Example application for Registered Scientist (RSci)

Application: Registered Scientist

Job Title: Senior Scientist, Water Testing Services Ltd

Competencies
1. A. Application of knowledge and understanding
1. Develop, maintain and extend a sound theoretical approach to application of science and technology in practice

I am Senior Scientist at Water Testing Services Limited, working in the southern sector Microbiology Laboratory. I moved into the Microbiology Laboratory having completed a 1 year period as Field Scientists, sampling water systems and responding to client requests for support and investigation. WTS field work included a lot of customer contact and for this I was trained specifically by the Customer Care Team, and by Finance who trained me in the provision of informal WTS cost estimates and quotations.

I trained in Biomedical Sciences for 1 year at the University of Grantchester, and then switched my degree to Biology with Microbiology. I graduated with a 2:1 in 2005, having completed an honours project entitled “Global spread of New Delhi metallo-beta-lactamase-1 (NDM-1) mediated antibiotic resistance”. My degree course offered considerable opportunities for widening my experience through a joint lecture programme with other courses, student societies that included science club, biology field trips and visits to research laboratories, commercial R&D labs and to the regional forensics service laboratories located in Midsummer.

After leaving university, I spent 1 year working as a Medical Laboratory Assistant at St Jude’s NHS Trust. This gave me my first real experience of safety in the laboratory environment, equipment care, sample handling and the use of computerised record keeping (IT) systems. I left to join WTS as a Microbiology Technician and for my first 2 years progressed through the company training scheme to become fully competent in all relevant microbiological analyses. Toward the end of this period, I was allowed to support developmental and client investigations, learning a number of additional high level microbiological and related techniques that were not part of the standard laboratory repertoire. My work was acknowledged on two presentations made by the Head of Department to the Royal Society of Public Health annual Water Sciences conference, and was included as an author on a paper in the National Journal of Water Sciences.

After almost 4 years as a WTS microbiology technician I was able to apply for upgrading in 2011 and was successful at the first attempt, being upgraded to Senior Microbiologist in December 2011. I was working in parallel with a more experienced Senior Microbiologist who was Technical Head of the laboratory and I was deputy. When the company was restructured in the spring of 2013, I applied for and was appointed as the sole Senior Microbiologist post and Technical Head, reporting to the Senior Water Scientist.

I am now responsible for 4 full time and 2 part time technicians working with me in the Microbiology lab, and two lab aides, and provide additional supervision together with my Senior Chemist colleague for a

team of 11 Field Scientists. Together we process over 1,200 water samples each week with total viable count, total coliforms, E coli, P aeruginosa, Enterococcus species and Legionella as required, sometimes performing just a single quantitative analysis on a sample and at other times up to 5 different tests. For all routine microbiology studies, we process a minimum of 0.5% split samples for IQA, and all relevant EQA samples as specified by SI and agreed with UKAS Ltd.

We also investigate selected hospital and care home waters for the presence of specific antibiotic resistant bacteria, usually P aeruginosa and Klebsiella/Enterobacter/Serratia, to support the work of Infection Control Teams. For these studies, we usually collect multiple isolates for antibiotic testing at the local hospital microbiology laboratory but are presently running parallel testing to confirm our methods and results, and I have been seconded for 1 week to St Jude's to study and replicate their techniques. Last year I was appointed to an additional role and joint Safety Officer for the southern area WTS laboratories.

I work closely with all internal company standards and Standard Operating Procedures, and now contribute to the drafting and periodic revision of those SOPs. I also have responsibility with and on behalf of the Senior Water Scientist to keep myself and the company fully informed about all the technical aspects of statutory water testing including sample collection and transport, primary and alternate (back-up or confirmatory) testing procedures, quality assurance and data management obligations, and statutory reporting obligations of at risk data that is sent immediately to the client, to the relevant water company and if applicable to Public Health England.

We have access to a limited range of technical monographs, SIs and journal resources and I make sure that I keep fully aware of new developments etc relevant to the work of the department. I produce a 'learning agenda' for all team members, including myself, to read and keep abreast of new developments, changing statutory obligations etc. This is used as a framework and agenda for team meetings, and is summarised in a monthly report to my Senior Scientist. In agreement with my WTS Wales equivalent we exchange learning agendas monthly, to share information and to double-check that nothing slips through without us being unaware of a relevant change. This also helps us unify teaching and training of all staff across the company.

WTS sponsor my membership of the RSPH and their Water Sciences group, and I have become active in that group, attending meetings and conferences when possible, reading their quarterly newsletter and taking an active part in its online technical forum. This allows me to keep fully up to date in technical developments and important commercial developments that might include new reagent kits, new or improved analytical equipment and other developments. I can take this forward to gather additional information from manufacturers and suppliers, and from trade conferences and exhibitions that I can attend subject to approval by my line manager.

2. A. Application of knowledge and understanding
2. Apply underlying scientific concepts, principles and techniques in the context of new and different areas of work

Much of our work is highly repetitive. To ensure that we maintain accuracy in performance, the company subscribes to two different EQA schemes and has adopted additional internal QA testing based on duplicate or split samples. These samples are always collected by our filed staff and submitted to us blind. However, there are circumstances where split samples might be processed in the same batch by the same technician. To avoid this, I have created a system where sample pairs are separated at source and arrive at the laboratory not less than 1 hour apart. We control interim storage to ensure no deterioration. This system works well and only rarely will split or paired samples be processed together or even by the same technician.

I was responsible for planning modifications to out IT systems that allows identification of paired samples to make sure only one report is issued. Additionally, this gives a daily list of paired results, identified by test and technician. We review these data at least once weekly at our regular lab meeting, or same day if there is a large discrepancy. The review is always non-judgemental; we monitor separately and regularly underperforming staff member, including myself. Technical review is implemented is any test shows persistent drift or other inaccuracy and we check instrument calibrations, reagent lot numbers, expiry date and storage conditions etc until our results are back on track.

I think that it was this checking system and approach to IQA that was central to my upgrading. The idea came from university lectures and in particular visits to a pharmaceutical QC lab where we were told in great detail of the arrangements they had for similar checks of their production QC sample testing. My system is a derivation of that process though for cost reasons I was told to limit sample splitting to 0.5% rather that 2% used at Big Pharma. I got further ideas regarding meetings with staff and investigations from a system at St Jude's, and was able to call on friends who were still there to ask for assistance before presenting the idea to my line manager and others, and later to the team. Everyone was very supportive, and the arrangements were praised by UKAS.

Further evaluations are performed when we consider substitution of a new process of technique for our routine analyses. These must be compliant with the existing SIs and when possible with existing UKAS accreditations. We gain much information via RSPH Water group and from suppliers. Each candidate product is reviewed and assessed, and if considered cost- and time-effective is obtained for trial. We then run the method in parallel to existing systems, generally by myself and one of the technicians working independently that comparing our thoughts about 'usability'. If everything is OK at that stage, we obtain more supplies and run tests in parallel to routine systems, comparing the results of between 100 and 500 individual tests. We also make sure that we run duplicates on known positive and negative samples, and on borderline samples, on split samples and on any relevant EQA samples. Results are analysed statistically and if all is OK, I present a report with costings and an assessment of possible advantages and disadvantages to the lab service, for review by my Line Manager and others. If approved and implemented, I revise relevant SOPs, train junior staff, and prepare a variance note for UKAS to maintain or extend the scope of our accreditation.

3. A. Application of knowledge and understanding
3. Analyse, interpret and evaluate relevant scientific information, concepts and ideas and to propose solutions to problems

Our R&D work screening water isolates for antibiotic-resistant species for hospital clients is assisted by working closely with their own lab staff and staff at St Jude's micro lab. I had to test isolates using NHS, HPA and BSAC approved methods. This was not entirely new to me as I already had a basic understanding. However, to streamline testing of large numbers of isolates I was allowed to go on a 1 week secondment to one of our client's lab, to learn their methods and reproduce that at WTS. This worked well, and we were able to support our clients using their approved methods, to we did not apply for UKAS accreditation of this particular analysis.

Though I do much of the susceptibility testing work myself I make sure that all of the team are familiar with the techniques, of media production, inoculum preparation, seeding and eTest strip application, and later reading of results to ensure continuity and to add to their own skill sets.

The work was not without problems. We had some unreliable results caused by zonal media damage to plates that sat in our incubator at locations close to the air circulation fans that caused slight drying of those plates. This affected growth of test strains and almost certainly drug diffusion from eTest strips as

zones of inhibition were distorted on affected plates. I checked the literature and found little of immediate help, but sufficient general guidance to recognise media effects as a problem. I tried first covering the air circulation fans but was concerned about the effect of irregular air flows and uneven incubation temperatures. We tried adding a tray of water to improve humidification and prevent drying but with little effect. Ultimately, I recommended that we use a different incubator and so we swapped ours with the incubator used in another section that had its air circulation fan in the ceiling rather than on the side wall. This solved the problem.

Occasionally, our EQA samples return poor results. I immediately inform my line manager and the entire team. Together we review all of our SOPs and check reagent/media batch numbers. Batch numbers are cross-checked against our spilt sample analyses and for some time we considered this the best we could do. However, after subscribing an RSPH Water Webinar I realised that this might conform precision but not necessarily accuracy. Consequently, we now request second samples of all non-compliant EQA samples and process these using different media, reagents etc, different staff, and then review the results again. We review our results also against those of other laboratories to confirm that we are an outlier and if so, how bad we were. Together, this can provide some assurance that moving forward all is well. If a cause is found we correct it, and I then double check the method and SOP to make sure that all of the team and working properly. This is, as defined in the WTS handbook, a no-fault check of performance. Completing an urgent review is done as quickly as possible, and the results of my investigation forwarded to my Line Manager who will discuss the impact with myself and others including the Quality Manager and CEO. In turn, I will discuss with the lab team, creating an opportunity to reinforce or extend training as appropriate.

At my suggestion, I also cross-check the EQA test divergences and flag any out-of-spec or noncompliant client test results. Since we are responsible for the actions necessitated by our results we have a responsibility to do this, though as yet we have never had to contact clients to issue a Caution Notice or to retract an earlier report. This approach was accepted by the Company CEO who asked me to roll it out to our other lab site and to each of the two chemistry labs who now do the same as us.

4. B. Personal Responsibility
1. Work autonomously while recognising limits of scope of practice

I work as Senior Microbiologist and technical head of the microbiology lab at WTS Limited southern lab. I am responsible for day to day running of the service including all technical matters, stock control and order processing, rostering, staff training, and quality management.

I am responsible as safety supervisor for my own lab and all other on site activities, and to provide safety support to the field microbiologists in biological safety matters.

I see my line manager on most days, but only informally, but she is almost always available if I need help. As required by the company I prepare and submit brief weekly summaries. These are used as the agenda for a weekly 30-45 minute meeting to keep her informed. Otherwise, I am left to my own initiative to run the service.

I defer to the client support team managers and to finance and HR as appropriate.

When I feel that I need support, this is always provided. This happened when I noted a pattern of minor sickness absence for one of our lab support workers. I was certain that there was little substance to this, and having failed to get any improvement referred the problem to my line manager who suggested I leave it with HR. From a science perspective, there have been very few times when I was uncertain about a particular issue. The work-up of antibiotic susceptibility testing described already is a good example as this was quite new to me. However, as it was required that we work closely with the client

and adopt their procedures precisely they provided initial training. I read as much as possible before joining them for a week and was able to match their results when I got back. I was able then to teach the whole team the techniques I had learned.

We often get calls from clients, either directly or referred via our field teams. I must be cautious when offering advice to clients since 'problems' are rarely if ever related exclusively to microbiological matters and may have some associated chemical issues about which I have only limited access to live data, or detailed knowledge sufficient to resolve an enquiry. When this arises, I always check with my chemistry colleague and we put our heads together, or refer to my line manager who has responsibility for and knowledge of both laboratory specialties. All client enquiries are summarised in a simple log in which we make a note regarding the caller, their questions and the answers given.

5. B. Personal Responsibility
2. Take responsibility for safe working practices and contribute to their evaluation and improvement

All WTS Ltd staff are required to abide to the company's H&S policy.

I first received specific health and safety training at St Jude's where it was central to new staff induction. However, though I received further training from my supervisors and from all of the senior scientists, there was no further formal training.

At WTS I was given an initial induction. Additionally, we had monthly safety meetings where all staff were allowed to attend, and almost all staff including myself did attend regularly. When I was appointed Senior Microbiologist and later joint Safety Officer for the southern area WTS laboratories, I was required to go on a training course and obtained NEBOSH General Certificate in Health & Safety.

This equipped me to supervise all biological and general safety matters other than fire in my own lab, for the chemistry lab, and biological safety matters for the field team members.

All of our work is covered by written SOPs. Each has a safety section to which everyone is required to adhere. All equipment is tested at regular intervals for safe performance, including in particular HEPA filtered clean hoods, safety cabinets and additional smoke extractors, and miscellaneous equipment items. We cover all vacuum lines with terminal filters and are careful to date these, as part of our written schedule of testing and periodic replacement.

As a microbiology lab, we are at higher risk of infection. We take great care to train and supervise junior staff, and that is my responsibility so safety and training can go together easily. We record all incidents in a safety and accident book though fortunately these incidents are rare. Each report is discussed at the next safety meeting, and the summary forwarded to the company safety officer and CEO.

We meet or exceed all COSHH requirements and comply with environmental legislation regarding disposal of potentially hazardous laboratory wastes and liquid effluents. To be certain, all staff are aware of their obligations, these safety and disposal requirements are summarised into our SOPs, which for convenience are now being made available online, and are referred to in training of junior staff. I am responsible for safety training of all of the lab teams, excluding fire training, and maintain a written record of their training, or annual updates and of any supplementary training that may be required. My own training is overseen notionally by my line manager and is an included section in my annual appraisal.

6. B. Personal Responsibility
3. Promote and ensure the application of quality standards

I am responsible for managing all IQA and EQA activities in the micro lab. The arrangements for IQA using split and blinded samples, and subsequent data review and investigation was my idea, was developed by me and is now used in our partner micro lab and in both WTS chemistry labs.

The repetitive nature of 95% of our work is a potential source of problems and inaccuracy as we do tend to work in a rather automatic way, especially when workloads are high. Though IQA and EQA processes detect any problem this is always too late and at worst results from the same sample batches would have to be retracted and repeat samples obtained. This risks damaging the reputation of WTS, financial costs and inconvenience for our customers as well as much additional work for our field teams. We had discussed ways to avoid this, to detect more quickly errors in processing before damage is done, and to prevent boredom that might introduce error to repetitive tasks. This was initiated by the WTS Senior Scientist and passed down via my line manager. We had several brainstorming sessions and I held similar meetings with the lab team, together with my opposite number in chemistry. We concluded that adding variety to the workload would help and this was agreed by everyone.

For micro, I changed the work plan from a 6 week rotation between each specialist test bench to daily as this seemed most popular. Problems quickly surfaced because of day release absences and occasional sick leave that meant daily tweaking of the work schedule. I spotted a much bigger problem when I realised that trainees new to the lab or new to a particular test bench would not get much experience in a useful timescale, at best 1 day per 6 working days. It was impossible to synchronise their time on any bench with a particular technician more able to teach them. Because of this I changed the rotation frequency to a weekly cycle. Immediately, this gave trainees at least 5 consecutive days on one bench with one experienced technician and improved training outcomes.

We have not seen any obvious improvement in IQA outcomes as yet, but I think that overall the results should be better, even though the improvement may be small. My line manager has suggested that I review the data again at 1 year and this is now scheduled for November of this year. Our UKAS link assessor has been helpful and made suggestions as to how I might analyse the data. She has also suggested that I should consider presenting this at next year's UKAS conference.

7. B. Personal Responsibility
4. Take responsibility for planning and developing courses of action as well as exercising autonomy and judgement within broad parameters

When I was appointed as Senior Microbiologist there were many improvements that I wanted to try but my line manager told me to wait, to get properly established and then make changes carefully, evaluating the outcome before considering anything else. I now realise that this was great advice, though at the time I was upset and thought that I was not being allowed to run my lab as I thought best.
For the first 3 months, I made a note to help me identify important and desirable changes and rank these in order of need, and to list any cost implications.

One regular concern had been the wastage of some reagents that went out of date during storage. This meant we had to discard quite a lot of often expensive reagents, and yet every few weeks we were running out of some reagents because our stock had gone out of date. I tried to get all of the lab staff to check dates and keep stock in fridges or freezers in strict date order, and take only the oldest in date item. This helped but we still had problems and on one or two occasions it was necessary to check back against reagent batch numbers on record sheets to find out who was responsible.

To create a better and more reliable stock control system I developed a stock control system using Excel. Each product was identified and supplier information, current cost, product code etc were recorded. I set a minimum stock level for each product line and recorded the current stock. If 'current > minimum' then no action is taken. However, if 'current <= minimum' the product is flagged. I order sufficient to raise the stock level safely above the required minimum.

To keep a check on stock levels, every item is tagged with a slip of paper using adhesive tape. This slip has the product identity and expiry date printed on it. When taken from stock, staff remove that paper tag and place it into a box that is checked every couple of days when the spreadsheet is updated. This allows a list of required products to be ordered to be produced.

Over time, I improved the spreadsheet to include into the checking formula the number of units on order, and to record the batch number and expiry dates of goods in stock. As a double check I recorded the required storage conditions, and later added into the formula the typical lead time for delivery to make sure that we would not run out of those products coming from overseas that can take several weeks to arise.

Initially, everyone was happy with the new system I devised as running out of any reagent was hugely disruptive. I made further adjustments to hold larger stocks of long shelf life products because this allows savings on larger orders. I am really pleased with this stock system. I have trained others in its use and everyone finds it really easy. I wanted to do an analysis of stock level versus available discounts for larger purchases but decided that was too time-consuming. My line manager agrees that the avoidance of unnecessary waste is evidence enough of success and cost saving, even if we now sometimes pay a slight premium for smaller orders. We now never run out of reagents and there are no disruptions to our service provision.

8. C. Interpersonal Skills
1. Demonstrate effective and appropriate communication skills

I mainly communicate by organising meetings for everyone in the team, for joint lab and safety meetings, and meetings with my line manager at regular intervals. These are all face-to-face meetings, with agenda items circulated by email. The minutes of each meeting are recorded, to list action points and concerns, and these are circulated to everyone after the meeting. Safety meetings have more formal agendas, detailed minutes and action points, and are reviewed for action at the start of the next meeting. As H&S officer that is my responsibility.

I also communicate with my opposite numbers in the chemistry and micro labs at our other centre, generally be email. This is based on making sure that we work to the same standards, share best practice, and flag concerns that may be a problem for each lab.

At University, I had to do various short presentations, at least twice a year in my last 2 years. I prepared a formal presentation using PowerPoint for my final year project, as well as my Viva. I rarely use PowerPoint at lab meetings, though I have done, as most people think it makes our meetings too formal. However, I use this to present new technical procedures so that I can print out the slides as a step-bystep guide for everyone to take away as reference.

Every week I have a meeting with my team of microbiology technicians, and I also meet occasionally with the field team members (usually only when they are at base). I believe that for a workplace, this is the most effective method of communication and we usually have these meetings over morning coffee on Tuesday as this is the quietest time and day so we are least pressed for time.

I developed a simple training curriculum which was introduced after I was upgraded, to bring training into line with bench rotations, and with the requirements of our accreditation scheme that has training and competency checks embedded into a core SOP. For presentation to the UKAS accreditation officers, I also maintain Q-Sum charts and more detailed lists of all our IQA and EQA data, equipment calibration checks and performance monitoring, temperature checks for fridges, freezers and water baths etc. These are posted for everyone to review our performance, and filed for UKAS review. I am currently converting all of these data to electronic format for ease of filing and retrieval.

9. C. Interpersonal Skills
2. Demonstrate interpersonal and behavioural skills

During October and November of last year, I was told about recurring bacterial and fungal contamination in one section of the lab. This affected our TVC and other counts and appeared on almost all media. Eventually, we realised that this was happening only with filter pad cultures comprising the 0.45 micron acetate filters used to concentrate viable cells from water samples.

After some rapid investigation I could not identify a specific cause so we tried to isolate each step in the process. I did this by substituting one item at a time, with commercially prepared products in place of inhouse prepared items. Eventually, I narrowed this down to the filter pads themselves but changing these made no difference and contamination continued to occur in a percent of samples.

Eventually, I discovered that when the filter manifolds were dismantled to place a new sterile filter one staff member put the top funnel onto the bench surface close to the suction reservoir and filter. This area was contaminated with similar organisms to those found in some samples so we had found the source. However, it was only by close observation that I discovered she was rinsing the assembled filter in 70% alcohol. However, the volume of alcohol used was very small and this was flamed off instantly. I asked that she use a little more alcohol squirted around the full circumference of the filter funnel, and leaves this for at least 5 seconds before flaming off. This solved the problem.

I added this technical point as an addendum to the relevant SOPs and we discussed this at a team meeting to make sure we were all doing this properly. I asked the technician who was probably taking one too many shortcuts and had caused this problem to show everyone the right and wrong way, and to keep an eye on things thereafter. Though I was responsible for standards and performance in my lab, and thus for training and supervision, I decided this was a good way to make sure she wasn't upset or embarrassed by what had happened. No further major contamination events have occurred since then.

10. C. Interpersonal Skills
3. Demonstrate an ability to work effectively with others

There are few if any problems between staff at every level, in the southern micro lab and elsewhere at WTS.

Liaising with clients and with UKAS accreditors, and with company reps from the various companies we purchase from is a welcome diversion and always positive. UKAS accreditors will attend in person, usually over a 2-day period having first scrutinised our written submissions. We have few problems, but the company makes us all very aware that it is absolutely essential to retain accreditation as this is crucial to our business.

Customer queries can sometimes be quite challenging. Contact is usually by phone or email, and I must deal with these urgently. To resolve these issues when I cannot give an immediate answer may need me to research statutory documentation and/or other technical resources, to consult with my chemistry opposite number, and for the more serious issues refer to my Senior Water Scientist.

At least once every term, we are host to a visit by up to 30 students from a local school. We always give them a snack while I remind them of basic safety requirements and equip them all with lab coats and safety glasses. We always give them a pair of gloves to wear because it seems fun even though it's not really essential. I always take them around the specimen reception area, through the prep lab, and then into the main micro lab, explaining what we do, and why and how we do it. We always get lots of questions and I answer these as fully as possible. I sometimes prepare a demonstration but this depends on workload at the time as we don't have a huge amount of space available.

Twice, one of the supervising science teachers has asked me to attend the school and give a more detailed talk about water microbiology and waterborne illnesses. I have also given them ideas about class experiments and assisted in microscope set up. This has always been a success and adds some exciting variety and challenges to my role.

11. D. Professional Practice
1. Identify, review and select scientific techniques procedures and methods to undertake tasks

I am occasionally called on to propose and investigate new test procedures, not for statutory water testing proscribed methods, but for additional client studies that we sometimes accept. These are generally supporting the client's own research or process and development investigations.
Most recently, I was told to provide support to a Japanese company who were having difficult with their water tank manufacturing processes. The material of construction was found to leach something that promoted limited bacterial multiplication and biofilm formation (biotests). This failed statutory testing and we were asked to assist in investigating where this leachate was coming from – the final product was a composite assembly comprising several different major plastic materials together with adhesives, hot weld infill and some metals.

We were provided with a copy of the statutory test methods, and or several complete assemblies that were provided for review.

The test method required samples of known surface area, between 20 and 35 cm^2 surface area, to be immersed in sterile triple glass distilled water in a sterile lidded glass container of 1 litre capacity. An inoculum comprising 1ml of 100cfu/ml Ps aeruginosa is added to each test assembly. These are left at 25C for 21 days before sampling for viable counting. Negative tests must have <100 cfu/ml. Counts >150 cfu/ml are positive, with counts 100-150 cfu/ml are borderline fail and must be repeated with extended incubation to 28 days. Negative controls have no inoculum, or have a piece of sterile glass pate of similar surface area as the test pieces. Positive controls have glass plate or product plus 1ml of a defined mixed salts solution with phytopeptone 0.5%.

First I ran the statutory leachate biotests and confirmed failure. Positive and negative controls were OK. I then suggested we test each material used in manufacture individually and each passed the relevant tests. In total we ran three replicates, with no variation in results.

I was unhappy to leave the problem unresolved, but wondered if the hot weld material had been properly tested. In our product tests and those undertaken by the manufacturer the individual materials of construction were tested individually, and after final assembly. It occurred to me that the hot weld fill material was provided in its raw state but in the final assemble had been heated. When I emailed this to the customer they agreed and said the same issue was true of the two adhesives that they use – these were not tested 'raw' or after curing as it had been considered insignificant.

I then started to test the possibility of significant change during heating or curing. I found no failure with cured adhesives. I discounted testing of raw adhesives as these were not present in the final product.

Additionally, I couldn't find any was to expose the raw adhesive in the test system and both adhesives were water set.

I did find that the heat weld fill material gave marginally positive results. Repeating this the result was confirmed but we considered it unlikely to result in overall failure as the impact was small, and the amount of hot weld was minimal in exposed surface area. However, the technical contact I knew at the manufacturer's suggested this might be significant. He sent me many more samples to test from different batches, and test blocks heated to slightly different temperatures. Testing each of these showed that those materials heated least gave the strongest positive result. This seemed to identify the cause of the problem. I emailed them immediately and wrote a full report that was submitted through WTS Customer Services. I was pleased with the outcome and was thanked by those concerned. My line manager suggested that we write up the results for a publication. Sadly, we were not allowed as the client did not want to be associated with a report that focused on product failure.

12. D. Professional Practice
2. Contribute to the organisation of tasks and resources

Within the WTS Southern Micro lab each member of the team is responsible for keeping their workspace clean and safe. There is a 2 weekly deep clean which requires all surfaces to be clear of items, this is both in the segregated labs and shared lab space. Additional deep cleans are done when necessary, for example after any significant upheaval, or if we note any increase in 1 hour settle plate results that are run every day.

I am responsible for allocating staff to different 'benches' or tasks, including core tasks such as twice daily temperature checks of incubators, water baths, fridges etc. Additional tats include checking of supplies, media and reagent QC checks, maintaining stock cultures or each control organism, and waste management. I take my part in all of this, rotating with all other members of the team.

13. D. Professional Practice
3. Participate in the design, development and implementation of solutions

My department is required to adhere precisely to statutory test methods and we have only limited opportunity to design or develop solutions. This does become necessary when we have aberrant control data in any of our core test repertoires, or problems of increasing variation in the pair results of split samples.

Finding solutions to the few problems that we experience in routine testing is usually straightforward as the cause of any failure is usually apparent. I have explained this problem solving already, including prevention of contamination and improved sterilisation of filter funnels after assembly, and the work I did with leachate testing investigations that identified under-heated hot weld fill materials as the source of leachate promoting bacteria in sterile water.

In preparation for a move to a larger lab in March next year I am currently planning the benches and equipment layout for our extension, and beginning to think about the change-over period that might be phased or done over one very busy Bank Holiday weekend. I am presently thinking about the likely disruption during the building works that include removing a length of wall that will affect our largest work bench. During this period, we plan to isolate all of our work areas with polythene sheeting and are making inquiries about air pumps that will keep the enclosure at slightly positive pressure. This may need additional air conditioning as the use of Bunsen burners will not reduce and temperatures may become uncomfortable. We will also consider a temporary lab facility in a Portakabin if necessary and I am exploring costs for hire etc and the practicalities of gas and electric supplies, water and drainage, for

a short 5 week installation. Decisions will be made by my line manager and others but since the quality of our analytical work is paramount those decisions will based in large part on the information I provide.

14. D. Professional Practice
4. Contribute to continuous performance improvement

As a member of the RSPH Water Sciences group I attend almost all of their meetings and subscribe to each of their webinars. I have made many contacts among the group and am able to share ideas regarding new and improved reagents, equipment items, advanced information concerning revisions to statutory testing methods and sometimes an opportunity to make comments and give feedback on them.

Our UKAS accreditation demands that we maintain a high standard of performance at all times. My line manager compares it to the Army when everything is done 'by the book'. With the opportunity for leaning and continuous personal improvement through RSPH Water group membership, and through the training opportunities provided by WTS I feel that I keep fully up to date in all aspects of my work.

15. E. Professional Standards
1. Comply with relevant codes of conduct and practice

A basic WTS Code of Laboratory Practice is central to all of our day-to-day work, for example ensuring any flammable substances I use are returned to the flammables cupboard, any hazardous or hazardous substances are returned to their safety cabinets, and that I follow appropriate liquid waste disposal guidelines (disposal of Virkon waste pots after not less than 30 mins contact time and usually overnight).

All of our work is done in a containment level 2 lab, requiring a standard lab coat, gloves and safety glasses at all times. I always remove gloves and coat and always wash my hands when leaving the lab, and then remove glasses. As Senior Microbiologist, head of the lab, and safety officer it is also my responsibility to train others, and to supervise to ensure that these basic rules and others are properly adhered to at all times.

16. E. Professional Standards
2. Maintain and enhance competence in own areas of practice through professional development activity.

When I was at university I attended lectures, seminars and practical laboratory sessions; and for my second and third year exams I did thorough further reading around each topic so as to be able to give more detailed answers for the extended essay questions.

Starting at St Jude's, I took every opportunity to study and learn from the senior staff. At this time, although I had changed my degree course, I was considering a career in BMS so put everything possible into gaining experience.

I continued my training and gained much further experience at WTS. Here we are lucky to have access to several key journals and can obtain other papers are required. I am a member of the RSPH and their water sciences group that gives me access to much additional information, lectures and webinars etc. I am a member of the RSB and last year signed up to its CPD scheme. Presently I have not completed a full cycle of CPD but am over 90% complete. Going forward, I am committed to continuing with this, which is supported by my employer. I use the CPD entries as part of my self-assessment document for my annual appraisal.

Career Overview/Prof. Background
Water Testing Services Ltd, Southern Laboratory
Senior Microbiologist.
2015-09-06 to date

Microbiology Technician
2013-01-04 to 2015-09-05

St Jude's NHS Trust Pathology Lab
Medical Laboratory Assistant to
2012-11-12 to 2015-07-08

University of Grantchester
BSc Biology with Microbiology
2010-09-10 to 2012-07-03 (graduated 2:1)

BSc Biomedical Sciences
2009-07-04 to 2010-07-10 (1 year only)

Declaration
Signed: 2016-03-03