**CACIE Tool #10.4a** – ***ca-radmb (mass-balance-rad1.exe)***

**CACIE Tools #11.4b** – ***ca-radmb (mass-balance-rad2.exe)***

**CACIE Tools #18.5c** – ***ca-radmb (mass-balance-cie.exe)***

**Version** **1.0**

**QA**: **TEST** or **NA** or **QA**

1. **Description and Purpose**

One or two paragraphs describing the tool’s function and purpose.

This tool reads the STOMP output file, STOMP surface files, RET integration table, and source script summation csv files. Extracts values needed for the mass balance calculation for the rads1/rads2/cie no-decay simulation.

1. **Functional Requirements**

The functional requirements of the tool will be documented in this section. Each requirement will have an ID, such as: FR-N, where N starts at 1 and increments for each Functional Requirement. Each of the Functional Requirement IDs will have a corresponding test ID listed in the RTM.

FR-1: Read command line arguments

FR-2: Open outfile1 “ModelName\_(rads1/rads2/cie)\_mass\_balance.dat” with STATUS=REPLACE

FR-3: Open “mass\_bal\_inputs\_(rads1/rads2/cie)” with STATUS=OLD (input)

FR-4: Read input to generate “inlist” variable, a list of input files

FR-5: Open inlinst(1) with STATUS=OLD

FR-6: Read inlist(1)

FR-7: Close inlist(1), Open inlist(2) with STATUS=OLD (output file)

FR-8: Write to ModelName\_X\_mass\_balance.dat

FR-9: Read inlist(2), write year, watmass, and radmas to ModelName\_X\_mass\_balance.dat

FR-10: Close inlist(2), Open inlist(3) with STATUS=OLD (water surface file)

FR-11: Write information to ModelName\_X\_mass\_balance.dat

FR-12: Close inlist(3)

FR-13: DO loop for irm beginning at 1 to 8

FR-14: Open inlist(irm+3) with STATUS=OLD (surface files)

FR-15: Read from inlist and write to ModelName\_X\_mass\_balance.dat.

FR-16: Close inlist(irm+3), finish loop, go to FR-14

FR-17: Open inlist(12) with STATUS=OLD (RET integration table)

FR-18: Read inlist(12) and write out to ModelName\_X\_mass\_balance.dat

FR-19: Close inlist(12). Open inlist(13) with STATUS=OLD (rads1/rads2/cie source summary file)

FR-20: Read a value from inlist(13) and add it to watsrc (water source?)

FR-21: Close inlist(13). Write watsrc to output file

FR-22: If ibuf flag from command line arguments = 1, then Open inlist(14) with STATUS=OLD (buffer source summary file if included). Else Skip to FR-25

FR-23: Read inlist(14) and add a value to watbuf

FR-24: Write watbuf value to output file.

FR-25: Calculate watin and watmod values (mass balance). Write both to output file

1. **Software Requirements Specifications**

The software requirements specification of the tool will be documented in this section.

FORTRAN

1. **Software Design Description**

The software design description of the tool will be documented in this section. The results of a Code Walkthrough with an independent third party will be summarized in this section.

Command line arguments:

Model name.

The keyword: “buffer” (only included if there is an aqueous-only buffer for the model)

Input files:

mass\_bal\_inputs\_(rads1/rads2/cie)

input file (?)

output file (?)

water surface file

surface files

RET integration table file

Source summary file

Buffer source summary file (if it is included)

Output files:

ModelName\_(rads1/rads2/cie)\_mass\_balance.dat

1. **Requirements Traceability Matrix**

A requirements traceability matrix for the tool will be documented in this section. At a minimum, the matrix will include IDs of: Functional Requirements and the corresponding Acceptance Test, along with an indication of the test result (Pass/Fail).

Table 1 presents the requirements traceability matrix for the ca-radmb tool.

| **Table 1. ca-radmb Tool Requirements Traceability Matrix** | | |
| --- | --- | --- |
| **Functional Requirement** | **Acceptance Test** | **Test Result (Pass/Fail)** |
| FR-1 |  |  |
| FR-2 |  |  |
| FR-3 |  |  |
| FR-4 |  |  |
| FR-5 |  |  |
| FR-6 |  |  |
| FR-7 |  |  |
| FR-8 |  |  |
| FR-9 |  |  |
| FR-10 |  |  |
| FR-11 |  |  |
| FR-12 |  |  |
| FR-13 |  |  |
| FR-14 |  |  |
| FR-15 |  |  |
| FR-16 |  |  |
| FR-17 |  |  |
| FR-18 |  |  |
| FR-19 |  |  |
| FR-20 |  |  |
| FR-21 |  |  |
| FR-22 |  |  |
| FR-23 |  |  |
| FR-24 |  |  |
| FR-25 |  |  |

1. **Test Plan and Cases**

The test plan for the tool will be documented in this section. Each test will have a unique ID and criteria for determining if the test result is pass or fail. The TEST ID will be referenced in the RTM and ATR. An installation test, labeled **IT-1**, will be used by the Tool Runner to confirm the version of the tool being used is running correctly before launching it with the user’s parameters.

The Unit Testing done on the tool will be documented here, also.

The test plan for the ca-radmb tool is as follows.

| **Table 2. ca-radmb Tool Test Plan** | | |
| --- | --- | --- |
| **TEST ID** | **Test Case** | **Test Result (Pass/Fail)** |
| IT-1 | Installation Test |  |
| ATC-X |  |  |
| ATC-X |  |  |

1. **Acceptance Test Report**

The test report will state whether the tool is qualified for use, summarize test case results, and report all resolved incidents and resolution of unresolved incidents.

1. **User Guide**

A guide for using the tool will be documented in this section.