A Review of Stormwater Quality Modelling Tools and How They Compare to MUSIC

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Background

MUSIC is NOT and Industry Standard.

MUSIC **inputs** and **outputs/results**

Are the Industry Standard.

How do we verify that tools responsible for billions of dollars worth of assets are appropriate?

Current Best Practice and Authority Guidelines

MUSIC-type inputs (catchment areas, treatments, etc.)

Some form/type of mathematical engine. This engine can be the MUSIC engine or an alternative

Outputs similar to MUSIC

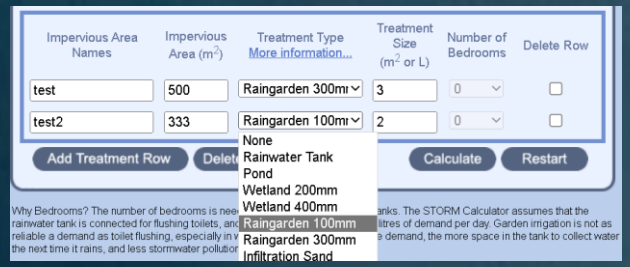
Background

STORM can comply with “Industry Standard”.

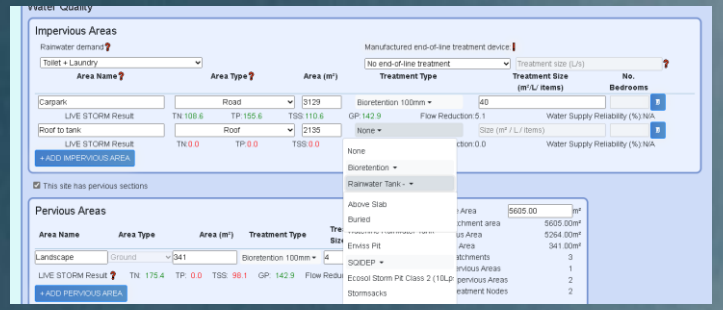
InSite Water can comply with “Industry Standard”.

STORMupdated can comply with “Industry Standard”.

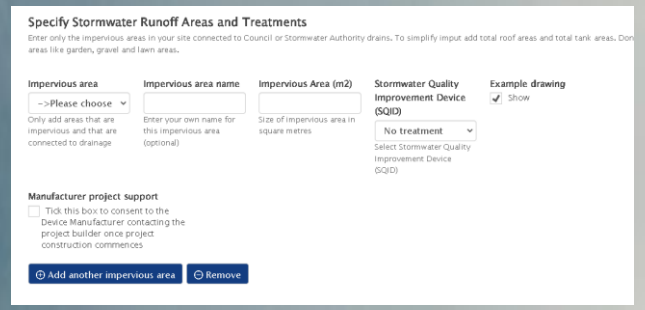
STORM



STORMupdated Calculator



InSite Water



Some form/type of mathematical engine. This engine can be the MUSIC engine or an alternative

Outputs similar to MUSIC

Cleanstormwater

STORM vs InSite vs STORMupdated vs MUSIC input interface

Problem

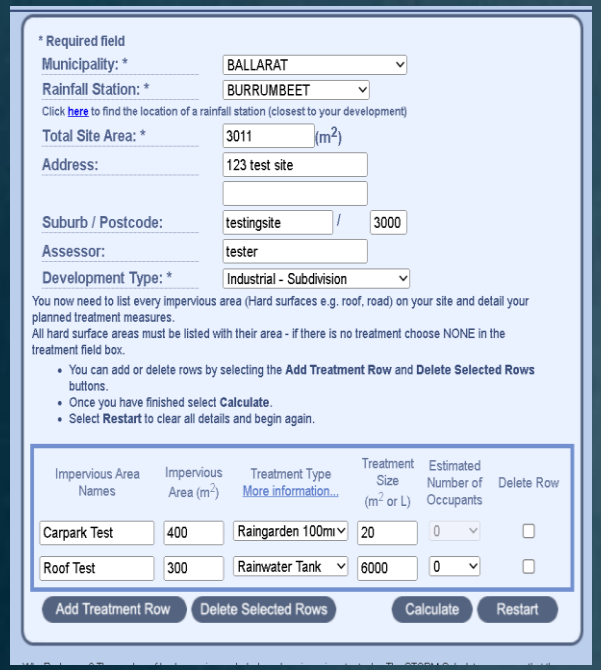
Are these tools:

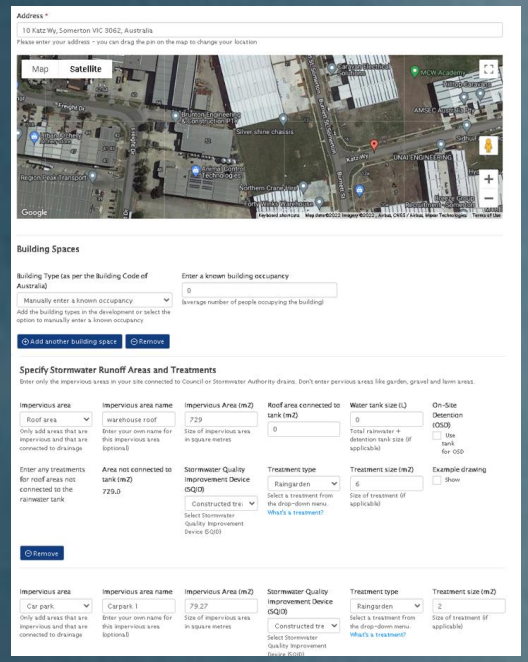
STORM

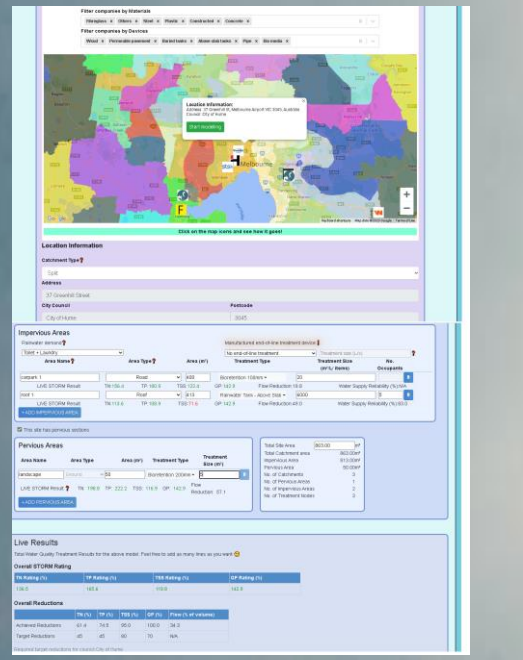
InSite Water

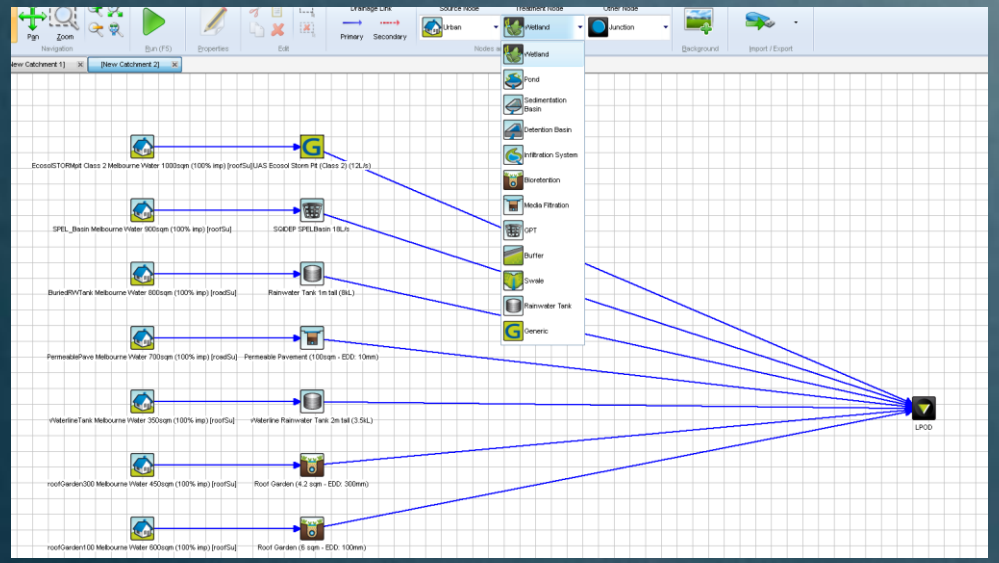
STORMupdated

Complying with current Industry Standard?









Cleanstormwater

STORM and STORMupdated vs MUSIC input interface

Analysis

STORM

and

STORMupdated

Compared to same models built by MUSIC

STORM Assumptions:

1. Rainfall impact is negligible – STORM rainfall data doesn't comply with the Guidelines,
2. Difference between mixed and roof/road/landscape is not relevant,
3. Permeable areas are not relevant and
4. Total Nitrogen is the hardest to remove pollutant.

STORMupdated Assumptions:

None.

InSite Assumptions

1. Rainfall can be modified significantly – Insite rainfall data doesn't comply with the Guidelines,
2. Difference between mixed and roof/road/landscape is not relevant,
3. Permeable areas are not relevant and
4. Total Nitrogen is the hardest to remove pollutant.

STORM and STORMupdated vs MUSIC input interface

Analysis

STORM

and

STORMupdated

Compared to same models built by MUSIC

Analysis:

1. Models built appropriately in MUSIC (following Guidelines) vs STORM vs STORMupdated
   - Comparison with and without permeable areas
2. Models built only with Mixed nodes
   - Comparison with and without permeable areas

Rainwater Tank Demand was set at 20L/person/day, as it is confirmed in STORM.

Comparison – models created as per Guidelines

Project Identifier	Council	Address	Total Area (sqm)	Impervious Areas	Size (sqm)	Treatment	Catchment Type	STORM	STORMupdated (no perv)			MUSIC (no perv)			STORMupdated (w perv)			MUSIC (w perv)			Pervious Area	Difference (no pervious)				Difference (pervious)			
																						MUSIC & STORM	MUSIC and STORMupdated			MUSIC & STORM	MUSIC and STORMupdated		
								TN	TN	TP	TSS	TN	TP	TSS	TN	TP	TSS	TN	TP	TSS		TN	TN	TP	TSS	TN	TN	TP	TSS
101	Campaspe	127 Stawell Echuca VIC 3564	996	Roof 1	155.00	Rainwater Tank 3,000L 2Broom	Split	99.67	75.20	98.70	85.30	80.44	105.11	87.25	63.30	85.90	76.90	66.22	90.22	78.88	406.00	-19.23	5.24	6.41	1.95	-33.45	2.92	4.32	1.97
				Roof 2	130.00	Rainwater Tank 3,000L 2Broom																								
				Roof 3	130.00	Rainwater Tank 3,000L 2Broom																								
				Unit Driveway	30.00	Bioretention100mm1.3sqm																								
				Common Driveway	115.00	Bioretention100mm1.3sqm																								
				Common Driveway	30.00	N/A																								
103	Campaspe	2 Despatch Street Echuca VIC 3564	3456	Bldg 1	500.00	Rainwater Tank15,000L 5Broom	Split	100.11	66.60	105.30	92.40	65.11	103.56	91.50	56.00	93.40	85.20	56.22	92.22	86.00	1221.00	-19.23	-1.49	-1.74	-0.90	-43.89	0.22	-1.18	0.80
				Bldg 2	500.00	Rainwater Tank15,000L 5Broom																								
				Bldg 3	500.00	Rainwater Tank15,000L OBroom																								
				Drive	735.00	Bioretention100mm5sqm																								
148	Surf Coast Shire	12 Gairloch Avenue Jan Juc VIC 3228	292.5	Roof 1	145.00	Rainwater Tank 2,000L 3Broom	Split	104.58	97.50	119.00	105.30	98.44	124.89	106.88	88.50	109.90	104.00	87.56	115.33	105.38	118.50	-6.14	0.94	5.89	1.58	-17.02	-0.94	5.43	1.38
				Paving	29.00	Bioretention100mm1sqm																								
151	Surf Coast Shire	3 Regal Road Jan Juc VIC 3228	586	Unit 1 Roof	157.00	Rainwater Tank 4000L 4Broom	Split	109.55	95.80	61.90	27.00	92.44	61.33	22.88	87.20	56.80	26.60	83.11	56.89	22.63	232.00	-17.11	-3.36	-0.57	-4.13	-26.44	-4.09	0.09	-3.98
				Unit 1 Paved	5.00	N/A																								
				Unit 1 Driveway	15.00	N/A																								
				Unit 2 Roof	157.00	Rainwater Tank 4000L 4Broom																								
				Unit 2 Paved	5.00	N/A																								
				Unit 2 Driveway	15.00	N/A																								
184	Hume	56 Stanhope Street Broadmeadows VIC	695	Unit 1	95.00	Rainwater Tank 1000L 3Broom	Split	101.70	92.20	56.10	17.00	94.67	61.11	17.63	83.10	51.70	16.80	82.67	57.00	17.38	295.50	-7.03	2.47	5.01	0.63	-19.03	-0.43	5.30	0.57
				Unit 2	74.80	Rainwater Tank 1000L 3Broom																								
				Unit 3	74.80	Rainwater Tank 1000L 3Broom																								
				Unit 4	75.70	Rainwater Tank 1000L 3Broom																								
				Impervious Surfaces	79.20	N/A																								
189	Hume	143 McKell Avenue Sunbury VIC	607	Unit 1	166.05	Rainwater Tank 3,000L 3Broom	Split	100.28	78.10	65.30	57.49	80.22	77.33	64.75	66.20	57.70	52.60	68.44	63.33	57.99	289.51	-20.06	1.52	12.03	7.35	-31.84	2.24	6.63	4.40
				Unit 2	151.44	Rainwater Tank 3,000L 2Broom																								
207	Hume	10 Katz Wy, Somerton VIC 3062, Australia	1226	Warehouse Roof	729.00	Raingarden100mm 6sqm	Split	106.42	98.40	105.80	99.90	102.00	107.11	101.50	95.90	104.00	99.70	98.89	105.33	101.25	181.43	-4.42	3.60	1.31	1.60	-7.53	2.99	1.33	1.55
				Carpark 1	79.27	Raingarden100mm 2sqm																								
				Carpark 2	219.00	Raingarden100mm 2sqm																								
				Untreated	17.30	N/A																								
621	Ballarat	45 Victoria Street Sebastopol VIC 3350	977	Roof	475.00	Raingarden 300mm 7.6sqm	Split	99.60	104.00	22.40	19.30	107.33	21.33	20.00	86.60	19.60	19.00	86.00	18.67	19.63	357.00	7.73	3.33	-1.07	0.70	-13.60	-0.60	-0.93	-0.63
				Driveway	145.00	N/A																								
623	Ballarat	419a York Street Ballarat East 3350 VIC	4763	Roof Areas	1,645.00	Rainwater Tank 24000L 30Broom	Split	99.71	86.40	120.40	96.80	89.78	124.44	98.00	69.90	106.70	95.50	69.33	109.78	96.63	1938.00	-9.93	3.38	4.04	1.20	-30.38	-0.57	3.08	1.13
				Driveway	1,030.00	Raingarden100mm18sqm																								
				Pavement	150.00	N/A																								

Comparison – models created as per Guidelines

Analysis

STORM

and

STORMupdated

Compare the results to same models built in MUSIC – SPLIT nodes, as per Guidelines

These models are created with “split” nodes approach, and include analysis with and without the permeable area.

Analysis:

1. The red cells show where STORM or STORMupdated results are less than MUSIC
2. The green cells show areas where STORMupdated performance results are same or more conservative than MUSIC

Comments:

1. STORM fails all the projects on one or more pollutant
2. STORM fails most of the projects on TN
3. TSS appears to be the hardest pollutant to remove
4. Permeable areas appear to make a relevant impact.
5. STORMupdated results are more appropriate than MUSIC results for very small areas.

	Difference (no pervious)				Difference (pervious)			
Pervious Area	MUSIC & STORM	MUSIC and STORMupdated			MUSIC & STORM	MUSIC and STORMupdated		
	TN	TN	TP	TSS	TN	TN	TP	TSS
406.00	-19.23	5.24	6.41	1.95	-33.45	2.92	4.32	1.97
1221.00	-19.23	-1.49	-1.74	-0.90	-43.89	0.22	-1.18	0.80
118.50	-6.14	0.94	5.89	1.58	-17.02	-0.94	5.43	1.38
232.00	-17.11	-3.36	-0.57	-4.13	-26.44	-4.09	0.09	-3.98
295.50	-7.03	2.47	5.01	0.63	-19.03	-0.43	5.30	0.57
289.51	-20.06	1.52	12.03	7.35	-31.84	2.24	6.63	4.40
181.43	-4.42	3.60	1.31	1.60	-7.53	2.99	1.33	1.55
357.00	7.73	3.33	-1.07	0.70	-13.60	-0.60	-0.93	-0.63
1938.00	-9.93	3.38	4.04	1.20	-30.38	-0.57	3.08	1.13

Comparison – models created with MIXED nodes

Project Identifier	Council	Address	Total Area (sqm)	Impervious Areas	Size (sqm)	Treatment	Catchment Type	STORM	STORMupdated (no peru)			MUSIC (no peru)			STORMupdated (w peru)			MUSIC (w peru)			Pervious Area	Difference (no pervious)				Difference (pervious)			
																						MUSIC & STORM	MUSIC and STORMupdated			MUSIC & STORM	MUSIC and STORMupdated		
								TN	TN	TP	TSS	TN	TP	TSS	TN	TP	TSS	TN	TP	TSS		TN	TN	TP	TSS	TN	TN	TP	TSS
148	Surf Coast Shire	12 Gairloch Avenue Jan Juc VIC 3228	292.5	Roof 1	145.00	Rainwater Tank 2,000L 3Broom	Mixed	104.58	102.90	130.20	90.40	102.67	132.22	91.13	97.00	126.30	89.70	97.56	128.44	90.50	118.50	-1.91	-0.23	2.02	0.73	-7.02	0.56	2.14	0.80
				Paving	29.00	Bioretention 100mm 1sqm																							
184	Hume	56 Stanhope Street Broadmeadows VIC	695	Unit 1	95.00	Rainwater Tank 1000L 3Broom	Mixed	101.70	78.90	96.90	62.50	81.11	100.22	63.88	69.50	90.10	61.30	71.78	93.78	62.75	295.50	-20.59	2.21	3.32	1.38	-29.92	2.28	3.68	1.45
				Unit 2	74.80	Rainwater Tank 1000L 3Broom																							
				Unit 3	74.80	Rainwater Tank 1000L 3Broom																							
				Unit 4	75.70	Rainwater Tank 1000L 3Broom																							
				Impervious Surfaces	79.20	N/A																							
189	Hume	143 McKell Avenue Sunbury VIC	607	Unit 1	166.05	Rainwater Tank 3,000L 3Broom	Mixed	100.28	78.90	116.70	83.80	81.33	122.44	85.25	74.40	110.00	82.30	74.00	116.00	83.75	289.51	-18.95	2.43	5.74	1.45	-26.28	-0.40	6.00	1.45
				Unit 2	151.44	Rainwater Tank 3,000L 2Broom																							
207	Hume	10 Katz Wy, Somerton VIC 3062, Australia	1226	Warehouse Roof	729.00	Raingarden 100mm 6sqm	Mixed	106.42	96.50	126.50	100.20	99.11	127.56	101.75	94.60	125.00	99.80	97.33	126.22	101.38	181.43	-7.31	2.61	1.06	1.55	-9.09	2.73	1.22	1.57
				Carpark 1	79.27	Raingarden 100mm 2sqm																							
				Carpark 2	219.00	Raingarden 100mm 2sqm																							
				Untreated	17.30	N/A																							
621	Ballarat	45 Victoria Street Sebastopol VIC 3350	977	Roof	475.00	Raingarden 300mm 7.6sqm	Mixed	99.60	116.20	117.20	90.20	117.33	115.11	90.00	104.40	110.50	89.10	106.22	108.89	89.13	357.00	[redacted]	13	-2.09	-0.20	6.62	1.82	-1.61	0.03
				Driveway	145.00	N/A																							
623	Ballarat	419a York Street Ballarat East VIC 3350	4763	Roof Areas	1,645.00	Rainwater Tank 24000L 30Broom	Mixed	99.71	97.60	120.60	90.00	99.56	123.78	90.75	86.00	112.50	88.70	88.44	116.00	89.63	1938.00	-0.15	1.96	3.18	0.75	-11.27	2.44	3.50	0.92
				Driveway	1,030.00	Raingarden 100mm 18sqm																							
				Pavement	150.00	N/A																							
1399	City of Melbourne	Unit 1 45 Albert Street East Melbourne VIC 3002	170	Roof	101.10	Rainwater Tank 2000L 2Broom	Mixed	102.00	77.40	116.90	84.50	81.11	123.56	86.88	68.90	109.30	82.90	72.67	116.00	85.38	68.90	-20.89	3.71	6.66	2.38	-29.33	3.77	6.70	2.47
1401	Glen Eira	10-16 SELWYN ST ELSTERNWICK VIC 3185	5600	Roof Area South	825.00	Rainwater Tank 30000L 100Broom	Mixed	104.30	92.40	106.90	65.10	95.78	110.22	67.25	88.20	104.10	64.60	91.78	107.56	66.88	1165.00	-8.52	3.38	3.32	2.15	-12.52	3.58	3.46	2.28
				Roof Area North	2,270.00	Rainwater Tank 40000L 100Broom																							
				Remaining Impervious Untreated	1,340.00	N/A																							
1404	Melbourne	36-58 Macaulay Road North Melbourne VIC	2784	Roof Catchment Area	1,400.00	Rainwater Tank 60000L 80Broom	Mixed	100.04	95.30	103.50	61.90	95.11	106.44	65.63	93.50	102.3	61.70	92.22	104.67	65.38	405.00	-4.93	-0.19	2.94	3.73	-7.82	-1.28	2.37	3.68
				Remaining Impervious Untreated	979.00	N/A																							
1423	Melbourne	64 Clarendon Street Southbank VIC 3006	412	Roof Catchment Incl Terrace	293.00	Rainwater Tank 5000L 100Broom	Mixed	105.68	133.10	131.00	76.80	133.78	134.00	76.38	132.00	130.70	76.80	133.78	134.00	76.38	10.00	28.1	0.68	3.00	-0.42	1.78	1.78	3.30	-0.42
				Remaining Impervious	109.00	N/A																							

Comparison – models created with Mixed nodes

Analysis

STORM

and

STORMupdated

Compare the results to same models built in MUSIC – MIXED nodes

These models are created with “mixed” nodes approach, and include analysis with and without the permeable area.

Analysis:

1. The red cells show where STORM or STORMupdated results are less than MUSIC
2. The green cells show areas where STORMupdated performance results are same or more conservative than MUSIC

Comments:

1. STORM fails all the projects on one or more pollutant, EVEN ON MIXED
2. STORM fails most of the projects on TN
3. TSS appears to be the hardest pollutant to remove
4. Permeable areas appear to make a relevant impact.
5. STORMupdated results are slightly conservative compared to MUSIC.

	Difference (no pervious)				Difference (pervious)			
Pervious Area	MUSIC & STORM	MUSIC and STORMupdated			MUSIC & STORM	MUSIC and STORMupdated		
	TN	TN	TP	TSS	TN	TN	TP	TSS
118.50	-1.91	-0.23	2.02	0.73	-7.02	0.56	2.14	0.80
295.50	-20.59	2.21	3.32	1.38	-29.92	2.28	3.68	1.45
289.51	-18.95	2.43	5.74	1.45	-26.28	-0.40	6.00	1.45
181.43	-7.31	2.61	1.06	1.55	-9.09	2.73	1.22	1.57
357.00		1.13	-2.09	-0.20	6.62	1.82	-1.61	0.03
1938.00	-0.15	1.96	3.18	0.75	-11.27	2.44	3.50	0.92
68.90	-20.89	3.71	6.66	2.38	-29.33	3.77	6.70	2.47
1165.00	-8.52	3.38	3.32	2.15	-12.52	3.58	3.46	2.28
406.00	-4.93	-0.19	2.94	3.73	-7.82	-1.28	2.37	3.68
10.00	28.1	0.68	3.00	-0.42	1.78	1.78	3.30	-0.42

Cleanstormwater

Comparison – models created per Guidelines w 60Lpd RWT demand

Project Identifier	Council	Address	Total Area (sqm)	Impervious Areas	Size (sqm)	Treatment	Catchment Type	STORMupdated (no perv)			MUSIC (no perv)			Pervious Area	InSite	Rainfall Location	STORMupdated vs InSite	MUSIC vs InSite
								TN	TP	TSS	TN	TP	TSS		TN			
1605	Boroondara	1 Studley Park Road Kew VIC 3101	538.00	All Roof Areas	343.00	RainwaterTank7000L50BRx3	'Split'	136.00	78.60	15.10	135.78	71.78	15.25	21.00	133.00	2.00	3.00	2.78
				Other Impervious Area	174.00	N/A												
1697	Port Philip	13 Wilton Grove Elwood VIC 3184	748.00	Roof existing building	123.00	RainwaterTank3800L3BRx3	'Split'	116.70	80.80	37.20	119.33	81.56	39.00	130.00	126.00	2.00	-9.30	-6.67
				Roof apartment building including roof terrace	228.00	RainwaterTank7000L10BRx3												
				Driveway adjacent to existing building	66.00	Raingarden300mm11.9sqm												
				Remaining Impermeable area	201.00	n/a												
2166	Kingston	119 Beach Road Parkdale VIC 3195	1015.00	Roof Areas	527.00	RainwaterTank17500 15BRx3	'Split'	129.00	80.40	20.20	131.33	80.89	20.50	332.00	83.00	16.00	46.00	48.33
				Remaining Impervious	156.00	N/A												
2203	Wyndham	Lot 534, 80 Woods Rd Truganina VIC 3029	2104.00	Roof Areas	1,092.00	RainwaterTank20000L30BRx3	'Split'	121.20	94.70	47.30	122.00	94.89	47.88	567.00	130.00	2.00	-8.80	-8.00
				Remaining Impervious	295.00	N/A												
				Driveway to rain garden	150.00	Raingarden100mm3sqm												
2231	Nillumbik	22 Arthur Street Eltham VIC 3095	1207.00	Roof & Terrace Areas	612.00	RainwaterTank20000L30BRx3	'Split'	116.80	51.70	11.60	118.67	57.78	11.75	190.00	122.00	2.00	-5.20	-3.33
				Remaining Impervious	405.00	n/a												
2264	Moreland	121 Lygon Street East Brunswick VIC 3057	1382.00	Roof & Terraces	620.00	RainwaterTank17500 30BRx3	'Split'	111.40	45.70	13.00	112.00	48.67	13.13	56.00	116.00	2.00	-4.60	-4.00
				TH Roof & Terraces	239.00	Raingarden300mm8sqm												
				Remaining Impervious	467.00	n/a												
3497	Whittlesea	1 Lombardy drive Mernda VIC 3754	3470.50	Roof	2,351.60	RainwaterTank50000L60BRx3	'Split'	137.60	118.60	67.20	138.89	122.89	68.25	642.80	149.00	2.00	-11.40	-10.11
				Carpark	233.20	Raingarden300mm4sqm												
				Footpath	242.90	n/a												
3914	Maribyrnong	293 - 295 Ballarat Road Braybrook VIC 3019	1117.59	Roof	449.34	RainwaterTank12200L20BRx3	'Split'	107.40	42.90	10.90	106.44	53.11	11.00	355.50	95.00	2.00	12.40	11.44
				Balcony	17.85	N/A												
				Driveway/Paving	294.90	N/A												
3472	Geelong	78 Newcombe St Portarlington VIC 3223	3451.00	RW tank shed	154.00	RainwaterTank4000L7BRx3	'Split'	177.60	181.40	121.20	180.22	182.89	122.38	1356.00	170.00	17.00	7.60	10.22
				RW tank E	445.00	RainwaterTank10000L20BRx3												
				RW tank W	541.00	RainwaterTank14000L30BRx3												
				RG1	600.00	Raingarden300mm20sqm												
				RG2	355.00	Raingarden300mm10sqm												

Comparison – models created with Split nodes

Analysis

InSite

and

STORMupdated

Compare the results to same models built in MUSIC – SPLIT nodes

These models are created with “split” nodes approach, and include analysis with and without the permeable area.

Analysis:

1. The red cells show where InSite has better TN results than MUSIC or STORMupdated
2. The green cells show areas where InSite performance results are same or more conservative than MUSIC or STORMupdated

Comments:

1. InSite fails 8 our of 9 projects on pollutants other than TN.
2. InSite TN results vary wildly compared to MUSIC or STORMupdated (4 x conservative, 5 x overpredicting)
3. STORMupdated results consistently track MUSIC results
4. TN is clearly not the hardest pollutant to remove.

Pervious Area	InSite TN	Rainfall Location	STORMupdated vs InSite	MUSIC vs InSite
21.00	133.00	2.00	3.00	2.78
130.00	126.00	2.00	-9.30	-6.67
332.00	83.00	16.00	46.00	48.33
567.00	130.00	2.00	-8.80	-8.00
190.00	122.00	2.00	-5.20	-3.33
56.00	116.00	2.00	-4.60	-4.00
642.80	149.00	2.00	-11.40	-10.11
355.50	95.00	2.00	12.40	11.44
1356.00	170.00	17.00	7.60	10.22

Comparison
InSite Rainfall coverage vs MW MUSIC Guidelines Map

Analysis

InSite rainfalls.

Compare the Rainfalls allocated by InSite to ONE council to the rainfalls covered by that Council in the MW MUSIC Guidelines Map.

InSite only allocates one rainfall per Council.

Table to the right shows overlap of rainfalls (top) over Council areas, with “InSite rainfall location” showing the one rainfall InSite allocates to that Council.

Appendix D: Comparison of Insite Rainfall Locations

Council	InSite Rainfall Location	Melbourne Water Rainfall Regions					
		Little River	Melbourne Airport	Melbourne City	Koo Wee Rup	Narre Warren North	Mount St Leonard
		400mm-500mm	500mm-650mm	650mm-750mm	750mm-850mm	850mm-1100mm	1100mm-2100mm
Boroondara	2			■	■		
Knox	6				■	■	
Bass Coast	16			■	■		
Banyule	2			■	■		
Bayside	2			■			
Brimbank	2		■				
Cardinia	6				■	■	■
Casey	16				■	■	
Darebin	2			■	■		
Frankston	16			■	■		
French Island	16				■	■	
Glen Eira	2			■	■		
Golden Plains Shire[1]	17						
Greater Dandenong	16			■	■	■	
Greater Geelong[2]	17						
Hobsons Bay	2		■				
Hume	2		■	■			
Kingston	16			■	■		
Macedon Ranges	2		■	■	■	■	■
Manningham	6			■	■	■	
Maribyrnong	2		■				
Maroondah	6				■	■	■
Melbourne	2		■	■			
Melton Shire	2	■	■				
Mildura[3]	22						
Mitchell[4]	2		■	■			
Monash	6			■	■	■	
Moonee Valley	2		■	■			
Moorabool[5]	2	■	■	■	■	■	
Moreland	2		■	■			
Mornington Peninsula	16			■	■	■	
Murrindindi[6]	6						
Nillumbik	2		■	■	■	■	■
Port Phillip	2		■	■			
South Gippsland[7]	16					■	■
Stonnington	2			■	■		
Whitehorse	6			■	■	■	
Whittlesea	2		■	■	■	■	
Wyndham	2	■	■				
Yarra	2			■	■		
Yarra Ranges	6			■	■	■	■

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Comparison InSite Rainfall coverage vs MW MUSIC Guidelines Map

Analysis

Insite value is used to replace:	Little River	Melbourne Airport	Melbourne City	Koo Wee Rup	Narre Warren Nth	Mount St Leonard	Others
	400mm-500mm	500mm-650mm	650mm-750mm	750mm-850mm	850mm-1100mm	110mm-2100mm	mm specified below
2							+ 493mm +719mm (Moorabool) + 564mm + 618mm (Mitchell)
6							+ 618mm, 1,105mm, 753mm (Murrindindi)
16							+ 1,106mm South Gippsland mlb
17							2 x Greater Geelong, 1 x Golden Plains
22							1 mlb in Mildura

Conclusions

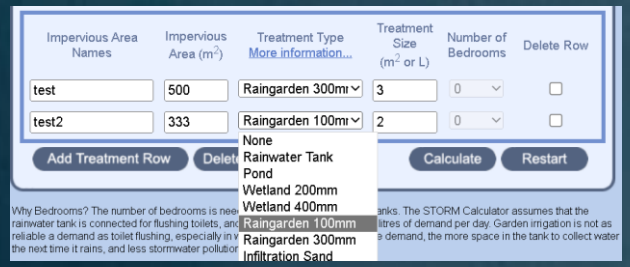
Our analysis shows definitively that:

STORM does NOT comply with “Industry Standard”

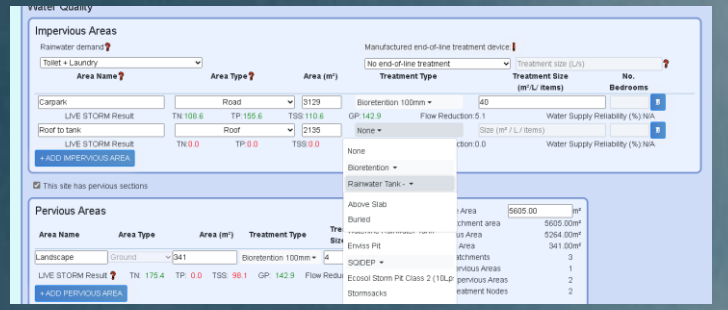
InSite Water does NOT comply with “Industry Standard”

STORMupdated DOES comply with “Industry Standard”

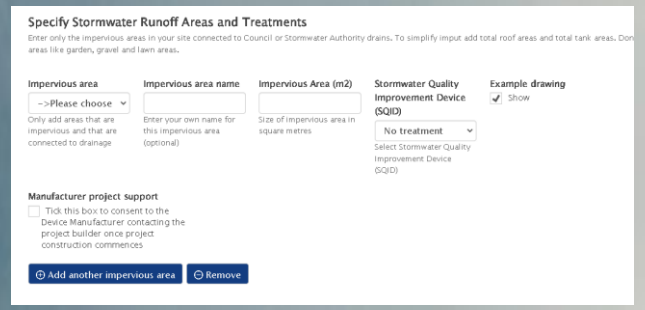
STORM



STORMupdated Calculator



InSite Water



Some form/type of mathematical engine. This engine can be the MUSIC engine or an alternative

Outputs vastly different from MUSIC

Outputs VERY SIMILAR to MUSIC

Outputs vastly different from MUSIC

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Conclusions

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