

NYSDOH Environmental Laboratory Approval Program – Radon Checklist

LAB ID and/or LABORATORY NAME:	
ASSESSOR NAME:	DATE:

CHARCOAL CANISTER (Activated Charcoal Adsorption Device) by Proportional Counting

Method Number: ELAP method number 7036

SOP Number:

Revision Number:

SOP Date:

Personnel / Data Records observed:

General LLD: < 1 pCi/L

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Question	Y	N	NA	Codes	Comments
RADON IN AIR					
1. Are both of the following EPA publications available at the lab:					
a. Protocols for Radon and Radon Decay Product Measurements in Homes? (EPA 402-R92-003)				N002	
b. Indoor Radon and Radon Decay Product Measurement Device Protocols? (EPA 402-R92-004)				N003	
2. Does the facility monitor Radon levels in air for a minimum of 48 continuous hours, process the collective data and interpret the result for the client (rather than merely distributing devices)?				N004	
3. Is a written standard operating procedure (SOP) available? (Duplication of the protocols will not suffice.)				N005	
a. Does the analyst follow the manufacturer's instructions, the US EPA protocols and the lab's SOP?				N072	
4. Is a written quality assurance project plan (QAPP) appropriate to each device available?				N006	
5. Does the data collection log include:					
a. Date and time of deployment?				N007	
b. Date and time of removal?				N008	
c. Condition of the devices?				N009	
d. Attainment of closed building conditions?				N010	
e. Exact location of device (i.e., building, room and sampling position) within the property being monitored?				N011	
f. Serial number, model number, and manufacturer of the detector?				N012	
g. Unique identifier of client and client's address (if different from testing location)?				N013	
h. Condition of crawl space vents?				N014	
6. Are monitoring devices deployed and retrieved by trained employees of the radon laboratory?				N015	
7. When monitoring devices are set out and picked up by different persons, is this noted in the record?				N016	
8. Is a qualifying statement used if the lab does not control the monitoring process (i.e., placed and/or retrieved by persons other than trained lab personnel)?				N017	

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9. Are all devices deployed for 48 continuous hours if the measurement is used for remedial action or to determine the need for further measurements?				N018	
10. Is the technical director of the laboratory aware of the device's Lower Limit of Detection (LLD), and has the background level been determined?				N019	
EQUIPMENT					
1. Are charcoal containers sealed with a protective cover?				N023	
2. Is an instruction sheet provided to the client?				N024	
3. Is a shipping container provided to the client for returning the charcoal container(s)?				N025	
4. Is a data collection log available?				N026	
5. Is counting done with a sodium iodide gamma scintillation detector?				N027	
6. Is the detector linked to either a multi-channel gamma spectrometer or a single-channel analyzer with the window set to include the appropriate gamma energy window?				N028	
7. Is the detector system and geometry identical to that used to derive the calibration factors?				N029	
8. Does analysis start at least 3 hours after sampling?				N030	
9. If no desiccant is used, are charcoal containers weighed before and after analysis to account for water adsorption?				N031	
a. Is a correction factor applied to results for water adsorption?				N031A	
10. Is the shelf life of the desiccant documented?				N032	
QUALITY CONTROL					
<i>Routine Instrument Check Source</i>					
1. Is an instrument check source (ICS) used to calibrate the scintillation detector daily or with use?				N034	
2. Is there a record of daily or with use calibration using an ICS?				N035	
3. Does the ICS yield a good count rate (e.g., 1000 - 10,000 cpm) in				N036	

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a short time?					
4. Is the ICS of similar geometry and type to the samples to be counted?				N037	
5. Are in-house derived control limits determined?				N039	
<i>Field Control Detectors</i>					
1. Are field control detectors kept in a low radon (less than 0.2 pCi/L) area? (field control detectors = field blanks)				N042	
2. Are field control detectors deployed at at the rate of 5% of deployed detectors each month with a maximum of 25 per month?				N043	
3. Are field blanks labeled as real samples and returned to the supplier for analysis?				N044	
4. Are the results of field blanks tabulated?				N045	
5. Are acceptance limits indicated on the tabulation of field blanks?				N046	
6. Is the tabulation of field blanks up to date?				N047	
7. If the acceptance limits are exceeded, is the source of the problem determined and corrected?				N048	
<i>Duplicate Collocated Detectors</i>					
1. Are duplicate detectors installed in homes at the rate of 10% of deployed detectors each month with a maximum of 50 per month?				N050	
2. Are the duplicates systematically distributed throughout the workload?				N051	
3. Are the duplicates handled identically to the samples?				N052	
4. Are the duplicates not identified as such to the analyzing laboratory (i.e., submitted blindly)?				N053	
5. Is the precision of the duplicate data from radon levels measured at 4 pCi/L or above within 10% Relative Standard Deviation (RSD: for a long-term series of duplicate measurements), or 14% Relative Percent Difference (RPD: for a single pair of duplicates)?				N054	
6. Are the data from duplicates available (e.g., control charts)?				N055	
7. Are the acceptance limits for duplicates determined?				N056	
<i>Spiked Samples</i>					

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1. Are Spiked samples with known radon exposures submitted at the rate of 3 per 100 measurements, with a minimum of 3 per year and a maximum of 6 per month?				N060	
2. Are spiked samples labeled as routine samples?				N061	
3. Are the results of spiked samples kept as part of the record (e.g., control charts)?				N062	
4. If the acceptance limits are exceeded, is the source of the problem determined?				N065	
SYSTEM CALIBRATION					
1. Has either the manufacturer or the lab calibrated the complete system (detectors and readers) in a Radon Chamber yearly?				N067	
a. Does the lab maintain the charcoal suitability study from the manufacturer?				N068	
b. Is the exposure period sufficient to allow the detector to achieve equilibrium with the chamber atmosphere?				N069	
3. If the manufacturer is performing the calibration, does the lab utilize the correct calibration coefficient?				N070	
RECORD KEEPING					
1. Are the following record(s) kept for 5 years by the measurement organization:					
a. A copy of the final report including measurement results and the statement outlining any recommendations concerning retesting or mitigation provided to the building occupant or agent?				N237	
b. The address of the building monitored including zip code?				N238	
c. The exact locations of all deployed measurement devices? (Examples: room sketches, detailed written description)				N239	
d. Exact start and stop dates and times of the measurement period required for analysis?				N240	
e. A description of the device used including the device identification number and serial number, if applicable?				N241	
f. A description of the condition of any permanent vents?				N242	
g. The name of the service organization used for calibrations and the certificates of calibration?				N243	

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h. The name of the individual who conducted the test along with their associated training records?				N244	
i. A description of any variations from or uncertainties about standard measurement procedures, closed building conditions, or other factors that may affect the measurement result?				N245	
j. A description of any non-interference controls and copies of signed non-interference agreements?				N246	
k. A record of any quality control measurements associated with the test?				N247	
l. The written authorization from the client enabling the lab to report results to a third party (if applicable)?				N254	
REPORTING					
1. Does the lab report the result with an uncertainty or error factor, one is provided by the manufacturer?				N249	
2. Does the report contain the advisory of 10 NYCRR 16.130 for properties tested within New York State having measured radon gas levels >20 pCi/L or 0.1 working level?				N257	
3. For labs within NYS, does the laboratory report all of its radon monitoring data to the State according to 10 NYCRR 16.130?				N258	
4. Are field duplicate readings, if available, reported in an acceptable manner? (See EPA 402R92-003).				N259	

When any radon screening or long term testing result exceeds 20 pCi/L or 0.1 working level as defined in section 16.2(a)(145), the customer, if a resident of New York State, is advised to contact the New York State Department of Health, Bureau of Environmental Radiation Protection, for further technical advice and assistance.

New York State Radon Office

Phone (518) 402-7556

Toll Free (800) 458-1158

Website: <http://www.health.state.ny.us/environmental/radiological/radon>

NOTES:

The calibration factor (CF) of monitoring devices **decreases** with **increasing** humidity and exposure time (A.C. George 1984).

Results from A.C. George study:

A 3-day exposure (with T = 23°C and relative humidity = 50%) resulted in a CF of 0.042 ± .003 l/min. The CF is the effective sampling rate in l/min.

The lower limit of detection (LLD) for a 3-day exposure when counted 3 and 72 hour post exposure was 0.2 and 0.3 pCi/l.