**CACIE Tool #NN** – **Duplicate Source Nodes Tool  
ca-dups.pl**

**Version** **1.0**

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

# Description and Purpose

Numerical representation of sites may result in overlapping nodes between different sites in the I-, J- or K-directions. When there are overlapping nodes, the corresponding source releases may not be recognized by the STOMP simulator. The Duplicate Source Nodes tool (DSN) scans all sites within an input source card file, compares each site’s spatial representation against all the other sites, identifies any source nodes that overlap spatially, and writes the duplicate source node(s) to the output file. The tool does not identify temporal overlaps; it identifies only spatial overlaps.

The input for this tool is a source card file, which is generated by the Source to STOMP tool (***ca-src2stomp.pl***). It is noted that the tool only determines overlapping source nodes and does not modify the source card input file. Any modifications to a source card file will be done by a modeler based on the generated output file.

A site in a STOMP Source Card is represented by one or multiple sources, each with a specified I-, J- and K-directional range. The following is an example of a site’s two sources, *Aqueous Volumetric* and *Solute Tc-99*, and their distribution in I-, J- and K:

Aqueous Volumetric, 27, 32, 26, 28, 312, 312, 3,

1953.0, year, 1.43909e+03, m^3/year,

1954.0, year, 1.43909e+03, m^3/year,

1954.0, year, 0.00000e+00, m^3/year,

Solute, Tc-99, 27, 32, 26, 28, 312, 312, 3,

1953.0, year, 7.93600e-08, 1/year,

1954.0, year, 7.93600e-08, 1/year,

1954.0, year, 0.00000e+00, 1/year,

The first entry of a source line will contain either *Aqueous Volumetric,* or *Solute* and the given solute name. The following entries are integers that represent I1, I2, J1, J2, K1, and K2 indices, describing the nodal range of a source in the X- (I1 to I2), Y- (J1 to J2), and Z-direction (K1 to K2). Accordingly, the source in the example above occupies the 27th to 32nd nodes in the X-direction, the 26th to 28th nodes in the Y-direction, and the 312th node in the Z-direction.

For sites with no duplicate nodes, the output file will report “none.” In the following example, the site 2101-M Pond does not overlap with any other sites in the model domain, therefore the following record is written to the output file:

------------------------

Site Name = 2101-M Pond

Sites with some x,y,z overlap:

none

------------------------

However, if the 2101-M Pond site does overlap with another site, such as site 2607-EQ at node 78, 50, 225, then the following record is written to the output file:

------------------------

Site Name = 2101-M Pond

Other Sites with some x,y,z overlap:

some

2607-EQ

Aqueous Volumetric,78,50,225

2607-EQ

Solute,U-232,78,50,225

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# Functional Requirements

The following are the functional requirements (FR) of the Duplicate Source Nodes Tool:

FR-1: Parse the following command line arguments:

* Source card input file name
* Output file name

FR-2: From the source card input file, parse the following for each site:

* The site name
* The source (“Aqueous Volumetric” or Solute” followed by the solute name)
* The nodal ranges (I, J, and K) for each site

FR-3: Using the site’s nodal range, generate a list of source nodes associated with each site.

FR-4: Sum the number of sources associated with each site within the model domain and record the total number of sources for all sites in the model domain to the output file.

FR-5: For each site’s number of nodes and sources, calculate the total number of source nodes in the model domain and record that value to the output file.

FR-6: For each site in the source card input file, compare each source node against the source nodes in each of the other sites listed in the source card input file.

FR-7: If a source node is duplicated in another site, record the duplicate site name, the source type, and the source node indices corresponding to the duplicated source node to the output file.

FR-8: If all source nodes in a site are unique (i.e. no duplicate source nodes are identified in the other sites within the same source card input file), record “none” for the site to the output file.

FR-9: Save the output file as the output file name parsed in from the command line argument (FR-1).

# Software Requirements Specifications

The Perl programming language was used to develop this script. No libraries outside of the standard distribution of the Perl v5.18.2 interpreter were used.

# Software Design Description

Flow:

The Duplicate Source Nodes tool performs the following steps:

1. From the command line:
   1. Read in the source card input file name entered as a command line argument
   2. Read in the output file name entered as a command line argument
2. Open the source card input file, then find the first non-commented line.
3. Parse the following for each site in the source card input file:
   1. Site name
   2. Source type: “Aqueous Volumetric”, or “Solute” and the specified solute
   3. The I-, J-, K-index ranges of the source (I1, I2, J1, J2, K1, K2)
4. For each site, create a list of nodes based on the index ranges of the source.
5. Record number of sources in output file.
6. Record number of source nodes in output file.
7. For each site in the source card input file, check each node against the nodes in all other sites included the source card input file and identify if a node is duplicated (i.e. I, J and K values are all equal for two nodes).
8. If a node is duplicated record the other site name, the source type, and the node indices for each duplicated node in the output file.
9. If a site does not have any nodes that are duplicated in any other sites record “none” in the output file.

Arguments:

Source card input file name

Output file name

Input Files:

The input file for the DSN tool is a source card file, generated by the ***ca\_src2stomp.pl*** tool. The file name is entered as a command line argument. Example file names may be:

* ***rads1-src.card*** – source card of the rads1 radionuclide group
* ***rads2-src.card*** – source card of the rads2 radionuclide group
* ***buffer-aq-src.card*** – buffer source card

Output Files:

The output files generated by the DSN tool are saved to a file name corresponding to the output file name entered as a command line argument. Example file names may be:

* ***rads1-src-dups.txt*** – provides duplicate information for sites in ***rads1-src.card***
* ***rads2-src-dups.txt*** – provides duplicate information for sites in ***rads2-src.card***
* ***buffer-src-dups.txt*** – provides duplicate information for sites in ***buffer-aq-src.card***

Tool Runner:

The following is the shell script configuration that will be passed as an argument to the Tool Runner for qualified runs:

perl {directory path to repository}/tools/ca-dups/ca-dups.pl path/to/input\_file path/to/output\_file

Code Review:

A code walkthrough was performed by Sara Lindberg on 04/13/2020. No impacts to other repository tools or library dependencies were identified for the DSN tool.

# Requirements Traceability Matrix

Table 1 presents the requirements traceability matrix for the Duplicate Source Nodes tool.

| Table  Requirements Traceability Matrix | | |
| --- | --- | --- |
| **Functional Requirement ID** | **Acceptance Test ID** | **Test Case** |
| QA Level | CACIE-ca-dups-IT-1 | Installation Test |
| FR-1  FR-9 | CACIE-ca-dups-AT-1 | Check that the output files were generated based on the command line arguments. |
| FR-2  FR-4 | CACIE-ca-dups– AT-1 | Verify all sites in an input source card file were written to a corresponding output file. |
| FR-2  FR-4 | CACIE-ca-dups-AT-1 | Verify the number of sources in an input source card file equals the number of sources reported in the corresponding output files. |
| FR-2  FR-5 | CACIE-ca-dups-AT-1 | Verify the total number of source nodes in an input source card file equals the number of source nodes reported in the corresponding output files. |
| FR-6  FR-7 | CACIE-ca-dups-AT-1 | For each site with duplicate source node(s) verify each duplicate site name, source type, and source node indices are recorded to the output file. |
| FR-8 | CACIE-ca-dups-AT-1 | For each site with no duplicate source nodes verify “none” for that site is recorded to the output file. |

# Installation Test Plan and Acceptance Test Plan Cases

The installation test plan for Duplicate Source Nodes is presented in Table 2 and the acceptance test plan cases for Duplicate Source Nodes are presented in Table 3.

| Table  **Duplicate Source Nodes Installation Test Plan** | | | |
| --- | --- | --- | --- |
| **Duplicate Source Nodes Installation Testing**  **CACIE-Duplicate Source Nodes – IT-1** | | **Date:** | |
| **Tool Runner Log File Location for this test:**  **[PUT LINK TO THE DIRECTORY HERE]** | | **Test Performed By: [FIRST & LAST NAME]** | |
| **Testing Directory: [PROVIDE LINK TO TESTING DIRECTORY]** | | | |
| **Test Step** | **Test Instruction** | **Expected Result** | **Test Result  (Pass/Fail)** |
| Tools Code Repository Directory: | | | |
| Navigate to the testing directory | | | |
| 1 | Invoke Tool runner and test the installation of the tool as follows:  *./CACIE\_ca\_dups\_IT-1.sh* | | |
| 2 | Verify Tool Runner is invoked and executed. | Tool runner log file is generated  *(****sources\_dups\_install\_test.log****)* |  |
| 3 | Verify tool is invoked and executed. | ***install\_test-src-dups.txt***file is generated |  |

| Table  **Duplicate Source Nodes Acceptance Test Plan Case 1** | | | |
| --- | --- | --- | --- |
| **Duplicate Source Nodes Acceptance Testing**  **CACIE-Duplicate Source Nodes – AT-1** | | **Date:** | |
| **Tool Runner Log File Location for this test:**  \\olive\backups\CAVE\v4-2Test\mpondDUP\sources\ | | **Test Performed By:** | |
| **Testing Directory:** \\olive\backups\CAVE\v4-2Test\mpondDUP\sources\ | | | |
| **Test Step** | **Test Instruction** | **Expected Result** | **Test Result  (Pass/Fail)** |
| Note, this test uses a source and buffer zone.  Navigate to the Testing Directory. | | | |
| 1 | Verify the following input files and shell script are present in the testing directory:   * ***rads1-src.card*** * ***rads2-src.card*** * ***buffer-aq-src.card*** * ***run-ca-dups.sh***   There is an /extraneous\_files/ folder, and a file titled ***mpond-CA-source-nodes\_apr22020.png***, as well. | The files listed in Test Instruction 1 are present in the testing directory. |  |
| 2 | Open the shell ***run-ca-dups.sh*** and verify the following:   * Line 6 🡪 model=mpondDUP * Line 7  buffer=buffer | The shell is setup accordingly. |  |
| 3 | In a Linux terminal navigate to the testing directory and execute the ***run-ca-dups.sh*** file. Ensure the three output files were produced in the same directory:   * ***rads1-src-dups.txt*** * ***rads2-src-dups.txt*** * ***buffer-src-dups.txt***   Additional file created from the script:   * ***sources\_mpondDUP.log*** | The ***run-ca-dups.sh*** file executes successfully and the list of files in this test instruction were created in the same directory. |  |
| 4 | Open ***rads1-src.card*** and ***rads1-src-dups.txt*** in a preferred text editor. Verify the number of sources reported on line 8 of the ***rads1-src.card*** is the same value reported for the Number of Sources on line 3 in ***rads1-src-dups.txt***. | The number of sources in each file matches. |  |
| 5 | The following Test Steps are to verify that the number source nodes in the input source card file ***rads1-src.card*** equals the value reported in the corresponding output file, ***rads1-src-dups.txt*** . | | |
| 5.1 | Copy and paste the ***rads1-src.card*** file in the same directory and name the file ***rads1-src\_numnodes.txt***. | The ***rads1-src.card*** file was successfully copied, pasted and renamed. |  |
| 5.2 | Open ***rads1-src\_numnodes.txt*** specifically in the Notepad++ program and perform the following steps:   1. Press Ctrl + F to bring up the Find window, then click the tab titled Mark 2. Check the box titled “Bookmark line” and in the Find what: box type # Number of Nodes= 3. Press the Mark All button. This marks every line in this file with the Number of Nodes as a bookmark. 4. Next, in the Find what: box type Solute, *(be sure to include a space after the comma)* 5. Press the Mark All button. This marks every line in this file with the Solute sources as a bookmark. 6. Next, in the Find what: box type Aqueous Volumetric, *(be sure to include a space after the comma)* 7. Press the Mark All button. This marks every line in this file with the Aqueous Volumetric sourcesas a bookmark. 8. Close the Mark window, then click Search 🡪 Bookmark 🡪 Remove Unmarked Lines. This may take a second. 9. Save the file. 10. For each Node **block** and its associated sources (Aqueous Volumetric and Solute), multiply the # Number of Nodes value by the number of sources for that block.     1. For example, if the Number of Nodes value is 10 and there are 4 sources (Aqueous Volumetric, C-14, I-129, and H-3) the total for **that block** would be 40. That equals 40 source nodes **for that block**. 11. Sum the total number of source nodes from the ***rads1-src\_numnodes.txt*** file and report the value in the Test Result cell of this table’s row. | The ***rads1-src\_numnodes.txt*** file was manipulated to only present the requested lines, and the value sum of each line was reported in the Test Result cell of this table’s row.  Expected value is 166. |  |
| 5.3 | Open ***rads1-src-dups.txt*** in a preferred text editor. Verify the summed value from the previous Test Step equals the reported value on line 4, Number of source nodes, in the ***rads1-src-dups.txt*** file. | The number of source nodes summed from ***rads1-src\_numnodes.txt*** and reported on line 4 of ***rads1-src-dups.txt*** are the same.  Both values should be 166. |  |
| 6 | Open ***rads2-src.card*** and ***rads2-src-dups.txt*** in a preferred text editor. Verify the number of sources reported on line 8 of the ***rads2-src.card*** is the same value reported for the Number of Sources on line 3 in ***rads2-src-dups.txt***. | The number of sources in each file matches. |  |
| 7 | The following Test Steps are to verify that the number of source nodes in the input source card file ***rads2-src.card*** equals the value reported in the corresponding output file, ***rads2-src-dups.txt***. | | |
| 7.1 | Copy and paste the ***rads2-src.card*** file in the same directory and name the file ***rads2-src\_numnodes.txt***. | The ***rads2-src.card*** file was successfully copied, pasted and renamed. |  |
| 7.2 | Open ***rads2-src\_numnodes.txt*** in the Notepad++ program and perform the following steps:   1. Press Ctrl + F to bring up the Find window, then click the tab titled Mark 2. Check the box titled “Bookmark line” and in the Find what: box type #Number of Nodes= 3. Press the Mark All button. This marks every line in this file with the Number of Nodes as a bookmark. 4. Next, in the Find what: box type Solute, *(be sure to include a space after the comma)* 5. Press the Mark All button. This marks every line in this file with the Solute sources as a bookmark. 6. Next, in the Find what: box type Aqueous Volumetric, *(be sure to include a space after the comma)* 7. Press the Mark All button. This marks every line in this file with the Aqueous Volumetric source as a bookmark. 8. Close the Mark window, then click Search 🡪 Bookmark 🡪 Remove Unmarked Lines. This may take a second. 9. Save the file. 10. For each Node **block** and its associated sources (Aqueous Volumetric and Solute), multiply the # Number of Nodes value by the number of sources for that block.     1. For example, if the Number of Nodes value is 10 and there are 4 sources (Aqueous Volumetric, C-14, I-129, and H-3) the total for **that block** would be 40. That equals 40 source nodes **for that block**. 11. Sum the total number of source nodes from the ***rads2-src\_numnodes.txt*** file and report the value in the Test Result cell of this table’s row. | The ***rads2-src\_numnodes.txt*** file was manipulated to only present the requested lines, and the value sum of each line was reported in the Test Result cell of this table’s row.  Expected value is 166. |  |
| 7.3 | Open ***rads2-src-dups.txt*** in a preferred text editor. Verify the summed value from the previous Test Step equals the reported value on line 4, Number of source nodes, in the ***rads2-src-dups.txt*** file. | The number of source nodes summed from ***rads2-src\_numnodes.txt*** and reported on line 4 of ***rads2-src-dups.txt*** are the same.  Both values should be 166. |  |
| 8 | Open ***buffer-aq-src.card*** and ***buffer-src-dups.txt*** in a preferred text editor. Verify the number of sources reported on line 8 of the ***buffer-aq-src.card*** is the same value reported for the Number of Sources on line 3 in ***buffer-src-dups.txt***. | The number of sources in each file matches. |  |
| 9 | The following Test Steps are to verify that the number of source nodes in the input source card file ***buffer-aq-src.card*** equals the value reported in the corresponding output file, ***buffer-src-dups.txt***. | | |
| 9.1 | Copy and paste the ***buffer-aq-src.card*** file in the same directory and name the file ***buffer1-src\_numnodes.txt***. | The ***buffer-aq-src.card*** file was successfully copied, pasted and renamed. |  |
| 9.2 | Open ***buffer1-src\_numnodes.txt*** in the Notepad++ program and perform the following steps:   1. Press Ctrl + F to bring up the Find window, then click the tab titled Mark 2. Check the box titled “Bookmark line” and in the Find what: box type #Number of Nodes= 3. Press the Mark All button. This marks every line in this file with the Number of Nodes as a bookmark. 4. Next, in the Find what: box type Solute, *(be sure to include a space after the comma)* 5. Press the Mark All button. This marks every line in this file with the Solute sources as a bookmark. 6. Next, in the Find what: box type Aqueous Volumetric, *(be sure to include a space after the comma)* 7. Press the Mark All button. This marks every line in this file with the Aqueous Volumetric sources as a bookmark. 8. Close the Mark window, then click Search 🡪 Bookmark 🡪 Remove Unmarked Lines. This may take a second. 9. Save the file. 10. For each Node **block** and its associated sources (Aqueous Volumetric and Solute), multiply the # Number of Nodes value against the number of sources for that block.     1. For example, if the Number of Nodes value is 10 and there are 4 sources (Aqueous Volumetric, C-14, I-129, and H-3) the total for **that block** would be 40. That equals 40 source nodes **for that block**. 11. Sum the total number of source nodes from the ***buffer1-aq-src\_numnodes.txt*** file and report the value in the Test Result cell of this table’s row. | The ***buffer1-src\_numnodes.txt*** file was manipulated to only present the requested lines, and the value sum of each line was reported in the Test Result cell of this table’s row.  Expected value is 26. |  |
| 9.3 | Open ***buffer-src-dups.txt*** in a preferred text editor. Verify the summed value from the previous Test Step equals the reported value on line 4, Number of source nodes, in the ***buffer-src-dups.txt*** file. | The number of source nodes summed from ***buffer1-src\_numnodes.txt*** and reported on line 4 of ***buffer-src-dups.txt*** are the same.  Expected values are 26 for both. |  |
| 10 | The following Test Steps are to verify the number of sites in the input source card file ***rads1-src.card*** equals the value reported in the corresponding output file, ***rads1-src-dups.txt***. | | |
| 10.1 | Open ***rads1-src.card*** in the Notepad++ program and perform the following steps:   1. Press Ctrl + F to bring up the Find window. 2. Type in the Find What field # Site = 3. Press the Count button. 4. Record the reported value on the base of the Find window in the Test Result cell of this table’s row. | The ***rads1-src.card*** file was searched to determine the number of # Site = lines, and the count was reported in the Test Result cell of this table’s row.  Expected value is 4. |  |
| 10.2 | Open ***rads1-src-dups.txt*** in the Notepad++ program and perform the following steps:   1. Press Ctrl + F to bring up the Find window. 2. Type in the Find What field Source Name = 3. Press the Count button. 4. Record the reported value on the base of the Find window in the Test Result cell of this table’s row. | The ***rads1-src-dups.txt*** file was searched to determine the number of Source Name = lines, and the count was reported in the Test Result cell of this table’s row.  Expected value is 4. |  |
| 10.3 | Verify the values from the previous two Test Steps equal each other. | The number of sites from ***rads1-src.card*** and ***rads1-src-dups.txt*** match each other.  Both values are expected to be 4. |  |
| 11 | The following Test Steps are to verify the number of sites in the input source card file ***rads2-src.card*** equals the value reported in the corresponding output file, ***rads2-src-dups.txt***. | | |
| 11.1 | Open ***rads2-src.card*** in the Notepad++ program and perform the following steps:   1. Press Ctrl + F to bring up the Find window. 2. Type in the Find What field # Site = 3. Press the Count button. 4. Record the reported value on the base of the Find window in the Test Result cell of this table’s row. | The ***rads2-src.card*** file was searched to determine the number of # Site = lines, and the count was reported in the Test Result cell of this table’s row.  Expected value is 4. |  |
| 11.2 | Open ***rads2-src-dups.txt*** in the Notepad++ program and perform the following steps:   1. Press Ctrl + F to bring up the Find window. 2. Type in the Find What field Source Name = 3. Press the Count button. 4. Record the reported value on the base of the Find window in the Test Result cell of this table’s row. | The ***rads2-src-dups.txt*** file was searched to determine the number of Source Name = lines, and the count was reported in the Test Result cell of this table’s row.  Expected value is 4. |  |
| 11.3 | Verify the values from the previous two Test Steps equal to each other. | The number of sites from ***rads2-src.card*** and ***rads2-src-dups.txt*** match each other.  Both values are expected to be 4. |  |
| 12 | The following Test Steps are to verify the number of sites in the input source card file ***buffer-aq-src.card*** equals the value reported in the corresponding output file, ***buffer-src-dups.txt***. | | |
| 12.1 | Open ***buffer-aq-src.card*** in the Notepad++ program and perform the following steps:   1. Press Ctrl + F to bring up the Find window. 2. Type in the Find What field # Site = 3. Press the Count button. 4. Record the reported value on the base of the Find window in the Test Result cell of this table’s row. | The ***buffer-aq-src.card*** file was searched to determine the number of # Site = lines, and the count was reported in the Test Result cell of this table’s row.  Expected value is 4. |  |
| 12.2 | Open ***buffer-src-dups.txt*** in the Notepad++ program and perform the following steps:   1. Press Ctrl + F to bring up the Find window. 2. Type in the Find What field Source Name = 3. Press the Count button. 4. Record the reported value on the base of the Find window in the Test Result cell of this table’s row. | The ***buffer-src-dups.txt*** file was searched to determine the number of Source Name = lines, and the count was reported in the Test Result cell of this table’s row.  Expected value is 4. |  |
| 12.3 | Verify the values from the previous two Test Steps equal to each other. | The number of sites from ***buffer-aq-src.card*** and ***buffer-src-dups.txt*** match each other.  Expected value for both is 4. |  |
| 13 | The following steps determine if there are duplicate nodes in the ***rads1-src.card*** file and verifies the results using the ***rads1-src-dups.txt*** file. | | |
| 13.1 | Copy and paste the ***rads1-src.card*** file and name the pasted file ***rads1-src\_nodes.txt***. | The ***rads1-src.card*** file was copied, pasted and the product renamed. |  |
| 13.2 | Open ***rads1-src\_nodes.txt*** in the Notepad++ program and perform the following steps:   1. Press Ctrl + F to bring up the Find window, then click the tab titled Mark 2. Check the box titled “Bookmark line” and in the Find what: box type # Site = 3. Press the Mark All button. This marks every line in this file with the site name as a bookmark. 4. Next, in the Find what: box type Solute, *(be sure to include a space after the comma)* 5. Press the Mark All button. This marks every line in this file with the Solute sources as a bookmark. 6. Next, in the Find what: box type Aqueous Volumetric, *(be sure to include a space after the comma)* 7. Press the Mark All button. This marks every line in this file with the Aqueous Volumetric sources as a bookmark. 8. Close the Mark window, then click Search 🡪 Bookmark 🡪 Remove Unmarked Lines. This may take a second. 9. Save the file. | The file, ***rads1-src\_nodes.txt***, was successfully modified and saved. |  |
| 13.3 | For detailed description of the I-, J-, and K-index classification of a site see **Section 1** of this document. In addition, open the ***mpond-CA-source-nodes\_apr22020.png*** in the same directory as the input/output files for visualization of this Test Step.  Verify using the ***rads1-src\_nodes.txt*** file that *SrcSite1* and *SrcSite3* have overlapping nodes in the I-, J-, and K-plane. | Using the file, ***rads1-src\_nodes.txt***, it was determined that *SrcSite1* and *SrcSite3* have overlapping nodes in the I-, J-, and K-planes. |  |
| 13.4 | For detailed description of the I-, J-, and K-index classification of a site see **Section 1** of this document. In addition, open the ***mpond-CA-source-nodes\_apr22020.png*** for visualization of this Test Step.  Verify using the ***rads1-src\_nodes.txt*** file that *SrcSite1* and *SrcSite2* have overlapping nodes only in the I- and J-plane. | Using the file, ***rads1-src\_nodes.txt***, it was determined that *SrcSite1* and *SrcSite2* have overlapping nodes only in the I- and J-planes. |  |
| 13.5 | Open ***rads1-src-dups.txt***. Verify that the *SrcSite1* block reads as follows:  ------------------------  Site Name = SrcSite1  Other Sites with x,y,z, overlap:  some  SrcSite3  Aqueous Volumetric,31,26,312  SrcSite3  Aqueous Volumetric,31,27,312  SrcSite3  Aqueous Volumetric,31,28,312  SrcSite3  Aqueous Volumetric,32,26,312  SrcSite3  Aqueous Volumetric,32,27,312  SrcSite3  Aqueous Volumetric,32,28,312  SrcSite3  Solute,C-14,31,26,312  SrcSite3  Solute,C-14,31,27,312  SrcSite3  Solute,C-14,31,28,312  SrcSite3  Solute,C-14,32,26,312  SrcSite3  Solute,C-14,32,27,312  SrcSite3  Solute,C-14,32,28,312  SrcSite3  Solute,I-129,31,26,312  SrcSite3  Solute,I-129,31,27,312  SrcSite3  Solute,I-129,31,28,312  SrcSite3  Solute,I-129,32,26,312  SrcSite3  Solute,I-129,32,27,312  SrcSite3  Solute,I-129,32,28,312  Verify for the *SrcSite3* block is similar except the presented overlapping site reads *SrcSite1*. | In the file the *SrcSite1* block reads accordingly, and similarly the *SrcSite3* reads accordingly, showing these sites overlap each other in the I-, J-, and K-planes. |  |
| 13.6 | Confirm the observed sites and overlapping nodes in the ***rads1-src\_nodes.txt*** file are the same sites and overlapping nodes presented in the ***rads1-src-dups.txt*** file. These two sites overlap on the I-, J-, and K-planes. | Both ***rads1-src\_nodes.txt*** and ***rads1-src-dups.txt*** files agree the *SrcSite1* and *SrcSite3* sites overlap on the I-, J-, and K-plane. |  |
| 14 | The following steps determine if there are duplicate nodes in the ***rads2-src.card*** file and verifies the results using the ***rads2-src-dups.txt*** file. | | |
| 14.1 | Copy and paste the ***rads2-src.card*** file and name the pasted file ***rads2-src\_nodes.txt***. | The ***rads2-src.card*** file was copied, pasted and the product renamed. |  |
| 14.2 | Open ***rads2-src\_nodes.txt*** in the Notepad++ program and perform the following steps:   1. Press Ctrl + F to bring up the Find window, then click the tab titled Mark 2. Check the box titled “Bookmark line” and in the Find what: box type # Site = 3. Press the Mark All button. This marks every line in this file with the site name as a bookmark. 4. Next, in the Find what: box type Solute, *(be sure to include a space after the comma)* 5. Press the Mark All button. This marks every line in this file with the Solute sources as a bookmark. 6. Next, in the Find what: box type Aqueous Volumetric, *(be sure to include a space after the comma)* 7. Press the Mark All button. This marks every line in this file with the Aqueous Volumetric sources as a bookmark. 8. Close the Mark window, then click Search 🡪 Bookmark 🡪 Remove Unmarked Lines. This may take a second. 9. Save the file. | The file, ***rads2-src\_nodes.txt***, was successfully modified and saved. |  |
| 14.3 | For detailed description of the I-, J-, and K-index classification of a site see **Section 1** of this document. In addition, open the ***mpond-CA-source-nodes\_apr22020.png*** for visualization of this Test Step.  Verify using the ***rads2-src\_nodes.txt*** file that *SrcSite1* and *SrcSite3* have overlapping nodes in the I-, J-, and K-plane. | Using the file, ***rads2-src\_nodes.txt***, it was determined that *SrcSite1* and *SrcSite3* have overlapping nodes in the I-, J-, and K-planes. |  |
| 14.4 | For detailed description of the I-, J-, and K-index classification of a site see **Section 1** of this document. In addition, open the ***mpond-CA-source-nodes\_apr22020.png*** for visualization of this Test Step.  Verify using the ***rads2-src\_nodes.txt*** file that *SrcSite1* and *SrcSite2* have overlapping nodes only in the I- and J-plane. | Using the file, ***rads2-src\_nodes.txt***, it was determined that *SrcSite1* and *SrcSite2* have overlapping nodes only in the I- and J-planes. |  |
| 14.5 | Open ***rads2-src-dups.txt***. Verify that the *SrcSite1* block reads as follows:  ------------------------  Site Name = SrcSite1  Other Sites with x,y,z, overlap:  some  SrcSite3  Aqueous Volumetric,31,26,312  SrcSite3  Aqueous Volumetric,31,27,312  SrcSite3  Aqueous Volumetric,31,28,312  SrcSite3  Aqueous Volumetric,32,26,312  SrcSite3  Aqueous Volumetric,32,27,312  SrcSite3  Aqueous Volumetric,32,28,312  SrcSite3  Solute,U-236,31,26,312  SrcSite3  Solute,U-236,31,27,312  SrcSite3  Solute,U-236,31,28,312  SrcSite3  Solute,U-236,32,26,312  SrcSite3  Solute,U-236,32,27,312  SrcSite3  Solute,U-236,32,28,312  SrcSite3  Solute,U-238,31,26,312  SrcSite3  Solute,U-238,31,27,312  SrcSite3  Solute,U-238,31,28,312  SrcSite3  Solute,U-238,32,26,312  SrcSite3  Solute,U-238,32,27,312  SrcSite3  Solute,U-238,32,28,312  Verify for the *SrcSite3* block is similar except the presented overlapping site reads *SrcSite1*. | In the file the *SrcSite1* block reads accordingly, and similarly the *SrcSite3* reads accordingly, showing these sites overlap each other in the I-, J-, and K-planes. |  |
| 14.6 | Confirm the observed sites and overlapping nodes in the ***rads2-src\_nodes.txt*** file are the same sites and overlapping nodes presented in the ***rads2-src-dups.txt*** file. These two sites overlap on the I-, J-, and K-planes. | Both ***rads2-src\_nodes.txt*** and ***rads2-src-dups.txt*** files agree the *SrcSite1* and *SrcSite3* sites overlap on the I-, J-, and K-plane. |  |
| 15 | The following steps determine if there are duplicate nodes in the ***buffer-aq-src.card*** file and verifies the results using the ***buffer-src-dups.txt*** file. | | |
| 15.1 | Copy and paste the ***buffer-aq-src.card*** file and name the pasted file ***buffer-aq-src\_nodes.txt***. | The ***buffer-aq-src.card*** file was copied, pasted and the product renamed. |  |
| 15.2 | Open ***buffer-aq-src\_nodes.txt*** in the Notepad++ program and perform the following steps:   1. Press Ctrl + F to bring up the Find window, then click the tab titled Mark 2. Check the box titled “Bookmark line” and in the Find what: box type # Site = 3. Press the Mark All button. This marks every line in this file with the Site name as a bookmark. 4. Next, in the Find what: box type Aqueous Volumetric, *(be sure to include a space after the comma)* 5. Press the Mark All button. This marks every line in this file with the Aqueous Volumetric sources as a bookmark. 6. Close the Mark window, then click Search 🡪 Bookmark 🡪 Remove Unmarked Lines. This may take a second. 7. Save the file. | The file, ***buffer-aq-src\_nodes.txt***, was successfully modified and saved. |  |
| 15.3 | For detailed description of the I-, J-, and K-index classification of a site see **Section 1** of this document. In addition, open the ***mpond-CA-source-nodes\_apr22020.png*** for visualization of this Test Step.  Verify using the ***buffer-aq-src\_nodes.txt*** file that *BuffSite1* and *BuffSite3* have overlapping nodes in the I-, J-, and K-plane. | Using the file, ***buffer-aq-src\_nodes.txt***, it was determined that *BuffSite1* and *BuffSite3* have overlapping nodes in the I-, J-, and K-planes. |  |
| 15.4 | For detailed description of the I-, J-, and K-index classification of a site see **Section 1** of this document. In addition, open the ***mpond-CA-source-nodes\_apr22020.png*** for visualization of this Test Step.  Verify using the ***buffer-aq-src\_nodes.txt*** file that *BuffSite1* and *BuffSite2* have overlapping nodes only in the I- and J-plane. | Using the file, ***buffer-aq-src\_nodes.txt***, it was determined that *BuffSite1* and *BuffSite2* have overlapping nodes only in the I- and J-planes. |  |
| 15.5 | Open ***buffer1-aq-src-dups.txt***. Verify that the *BuffSite1* block reads as follows:  ------------------------  Site Name = BuffSite1  Other Sites with x,y,z, overlap:  some  BuffSite3  Aqueous Volumetric,57,25,318  BuffSite3  Aqueous Volumetric,57,26,318  Verify for the *BuffSite3* block is similar except the presented overlapping site reads *BuffSite1*. | In the file the *BuffSite1* block reads accordingly, and similarly the *BuffSite3* reads accordingly, showing these sites overlap each other in the I-, J-, and K-planes. |  |
| 15.6 | Confirm the observed sites and overlapping nodes in the ***buffer-aq-src\_nodes.txt*** file are the same sites and overlapping nodes presented in the ***buffer1-aq-src-dups.txt*** file. These two sites overlap on the I-, J-, and K-planes. | Both ***buffer-aq-src\_nodes.txt*** and ***buffer1-aq-src-dups.txt*** files agree the *BuffSite1* and *BuffSite3* sites overlap on the I-, J- and K-plane. |  |
| 16 | Open ***rads1-src-dups.txt***.  Confirm sites *SrcSite2* and *SrcSite4* have no duplicate nodes and read as follows:  ------------------------  Site Name = SrcSite2  Other Sites with x,y,z overlap:  None  ------------------------  ------------------------  Site Name = SrcSite4  Other Sites with x,y,z overlap:  None  ------------------------ | The sites *SrcSite2* and *SrcSite4* have no duplicate nodes and read accordingly. |  |
| 17 | Open ***rads2-src-dups.txt***.  Confirm sites *SrcSite2* and *SrcSite4* have no duplicate nodes and read as follows:  ------------------------  Site Name = SrcSite2  Other Sites with x,y,z overlap:  None  ------------------------  ------------------------  Site Name = SrcSite4  Other Sites with x,y,z overlap:  None  ------------------------ | The sites *SrcSite2* and *SrcSite4* have no duplicate nodes and read accordingly. |  |
| 18 | Open ***buffer-src-dups.txt***.  Confirm sites *BufSite2* and *BufSite4* have no duplicate nodes and read as follows:  ------------------------  Site Name = BufSite2  Other Sites with x,y,z overlap:  None  ------------------------  ------------------------  Site Name = BufSite4  Other Sites with x,y,z overlap:  None  ------------------------ | The sites *BufSite2* and *BufSite4* have no duplicate nodes and read accordingly. |  |

# Acceptance Test Report

To complete the Acceptance Testing use Appendix A. Acceptance Test 1 (AT-1) is in Table A-1 The Acceptance Test is the M Pond model. AT-1 has both a source zone and buffer zone present and several overlapping sites in both zones. Details of this test, when conducted, by whom, and if it Passed or Failed is in Appendix A.

# User Guide

To run this tool, you will need to pass 2 arguments into it.

1. Path/name of the source card you want to check for duplicates
2. Path/name you want to name the output file

Refer to Section [4](#_Software_Design_Description) of this software management plan for a full description of the required inputs for the DSN tool. It is recommended that a shell script is used to execute the tool. The recommended structure of this shell script is shown below.

TOOL=<path/to/ca\_dups.pl>

INPUTFILE=<path/to/input/file>

OUTPUTFILE=<path/to/output/file>

perl $TOOL $ INPUTFILE $ OUTPUTFILE

# Tool Versions

This section details changes incorporated into each version of the DSN tool.

* 1.0 – Tool was developed.

# Appendix

**Completed Acceptance Test Cases**

**Tool Runner Log**

###Executing Duplicate node Tool###

###Executing Fingerprint Tool###

INFO--04/14/2020 11:46:11 AM--Starting CA-CIE Tool Runner. Logging to "./sources\_mpondDUP.log"

INFO--04/14/2020 11:46:11 AM--Code Version: bb94b8b19268fea89ecc180d9e6e1e670082a299 v2.8: /opt/tools/pylib/runner/runner.py<--1bcfd6779e9cbdb82673405873a8e5e81514ae27

INFO--04/14/2020 11:46:11 AM--Code Version: bb94b8b19268fea89ecc180d9e6e1e670082a299 v2.8: /opt/tools/pylib/fingerprint/fingerprint.py<--e9692a4faec2ee264fe50417b6b6a516ba82b2f6

INFO--04/14/2020 11:46:11 AM--QA Status: QUALIFIED : /opt/tools/pylib/runner/runner.py

INFO--04/14/2020 11:46:11 AM--QA Status: QUALIFIED : /opt/tools/pylib/fingerprint/fingerprint.py

INFO--04/14/2020 11:46:11 AM--Invoking Command:"python3.6" with Arguments:"/opt/tools/pylib/fingerprint/fingerprint.py /home/gtartakovsky/CAVE/v4-2Test/mpondDUP/sources/rads1-src.card --output ./sources\_mpondDUP.log --outputmode a"

INFO--04/14/2020 11:46:11 AM--Username:gtartakovsky Computer:olive Platform:Linux 4.4.0-38-generic #57~14.04.1-Ubuntu SMP Tue Sep 6 17:20:43 UTC 2016

Fingerprint generated at 2020-04-14 11:46:11.286337

/home/gtartakovsky/CAVE/v4-2Test/mpondDUP/sources/rads1-src.card 23b849ffce0e0c3358d7b159b3f9251020b245a6d3cb887563b5de5800ed2c38

###Finished Process###

###Executing Fingerprint Tool###

INFO--04/14/2020 11:46:11 AM--Starting CA-CIE Tool Runner. Logging to "./sources\_mpondDUP.log"

INFO--04/14/2020 11:46:11 AM--Code Version: bb94b8b19268fea89ecc180d9e6e1e670082a299 v2.8: /opt/tools/pylib/runner/runner.py<--1bcfd6779e9cbdb82673405873a8e5e81514ae27

INFO--04/14/2020 11:46:11 AM--Code Version: bb94b8b19268fea89ecc180d9e6e1e670082a299 v2.8: /opt/tools/pylib/fingerprint/fingerprint.py<--e9692a4faec2ee264fe50417b6b6a516ba82b2f6

INFO--04/14/2020 11:46:11 AM--QA Status: QUALIFIED : /opt/tools/pylib/runner/runner.py

INFO--04/14/2020 11:46:11 AM--QA Status: QUALIFIED : /opt/tools/pylib/fingerprint/fingerprint.py

INFO--04/14/2020 11:46:11 AM--Invoking Command:"python3.6" with Arguments:"/opt/tools/pylib/fingerprint/fingerprint.py /home/gtartakovsky/CAVE/v4-2Test/mpondDUP/sources/rads2-src.card --output ./sources\_mpondDUP.log --outputmode a"

INFO--04/14/2020 11:46:11 AM--Username:gtartakovsky Computer:olive Platform:Linux 4.4.0-38-generic #57~14.04.1-Ubuntu SMP Tue Sep 6 17:20:43 UTC 2016

Fingerprint generated at 2020-04-14 11:46:11.532744

/home/gtartakovsky/CAVE/v4-2Test/mpondDUP/sources/rads2-src.card ba7b17999a6e1edd6b4c3e88d30b2c6b12db6c0f1995b6edb196d0605e6811d7

###Finished Process###

###Executing Fingerprint Tool###

INFO--04/14/2020 11:46:11 AM--Starting CA-CIE Tool Runner. Logging to "./sources\_mpondDUP.log"

INFO--04/14/2020 11:46:11 AM--Code Version: bb94b8b19268fea89ecc180d9e6e1e670082a299 v2.8: /opt/tools/pylib/runner/runner.py<--1bcfd6779e9cbdb82673405873a8e5e81514ae27

INFO--04/14/2020 11:46:11 AM--Code Version: bb94b8b19268fea89ecc180d9e6e1e670082a299 v2.8: /opt/tools/pylib/fingerprint/fingerprint.py<--e9692a4faec2ee264fe50417b6b6a516ba82b2f6

INFO--04/14/2020 11:46:11 AM--QA Status: QUALIFIED : /opt/tools/pylib/runner/runner.py

INFO--04/14/2020 11:46:11 AM--QA Status: QUALIFIED : /opt/tools/pylib/fingerprint/fingerprint.py

INFO--04/14/2020 11:46:11 AM--Invoking Command:"python3.6" with Arguments:"/opt/tools/pylib/fingerprint/fingerprint.py /home/gtartakovsky/CAVE/v4-2Test/mpondDUP/sources/buffer-aq-src.card --output ./sources\_mpondDUP.log --outputmode a"

INFO--04/14/2020 11:46:11 AM--Username:gtartakovsky Computer:olive Platform:Linux 4.4.0-38-generic #57~14.04.1-Ubuntu SMP Tue Sep 6 17:20:43 UTC 2016

Fingerprint generated at 2020-04-14 11:46:11.775744

/home/gtartakovsky/CAVE/v4-2Test/mpondDUP/sources/buffer-aq-src.card 4908c60de6087357f06bca0d62b2d7f2e84ef254a7f30514c599064ae25f703e

###Finished Process###

###Executing Duplicate node RAD1 src##

INFO--04/14/2020 11:46:11 AM--Starting CA-CIE Tool Runner. Logging to "./sources\_mpondDUP.log"

INFO--04/14/2020 11:46:11 AM--Code Version: bb94b8b19268fea89ecc180d9e6e1e670082a299 v2.8: /opt/tools/pylib/runner/runner.py<--1bcfd6779e9cbdb82673405873a8e5e81514ae27

INFO--04/14/2020 11:46:11 AM--Code Version: 89e1220b658f59002d6db61a0a645338bd7da731 Local repo SHA-1 has does not correspond to a remote repo release version: ../../../CA-CIE-Tools-TestRepos/repo\_ca-dups.pl/tools/ca-dups/ca-dups.pl<--1c25e6341a415accac25713a72c48bf70cf22d94

INFO--04/14/2020 11:46:11 AM--QA Status: QUALIFIED : /opt/tools/pylib/runner/runner.py

INFO--04/14/2020 11:46:11 AM--QA Status: TEST : ../../../CA-CIE-Tools-TestRepos/repo\_ca-dups.pl/tools/ca-dups/ca-dups.pl

INFO--04/14/2020 11:46:11 AM--Invoking Command:"perl" with Arguments:"../../../CA-CIE-Tools-TestRepos/repo\_ca-dups.pl/tools/ca-dups/ca-dups.pl /home/gtartakovsky/CAVE/v4-2Test/mpondDUP/sources/rads1-src.card /home/gtartakovsky/CAVE/v4-2Test/mpondDUP/sources/rads1-src-dups.txt"

INFO--04/14/2020 11:46:11 AM--Username:gtartakovsky Computer:olive Platform:Linux 4.4.0-38-generic #57~14.04.1-Ubuntu SMP Tue Sep 6 17:20:43 UTC 2016

###Finished Process###

###Executing Duplicate node RAD2 src##

INFO--04/14/2020 11:46:12 AM--Starting CA-CIE Tool Runner. Logging to "./sources\_mpondDUP.log"

INFO--04/14/2020 11:46:12 AM--Code Version: bb94b8b19268fea89ecc180d9e6e1e670082a299 v2.8: /opt/tools/pylib/runner/runner.py<--1bcfd6779e9cbdb82673405873a8e5e81514ae27

INFO--04/14/2020 11:46:12 AM--Code Version: 89e1220b658f59002d6db61a0a645338bd7da731 Local repo SHA-1 has does not correspond to a remote repo release version: ../../../CA-CIE-Tools-TestRepos/repo\_ca-dups.pl/tools/ca-dups/ca-dups.pl<--1c25e6341a415accac25713a72c48bf70cf22d94

INFO--04/14/2020 11:46:12 AM--QA Status: QUALIFIED : /opt/tools/pylib/runner/runner.py

INFO--04/14/2020 11:46:12 AM--QA Status: TEST : ../../../CA-CIE-Tools-TestRepos/repo\_ca-dups.pl/tools/ca-dups/ca-dups.pl

INFO--04/14/2020 11:46:12 AM--Invoking Command:"perl" with Arguments:"../../../CA-CIE-Tools-TestRepos/repo\_ca-dups.pl/tools/ca-dups/ca-dups.pl /home/gtartakovsky/CAVE/v4-2Test/mpondDUP/sources/rads2-src.card /home/gtartakovsky/CAVE/v4-2Test/mpondDUP/sources/rads2-src-dups.txt"

INFO--04/14/2020 11:46:12 AM--Username:gtartakovsky Computer:olive Platform:Linux 4.4.0-38-generic #57~14.04.1-Ubuntu SMP Tue Sep 6 17:20:43 UTC 2016

###Finished Process###

###Executing Duplicate node Buffer##

INFO--04/14/2020 11:46:12 AM--Starting CA-CIE Tool Runner. Logging to "./sources\_mpondDUP.log"

INFO--04/14/2020 11:46:12 AM--Code Version: bb94b8b19268fea89ecc180d9e6e1e670082a299 v2.8: /opt/tools/pylib/runner/runner.py<--1bcfd6779e9cbdb82673405873a8e5e81514ae27

INFO--04/14/2020 11:46:12 AM--Code Version: 89e1220b658f59002d6db61a0a645338bd7da731 Local repo SHA-1 has does not correspond to a remote repo release version: ../../../CA-CIE-Tools-TestRepos/repo\_ca-dups.pl/tools/ca-dups/ca-dups.pl<--1c25e6341a415accac25713a72c48bf70cf22d94

INFO--04/14/2020 11:46:12 AM--QA Status: QUALIFIED : /opt/tools/pylib/runner/runner.py

INFO--04/14/2020 11:46:12 AM--QA Status: TEST : ../../../CA-CIE-Tools-TestRepos/repo\_ca-dups.pl/tools/ca-dups/ca-dups.pl

INFO--04/14/2020 11:46:12 AM--Invoking Command:"perl" with Arguments:"../../../CA-CIE-Tools-TestRepos/repo\_ca-dups.pl/tools/ca-dups/ca-dups.pl /home/gtartakovsky/CAVE/v4-2Test/mpondDUP/sources/buffer-aq-src.card /home/gtartakovsky/CAVE/v4-2Test/mpondDUP/sources/buffer-src-dups.txt"

INFO--04/14/2020 11:46:12 AM--Username:gtartakovsky Computer:olive Platform:Linux 4.4.0-38-generic #57~14.04.1-Ubuntu SMP Tue Sep 6 17:20:43 UTC 2016

###Finished Process###

###Executing Fingerprint Tool###

INFO--04/14/2020 11:46:12 AM--Starting CA-CIE Tool Runner. Logging to "./sources\_mpondDUP.log"

INFO--04/14/2020 11:46:12 AM--Code Version: bb94b8b19268fea89ecc180d9e6e1e670082a299 v2.8: /opt/tools/pylib/runner/runner.py<--1bcfd6779e9cbdb82673405873a8e5e81514ae27

INFO--04/14/2020 11:46:12 AM--Code Version: bb94b8b19268fea89ecc180d9e6e1e670082a299 v2.8: /opt/tools/pylib/fingerprint/fingerprint.py<--e9692a4faec2ee264fe50417b6b6a516ba82b2f6

INFO--04/14/2020 11:46:12 AM--QA Status: QUALIFIED : /opt/tools/pylib/runner/runner.py

INFO--04/14/2020 11:46:12 AM--QA Status: QUALIFIED : /opt/tools/pylib/fingerprint/fingerprint.py

INFO--04/14/2020 11:46:12 AM--Invoking Command:"python3.6" with Arguments:"/opt/tools/pylib/fingerprint/fingerprint.py /home/gtartakovsky/CAVE/v4-2Test/mpondDUP/sources/rads1-src-dups.txt --output ./sources\_mpondDUP.log --outputmode a"

INFO--04/14/2020 11:46:12 AM--Username:gtartakovsky Computer:olive Platform:Linux 4.4.0-38-generic #57~14.04.1-Ubuntu SMP Tue Sep 6 17:20:43 UTC 2016

Fingerprint generated at 2020-04-14 11:46:12.566482

/home/gtartakovsky/CAVE/v4-2Test/mpondDUP/sources/rads1-src-dups.txt ff801555883a0a84e9270732834d43ee11a91d1340bc284185a3890f81af6517

###Finished Process###

###Executing Fingerprint Tool###

INFO--04/14/2020 11:46:12 AM--Starting CA-CIE Tool Runner. Logging to "./sources\_mpondDUP.log"

INFO--04/14/2020 11:46:12 AM--Code Version: bb94b8b19268fea89ecc180d9e6e1e670082a299 v2.8: /opt/tools/pylib/runner/runner.py<--1bcfd6779e9cbdb82673405873a8e5e81514ae27

INFO--04/14/2020 11:46:12 AM--Code Version: bb94b8b19268fea89ecc180d9e6e1e670082a299 v2.8: /opt/tools/pylib/fingerprint/fingerprint.py<--e9692a4faec2ee264fe50417b6b6a516ba82b2f6

INFO--04/14/2020 11:46:12 AM--QA Status: QUALIFIED : /opt/tools/pylib/runner/runner.py

INFO--04/14/2020 11:46:12 AM--QA Status: QUALIFIED : /opt/tools/pylib/fingerprint/fingerprint.py

INFO--04/14/2020 11:46:12 AM--Invoking Command:"python3.6" with Arguments:"/opt/tools/pylib/fingerprint/fingerprint.py /home/gtartakovsky/CAVE/v4-2Test/mpondDUP/sources/rads2-src-dups.txt --output ./sources\_mpondDUP.log --outputmode a"

INFO--04/14/2020 11:46:12 AM--Username:gtartakovsky Computer:olive Platform:Linux 4.4.0-38-generic #57~14.04.1-Ubuntu SMP Tue Sep 6 17:20:43 UTC 2016

Fingerprint generated at 2020-04-14 11:46:12.789780

/home/gtartakovsky/CAVE/v4-2Test/mpondDUP/sources/rads2-src-dups.txt f49aa2e1ab1cbb48e4093e0c6efaccb2d8d0291d21fd7ea0d235b3a79b04f38b

###Finished Process###

###Executing Fingerprint Tool###

INFO--04/14/2020 11:46:12 AM--Starting CA-CIE Tool Runner. Logging to "./sources\_mpondDUP.log"

INFO--04/14/2020 11:46:12 AM--Code Version: bb94b8b19268fea89ecc180d9e6e1e670082a299 v2.8: /opt/tools/pylib/runner/runner.py<--1bcfd6779e9cbdb82673405873a8e5e81514ae27

INFO--04/14/2020 11:46:12 AM--Code Version: bb94b8b19268fea89ecc180d9e6e1e670082a299 v2.8: /opt/tools/pylib/fingerprint/fingerprint.py<--e9692a4faec2ee264fe50417b6b6a516ba82b2f6

INFO--04/14/2020 11:46:12 AM--QA Status: QUALIFIED : /opt/tools/pylib/runner/runner.py

INFO--04/14/2020 11:46:12 AM--QA Status: QUALIFIED : /opt/tools/pylib/fingerprint/fingerprint.py

INFO--04/14/2020 11:46:12 AM--Invoking Command:"python3.6" with Arguments:"/opt/tools/pylib/fingerprint/fingerprint.py /home/gtartakovsky/CAVE/v4-2Test/mpondDUP/sources/buffer-src-dups.txt --output ./sources\_mpondDUP.log --outputmode a"

INFO--04/14/2020 11:46:12 AM--Username:gtartakovsky Computer:olive Platform:Linux 4.4.0-38-generic #57~14.04.1-Ubuntu SMP Tue Sep 6 17:20:43 UTC 2016

Fingerprint generated at 2020-04-14 11:46:12.982288

/home/gtartakovsky/CAVE/v4-2Test/mpondDUP/sources/buffer-src-dups.txt 5b80a8da2d5e8bb0d6cb3a94cf255bdf1b873189b97b78bd0b7db1b1850da27b

###Finished Process###

| Table A-1  **Duplicate Source Nodes Acceptance Test Plan Case 1** | | | |
| --- | --- | --- | --- |
| **Duplicate Source Nodes Acceptance Testing**  **CACIE-Duplicate Source Nodes – AT-1** | | **Date: 04/14/2020** | |
| **Tool Runner Log File Location for this test:**  \\olive\backups\CAVE\v4-2Test\mpondDUP\sources\ | | **Test Performed By: Guzel Tartakovsky** | |
| **Testing Directory:** \\olive\backups\CAVE\v4-2Test\mpondDUP\sources\ | | | |
| **Test Step** | **Test Instruction** | **Expected Result** | **Test Result  (Pass/Fail)** |
| Note, this test uses a source and buffer zone.  Navigate to the Testing Directory. | | | |
| 1 | Verify the following input files and shell script are present in the testing directory:   * ***rads1-src.card*** * ***rads2-src.card*** * ***buffer-aq-src.card*** * ***run-ca-dups.sh***   There is an /extraneous\_files/ folder, and a file titled ***mpond-CA-source-nodes\_apr22020.png***, as well. | The files listed in Test Instruction 1 are present in the testing directory. | PASS |
| 2 | Open the shell ***run-ca-dups.sh*** and verify the following:   * Line 6 🡪 model=mpondDUP * Line 7  buffer=buffer | The shell is set up accordingly. | PASS |
| 3 | In a Linux terminal navigate to the testing directory and execute the ***run-ca-dups.sh*** file. Ensure the three output files were produced in the same directory:   * ***rads1-src-dups.txt*** * ***rads2-src-dups.txt*** * ***buffer-src-dups.txt***   Additional file created from the script:   * ***sources\_mpondDUP.log*** | The ***run-ca-dups.sh*** file executes successfully and the list of files in this test instruction were created in the same directory. | PASS |
| 4 | Open ***rads1-src.card*** and ***rads1-src-dups.txt*** in a preferred text editor. Verify the number of sources reported on line 8 of the ***rads1-src.card*** is the same value reported for the Number of Sources on line 3 in ***rads1-src-dups.txt***. | The number of sources in each file matches. | PASS |
| 5 | The following Test Steps are to verify that the total number of source nodes in the input source card file ***rads1-src.card*** equals the value reported in the corresponding output file, ***rads1-src-dups.txt*** . | | |
| 5.1 | Copy and paste the ***rads1-src.card*** file in the same directory and name the file ***rads1-src\_numnodes.txt***. | The ***rads1-src.card*** file was successfully copied, pasted and renamed. | PASS |
| 5.2 | Open ***rads1-src\_numnodes.txt*** specifically in the Notepad++ program and perform the following steps:   1. Press Ctrl + F to bring up the Find window, then click the tab titled Mark 2. Check the box titled “Bookmark line” and in the Find what: box type # Number of Nodes= 3. Press the Mark All button. This marks every line in this file with the Number of Nodes as a bookmark. 4. Next, in the Find what: box type Solute, *(be sure to include a space after the comma)* 5. Press the Mark All button. This marks every line in this file with the Solute source as a bookmark. 6. Next, in the Find what: box type Aqueous Volumetric, *(be sure to include a space after the comma)* 7. Press the Mark All button. This marks every line in this file with the Aqueous Volumetric source as a bookmark. 8. Close the Mark window, then click Search 🡪 Bookmark 🡪 Remove Unmarked Lines. This may take a second. 9. Save the file. 10. For each Node **block** and its associated sources (Aqueous Volumetric and Solute), multiply the # Number of Nodes value by the number of sources for that block.     1. For example, if the Number of Nodes value is 10 and there are 4 sources (Aqueous Volumetric, C-14, I-129, and H-3) the total for **that block** would be 40. That equals 40 source nodes **for that block**. 11. Sum the total number of source nodes from the ***rads1-src\_numnodes.txt*** file and report the value in the Test Result cell of this table’s row. | The ***rads1-src\_numnodes.txt*** file was manipulated to only present the requested lines, and the value sum of each line was reported in the Test Result cell of this table’s row.  Expected value is 166. | The total number of source nodes has been calculated using the procedure provided in Test Step 5.2:  18x3 + 18x3 + 18x3 +4x1 = 166  PASS |
| 5.3 | Open ***rads1-src-dups.txt*** in a preferred text editor. Verify the summed value from the previous Test Step equals the reported value on line 4, Number of source nodes, in the ***rads1-src-dups.txt*** file. | The number of source nodes summed from ***rads1-src\_numnodes.txt*** and reported on line 4 of ***rads1-src-dups.txt*** are the same.  Both values should be 166. | The total number of source nodes in both files is equal to 166.  PASS |
| 6 | Open ***rads2-src.card*** and ***rads2-src-dups.txt*** in a preferred text editor. Verify the number of sources reported on line 8 of the ***rads2-src.card*** is the same value reported for the Number of Sources on line 3 in ***rads2-src-dups.txt***. | The number of sources in each file matches. | PASS |
| 7 | The following Test Steps are to verify the total number of source nodes in the input source card file ***rads2-src.card*** equals the value reported in the corresponding output file, ***rads2-src-dups.txt***. | | |
| 7.1 | Copy and paste the ***rads2-src.card*** file in the same directory and name the file ***rads2-src\_numnodes.txt***. | The ***rads2-src.card*** file was successfully copied, pasted and renamed. | PASS |
| 7.2 | Open ***rads2-src\_numnodes.txt*** in the Notepad++ program and perform the following steps:   1. Press Ctrl + F to bring up the Find window, then click the tab titled Mark 2. Check the box titled “Bookmark line” and in the Find what: box type #Number of Nodes= 3. Press the Mark All button. This marks every line in this file with the Number of Nodes as a bookmark. 4. Next, in the Find what: box type Solute, *(be sure to include a space after the comma)* 5. Press the Mark All button. This marks every line in this file with the Solute sources as a bookmark. 6. Next, in the Find what: box type Aqueous Volumetric, *(be sure to include a space after the comma)* 7. Press the Mark All button. This marks every line in this file with the Aqueous Volumetric source as a bookmark. 8. Close the Mark window, then click Search 🡪 Bookmark 🡪 Remove Unmarked Lines. This may take a second. 9. Save the file. 10. For each Node **block** and its associated sources (Aqueous Volumetric and Solute), multiply the # Number of Nodes value against the number of sources for that block.     1. For example, if the Number of Nodes value is 10 and there are 4 sources (Aqueous Volumetric, C-14, I-129, and H-3) the total for **that block** would be 40. That equals 40 source nodes **for that block**. 11. Sum the total number of source nodes from the ***rads2-src\_numnodes.txt*** file and report the value in the Test Result cell of this table’s row. | The ***rads2-src\_numnodes.txt*** file was manipulated to only present the requested lines, and the value sum of each line was reported in the Test Result cell of this table’s row.  Expected value is 166. | The total number of source nodes has been calculated using the procedure provided in Test Step 7.2:  18x3 + 18x3 + 18x3 +4x1 = 166  PASS |
| 7.3 | Open ***rads2-src-dups.txt*** in a preferred text editor. Verify the summed value from the previous Test Step equals the reported value on line 4, Number of source nodes, in the ***rads2-src-dups.txt*** file. | The number of source nodes summed from ***rads2-src\_numnodes.txt*** and reported on line 4 of ***rads2-src-dups.txt*** are the same.  Both values should be 166. | PASS  The total number of source nodes in both files is equal to 166. |
| 8 | Open ***buffer-aq-src.card*** and ***buffer-src-dups.txt*** in a preferred text editor. Verify the number of sources reported on line 8 of the ***buffer-aq-src.card*** is the same value reported for the Number of Sources on line 3 in ***buffer-src-dups.txt***. | The number of sources in each file matches. | PASS |
| 9 | The following Test Steps are to verify the total number of source nodes in the input source card file ***buffer-aq-src.card*** equals the value reported in the corresponding output file, ***buffer-src-dups.txt***. | | |
| 9.1 | Copy and paste the ***buffer-aq-src.card*** file in the same directory and name the file ***buffer1-src\_numnodes.txt***. | The ***buffer-aq-src.card*** file was successfully copied, pasted and renamed. | PASS |
| 9.2 | Open ***buffer1-src\_numnodes.txt*** in the Notepad++ program and perform the following steps:   1. Press Ctrl + F to bring up the Find window, then click the tab titled Mark 2. Check the box titled “Bookmark line” and in the Find what: box type #Number of Nodes= 3. Press the Mark All button. This marks every line in this file with the Number of Nodes as a bookmark. 4. Next, in the Find what: box type Solute, *(be sure to include a space after the comma)* 5. Press the Mark All button. This marks every line in this file with the Solute sources as a bookmark. There should be zero Solute sources in this file. 6. Next, in the Find what: box type Aqueous Volumetric, *(be sure to include a space after the comma)* 7. Press the Mark All button. This marks every line in this file with the Aqueous Volumetric source as a bookmark. 8. Close the Mark window, then click Search 🡪 Bookmark 🡪 Remove Unmarked Lines. This may take a second. 9. Save the file. 10. For each Node **block** and its associated sources (Aqueous Volumetric and Solute), multiply the # Number of Nodes value against the number of sources for that block.     1. For example, if the Number of Nodes value is 10 and there are 4 sources (Aqueous Volumetric, C-14, I-129, and H-3) the total for **that block** would be 40. That equals 40 source nodes **for that block**. 11. Sum the total number of source nodes from the ***buffer1-aq-src\_numnodes.txt*** file and report the value in the Test Result cell of this table’s row. | The ***buffer1-src\_numnodes.txt*** file was manipulated to only present the requested lines, and the value sum of each line was reported in the Test Result cell of this table’s row.  Expected value is 26. | PASS  The total number of source nodes has been calculated using the procedure provided in Test Step 9.2:  8x1 + 8x1 + 8x1 +2x1 = 26 |
| 9.3 | Open ***buffer-src-dups.txt*** in a preferred text editor. Verify the summed value from the previous Test Step equals the reported value on line 4, Number of source nodes, in the ***buffer-src-dups.txt*** file. | The number of source nodes summed from ***buffer1-src\_numnodes.txt*** and reported on line 4 of ***buffer-src-dups.txt*** are the same.  Expected values are 26 for both. | PASS  The total number of source nodes in both files is equal to 26. |
| 10 | The following Test Steps are to verify the number of sites in the input source card file ***rads1-src.card*** equals the value reported in the corresponding output file, ***rads1-src-dups.txt***. | | |
| 10.1 | Open ***rads1-src.card*** in the Notepad++ program and perform the following steps:   1. Press Ctrl + F to bring up the Find window. 2. Type in the Find What field # Site = 3. Press the Count button. 4. Record the reported value on the base of the Find window in the Test Result cell of this table’s row. | The ***rads1-src.card*** file was searched to determine the number of # Site = lines, and the count was reported in the Test Result cell of this table’s row.  Expected value is 4. | The total count of # Site = appearances in this file is 4.  PASS |
| 10.2 | Open ***rads1-src-dups.txt*** in the Notepad++ program and perform the following steps:   1. Press Ctrl + F to bring up the Find window. 2. Type in the Find What field Source Name = 3. Press the Count button. 4. Record the reported value on the base of the Find window in the Test Result cell of this table’s row. | The ***rads1-src-dups.txt*** file was searched to determine the number of Source Name = lines, and the count was reported in the Test Result cell of this table’s row.  Expected value is 4. | The total count of Source Name= appearances in this file is 4.  PASS |
| 10.3 | Verify the values from the previous two Test Steps equal each other. | The number of sites from ***rads1-src.card*** and ***rads1-src-dups.txt*** match each other.  Both values are expected to be 4. | The total number of sites in both files is equal to 4.  PASS |
| 11 | The following Test Steps are to verify the number of sites in the input source card file ***rads2-src.card*** equals the value reported in the corresponding output file, ***rads2-src-dups.txt***. | | |
| 11.1 | Open ***rads2-src.card*** in the Notepad++ program and perform the following steps:   1. Press Ctrl + F to bring up the Find window. 2. Type in the Find What field # Site = 3. Press the Count button. 4. Record the reported value on the base of the Find window in the Test Result cell of this table’s row. | The ***rads2-src.card*** file was searched to determine the number of # Site = lines, and the count was reported in the Test Result cell of this table’s row.  Expected value is 4. | PASS  The total number of #Site= occurrences in this file is 4. |
| 11.2 | Open ***rads2-src-dups.txt*** in the Notepad++ program and perform the following steps:   1. Press Ctrl + F to bring up the Find window. 2. Type in the Find What field Source Name = 3. Press the Count button. 4. Record the reported value on the base of the Find window in the Test Result cell of this table’s row. | The ***rads2-src-dups.txt*** file was searched to determine the number of Source Name = lines, and the count was reported in the Test Result cell of this table’s row.  Expected value is 4. | PASS  The total number of Source Name= occurrences in this file is 4. |
| 11.3 | Verify the values from the previous two Test Steps equal each other. | The number of sites from ***rads2-src.card*** and ***rads2-src-dups.txt*** match each other.  Both values are expected to be 4. | The total number of sites in both files is equal to 4.  PASS |
| 12 | The following Test Steps are to verify the number of sites in the input source card file ***buffer-aq-src.card*** equals the value reported in the corresponding output file, ***buffer-src-dups.txt***. | | |
| 12.1 | Open ***buffer-aq-src.card*** in the Notepad++ program and perform the following steps:   1. Press Ctrl + F to bring up the Find window. 2. Type in the Find What field # Site = 3. Press the Count button. 4. Record the reported value on the base of the Find window in the Test Result cell of this table’s row. | The ***buffer-aq-src.card*** file was searched to determine the number of # Site = lines, and the count was reported in the Test Result cell of this table’s row.  Expected value is 4. | PASS  The total number of #Site = occurrences in this file is 4. |
| 12.2 | Open ***buffer-src-dups.txt*** in the Notepad++ program and perform the following steps:   1. Press Ctrl + F to bring up the Find window. 2. Type in the Find What field Source Name = 3. Press the Count button. 4. Record the reported value on the base of the Find window in the Test Result cell of this table’s row. | The ***buffer-src-dups.txt*** file was searched to determine the number of Source Name = lines, and the count was reported in the Test Result cell of this table’s row.  Expected value is 4. | PASS  The total number of Source Name = occurrences in this file is equal to 4. |
| 12.3 | Verify the values from the previous two Test Steps equal each other. | The number of sites from ***buffer-aq-src.card*** and ***buffer-src-dups.txt*** match each other.  Expected value for both is 4. | PASS  The total number of sites in both files is equal to 4. |
| 13 | The following steps determine if there are duplicate nodes in the ***rads1-src.card*** file and verifies the results using the ***rads1-src-dups.txt*** file. | | |
| 13.1 | Copy and paste the ***rads1-src.card*** file and name the pasted file ***rads1-src\_nodes.txt***. | The ***rads1-src.card*** file was copied, pasted and the product renamed. | PASS |
| 13.2 | Open ***rads1-src\_nodes.txt*** in the Notepad++ program and perform the following steps:   1. Press Ctrl + F to bring up the Find window, then click the tab titled Mark 2. Check the box titled “Bookmark line” and in the Find what: box type # Site = 3. Press the Mark All button. This marks every line in this file with the source site as a bookmark. 4. Next, in the Find what: box type Solute, *(be sure to include a space after the comma)* 5. Press the Mark All button. This marks every line in this file with the Solute source as a bookmark. 6. Next, in the Find what: box type Aqueous Volumetric, *(be sure to include a space after the comma)* 7. Press the Mark All button. This marks every line in this file with the Aqueous Volumetric source as a bookmark. 8. Close the Mark window, then click Search 🡪 Bookmark 🡪 Remove Unmarked Lines. This may take a second. 9. Save the file. | The file, ***rads1-src\_nodes.txt***, was successfully modified and saved. | PASS |
| 13.3 | For detailed description of the I-, J-, and K-index classification of a site see **Section 1** of this document. In addition, open the ***mpond-CA-source-nodes\_apr22020.png*** in the same directory as the input/output files for visualization of this Test Step.  Verify using the ***rads1-src\_nodes.txt*** file that *SrcSite1* and *SrcSite3* have overlapping nodes in the I-, J-, and K-plane. | Using the file, ***rads1-src\_nodes.txt***, it was determined that *SrcSite1* and *SrcSite3* have overlapping nodes in the I-, J-, and K-planes. | PASS |
| 13.4 | For detailed description of the i-, j-, and k-index classification of a site see **Section 1** of this document. In addition, open the ***mpond-CA-source-nodes\_apr22020.png*** for visualization of this Test Step.  Verify using the ***rads1-src\_nodes.txt*** file that *SrcSite1* and *SrcSite2* have overlapping nodes only in the I- and J-plane. | Using the file, ***rads1-src\_nodes.txt***, it was determined that *SrcSite1* and *SrcSite2* have overlapping nodes only in the I- and J-planes. | PASS |
| 13.5 | Open ***rads1-src-dups.txt***. Verify that the *SrcSite1* block reads as follows:  ------------------------  Site Name = SrcSite1  Other Sites with x,y,z, overlap:  some  SrcSite3  Aqueous Volumetric,31,26,312  SrcSite3  Aqueous Volumetric,31,27,312  SrcSite3  Aqueous Volumetric,31,28,312  SrcSite3  Aqueous Volumetric,32,26,312  SrcSite3  Aqueous Volumetric,32,27,312  SrcSite3  Aqueous Volumetric,32,28,312  SrcSite3  Solute,C-14,31,26,312  SrcSite3  Solute,C-14,31,27,312  SrcSite3  Solute,C-14,31,28,312  SrcSite3  Solute,C-14,32,26,312  SrcSite3  Solute,C-14,32,27,312  SrcSite3  Solute,C-14,32,28,312  SrcSite3  Solute,I-129,31,26,312  SrcSite3  Solute,I-129,31,27,312  SrcSite3  Solute,I-129,31,28,312  SrcSite3  Solute,I-129,32,26,312  SrcSite3  Solute,I-129,32,27,312  SrcSite3  Solute,I-129,32,28,312  Verify for the *SrcSite3* block is similar except the presented overlapping site reads *SrcSite1*. | In the file the *SrcSite1* block reads accordingly, and similarly the *SrcSite3* reads accordingly, showing these sites overlap each other in the I-, J-, and K-planes. | PASS |
| 13.6 | Confirm the observed sites and overlapping nodes in the ***rads1-src\_nodes.txt*** file are the same sites and overlapping nodes presented in the ***rads1-src-dups.txt*** file. These two sites overlap on the I-, J-, and K-planes. | Both ***rads1-src\_nodes.txt*** and ***rads1-src-dups.txt*** files agree the *SrcSite1* and *SrcSite3* sites overlap on the I-, J-, and K-plane. | PASS |
| 14 | The following steps determine if there are duplicate nodes in the ***rads2-src.card*** file and verifies the results using the ***rads2-src-dups.txt*** file. | | |
| 14.1 | Copy and paste the ***rads2-src.card*** file and name the pasted file ***rads2-src\_nodes.txt***. | The ***rads2-src.card*** file was copied, pasted and the product renamed. | PASS |
| 14.2 | Open ***rads2-src\_nodes.txt*** in the Notepad++ program and perform the following steps:   1. Press Ctrl + F to bring up the Find window, then click the tab titled Mark 2. Check the box titled “Bookmark line” and in the Find what: box type # Site = 3. Press the Mark All button. This marks every line in this file with the source site as a bookmark. 4. Next, in the Find what: box type Solute, *(be sure to include a space after the comma)* 5. Press the Mark All button. This marks every line in this file with the solute source as a bookmark. 6. Next, in the Find what: box type Aqueous Volumetric, *(be sure to include a space after the comma)* 7. Press the Mark All button. This marks every line in this file with the Aqueous volumetric source as a bookmark. 8. Close the Mark window, then click Search 🡪 Bookmark 🡪 Remove Unmarked Lines. This may take a second. 9. Save the file. | The file, ***rads2-src\_nodes.txt***, was successfully modified and saved. | PASS |
| 14.3 | For detailed description of the I-, J-, and K-index classification of a site see **Section 1** of this document. In addition, open the ***mpond-CA-source-nodes\_apr22020.png*** for visualization of this Test Step.  Verify using the ***rads2-src\_nodes.txt*** file that *SrcSite1* and *SrcSite3* have overlapping nodes in the I-, J-, and K-plane. | Using the file, ***rads2-src\_nodes.txt***, it was determined that *SrcSite1* and *SrcSite3* have overlapping nodes in the I-, J-, and K-planes. | PASS |
| 14.4 | For detailed description of the I-, J-, and K-index classification of a site see **Section 1** of this document. In addition, open the ***mpond-CA-source-nodes\_apr22020.png*** for visualization of this Test Step.  Verify using the ***rads2-src\_nodes.txt*** file that *SrcSite1* and *SrcSite2* have overlapping nodes only in the I- and J-plane. | Using the file, ***rads2-src\_nodes.txt***, it was determined that *SrcSite1* and *SrcSite2* have overlapping nodes only in the I- and J-planes. | PASS |
| 14.5 | Open ***rads2-src-dups.txt***. Verify that the *SrcSite1* block reads as follows:  ------------------------  Site Name = SrcSite1  Other Sites with x,y,z, overlap:  some  SrcSite3  Aqueous Volumetric,31,26,312  SrcSite3  Aqueous Volumetric,31,27,312  SrcSite3  Aqueous Volumetric,31,28,312  SrcSite3  Aqueous Volumetric,32,26,312  SrcSite3  Aqueous Volumetric,32,27,312  SrcSite3  Aqueous Volumetric,32,28,312  SrcSite3  Solute,U-236,31,26,312  SrcSite3  Solute,U-236,31,27,312  SrcSite3  Solute,U-236,31,28,312  SrcSite3  Solute,U-236,32,26,312  SrcSite3  Solute,U-236,32,27,312  SrcSite3  Solute,U-236,32,28,312  SrcSite3  Solute,U-238,31,26,312  SrcSite3  Solute,U-238,31,27,312  SrcSite3  Solute,U-238,31,28,312  SrcSite3  Solute,U-238,32,26,312  SrcSite3  Solute,U-238,32,27,312  SrcSite3  Solute,U-238,32,28,312  Verify for the *SrcSite3* block is similar except the presented overlapping site reads *SrcSite1*. | In the file the *SrcSite1* block reads accordingly, and similarly the *SrcSite3* reads accordingly, showing these sites overlap each other in the I-, J-, and K-planes. | PASS |
| 14.6 | Confirm the observed sites and overlapping nodes in the ***rads2-src\_nodes.txt*** file are the same sites and overlapping nodes presented in the ***rads2-src-dups.txt*** file. These two sites overlap on the I-, J-, and K-planes. | Both ***rads2-src\_nodes.txt*** and ***rads2-src-dups.txt*** files agree the *SrcSite1* and *SrcSite3* sites overlap on the I-, J-, and K-plane. | PASS |
| 15 | The following steps determine if there are duplicate nodes in the ***buffer-aq-src.card*** file and verifies the results using the ***buffer-src-dups.txt*** file. | | |
| 15.1 | Copy and paste the ***buffer-aq-src.card*** file and name the pasted file ***buffer-aq-src\_nodes.txt***. | The ***buffer-aq-src.card*** file was copied, pasted and the product renamed. | PASS |
| 15.2 | Open ***buffer-aq-src\_nodes.txt*** in the Notepad++ program and perform the following steps:   1. Press Ctrl + F to bring up the Find window, then click the tab titled Mark 2. Check the box titled “Bookmark line” and in the Find what: box type # Site = 3. Press the Mark All button. This marks every line in this file with the source site as a bookmark. 4. Next, in the Find what: box type Aqueous Volumetric, *(be sure to include a space after the comma)* 5. Press the Mark All button. This marks every line in this file with Aqueous Volumetric sources as a bookmark. 6. Close the Mark window, then click Search 🡪 Bookmark 🡪 Remove Unmarked Lines. This may take a second. 7. Save the file. | The file, ***buffer-aq-src\_nodes.txt***, was successfully modified and saved. | PASS |
| 15.3 | For detailed description of the I-, J-, and K-index classification of a site see **Section 1** of this document. In addition, open the ***mpond-CA-source-nodes\_apr22020.png*** for visualization of this Test Step.  Verify using the ***buffer-aq-src\_nodes.txt*** file that *BuffSite1* and *BuffSite3* have overlapping nodes in the I-, J-, and K-plane. | Using the file, ***buffer-aq-src\_nodes.txt***, it was determined that *BuffSite1* and *BuffSite3* have overlapping nodes in the I-, J-, and K-planes. | PASS |
| 15.4 | For detailed description of the I-, J-, and K-index classification of a site see **Section 1** of this document. In addition, open the ***mpond-CA-source-nodes\_apr22020.png*** for visualization of this Test Step.  Verify using the ***buffer-aq-src\_nodes.txt***  file that *BuffSite1* and *BuffSite2* have overlapping nodes only in the I- and J-plane. | Using the file, ***buffer-aq-src\_nodes.txt***, it was determined that *BuffSite1* and *BuffSite2* have overlapping nodes only in the I- and J-planes. | PASS |
| 15.5 | Open ***buffer1-aq-src-dups.txt***. Verify that the *BuffSite1* block reads as follows:  ------------------------  Site Name = BuffSite1  Other Sites with x,y,z, overlap:  some  BuffSite3  Aqueous Volumetric,57,25,318  BuffSite3  Aqueous Volumetric,57,26,318  Verify for the *BuffSite3* block is similar except the presented overlapping site reads *BuffSite1*. | In the file the *BuffSite1* block reads accordingly, and similarly the *BuffSite3* reads accordingly, showing these sites overlap each other in the I-, J-, and K-planes. | PASS |
| 15.6 | Confirm the observed sites and overlapping nodes in the ***buffer-aq-src\_nodes.txt*** file are the same sites and overlapping nodes presented in the ***buffer1-aq-src-dups.txt*** file. These two sites overlap on the I-, J-, and K-planes. | Both ***buffer-aq-src\_nodes.txt*** and ***buffer1-aq-src-dups.txt*** files agree the *BuffSite1* and *BuffSite3* sites overlap on the I-, J- and K-plane. | PASS |
| 16 | Open ***rads1-src-dups.txt***.  Confirm sites *SrcSite2* and *SrcSite4* have no duplicate nodes and read as follows:  ------------------------  Site Name = SrcSite2  Other Sites with x,y,z overlap:  None  ------------------------  ------------------------  Site Name = SrcSite4  Other Sites with x,y,z overlap:  None  ------------------------ | The sites *SrcSite2* and *SrcSite4* have no duplicate nodes and read accordingly. | PASS |
| 17 | Open ***rads2-src-dups.txt***.  Confirm sites *SrcSite2* and *SrcSite4* have no duplicate nodes and read as follows:  ------------------------  Site Name = SrcSite2  Other Sites with x,y,z overlap:  None  ------------------------  ------------------------  Site Name = SrcSite4  Other Sites with x,y,z overlap:  None  ------------------------ | The sites *SrcSite2* and *SrcSite4* have no duplicate nodes and read accordingly. | PASS |
| 18 | Open ***buffer-src-dups.txt***.  Confirm sites *BufSite2* and *BufSite4* have no duplicate nodes and read as follows:  ------------------------  Site Name = BufSite2  Other Sites with x,y,z overlap:  None  ------------------------  ------------------------  Site Name = BufSite4  Other Sites with x,y,z overlap:  None  ------------------------ | The sites *BufSite2* and *BufSite4* have no duplicate nodes and read accordingly. | PASS |

# Appendix

**Completed Installation Test**

| Table B-1  **Duplicate Source Nodes Installation Test Plan** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Duplicate Source Nodes Installation Testing**  **CACIE-Duplicate Source Nodes – IT-1** | | | **Date:** | | |
| **Tool Runner Log File Location for this test:**  **[PUT LINK TO THE DIRECTORY HERE]** | | | **Test Performed By: [FIRST & LAST NAME]** | | |
| **Testing Directory: [PROVIDE LINK TO TESTING DIRECTORY]** | | | | | |
| **Test Step** | **Test Instruction** | | **Expected Result** | **Test Result  (Pass/Fail)** | |
| Tools Code Repository Directory: | | | | | |
| Navigate to the testing directory | | | | | |
| 1 | Invoke Tool runner and test the installation of the tool as follows:  *./CACIE\_ca\_dups\_IT-1.sh* | | | | |
| 2 | Verify Tool Runner is invoked and executed. | Tool runner log file is generated  *(****sources\_dups\_install\_test.log****)* | | |  |
| 3 | Verify tool is invoked and executed. | ***install\_test-src-dups.txt***file is generated | | |  |