

### Instrument Efficiency Calculator (Rev 2)

**PROJECT NAME**

WRAMC

ISOTOPE	SOURCE ID #:	SOURCE CREATION DATE:	Initial Source				DPM on Date	
			DPM	half life, yrs	Decay-to-Date	lamda, yr-1	decay, yrs	Efficiency Performed
Pu 239	48262	1/9/2004	36,300	7.54E+04	11/12/2004	9.193E-06	0.84	36300
			Source $\mu$ Ci	half life, yrs	Decay-to-Date	lamda, yr-1	decay, yrs	$\mu$ Ci on Date

Average background counts, cpm	Average Source plus background counts, cpm	DPM Based Calculated Efficiency, cpm/dpm	$\mu$ Ci Based Calculated Efficiency, cpm/dpm
0.1	14373.9	0.396	

Background Counts, cpm	Source plus Background Counts, cpm
0.6	14409
0.2	14367
0	14321
0	14247.33333
0	14280
0.2	14415.66667
0	14603.33333
0	14346.66667
0	14330
0	14418.66667
Average 0.1	14373.9

**For:**  
**Instrument/Probe** Ludlum 2929 w 43-10-1  
**Serial numbers** 152275 / PR155350

**By:**

Name	Date Performed
Al Craig	11/16/2009

Average

### Instrument Efficiency Calculator (Rev 2)

**PROJECT NAME**

WRAMC

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			DPM	half life, yrs	Decay-to-Date	lamda, yr-1	decay, yrs	Efficiency Performed
Tc99	971115-3	1/29/2004	21,500	7.54E+04	11/16/2009	9.193E-06	5.80	21499

  

Source $\mu$ Ci	half life, yrs	Decay-to-Date	lamda, yr-1	decay, yrs	$\mu$ Ci on Date

Average background counts, cpm	Average Source plus background counts, cpm	DPM Based Calculated Efficiency, cpm/dpm	$\mu$ Ci Based Calculated Efficiency, cpm/dpm
169.4	4361.3	0.195	

Background Counts, cpm	Source plus Background Counts, cpm
192	4318.333333
167	4363.333333
137	4348.666667
166	4342
164	4329.333333
184	4419.666667
162	4427
173	4366.666667
185	4344
164	4354.333333
Average	169.4      4361.3

**For:**  
**Instrument/Probe** Ludlum 2929 w 43-10-1  
**Serial numbers** 152275 / PR155350

**By:**

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Al Craig	11/16/2009

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Pu 239	48262	1/9/2004	36,300	7.54E+04	11/12/2004	9.193E-06	0.84	36300
			Source $\mu$ Ci	half life, yrs	Decay-to-Date	lamda, yr-1	decay, yrs	$\mu$ Ci on Date

Average background counts, cpm	Average Source plus background counts, cpm	DPM Based Calculated Efficiency, cpm/dpm	$\mu$ Ci Based Calculated Efficiency, cpm/dpm
0.8	7807.0	0.215	

Background Counts, cpm	Source plus Background Counts, cpm	
2	7761.5	
0	7888.5	
1.5	7806.5	
0.5	7794.5	
0	7793	
0	7870	
1	7815	
1	7722.5	
0.5	7791.5	
1	7826.5	
Average	0.8	7807.0

**For:**  
**Instrument/Probe** Ludlum 2360 w 43-68  
**Serial numbers** 184906 / PR116721

**By:**

Name	Date Performed
Al Craig	11/16/2009

### Instrument Efficiency Calculator (Rev 2)

**PROJECT NAME**

WRAMC

ISOTOPE	SOURCE ID #:	SOURCE CREATION DATE:	Initial Source				DPM on Date	
			DPM	half life, yrs	Decay-to-Date	lamda, yr-1	decay, yrs	Efficiency Performed
Tc99	971115-3	1/29/2004	21,500	7.54E+04	11/16/2009	9.193E-06	5.80	21499

  

Source $\mu$ Ci	half life, yrs	Decay-to-Date	lamda, yr-1	decay, yrs	$\mu$ Ci on Date

Average background counts, cpm	Average Source plus background counts, cpm	DPM Based Calculated Efficiency, cpm/dpm	$\mu$ Ci Based Calculated Efficiency, cpm/dpm	Source plus Background Counts, cpm	Background Counts, cpm	
48.4	4713.2	0.217		49	4679.5	
				54.2	4677	
				45.2	4713.5	
				48.8	4691	
				44.4	4741	
				46.8	4780	
				48	4766.5	
				48.8	4727.5	
				49.4	4704	
				49.6	4651.5	
				Average	48.4	4713.2

**For:**  
**Instrument/Probe** Ludlum 2360 w 43-68  
**Serial numbers** 184906 / PR116721

**By:**

Name	Date Performed
Al Craig	11/16/2009

### Instrument Efficiency Calculator (Rev 2)

**PROJECT NAME**

WRAMC

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Pu 239	48262	1/9/2004	36,300	7.54E+04	11/12/2004	9.193E-06	0.84	36300
			Source $\mu$ Ci	half life, yrs	Decay-to-Date	lamda, yr-1	decay, yrs	$\mu$ Ci on Date

Average background counts, cpm	Average Source plus background counts, cpm	DPM Based Calculated Efficiency, cpm/dpm	$\mu$ Ci Based Calculated Efficiency, cpm/dpm
0.5	8243.7	0.227	

Source plus Background Counts, cpm		
1.2	8182	
0.8	8218.5	
0.2	8234	
0.2	8305.5	
0	8108	
0.8	8180	
0.4	8337	
0.8	8221.5	
0	8238.5	
0.2	8412	
Average	0.5	8243.7

**For:**  
**Instrument/Probe** Ludlum 2360 w 43-68  
**Serial numbers** 225241 / PR160790

**By:**

Name	Date Performed
Al Craig	11/16/2009

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**PROJECT NAME**

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			DPM	half life, yrs	Decay-to-Date	lamda, yr-1	decay, yrs	Efficiency Performed
Tc99	971115-3	1/29/2004	21,500	7.54E+04	11/16/2009	9.193E-06	5.80	21499

  

Source $\mu$ Ci	half life, yrs	Decay-to-Date	lamda, yr-1	decay, yrs	$\mu$ Ci on Date

Average background counts, cpm	Average Source plus background counts, cpm	DPM Based Calculated Efficiency, cpm/dpm	$\mu$ Ci Based Calculated Efficiency, cpm/dpm	Source plus Background Counts, cpm	Background Counts, cpm
130.2	4602.4	0.208		140	4589.5
				129	4591
				118	4613
				123	4311
				136	4658
				124	4554
				141.5	4607.5
				134	4727.5
				124.5	4706.5
				131.5	4666
				Average	130.2
					4602.4

**For:**  
**Instrument/Probe** Ludlum 2360 w 43-68  
**Serial numbers** 225241 / PR160790

**By:**

Name	Date Performed
Al Craig	11/16/2009

### Instrument Efficiency Calculator (Rev 2)

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			Source $\mu$ Ci				$\mu$ Ci on Date	
			half life, yrs	Decay-to-Date	lamda, yr-1	decay, yrs	Efficiency Performed	

Average background counts, cpm	Average Source plus background counts, cpm	DPM Based Calculated Efficiency, cpm/dpm	$\mu$ Ci Based Calculated Efficiency, cpm/dpm
2.2	2549.3	0.070	

Source plus Background Counts, cpm		
2	2282.5	
2	2360	
2.4	2382	
1.8	2364	
1.4	2486.5	
3	2503.5	
2.4	2346	
2.4	2731	
2.8	2964	
2.2	3073.5	
Average	2.2	2549.3

**For:**  
**Instrument/Probe** Ludlum 2360 w 43-37  
**Serial numbers** 145474 / PR066273

**By:**

Name	Date Performed
Al Craig	11/16/2009

Average

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			DPM	half life, yrs	Decay-to-Date	lamda, yr-1	decay, yrs	Efficiency Performed
Tc99	971115-3	1/29/2004	21,500	7.54E+04	11/16/2009	9.193E-06	5.80	21499
			Source $\mu$ Ci	half life, yrs	Decay-to-Date	lamda, yr-1	decay, yrs	$\mu$ Ci on Date

Average background counts, cpm	Average Source plus background counts, cpm	DPM Based Calculated Efficiency, cpm/dpm	$\mu$ Ci Based Calculated Efficiency, cpm/dpm
63.3	3290.6	0.150	

Source plus Background Counts, cpm		
64.4	3053.5	
59.4	3065.5	
60.4	3409.5	
58.2	3484.5	
52.8	3547.5	
57.4	3250.5	
68	3282.5	
65	3308	
71	3244	
76.8	3260.5	
Average	63.3	3290.6

**For:**  
**Instrument/Probe** Ludlum 2360 w 43-37  
**Serial numbers** 145474 / PR066273

**By:**

Name	Date Performed
Al Craig	11/16/2009

Average