

## The RAD8 Continuous Radon Monitor for Quantitative Groundwater Tracing Applications

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In 1997, Durridge Company, Inc. launched the RAD7 electronic continuous radon monitor. Since then, RAD7 has become a defacto standard in various scientific research and professional air quality monitoring applications. In 2001, Burnett, Kim & Lane-Smith [1] introduced the technique for measuring radon in water using a DURRIDGE RAD7 continuous radon monitor paired with a continuous water-air equilibrator, commercialised as the RAD Aqua. The RAD H2O, for discrete measurements, followed several years later [2]. In the two decades since, these techniques have gained popularity for their ease of use and fast results, and radon measurements with the RAD Aqua and RAD H2O are now routinely used by aquatic scientists to quantitatively study groundwater movement in coastal, lacustrine and riverine systems. To date, several thousand scientific works have been published using these devices and techniques pioneered by Durridge.

Here, we present the RAD7's successor: the RAD8 continuous radon monitor. Redesigned from the ground up with aquatic science applications in mind, the RAD8 represents a technological leap forward in the researcher's toolkit. This submission will present the RAD8's technological improvements (higher sensitivity! Lower background!) and new features (Wi-Fi! Waterproof, even with the lid open!), as well as results of benchmarking tests against the mature RAD7 + RAD Aqua and RAD H2O techniques.

[1] Burnett, W. C., Kim, G., & Lane-Smith, D. (2001). A continuous monitor for assessment of <sup>222</sup>Rn in the coastal ocean. *Journal of Radioanalytical and Nuclear Chemistry*, 249(1), 167–172. <https://doi.org/10.1023/A:1013217821419>

[2] Lee, J. M., & Kim, G. (2006). A simple and rapid method for analyzing radon in coastal and ground waters using a radon-in-air monitor. *Journal of Environmental Radioactivity*, 89(3), 219–228. <https://doi.org/10.1016/j.jenvrad.2006.05.006>

