

STANDARD OPERATING PROCEDURE

Procedure:	Performing a wipe test for radioactive contamination
School/Department:	School of Molecular Bioscience
SOP prepared by:	Nick Coleman
Version:	SMB060.1

Section 1 - Personal Protective Equipment

1. Lab coat or lab gown
2. Nitrile or Latex gloves
3. Proper enclosed footwear
4. Radiation dosimeter/badge (if appropriate)

Section 2 – Potential Hazards + Safety precautions

1. Radioactive isotopes emit alpha particles, beta particles or gamma rays, which can cause burns and radiation sickness (acute exposure) or reproductive damage and cancer (chronic exposure)
2. The chemicals labelled with the isotopes may also pose their own toxicity, flammability or corrosive risks separate from the radiation risk
3. No food or drink is to be consumed in radiation work area. Isotopes could be very harmful if swallowed - seek medical advice if this occurs.
4. All workers using radioactive isotopes must have been trained in either the University's Radiation Safety Training course, or an equivalent course.
5. Work at >4 MBq activity (^3H , ^{14}C , ^{35}S , ^{32}P , ^{33}P ,) or > 400 kBq activity (^{125}I) needs to be done by a licenced radiation user ("licence to use", NSW EPA). Exempted students (not staff) may work under supervision of another licence holder.
6. Workers with pre-existing medical conditions (e.g. allergy, immunocompromised state, chemical sensitivity) and workers who are pregnant or expecting pregnancy must consult with their supervisor AND medical specialist AND the university's WHS services before performing this procedure. If there are any serious concerns expressed by any of these individuals, this task must not be performed.

Section 3 – Procedure

1. A routine wipe test should be done bi-monthly in any medium or high-level radioactive work area, focusing on the benchtop locations where most work is done. If multiple work locations are used, multiple tests should be performed.
2. A wipe test should also be done in the event of a spill, where the isotope spilled cannot be easily detected by a Geiger counter- in practice, this means any spills of ^{33}P , ^{14}C or ^3H . (Note: first clean up the spill, then perform the wipe test)
3. Before commencing the wipe test, draw up a simple map of the area(s) to be sampled in the wipe test log book.
4. Before commencing the wipe test, put on PPE, especially lab coat and gloves.
5. Moisten a disposable cotton swab (cotton bud) with water, and swab this thoroughly over a 10 cm x 10 cm region of the benchtop (or other item to be surveyed). Start at the outside of the sample area and work your way in.
6. Cut off the swab head with scissors, and place into a 20 ml scintillation counter tube. Add 5 ml of liquid scintillant fluid.
7. Repeat steps 4 and 5 if multiple locations are checked. Label the counter tubes and make a note of these labels so you know which location is which.
8. As a control for background radiation, cut off the head of an unused swab into another counter tube, and add scintillant as above.
9. Put all the tubes into the liquid scintillation counter (Perkin Elmer Tri-Carb 2810 TR) and count the radioactivity in each. (check instrument manual for details)
10. Note the count in the negative control due to background radiation (this will not be zero), and identify any tubes from sampled locations that give counts significantly greater (>10%) than background. In these cases, convert the counts into Bq/cm² of sampling area, then compare the values against the acceptable 'Surface contamination limits' from the NHMRC document RHS38 (below).

Surface contamination limits

^3H , ^{14}C , ^{35}S : 1000 Bq/ cm²

^{32}P , ^{33}P , ^{125}I : 100 Bq/cm²

11. Any locations yielding counts higher than the acceptable surface contamination limits need to be cleaned thoroughly. Use paper towel soaked in Decon reagent, allow the location to dry, then repeat wipe testing (steps above). The contaminated paper towel must be disposed of as hazardous radioactive waste into the appropriate location.
12. This whole procedure from wipe testing to cleaning needs to be repeated enough times to bring the counts down to below the limits above.
13. Record the results of the whole sampling and cleaning procedure (including the raw counts and the calculations) in the wipe test log book. Make sure you link the contamination levels to the specific locations using the map.
14. Wipe test results log books must not be discarded. These records must be kept in the school for the foreseeable future.

Section 6 – Relevant Material safety data sheets

Safe handling guides and MSDS for ^{32}P , ^{33}P , ^{14}C , ^3H , ^{125}I (as appropriate)

Section 7 - References

1. SMB Risk assessment and SOP for working with P32/P33
2. SMB Risk assessment and SOP for working with 14C/3H
3. <http://www.perkinelmer.com/catalog/product/id/b281000>
4. Users manual for TriCarb scintillation counter


SOP Consultation, Training and Approval

Print names and enter signatures and dates to certify that the persons named in this section have been consulted/trained in relation to the development and implementation of this Standard Operating Procedure. WHS Representative (WHS Committee) certifies that consultation has taken place.

Position	Name	Signature	Date
Supervisor			
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Name Authorising (Printed): DIANNE FISHER.....

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