

**The IAEA's Programme on
Environmental Modelling for Radiation Safety
(EMRAS II)**

**EMRAS II
Wildlife Transfer Coefficient Handbook
Working Group 5
MINUTES**

**of the Fifth WG5 Meeting held at IAEA Headquarters, Vienna
24–28 January 2011
(during the Third EMRAS II Technical Meeting)**

IAEA Scientific Secretary	Working Group Leader
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*Initials used to refer to participants within minutes and actions as appropriate.

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In addition Mr Mike Wood (**MW**) (M.Wood@mmu.ac.uk), Manchester Metropolitan University, UK) participated via web-video link.

Review of the TRS Handbook (Monday pm and Thursday am)

A final draft version of the TRS was distributed (by CEH) one week prior to the meeting. After a brief introduction to the revised text and CR tables by **BJH** and **NAB**, the members of Working Group 5 (WG5) had two sessions to give comments and discuss the document. The aim of the WG5 sessions was to provide a final peer review of the document text and tables so that appropriate modification could be made and the document then submitted to the IAEA for its publication formatting and review procedures.

During the two sessions the WG5 provided comments which were both constructive and helpful. The final amendments were compiled into a final revision list (not included here as it mainly related to individual small changes rather than major alterations) which mainly focused on making the text consistent and as concise and clear as possible. A number of footnotes were requested in the CR tables and a few CR values

were queried. *NAB* and *DC* agreed to follow these issues up in the online database and prepare the final tables once any revisions had been made.

Access to the completed TRS was requested by some WG5 participants. *BJH* agreed to discuss the issue with the IAEA Secretariat since the document formatting and internal IAEA publication review and publication process will mean that the TRS will not be published for at least six months.

The agreed schedule for any remaining comments was as follows:

Action	Who	Deadline
Provide any final comments to CEH	All WG5 attendees	5 February 2011
Provide any final comments on the CR tables	All WG5 attendees	11 February 2011
Check and revise database and extract revised tables	NAB, DC, TY and NRPA staff	18 February 2011
Amend text and include revised tables	BJH	28 February 2011
Send to IAEA	BJH	2 March 2011
Distribute to WG5 if possible	BJH	TBA

Please note the CR tables in the final version submitted to the IAEA have changed and therefore the version considered during the January 2011 meeting **SHOULD NOT BE USED**.

Initial discussion of TRS values and the derivation of screening values

The latter part of Thursday was devoted to some initial consideration of the TRS CR values and derivation of soil screening values using the new TRS CR_{wo-media} values for a limited number of situations.

NAB provided a short comparison of the TRS CR values with those available in the ERICA Tool (the database of which formed the initial basis of the online database). *NAB* highlighted the values where there were substantial (c. order of magnitude or more) differences between the two datasets. However, the numbers of values changing by more than an order of magnitude was only approximately 20. Changes were least for the marine ecosystem and greatest for freshwater for which revised inputs dominate the database rather than values originating from the ERICA Tool reviews.

BJH and *KBS* showed the derivation of new media screening values using the TRS CR data where possible. *BJH* considered some radionuclides likely to be released by nuclear power plants to terrestrial ecosystems and made some initial suggestions concerning how to identify which CR values and data gaps were the most important with respect to dose or failing a screening tier. These included the relative importance of internal and external dose for each radionuclide and the quantity and quality of the data used to derive the CR value, especially that of the limiting organisms. *BJH* derived soil screening values with respect to: (i) the 10 uGy h⁻¹ ERICA / PROTECT value; and (ii) the lower limit of the ICRP DCRL values. *KB* derived new screening values for U decay chain products in freshwater systems using TRS CR values and extrapolated values where necessary. CR values were still missing for birds, gastropods, insect larvae and zooplankton. Kd values were the same as currently in the ERICA Tool. For both sediment and water some screening values for the limiting organisms had increased, others decreased (especially for Th isotopes), and some remained similar to those in ERICA Tool.

JT presented an analysis by Mat Johansen (*MJ*)¹ comparing the terrestrial soil screening values derived by *BJH* with measured soil values in nuclear test sites. Not surprisingly, the Environmental Media Concentration Limits (EMCLs) were frequently exceeded. The appropriateness of using soil screening values

¹ Unable to attend the Third EMRAS II Technical Meeting.

in this situation was queried and **DC** felt that current and future deliberations in the ICRP Committee 5 would be considering this issue further.

KBS outlined considerations of the derivation of screening values and their need for conservatism. At the screening stage of the ERICA method, measured or modelled concentrations in the exposure media are compared to EMCLs. To ensure the required conservatism of this screening, the EMCL derivation itself should be conservative. The method employed today in the ERICA tool allows to each combination (radionuclide, reference organism) exposed to the radionuclide EMCL to reach the dose benchmark. For a given radionuclide, the lowest of them is then retained to obtain the Risk Quotient (RQ, ratio between the concentration of the radionuclide in the exposure media and this lowest EMCL). The additivity of effects is considered by summing the RQ on the radionuclides list that results in a global RQ. In this way, the EMCL value for a given radionuclide is constant whatever the number of radionuclides present in the exposure media. Intuitively, the dose rate benchmark should be shared between radionuclides as their effects are additive, then the most numerous they are in the exposure media, the lowest their respective EMCL should be. Moreover, even with the same number of radionuclides, the values of the EMCL should change depending on their relative contribution to the media contamination and their relative efficiency in terms of transfer and dose generation. Alternative calculation methods of these EMCLs are being explored at IRSN.

Data on ¹³⁷Cs concentrations in some marine fish species (whole body) and associated seawater samples from Japanese literatures were used by **KT** to calculate CR_{wo} values for fish and cephalopods. CR values were compared for fish species with different geometries (flatfish (benthic feeding) and salmonid (piscivorous)) and similar. The CR_{wo} values were compared with those in the current version of the TRS wildlife tables for a range of elements. CR for muscle of these fish species were compared with whole body CR. The values were almost the same among fish species. For the case of Cs, fish weight could affect CR values for muscle, but the tendency is different in different fish species although their geometry is similar. The muscle CR for Cs is slightly higher than whole body CR for most species. The conversion factor for tissue to whole organism for marine fish in wildlife transfer TRS, which is 1, is in good agreement with the Japanese data.

Feedback from the steering committee meeting (held 26 January 2011)

The IAEA has agreed that the TRS will constitute the main report from WG5. It will therefore only be necessary to prepare a short overview document. Since WG5 is also preparing a presentation and summary for the International Conference on Radioecology and Environmental Radioactivity: Environment and Nuclear Renaissance (ICRER 2011), Hamilton, Ontario, Canada, 19–24 June 2011, it is likely that the text prepared for the conference can form the basis for the EMRAS II report.

BJH requested time in the January 2012 schedule for WG5 to meet to discuss application and analysis of the TRS CR_{wo-media} value.

WG5 MEETING AGENDA

Monday, 24 January 2011

09:30–13:00	Opening Plenary Session	
13:00–14:00	<i>LUNCH BREAK</i>	
14:00–15:30	*Update on the derivation of the final CR data tables	Nick Beresford (CEH, UK)
	Presentation of the draft TRS on Wildlife	Brenda Howard (CEH, UK)
16:00–17:30	Comments on the TRS Handbook	All

Tuesday, 25 January 2011 (WG5 did not meet, attendance at other WG Meetings)

Wednesday, 26 January 2011 (WG5 did not meet, attendance at other WG Meetings)

09:00–10:30	Plenary Session	
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Thursday, 27 January 2011

09:00–10:30	Final comments on the revised TRS	All (including participants who were in WG6 meeting on Monday)
	Comparison of the TRS CR data tables with the original CR data in the ERICA Tool	Nick Beresford
11:00–13:00	Trends in the TRS CR values / data quality and quantity	Brenda Howard
	Derivation of new EMCL values using the TRS for key radionuclides associated with aerial discharges from Nuclear power plants for terrestrial ecosystems	
13:00–14:00	<i>LUNCH BREAK</i>	
14:00–15:30	New freshwater EMCLs values for U decay chain	Karine Beaugelin-Seiller (IRSN, France)
	Some initial data/thoughts on applying Biota EMCL's to nuclear weapons related sites	John Twining on behalf of Mat Johansen (ANSTO, Australia)
16:00–17:30	New whole body CR _{wo} values for some marine fish and relationship to geometry	Keiko Tagami (NIRS, Japan)
	Preparation for the TRS presentation and paper at the conference in Hamilton, Canada, the EMRAS II report and Future plans	All

Friday, 28 January 2011

09:00–13:00	Closing Plenary Session	
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* Indicates the name of the presentation given on the WG5 web page (<http://www-ns.iaea.org/projects/emras/emras2/working-groups/working-group-five.asp?s=8>).