	Realm: Atmospheric Chemistry				
Date	**Reviewer's Name**	**Reviewer's Institution**	**Component**	**Comment**	**ES-DOC Response *(include the date, the responder's name, and the new version number if implementing any changes)***
Pre-stage 3	John Scinocca	CCCma	Atmoschem	Does the question 'Number of tracers in atmospheric chemistry model' refer to the number of advected tracers?	Yes. Updated description to make this clear. (0.2.0) David Hassell
Pre-stage 3	John Scinocca	CCCma	Atmoschem	Is 'atmospheric chemistry calculations generalized into families of species?' specifically referring to the use of families for advection?	I believe that it is not referring to advection, rather the chemical dynamics. I shall update the description to make this clear. (0.2.0) David Hassell
Pre-stage 3	John Scinocca	CCCma	Atmoschem	Are the questions 'Timestep for physics and chemistry (in seconds).' and 'Timestep for the atmospheric chemistry model (in seconds)' redundant or are they requesting information on different aspects? Do the physics and chemistry necessarily have the same timestep, as implied in the first question?	I have separated these into two questions - one for physics one for chemistry. We now have timestep questions on advection , physic, chemistry and the integrated atmos chem timestep. (0.2.0) David Hassell
Pre-stage 3	John Scinocca	CCCma	Atmoschem	For the questions on 'Split Operator Order' is there a syntax for use if two of these processes are included in the same calculation? For example, we calculate emissions as part of chemistry and would assigning both of these operators the same number be understood correctly?	Yes - that would be fine. The descriptions have been updated to make this clear. (0.2.0) David Hassell
Pre-stage 3	John Scinocca	CCCma	Atmoschem	Should the request 'Split Operator Order' for 'Call order for heterogeneous phase chemistry scheme' specify 'tropospheric heterogeneous chemistry'?	We can specify tropospheric, and also have a similar question for stratospheric, for consistency (0.2.0) David Hassell
Pre-stage 3	John Scinocca	CCCma	Atmoschem	The three questions on 'Meteorological Forcings' seem more applicable for chemical transport models. For a model with on-line chemistry the question is confusing, particularly the question on which 2D and 3D forcing variables are used.	These questions have been removed (in line with the simplification of the "transport" process). (0.2.0) David Hassell
Pre-stage 3	John Scinocca	CCCma	Atmoschem	Under 'Method used to ensure mass conservation' there are entries for 'Concentration positivity' and 'Gradient monotonicity'. These two are, strictly speaking, not sufficient to ensure mass conservation. I would suggest a first question on whether there is a mass conservation check required. Then a follow-on question of, if yes how is the correction distributed spatially.	The whole "transport" process has been replaced with the questions "is transport handled by the atmosphere scheme" and "if not, describe it (in free text)". (0.2.0) David Hassell
Pre-stage 3	John Scinocca	CCCma	Atmoschem	Under the question 'Method used to define chemical species emitted at the surface' is the choice 'Prescribe[d] (spatially uniform)' meant to refer to a prescribed spatially uniform mixing ratio?	Replaced 'Prescribe[d] (spatially uniform)' with two options: 'spatially uniform mixing ratio' and 'spatially uniform concentration (0.2.0) David Hassell
Pre-stage 3	John Scinocca	CCCma	Atmoschem	The question 'Method used to define the chemical species emitted in the atmosphere' could be more clear that the question applies to sources that emit directly into model layers above the surface.	Changed the description to "Methods used to define chemical species emitted directly into model layers above the surface (0.2.0) David Hassell
Pre-stage 3	John Scinocca	CCCma	Atmoschem	The question 'The number of steady state species in the gas phase chemistry scheme.' seems to me a bit unclear. I think the reference is to species that are assumed to adjust quickly and are therefore not advected – like the hydroxyl radical for example. But the question could also refer to the number of chemical species that are solved numerically assuming photochemical steady state?	Updated the description of this property to "The number of gas phase species for which the concentration is updated in the chemical solver assuming photochemical steady state" (0.2.0) David Hassell

Pre-stage 3	John Scinocca	CCCma	Atmoschem	Is the question ‘The number of advected species in the stratospheric heterogeneous chemistry scheme.’ specifically referring to solid or liquid phase (aerosol) constituents?	This question has been removed as it it advection is not part of this process (0.2.0) David Hassell
Pre-stage 3	John Scinocca	CCCma	Atmoschem	The question ‘Reaction information taken into account by the photolysis scheme.’ seems unclear. Perhaps ‘Environmental conditions taken into account by the photolysis scheme’? I am guessing the question is whether pressure- and temperature-sensitive cross-sections and quantum yields in the photolysis calculations are modified to reflect the modelled conditions.	It was indeed unclear. Your suggestion has been incorporated (0.2.0) David Hassell