**CACIE Tool #14.4** – ***XPRT Bottom Flux to Groundwater Tool (Run\_2D\_Botflux\_to\_GW.py)***

**Version** **1.0**

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

1. **Description and Purpose**

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

The XPRT Bottom Flux to Groundwater tool automates generating two-dimensional cartesian plots of ??? mass (activity) flux out of the bottom of the model domain by year ??? .

The .pngs for each model are saved in a figures folder in the same model directory as the .lay/.dat files.

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: Connect to the Tecplot software;

FR-2: Load layout file (argument from the .bat file) (Note: script has functionality to iterate through multiple layout files);

FR-3: Get variable names from layout and save as string variable (for input to load command [FR-7]);

FR-4: Sort filenames by referenced year in filename (data needs to be load in chronological order for animation of the maps);

FR-5: Get filenames of all .dat files located in ..\plts\[rad]PlotFiles (filenames are sorted by referenced year [data needs to be load in chronological for correct order of the maps for the animation]) and save as single dataset string variable (for input to load command [FR-7]);

FR-6: Delete all existing zones in initial layout except the first zone;

FR-7: Execute load command to appends data from .dat files in dataset string (FR-3);

FR-8: Delete the first zone if it is an existing zone from initial layout (FR-2);

FR-9: For each plot, reset:

* scatter symbol type to text;
* reset the scattertext to “”;
* reset use\_base\_font to false;
* reset map not to show;

FR-10: For each map:

* Reset map to show;
* Save plot as .png if filename is not in directory (script does not overwrite existing files).;
* Export animation frame;
* Reset map not to show.

1. **Software Requirements Specifications**

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

Python 3.?

Python libraries:  
tecplot  
tecplot.exception   
tecplot.constant)  
os  
argparser

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.

Arguments:  
[rad]PlotFiles\[modelname]\_botflux\_[rad].lay

Output files:   
[year].png  
output.avi

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 XPRT Bottom Flux to Groundwater tool.

| **Table 1.** **XPRT Bottom Flux to Groundwater Tool Requirements Traceability Matrix** | | |
| --- | --- | --- |
| **Functional Requirement** | **Acceptance Test** | **Test Result (Pass/Fail)** |
| FR-1 | ATC-1 |  |
| FR-2 | ATC-2 |  |
| FR-3 |  |  |
| FR-4 |  |  |
| FR-5 |  |  |
| FR-6 |  |  |
| FR-7 |  |  |
| FR-8 |  |  |
| FR-9 |  |  |
| FR-10 |  |  |

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 XPRT\_Run\_2D\_Botflux\_to\_GW tool is as follows.

| **Table 2. XPRT\_Run\_2D\_Botflux\_to\_GW Tool Test Plan** | | |
| --- | --- | --- |
| **TEST  ID** | **Test Case** | **Test Result  (Pass/Fail)** |
| IT-1 | Installation Test |  |
| ATC-1 | Confirm script executes (script will terminate if TecPlot connection is not made) |  |
| ATC-2 | Check Tecplot interface to confirm loaded layout filename matches .bat argument filename |  |
|  |  |  |
|  |  |  |

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.