still ongoing in relation to the hydraulic imbalance between the tanks. IP to issue methodology from O&Ms indicating how the system should operate. **IP/All**

#### 4. **The Site**

DC confirmed that a site compound is no longer required as office space on site can be provided.

The portering manager had expressed concerns regarding the basement tunnels being used for access and deliveries due to clashes with the AGVs (automatic guided vehicles). IP confirmed that this is still the preferred route. M&S to notify Estates in advance of any large bits of kit arriving.

A permit for work via MMacM should be in place before any break-ins or isolations are undertaken. In any instance where a specific permit does not exist, the generic template should be used.

DC committed to providing AW with weekly updates on who is holding the access cards.

#### 5. **Health & Safety**

##### **H&S Plan**

A letter formally appointing M&S as Principal Designer under CDM Regs has been issued. DC confirmed that they have delegated this role to Faithful & Gould. Named person is Derek Ramage.

The duty to issue the F10 has also been discharged to M&S, a copy of the F10 has now been provided.

NHS Contractors Information Pack now issued to M&S

The construction Health & Safety Plan plus Risk Assessment and Method Statements have now been issued by DC. The Principal Designer (Derek Ramage) has reviewed the document and has confirmed they are happy with its content.

A HAI Scribe review has now been undertaken with Infection Control which covers the remote monitoring locations.

An issue occurred on the Renal installation where an alarm didn't trip which is being treated as a near miss in terms of patient safety by the clinical team. IP requires a full report into this incident at the earliest detailing what happened, what measures are now in place, protocol, fail safe, RAMS, etc. **AC/DC**

#### 6. **Meetings**

A recurring meeting invite has been issued.

#### 7. **Commissioning**

The AE agreed in writing that leachate flushing will not be required due to the short sections of pipework affected.

Prior to any go live date, all commissioning documentation, pressure testing, etc should be collated and issued to allow review. TW is witnessing go live pre-and post checks, IP to witness is TW not available.



**8. AOCB**

A revised Risk Register has been circulated taking into account commentary received to date. Any comments to be forwarded to JH.

A purchase order has now been raised for the first years managed service contract which will commence upon practical completion. Scotmas have committed to providing a minimum of 2 weeks presence on site following PC for monitoring and stabilisation. Fitted pipework in main plant area does not match the as built record information and is a mix of non-standard Italian brand Italinox and Finnish pipework. Italinox is not WRAS approved. The AE has issued a letter of comfort regarding the existing pipework.

A revised letter of comfort has been provided to M&S confirming that they cannot be held accountable for any galvanised corrosion on existing pipe work/fittings.

It has been agreed that the additional sockets required within the DSR rooms for the remote monitors can be taken from the cleaners socket loop.

One hard copy and 2 disc copies of the O&Ms will be required as well as full size printed schematics for installing within the plant room & DWG files. Draft O&Ms to be issued by 15<sup>th</sup> March. TW, RB and Estates to review.

DC

**Chemical Storage & Safety**

Scotmas have issued initial draft of risk assessments for review. Some additional risk assessment required from the NHS/TW. IP to set up a review with the NHS H&S team to go over all the documentation on Thursday 14<sup>th</sup> March.

IP

An additional set of standalone risk assessments to be provided by Scotmas covering the specific Renal installation covering both maintenance and patient protection protocols. Assessment to reference any relevant industry best practice guidelines.

AC

TW noted that a couple of bladders from the replaced expansion vessels should be retained to allow sampling.

DC

DC confirmed that the expansion vessels will be jacket insulated.

IP requested confirmation of the ongoing monitoring that will be covered by Scotmas under the managed contract. The managed service regime is required so IP can identify what additional monitoring the NHS needs to undertake.

AC

Snagging walkround has been undertaken and list issued. Snags to be addressed on site.

AC/DC

KCE graphics now submitted and will be reviewed on Wed 6<sup>th</sup> March as IP expressed some tweaks will be required.

IP/DC

**9. Date & Time of Next Meeting**

Next progress meeting will be held on Friday 15<sup>th</sup> March at 2pm in the CMB Building, QEUH, meeting room 1.

**NHS Greater Glasgow & Clyde  
Chlorine Dioxide ClO<sub>2</sub> Water Treatment - Project Progress Meeting  
Friday 15<sup>th</sup> March 2019 at 2pm  
QEUE Central Medical Block**

**Present:**

|                            |   |  |
|----------------------------|---|--|
| Steve Russell (Chair) (SR) | - | Principal Project Manager, Capital Planning, NHSGG&C |
| Ian Powrie (IP)            | - | Deputy General Manager Estates, NHSGG&C, QEUE        |
| James Huddleston (JH)      | - | Senior Project Manager, Capital Planning, NHSGG&C    |
| Mark Riddell (MR)          | - | Estates Manager, NHSGG&C                             |
| David Carmichael (DC)      | - | Project Manager, Morris & Spottiswood, (M&S)         |
| Richard Beattie (RB)       | - | Aecom  |
| Alistair Cameron (AC)      | - | Scotmas  |
| Tim Wafer (TW)             | - | Consultant, Water Solutions                          |
| Piotr Biskup (PB)          | - | Atkins (Mech)  |
| Craig Patrick (CP)         | - | Atkins (Elec)  |

**Apologies:**

|                       |   |                                |
|-----------------------|---|--------------------------------|
| Andy Hewitt (AH)      | - | Aecom                          |
| Scott Thompson (ST)   | - | Scotmas (on-site lead)         |
| Andy Russell (AR)     | - | Morris & Spottiswood, (M&S)    |
| Stephen Clark (SC)    | - | Atkins                         |
| Mel MacMillan (MMacM) | - | Estates Officer, NHSGG&C, QEUE |

**Action****1. Welcome/Introductions**

IP is the Technical Lead for the project and SR is the budget holder and will also be chairing meetings.

**2. Contract Award**

Letter of Appointments and Purchase Orders are now in place for all parties.

Formal instruction has been give to proceed with variations 01, 03, 04, 05, 06, 07, 08, 09 and 10.

Costs has been provided for the following variations and a notification of intent has been issued confirming the NHS wish M&S to proceed with these works. Formal instruction will follow once the Cost Advisor has confirmed that the costs submitted represent value of money;

**AH**

Variation 11 – Sensors to 8nr locations

Variation 12 – Extract ventilation to basement plantroom

Variation 14 – Ultrasonic strap on meters (these are unlikely to be required now)

Variation 15 – Additional cold water boosted vessels

Variation 16 – Ward 2a/2b riser remove temp units

Above works require to be wholly or substantially complete by end of financial year. DC to confirm deliverable dates by close of play Monday 18<sup>th</sup> March.

**DC**

A provisional sum for variation 13 sump pits has been submitted however it has been confirmed that these works will be taken out with this contract.

Valuation to be undertaken by cost advisor on Friday 22<sup>nd</sup> to tie in with end of financial year. Scotmas & M&S agreed to get as much equipment, materials, etc on site prior to this date.

**AH / All**

**Contract Particulars****a. Commencement & Completion Dates**

Works to Wards 2a and 2b commenced 15<sup>th</sup> October with system now live. All works, were scheduled for completion by 15th March 2019. This date has not been and the project is currently in delay. Anticipated completion 22nd

**b. Programme**

DC has circulated simplified programme, full contractual programme to be issued by close by close of play Monday 18<sup>th</sup> March. DC

A total of 7 week delay has now been reflected into the programme. Programme delays occurred in relation to getting sufficient residual in the system. Programme now in further delay beyond 15<sup>th</sup> March.

It was noted that the final account must be submitted for cost approval two weeks prior to financial year end to allow processing time before payment. DC

**Overarching Plan**

The revised overarching plan has now been signed off by TW.

TW to revise and reissue the following appendix documents to the Overarching Plan document upon project completion; TW

- Variations List
- Derogations List
- Standards List

**Treatment Plant Installation Plan**

Installation plan now agreed.

**CIO2 Monitoring Installation Plan**

Remote monitoring locations have now been identified by IP and agreed following survey on site. IP subsequently circulated updated schedule of monitoring locations.

**Go Live Plan**

Go live plan has now been programmed and the clinical team are cited. Document to include dosing programme, monitoring requirements, etc until desired outcome is reached as covered under first year support contract.

**Monitoring & Test Training Plan**

IP indicated that roughly 35-40 people will need system training. Groups of around 10 people can be trained at one time in 2-3 hour sessions, taking place over a 2 week period which is now shown on the programme.

A core team of Estates staff have now been given high level awareness training following the completion of the 2a and 2b works.

Training to be filmed and to include the process for flushing the taps. TW has agreed a filming syllabus with Scotmas which IP will agree with the relevant NHS personnel. Scotmas to confirm training dates to IP/MR. IP/AC

**c. Technical Clarifications**

It was agreed that IP will lead on separate technical meetings.

RB at Aecom has further revised his commentary on the recently circulated drawings. A collated response to be issued by M&S and agreed with TW. This will merge with overarching plan. DC/TW

Various Atkins drawings required;

- Extract ventilation drawing now agreed. Note: guidance on 'chlorine' being used for extract design in the absence of specific guidance.
- Cage drawing to be issued as part of O&Ms. PB

Renal installation inclusive of BMS linked integrity needs to be completed and tested prior to anything else going live. Final tests to be undertaken Thursday 21<sup>st</sup> March. TW, DC & AC to liaise with IP, Veolia and Renal to coordinate.

All

Documentation now provided by TW detailing the rationale behind the decision to retain the in tank monitoring.

As part of the shutdown protocol there will be a requirement to ensure that mobile phone/email alerts are set up for Renal, etc. Alarm schedule has been issued, IP to provide email addresses/phone numbers for alerts.

IP

An issue has been identified with the flow meters fitted at low flow levels. TW advised you cannot get higher sensitivity meters on the pipe size. AC advised that a software fix will be made available.

Investigations have shown only a 1-2% variation in the tanks hydraulic balance. To be removed from this contract.

#### 4. The Site

DC confirmed that a site compound is no longer required as office space on site can be provided.

The portering manager had expressed concerns regarding the basement tunnels being used for access and deliveries due to clashes with the AGVs (automatic guided vehicles). IP confirmed that this is still the preferred route. M&S to notify Estates in advance of any large bits of kit arriving.

A permit for work via MMacM should be in place before any break-ins or isolations are undertaken. In any instance where a specific permit does not exist, the generic template should be used.

DC committed to providing AW with weekly updates on who is holding the access cards.

#### 5. Health & Safety

##### H&S Plan

A letter formally appointing M&S as Principal Designer under CDM Regs has been issued. DC confirmed that they have delegated this role to Faithful & Gould. Named person is Derek Ramage.

The duty to issue the F10 has also been discharged to M&S, a copy of the F10 has now been provided.

NHS Contractors Information Pack now issued to M&S

The construction Health & Safety Plan plus Risk Assessment and Method Statements have now been issued by DC. The Principal Designer (Derek Ramage) has reviewed the document and has confirmed they are happy with its content.

A HAI Scribe review has now been undertaken with Infection Control which covers the remote monitoring locations.

An issue occurred on the Renal installation where an alarm didn't trip which is being treated as a near miss in terms of patient safety by the clinical team. IP requires a full report into this incident at the earliest detailing what happened, what measures are now in place, protocol, fail safe, RAMS, etc.

AC

Scotmas to provide their permit to work on CIO2 template to the NHS which can be adopted, including audit trails, master setting, etc.

AC

- 6. Meetings**  
A recurring meeting invite has been issued.
- 7. Commissioning**  
The AE agreed in writing that leachate flushing will not be required due to the short sections of pipework affected.
- Prior to any go live date, all commissioning documentation, pressure testing, etc should be collated and issued to allow review. TW is witnessing go live pre-and post checks, IP to witness is TW not available.
- Prior to Thu 21 /Fri 22<sup>nd</sup> commissioning, TW to provide an agenda and methodology for the witness testing. TW
- 8. AOCB**  
A revised Risk Register has been circulated taking into account commentary received to date. Any comments to be forwarded to JH.
- A purchase order has now been raised for the first years managed service contract which will commence upon practical completion. Scotmas have committed to providing a minimum of 2 weeks presence on site following PC for monitoring and stabilisation.
- A revised letter of comfort has been provided to M&S confirming that they cannot be held accountable for any galvanised corrosion on existing pipe work/fittings.
- One hard copy and 2 disc copies of the O&Ms will be required as well as full size printed schematics for installing within the plant room & DWG files. Draft O&Ms to be issued for review. TW, RB and Estates to review as well as Principal Designer. DC
- Chemical Storage & Safety**  
Scotmas have issued initial draft of risk assessments for review. Some additional risk assessment required from the NHS/TW. IP to set up a review with the NHS H&S team to go over all the documentation on 29th March. IP
- An additional set of standalone risk assessments to be provided by Scotmas covering the specific Renal installation covering both maintenance and patient protection protocols. Assessment to reference any relevant industry best practice guidelines. AC
- TW noted that a couple of bladders from the replaced expansion vessels should be retained to allow sampling. DC
- DC confirmed that the expansion vessels will be jacket insulated.
- Scotmas have now confirmed ongoing monitoring that will be covered under the managed contract.
- Snagging walkround has been undertaken and list issued. Snags to be addressed on site. 3 separate snagging lists exist (TW, M&S and Scotmas) – to be combined into a single list and re-issued by close of play Monday 18<sup>th</sup> March. DC
- KCE graphics now submitted and agreed.
- It was agreed that Scotmas would provide the required padlocks. Coded padlocks were requested an IP will provide the code required. AC/IP
- 9. Date & Time of Next Meeting**  
Next progress meeting will be held on Friday 22<sup>nd</sup> March at 12noon in the CMB Building, QEUH, meeting room 1.

**NHS Greater Glasgow & Clyde  
Chlorine Dioxide CIO2 Water Treatment - Project Progress Meeting  
Friday 29<sup>th</sup> March 2019 at 11am  
QEUEH Central Medical Block**

**Present:**

|                            |   |  |
|----------------------------|---|--|
| Steve Russell (Chair) (SR) | - | Principal Project Manager, Capital Planning, NHSGG&C |
| Ian Powrie (IP)            | - | Deputy General Manager Estates, NHSGG&C, QEUEH       |
| James Huddleston (JH)      | - | Senior Project Manager, Capital Planning, NHSGG&C    |
| Mark Riddell (MR)          | - | Estates Manager, NHSGG&C                             |
| David Carmichael (DC)      | - | Project Manager, Morris & Spottiswood, (M&S)         |
| Tim Wafer (TW)             | - | Consultant, Water Solutions                          |
| Andy Hewitt (AH)           | - | Aecom  |

**Apologies:**

|                       |   |                                 |
|-----------------------|---|---------------------------------|
| Richard Beattie (RB)  | - | Aecom                           |
| Alistair Cameron (AC) | - | Scotmas                         |
| Piotr Biskup (PB)     | - | Atkins (Mech)                   |
| Craig Patrick (CP)    | - | Atkins (Elec)                   |
| Scott Thompson (ST)   | - | Scotmas (on-site lead)          |
| Andy Russell (AR)     | - | Morris & Spottiswood, (M&S)     |
| Stephen Clark (SC)    | - | Atkins                          |
| Mel MacMillan (MMacM) | - | Estates Officer, NHSGG&C, QEUEH |

**Action****1. Welcome/Introductions**

IP is the Technical Lead for the project and SR is the budget holder and will also be chairing meetings.

**2. Contract Award**

Letter of Appointments and Purchase Orders are now in place for all parties.

Formal instruction has been give to proceed with variations 01, 03, 04, 05, 06, 07, 08, 09 and 10.

Costs has been provided for the following variations and a notification of intent has been issued confirming the NHS wish M&S to proceed with these works. Formal instruction will follow once the Cost Advisor has confirmed that the costs submitted represent value of money;

**AH**

Variation 11 – Sensors to 8nr locations

Variation 12 – Extract ventilation to basement plantroom

Variation 14 – Ultrasonic strap on meters (these are unlikely to be required now)

Variation 15 – Additional cold water boosted vessels

Variation 16 – Ward 2a/2b riser remove temp units

Variation 17 – Plantroom 22 & 41 additional pipework

Variation 18 – Veolia data point

A provisional sum for variation 13 sump pits has been submitted however it has been confirmed that these works will be taken out with this contract.

End of year application now submitted, Cost Advisor to review and M&S to submit invoice by close of play 29<sup>th</sup> March..

**AH / DC****Contract Particulars****a. Commencement & Completion Dates**

Works to Wards 2a and 2b commenced 15<sup>th</sup> October 2018. Practical completion was achieved on 22<sup>nd</sup> March 2019.

b. **Programme**

Revised programme now circulated. Snagging works outstanding.

A total of 8 week delay was incurred and reflected into the programme. Programme delays occurred in relation to getting sufficient residual in the system.

**Overarching Plan**

The revised overarching plan has now been signed off by TW.

The following appendix documents are now included within the O&Ms pending some final Scotmas info.

TW/Scotmas

- Variations List
- Derogations List
- Standards List

**Treatment Plant Installation Plan**

Installation plan now agreed.

**CIO2 Monitoring Installation Plan**

Remote monitoring locations have now been identified by IP and agreed following survey on site. IP subsequently circulated updated schedule of monitoring locations.

**Go Live Plan**

Go live plan has now been programmed and the clinical team are cited. Document to include dosing programme, monitoring requirements, etc until desired outcome is reached as covered under first year support contract.

**Monitoring & Test Training Plan**

IP indicated that roughly 35-40 people will need system training. Groups of around 10 people can be trained at one time in 2-3 hour sessions, taking place over a 2 week period which is now shown on the programme.

A core team of Estates staff have now been given high level awareness training following the completion of the 2a and 2b works.

Training to be filmed and to include the process for flushing the taps. TW has agreed a filming syllabus with Scotmas which IP will agree with the relevant NHS personnel. Scotmas to forward to IP and confirm training dates to IP/MR. To be added to snagging list.

IP/AC/  
DCc. **Technical Clarifications**

Various Atkins drawings required;

- Extract ventilation drawing now agreed. Note: HSE guidance on 'chlorine' being used for extract design in the absence of specific guidance.
- Cage drawing now issued as part of O&Ms.

Renal installation inclusive of BMS linked integrity now completed however final witnessing sign off of operation required from TW and Renal team. Protocol also requires sign off.

TW/Renal

Mobile phone/email alerts still to be set up for Renal. Alarm schedule has been issued, IP to provide email addresses/phone numbers for alerts. To be added to snagging list.

IP/DC

An issue has been identified with the flow meters fitted at low flow levels. TW advised you cannot get higher sensitivity meters on the pipe size. AC advised that a software fix will be made available.

Tank hydraulic balance still giving issues and a hydraulic specialist may need to be appointed. This is now to be removed from this contract.

#### 4. **The Site**

DC confirmed that a site compound is no longer required as office space on site can be provided.

A permit for work via MMacM should be in place before any break-ins or isolations are undertaken. In any instance where a specific permit does not exist, the generic template should be used.

DC committed to providing AW with weekly updates on who is holding the access cards.

#### 5. **Health & Safety**

##### **H&S Plan**

A letter formally appointing M&S as Principal Designer under CDM Regs has been issued. DC confirmed that they have delegated this role to Faithful & Gould. Named person is Derek Ramage.

The duty to issue the F10 has also been discharged to M&S, a copy of the F10 has now been provided.

NHS Contractors Information Pack now issued to M&S

The construction Health & Safety Plan plus Risk Assessment and Method Statements have now been issued by DC. The Principal Designer (Derek Ramage) has reviewed the document and has confirmed they are happy with its content.

A HAI Scribe review has now been undertaken with Infection Control which covers the remote monitoring locations.

An issue occurred on the Renal installation where an alarm didn't trip which is being treated as a near miss in terms of patient safety by the clinical team. IP requires a full report into this incident at the earliest detailing what happened, what measures are now in place, protocol, fail safe, RAMS, etc.

**AC**

Scotmas to provide their permit to work on ClO2 template to the NHS which can be adopted, including audit trails, master setting, etc. Template to be added to O&Ms.

**Scotmas**

#### 6. **Meetings**

Meetings will now be fortnightly to close out remaining snagging items to tie in with water group meetings.

#### 7. **Commissioning**

The AE agreed in writing that leachate flushing will not be required due to the short sections of pipework affected.

Prior to any go live date, all commissioning documentation, pressure testing, etc should be collated and issued to allow review. TW is witnessing go live pre-and post checks, IP to witness is TW not available.

#### 8. **AOCB**

A revised Risk Register has been circulated taking into account commentary received to date. Any comments to be forwarded to JH.

A purchase order has now been raised for the first years managed service contract which will commence upon practical completion. Scotmas have committed to providing a minimum of 2 weeks presence on site following PC for monitoring and stabilisation.



A revised letter of comfort has been provided to M&S confirming that they cannot be held accountable for any galvanised corrosion on existing pipe work/fittings.

One hard copy and 2 disc copies of the O&Ms will be required as well as full size printed schematics for installing within the plant room & DWG files. Draft O&Ms have been issued and reviewed pending revision. To be added to snagging list. TW, RB and Estates to review as well as Principal Designer.

DC

#### **Chemical Storage & Safety**

Scotmas have issued initial draft of risk assessments for review. Some additional risk assessment required from the NHS/TW. Review with NHS H&S team now undertaken and is generally signed off pending some re-formatting.

DC

An additional set of standalone risk assessments now provided by Scotmas covering the specific Renal installation covering both maintenance and patient protection protocols. Assessment to reference any relevant industry best practice guidelines.

DC confirmed that the expansion vessels will be jacket insulated.

Scotmas have now confirmed ongoing monitoring that will be covered under the managed contract.

Snagging walkround has been undertaken and list issued, TW has confirmed that his list is now merged with M&S. RB snags to also be included. Snags to be addressed on site.

DC

KCE graphics now submitted and agreed.

NHS to provide the required padlocks. 4 digit coded padlocks required. 30 small and 2 larger.

IP

DC to issue weekly updates on progress of the snagging items (revised snagging list) to all.

DC

#### **9. Date & Time of Next Meeting**

Next meeting will be to review status of snagging items and will be held on Friday 12<sup>th</sup> April at 11am in the CMB Building, QEUH, meeting room 1.

**NHS Greater Glasgow & Clyde  
Chlorine Dioxide ClO<sub>2</sub> Water Treatment - Project Progress Meeting  
Friday 26<sup>th</sup> April  
QEUEH Central Medical Block**

**Present:**

|                            |   |  |
|----------------------------|---|--|
| Steve Russell (Chair) (SR) | - | Principal Project Manager, Capital Planning, NHSGG&C |
| James Huddleston (JH)      | - | Senior Project Manager, Capital Planning, NHSGG&C    |
| Mark Riddell (MR)          | - | Estates Manager, NHSGG&C                             |
| David Carmichael (DC)      | - | Project Manager, Morris & Spottiswood, (M&S)         |
| Tim Wafer (TW)             | - | Consultant, Water Solutions                          |
| Alistair Cameron (AC)      | - | Scotmas  |
| Ross Miller (RM)           | - | QS, Morris & Spottiswood, (M&S)                      |

**Apologies:**

|                       |   |  |
|-----------------------|---|--|
| Ian Powrie (IP)       | - | Deputy General Manager Estates, NHSGG&C, QEUEH |
| Richard Beattie (RB)  | - | Aecom  |
| Andy Hewitt (AH)      | - | Aecom  |
| Piotr Biskup (PB)     | - | Atkins (Mech)                                  |
| Craig Patrick (CP)    | - | Atkins (Elec)                                  |
| Scott Thompson (ST)   | - | Scotmas (on-site lead)                         |
| Andy Russell (AR)     | - | Morris & Spottiswood, (M&S)                    |
| Stephen Clark (SC)    | - | Atkins   |
| Mel MacMillan (MMacM) | - | Estates Officer, NHSGG&C, QEUEH                |

**Action****1. Welcome/Introductions**

IP is the Technical Lead for the project and SR is the budget holder and will also be chairing meetings.

**2. Contract Award**

Letter of Appointments and Purchase Orders are now in place for all parties.

Formal instruction was given proceed with variations 01, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 14, 15, 16, 17 and 18.

A provisional sum for variation 13 sump pits has been submitted however it has been confirmed that these works will be taken out with this contract.

**Contract Particulars****a. Commencement & Completion Dates**

Works to Wards 2a and 2b commenced 15<sup>th</sup> October 2018. Practical completion was achieved on 22<sup>nd</sup> March 2019.

**b. Programme**

Revised programme now circulated. Snagging works outstanding.

A total of 8 week delay was incurred and reflected into the programme. Programme delays occurred in relation to getting sufficient residual in the system.

**Overarching Plan**

The revised overarching plan has now been signed off by TW.

The following appendix documents are now included within the O&Ms and are to be included in final issue

- Variations List
- Derogations List
- Standards List

**DC**

Final O&M issue outstanding and still requires electrical schematics, install certificates, Atkins drawings, BMS graphic screenshots and alarm protocol. Information being collated by DC for issue and review prior to next progress meeting.

DC

It was noted that the next issue of the O&Ms should also be copied to Mark Riddell, Mel MacMillan and Colin Purdon (estates team).

### **Monitoring & Test Training Plan**

IP indicated that roughly 35-40 people will need system training. Groups of around 10 people can be trained at one time in 2-3 hour sessions, taking place over a 2 week period which is now shown on the programme. Date to be agreed with Scotmas

IP/MR

Training to be filmed and to include the process for flushing the taps. TW has agreed a filming syllabus with Scotmas which IP will agree with the relevant NHS personnel. Dates to be confirmed for completion.

AC

### c. **Technical Clarifications**

Renal installation inclusive of BMS linked integrity now completed however final witnessing sign off of operation required from TW and Renal team. Protocol also requires sign off. A meeting has been set up for 16<sup>th</sup> May with IP and Renal to close out.

TW/Renal

Mobile phone/email alerts still to be set up for Renal. Alarm schedule has been issued, IP to provide email addresses/phone numbers for alerts. To be added to snagging list.

IP/DC

An issue has been identified with the flow meters fitted at low flow levels. TW advised you cannot get higher sensitivity meters on the pipe size. AC advised that a software fix will be made available.

Tank hydraulic balance still giving issues and a hydraulic specialist may need to be appointed. This is now to be removed from this contract.

### 4. **The Site**

DC confirmed that a site compound is no longer required as office space on site can be provided.

DC committed to providing IP with weekly updates on who is holding the access cards.

### 5. **Health & Safety**

#### **H&S Plan**

A letter formally appointing M&S as Principal Designer under CDM Regs has been issued. DC confirmed that they have delegated this role to Faithful & Gould. Named person is Derek Ramage.

The duty to issue the F10 has also been discharged to M&S, a copy of the F10 has now been provided.

NHS Contractors Information Pack now issued to M&S

The construction Health & Safety Plan plus Risk Assessment and Method Statements have now been issued by DC. The Principal Designer (Derek Ramage) has reviewed the document and has confirmed they are happy with its content.

A HAI Scribe review has now been undertaken with Infection Control which covers the remote monitoring locations.

### 6. **Meetings**

Meetings will now be fortnightly to close out remaining snagging items to tie in with water group meetings.

**7. Commissioning**

The AE agreed in writing that leachate flushing will not be required due to the short sections of pipework affected.

**8. AOCB**

A revised Risk Register has been circulated taking into account commentary received to date.

A purchase order has now been raised for the first years managed service contract which will commence upon practical completion.

A revised letter of comfort has been provided to M&S confirming that they cannot be held accountable for any galvanised corrosion on existing pipe work/fittings.

One hard copy and 2 disc copies of the O&Ms will be required as well as full size printed schematics for installing within the plant room & DWG files. Draft O&Ms have been issued and reviewed pending revision. To be added to snagging list. TW, RB and Estates to review as well as Principal Designer.

**DC****Chemical Storage & Safety**

Scotmas have issued initial draft of risk assessments for review. Some additional risk assessment required from the NHS/TW. Review with NHS H&S team now undertaken and is generally signed off pending some re-formatting.

**IP**

An additional set of standalone risk assessments now provided by Scotmas covering the specific Renal installation covering both maintenance and patient protection protocols. Assessment to reference any relevant industry best practice guidelines.

DC confirmed that the expansion vessels will be jacket insulated.

Scotmas have now confirmed ongoing monitoring that will be covered under the managed contract.

Snagging list now has 16 items with most due to be closed out prior to the next progress meeting.

**DC**

DC to issue weekly updates on progress of the snagging items (revised snagging list) to all.

TW raised a concern regarding the condensate pumps and how a failure would be notified to reduce the risk of a floor. DC to look into and advise.

**DC**

Dates for the removal of the wards 2A & B bravo units to be removed still to be agreed.

**Note**

Ventilation ducting now in place, extract fan due to be delivered on 3<sup>rd</sup> May and likely be fitted shortly after. Following this an alarm and fan text will be required. Date of this to be notified in advance.

**DC****9. Date & Time of Next Meeting**

Next meeting will be to review status of snagging items and will be held on Wednesday 22<sup>nd</sup> April at 1pm in the CMB Building, QEUH, meeting room 1.

**NHS Greater Glasgow & Clyde**  
**Chlorine Dioxide ClO<sub>2</sub> Water Treatment - Project Snagging Update**  
**Thursday 13<sup>th</sup> June**  
**QEUEH Central Medical Block**

**Present:**

|                            |   |  |
|----------------------------|---|--|
| Steve Russell (Chair) (SR) | - | Principal Project Manager, Capital Planning, NHSGG&C |
| James Huddleston (JH)      | - | Senior Project Manager, Capital Planning, NHSGG&C    |
| Mark Riddell (MR)          | - | Estates Manager, NHSGG&C                             |
| Ian Powrie (IP)            | - | Deputy General Manager Estates, NHSGG&C, QEUEH       |
| David Carmichael (DC)      | - | Project Manager, Morris & Spottiswood, (M&S)         |
| Tim Wafer (TW)             | - | Consultant, Water Solutions                          |
| Richard Beattie (RB)       | - | Aecom  |
| Brian Kelly (BK)           | - | Kelvin Controls                                      |

**Apologies:**

|                       |   |                                 |
|-----------------------|---|---------------------------------|
| Alistair Cameron (AC) | - | Scotmas                         |
| Ross Miller (RM)      | - | QS, Morris & Spottiswood, (M&S) |
| Andy Hewitt (AH)      | - | Aecom                           |
| Piotr Biskup (PB)     | - | Atkins (Mech)                   |
| Craig Patrick (CP)    | - | Atkins (Elec)                   |
| Scott Thompson (ST)   | - | Scotmas (on-site lead)          |

**Action****1. Welcome/Introductions**

IP is the Technical Lead for the project and SR is the budget holder and will also be chairing meetings.

**2. Contract Award**

Letter of Appointments and Purchase Orders are now in place for all parties.

Formal instruction was given proceed with variations 01, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 14, 15, 16, 17 and 18.

A provisional sum for variation 13 sump pits has been submitted however it has been confirmed that these works will be taken out with this contract.

**Contract Particulars****a. Commencement & Completion Dates**

Practical completion was achieved on 22<sup>nd</sup> March 2019.

**b. Programme**

Snagging works outstanding.

A total of 8 week delay was incurred and reflected into the programme. Programme delays occurred in relation to getting sufficient residual in the system.

**Overarching Plan**

The revised overarching plan has now been signed off by TW.

The following appendix documents are to be included within the O&Ms

- Variations List
- Derogations List
- Standards List

Final O&M issue outstanding and still requires install certificates, renal risk assessments and confirmation of BMS graphics. Information being collated by DC for issue and review prior to next progress meeting.

**DC****Monitoring & Test Training Plan**

Training has still not taken place. 35-40 people will need system training. Groups of around 10 people can be trained at one time in 2-3 hour sessions, taking place over a 2 week period which is now shown on the programme. Date to be set up late June / early July. DC to confirm date to allow MR to arrange staff.

DC/MR

Training video not yet received, this is now long outstanding. Needs to include the process for flushing the taps. TW has agreed a filming syllabus with Scotmas which IP will agree with the relevant NHS personnel (TW to circulate). Dates to be confirmed for completion ASAP.

DC/TW/AC

c. **Technical Clarifications**

Renal installation inclusive of BMS linked integrity now completed.

Mobile phone/email alerts still to be set up for Renal. Alarm schedule has been issued, IP has provided email addresses and numbers. Demonstrations of alarm link required. IP and TW to draw up a test strategy and circulate. RB to undertake an interim review on the 27<sup>th</sup> Jun to provide comfort that the system is workable. Formal sign off to be undertaken by TW on the 18<sup>th</sup> July. DC/IP to coordinate relevant people to attend.

DC/IP/TW/RB

4. **The Site**

DC committed to providing IP with weekly updates on who is holding the access cards.

5. **Health & Safety**

**H&S Plan**

A letter formally appointing M&S as Principal Designer under CDM Regs has been issued. DC confirmed that they have delegated this role to Faithful & Gould. Named person is Derek Ramage.

The duty to issue the F10 has also been discharged to M&S, a copy of the F10 has now been provided.

A HAI Scribe review has now been undertaken with Infection Control which covers the remote monitoring locations.

6. **Meetings**

Snagging meetings will now be scheduled as agreed until all items are closed out.

7. **Commissioning**

The AE agreed in writing that leachate flushing will not be required due to the short sections of pipework affected.

8. **AOCB**

A revised Risk Register is in circulation.

A purchase order has now been raised for the first years managed service contract which will commence upon practical completion.

A revised letter of comfort has been provided to M&S confirming that they cannot be held accountable for any galvanised corrosion on existing pipe work/fittings.

One hard copy and 2 disc copies of the O&Ms will be required as well as full size printed schematics for installing within the plant room & DWG files. Draft O&Ms have been issued and reviewed pending revision. To be added to snagging list. TW, RB and Estates to review as well as Principal Designer.

DC

#### **Chemical Storage & Safety**

Scotmas have issued initial draft of risk assessments for review. Review with NHS H&S team now undertaken and is generally signed off pending some re-formatting.

IP

Scotmas have still to provide a risk assessment covering the basement plantroom inc, emergency response provision (to be issued urgently). DC to take lead on chasing Scotmas for this.

DC/Scotmas

Snagging list has 16 items on snagging list now closed out however there are numerous items to be added. List to be revised by DC and circulated at the earliest. See attached Aecoms site visit report for items picked up.

DC

DC to issue weekly updates on progress of the snagging items (revised snagging list) to all.

DC

TW raised a concern regarding the condensate pumps and how a failure would be notified to reduce the risk of a flood. Pumps to be added to BMS as a critical failure alarm. Protocol to be agreed to allow easy manual switchover.

DC/BK

BK to tie in with IP to finalise some BMS graphics and calibrations. Scotmas also to be set up as a user to be able to view the BMS on site.

BK/IP

Some BMS data points outstanding. IP to tie in with BK to resolve.

BK/IP

Bravo units in wards 2A & B now removed.

Ventilation ducting and fan now in place, alarm and fan test now undertaken.

#### **9. Date & Time of Next Meeting**

Next meeting will follow the renal alarm review on site on the 27<sup>th</sup> June.

**NHS Greater Glasgow & Clyde**  
**Chlorine Dioxide ClO<sub>2</sub> Water Treatment - Project Snagging Update**  
**Thursday 27<sup>th</sup> June**

**Present:**

|                            |   |  |
|----------------------------|---|--|
| Steve Russell (Chair) (SR) | - | Principal Project Manager, Capital Planning, NHSGG&C |
| James Huddleston (JH)      | - | Senior Project Manager, Capital Planning, NHSGG&C    |
| Mark Riddell (MR)          | - | Estates Manager, NHSGG&C                             |
| David Carmichael (DC)      | - | Project Manager, Morris & Spottiswood, (M&S)         |
| Richard Beattie (RB)       | - | Aecom  |
| Steven Freel (SF)          | - | Kelvin Controls                                      |

**Apologies:**

|                       |   |   |
|-----------------------|---|---|
| Ian Powrie (IP)       | - | Deputy General Manager Estates, NHSGG&C, QEUH |
| Tim Wafer (TW)        | - | Consultant, Water Solutions                   |
| Brian Kelly (BK)      | - | Kelvin Controls                               |
| Alistair Cameron (AC) | - | Scotmas                                       |
| Ross Miller (RM)      | - | QS, Morris & Spottiswood, (M&S)               |
| Scott Thompson (ST)   | - | Scotmas (on-site lead)                        |

**Action****1. Welcome/Introductions**

IP is the Technical Lead for the project and SR is the budget holder and will also be chairing meetings. IP due to retire shortly, Mark Riddell to take over as Estates lead.

**2. Contract Award**

Formal instruction was given proceed with variations 01, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 14, 15, 16, 17 and 18. A provisional sum for variation 13 sump pits has been submitted however it has been confirmed that these works will be taken out with this contract.

**3. Contract Particulars****a. Commencement & Completion Dates**

Practical completion was achieved on 22<sup>nd</sup> March 2019.

**b. Programme**

A total of 8 week delay was incurred and reflected into the programme. Programme delays occurred in relation to getting sufficient residual in the system. Snagging works outstanding.

**Monitoring & Test Training Plan**

Training has still not taken place. Date to be set up late June / early July. DC to confirm date with Scotmas ASAP to allow MR to arrange staff. Date to be agreed prior to next meeting.

**DC/Scotmas**

Training video not yet received, this is now long outstanding. Needs to include the process for flushing the taps. TW has agreed a filming syllabus with Scotmas which IP will agree with the relevant NHS personnel (TW to circulate). Dates to be confirmed for completion prior to next meeting.

**DC/Scotmas****c. Technical Clarifications**

Renal installation inclusive of BMS linked integrity now completed.

Email alerts set up but mobile alerts outstanding for Renal. Formal sign off to be undertaken by TW on the 18<sup>th</sup> July. **Meeting invite now circulated all parties to ensure representation can attend.**

**All/TW**

It was noted that the dedicated Renal alarm email address gets a lot of NHS internal circular emails. MR to liaise with NHS IT to have the address taken off all the circular distribution lists.

**MR**



4. **The Site**5. **Health & Safety**6. **Meetings**

Snagging meetings will now be scheduled as agreed until all items are closed out.

7. **Commissioning****O&M Issue**

Final O&M issue outstanding. DC confirmed that outstanding info relates to Renal sign off from TW. DC confirmed this will be issued Monday 1<sup>st</sup> July. **DC**

One hard copy and 2 disc copies of the O&Ms will be required as well as full size printed schematics for installing within the plant room & DWG files. Draft O&Ms have been issued and reviewed pending revision. To be added to snagging list. TW, RB and Estates to review as well as Principal Designer. **DC**

8. **AOCB****Chemical Storage & Safety**

Risk assessments now reformatted by IP and passed onto DC for inclusion in the O&Ms..

Scotmas have still to provide a risk assessment covering the basement plantroom inc, emergency response provision (to be issued urgently). DC to take lead on chasing Scotmas for this. This will need to include the process for resetting the BMS alarm once an issue has been resolved (see below). **DC/Scotmas**

KCE to write up a procedure (using screen grabs) to describe how to reset alarms. It was noted that Schneider will need to tie in with this as they will maintain the BMS system. **SF**

KCE to tie in with Scotmas to ensure the software/calibrations are aligned on the 6 remaining bravo units. **SF/Scotmas**

Snagging list to be revised by DC and circulated at the earliest. See attached Aecoms site visit report for items picked up. DC to issue a weekly revised snagging list. All snags to be resolved prior to the next meeting on 18<sup>th</sup> July. **DC**

Condensate pumps failure has now been added as a critical alarm on the BMS. to reduce the risk of a flood.

BMS data points now resolved.

Ventilation ducting still has outstanding snags (missing fire damper, etc), see attached Aecoms site visit report for items picked up. **DC**

9. **Date & Time of Next Meeting**

Next meeting will be on Thursday 18<sup>th</sup> July at 9:30am and will be to witness the final renal alarm tests and close out final snagging items. Meet in main foyer of adult hospital. **All**

**NHS Greater Glasgow & Clyde**  
**Chlorine Dioxide ClO<sub>2</sub> Water Treatment - Project Snagging Update**  
**Thursday 18<sup>th</sup> July**

**Present:**

|                            |   |  |
|----------------------------|---|--|
| Steve Russell (Chair) (SR) | - | Principal Project Manager, Capital Planning, NHSGG&C |
| James Huddleston (JH)      | - | Senior Project Manager, Capital Planning, NHSGG&C    |
| Mark Riddell (MR)          | - | Estates Manager, NHSGG&C                             |
| David Carmichael (DC)      | - | Project Manager, Morris & Spottiswood, (M&S)         |
| Richard Beattie (RB)       | - | Aecom  |

**Apologies:**

|                       |   |   |
|-----------------------|---|---|
| Steven Freel (SF)     | - | Kelvin Controls                               |
| Ian Powrie (IP)       | - | Deputy General Manager Estates, NHSGG&C, QEUH |
| Tim Wafer (TW)        | - | Consultant, Water Solutions                   |
| Brian Kelly (BK)      | - | Kelvin Controls                               |
| Alistair Cameron (AC) | - | Scotmas                                       |
| Ross Miller (RM)      | - | QS, Morris & Spottiswood, (M&S)               |
| Scott Thompson (ST)   | - | Scotmas (on-site lead)                        |

**Action****1. Welcome/Introductions**

IP is the Technical Lead for the project and SR is the budget holder and will also be chairing meetings. IP has now retired, Mark Riddell has taken over as Estates lead.

**2. Contract Award**

Formal instruction was given proceed with variations 01, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 14, 15, 16, 17 and 18. A provisional sum for variation 13 sump pits has been submitted however it has been confirmed that these works will be taken out with this contract.

**3. Contract Particulars****a. Commencement & Completion Dates**

Practical completion was achieved on 22<sup>nd</sup> March 2019.

**b. Programme**

A total of 8 week delay was incurred and reflected into the programme. Programme delays occurred in relation to getting sufficient residual in the system. Snagging works outstanding.

**Monitoring & Test Training Plan**

Training has still not taken place and is now long overdue and posing a significant risk to the NHS. Scotmas to confirm dates to DC ASAP to allow MR to arrange staff.

**DC/Scotmas**

Training video not yet received, this is now long outstanding. Needs to include the process for flushing the taps. Now long overdue.

**DC/Scotmas****c. Technical Clarifications**

Renal installation inclusive of BMS linked integrity now completed.

Email alerts now set up but mobile alerts outstanding for Renal. Formal sign off to be undertaken by TW and team on 15<sup>th</sup> August. **Meeting invite now circulated all parties to ensure representation can attend.**

**All/TW**

It was noted that the dedicated Renal alarm email address gets a lot of NHS internal circular emails. MR to liaise with NHS IT to have the address taken off all the circular distribution lists.

**MR****4. The Site****5. Health & Safety**

**6. Meetings**

Snagging meetings will now be scheduled as agreed until all items are closed out.

**7. Commissioning****O&M Issue**

Final O&M issue outstanding. Following re-issue RB has reviewed and there are still a few outstanding items. DC to finalise and re-issue. Some input from TW Wafer required.

**DC/TW**

One hard copy and 2 disc copies of the O&Ms will be required as well as full size printed schematics for installing within the plant room & DWG files. Draft O&Ms have been issued and reviewed pending revision. To be added to snagging list. TW, RB and Estates to review as well as Principal Designer.

**DC****8. AOCB****Chemical Storage & Safety**

Risk assessments now reformatted by IP and passed onto DC for inclusion in the O&Ms..

Scotmas to provide a risk assessment covering the basement plantroom inc, emergency response provision (to be issued urgently). DC to take lead on chasing Scotmas for this. This will need to include the process for resetting the BMS alarm once an issue has been resolved (see below). Now long outstanding and a significant risk to the NHS

**DC/Scotmas**

KCE to write up a procedure (using screen grabs) to describe how to reset alarms. It was noted that Schneider will need to tie in with this as they will maintain the BMS system.

**SF**

KCE to tie in with Scotmas to ensure the software/calibrations are aligned on the 6 remaining bravo units. These will likely need to be signed off again by TW

**SF/Scotmas  
/TW**

Final snags to be picked up, see Aecom's site visit report.

**DC**

Condensate pumps failure has now been added as a critical alarm on the BMS to reduce the risk of a flood.

DC confirmed that ventilation ducting now resolved, to be demonstrated when on site on the 15<sup>th</sup> August.

**DC**

Sounder to be demonstrated on site on the 15<sup>th</sup> August to determine what sounds it can make and what could be used that is distinguishable from the fire alarms.

**DC**

JH to set up a conference call between the NHS and TW within the next week to discuss various items.

**JH****9. Date & Time of Next Meeting**

Next meeting will be on Thursday 15<sup>th</sup> August 9:30am and will be to witness the final renal alarm tests and close out final snagging items. Meet in main foyer of adult hospital.

**All**

**NHS Greater Glasgow & Clyde**  
**Chlorine Dioxide ClO<sub>2</sub> Water Treatment - Project Snagging Update**  
**Thursday 15<sup>th</sup> August**

**Present:**

|                            |   |  |
|----------------------------|---|--|
| Steve Russell (Chair) (SR) | - | Principal Project Manager, Capital Planning, NHSGG&C |
| James Huddleston (JH)      | - | Senior Project Manager, Capital Planning, NHSGG&C    |
| Mark Riddell (MR)          | - | Estates Manager, NHSGG&C                             |
| David Carmichael (DC)      | - | Project Manager, Morris & Spottiswood, (M&S)         |
| Richard Beattie (RB)       | - | Aecom  |
| Tim Wafer (TW)             | - | Consultant, Water Solutions                          |

**Apologies:**

|                       |   |                                 |
|-----------------------|---|---------------------------------|
| Steven Freel (SF)     | - | Kelvin Controls                 |
| Brian Kelly (BK)      | - | Kelvin Controls                 |
| Alistair Cameron (AC) | - | Scotmas                         |
| Ross Miller (RM)      | - | QS, Morris & Spottiswood, (M&S) |
| Scott Thompson (ST)   | - | Scotmas (on-site lead)          |

**Action****1. Welcome/Introductions**

IP is the Technical Lead for the project and SR is the budget holder and will also be chairing meetings. IP has now retired, Mark Riddell has taken over as Estates lead.

**2. Contract Award**

Formal instruction was given proceed with variations 01, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 14, 15, 16, 17 and 18. A provisional sum for variation 13 sump pits has been submitted however it has been confirmed that these works will be taken out with this contract.

**3. Contract Particulars****a. Commencement & Completion Dates**

Practical completion was achieved on 22<sup>nd</sup> March 2019.

**b. Programme**

A total of 8 week delay was incurred and reflected into the programme. Programme delays occurred in relation to getting sufficient residual in the system. Snagging works outstanding.

**Monitoring & Test Training Plan**

Training has still not taken place and is now long overdue and posing a significant risk to the NHS. It is reported that dates are awaited from Mel MacMillan, MR to chase up.

**MR**

Training video has now been undertaken, awaiting final edit. Once received, a screening to be arranged.

**DC****c. Technical Clarifications**

Renal installation inclusive of BMS linked integrity now completed.

Email alerts still to be added, MR to provide. It was noted that any critical alarm should go to Hillington and that quarterly tests of the alarm should be undertaken. **Final renal alarm text will now be required once snags resolved.**

**All/TW**

It was noted that the dedicated Renal alarm email address gets a lot of NHS internal circular emails. MR to liaise with NHS IT to have the address taken off all the circular distribution lists.

**4. The Site****5. Health & Safety****6. Meetings**

Snagging meetings will now be scheduled as agreed until all items are closed out.

## 7. Commissioning

### O&M Issue

Final O&M issue outstanding. DC to finalise and re-issue. TW has now provided this information on flash disk. One hard copy and 2 disc copies of the O&Ms will be required as well as full size printed schematics for installing within the plant room & DWG files

DC

## 8. AOCB

### Chemical Storage & Safety

Risk assessments now reformatted by IP and passed onto DC for inclusion in the O&Ms..

Scotmas to provide a risk assessment covering the basement plantroom inc, emergency response provision (to be issued urgently). This will need to include the process for resetting the BMS alarm once an issue has been resolved (see below). It has been advise dthat this has been sent to NHS H&S rep John Green for re-formatting. SR to chase.

SR

KCE to write up a procedure (using screen grabs) to describe how to reset alarms. It was noted that Schneider will need to tie in with this as they will maintain the BMS system. **Outstanding.**

SF

KCE to tie in with Scotmas to ensure the software/calibrations are aligned on the 6 remaining bravo units. These will likely need to be signed off again by TW.

**Ongoing – still require works in plantrooms 41 & 21 hot and 2A cold.**

SF/Scotmas  
/TW

Final snags to be picked up, main items as noted;

- Arrows to be added to insulation
- Schematics to be erected on plant room walls.
- New vessel test plates to be made and added on top of insulation.

DC

Condensate pumps failure has now been added as a critical alarm on the BMS to reduce the risk of a flood.

Fire dampers to ventilation ducting now witnessed – item closed.

Sounder now demonstrated on site – item closed.

Dead legs still in riser being flushed. Were retained in case re-connection required. TW to raise question at water group to confirm if these should now be removed.

TW

## 9. Date & Time of Next Meeting

Next meeting will be screening of training video and review last few snags. Date TBC

All

# ARHAI Scotland

Antimicrobial Resistance and Healthcare Associated Infection

## Appendix 14 –Mandatory - NIPCM Healthcare Infection Incident Assessment Tool (HIIAT)

The Healthcare Infection Incident Assessment Tool (HIIAT) should be used by the Infection Prevention and Control Team (IPCT) or Health Protection Team (HPT) to assess every healthcare infection incident i.e. all outbreaks and incidents (including decontamination incidents or near misses) in any healthcare setting (that is, NHSScotland, independent contractors providing NHS services and private providers of healthcare).

The HIIAT has two parts/functions:

### Part 1: Assessment

Assesses impact of a healthcare infection incident/outbreak on patients, services and public health.

The HIIAT should be utilised to assess the initial impact and monitor any ongoing impact (escalating and de-escalating the incident/outbreak until declared closed).

An individual member of the IPCT or HPT may undertake the initial assessment. If a PAG/IMT is established then further assessments will be led by the chair of the PAG/IMT.

| Incident        | Severity of illness   | Impact on services  | Risk of transmission  | Public Anxiety  |
|-----------------|---|---|---|---|
| <b>Minor</b>    | Patients require only minor clinical interventional support as a consequence of the incident.<br>There is no associated mortality as a direct result of this incident.      | No or minor impact on services.   | Minor implications for Public Health.<br>Minor risk or no evidence of cross transmission or on-going exposure   | No or minor public anxiety is anticipated.<br>No, or minimal, media interest: no press statement. |
| <b>Moderate</b> | Patients require moderate clinical interventional support as a consequence of the incident.<br>There is no associated mortality as a direct result of this incident.        | Moderate impact on services e.g. multiple wards closed or ITU closed as a consequence of the control measures     | Moderate implications for Public Health.<br>Moderate risk or evidence of cross transmission or on-going exposure  | Moderate public anxiety is anticipated.<br>Media interest expected: prepare press statement       |
| <b>Major</b>    | Patients require major clinical interventional support as a consequence of the incident and/or Severe/life threatening/rare infection and/or there is associated mortality* | Major impact on services e.g. hospital closure(s) for any period of time as a consequence of the control measures | Major implications to Public Health or Significant risk of cross transmission, of a severe/life threatening/rare infection or significant on-going exposure | Major public anxiety anticipated.<br>Significant media interest: prepare press statement          |

**Calculate the Impact:**All Minor = **GREEN**3 minor and 1 Moderate = **GREEN**No major and 2-4 Moderate = **AMBER**Any Major = **RED**

## Part 2: Communication

Supports a single channel of infection incident/outbreak assessment and information reporting both internally within a NHS Board area and externally to ARHAI Scotland and Scottish Government Health and Social Care Department (SGHSCD).

| GREEN  | AMBER   | RED   |
|--|---|---|
| <p>If the HIIAT is assessed as Green, this should be reported through the electronic outbreak reporting tool (ORT).</p> <p>If support from ARHAI Scotland is required this should be communicated to ARHAI Scotland by <a href="#">email</a> <b>and</b> through the ORT.</p> <p>Follow local governance procedures for assessing and internal reporting.</p> | <p>If the HIIAT is assessed Amber, report to ARHAI Scotland through the ORT. This will be reviewed within 24 hours for onward reporting to SGHSCD. NHS board will be cited.</p> <p>Ensure fields are completed as fully as possible.</p> <p>If ARHAI Scotland support is required, this should be communicated by <a href="#">email</a> or by telephone (see contact pages) <b>and</b> through the ORT.</p> <p>Press statement (holding or release) must be prepared and sent to ARHAI Scotland via the ORT.</p> <p>Follow local governance procedures for assessing and internal reporting.</p> <p>Review and report HIIAT <b>at least twice weekly</b> or as agreed between IMT and ARHAI Scotland.</p> | <p>If the HIIAT is assessed Red, report to ARHAI Scotland through the ORT. This will be reviewed within 24 hours for onward reporting to SGHSCD. NHS board will be cited.</p> <p>Ensure fields are completed as fully as possible.</p> <p>If ARHAI Scotland support is required, this should be communicated by <a href="#">email</a> or by telephone (see contact pages) <b>and</b> through the ORT.</p> <p>Press statement (holding or release) must be prepared and sent to ARHAI Scotland via the ORT.</p> <p>Follow local governance procedures for assessing and internal reporting.</p> <p>Review and report HIIAT <b>daily</b> or as agreed between HPS and IMT (<b>a minimum of weekly</b>).</p> |
| <p>The final decision to release a press statement irrespective of HIIAT assessment (colour) is the decision of the IMT</p> <p>Following assessment by the NHS Board and ARHAI Scotland one collective HIIORT may be submitted for instances where multiple areas within a site are affected by the same infection such as seasonal influenza</p>            |   |   |

\* Only HAI deaths which pose an acute and serious public health risk must be reported to the Procurator Fiscal (SGHD/CMO(2014)27).



## The National Support Framework 2017

The National Support Framework ('the Framework') is a structure that sets out the roles and responsibilities of organisations in the event that a healthcare infection outbreak/incident, data exceedance or Healthcare Environment Inspectorate (HEI) report deems additional support to a NHS Board is required. This framework supersedes CNO algorithm (2015).

The National Support Framework may be invoked by the Scottish Government HAI /AMR Policy Unit or by a NHS Board to optimise patient safety during or following: any healthcare incident/outbreak(s)/data exceedance or HEI inspectorate visit/report.

### Section 1: Criteria for invocation

#### Healthcare infection incident/outbreak(s)/data exceedance

This is contained within the National Infection Prevention and Control Manual ([NIPCM](#)) Chapter 3:

- an infectious agent that has major infection control/public health implications and control measures put in place locally have been unsuccessful; or
- a higher than expected number of cases in a given healthcare area over a specified period of time and control measures put in place locally have been unsuccessful; or
- ongoing exposure of individuals to infectious agent as a result of healthcare system failure.
- three consecutive mandatory surveillance data exceptions e.g. *clostridium difficile*.

#### HEI Inspection

If as part of the inspection process:

- it is observed that there are serious HAI issues that have a direct impact on care provision which cannot be addressed through local resolution or warrants direct escalation or;
- there is a pattern of failure to implement sufficient actions to resolve HAI related issues or;
- there is a pattern of unsustainable improvements that cause concern to the inspectorate that cannot be resolved or;
- there are concerns regarding the implementation of national policies throughout the Board area which require resolution at a national level.

## Section 2: Actions and Communication

### When the SG HAI/AMR Policy Unit invoke the Framework they will:

1. Inform the appropriate NHS Board Executive Lead or deputy that the National Support Framework is being invoked and the rationale for this.
2. Inform Health Protection Scotland (HPS) of the invocation citing the reason: this would normally be to the Lead Consultant for HAI or Associate Director who will then assign to a NCIC. The NCIC will inform the HPS HAI IPCT.
3. Request HPS action, a healthcare infection situation needs assessment to be completed within 5 working days <http://www.nipcm.hps.scot.nhs.uk/web-resources-container/sbar-hai-situation-needs-assessment/>.
4. Instruct HPS on the expected leadership and coordination of all national activity and communicate with the SG HAI/AMR Policy Unit accordingly.

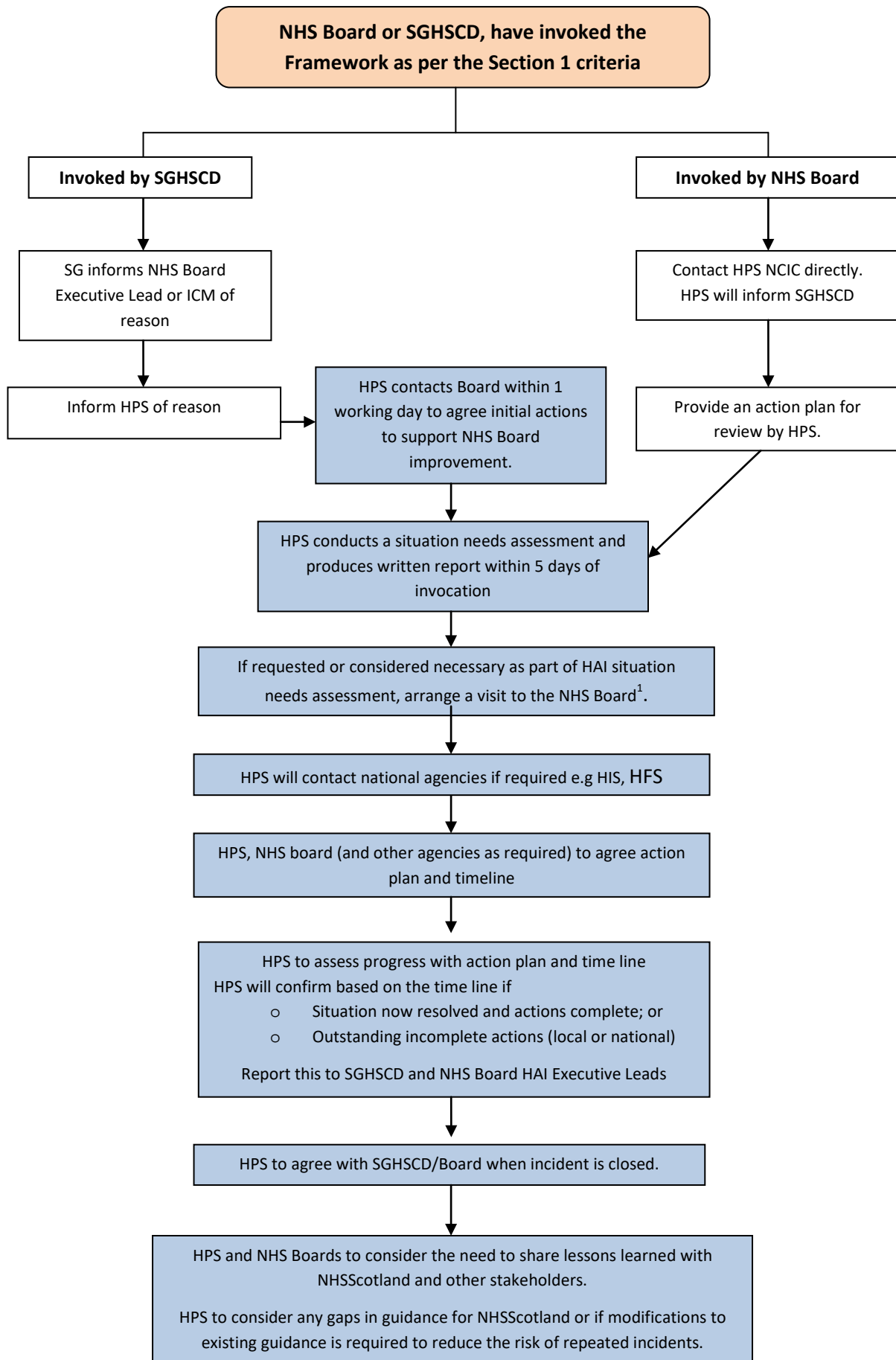
### When the Framework has been invoked by SG HAI/AMR Policy Unit, HPS will:

1. Contact the NHS Board within one working day and agree initial actions to determine if sufficient actions have been planned to support NHS Board improvement
2. Produce a written assessment – healthcare infection situation needs assessment - within 5 working days of any invocation. This will be sent to SG HAI/AMR Policy Unit and appropriate NHS Board Executive lead or deputy for information.
3. If requested or considered necessary, as part of HAI situation needs assessment, arrange a visit to the NHS Board. This visit will take place within 10 working days of invocation. The NHS Board should be informed of all urgent recommendations on the day of visit either verbally or written.
4. Send a written report of the visit to the NHS Board within 5 working days. The NHS Board will have 2 working days to respond before HPS forwards the agreed report to SG HAI/AMR Policy Unit and the NHS Board. The report should be sent to SG HAI/AMR Policy Unit within 10 working days of the visit. Any variation in timeline will be agreed on behalf of SG HAI/AMR Policy Unit by HPS.
5. Contact other national agencies e.g. Health Facilities Scotland (HFS), Healthcare Improvement Scotland (HIS), HEI to request support or clarification if required.
6. Support the NHS Board until all actions is completed, identifying any gaps in national guidance and tools as appropriate.
7. Support the board with management of any/all subsequent incident(s)/outbreak(s)/data exceedance within the same ward/area that occur while the original incident(s)/outbreak(s)/data exceedance is still under investigation
8. Report any failures to complete actions as planned/agreed to SG HAI/AMR Policy Unit and appropriate NHS Board Executive Lead.
9. Agree/confirm with SG HAI/AMR Policy Unit when the incident is closed and lessons to reduce risk have been made and/or update SG HAI/AMR Policy Unit on any residual risk/incomplete actions.
10. Consider the need to share lessons with NHSScotland and other stakeholders.

**When a NHS Board invokes the Framework they will:**

1. Contact HPS ICT nurse consultant directly to declare that they are invoking the Framework and the rationale for this. HPS will inform SG HAI/AMR Policy Unit .
2. Provide a related action plan, any relevant epidemiological data, incident/outbreak reports and/or requested information for review by HPS.
3. HPS will produce a written situation needs assessment within 5 working days of any invocation. This will be sent to SG HAI/AMR Policy Unit for information
4. Consider and discuss with HPS the need for a Board visit. This visit will take place within 10 working days of invocation.
5. Agree specific objective(s) of the site visit and agree a timeline of actions with HPS.
6. Implement urgent recommendations (written and verbal) provided by HPS and agree a timeline for any further recommendations/actions identified.
7. Discuss and agree with HPS the need for other national agency support or clarification e.g. HFS, HIS, HEI.
8. Liaise and communicate with HPS until all actions are completed and identify any gaps in local guidance, tools as appropriate.
9. Agree that HPS include in their support any/all subsequent incident(s)/outbreak(s)/data exceedance within the same ward/area that occur while the original incident(s)/ outbreak(s)/ data exceedance is still under investigation.
10. Report any incomplete planned/agreed actions to HPS.
11. Agree/confirm with HPS when the incident is closed and lessons to reduce risk have been made. HPS will inform SG HAI/AMR Policy Unit of any residual risk/incomplete actions.
12. Consider the sharing of lessons with NHSScotland and other stakeholders.

# The National Support Framework Algorithm



<sup>1</sup>This visit will take place within 10 working days of invocation: on the day of the visit the NHS Board will be informed of urgent recommendations with a written report sent to them within 5 working days. The Board will then have 2 working days to respond before the report is forwarded to SGHSCD. Any variation to timescales must be agreed by HPS on behalf of SGHSCD.

**From:** Allan McRobbie  
**Sent:** 10 June 2015 17:01  
**To:** ian.powrie [REDACTED]  
**Cc:** David Watson  
**Subject:** NHS SGUH  
**Attachments:** QAM15031b NHS SGUH Legionella Control Costs.pdf

Ian

Please find attached details of our recent meeting with Estates managers with costs from DMA to fill some of the gaps found in the current Legionella control program.

We would be happy to attend site at a time suitable to you to discuss this in greater depth.

Should you require any further information in the meantime please do not hesitate to call David or I.

Best regards


Allan McRobbie  
Compliance Manager



14 Canyon Road  
Wishaw  
ML2 0EG

T: 01698 536790  
F: 01698 360211  
E: [office@dmawater.co.uk](mailto:office@dmawater.co.uk)  
[www.dmawater.co.uk](http://www.dmawater.co.uk)



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**From:** Powrie, Ian [REDACTED]  
**Sent:** 09 January 2015 14:15  
**To:** Allan McRobbie  
**Cc:** David Watson  
**Subject:** RE: NSGH Water System Drawings  
**Attachments:** xpo\_view.pdf; ATT00001.txt

Hi Alan

I hope yesterdays visit was of assistance in the delivery of your RA & written schemes, please let me know if you need any more support on site during this process.

I have also attached FYI a copy of the PO which you should receive shortly through normal channels.

Regards

Ian

*I. Powrie*

Sector Estates Manager (NSGH)  
Project Team, New South Glasgow Hospitals,  
Southern General Hospitals Construction Site,  
2nd Floor, Modular Building, Off Hardgate Road, Glasgow,G51 4SX

---

**From:** Allan McRobbie [REDACTED]  
**Sent:** 06 January 2015 14:11  
**To:** Powrie, Ian  
**Cc:** David Watson  
**Subject:** RE: NSGH Water System Drawings

Thanks Ian, sorry I missed your call earlier I was in a meeting.

This is fine for us, we have received emails from Zutec and set up the accounts.

Will call you after the inductions tomorrow and proceed from there.

Best regards

Allan McRobbie  
Compliance Manager


[REDACTED]



14 Canyon Road  
Wishaw  
ML2 0EG

[REDACTED]  
E: office@dmawater.co.uk  
www.dmawater.co.uk



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**From:** Powrie, Ian [REDACTED]  
**Sent:** 06 January 2015 12:24  
**To:** Allan McRobbie  
**Cc:** David Watson  
**Subject:** RE: NSGH Water System Drawings

Hi Allan\David

The drawing produced below are construction phase drawing, which until this week where all that was available to me, however I now have access to the as fitted drawings via a document management system called Zutec, which is a web hosted system.

I would therefore propose to have you both provide with access rights to the fitted drawings and system description & equipment information for the relevant services namely:

- Water services
- Hydrotherapy pool
- Ventilation

In order to support your effective access to the required documentation I have arranged for Zutec user training for you both tomorrow after your site induction, if you call me on my mobile when the induction is complete I will come and introduce you to Garreth Tackney from Zutec who will provide your user training. This can be tailored to your available time but 30 – 60 mins.

Please confirm that you are comfortable with this approach and that your availability for training after site induction tomorrow.

Regards

Ian



*I. Powrie*

Sector Estates Manager (NSGH)  
Project Team, New South Glasgow Hospitals,  
Southern General Hospitals Construction Site,  
2nd Floor, Modular Building, Off Hardgate Road, Glasgow, G51 4SX

---

**From:** Allan McRobbie [REDACTED]  
**Sent:** 06 January 2015 10:21  
**To:** Powrie, Ian  
**Cc:** David Watson  
**Subject:** NSGH Water System Drawings

Ian

We have had a review of the drawings provided.

We found 7 of the drawings appear to be older versions which were superseded by other drawings provided. We would assume that the newer version is the most up-to-date drawing available. The following appear to be older versions:

- ZBP-XX-XX-SC-500-021\_01 (2)
- ZBP-XX-XX-SC-500-021\_01
- ZBP-XX-XX-SC-500-022\_03
- ZBP-XX-XX-SC-500-031\_03
- ZBP-XX-XX-SC-500-032\_03
- ZBP-XX-XX-SC-500-033\_03
- ZBP-XX-XX-SC-500-041\_03

G1313-P(53)01\_0[1] is a drawing from the laboratory medicine building.

The drawing review at present will be based on the following:

- ZBP XX XX PL 500 050 02[1] Typical Ward Layout
- ZBP ZA 04 PL 500 151 02[1] Plantroom 41 4<sup>th</sup> floor
- ZBP ZB 04 PL 500 153 02[1] Plantroom 41 4<sup>th</sup> floor
- ZBP-FM-B1-PL-500-061\_F[1] Basement FM and Kitchen Area
- ZBP-FM-B1-PL-500-065\_02 Basement Tank Layout
- ZBP-FM-B1-SC-500-001\_01 Primary Water Services Schematic
- ZBP-XX-XX-SC-500-021\_B[1] Plantroom 21 Secondary Water Services Schematic
- ZBP-XX-XX-SC-500-022\_C[1] Plantroom 22 Secondary Water Services Schematic
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- ZBP-XX-XX-SC-500-033\_C[1] Plantroom 33 Secondary Water Services Schematic
- ZBP-XX-XX-SC-500-041\_C[1] Plantroom 41 Secondary Water Services Schematic
- ZBP-XX-XX-SC-509-001\_02[1] Renal Water Services Schematic
- ZBP-ZA-03-PL-500-031\_C[1] NCH 3<sup>rd</sup> floor In Patient Ward and Renal
- ZBP-ZB-00-PL-500-002\_E[1] NCH Ground floor OPD
- ZBP-ZB-01-PL-500-012\_C[1] NCH 1<sup>st</sup> floor Cardiology, PICU Support and MDU

ZBP-ZB-02-PL-500-022\_C[1] NCH 2<sup>nd</sup> floor Aseptic Unit, Day Case & Ward Sup  
ZBP-ZB-03-PL-500-032\_C[1] NCH 3<sup>rd</sup> floor In Patient Ward and Ward Support  
ZBP-ZC-01-PL-500-013\_D[1] NCH 1<sup>st</sup> floor 23 Hours Unit

We will proceed with the assessment based on these and would also request the following if available:

- Can the drawings be provided in colour
- The 'Symbology Key' DT 590 001
- Sanitary Ware Installation Arrangements for 'typical ward', 'non typical ward', 'clinical' area and 'non clinical' areas (including for both types of TMV taps being used in clinical/non clinical) – possibly on drawings ZBP XX XX DT 581-006 and 007 though this should be confirmed
- Drawings from a selection of ward areas which are deemed to be 'higher risk' or 'non typical' to provide a representative sample
- Drawings from a selection of other clinical areas (non-wards) to provide a representative sample

We will be on site tomorrow morning at 8am for the induction so can collect any discs or hard copies then.

Best regards

Allan McRobbie  
Compliance Manager



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Wishaw  
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\*\*\*\*\*

Sent: 06 January 2015 12:24  
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Regards

Ian

I.Powrie  
Sector Estates Manager (NSGH)  
Project Team, New South Glasgow Hospitals,  
Southern General Hospitals Construction Site,  
2nd Floor, Modular Building, Off Hardgate Road, Glasgow,G51 4SX



From: Allan McRobbie [mailto:Allan [redacted]]  
Sent: 06 January 2015 10:21  
To: Powrie, Ian  
Cc: David Watson  
Subject: NSGH Water System Drawings

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 ZBP-ZC-01-PL-500-013\_D[1] NCH 1st floor 23 Hours Unit

We will proceed with the assessment based on these and would also request the following if available:

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Best regards

Allan McRobbie  
Compliance Manager



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**Cc:** David Watson  
**Subject:** NSGH Water System Drawings

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 ZBP-ZB-03-PL-500-032\_C[1] NCH 3<sup>rd</sup> floor In Patient Ward and Ward Support  
 ZBP-ZC-01-PL-500-013\_D[1] NCH 1<sup>st</sup> floor 23 Hours Unit

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Best regards

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Compliance Manager



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**Bundle of documents for Oral hearings commencing from 19 August 2024 in relation to the  
Queen Elizabeth University Hospital and the Royal Hospital for Children, Glasgow**

**Bundle 27 – Volume 1**

**Miscellaneous Documents**

A49634718