This is a document which explains how to create RMA-4 files

The following cards are always needed:

T1 any title you wish.
T2 any title you wish.
T3 any title you wish.

$L eight values for fortran "file pointers". The files are: 1- gfgen output;2- rma2 output; 3- alternate initial conditions; 4- alternate bc file; 5- rma4 solution; 6- restart quality conditions output; 7- full print output file; 8- optional special output summary file. If the value is 0, the file is not used. If negative, the absolute value of the number specified will be used. If positive, the default will be used.
Defaults are:
$L 10 20 30 4 31 32 33 34

$M this gives the machine type. Same values as in the RMA-2 bc file.

TC start-time time-step total-steps max-time Ssflag The simulation will stop when either total-steps or max-time is reached.
SSflag is usually 0.

TH two values for time info. The first is the number of hours to be subtracted from the RMA-2 input velocity file. The second is the last time step from the RMA-2 velocity file to be used. When this is reached, the velocity file will be rewound (if RMA-4 still has simulation time remaining).

TP five values for optional printing stuff. The values are: value1- (0)do not print node/element data, (1)print everything, (2)do not print node/element data and print short form of results; value2- (0)don't print time step info, (+)print certain intervals; value3- (1)Echo inputs, (0)do not.value4- (1)trace program logic during run, (0)do not; value5- (0)no detail internal print trace, (1-4)diagnostic debug print trace.Generally, you should use the following:
TP 1 1 0 0 0

FQ two values. The first tells the number of constituents. The second tells the following: (1)BOD is a constituent (2)DO is a constituent (0)otherwise.

FQC this needs one decay coefficient per constituent, used for decay of each:
0 = no decay.
0 < n < 1 = growth.
infinity = rapid decay

DF one integer and two floats. The integer is the material type id. The floats are the x- and y- diffusion coefficients for the material. One DF card is needed for every material type in the mesh.

STOP this card should be at the very end of the run.

The following card is needed for a cold start (no input hotstart file).

IC one integer and a float for each constituent. For the integer, use the number 1, unless you study about this card. The floats are the initial concentration of each constituent.

The following cards are needed for a time dependant run.

RE three values are needed. The values are: value1- (1)save the global matrix, (-1)do not, (0)use value2; value2- (n)use resolve file saved during the time step n, (0)use value1; value3- time step for this solution step. (Only used when value1 is active.)

END this card should be at the end of each time step. If there are not as many 'end' cards as there are time steps, the simulation will stop early. In other words, even if there is no concentration data for a time step, there should still be an 'end' card for that time step.

The following cards are needed if you use ENGLISH units:

GS .3048 .3048 (scales x- and y- coordinates)
HS .3048 .3048 .3048 (scales x-vel, y-vel, and water depth)

To define concentrations:

* At a node:
BCN node-number list-of-concentrations value1 value2

* At a continuity line:
GC line-number list-of-nodes -1
The GC cards should all be after the $M card. The no more than 8 nodes should be on one line, and the -1 terminates the string.
BCL line-number list-of-concentrations value1 value2

list-of-concentrations is a list of the concentration for each constituent numbered in the FQ card.
Value1 determines how the constituent concentrations are handled when the flow changes direction.
1 = a factor is applied to allow for a gradual change in constituent concentration
0 = no factor will be applied (this is default). Value2 is the factor applied if Value1 is 1. The factor is between 0 & 1.
0 = Shock
1 = Very gradual.

A BCL or BCN card can be placed in any desired time step

The following cards are optional

FT fluid-temperature: this is needed if the temperature is not 15C.

TO frequency-to-save begin-saving-here stop-saving-here
frequency-to-save: the frequency in decimal hours at which time steps should be saved to the solution file. A negative or zero value causes all time steps to be saved.
begin-saving-here: if frequency-to-save is positive, this is the time at which the specified frequency will start to be saved. A negative or zero value causes all time steps of the specified frequency to be saved. (No lower limit).
stop-saving-here: if frequency-to-save is positive, this is the time at which the specified frequency will stop being saved. A negative or zero value causes all time steps of the specified frequency to be saved. (No upper limit).