Excel Calculator Workflow

This Document describes the workflow to use the various Excel Calculator Modules(Module)[1]. An R script was developed to download Report Management System (RMS) and electronic Water Rights Information Management System (eWRIMS) flat files and format these data into tables that can be read by their corresponding Excel Calculator Module. Please note: the Priority Date Calculator Module must be run first to ensure that the other Modules run correctly.

1. **Save a local copy of each Module located in the** Data Processing Modules **Folder.**
2. **The QAQC R Script will produce a CSV file for each Module containing the relevant eWRIMS/RMS data**. You will need to open each Module, find the orange data input fields, and paste those corresponding fields from the appropriate CSV files. This process is shown in steps 3-8 below.

3. **Review each Module and take note of the sheets and tabs present. For example, this Module contains a Description, Module Calculator (filename), and a Data Dictionary sheet.**

File Name	Location	Description	Source Files	Table Structure	Action
Spreadsheet file name	*Final location*	*Briefly describe the intent of the process / flag.*	*Which flat files was the data derived from?*	*How are the records organized? (by Application, by Report, by month, etc)*	*What action items result from this process / flag?*
DuplicateMonths_Years	TBD	Identify water rights with duplicate values reported for multiple months in year of annual report	water_use_report.csv	Report and Year/Month	Remove annual report(s)

Figure 1: The Module general description in the Description sheet

LEGEND of COLOR CODING	
Color	**Meaning**
	Paste new data here
	Manually Entered Values
	Formulas - FILL DOWN, BUT DON'T MODIFY
	Results of calculations

Figure 2: The Legend in the Description Sheet

INFO:	INPUT DATA FOR SPREADSHEET - FROM FLAT FILES				
ACTION:	PASTE NEW INPUT DATA FROM [NAME OF SCRIPT] SCRIPT HERE - DELETE SA				
APPLICATION	WATER_RIGHT_ID	YEAR	MONTH	AMOUNT	DIVERSION_TYPE

Figure 3: Preview of the Input tabs (orange highlight) in the Module Calculator (filename) sheet

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[1] There are seven Modules included the Priority Date; Missing RMS Reports; Beneficial Use and Return Flow; Duplicate Values – Months and Years; Duplicate Diversion for Multiple Water Rights; Diversion Out of Season; and Statistics, Diversion Exceeds Face Value, and Unit Conversion Modules.

FORMULA - INTERMEDIATE CALCULATION			
FILL DOWN FORMULA - DO NOT MODIFY FORMULA			
TotalMonthlyDiverted	AnnualReportedTotalDirect	AnnualTotalStorage	AnnualTotalDiversion

Figure 4: Preview of the Intermediate Calculation tabs (grey highlight) in the Module Calculator (filename) sheet

FINAL RESULTS - DUPLICATE MONTHS_YEARS			
FILL DOWN FORMULA - DO NOT MODIFY FORMULA - USE THESE RESULTS FOR QAQC - REFER TO DESCRIPTION			
NumberOfOccurencesWithinSingleReport	OccurencesAcrossReports		

Figure 5: Preview of the Results tab (blue highlight) in the Module Calculator (filename) sheet

4. **For each QAQC R Script Output CSV, copy the input data from the CSV and paste into their respective Modules making sure column headings match.**

APPLICATI	WATER_RI	YEAR	MONTH	AMOUNT	DIVERSION_TYPE

Figure 6: Input Column Headers

ACTION:	PASTE NEW INPUT DATA FROM [NAME OF SCRIPT] SCRIPT HERE - DELETE SA

APPLICATION	WATER_RIGHT_ID	YEAR	MONTH	AMOUNT	DIVERSION_TYPE

Figure 7: Module Calculator Input Headers

NOTE: The ExpectedDemand_Input_Table Module includes two steps. Paste input data into Step 1, which is then converted to a pivot table in Step 2.

5. **Before performing calculations, on the Excel tabs, click "Formulas", look at the right-hand side, select "Calculation Options" drop down and select "Manual".**
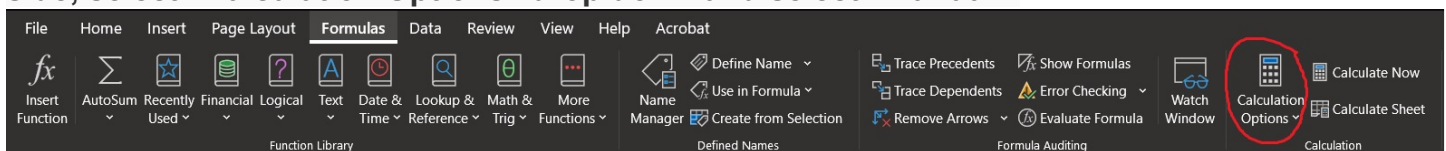

Figure 8: Excel tab showing Calculation Options

6. **Move over to the grey headings mentioned in Step 2 and fill down the formulas in the first cell and fill it down to the last row entry. Repeat until all grey tabs are filled down. Then, click "Calculate Now" (refer to Step 4 for figure). (NOTE: depending on the number of entries in the input file, the calculation process may take a significant amount of time.**

FORMULA - INTERMEDIATE CALCULATION

FILL DOWN FORMULA - DO NOT MODIFY FORMULA

TotalMonthlyDiverted	AnnualReportedTotalDirect	AnnualTotalStorage	AnnualTotalDiversion
0	15.72	0	15.72
2.465922528	6.781286952	6.781286952	13.5625739
2.1	13.5	0	13.5
0	15.72	0	15.72
0	15.72	0	15.72
1.8	13.5	0	13.5
0	13.5	0	13.5
0	6.77	0	6.77
0	13.5	0	13.5
2.1	13.5	0	13.5
1.232961264	6.781286952	6.781286952	13.5625739
0	6.77	0	6.77
2.465922528	6.781286952	6.781286952	13.5625739
2.9	13.5	0	13.5
0	6.77	0	6.77
2.465922528	6.781286952	6.781286952	13.5625739
0.6	11.2	0	11.2
2.465922528	6.781286952	6.781286952	13.5625739
0	15.72	0	15.72

Figure 9: Calculation section example of filling down the formula

7. **For the blue colored headings, repeat Step 6 to fill down the formulas then hit "Calculate Now" to get the final results from the Module Calculator.**

FINAL RESULTS - DUPLICATE MONTHS_YEARS
FILL DOWN FORMULA - DO NOT MODIFY FORMULA - USE THESE RESULTS FOR QAQC - REFER TO DESCRIPTION

NumberOfOccurencesWithinSingleReport	OccurencesAcrossReports
0	1
0	1
0	1
0	1
0	1
0	1
0	1
0	2
0	1
0	1
0	1
0	2
0	1
1	1
0	2
5	1
1	1
5	1
0	1
1	1
1	1
0	2
5	2
0	2
1	1

Figure 10: Final Results section example of filling down the formula to get the final result

8. **Copy the "Final Results" section of each Module as values only into their corresponding sheets in the "QAQC Working file."**

APPLICATION_NUMBER	WATER_RIGHT_TYPE	PRIORITY_DATE	APPLICATION_RECD_DATE	APPLICATION_ACCEPTANCE_DATE	SUB_TYPE	YEAR_DIVERSION_COMMENCED	ASSIGNED_PRIORITY_DATE	ASSIGNED_PRIORIT
298	A001983	Appropriative				8/26/1920	NA	
411	A002723	Appropriative		1/16/1922		1/16/1922	NA	
442	A002928	Appropriative				7/14/1922	NA	
539	A003421	Appropriative				5/16/1923	NA	
568	A003565	Appropriative				8/3/1923	NA	
576	A003601	Appropriative				8/20/1923	NA	
755	A004307	Appropriative		11/7/1924		11/7/1924	NA	
756	A004308	Appropriative		11/7/1924		11/7/1924	NA	
889	A004832	Appropriative				11/12/1925	NA	
1274	A006464	Appropriative				10/21/1929	NA	
1318	A006642	Appropriative				4/16/1930	NA	
1354	A006805A	Appropriative				9/26/1930	NA	
1366	A006854	Appropriative				12/26/1930	NA	
1367	A006855	Appropriative				12/26/1930	NA	
1824	A008974	Appropriative				5/17/1937	NA	
2084	A009832A	Appropriative		2/20/1940		2/20/1940	NA	
2085	A009832B	Appropriative				2/20/1940	NA	
2647	A011383	Appropriative				4/23/1946	NA	
2838	A011846	Appropriative				4/28/1947	NA	
3020	A012232	Appropriative		1/8/1948		1/8/1948	NA	
3127	A012525	Appropriative				5/27/1948	NA	
3246	A012850	Appropriative				12/6/1958	NA	
3277	A012919A	Appropriative				1/28/1949	NA	
3278	A012919B	Appropriative		1/28/1949		1/28/1949	NA	
3292	A012951	Appropriative				2/24/1949	NA	
3294	A012958	Appropriative				3/3/1949	NA	
3322	A013030A	Appropriative				4/18/1949	NA	
3323	A013030B	Appropriative				4/18/1949	NA	

PriorityDate | MissingRMS | BeneficialUse_ReturnFlow | Duplicate_MonthsYears | Duplicate_SameOwnerMultiWR | ... + :

Figure 11: Tab selected (red circle to emphasize selected tab, make sure the correct one is selected)

9. **Use the Data Processing Module Tabs of the QAQC Working File to identify errors or other changes that need to be made. Use the QAQC Suggested Review Guidelines document for considerations to make when evaluating the results of the Data Processing Modules. If it's determined that any changes need to made, overwrite the corresponding data field in the Master Demand Table within the QA/QC Working file and update the three QA/QC action columns to document whether a change was made, what the specific change was, and the reason for the change.**

QAQC_ACTION_TAKEN_Y_N	CHANGE_MADE	REASON_FOR_CHANGE

Figure 12: Example of the manual QAQC fields in the Master Demand Table tab within the QAQC Working File.