MONTHLY CONTAMINATION MONITORING RECORD

UNIVERSITY of GUELPH

Permit Holder_____Room number (s)_____

Contamination monitoring must be conducted weekly where radioisotopes have been used during the previous seven calendar days.

1. Wipe Test by using Liquid Scintillation Counter (Indirect monitoring)

Counter Type	Make	Model	Isotope	Detector Efficiency (%) Please consult service manual or use 50% as a conservative approach	Collection Efficiency (%) Wipe Efficiency use 10% or 0.1 for wet wipes and 1% or 0.01 for dry wipes	Net count rate equal to contamination limit (cpm) Area is 100cm² for wipe tests	Bq/cm² Contamination limit is 3 Bq/cm²

2. Use of Survey Meter (Direct Monitoring)

Detector #	Make	Model	Isotope Example P-32	Detector Efficiency (%) Please consult user manual or sticker on detector	Net count rate equal to contamination limit (cpm) Area is 19.6cm² for a pancake probe	Bq/cm² Contamination limit is 3 Bq/cm²

Formula:

$\text{Bq/cm}^2 = \frac{(Cpm - Bkg)}{E * A * T * D}$, Please see Radiation safety manual for detailed instructions and sample calculation.

Monitoring is required and must be documented below. Record results in the table below and keep a copy in the binder

Date (Year/ Month)					Method of Monitoring		☐ Wipe-Test		☐ Survey Meter					
Contamination Limit is 3 Bq/cm²					Location of # areas to be monitored as per room diagram									
Week	**Name of User**	**Isotope Used**	**Counted Unit**	**Background**	**1 (Bq/cm²)**	**2 (Bq/cm²)**	**3 (Bq/cm²)**	**4 (Bq/cm²)**	**5 (Bq/cm²)**	**6 (Bq/cm²)**	**7 (Bq/cm²)**	**8 (Bq/cm²)**	**9 (Bq/cm²)**	**10 (Bq/cm²)**
1st Week														
2nd Week														
3rd Week														
4th Week														
5th Week														

Note: If radioactive work is not conducted in any given week, contamination monitoring is not required. However, please indicate all non-radioactive work weeks with ***NR.***
DO NOT LEAVE ANY WEEK BLANK

Monitoring is required and must be documented below. Record results in the table below and keep a copy in the binder

Date (Year/ Month)					Method of Monitoring		☐ **Wipe-Test**		☐ **Survey Meter**					
Contamination Limit is 3 Bq/cm^2					**Location of # areas to be monitored as per room diagram**									
Week	**Name of User**	**Isotope Used**	**Counted Unit**	**Background**	**11 (Bq/cm^2)**	**12 (Bq/cm^2)**	**13 (Bq/cm^2)**	**14 (Bq/cm^2)**	**15 (Bq/cm^2)**	**16 (Bq/cm^2)**	**17 (Bq/cm^2)**	**18 (Bq/cm^2)**	**19 (Bq/cm^2)**	**20 (Bq/cm^2)**
1st Week														
2nd Week														
3rd Week														
4th Week														
5th Week														

Note: If radioactive work is not conducted in any given week, contamination monitoring is not required. However, please indicate all non-radioactive work weeks with ***NR.***
DO NOT LEAVE ANY WEEK BLANK

The formula used to calculate "Bq/cm²" for
Indirect monitoring (using wipe tests and an LSC) is:

$$\frac{\mathbf{Bq}}{\mathbf{cm^2}} = \frac{\mathbf{(Cpm - Bkg)}}{\mathbf{E * A * T * D}}$$

Cpm	=	Sample count rate in counts per minute for the wipe.
Bkg	=	Background count rate in cpm or cps
E	=	Detector efficiency (Scintillation counter efficiency) Please consult service manual or used 50% as a conservative approach i.e. E= 0.50
A	=	Area wiped i.e. 100cm^2
T	=	60 sec/min if count rate in cpm
T	=	1 if count rate in cps
D	=	0.1 ; use 10% or 0.1 for wet wipes and 1% or 0.01 for dry wipes

The formula used to calculate "Bq/cm²" for
Direct monitoring (using Survey Meters) is:

$$\frac{\mathbf{Bq}}{\mathbf{cm^2}} = \frac{\mathbf{(Cpm - Bkg)}}{\mathbf{E * A * T}}$$

Cpm	=	Sample count rate in counts per minute for the wipe.
Bkg	=	Background count rate in cpm or cps
E	=	Detector efficiency Please consult User manual or calibration sticker
A	=	Area wiped in cm^2. For pancake probe its 19.6 cm^2
T	=	60 sec/min if count rate in cpm
T	=	1 if count rate in cps

Sample Problem: Your lab is designated to use Tritium (^{3}H) and you have just taken a swipe of the Fume hood (in 100 cm^2) after your experiment. You have taken the wipe tests according to standard procedures and use your liquid scintillation counter (LSC) for count rate of your sample. Your LSC printout shows 900 cpm, what is the contamination level in Bq/cm^2?

Solution: Assuming that the minimum detector efficiency is 50% (for LSC), the collection efficiency is 10% (for wet wipes) and background count rate is 40 cpm.

We have:

$$\text{Contamination Level (Bq/cm}^2\text{)} = \frac{\mathbf{900-40\ (cpm)}}{\mathbf{0.5 \times 100cm^2 \times 60\ \frac{sec}{min} \times 0.1}} = \mathbf{3\ \frac{Bq}{cm^2}}$$