Example application for Registered Science Technician (RSciTech)

Application: Registered Science Technician

Job Title: Assistant Ecotoxicologist

Competencies
1. A. Application of knowledge and understanding
1. Apply knowledge of underlying concepts and principles associated with area of work

My job role at Buzzy Bee Research Agency is as an Assistant Ecotoxicologist within the Chemical Safety and Residues (CSR) programme. I have been working in this area for 2 years. I mainly assist with field work studies but have recently become more involved in lab based studies.

The work I carry out is looking at pesticide safety for the environment. I mainly work with bees, birds, worms and small mammals. My work can range from RFID (Radio-frequency identification) tagging bees for field studies, dosing, weighing feeding bees for lab studies to plant studies carried out in the field or lab and sample collections. I work both across many teams (within Buzzy Bee Research Agency as a whole) and also as part of the Environmental Fate team as part of my RPS role (radioactive protection supervisor), as they work with a lot of radioactive material in their studies.

Bees as pollinators are very important to us and to the environment; therefore, I have spent the past year looking at the effects of pesticides on Honey bees and bumble bees. Neonicotinoids are a class of insecticide that has been reported to affect a bee's nervous system resulting in them being unable to return successfully to the hive. This has caused a decrease of bee populations in the past few years, and widespread concern. This phenomenon has been labelled by some as honey bee colony collapse disorder or CCD. Previous studies carried out by different organisations have only been conducted in a lab environment, whereas I am working on both lab and field studies to gain a truer picture of the effects.

Neonicotinoids are systemic pesticides absorbed through the roots of plants and transported around its tissues. They are widely used on the food we consume, often used in the form of a 'seed coating' and can be used on a wide variety of produce from fruit to corn. Bees can feed on guttation fluid which is produced by the plant through its leaves round dawn time. This is where the large concern is. These neonicotinoids are classed as relatively low toxic pesticides. If these were to be banned permanently other methods of pest control would need to be brought in, which hold other concerns, such as spraying which could contaminate non target species.

I hope to show within my lab and field studies that neonicotinoids are one of the safer pesticides to bees but also non target species. I am approaching this be following individual bees to may foraging and feeding patterns, observing for neonicotinoid-related effects in individuals and in colonies, and with others running assays for neonicotinoid concentrations and derivatives in a variety of plants and plant structures, seeking evidence for significant diurnal variations, and assaying the corresponding drug concentrations in bees, honey, and more generally in the detritus of the hive.

2. A. Application of knowledge and understanding
2. Review and select appropriate scientific techniques and methods to undertake tasks

As pollinators act as agents moving pollen from the male anthers of a flower to the female stigma of to accomplish fertilisation of the female gamete in the ovule of the flower by the male gametes they participate indirectly in the sexual reproduction of many plants, ensuring essential cross-pollination and creating genetic diversity for others. Since plants are the primary food source for animals, the reduction of one of the primary pollination agents or worse their possible disappearance, has raised concern and the conservation of pollinators has become part of biodiversity conservation efforts. Pollinator decline refers to the reduction in abundance of insect and other pollinators in many ecosystems worldwide, beginning at the end of the twentieth century and continuing into the present day.

Neonicotinoids are a class of insecticides with a common action that affects the central nervous system of insects. They bind to and activate receptors of the nicotinic acetylcholine receptor causing excitation of the nerves, leading to eventual paralysis and death. This specific neural pathway is more abundant in insects than animals, so these insecticides are more toxic to insects than mammals. Bees have a particular genetic vulnerability to neonicotinoids because they have more of these receptors than other insects. Unlike many insect pest species which are able to detoxify harmful chemicals, bees possess fewer genes for detoxification.

While the older organophosphate and carbamate insecticides tend to degrade quite rapidly in the environment, Neonicotinoids are more persistent, for example Imidacloprid can last for months or even years in soil and may also get into groundwater. Because these agents are biologically active at very low concentrations, neonicotinoids can be applied at much lower volumes in the field than the older groups of insecticides - in doses of a few grams, rather than kilos, per hectare of the active ingredient.

Within my role, I am looking at the effects of neonicotinoids on bees. I work with honey bees and bumblebees. Both species are different in the ways the studies need to be carried out. Bumblebees like to be close to each other as they are eusocial which is the highest level of organization of animal sociality. This is because they share the care of the brood, each having their own role in the nest, so studies need to be set up with this in mind. Honey bees also prefer to be in contact with other honey bees, but previous studies that have been carried out demonstrate that they act the same if they are caged with dead or living honey bees.

To test appropriate techniques to use to house the bees myself and my team carried out some preliminary research to determine possible options. Previously I had used delipots - plastic pots with lids - and put individual bees in each one, which had a glass feeder containing the neonicotinoids. After the research, I carried out a trial using hair curlers instead of deli pots. The hair curlers were stood in petri dishes so the bees couldn’t escape and the glass feeder were in placed in the hair curler then Individual

bees were placed in the curlers, the thought being they will still be able to touch each other through the gaps. They were grouped within the treatments (i.e. Etoxazole 3.75µg/µl, 0.375 µg/µ, toxic ref, control), but I had bees that managed to escape through the gaps in the curlers, some then crawled into other curlers and some just flew to the windows in the lab.

I spoke to the National bee unit who advised me about Nicot queen rearing cages, which are very similar to hair curlers but are designed to house bees. Nicot queen cages are designed for placing over the queen cells on the 14th day to prevent damage by the first queen out.

Subsequently, I ran another trial using these nicot cages, which were placed on a tray so the bees were all next to each other. No bees escaped. Also instead of the glass feeders I used syringes which had been altered so the bee could get its tongue in to the nib, I cut the nib at a slight angle, these were placed through the top of the cage, and trays were placed in the incubator on a slight angle to minimise the risk of getting air bubbles in the syringe.

3. A. Application of knowledge and understanding
3. Interpret and evaluate data and make sound judgements in relation to scientific concepts

One of the studies I have worked on was an RFID study (Radio-frequency identification). A RFID tag is attached to a worker bee with shellac glue and RFID reader is attached to that bee's hive. As the bee passes through the reader on the hive, it logs the bee as leaving or entering. The reader records how long the bee is out of the hive for. There is a data card in the reader which is downloaded daily. I attached RFID tags on to the dorsal thorax (back above the wings) of a honey bee. This was for a field trial; in total I and 3 others tagged 4000 bees. I produced a method as I went as no one had carried out a task like this before. The procedure I used in the first setup was, collect newly emerged bees, gas them with co2, put them in batches of 10, apply shellac glue to the dorsal thorax then apply the RFID tag. Place the bee in a queen cage this is a holding cage for introducing new queens in to colonies I filled one end with a thick sugar paste so by the time the bees eat their way out the new colony will have accepted the queen.

I had some issues with the tags staying attached to the bees, I wasn't sure if this was my process or the glue so after the study I carried out my own little test. I used 3 different glues, shellac, superglue and queen marking glue. I used honey bees again as used in the previous study. I had 3 reps for each glue but with different time points. I also had control bees, these were gassed with co2 and placed in queen cages (10 bees per cage) I used them to place the RFID tagged bees back into the colonies once tagged. But for my study I shall just be using them as a holding cage to represent the study use.

I thought about why the tags may be falling off before starting my study. The glue had not dried, when the bees are coming round, they try and clean themselves, walking over each other in the cage, the cage has holes into which tags fit nicely so can easily get caught and pulled off.

The bees were gassed using CO2 for 2 minutes, the glue was applied to the bee and the tag placed on, rep 1 was then placed straight into the queen cage and placed in a petri dish, in case they escaped. Rep 2 followed the same procedure but were left to come round slightly before being placed in to the queen cage. Rep3 followed the same procedure but were left to fully come round from the gas to make sure the

tags were fully attached, they were then knocked down with co2 again for 30 seconds so I could place them in to the cage. I did this for each type of glue and then placed in to the incubator; this was set at 25 ± 5 ºc and humidity 60 ± 5 %.

I monitored the bees after 2 hours, I checked every cage for mortality and dropped tags and recorded this. I then carried out a check every day for the next 3 days. I was looking at, bee survival, tags dropped and time. The tags are usually dropped within the first few hours. I carried the test on for 3 days as they would have nearly eaten all the sugar paste after 3 days.

The results showed that the super glue was toxic to the honey bees, most died after the first 2 hours. All tags stayed attached in all reps and the rest of the bees died within the first 24 hours.
The queen marking glue, as suspected after talking to the national bee unit, dropped the most tags in all reps, but mainly in rep 1. There were a few dead bees but that is to be expected, as some may have been damaged in the removal from the nest and gassing.

The shellac glue produced the best results, most of the tags stayed attached. There were a couple of dead bees but these seemed to be from the bee getting stuck to the sugar paste. The bees that seem to have the best attached tags were the bees that had been gassed, tagged and left to come round and then placed into the queen cage. From the results I gained I was able to go back to my manager with a possible new method of tag application. After he reviewed my results we decided that the next RFID study we carry out we shall follow the new procedure.
Just to summarise, the protocol was defined eventually on the basis of results from this series of extensive but preliminary studies:
• Gas bees with Co2
• Tag bees with shellac glue
• Leave to come round
• Then place in to queen cage

We will use this as it is the most effective way to attach tags and keep the bees healthy.

4. B. Personal Responsibility
1. Work consistently and effectively with minimal supervision to appropriate standards and protocols

A study was conducted in order to determine residues of Clothianidin and its metabolites in nectar and pollen of flowering rotational crops and in guttation fluid – guttation is the sap like solution that is produced 30 minutes after sunrise - on the tips or edges of leaves of some vascular plants such as maize.

Previous work had been carried out to find suitable plots for this study, the residue pesticide levels had to be high enough for the maize to produce guttation that was suitable for us to be able to sample. Once the site had been located, the field was separated into two. Half was planted with Phacelia tanacetifolia (Phacelia) this is a very popular plant for all bees as the flowers produce a lot of nectar. The other half was planted with the treated crop, maize.

Guttation occurs mainly on the tips of leaves. It is not to be confused with dew that occurs from condensation onto the entire plant surface. Accumulated water found in the “funnels”/leaf axils formed by adjacent maize leaves may consist of guttation fluid and dew or rainfall. Consequently, the state of each individual sample will be described in the raw data (e.g.: GF: concentrated guttation fluid, without any proportion of dew or rain water found on the leaf edges; MGF: guttation fluid mixed with dew or rain water found on the upper side of the leaves; FW: Fluid found in leaf axils).’

I split the maize in to 3 sub plots - to check the reliability of a finding, replicates are used. All this information I added to the study file, which is a file that contains all the relevant information on the study plan (what is going to happen, what is expected and how it will be carried out) along with contact details for farmers, study forms to record data.
Within my job role I am expected to work away from my office site at field trial sites, so after discussing with the study director (the study director under GLP means the individual responsible for the overall conduct of a study) I read the study plan (study plan under GLP means a document which defines the objectives and experimental design for the conduct of the study, and includes any amendments) and collected all the equipment that was required for the study. Such as, watering cans, marker flags, freezer, thermometers, mobile freezer and also print out the outlook calendar that I had created to remind me what days I was working at which site. This study involved me getting up at 2am most mornings so I did as much preparation as possible.

I was working on a site in Southend-On-Sea. I was the first person on site so I had to meet with the farmer on arrival, introduce myself, and find the correct field from the maps in the study plan (these had all been GPS marked in the study file)

The study involved me collecting guttation fluid from the maize on the correct plots 30 minutes ± 15 minutes after sunrise; I had read the study plan so knew the procedure to follow. The collection had to take no longer than 30 minutes and I had to use at least 10 plants per field and collect 1ml.
The samples needed to be collected every second day from that site, so on the other days I drove from Southend field to Cambridge and did the guttation collection on that site.
I kept in contact with the study director on a daily basis either by text or phone call, as I was lone working. The study director was never at the site with me.
I knew that a colleague was taking over from me after a couple of weeks so I entered all the post codes of the fields in to the sat nav.
I carried out this work for 2 weeks, coming back to Buzzy Bee Research Agency when my colleague took over.

5. B. Personal Responsibility
2. Manage and apply safe working practices

Working with bees can have its dangers, from stings to lifting heavy equipment such as hives when doing colony assessment. When I applied for my job I was asked if I was allergic to bee stings. I had not been stung by a bee before but had been stung plenty of times by wasps so presumed I was OK. It is a very hands-on job and common sense is a key factor with bees. It is possible to read a situation by watching the bees.

I only wear a bee suit when working outside with the bees, and although it is advisable to wear a suit at all times, bees are very calm unless aggravated, so carrying out quick jobs may not require a full suit or veil. When I assist with colony assessments it is recommended that we wear marigold gloves, as the bees struggle to penetrate the rubber. Boots or wellies are best footwear as they cover your ankles, as bees have a tendency to search out warm areas. You always need to check that your veil is zipped up fully, should a bee get into your veil, stay calm ask your colleague or if you can do it yourself fold the veil away from your face on the bee and kill it. The key is not to panic. When opening up a hive to look at the colony I use a smoker. Smoke calms bees this has been known since ancient times; however, the scientific explanation was unknown until the 20th century and is still not fully understood. Smoke masks alarm pheromones which include various chemicals, e.g., isopentyl acetate that are released by guard bees or bees that are injured during a beekeeper's inspection, therefore lower the chance of attack.

When I finish work I check myself for bees on my suit before I start unzipping as they have a tendency to hang around in warm areas, but also if you have irritated the hive a bee can follow me for a long time. You can usually hear an annoyed bee, their buzz changes when they are annoyed.

When carrying out lab-based bee work it is much different as there are more people that may come in contact with the bees should they escape. I put signage on the lab doors to warn people that work is being carried out on live bees. Lab coats are worn in the labs not bee suits, when I handle the bees in the lab I am usually dealing with one bee at a time so forceps can be used to minimise the chance of a sting. Lab glasses need to be worn as part of standard lab procedures. Should people enter the lab such as contractors I always make them aware there are bees about and ask if they are allergic.

6. B. Personal Responsibility
3. Accept responsibility for the quality of work of self and others

When a new test item is received I complete a ‘Test Item Control’ form. This form is used so that all the relevant data and information associated with the test item is recorded and can be placed on the study file. The form records information such as: date received; batch number; storage conditions; storage location; manufacturer; purity; expiry date; visual description; received by. Each Test Item Control form has a unique identifier printed on it (e.g. NBU 555) and when the form has been completed this number is then assigned to that particular test item.

Study Directors request the dispensing of a test item using a Test Item Request Form. It is the responsibility of myself (Test Item Dispenser - The Test Item Dispenser is someone who looks after the entire test items for all of the studies) to ensure that a signed study plan is in place before anything is dispensed. The Test Item Request Form contains information such as: is a QA audit required; when the item is required by; the test item name; the quantity (and range); what container to use; are there any special considerations such as photosensitive or use plastic only. For example: NBU486 → dimethoate → 0.5 g (± 0.25 g) → 10 mL volumetric

All dispensing has to be carried out accurately as the items will be used in live studies, any mistakes may affect the results, incurring lost time, money and business. The test item is weighed before anything is dispensed so I or my colleague can always tell if any item has been removed without authorisation.

When dispensing a test item a Test Item Control – Dispense Weighing's form is completed. This form records data such as: test item used; actual weight taken; batch number; carried out by.

Test item is a very important part of the study, therefore the GLP (Good laboratory practice) audit team often come and audit the dispensing and also booking in the test item when it arrives.

It is very important that I also wear the correct PPE for dispensing test item, lab coat, gloves, lab glasses and face mask if it is a powder- PPE is provided to keep you as safe as possible, face mask to stop you breathing in powder, gloves to keep chemicals off your skin, lab coat to keep chemicals from getting on to your clothes and spreading them around when you return to the office and glasses to protect your eyes from dust and splashes.

7. B. Personal Responsibility
4. Take responsibility for completing tasks and procedures as well as using judgement within defined parameters

After reading the study plan for the guttation collection and bee study, I was aware of the tasks that were required. I would be working alone, so I needed to be clear on my responsibilities.
I was to be working a new field site, so when I arrived I had to assess the crops and discuss with the farmer their growth.

When carrying out field work, weather is an important factor. Southend on sea is a very dry area, and after assessing the crops I decided that they would need watering twice daily. I contacted the study director to inform him of the situation and my thoughts on watering the crops. He agreed after consulting the customer as this would need to be in the study plan.
I arranged with the farmer for a water butt to be placed on the field and it to be filled twice daily so I could go out and water the crops.

I was keeping a record of growth scale and if I was able to collect any guttation fluid at all and after a week of watering, monitoring the crop growth and trying to collect samples it was decided after a discussion by myself and study director that the crops did not fill the criteria of the study and another location was found.

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

I am the Continuous Improvement (CI) rep for ecotoxicology. My team has weekly meetings, to update the team on what is happening, as well as health and safety, upcoming work and any help that may be required. I usually chair these as the rep. It involves getting all the team members together, if possible. Trying to get everyone involved but in a relaxed way. Managers attend the meetings but I try and get everyone to express ideas.
I am currently doing my six sigma green belt training course. This is an 8 day course followed by 12 months of Continuing Professional Development. Lean 6 Sigma is an application of both CI and lean methodologies, to eliminate 'waste' from a process.
I have completed the 8 days which involved learning the benefits and ways to bring CI and lean in to the work place, put people's minds at ease as they see it as job cuts. I was shown all the tools I would

require to gain my accreditation. Within the course I had to do presentations of my idea which I wanted to make more streamline. I had to do my first presentation on the first day of the course, which included my understanding of CI and what it meant.

After the 8 days and many more practice presentations in front of the group I did a PowerPoint presentation to my champion, my champion is someone also in ecotoxicology but in a management position. They are there to help you and push for change at a higher level.
As my project progresses I have created a rich picture, this shows the problem I am wishing to solve, how I intend to solve it, who will be involved, the outcome and why I wish to do this. I do this in 5 stages, define the problem, measure the process, analyse the process, improve the process and control the process.

Throughout the process I need to involve different people in my project, from apprentices to Heads of program. I shall be using different tools I have learnt from my course to gain feedback and their input. I have learnt that people find getting their ideas expressed easier in different ways, so hopefully with my knowledge from my course I will be able to put people at ease and get some good ideas and feedback. I will be keeping my champion up to date with my work via email, one to one meetings and group feedback sessions.

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

I am currently doing a Six Sigma green belt training which is a course that teaches you the define-measure-analyse-improve-control methodology using case studies from several industries.

Define the problem, Measure the process, Analyse the process, Improve the process and control the process. I have learnt to define improvement projects to satisfy the customer and reduce variation. I have identified an area that I believe can be improved for both staff and Food and Environment Research Agency. Working alongside members of my team as well as management I am hoping to bring in changes that will improve a system that we currently use.
The changes I have implemented will hopefully make our procedure more cost effective and also easy for other members of Buzzy Bee Research Agency to follow.

My project is looking at the booking out of field vehicles. The process will eliminate time wasted looking for vehicles and getting them ready for the work required. Currently the trucks are used by different teams and the process is not followed. I have put in place a process that is easy to follow, there is a board in an allocated office, this board will show each truck we have, it will be split into days and will require to be filled out before any truck is taken.

The trucks will be allocated a colour, the keys will be colour coordinated as we have a lot of truck by the same manufacturer. There is also a file with the same colour, this contains a mileage sheet, fuel card and check list. The check list is required to be filled out on return to Food and Environment Research Agency, this will show that you have left sufficient fuel in the truck so that people can get straight on with the work, you have parked in an allocated bay, the keys are returned to the office and you have emptied the truck of all equipment unless you have block booked that truck.

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

Within Buzzy Bee Research Agency there are many different teams that run as one area, I am in CSR (Chemical Safety and Residues), but often asked to help in other teams in cases of them being short staffed or during their busy periods.

I was asked to help out a member of staff from the national bee unit who had been studying key triggers for reproduction and survival time for the varroa mite. She was hoping to start her own culture to use in studies. The work was to look at what the varroa mite needed to feed on from the honey bee's blood, I was asked to work alongside other members of the bee unit. I had to open sealed brood, these are pupa of the honey bees in the early stage of development. There was a group of 4 people, we each had a frame of brood each to work on. As this was new work and we were unsure how any larvae we would require to get the correct amount. I had to break the wax seal over the cell where the pupa was. Honey bee larvae can be aged by the colour of their eye:

Age of Bees from laying (Days)	Age of Bees from hatching (Days)	Stage	Compound Eyes
0-3	-	Egg	
4	1	Larva	
5	2	Larva	
6	3	Larva	
7	4	Larva	
8	5	Larva sealed	
9	6	Prepupa	
10	7	Prepupa	
11	8	Prepupa pupation	
12	9	Pupa	White
13	10	Pupa	Pale Pink
14	11	Pupa	Pink
15	12	Pupa	Pale Purple
16	13	Pupa	Dark Purple
17	14	Pupa	Dark Purple
18	15	Pupa	Black
19	16	Pupa	Black
20	17	Pupa Moult	Black
21	18	Adult Emerge	Black

After this, I had to separate the pupa into the correct age stages, also checking them for varroa mites. We did not want to use the blood of pupa which had a varroa mite present. We did however collect them and they were used as practice for the bleeding stage. Once I and the others in the team had collected 40+ pupa in each stage, I was asked if I would like try the next stage of the procedure.

I was given a few practice pupae and the procedure was to pierce each pupa in the abdomen, then using a capillary tube drain some blood. The blood needed to be as clear as possible, as it was very easy to get fat in the tube. Each eye stage of pupa required a sample of blood.

I found a technique that worked very well with the white eyes, these are the very early stage of pupa so were very fiddly and delicate, I then trained the other team members in how I had carried it out. I was then asked to look at the other eye colours and see if the same technique worked, It had to be slightly changed but I showed my colleagues again the best way I found to extract the blood needed. The work needed to be completed by the end of that week. I worked on it for 2 days and we managed to get enough sample from each age cycle for analysis to be carried out. I received good feedback for this work from Clare, whose work I was assisting with and also my manager.

11. D. Professional Practice
1. Recognise problems and apply appropriate scientific methods to identify causes and achieve solutions.

Pipettes are used daily within our lab. The pipettes are Gilson air displacement, which is where the air is taken out the pipette and replaced with the liquid. Sometimes they are used for weights and sometimes they are used for amounts.

There have been several occasions' people using the incorrect pipette for a job, i.e. a dilution in a bee study required 20 µl to be added, the pipette used was a P200 which has a recommended use of 50 µl - 200 µl, you are able to pipette 20 µl but it may not be as accurate as a P20 or P100. After this error was spotted I carried out a pipette check on the incorrect pipette, this is where I dispense a certain amount of liquid (water) 3 times and compared the results. The pipette did pass on the lower tolerance.

All pipettes can be used in a tolerance range, if used out of this tolerance it could affect the results of the study and will also be picked up by the GLP audit team. Compliance with the principles of GLP is a legal requirement for test facilities that undertake health and environmental safety studies, and some other testing, that will be submitted to regulatory authorities for the purposes of risk assessment. GLP facilitates the proper conduct of studies, promotes their full and accurate reporting and provides means whereby the validity and integrity of the studies can be verified. As GLP compliance is granted to the facility all work undertaken in a GLP facility (regulatory or not) must adhere to the principles of GLP; however GLP compliance can only be claimed for regulatory studies. After that incident I produced a chart for every pipette in the lab which clearly shows, the tolerance for each one in µl, ml, how it is displayed on the pipette.

The pipettes are also calibrated monthly to make sure they are still working correctly. This is done by dispensing the minimum and maximum amounts of each pipette 6 times. All of this information is recorded on the calibration spreadsheet. I do this on an analytical balance, using HPLC grade water

(HPLC is an ultrapure water with low UV absorbance, packaged in solvent-rinsed amber glass bottles and sealed under an inert atmosphere, to minimize contaminants that could pollute your studies) I pipette the water in to a vial and record the weights on a spread sheet. Should there be any issues with the pipettes another person is required to carry out the checks, if the pipette is still out of tolerance it needs to be taken out of use and sent away to be calibrated.

1ml of water converts to 1g in weight.

This table is to show the pipettes we have in the lab, what ranges they can be used in and how the mounts are displayed:

	Min µl	**Max µl**	**Min ml**	**Max ml**	**Display**	
P20	2	20	0.002ml	0.020ml	02.0	20.0
P100	20	100	0.020ml	0.100ml	020	100
P200	50	200	0.050ml	0.200ml	050	200
P1000	200	1000	0.200ml	1.000ml	020	1 00
P5000	1000	5000	1.000ml	5.000ml	1 00	5 00

12. D. Professional Practice
2. Identify, organise and use resources effectively to complete tasks

The lab is used by lots of different people and equipment get used and sometimes not replaced. I have brought in ordering sheets in the lab so should someone use the last of something they can add it to the ordering list, this get checked as part of the weekly checks.

When I am aware that there is a study happening in the next few weeks I make a priority of doing a check of equipment that may be required and preparing what I can. I have also brought up to date the list of general chemicals that we keep in the lab. These are things from sugar to make sucrose for the bees to seeds. It shows when they came into the lab, and when they expire.

A daily check list of jobs is in the lab, which outlines the main daily/weekly jobs that require to be done. Freezer and fridge temperatures require checking and recording. Acceptable temperatures: fridge 0°C to +10°C and freezers -10°C or less as outlined in the SOP (standard operating procedure) FERA006. Should a freezer or fridge come out of spec it could affect the chemicals and samples stored in them, there is a tiny tag (data logger) attached to each freezer/fridge which can be downloaded to show when it went out of the spec and for how long. This information is printed out and kept in the calibration folders and a copy is sent to the study directors.

Checking all equipment that is in the lab is vital to smooth running of the lab and studies, I check weight the balances before I use them, and record the weights. I use a range of check weights to get an overview. The check weights are checked on a yearly basis also. Making sure that the correct equipment for the tasks is being used is vital as this could affect the integrity of the date produced.

I check the pipettes are checked monthly and they are also checked every 6 months by an external company. Every sample that is brought in to the lab is labelled with study number, initials and date. Control samples are always stored on top shelves so that they have less chance of being contaminated. This is also in keeping with GLP compliance.

13. D. Professional Practice
3. Contribute to continuous performance improvement

I am always looking for ways to expand my skills and experience, and also a way to look at procedures that will help mine and others working day. I have been looking at the processes in our team and seeing if there are any improvements. As I am part of the field team I looked at the field vehicle process, these are used by other members of staff from within the Buzzy Bee Research Agency.

There was really no procedure in place which caused confusion and time wasting in booking out vehicles. I discussed my thoughts and ideas within the six sigma green belt training course and was told that it was a feasible idea. I took my ideas to a member from the field team, whose role includes maintenance and upkeep of the field vehicles and look after the vehicles. My project is looking at the booking out field vehicles. The process will eliminate time wasted looking for vehicles and getting them ready for the work required.

I showed him my ideas, changes and asked for his feedback. We produced a flow chat that showed the current way of booking a truck and then we added new steps and took out old ones. He thought my idea was good and could be put in place.

I have had several meetings with my CI champion (a higher band member of staff who can speak for you at management meetings). My idea has been passed to the Head of Programmes, who has agreed that I can start implementing the changes. In addition I also attend monthly partnering meetings, this gives me a chance to express my ideas to other teams on site and so to hear other people's suggestions. It also gives me a chance to find out what is happening across site, in case there is anything I could assist with.

14. E. Professional Standards
1. Comply with relevant codes of conduct and practice
Working at Food and Environment Research Agency there are many different codes of conduct.

GLP – Good laboratory practice is used daily in my role, traceability, I record everything that happens within a study so should someone need to repeat the study they can get the study file out and every step will be noted.
Every study has a study file, data is recorded in there, raw and reports.

Buzzy Bee Research Agency local rules – All laboratories have these and need to be read and signed to say you have understood the rules and working conditions in that lab. If the work changes in that lab the local rules get updated so then need rereading and signing. There are local rules for entering and working in the labs, a rule for entering could be. Staff untrained in handling open sources must NOT

access fridges and freezers with the radiation trefoil sign on as these contain radioactive material. For working in a lab this is a local rule, Balances can be used by staff untrained in the handling of radioactive material. However please contact radiation workers in the lab to be given a safe route to and from the equipment.

Home office licence – Module 1-3 wild mammal and bird. This has to be completed to be able to carry out some of the work I do. Such as taking small mammals from the wild, depriving of food, giving treated food, the laws that are inforce. Also about the care and wellbeing of the birds and mammals in my care

Test item deputy - COSHH assessments must be read and signed for the test items. This is dispensing test item for all studies, booking in all test items. No study director is allowed to dispense their own test item, has to be carried out with another person. All work is checked; the GLP audit team quite often come and assess the dispensing. I also dispose of test items/chemicals, after checking with the study director if the chemical can be disposed I fill in a waste transfer note, which asks for the chemical name, quantity, type of container and also the hazard codes e.g Explosive, oxidising, toxic
I then book a job with the porters who take the chemicals away and dispose of them following the information I have provided.

Lone working – Lab alone working is no longer allowed, all work must be carried out in pairs. Field work is usually carried out with a team member but occasionally you are alone should this be the case there are strict guidelines to follow keeping in contact with team members, making sure you have all correct working equipment. Not taking risks, logging that you are taking a vehicle, keeping outlook updated so people know where you are working.

COSHH & Environmental Management – COSHH assessments are located in the team office and are regularly reviewed by COSHH trained members of staff. We also have an Environmental Management System that includes information such as: a useful 'Waste Users Guide'; an environmental incident form (and information relating to what to do if there is an incident) & information related to ISO 14001 (ISO 14001 sets out the criteria for an environmental management system and can be certified to).

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

Since I started at the Buzzy Bee Research Agency I have regular performance reviews, these are done quarterly between myself and my line manager. It gives me the chance to say what I have been doing, what I want to do and what my team leader who would like me to do.

I have recently started my RSciTech, which is a big part of my CPD as there are lots of new skills I hope to learn.

I have become a CI rep which has given me an opportunity to attend a six sigma green belt training course which will be very useful for me and Food and Environment Research Agency. Continuous improvement is a major part of every business these days. Being a CI rep I have become more involved in different areas of Food and Environment Research Agency and made lots of new contacts which are vital in building business.

I also attend the science talks that are held at the Buzzy Bee Research Agency; these are very interesting and given by different departments to keep you up to date on anything they are working on, or anything that is in the pipeline. We also have guest lectures from visiting and guest scientists.

I have also attended a Radiation protection supervisor course in Leeds which was 3 days, I am now a deputy Radiation protection supervisor for the site.

I have recently been on a 4x4 driving course as I do a lot of work out in the field. I learned new skills and techniques I will hopefully be able to put in to practice should I ever get stuck.

I feel that learning new skills and continuously improving already gained skills is a vital part of building myself a future in the Buzzy Bee Research Agency.

As certain members of our team are approaching retirement age it has become apparent to me that there are areas that will need someone to be trained in, I am currently getting much more involved in these areas as they are of great interest to me and I believe will bring more opportunity at the Buzzy Bee Research Agency such as being a trainee ringer for the BTO, British Trust of Ornithology as the Agency require birds being caught from the wild.

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

In my work, I adhere at all times to COSHH supplied by host institutions. The National Environmental Protection Agency (EPA) audits host laboratories regularly to ensure compliance with prevailing national environmental and safety legislation, and I help these labs to comply with regulations by supplying up to date strain lists and freezer contents to my laboratory manager. I catalogue MSDS sheets for all materials I use in my research, and ensure that SOPs are available for all protocols used routinely in the laboratory.

Risk assessments are carried out in collaboration with my supervisors and Principal Investigators for all new protocols to be adopted. Home Office licenses are administered by my PI and lab manager for all work with human tissue samples, Class 2 pathogens, and rodent in vivo work (although I do not carry out work with mice directly, I collaborate with those who do and supply samples with which to carry out said work). As a junior member of the lab, I have input into the adoption of legal requirements but ultimate responsibility does not lie with me for their implementation. Nevertheless, I am aware of my personal obligations, and I always work within the law and within laboratory guidelines to carry out good-quality, safe work.

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

I maintain a CPD folder that is a record of all of the activities I carry out in addition to my usual

responsibilities that contribute to my professional development. This includes areas such as self-directed learning, which includes personal research using internet sources, textbooks and journals (including The Biologist magazine) to further my scientific knowledge in particular around Microbiology and the approved methods. It also includes my attendance at 'lunch-time talks' in which guest speakers come to the laboratory to give a presentation on their area of work, giving me the opportunity to expand my knowledge about other areas within the company.
Another example is becoming an Associate of the Society of Biology which recognises that I am 'a professional biologist, well qualified and subject to rigorous code of conduct'. My CPD also involves completing the Society of Biology competencies to become a Registered Science Technician (RSciTech) as well as Anglian Waters own competencies.

My CPD also includes some work within the laboratory that is beyond my usual responsibilities. One example is my sole and personal responsibility for ensuring the Microbiology laboratory complies with the Legionella risk assessment. This involves carrying out weekly tap flushing's, monthly water temperature monitoring and reporting failing supplies.

We have very recently been approved to change our primary method of membrane filtration to IDEXX Colilert-18. This new method has many positive benefits to the laboratory including eliminating the need for further confirmation testing, eliminating the need for a large part of our media preparation, and eliminating subjective interpretation. Before my training begins on this new method I thought it would be beneficial for me to read more about it such as how it works. As part of my CPD I have also attended a presentation by my line manager about the Colilert method and its benefits. I have read the procedure set out by IDEXX themselves and practiced reading some Colilert demonstration AQCs and samples.

I am allocated such yearly PDR tasks by my line manager and have regular performance and development review meetings with him to monitor my progression. I am given 5 objectives for the year which must be achieved to receive a pay rise and bonus.

Career Overview/Prof. Background
Assistant Ecotoxicologist, Buzzy Bee Research Agency
From: 2012-08-01, Until:
To work in undertaking R&D studies to improve the understanding of the science behind regulatory risk assessment, primarily by improving exposure assessments and in GLP (Good Laboratory Practice) regulatory R&D studies for industry.
Also undertake GLP compliant non-target arthropod, plant and honeybee laboratory studies and assist with other work.
Looking at the effects of pesticides on honey bees and bumble bees in lab and field studies, such as honey Bee - Larval rearing, larval grafting, honey bee RFID field study, chronic and acute honey bee and bumble bees studies, contact and oral studies.
Deputy RPS, Radiation protection supervisor – assisting with radioactive waste collections on site.

Scientific Support Administrator, Buzzy Bee Research Agency
From: 2010-05-11, Until: 2012-08-01
I had day to day jobs and also do ad hoc work. My main areas were sample booking in of quarantine pests and disease, report writing, dealing with internal/external customers, invoicing, creating new

business, lab work. I have worked in the Seeds laboratory checking samples for import and export, products for plant material or insects. I had also worked in media prep. Virology laboratory filing, faxing, emails, telephone enquiries

Declaration
Signed: 10.09.2015