



Thoron concentration measurement in soil air

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Radon program in the Czech Republic

Year measurement
(bare passive track detectors SSNTD)

→ Case: Higher value

→ Radon diagnosis
Case: Confirmed

→ Asking for state support

→ Mitigation healthy detriment



Differences between placing SSNTD

Room	PSD* wall EER [$\text{Bq}\cdot\text{m}^{-3}$]	WEEK meas Rn conc. [$\text{Bq}\cdot\text{m}^{-3}$]
HR.kit.	616	200
J.liv.r.	234	-
M., kit.	267	-
M., liv.r.	297	-
P., child. r.	209	88
P., liv.r.	194	83

* PSD Passive track detector



RAMARN system

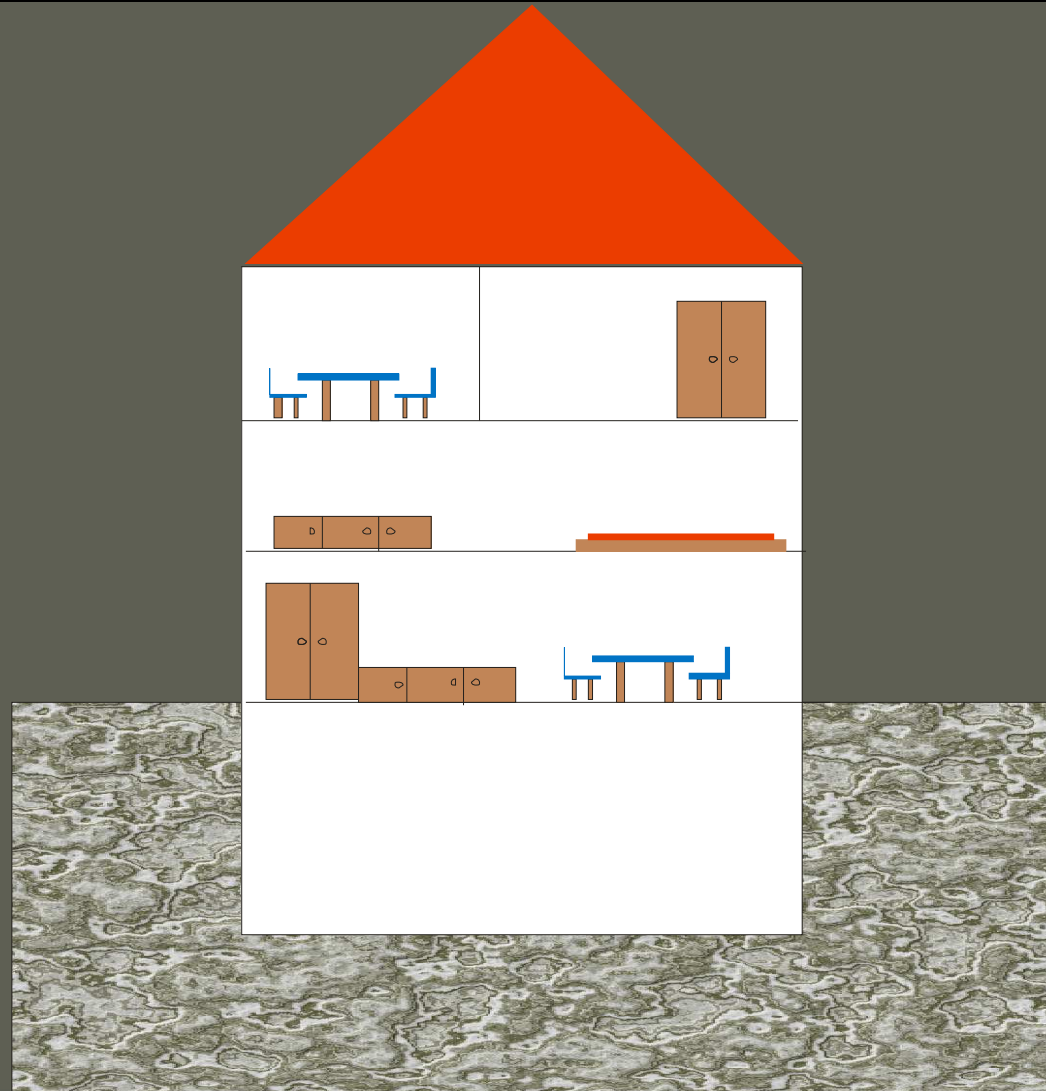
- Track detectors placed in diffusion chamber

Room	PSD* wall EER [Bq.m ⁻³]	PSD* centre EER [Bq.m ⁻³]	RAMARN Rn conc. [Bq.m ⁻³]
Hr.kit.	616	46	65
J., liv.r.	234	75	138
M., kit.	267	127	153
M., liv.r.	297	102	155
P., child.r.	209	133	80
P., liv.r.	194	72	53

* PSD Passive track detector



The penetration of thoron to the dwellings



Thoron sources in soil gas





Thoron sources in soil gas

- Abyssolith in central Bohemia (Těchnice)

$$Q = 19 - 21 \cdot 10^{-4} \% U_{ekv}$$

- Slate and greywacke of Barrandien Algonkian

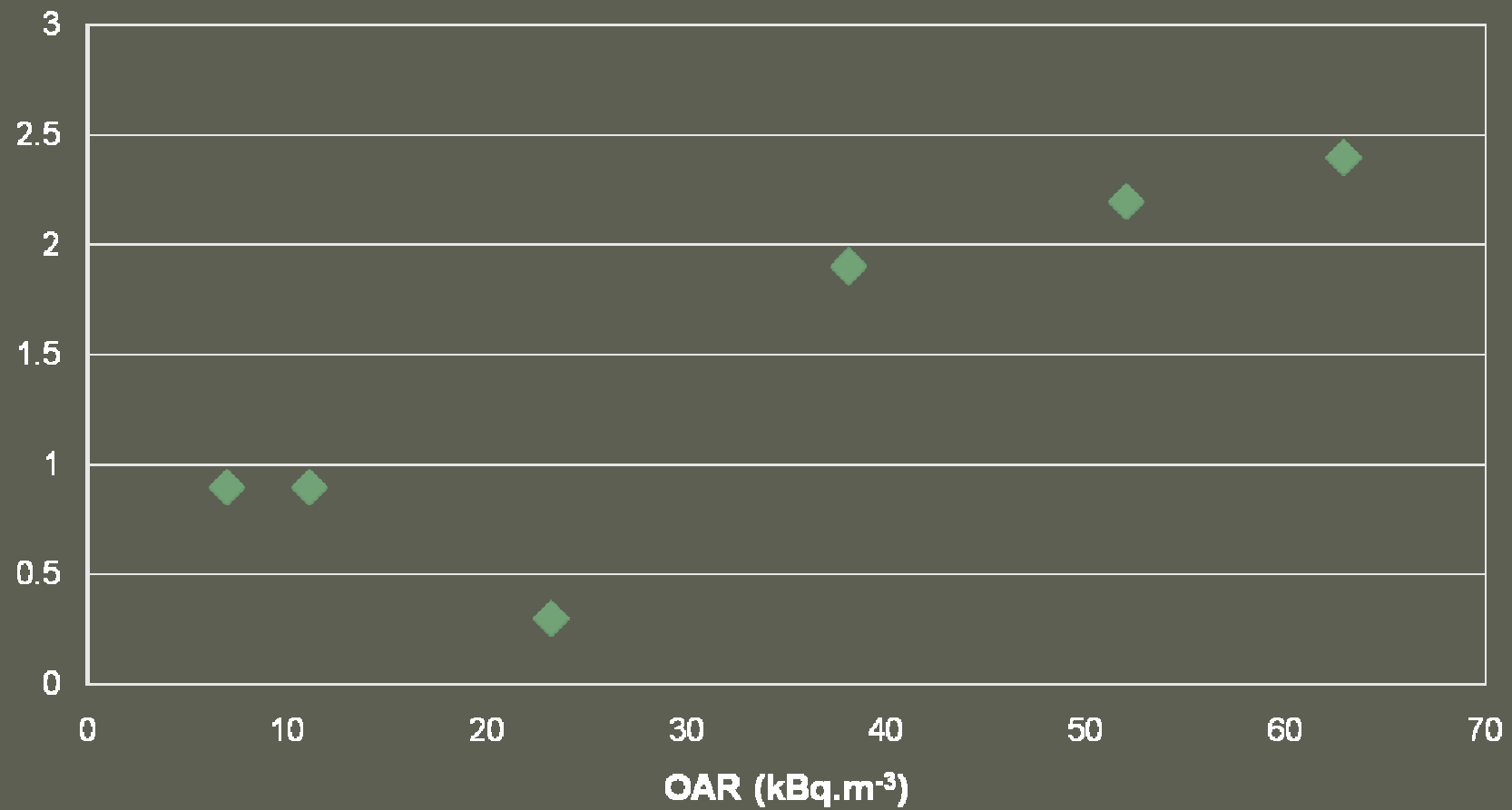
$$Q = 2 - 10 \cdot 10^{-4} \% U_{ekv}$$

Rock	OAT [kBq.m ⁻³]	OAR [kBq.m ⁻³]	OAT/OAR
Granite, type of Těchnice	148,6	62,9	2,4
	72,3	38,1	1,9
	114,6	52,0	2,2
Barrandien Algonkian	6,3	7,0	0,9
	7,4	23,2	0,3
	9,7	11,1	0,9

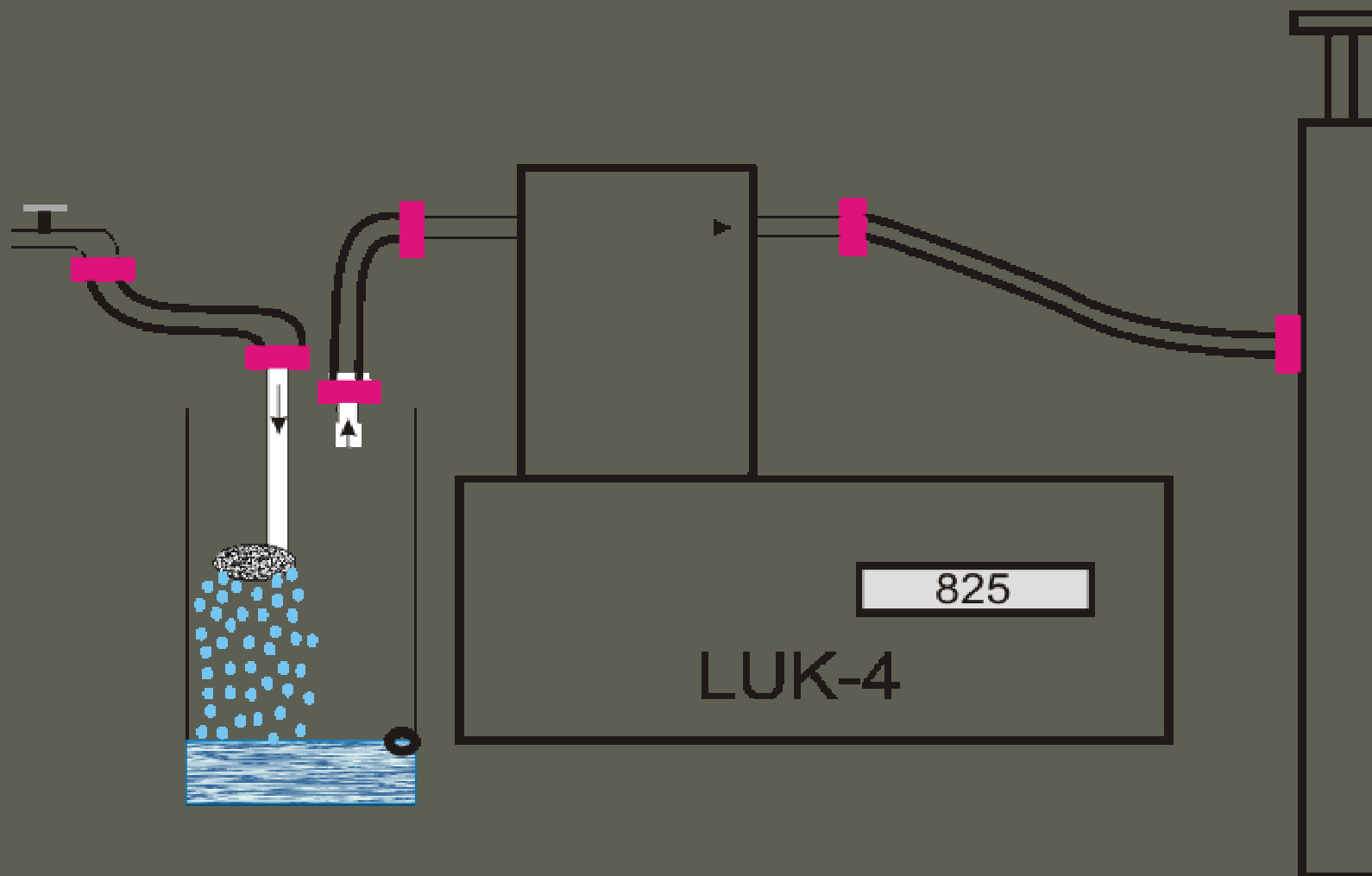


Graph OAT/ OAR

OAT/OAR



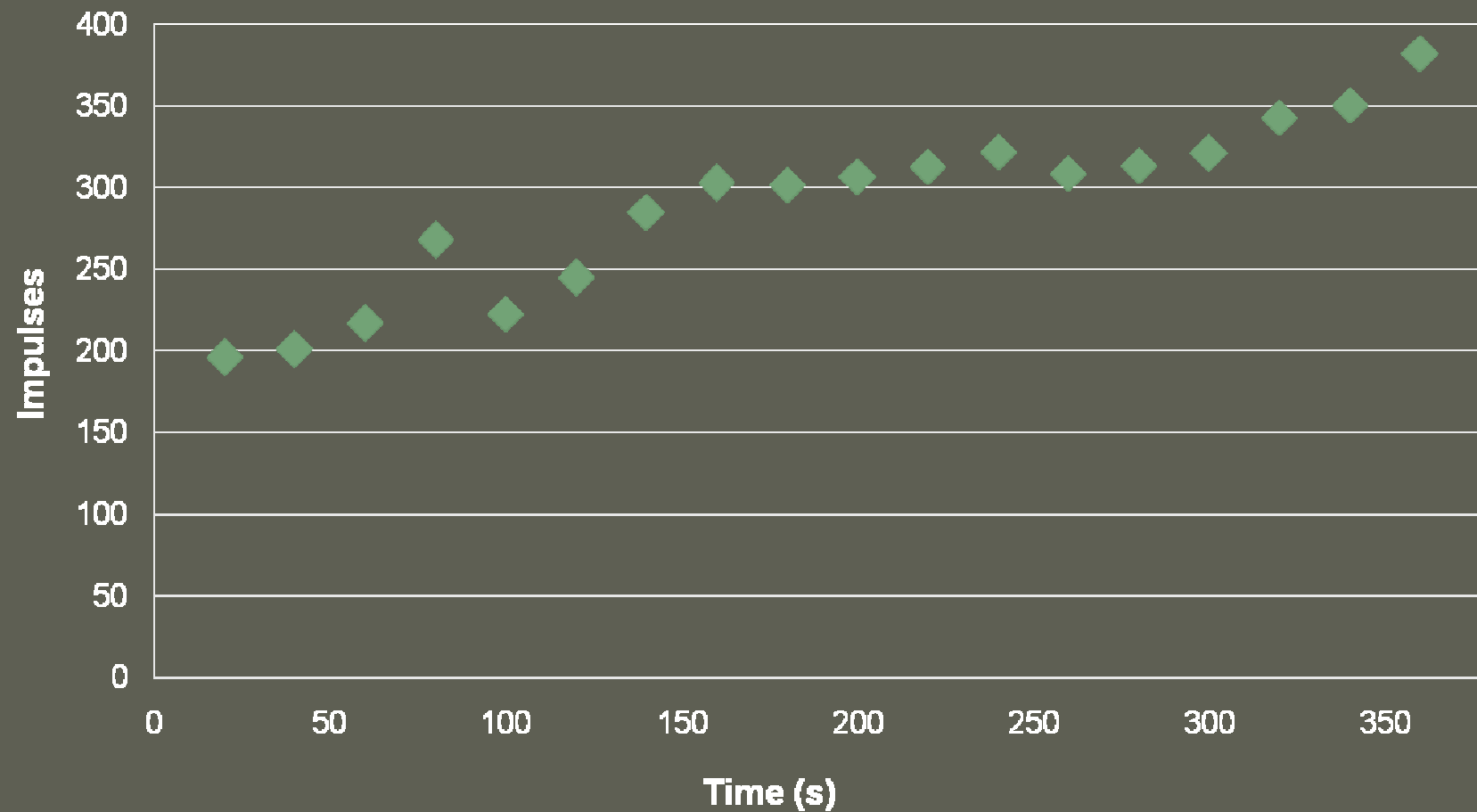
Measurement of thoron in water





Measurement of thoron in water

Response after water sampling





Conclusion

- The concentration of thoron in soil is on the similar level as radon. Strange, but truth.
- The occurrence of thoron in rooms is low (still it is not possible to explicate), but study of thoron behaviour indoor is still worth for the reason said afterwards.
- The cardinal problem is unhomogeneity – measuring must be realised in the volume of breathing, not near the surfaces.
- The reason of this activities is to estimate dose for inhabitants caused by thoron decay products (the ratio dose/concentration is approximately 5 times greater than for radon!).



Děkuji za pozornost