

SUMMARY OF RADON AND RDP MEASUREMENT DEVICES

SUMMARY OF DEVICE PROTOCOLS

METHOD	MEASURES	DESCRIPTION	COMPARATIVE ADVANTAGES	COMPARATIVE DISADVANTAGES	PRE - DEPLOYMENT/ DEPLOYMENT	SENSITIVITY/ PRECISION/ CALIBRATION	DUPLICATES/ BLANKS/ SPIKES	CHECKS
Activated Charcoal Adsorption Device	Rn (gamma: Bi & Pb 214);	Adsorb-desorb radon; 2-3 day open-faced;	Very low cost; Very simple to use; Passive (no power); Easy to mail	Can't read on-site; <i>Temperature, Rh, & airflow sensitive;</i> Not > 7 day measure.	No move-in/out; <i>Retrieval critical to lab ASAP!</i>	0.5 pCi/L; COV ≤ 10% @ 4pCi/L; every 12 months by analytical	10% or 50/month; 5% or 25/month; 3% or 6/month; minimum 3/year	1/day by analytical laboratory
Charcoal Liquid Scintillation	Rn (alpha & beta);	Adsorb-desorb radon; 2-3 day open-faced; 5-7 day diffusion barrier	Very low cost; Very simple to use; Passive (no power); Easy to mail	Can't read on-site; <i>Temperature, Rh, & airflow sensitive;</i> Not > 7 day measure.	No move-in/out; <i>Retrieval critical to lab ASAP!</i>	few 10ths of pCi/L; COV ≤ 10% @ 4pCi/L; every 12 months by analytical	10% or 50/month; 5% or 25/month; 3% or 6/month; minimum 3/year	1/day by analytical laboratory
Alpha Track Detectors	Rn (alpha)	Track damage to plastic or film from Rn; alpha particles are counted	Low cost; Very simple to use; Passive (no power); Easy to mail	Can't read on-site; <i>Temperature, Rh, & airflow sensitive;</i> Need > 100pCi/L days	No move-in/out; <i>Retrieval critical, to lab ASAP Few months stor.</i>	0.2 - 1.0 pCi/L/month/ depend on area counted/ analytical	10% or 50/month; 5% or 25/month; 3% or 6/month; minimum 3/year	1/day by analytical laboratory
Electret Ion Chambers	Rn (ions) (alpha, beta, & gamma)	Ions reduce voltage of electret (200 volts); ES = 2-7 days; EL = 1-12 months	On-site readings; Multi. electret use; Simple to use; Passive (no power)	Gamma & temperature sensitive; <i>Temperature, Rh, & airflow sensitive;</i>	No move-in/out; <i>Deploy ASAP after reading</i>	0.2 pCi/L @ 7 days; 0.3 pCi/L @ 3 months; COV ≤ 10% @ 4pCi/L; 12 mo. & gamma monitoring	10% or 50/month; 5% or 10/shipment; 3% or 6/month; minimum 3/year	5% set aside for volt drift
Grab Radon Sampling Scintillation Cell & PMT	Rn (alpha) (gamma)	RDPs filtered from scintillation cell & PMT, ion chamber, or solid state	On-site readings; Can also measure RDPs at same time	Not for decision to mitigate; Reader is an analytical laboratory	No move-in/out; Must be filtered	0.1 pCi/L; COV ≤ 10% @ 4pCi/L; every 12 months & 6 months cross-checks	10% or 50/month; 5% or 10/shipment; 3% or 6/month; minimum 3/year	use check source
Continuous Radon Monitors Scintillation Cell & PMT Pulsed Ion Chamber, Silicon Detector	Rn (alpha or ion from alpha)	RDPs filtered from scintillation cell & PMT, ion chamber, or solid state silicon detector	On-site readings; Real time results	Reader is an analytical laboratory	No move-in/out; Timer & pump checks	≤ 1.0 pCi/L; COV ≤ 10% @ 4pCi/L; every 12 months & 6 months cross-checks	6 months side/side; no blanks; SC every 1000 hours check background by flushing cell 6 months side/side;	use check source
Grab Sampling: RDP Scintillation cell & PMT	RDPs (alpha)	RDPs captured on filter and alpha particles counted	On-site readings; Can also measure Rn at same time	Not for decision to mitigate; Reader is an analytical laboratory	No move-in/out; Filter & pump checks; run continuous	0.0005 WL; COV ≤ 10% @ 0.02 WL; every 12 months & 6 months cross-checks	6 months side/side; no blanks; every 1000 hours	use check source
Continuous RDP Monitors	RDPs (alpha)	RDPs captured on filter and alpha	On-site readings; Real time results	Reader is an analytical laboratory;	No move-in/out; Filter & pump	≤ 0.01 WL; COV ≤ 10% @ 0.02	6 months side/side; no blanks;	use check source

<i>Scintillation Disk & PMT</i>	particles counted	Dust can bias	checks; run	WL; every 12 months &	every 168 hours
<i>Surface barrier</i>		measurements	continuous	6 months cross-checks	