Rutherford Update

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1. Executive Summary

This report for Professor David Coggon summarises activities at the University of Manchester following the presentation of Professor Coggon's final report "Health Risks from Contamination of the Rutherford Buildings, University of Manchester" (April 2010).

Professor Coggon made two recommendations in his final report that were accepted fully by the University. The first recommendation involved further analysis of material recovered from the sub-floor space of the Rutherford Building during the major 2004/05 remediation. Subsequent analyses do not offer any meaningful information. The assistance of the Health and Safety Laboratory (who provided the underpinning advice with regard to mercury for the Rutherford Review) has been sought and they have advised that there is no more useful chemistry that can be done to provide further information.

Professor Coggon's second recommendation was that mercury monitoring should continue to a specified frequency in the areas covered by the review. This has been undertaken and now forms part of the long term maintenance programme for the buildings concerned. Results of monitoring are presented on the University's web pages, along with a series of threshold values that define the University's response to above background levels.

The ongoing remediation of rooms 2.62/3 in the Rutherford Building is described. During the course of this work it transpired that two radioactive sources (a lead block containing a radium source and a "patch disc" that appears to be part of some old apparatus) had been removed from the building during the major remediation in 2004/05. These sources are described and ongoing characterisation work of one of these sources is discussed.

During ongoing monitoring for mercury, elevated levels (14 ug/m^3 – well below the assumed Workplace Exposure Limit of 20ug/ m^3) have been picked up in a room that has reduced air movements as a consequence of having been unoccupied for some time. Earlier measurements had not indicated levels of significant concern in this room. In line with the threshold levels already mentioned investigation work is ongoing. Mercury has been detected in the sub-floor space and, at the time of writing, it is expected that remediation work for this room may be more significant than originally envisaged.

The issues surrounding the Rutherford Review are very much "live" and change on a daily basis. This report is an attempt to best summarise the current position as of 29th September 2010. Ongoing characterisation work (for the lead block source) and investigation/remediation inevitably mean that there will be more information to come in time.

2. The University's response to Professor Coggon's recommendations

Professor David Coggon made two specific recommendations in his final report. The recommendations were accepted fully by the University and actions taken since receiving the report are detailed below.

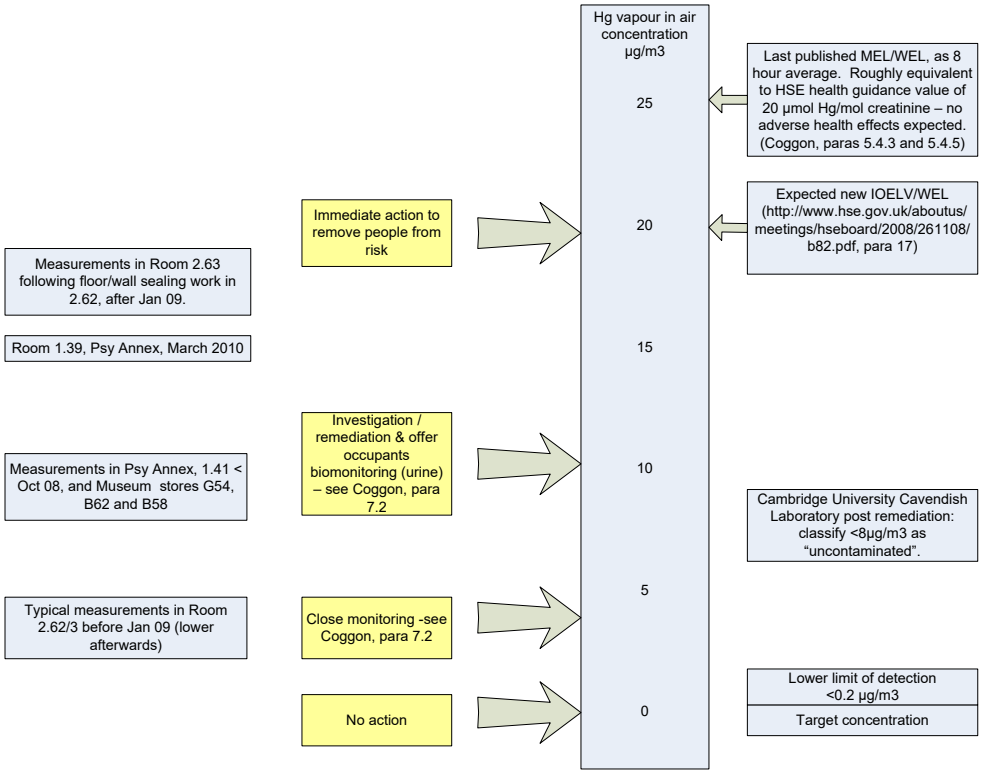
2.1 Recommendation one

"Further work has since been initiated to address the residual contamination by mercury. After completion of this work, repeat environmental monitoring for mercury should be carried out in the rooms concerned and in those adjacent to them (since changes in under-floor airflow associated with the remedial work might alter levels of mercury in adjacent rooms). In addition, it would be prudent to carry out further monitoring of mercury levels in air in those rooms, which in the most recent HSL survey, had airborne concentrations of mercury in excess of 4 μg/m3. The purpose would be to check that the measured values were not unrepresentatively low, with higher levels at other times of year. Thus, this additional monitoring (both post-remediation and in those rooms with measured concentrations above 4 μg/m3) should be carried out on four occasions at three-monthly intervals over the course of a year."

Further mercury monitoring has been commissioned from HSL, been undertaken and will continue as part of the long term maintenance programme for the building. This has been done with a greater coverage than that suggested by Professor Coggon. To support the ongoing monitoring programme, the University's Health and Safety Committee has agreed a series of threshold levels. This is presented below in Figure 1 and is also on the University's web pages.

Results of the monitoring are posted on the University's Rutherford Review web pages (www.manchester.ac.uk/rutherfordreview). Results of HSL's most recent mercury monitoring are presented as Appendix one. This correspondence includes a full set of monitoring data.

Figure 1: Proposed action levels for low-level mercury contamination



2.1.1 Additional radon monitoring

Although not a recommendation by Professor Coggon, we have considered it prudent to continue radon monitoring at a low frequency across the area covered by the Rutherford Review. The recent history of the building and especially intrusive press activity has understandably caused concern amongst staff in the Rutherford Building and we feel it is better to have solid data to confirm the status of the building rather than try to persuade in the absence of hard information. Monitoring will continue on a low frequency, random basis or in response to concerns raised by members of staff. Radon monitors must remain in place for a period of three months and are then sent away to the Health Protection Agency for analysis. A set of results was received on 21st September and correspondence/results are presented in Appendix two.

2 Recommendation two

"It would, however, be prudent to explore further the chemical form and origin of the mercury contamination of the waste removed from the Rutherford Building during the refurbishment carried out during 2004-06. In particular, it would help to establish whether the non-metallic mercury that is present in the waste is likely to have resulted from a chemical reaction of spilt mercury that collected under the floorboards, or to have been a contaminant of cotton insulation material when it was originally installed."

Lead by Dr Melanie Taylor, Head of Safety Services, with significant support from her colleague Catherine Davidge, attempts were made to identify external laboratories who could offer a suitable method of analysis and who were prepared to undertake the work. Commercial laboratories were very wary of potential cross-contamination issues, either from mercury if they were analysing radioactive components or a reluctance to deal with a risk (however small) of radioactive contamination if they were engaged in analysing mercury species.

With Professor Coggon's agreement, the work was undertaken by our own chemists in the School of Earth & Atmospheric Sciences, working closely with Dr Taylor and Miss Davidge. X ray Fluorescence (XRF) and X ray Diffraction (XRD) were investigated as analytical techniques. A full report, including methodology and results, is provided as Appendix three. In summary, the results are inconclusive and do not appear to confirm the observations made in the original analysis referenced in Professor Coggon's report.

Given the inconclusive nature of our investigations, further advice was sought from HSL and the Heads of Compliance & Risk and Safety Services met with representatives from HSL in July. The following agreed set of minutes from that meeting describes the current position. I would draw attention, in particular, to paragraphs 5, 8 and 9, highlighted in bold. Of the original analysis that catalysed this recommendation and subsequent actions, HSL comment, "HSL *would have expected full dissolution of mercury species in test samples in the selected acids and is surprised that an acid-insoluble residue was reported."* Notwithstanding the difficulties and inconclusive nature of our analyses, the University believes this statement may assist in bringing this particular avenue of enquiry to a close.

The minutes are presented on the University's Rutherford Review web pages as an "end-point". Given the advice received from HSL, the University does not intend to pursue any further analysis of the waste material. The waste material remains in storage and will continue to do so until outstanding inquests are completed and/or the Coroner's position becomes clearer. It is the University's intention to dispose of the waste as soon as feasibly possible.

Notes of Meeting: University of Manchester with HSL, 16 July 2010.

Present: *David Barker (UoM), Owen Butler (HSL), John Cocker (HSL), Andrew Easterbrook (HSL), Melanie Taylor (UoM).*

Purpose of meeting: *To consider the recommendations in section 7.1 of the Coggon Report (ref) with respect to mercury contamination in the waste removed from under the floor of rooms 2.63/3 in the Rutherford Building, during the 2004 refurbishment, and related issues.*

Main conclusions

2004 refurbishment waste

1. *There are many uncertainties associated with the quantitative measurement of mercury and mercury compounds in samples of the waste. These arise from*

    - *the known difficulty of performing reproducible solvent extractions of mercury and mercury compounds;*
    - *the relative ease with which Hg covalent bonds are broken during processing of samples;*
    - *carry-over of mercury in one sample into subsequent ones which confounds calculations of mercury concentrations;*
    - *the tendency of elemental mercury to "stick" to surfaces and contaminate sample and measurement equipment (even Teflon-smooth surfaces) and subsequent samples;*
    - *the heterogeneity of the waste stream (previous samples have found a range of 38.0 to 312,000 mg/Kg), and difficulty in obtaining representative samples.*

2. *Identification of each mercury compound present is similarly complex and subject to large sampling errors. The co-existence of radiological contamination restricts the technologies available (and the willingness of laboratories to risk contamination of expensive equipment).*

3. *The University has carried out some tentative X ray diffraction analysis, which has identified mostly gypsum, calcite, bassarite, anhydrite (i.e. substances normally present in plaster), with mercurous chloride found in one sample out of nine. This could have come from spillage of a calomel electrode, rather than reaction of elemental mercury. This technique has practical limitations in that it detects only crystalline forms and has a lower detection limit of 5% w/w Hg.*

4. *There is no evidence (from other enquiries) to suggest that mercury vapour measuring equipment, such as that used by Casella Winton in 2004, HSL and the University subsequently, does not respond to mercury in compounds such as mercuric chloride, although this is not conclusive.*

5. ***HSL would have expected full dissolution of mercury species in test samples in the selected acids and is surprised that an acid-insoluble residue was reported.***

6. *Manchester Museum staff (Conversation with AE) have commented that they are aware of historical preservative treatment of specimens with mercury-containing chemicals (e.g. $HgCl_2$), but not of cotton waste when used as building insulation.*

7. *The heterogeneity of the samples taken by IRAS and analysed by STL/SAL supports the hypothesis that preservative treatment is the less likely source of any non-metallic mercury.*

8. ***For these reasons, it is unlikely that further analysis of the waste will shed more light on the origin of mercury apparently identified in analyses carried out by STL/SAL for IRAS, or enable us to determine whether it comes from a preservative treatment of cotton insulation wadding or from chemical reactions between mercury of other spilled chemicals or other source, during the past 100-odd years.***

9. ***Assumptions made by HSL in their report to Professor Coggon erred on the side of caution and noted the difficulties and uncertainties of predicting historic exposures. It is unlikely that, given the issues noted above, further analysis of the waste would reduce these uncertainties.***

10. *HSL provided references to Waste Management Technology, which appears to provide a disposal route for waste streams contaminated with mercury and radiation, and to IKIMP, a knowledge exchange forum for storage and disposal of redundant mercury.*

2010 remediation

11. *In terms of occupational risk, it is reasonable to rely on measurement of mercury vapour, even if other mercury species are present.*

12. *It is possible that mercury / mercury compounds could have been present in plasterboard when installed in 2004 (as the board might have incorporated by-products from desulphurisation of flue gases in the manufacturing process,) although the existence of some samples from the same room (2.63) with very low concentrations suggests otherwise. What proportion of recycled material has been used and when it became available from desulphurisation of flue gas in the UK is unknown.*

13. *A possible explanation for higher mass concentrations in core samples taken higher up the party wall between 2.62/3 is the convection of contaminated air (due to heating by pipes and radiators) and subsequent surface deposition of mercury contamination.*

14. *Pumped samples collected by HSL (in the quarterly sampling programme from June 2009) will collect all airborne mercury species. Results from these are in reasonable agreement with passive samples and from mercury vapour indicators (sniffers), suggesting elemental mercury is the major species present.*

Manchester Museum herbarium samples

15. *Some organic plant material is known to have been treated with mercuric chloride decades ago. Monitoring with a ShawCity mercury vapour indicator by UoM staff has shown a very wide range of concentrations in specimen boxes, but there are many significant variables (source material collected and transported from all over the world; variation in preservation techniques and "recipes" used; various materials used between*

specimens and for boxes; no record of when boxes last opened and vented, etc). Hand-held Hg monitors based upon UV absorption can potentially be influenced by high concentrations of organic vapours.

16. *The key risk now was of exposure to elemental mercury vapour, and it was not practicable or necessary to differentiate between airborne mercury compounds. There was no known workplace data or studies of such exposures.*

17. *There was mutual interest in looking at such a study. A number of papers had looked at related topics, eg Roane and Snelling (2007) Bacterial Removal of Mercury from Museum Materials: A New Remediation Technology? Other papers described the development of pastes or dots that change colour in the presence of mercury vapour.*

Drafted: Melanie Taylor (UoM),
Finalised: HSL team, 23rd September 2010

For completeness, a series of documents are provided as appendices, detailing the analyses undertaken by IRAS and STL in 2006 and further discussions concerning the nature of mercury in waste and its behaviour, as follows:

Appendix four:	STL Test Report: IRAS/D4351 (21st March 2006)
Appendix five:	STL Test Report: IRAS/D4354 (22nd March 2006)
Appendix six:	STL Test Report: LL/358644/2006 (18th August 2006)
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4. Remediation of rooms 2.62/63 in the Rutherford Building

The HSL report "Mercury Contamination, Rutherford/Coupland 1 Building, University of Manchester" (OH/2009/09) details sub- (assumed)WEL levels of mercury in Rooms 2.62/63 of the Rutherford Building. The University decided that the best way to reduce exposure in these rooms was to remove the floor/ceiling between the first and second floors completely. This has been a prolonged and disruptive process. The rooms are currently due for reoccupation in early October 2010.

Neil Todd and John Churcher were invited to participate in discussions around the Contractors' method of work and have been kept updated with weekly reports from the Project Manager. Neil Todd and Melanie Taylor visited site early on in the project in order to observe the nature of the work being undertaken.

As expected, mercury was found in the sub-floor space. The mercury was scattered widely across the area concerned, rather than being concentrated in one or a number of locations. It was possible to recover some elemental mercury and this has been retained in the event that Dr Todd finds a method of analysis that will satisfy his radio-archaeological interests.

As part of the overall risk assessment and management of the working area, surveys for radiation were undertaken in the rooms and loft areas both directly above and separate from 2.62/63 (for the sake of completeness). Four minor spots of radioactive contamination were identified during the work. Three of these were in the attic space and one was on the surface of a joist, below the floor, in 2.62 (that would normally be covered by floorboard). These have been removed and are detailed in the contractor's survey reports.

At this stage, a series of reports is available, having been produced by the contractor, detailing their findings and they are appended here as follows:

Appendix nine:	Investigation of possible mercury contamination within roof voids at the University of Manchester (ALcontrol Report No. 11826)
Appendix ten:	Investigation of possible mercury contamination within 3 locations at the University of Manchester (ALcontrol Report No. 11826C amendment 1)
Appendix eleven:	Investigation of possible mercury contamination within 3 locations at the University of Manchester (ALcontrol Report No. 11826.2 amendment)
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The Project Manager's weekly reports are filed and available if required.

5. Sources recovered from the Rutherford Building during the 2004/05 refurbishment

During the site visit to the 2.62/63 remediation described above, Neil Todd and Melanie Taylor had a conversation with a Serco contractor who had previously been involved in the remediation of the building during 2004/05 (while working for IRAS). The contractor described removing a radioactive source from the loft, this having then been given to the University's Radiation Protection Service (RPS).

It was soon established that RPS held a lead block in their safe that correlated with the description given. There was no record of receiving the block in RPS and, indeed, during a cataloguing of the safe in February 2010 it was listed as "unknown lead block".

The only reference to the block that we could find at the time was provided by John Churcher, who found the following having scanned the estates project files:

From Andrew Frith (IRAS) to Martin Renshaw (UofM Estates Project Manager), 6th May 2005:

2. Lecture Theatre

A radium source in a lead shield has been found and has been transferred to RPS store for more secure storage. We are finding contamination in the Lecture Theatre, and have taken measures to increase the radiological controls.

It is obviously important that we properly understand the nature of the block and its contents. Coincidentally, the Environment Agency visited RPS on 20th July and the presence of the block was brought to their attention. Its activity has required a resubmission of our licence and the EA have subsequently written to the University requiring us to establish the activity and nature of the radium source embedded within, and identify a route for disposal.

Neil Todd has a particular interest in the block, which may be of historical interest. Dr Todd has a hypothesis as to its origin that may be confirmed by ongoing characterisation of the block. Dr Todd has been given open access (with appropriate risk assessment and control) to the block for the purposes of taking any measurements and has been actively involved with us in planning the way forward with regard to characterisation.

The strictures of the EA licence mean that the block cannot be removed from site. Andrew Frith from Serco has proposed a method for characterising the block and that work is currently underway. The level of activity of the block's contents will determine the ultimate route and cost of disposal (which is expected to be significant). There is a volume of filed correspondence, particularly with Neil Todd, around the nature of the block, its contents and provenance.

When Andrew Frith (from Serco) visited RPS to view the block in order to begin developing a method for its characterisation he stated that he did not believe that the block had come from the attic as originally thought. Further dialogue followed and, through discussions with colleagues who had been on-site in 2005 and references from IRAS site diary entries, Andrew Frith confirmed that two sources had been removed from the Rutherford Building during the remediation works in 2005.

The following correspondence from Andrew Frith to Stephen Bidey on 25th August 2010 best presents the origin of the two sources:

Further to our meeting earlier today in which we discussed our proposed method of assay of the "lead block source", which I will formalise in a costed proposal from Serco, I write as promised to clarify the origins of this source. Since the clearance work was not undertaken by Serco, I thought this had better come from IRAS.

1. The "lead block source" was discovered by IRAS on 3rd May 2005 underneath the staging of the Cohen Lecture Theatre (see attached note made by our lead Health Physicist at the time, and the site diary extract). This came to light yesterday when I was discussing the characterisation of this source with the former IRAS Health Physicist, Rob Price. When I mentioned that the source was ~ 17 kg he confirmed without hesitation that this was not the source found in the attic. After searching through our records, I have identified the attached documents.

2. This raises the question over the whereabouts of the "attic source", which was found on 04/08/2005 during the monitoring of the loft above the Cohen Lecture Theatre right at the end of the project. Following on from our meeting, I have been able to elaborate on the description of a "box" which was recorded in our site diary (attached). The artefact can be described as a small cardboard box (similar to the larger type matchbox). We briefly examined this by opening the box, which revealed a wrapping of greaseproof paper. The contents of this wrapping were not examined. Although the contact dose rate we recorded in the site diary of 80 μSv/h may seem high, I am sure you appreciate that even relatively low activity exempt sources are able to generate such dose rates, close up without shielding.

I have also asked our Health Physicists what became of the attic source, which according to the site diary, was transferred to RSU (formerly RPS). From discussions later today, we believe that both Rob Price and Gary Clarke brought this box to the RSU and transferred the source to Kevin Robinson who put it in a source safe within your unit. This is based on recollection only, as we did not generate any paperwork for this intra-University transfer. Of course, it may be that this has been disposed of in the intervening 5 years, given that its activity is apparently of low significance (assuming Ra-226). Now that we're able to provide a better description of the source, I would be most interested to learn whether this source can be located in your safe or shown to have been disposed. The other possibility is that it was transferred to the ISO Container, but as far was we are able to ascertain, this was not the case.

In both cases, the prompt removal of a source from Coupland 1 and its placement in secure storage was consistent with our priority objective of allowing the building refurbishment to start as soon as practicable. That there was no attempt to characterise the sources at this stage was on the anticipation that this would be done prior to waste disposal in a later phase of the work.

Should you or Kevin wish to discuss this further, I'd be pleased to hear from you. I will leave distribution of this email to the University.

Enc. Site Diary 04/08/2005 (box source in attic)
Lecture Theatre contamination summary (for staging
Site Diary 03/05/2005 (lead block source).

Contained within the RPS safe is an item described in February 2010's cataloguing as a "patch disc". Andrew Frith has now confirmed that this is indeed the source that was removed from the attic. The item is approximately 10cm square, is thought to be part of a piece of apparatus and estimated to be of 1960s origin. The "patch disc" is illustrated in Photo 1 below:

Photo 1: "Patch disc" source confirmed as having been removed from the attic above the Cohen Lecture Theatre, 4th August 2005

Appendix fourteen details what is known of the lead block source at this stage (NB. prior to knowing that it had come from the undercroft of the lecture theatre rather than the attic). Analysis is ongoing and Neil Todd has produced additional analyses that are available if required. Work is ongoing to characterise the lead block's contents and a full report will be added to the University's web pages once complete.

5.1 Amendments to the University's Code of Practice

There was no record of the receipt of either source by the University's RPS. The only documentation recording their transfer is relatively minor entries in the IRAS site diary. While there is some recollection of a lead block having been handed over in 2005 there is no recollection of the "patch disc" source having been given to RPS. There was no process in place at the time for the formal recording of receipt of such items.

In order to ensure that there is a clear process for receiving such material, in the event of the University being faced with similar circumstances, the Procedure for Ionising Radiation Safety has been modified to include sections on the receipt of both characterised and uncharacterised sources, as follows:

Procedure for dealing with radioactive materials of known identity and activity

61. The university Radiation Safety Unit will arrange for the transfer of life-expired sealed radioactive sources to approved contractors, in accordance with the site Permit issued by the Environment Agency under EPR2010. In accepting any such item, the RSU must be provided with all relevant documentation relating to the source. On receipt, the item will be placed in storage within the RSU (a lockable safe is provided for this purpose), with appropriate shielding, pending transfer to an approved contractor or disposal in accordance with the university's EPR2010 Permit. If disposal under a relevant EPR2010 exemption order is permissible, this may also be undertaken. All information relevant to the item, its date of receipt, storage and disposal will be entered into a written Inventory logbook.

Procedure for dealing with radioactive materials of unknown provenance

62. On occasions, the university Radiation Safety Unit may be required to deal with radioactive materials or artefacts of unknown origin and/or activity. In accepting such items, the RSU will endeavour to ascertain as much information as possible relating to each item, including written and verbal history, together with details of the owner and previous location on campus. On acceptance of such an item, the RSU will use appropriate monitoring apparatus to determine the nature of any radiological hazard, together with the activity and associated radiation dose rate. All such items will be regarded as inherently hazardous until proven otherwise. Once a characterisation of the item has been completed, it will be placed in storage within the RSU (a lockable safe is provided for this purpose), with appropriate shielding, pending transfer to an approved contractor or disposal in accordance with the university's Permit issued under the EPR2010. All information relevant to the item, its date of receipt, characterisation, storage and disposal will be entered into a written Inventory logbook. In certain cases, prior to accepting such materials for storage within the RSU, it may be necessary to notify the Environment Agency of the nature and activity, in order to ensure compliance with the terms of the university's EPR2010 Permit

The modified procedure has recently been through the University's Radiation Safety Advisory Group, been reported formally through to the University's Health & Safety Committee and will be communicated actively to RPOs across the University.

6. Communication

The university's Health & Safety Committee is the vehicle through which formal updates to staff and trades unions have been presented.

Descriptions of the University's response to Professor Coggon's recommendations have been placed on the University's webpages at www.manchester.ac.uk/rutherfordreview and we will continue to use that as the main source of open public information. Threshold levels for mercury contamination are also presented there as well as the results of ongoing mercury monitoring. We have recently received an agreed set of minutes our meeting with HSL with regard to analysis of the sub-floor material. There is a holding statement on the Rutherford Review web pages regarding these minutes and they will be put up as soon as possible.

In response to concern expressed by current occupants of the Rutherford Building during the remediation works a message was sent out to staff describing the location of the minor radioactive sources in the loft.

I have met informally with Dr Rachel Calam in order to update her on the response to Professor Coggon's recommendations and the discovery of the lead block source (at the time we were not aware of the "patch disc" source). Following this meeting I had a similar discussion with Oliver Clark (son of John Clark). The following update was provided to John Churcher and some other interested parties on 17th September 2010:

It is important that I update you with regard to recent developments concerning the "lead block" source and other matters.

As discussed with Neil Todd, when we met just before he went to Australia, we have brought in Andrew Frith from Serco who has proposed a methodology for characterising the block. This is underway and we will obviously share any results when we have a final report. Neil is more than welcome to observe when

he's back in the country. There will be a full report on completion of the work. While we have a commitment to the Environment Agency to characterise the block and identify a route to disposal, DWF (our insurers' lawyers) have written to the EA identifying the block as potential evidence in the forthcoming inquests and that it should therefore be retained at this stage, pending clarification from the Coroner. This is satisfactory from the EA's perspective.

Upon examining the lead block in RPS, and after holding subsequent discussions, Andrew Frith was clear that this block was not removed from the attic, but in fact came from the undercroft of the Cohen lecture theatre (IRAS' site diary records this as 3rd May 2005). Andrew further described a separate (ie. second) source that was removed from the attic. Although not examined closely at the time of removal this was described as being wrapped in greaseproofed paper and being in something akin to a large matchbox (with a surface activity of 80 microsieverts per hr). Andrew was able to provide site diary extracts (4th Aug 2005) noting the discovery of that source and its subsequent handover to RPS. RPS had no record of receipt for either item. Further discussions between members of Andrew Frith's team and RPS confirm that an item described as a "patch disc", catalogued in the RPS safe, is in fact the source removed from the attic. There is no recollection within RPS of receiving this patch disc. I am including a photograph of the item here. It does not match the initial description but has been confirmed by Andrew Frith as the item removed from the loft.

For the sake of completeness I am appending below this email correspondence from Andrew Frith that confirms the origin of the two sources. Attached to this email are the documents to which Andrew makes reference in his correspondence.

I am assured by Steve Bidey that the activity level of the "patch disc" source is not significant and that it is not unusual for an unshielded exempt source to have this kind of surface activity. Steve thinks that the packaging suggests that this may be of mid-1960s origin but does not know what the object was used for. We are presuming it is from a piece of apparatus. It's obviously not "Rutherford-era" material, but Neil may have some knowledge here perhaps? Kevin Robinson cannot remember receiving it, which is perhaps an indication of its relative insignificance from a radiological hazard perspective and it has been in the RPS safe since receipt. Clearly there was no process in place for recording the receipt of such material. As a result, The University's Procedure for Ionising Radiation Safety has been updated to include a procedure for the receipt of both characterised and uncharacterised sources, in order to ensure that we are not faced with a similar situation in the future. This is timely, given the introduction of the Environmental Permitting regulations 2010 (EPR2010) and the amendments to the procedure take EPR2010 into account. The revised procedure (which also carries a number of other changes to reflect EPR2010 and some recent changes re. NW Medical Physics) goes to the University's Radiation Safety Advisory Group today (Fri 17th) for approval.

We have to try to strike a balance between presenting useful information and swamping the audience with the large amounts of documentation that surround this issue. Documentation has previously been catalogued and provided to the Coroner's office. Ultimately documentation will be housed on dedicated shelf-space identified in the University Archive in the John Rylands University Library.

6. Appendices

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