SUPPLEMENTARY MATERIALS

Extensive supplementary materials are used to supplement the simulation algorithm, result and computer code, including:

S1. Supplementary equations,

S2. Raw result of continuous simulation,

S3. Continuous simulation code.

S1. SUPPLEMENTARY EQUATIONS

The *supplementary material S1* lists the supplementary algorithm for the following simulation:

(1) Pre-storm release volume calculation (previously discussed in section 2.2)

(2) Algorithm of active release system with baseflow-first and supply-first configuration ((previously discussed in section 2.2)

(3) Initial Loss Model (previously discussed in section 2.3.1 – Rainwater Inflow Module)

Pre-storm release volume

The pre-storm release volume Q_{purge} is the predicted overflow volume Q_{oTp} which is determined by following (Equation S1):

$$T_{inp} = \begin{cases} A*(R_{Tp} - D_{il}), R_{prob} \geq 70\% \\ 0, R_{prob} < 70\% \end{cases}$$

$$Q_{purge} = Q_{oTp} = \begin{cases} \min (V_{t-1} + T_{inp} - S, V_{t-1}), V_{t-1} + T_{inp} > S \\ 0, \text{otherwise} \end{cases} \quad (S1)$$

Where R_{Tp} is the historical records of rainfall forecast on the daily basis (mm/day), R_{prob} is the probability of predicted precipitation, D_{il} is the initial loss (0.2mm/day), A is the roof size (m^2), V_{t-1} is the volume in store (L) at time step t-1 (previous), T_{inp} is the predicted system inflow in the next 24 hours (L), Q_{purge} is the required volume of pre-storm release (L), Q_{oTp} is the predicted tank overflow (L), S is the tank size (L).

Algorithm of Active Release System

We designed and modelled two approaches to operate active release systems – baseflow-first configuration and supply-first configuration, using opposite control logic. In the baseflow-first configuration of this system, baseflow release is given priority, with release occurring prior to the tank yield in every timestep. The tank system will attempt to achieve the baseflow restoration target at each timestep, provided adequate volume is available. Consequently, the household water supply will only be delivered after the satisfaction of baseflow target. In contrast, supply-first configuration give priority in achieving water supply, with tank yield occurring prior to baseflow release. It is noted that the baseflow release will not be initiated if system overflow is occurring, with any pre-storm release contributing to the calculated volume of baseflow release. Baseflow-first and supply-first configuration are determined by Equation S2 and S3 respectively:

$$
\begin{aligned}
Q_{bt} &= Min \begin{cases} Q_{target} \\ V_{t-1} \end{cases} \\
Y_t &= \begin{cases} 0,\ V_{t-1} - Q_{bt} < D_{t+1} \\ Min \begin{cases} V_{t-1} - Q_{bt} - Q_{target},\ V_{t-1} - Q_{bt} > D_{t+1} \\ D_t \end{cases} \end{cases} \quad (S2) \\
V_t &= V_{t-1} + T_{in} - Y_t - Q_{bt}
\end{aligned}
$$

$$
\begin{aligned}
Y_t &= Min \begin{cases} D_t \\ V_{t-1} \end{cases} \\
Q_{bt} &= \begin{cases} Q_{bt} = 0,\ V_{t-1} - Y_t < D_{t+1} \\ Q_{bt} = Min \begin{cases} Q_{target} \\ V_{t-1} - Y_t - D_{t+1} \end{cases},\ V_{t-1} - Y_t > D_{t+1} \end{cases} \quad (S3) \\
V_t &= V_{t-1} + T_{in} - Y_t - Q_{bt}
\end{aligned}
$$

Where Q_{bt} is the baseflow releasing at t time-step (L/ 6minutes), V_{t-1} is the volume in store (L) at time step t-1 (previous), Y_t is the rainwater yield at current time step t (L/6 minutes), D_t and D_{t+1} is household demand at t and t+1 time-step (L/6minutes), Q_{target} is the baseflow target at each timestep defined by Q_x (L/minutes).

Initial Loss

The following logic flow chart illustrate the initial loss model.

Start Initial Loss Function Loop

Historical rainfall data at t

No rainfall in the previous timestep (t-1)?

No rainfall occurred at t && has event at (t-1)

No event count +1

No event count +1

No rainfall count over the defined antecedent dry period

Rainfall records in this timestep (t)?

Reset initial loss volume

1. No event count reset
2. Calculate roof runoff
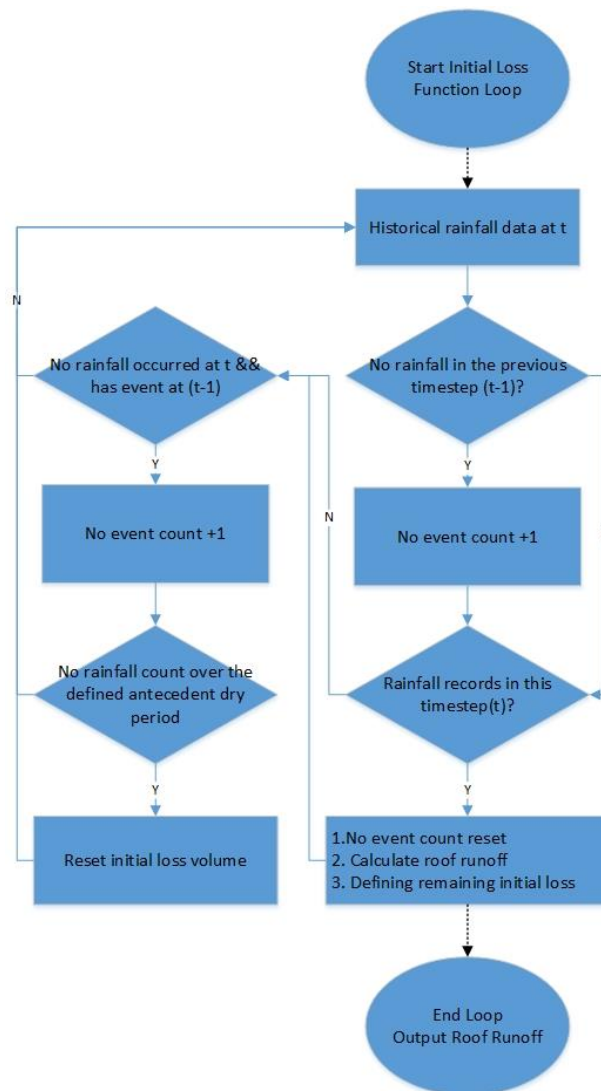3. Defining remaining initial loss

End Loop
Output Roof Runoff

Figure S1. Logic flow chart of initial loss model.

The tank inflow volume T_{in} (L/6min) is then determined by (Equation S4):

$$T_{in} = A * R_t \text{ (S4)}$$

Where R_t is the roof runoff at the t time-step (mm/6min) and A is the roof size (m^2).

S2 Raw Result of Continuous Simulation

Abbreviation

A – Roof Size (m^2)

AB – Annual Baseflow Release (L/yr)

ABO - Annual Baseflow Release during overflow process (L/yr)

ABP – Annual Baseflow Release during purge process (L/yr)

AI – Annual Inflow (L/yr)

AO – Annual Overflow (L/yr)

AP – Annual pre-event flood-mitigation release (purge) (L/yr)

AY – Annual Yield (L/yr)

BE – Baseflow Efficiency (%)

BF – Baseflow Frequency (%)

C – Cloth Washing

D – Dishwasher

D – Orifice Diameter (mm)

E – Enduse

H – Hot Water

O – Outdoor usage (e.g. garden irrigation)

OF – Overflow Frequency (%)

Qb – Baseflow Release Target (L/s/4km^2)

RE – Retention Efficiency (%)

S – Tank Size (L)

SE – Water Supply Efficiency (%)

SF – Water Supply Frequency (%)

TF – Toilet Flushing

Three assessment metrics that characterize the performance of water supply, baseflow restoration and stormwater retention are summarized by simple statistics, including min, max, mean, median and standard deviation (SD). These are presented in S2 Table 1. Water Supply Assessment Metrics Summary, S2 Table 2. Stormwater Retention Assessment Metrics Summary and S2 Table 3. Baseflow Restoration Assessment Metrics Summary. The simulation results of three configurations of active release system are shown in S2 Table 4, S2 Table 5 and S2 Table 8 respectively. S2 Table 6 and S2 Table 7 show the simulation result of passive release system with 25% detention volume and 75% detention volume respectively. The simulation result of conventional system is shown in S2 Table 9.

S2 Table 1. Water Supply Assessment Metrics Summary

Configuration	Supply Efficiency (%)					Supply Frequency (%)				
	Min	Max	Mean	Median	SD	Min	Max	Mean	Median	SD
Active Release System (Supply-First)	32.44	99.93	86.46	95.24	18.05	32.59	99.93	86.51	95.24	18.02
Active Release System (Baseflow-First)	32.27	99.93	86.41	95.21	18.09	32.50	99.93	86.46	95.21	18.06
Active Release System (No Baseflow Release)	34.04	99.93	88.61	97.56	17.40	34.23	99.93	88.60	97.40	17.36
Conventional System	34.09	99.93	89.07	98.31	17.39	34.28	99.93	89.09	98.31	17.36
Passive Release System (25% Detention Volume)	34.03	99.93	88.87	98.06	17.34	34.22	99.93	88.89	98.06	17.31
Passive Release System (75% Detention Volume)	33.70	99.93	88.18	97.02	17.46	33.86	99.93	88.20	97.02	17.43

S2 Table 2. Stormwater Retention Assessment Metrics Summary

Configuration	Overflow Frequency (%)					Retention Efficiency (%)				
	Min	Max	Mean	Median	SD	Min	Max	Mean	Median	SD
Active Release System (Supply-First)	0.00	1.97	0.88	0.99	0.52	53.04	100.00	77.16	74.26	13.01
Active Release System (Baseflow-First)	0.00	1.97	0.88	0.99	0.52	53.04	100.00	77.16	74.26	13.01
Active Release System (No Baseflow Release)	0.00	2.21	1.01	1.11	0.60	51.68	100.00	74.85	71.30	13.75
Conventional System	0.00	4.41	1.90	1.98	1.28	13.26	100.00	52.88	46.54	28.01
Passive Release System (25% Detention Volume)	0.00	3.47	1.56	1.65	0.98	18.26	100.00	58.29	54.85	24.83
Passive Release System (75% Detention Volume)	0.00	3.40	1.50	1.56	0.96	19.64	100.00	60.03	57.03	24.41

S2 Table 3. Baseflow Restoration Assessment Metrics Summary

Configuration	Baseflow Efficiency (%)					Baseflow Frequency (%)				
	Min	Max	Mean	Median	SD	Min	Max	Mean	Median	SD
Active Release System (Supply-First)	32.26	99.07	85.61	94.36	17.72	32.24	99.07	85.60	94.35	17.73
Active Release System (Baseflow-First)	35.74	99.08	86.17	94.43	16.84	35.05	99.07	86.12	94.43	16.92
Active Release System (No Baseflow Release)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Conventional System	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Passive Release System (25% Detention Volume)	0.00	99.98	54.92	61.74	32.46	0.00	96.13	47.50	45.84	31.74
Passive Release System (75% Detention Volume)	0.49	99.59	65.26	71.57	25.99	0.00	97.78	65.43	75.95	31.06

S2 Table 4. Active Release System (Supply-first configuration)

BF	OF	SF	SE	BE	RE	AY	AB	AO	AP	ABP	AI	E	S	A	Qb
98.35	1.05	99.39	99.39	98.35	72.51	20436.29	2823.68	14992.95	12980.81	7.37	51461.6	TF	2500	50	6.64
75.99	0.32	76.43	76.37	76	91.19	41877.1	2186.33	4802.25	2484.08	1.5	51461.6	TF+O+D	2500	50	6.64
54.68	0.16	55.01	54.91	54.7	95.01	46105.48	1573.99	2718.8	995.62	0.66	51461.6	TF+O+D+C	2500	50	6.64
33.23	0.06	33.54	33.4	33.24	97.4	48644.39	956.47	1415.55	444.91	0.28	51461.6	TF+O+D+C+H	2500	50	6.64
98.89	1.03	99.93	99.93	98.89	73.17	20546.47	2841.6	14630.73	12967.08	5.22	51461.6	TF	5000	50	6.64
82.01	0.19	82.3	82.24	82.02	94.84	45094.7	2360.75	2813.62	1081.75	0.44	51461.6	TF+O+D	5000	50	6.64
57.95	0.05	58.16	58.09	57.97	98.53	48772.13	1668.62	804.07	149.66	0.06	51461.6	TF+O+D+C	5000	50	6.64
34.27	0.01	34.53	34.39	34.28	99.28	50081.51	986.71	393.38	0	0	51461.6	TF+O+D+C+H	5000	50	6.64
98.91	1.02	99.93	99.93	98.91	73.94	20546.47	2843.16	14214.59	12882.9	3.99	51461.6	TF	10000	50	6.64
84.53	0.13	84.75	84.71	84.54	96.73	46447.76	2433.46	1782.86	686.96	0.21	51461.6	TF+O+D	10000	50	6.64
59.02	0	59.18	59.11	59.04	100	49630.08	1699.45	0	65	0.01	51461.6	TF+O+D+C	10000	50	6.64
34.54	0	34.79	34.65	34.55	100	50467.13	994.47	0	0	0	51461.6	TF+O+D+C+H	10000	50	6.64
98.92	1.01	99.93	99.93	98.92	74.24	20546.47	2843.63	14048.94	12548.2	3.85	51461.6	TF	15000	50	6.64

85.44	0.09	85.61	85.58	85.45	97.28	46922.93	2459.56	1484.03	484.58	0.16	51461.6	TF+O+D	15000	50	6.64
59.1	0	59.26	59.19	59.11	100	49692.89	1701.65	0	0	0	51461.6	TF+O+D+C	15000	50	6.64
34.54	0	34.79	34.65	34.55	100	50467.13	994.47	0	0	0	51461.6	TF+O+D+C+H	15000	50	6.64
97.96	1.39	99.3	99.28	97.96	64.48	20413.15	5593.34	38745.41	37908.13	46.34	102923.2	TF	2500	100	6.64
89.76	0.96	90.71	90.71	89.76	74.27	49734.97	5140.79	28065.65	19780.81	27.24	102923.2	TF+O+D	2500	100	6.64
77.62	0.69	78.38	78.3	77.65	80.88	65745.1	4452.53	20856.2	11714.4	17.85	102923.2	TF+O+D+C	2500	100	6.64
54.2	0.42	54.77	54.69	54.21	86.89	79650.53	3110.74	14301.66	5790.27	10.47	102923.2	TF+O+D+C+H	2500	100	6.64
98.56	1.36	99.93	99.93	98.56	65.64	20546.47	5645.49	37481.79	38753.53	29.05	102923.2	TF	5000	100	6.64
96.24	0.88	97.13	97.12	96.24	77.44	53254.65	5525.84	24607.6	19198.01	14.89	102923.2	TF+O+D	5000	100	6.64
86.92	0.53	87.5	87.48	86.93	86.43	73451.76	4997.22	14800.69	9407.16	7.51	102923.2	TF+O+D+C	5000	100	6.64
61.75	0.19	62.11	62.06	61.77	94.27	90384.9	3553.88	6254.94	2560.06	2.2	102923.2	TF+O+D+C+H	5000	100	6.64
98.57	1.36	99.93	99.93	98.57	66.12	20546.47	5654.58	36957.82	38777.03	20.45	102923.2	TF	10000	100	6.64
98.99	0.84	99.83	99.83	99	78.91	54738.49	5689.43	22998.92	18664.13	10.03	102923.2	TF+O+D	10000	100	6.64
93.37	0.36	93.76	93.74	93.38	90	78707.52	5371.96	10912.68	7668.03	4.15	102923.2	TF+O+D+C	10000	100	6.64
65.45	0.09	65.69	65.66	65.46	97.56	95633.81	3768.46	2664.59	688.78	0.35	102923.2	TF+O+D+C+H	10000	100	6.64

98.57	1.35	99.93	99.93	98.57	66.46	20546.47	5655.1	36579.35	38655.26	20.15	102923.2	TF	15000	100		6.64
99.03	0.83	99.86	99.86	99.03	79.36	54753.51	5691.37	22511.04	18635.22	9.85	102923.2	TF+O+D	15000	100		6.64
96.54	0.31	96.86	96.85	96.55	91.61	81311.86	5555.24	9156.43	6351.09	3.33	102923.2	TF+O+D+C	15000	100		6.64
66.72	0.05	66.91	66.87	66.73	98.97	97392.84	3841.58	1118.35	403.03	0.19	102923.2	TF+O+D+C+H	15000	100		6.64
97.03	1.67	98.55	98.39	97.03	60.04	20231.1	8253.96	65376.73	60184.46	125.51	154384.8	TF	2500	150		6.64
91.96	1.24	92.99	92.88	91.96	66.51	50925.41	7841.63	54798.25	40549.09	100.42	154384.8	TF+O+D	2500	150		6.64
82.57	1.06	83.46	83.36	82.59	70.68	69991.42	7050.53	47974.17	29153.63	81.67	154384.8	TF+O+D+C	2500	150		6.64
64.18	0.76	64.9	64.79	64.21	76.76	94359.65	5490.99	38017.83	16406.29	54.19	154384.8	TF+O+D+C+H	2500	150		6.64
98.34	1.58	99.92	99.92	98.34	62.96	20544.8	8419.12	60609.55	64274.28	73.82	154384.8	TF	5000	150		6.64
97.72	1.12	98.83	98.82	97.72	70.38	54185.05	8388.47	48458.48	42881.79	50.88	154384.8	TF+O+D	5000	150		6.64
92.85	0.91	93.77	93.77	92.85	76.33	78728.42	7983.82	38725.26	28528.77	35.04	154384.8	TF+O+D+C	5000	150		6.64
76.6	0.51	77.22	77.15	76.62	85.98	112361.8	6600.71	22943	12157.22	16.13	154384.8	TF+O+D+C+H	5000	150		6.64
98.35	1.58	99.93	99.93	98.35	63.51	20546.47	8443.58	59701.53	64680.09	49.91	154384.8	TF	10000	150		6.64
98.83	1.1	99.93	99.93	98.83	71.4	54790.58	8501.25	46788.39	43350.69	33.76	154384.8	TF+O+D	10000	150		6.64
97.45	0.84	98.3	98.3	97.45	78.6	82531.1	8393.99	35006.52	27740.94	22	154384.8	TF+O+D+C	10000	150		6.64

84.26	0.32	84.66	84.63	84.27	91.06	123253.9	7270.38	14629.08	8865.12	7.33	154384.8	TF+O+D+C+H	10000	150	6.64
98.36	1.57	99.93	99.93	98.36	63.82	20546.47	8445.31	59200.11	64680.92	48.77	154384.8	TF	15000	150	6.64
98.84	1.09	99.93	99.93	98.84	71.64	54790.58	8502.65	46397.74	43240.92	32.78	154384.8	TF+O+D	15000	150	6.64
98.97	0.82	99.79	99.78	98.97	79.35	83779.9	8526.2	33781.82	27085.84	20.8	154384.8	TF+O+D+C	15000	150	6.64
87.78	0.25	88.1	88.08	87.79	92.85	128289.1	7576.55	11697.69	6457.44	5.06	154384.8	TF+O+D+C+H	15000	150	6.64
96.3	1.83	97.93	97.64	96.31	56.39	20076.39	10855.43	95144.46	79326.77	234.22	205846.4	TF	2500	200	6.64
91.74	1.44	92.84	92.63	91.75	61.05	50789.81	10357.52	84961.39	59364.37	207.13	205846.4	TF+O+D	2500	200	6.64
84.29	1.31	85.23	85.03	84.3	64.08	71391.59	9525.29	78364.5	46254.06	181.39	205846.4	TF+O+D+C	2500	200	6.64
68.2	1.09	69.07	68.94	68.24	68.86	100407.3	7725.38	67930.17	29599.23	132.25	205846.4	TF+O+D+C+H	2500	200	6.64
98.23	1.68	99.86	99.83	98.23	61.12	20526.58	11164.82	84807.66	88742.18	145.6	205846.4	TF	5000	200	6.64
97.59	1.27	98.81	98.8	97.59	66.77	54171.2	11121.26	72490.92	67531.02	115.53	205846.4	TF+O+D	5000	200	6.64
94.76	1.08	95.79	95.76	94.76	70.85	80403.37	10820.25	63580.21	50571.73	91.02	205846.4	TF+O+D+C	5000	200	6.64
82.31	0.79	83.13	83.06	82.33	78.54	120974.4	9423.97	46815.93	28274.03	55.82	205846.4	TF+O+D+C+H	5000	200	6.64
98.27	1.66	99.93	99.93	98.27	62.29	20546.47	11222.08	82253.63	90771.78	92.86	205846.4	TF	10000	200	6.64
98.68	1.24	99.93	99.93	98.68	68.04	54790.58	11291.78	69727.54	69048.78	71.24	205846.4	TF+O+D	10000	200	6.64

98.3	1.04	99.34	99.34	98.3	72.74	83404.41	11266.08	59463.48	50779.48	53.1	205846.4	TF+O+D+C	10000	200	6.64
91.22	0.64	91.89	91.87	91.23	83.44	133801.6	10477.74	36134.2	24855.26	26.78	205846.4	TF+O+D+C+H	10000	200	6.64
98.27	1.66	99.93	99.93	98.27	62.47	20546.47	11225.41	81864.2	90660.98	89.76	205846.4	TF	15000	200	6.64
98.69	1.24	99.93	99.93	98.69	68.33	54790.58	11294.9	69091.03	69184.76	68.64	205846.4	TF+O+D	15000	200	6.64
98.86	1.03	99.89	99.89	98.86	73.28	83866.78	11332.88	58300.2	50915.7	50.99	205846.4	TF+O+D+C	15000	200	6.64
94.73	0.57	95.33	95.32	94.74	85.32	138822.5	10885.12	32018.55	23545.41	24.01	205846.4	TF+O+D+C+H	15000	200	6.64
95.51	1.97	97.25	96.83	95.51	53.04	19910.66	13385.71	128063.6	95381.09	361.89	257308	TF	2500	250	6.64
91	1.61	92.19	91.88	91.01	56.59	50379.78	12764.22	118374.6	75291.97	335.4	257308	TF+O+D	2500	250	6.64
84.45	1.48	85.46	85.19	84.47	58.98	71526.24	11851.63	111868.3	61630.4	305.78	257308	TF+O+D+C	2500	250	6.64
70.05	1.31	70.94	70.78	70.1	62.81	103086.5	9841.58	101418.1	42665.8	247.81	257308	TF+O+D+C+H	2500	250	6.64
98.04	1.77	99.7	99.59	98.04	59.6	20476.87	13864.35	110171	112092.9	247.02	257308	TF	5000	250	6.64
97.29	1.38	98.53	98.46	97.29	63.87	53987.31	13791.15	98532.99	90371.49	212.24	257308	TF+O+D	5000	250	6.64
95.25	1.2	96.33	96.26	95.25	67.24	80821.86	13531.5	89343.22	73057.11	178.14	257308	TF+O+D+C	5000	250	6.64
84.75	0.98	85.67	85.67	84.76	73.16	124775.4	12075.9	73200.1	46833.91	124.15	257308	TF+O+D+C+H	5000	250	6.64
98.2	1.73	99.93	99.92	98.2	61.56	20546.21	13983.69	104815.2	116856.3	150.7	257308	TF	10000	250	6.64

98.56	1.34	99.89	99.89	98.56	65.95	54772.03	14062.57	92859.16	94578.23	123.17	257308	TF+O+D	10000	250	6.64
98.25	1.14	99.39	99.39	98.25	69.76	83450.44	14040.56	82462.61	76376.94	101.25	257308	TF+O+D+C	10000	250	6.64
93.82	0.86	94.69	94.71	93.83	77.87	137933.9	13444.26	60336.87	44786.39	60.61	257308	TF+O+D+C+H	10000	250	6.64
98.2	1.73	99.93	99.93	98.2	61.81	20546.47	13989.84	104140.5	117030.5	144.79	257308	TF	15000	250	6.64
98.59	1.34	99.93	99.93	98.59	66.19	54790.58	14073.16	92186.96	94727.07	117.38	257308	TF+O+D	15000	250	6.64
98.77	1.14	99.9	99.9	98.77	70.23	83878.3	14119.92	81192.26	76645.59	95.71	257308	TF+O+D+C	15000	250	6.64
96.53	0.82	97.36	97.35	96.53	79.13	141790.4	13837.91	56904.26	43883.18	55.84	257308	TF+O+D+C+H	15000	250	6.64
98.12	1.02	99.14	99.14	98.12	73.49	20384.37	4299.43	14458.59	12090.15	10.47	51461.6	TF	2500	50	10.12
74.74	0.31	75.19	75.13	74.76	91.62	41193.49	3281.73	4570.59	2305.49	2.15	51461.6	TF+O+D	2500	50	10.12
53.78	0.15	54.12	54.07	53.8	95.11	45397.29	2362.23	2667.28	968.95	0.98	51461.6	TF+O+D+C	2500	50	10.12
32.88	0.06	33.2	33.07	32.89	97.42	48169.82	1444.42	1406.67	440.26	0.42	51461.6	TF+O+D+C+H	2500	50	10.12
98.93	1	99.93	99.93	98.93	74.23	20546.47	4337.93	14052.36	12048.8	7.46	51461.6	TF	5000	50	10.12
80.58	0.17	80.86	80.82	80.6	95.32	44312.24	3539.61	2550.52	950.49	0.59	51461.6	TF+O+D	5000	50	10.12
56.97	0.04	57.19	57.18	56.99	98.63	48009.53	2503.15	749.26	134.71	0.08	51461.6	TF+O+D+C	5000	50	10.12
33.89	0.01	34.16	34.04	33.9	99.28	49580.26	1489.25	392.09	0	0	51461.6	TF+O+D+C+H	5000	50	10.12

98.94	0.99	99.93	99.93	98.94	74.95	20546.47	4340.24	13659.81	11940.91	5.59	51461.6	TF	10000	50	10.12
82.84	0.12	83.08	83.03	82.86	97.01	45528.31	3639.36	1629.28	556.23	0.27	51461.6	TF+O+D	10000	50	10.12
57.99	0	58.17	58.16	58.01	100	48828.24	2548.14	0	20.34	0.01	51461.6	TF+O+D+C	10000	50	10.12
34.17	0	34.43	34.3	34.18	100	49960.35	1501.25	0	0	0	51461.6	TF+O+D+C+H	10000	50	10.12
98.95	0.98	99.93	99.93	98.95	75.34	20546.47	4340.99	13451.53	11648.59	5.43	51461.6	TF	15000	50	10.12
83.72	0.08	83.92	83.88	83.74	97.59	45991.38	3678.22	1314.18	369.5	0.19	51461.6	TF+O+D	15000	50	10.12
58.01	0	58.19	58.18	58.03	100	48847.68	2549.05	0	0	0	51461.6	TF+O+D+C	15000	50	10.12
34.17	0	34.43	34.3	34.18	100	49960.35	1501.25	0	0	0	51461.6	TF+O+D+C+H	15000	50	10.12
97.85	1.33	99.16	99.14	97.85	65.51	20384.05	8529.92	37622.58	36107.09	66.57	102923.2	TF	2500	100	10.12
88.41	0.94	89.39	89.39	88.44	75	49013.73	7730.93	27268.21	18702.06	38.36	102923.2	TF+O+D	2500	100	10.12
76.33	0.67	77.11	77.04	76.37	81.44	64684.42	6683.62	20242.21	11154.6	25.08	102923.2	TF+O+D+C	2500	100	10.12
53.24	0.41	53.84	53.82	53.27	87.04	78379.37	4664.71	14136.49	5671.89	15.04	102923.2	TF+O+D+C+H	2500	100	10.12
98.62	1.31	99.93	99.93	98.62	66.68	20546.47	8621.54	36347.93	36901.97	42.25	102923.2	TF	5000	100	10.12
95.62	0.85	96.48	96.49	95.62	78.44	52904.81	8379.37	23517.94	17800.4	21.09	102923.2	TF+O+D	5000	100	10.12
85.58	0.5	86.17	86.15	85.6	87.16	72327.97	7509.52	13999.97	8820.46	10.8	102923.2	TF+O+D+C	5000	100	10.12

60.63	0.18	61.01	60.99	60.66	94.37	88823.54	5325.76	6140.7	2467.19	3.19	102923.2	TF+O+D+C+H	5000	100	10.12
98.63	1.3	99.93	99.93	98.63	67.18	20546.47	8634.81	35799.15	36949.97	29.76	102923.2	TF	10000	100	10.12
98.91	0.8	99.72	99.71	98.92	80	54673.14	8675.8	21819.27	16995.66	13.96	102923.2	TF+O+D	10000	100	10.12
92.29	0.34	92.67	92.65	92.3	90.83	77788.76	8102.81	10001.92	6769.65	5.58	102923.2	TF+O+D+C	10000	100	10.12
64.28	0.08	64.54	64.52	64.3	97.73	93970.41	5648.62	2470.95	669.86	0.53	102923.2	TF+O+D+C+H	10000	100	10.12
98.63	1.29	99.93	99.93	98.63	67.53	20546.47	8635.63	35420.43	36828.35	29.29	102923.2	TF	15000	100	10.12
99.03	0.79	99.83	99.83	99.04	80.46	54738.11	8686.75	21314.85	16924.46	13.63	102923.2	TF+O+D	15000	100	10.12
95.51	0.28	95.82	95.8	95.52	92.53	80430.49	8387.02	8150.5	5486.7	4.34	102923.2	TF+O+D+C	15000	100	10.12
65.46	0.04	65.68	65.64	65.48	99.05	95607.25	5752.23	1040.16	360.46	0.26	102923.2	TF+O+D+C+H	15000	100	10.12
96.82	1.6	98.33	98.19	96.83	60.94	20188.83	12581.49	63912.13	57316.97	178.22	154384.8	TF	2500	150	10.12
90.55	1.2	91.63	91.53	90.57	67.22	50189.56	11794.52	53624.28	38472.17	140.14	154384.8	TF+O+D	2500	150	10.12
81	1.03	81.96	81.91	81.04	71.22	68770.59	10565.54	47086.65	27721.59	112.9	154384.8	TF+O+D+C	2500	150	10.12
62.87	0.75	63.68	63.58	62.92	77.05	92596.73	8217.03	37546.03	15900.21	74.75	154384.8	TF+O+D+C+H	2500	150	10.12
98.42	1.51	99.92	99.92	98.42	63.89	20544.57	12860.75	59087.72	61326.39	107.9	154384.8	TF	5000	150	10.12
97.17	1.08	98.25	98.24	97.17	71.25	53868.13	12731.63	47040.31	40257	73.35	154384.8	TF+O+D	5000	150	10.12

91.78	0.87	92.69	92.71	91.8	77.17	77841.35	12046.55	37351.5	26717.53	50.14	154384.8	TF+O+D+C	5000	150	10.12
75.29	0.49	75.92	75.89	75.33	86.45	110532.6	9903.17	22165.23	11460.44	23.14	154384.8	TF+O+D+C+H	5000	150	10.12
98.42	1.5	99.93	99.93	98.42	64.47	20546.47	12896.87	58138.21	61773.03	72.74	154384.8	TF	10000	150	10.12
98.75	1.06	99.8	99.81	98.75	72.41	54724.72	12964.38	45140.36	40592.65	48.3	154384.8	TF+O+D	10000	150	10.12
96.93	0.8	97.75	97.74	96.94	79.65	82061.47	12742.54	33297.02	25680.52	31.13	154384.8	TF+O+D+C	10000	150	10.12
82.87	0.3	83.27	83.27	82.89	91.58	121279.2	10912.5	13778.68	8051.79	10.17	154384.8	TF+O+D+C+H	10000	150	10.12
98.43	1.5	99.93	99.93	98.43	64.77	20546.47	12899.41	57636.22	61774.16	71.08	154384.8	TF	15000	150	10.12
98.88	1.05	99.93	99.93	98.88	72.68	54790.58	12982.58	44701.19	40449.23	46.84	154384.8	TF+O+D	15000	150	10.12
98.85	0.78	99.64	99.64	98.86	80.4	83656.82	12998.14	32070.29	24558.7	28.72	154384.8	TF+O+D+C	15000	150	10.12
86.33	0.24	86.65	86.65	86.35	93.33	126203.9	11372.26	10910.13	5539.5	6.56	154384.8	TF+O+D+C+H	15000	150	10.12
96	1.77	97.64	97.36	96.01	57.22	20019.35	16538.31	93330.67	75426.29	330.62	205846.4	TF	2500	200	10.12
90.17	1.41	91.37	91.16	90.18	61.7	49982.41	15559.02	83546.83	56313.71	286.16	205846.4	TF+O+D	2500	200	10.12
82.43	1.29	83.53	83.35	82.48	64.61	69983.43	14243.62	77192.73	44056.89	248.07	205846.4	TF+O+D+C	2500	200	10.12
66.64	1.07	67.63	67.52	66.7	69.23	98340.06	11538.85	67116.98	28626.09	180.18	205846.4	TF+O+D+C+H	2500	200	10.12
98.18	1.62	99.76	99.72	98.18	62.04	20503.46	17037.91	82800.4	84840.75	212	205846.4	TF	5000	200	10.12

97.22	1.23	98.42	98.41	97.22	67.68	53957.51	16915.51	70513.05	63884.8	166.71	205846.4	TF+O+D	5000	200	10.12
93.7	1.06	94.74	94.72	93.71	71.64	79525.56	16334.26	61877.92	47605.86	130.63	205846.4	TF+O+D+C	5000	200	10.12
80.94	0.76	81.78	81.75	80.98	79.18	119059.5	14147.9	45422.71	26841.77	79.93	205846.4	TF+O+D+C+H	5000	200	10.12
98.33	1.59	99.93	99.93	98.33	63.22	20546.47	17141.55	80225.37	86845.44	135.64	205846.4	TF	10000	200	10.12
98.58	1.21	99.79	99.78	98.58	69.02	54713.22	17217.99	67575.88	65327.17	103.29	205846.4	TF+O+D	10000	200	10.12
98.01	1.01	99.02	99.02	98.01	73.78	83136.51	17145.31	57189.03	47427.55	75.8	205846.4	TF+O+D+C	10000	200	10.12
90.11	0.61	90.77	90.78	90.12	84.33	132220.3	15796.83	34192.14	23056.95	38.11	205846.4	TF+O+D+C+H	10000	200	10.12
98.34	1.59	99.93	99.93	98.34	63.42	20546.47	17146.69	79790.78	86779.68	130.9	205846.4	TF	15000	200	10.12
98.73	1.2	99.93	99.93	98.73	69.38	54790.58	17246.92	66798.82	65501.73	99.52	205846.4	TF+O+D	15000	200	10.12
98.78	1	99.78	99.78	98.78	74.36	83771.82	17283.38	55928.24	47418.2	72.57	205846.4	TF+O+D+C	15000	200	10.12
93.79	0.52	94.33	94.32	93.79	86.34	137370.6	16445.69	29808.08	21646.13	33.82	205846.4	TF+O+D+C+H	15000	200	10.12
94.94	1.89	96.7	96.31	94.95	53.76	19802.37	20342.72	126077.6	90379.02	511.36	257308	TF	2500	250	10.12
89.24	1.57	90.56	90.24	89.27	57.25	49482	19144.39	116569.2	71499.84	460.62	257308	TF+O+D	2500	250	10.12
82.52	1.46	83.71	83.44	82.56	59.49	70057.36	17717.4	110458.9	58544.73	414.16	257308	TF+O+D+C	2500	250	10.12
68.34	1.29	69.43	69.21	68.4	63.16	100795.6	14690.79	100464.3	40986.43	332.64	257308	TF+O+D+C+H	2500	250	10.12

97.83	1.69	99.43	99.31	97.83	60.41	20419.36	21129.58	107964	106992.1	356.75	257308	TF	5000	250	10.12
96.87	1.33	98.08	98.01	96.87	64.78	53739.84	20969.32	96050.64	85838.86	306.18	257308	TF+O+D	5000	250	10.12
94.3	1.17	95.38	95.33	94.31	68.03	80041.54	20457.37	87173.13	69013.61	255.83	257308	TF+O+D+C	5000	250	10.12
83.38	0.95	84.32	84.28	83.41	73.78	122754.9	18140.06	71490.11	44455.06	178.89	257308	TF+O+D+C+H	5000	250	10.12
98.29	1.64	99.93	99.92	98.29	62.4	20546.21	21365.95	102522.7	111706.4	220.36	257308	TF	10000	250	10.12
98.46	1.29	99.74	99.74	98.46	66.96	54686.16	21444.14	90086.07	90008.64	179.69	257308	TF+O+D	10000	250	10.12
98.19	1.11	99.3	99.3	98.19	70.76	83371.9	21420.36	79728.73	71775.12	145.23	257308	TF+O+D+C	10000	250	10.12
92.85	0.83	93.71	93.72	92.86	78.76	136494.2	20308.33	57906.12	41780.91	86.79	257308	TF+O+D+C+H	10000	250	10.12
98.29	1.64	99.93	99.93	98.29	62.65	20546.47	21375.45	101845.7	111882.8	211.28	257308	TF	15000	250	10.12
98.65	1.28	99.93	99.93	98.65	67.27	54790.58	21494.58	89260.35	90188.37	170.83	257308	TF+O+D	15000	250	10.12
98.68	1.1	99.77	99.77	98.68	71.25	83767.93	21534.15	78408.74	72092.93	137.6	257308	TF+O+D+C	15000	250	10.12
95.99	0.79	96.79	96.79	96	80.19	140968.3	21004.29	54031.64	40493.12	78.95	257308	TF+O+D+C+H	15000	250	10.12
97.03	0.94	97.98	97.98	97.04	75.75	20145.56	7163.12	13227.32	10695.06	15.74	51461.6	TF	2500	50	17.05
72.23	0.27	72.71	72.72	72.28	92.53	39871.89	5344.08	4076.67	2061.98	3.2	51461.6	TF+O+D	2500	50	17.05
52.1	0.14	52.48	52.47	52.14	95.29	44057.06	3855.56	2567.62	919.3	1.55	51461.6	TF+O+D+C	2500	50	17.05

32.24	0.06	32.59	32.44	32.26	97.45	47254.63	2386.23	1388.98	431.04	0.71	51461.6	TF+O+D+C+H	2500	50		17.05
99	0.9	99.91	99.9	99	76.91	20541.88	7313.19	12590.4	10540.38	10.97	51461.6	TF	5000	50		17.05
77.55	0.14	77.86	77.86	77.58	96.08	42692.77	5738.94	2139.91	785.37	0.81	51461.6	TF+O+D	5000	50		17.05
55.15	0.04	55.41	55.42	55.19	98.78	46532.31	4082.65	664.83	121.19	0.11	51461.6	TF+O+D+C	5000	50		17.05
33.21	0.01	33.5	33.38	33.23	99.29	48613.73	2458.35	389.52	0	0	51461.6	TF+O+D+C+H	5000	50		17.05
99.01	0.89	99.91	99.9	99.01	77.63	20541.88	7316.74	12197.48	10432.44	8.27	51461.6	TF	10000	50		17.05
79.69	0.1	79.95	79.95	79.72	97.65	43838.12	5897.61	1282.87	338.94	0.26	51461.6	TF+O+D	10000	50		17.05
56.06	0	56.28	56.28	56.09	100	47251.37	4149.72	0	0	0	51461.6	TF+O+D+C	10000	50		17.05
33.47	0	33.76	33.63	33.5	100	48983.5	2478.1	0	0	0	51461.6	TF+O+D+C+H	10000	50		17.05
99.02	0.88	99.91	99.9	99.03	78.11	20541.88	7318.07	11936.06	10192.8	8	51461.6	TF	15000	50		17.05
80.53	0.06	80.75	80.75	80.56	98.3	44278.61	5960	929.32	189.73	0.15	51461.6	TF+O+D	15000	50		17.05
56.06	0	56.28	56.28	56.09	100	47251.37	4149.72	0	0	0	51461.6	TF+O+D+C	15000	50		17.05
33.47	0	33.76	33.63	33.5	100	48983.5	2478.1	0	0	0	51461.6	TF+O+D+C+H	15000	50		17.05
97.27	1.25	98.51	98.5	97.27	67.38	20252.61	14292	35583.98	32488.21	101.04	102923.2	TF	2500	100		17.05
85.92	0.88	86.91	86.89	85.97	76.41	47643.38	12662.77	25728.24	16669.09	57.43	102923.2	TF+O+D	2500	100		17.05

73.83	0.62	74.65	74.62	73.88	82.42	62652.41	10895.21	19178.23	10034.82	36.92	102923.2	TF+O+D+C	2500	100	17.05
51.55	0.4	52.2	52.15	51.59	87.29	75955.75	7611.62	13861.4	5424.17	22.21	102923.2	TF+O+D+C+H	2500	100	17.05
98.6	1.22	99.83	99.83	98.61	68.71	20526.25	14525.75	34125.5	33226.04	64.23	102923.2	TF	5000	100	17.05
94.02	0.78	94.83	94.83	94.03	80.4	51996.63	13881.88	21374.44	15350.13	31.06	102923.2	TF+O+D	5000	100	17.05
82.92	0.45	83.51	83.5	82.95	88.39	70109.84	12258.15	12659.85	7633.74	15.84	102923.2	TF+O+D+C	5000	100	17.05
58.6	0.18	59.01	58.96	58.64	94.56	85868.28	8670.88	5934.14	2290.69	5.08	102923.2	TF+O+D+C+H	5000	100	17.05
98.71	1.21	99.93	99.93	98.71	69.27	20546.47	14560.66	33515.4	33299.87	45.37	102923.2	TF	10000	100	17.05
98.47	0.71	99.19	99.18	98.47	82.56	54381.3	14549.84	19019.97	14367.63	20.1	102923.2	TF+O+D	10000	100	17.05
89.73	0.28	90.1	90.12	89.75	92.21	75663.03	13273.13	8494.97	5238.95	7.35	102923.2	TF+O+D+C	10000	100	17.05
62.14	0.07	62.42	62.38	62.17	98	90852.08	9198.38	2185.52	532.39	0.71	102923.2	TF+O+D+C+H	10000	100	17.05
98.72	1.21	99.93	99.93	98.72	69.64	20546.47	14561.97	33114.54	33200.22	44.57	102923.2	TF	15000	100	17.05
99.07	0.71	99.78	99.78	99.07	83.16	54708.82	14639.52	18371.55	14099.61	19.33	102923.2	TF+O+D	15000	100	17.05
92.9	0.23	93.2	93.22	92.92	93.98	78269.54	13743.85	6569.14	4089.4	5.49	102923.2	TF+O+D+C	15000	100	17.05
63.12	0.04	63.37	63.32	63.15	99.17	92225.54	9343.86	905.6	293.71	0.37	102923.2	TF+O+D+C+H	15000	100	17.05
95.91	1.42	97.3	97.18	95.92	62.72	19981.04	21022.62	61002.91	51915.45	267.17	154384.8	TF	2500	150	17.05

87.52	1.15	88.7	88.59	87.58	68.49	48575.3	19234.03	51554.74	34664.17	204.05	154384.8	TF+O+D	2500	150	17.05
78.09	0.99	79.17	79.09	78.17	72.21	66404.29	17186.66	45472.5	25043.25	162.13	154384.8	TF+O+D+C	2500	150	17.05
60.46	0.72	61.37	61.21	60.54	77.59	89156.72	13325.51	36664.2	15089.73	110.09	154384.8	TF+O+D+C+H	2500	150	17.05
98.28	1.33	99.61	99.6	98.28	65.88	20480.1	21646.96	55821.58	55823.77	166.28	154384.8	TF	5000	150	17.05
96	1.02	97.03	97.03	96	73	53203.96	21197.72	44169.75	35300.59	109.81	154384.8	TF+O+D	5000	150	17.05
89.41	0.81	90.3	90.32	89.45	78.77	75835.78	19776.57	34728.06	23602.68	75.38	154384.8	TF+O+D+C	5000	150	17.05
72.76	0.45	73.4	73.37	72.81	87.33	106866.5	16124.69	20732.16	10337.73	34.98	154384.8	TF+O+D+C+H	5000	150	17.05
98.6	1.33	99.93	99.93	98.6	66.51	20546.47	21773.03	54792.98	56215.08	111.16	154384.8	TF	10000	150	17.05
98.6	0.99	99.59	99.59	98.6	74.41	54607.87	21813.82	41864.33	35124.86	70.96	154384.8	TF+O+D	10000	150	17.05
95.77	0.73	96.52	96.51	95.78	81.87	81029.05	21212.31	29657.12	22009.95	45.35	154384.8	TF+O+D+C	10000	150	17.05
80.21	0.26	80.62	80.63	80.25	92.59	117430	17795.84	12124.6	6680.73	14.23	154384.8	TF+O+D+C+H	10000	150	17.05
98.61	1.32	99.93	99.93	98.61	66.82	20546.47	21776.66	54289.87	56216.78	108.93	154384.8	TF	15000	150	17.05
98.95	0.98	99.93	99.93	98.95	74.76	54790.58	21892.37	41300.19	34930.36	68.31	154384.8	TF+O+D	15000	150	17.05
98.31	0.69	99.02	99	98.32	83.06	83124.33	21779.4	27718.84	20890.22	41.42	154384.8	TF+O+D+C	15000	150	17.05
83.63	0.2	83.96	83.96	83.66	94.4	122283.8	18560.6	9159.76	4033.21	8.01	154384.8	TF+O+D+C+H	15000	150	17.05

94.39	1.59	95.94	95.7	94.41	58.85	19676.71	27439.55	89767.14	68279.69	497.73	205846.4	TF	2500	200	17.05
86.99	1.36	88.31	88.11	87.04	62.88	48311.13	25345.28	80977.86	50657.04	412.58	205846.4	TF+O+D	2500	200	17.05
78.95	1.25	80.24	80.08	79.04	65.6	67237.17	23034.26	75034.91	40077.19	356.93	205846.4	TF+O+D+C	2500	200	17.05
63.84	1.04	64.98	64.83	63.92	69.92	94420.87	18656.46	65615.29	26864.97	260.18	205846.4	TF+O+D+C+H	2500	200	17.05
97.98	1.43	99.39	99.34	97.98	63.95	20426.86	28669.32	78634.26	77352.91	326.45	205846.4	TF	5000	200	17.05
96.23	1.13	97.35	97.33	96.24	69.29	53365.28	28229.75	66988.33	56619.83	249.69	205846.4	TF+O+D	5000	200	17.05
91.35	1	92.4	92.38	91.39	73.23	77562.36	26848.58	58398.54	42484.07	195.97	205846.4	TF+O+D+C	5000	200	17.05
78.41	0.71	79.26	79.22	78.46	80.42	115384.6	23098.21	42705.74	24258.67	119.88	205846.4	TF+O+D+C+H	5000	200	17.05
98.52	1.41	99.93	99.93	98.52	65.14	20546.47	28945.55	76053.32	79155.61	208.75	205846.4	TF	10000	200	17.05
98.44	1.1	99.54	99.54	98.44	70.92	54579.4	28976.45	63430.03	57812.14	154.74	205846.4	TF+O+D	10000	200	17.05
96.87	0.93	97.82	97.81	96.88	76.05	82122.96	28555.49	52252.69	41964.5	114.03	205846.4	TF+O+D+C	10000	200	17.05
87.82	0.55	88.45	88.42	87.84	85.9	128782.4	25938.92	30759.66	19785.3	55.54	205846.4	TF+O+D+C+H	10000	200	17.05
98.52	1.41	99.93	99.93	98.52	65.38	20546.47	28953.7	75529.46	79178.56	201.46	205846.4	TF	15000	200	17.05
98.83	1.09	99.93	99.93	98.83	71.38	54790.58	29098.38	62432.69	57982.25	148.92	205846.4	TF+O+D	15000	200	17.05
98.6	0.9	99.5	99.5	98.6	76.96	83540.14	29071	50270.54	41520.36	107.59	205846.4	TF+O+D+C	15000	200	17.05

91.67	0.42	92.14	92.13	91.68	88.16	134184.1	27083.98	25831.95	18173.75	47.97	205846.4	TF+O+D+C+H	15000	200	17.05
92.64	1.76	94.37	94.03	92.67	55.26	19334.09	33509.35	121998.1	81521.52	769.98	257308	TF	2500	250	17.05
85.58	1.52	87.06	86.78	85.64	58.37	47580.64	31011.39	113522.5	64392.5	668.82	257308	TF+O+D	2500	250	17.05
78.71	1.42	80.14	79.89	78.81	60.4	67075.01	28560.21	107982	53003.44	591.63	257308	TF+O+D+C	2500	250	17.05
65.19	1.26	66.54	66.29	65.31	63.82	96549.84	23692.31	98665.51	37915.49	466.61	257308	TF+O+D+C+H	2500	250	17.05
97.49	1.53	98.97	98.85	97.49	62.21	20324.54	35518.47	103039.2	97454.17	544.67	257308	TF	5000	250	17.05
95.77	1.26	96.98	96.91	95.79	66.47	53135.73	34977.89	91445.21	76909.21	455.96	257308	TF+O+D	5000	250	17.05
91.92	1.11	93.02	92.96	91.96	69.49	78051.81	33631.9	83205.06	61688.02	383.8	257308	TF+O+D+C	5000	250	17.05
80.7	0.91	81.72	81.64	80.77	74.95	118907.8	29612.08	68296.66	39956.86	264.8	257308	TF+O+D+C+H	5000	250	17.05
98.44	1.49	99.93	99.92	98.44	64.26	20546.03	36074.73	97455.9	101964.2	339.83	257308	TF	10000	250	17.05
98.29	1.2	99.49	99.49	98.29	68.9	54550.02	36085.73	84803.53	80710.91	273.54	257308	TF+O+D	10000	250	17.05
97.43	1.04	98.47	98.48	97.43	72.51	82680.93	35826.75	74954.88	62782.63	215.14	257308	TF+O+D+C	10000	250	17.05
90.82	0.76	91.65	91.65	90.85	80.56	133477	33476.67	53006.76	36508.81	128.84	257308	TF+O+D+C+H	10000	250	17.05
98.44	1.49	99.93	99.93	98.44	64.51	20546.47	36090.47	96773.87	102145.1	324.71	257308	TF	15000	250	17.05
98.73	1.2	99.93	99.93	98.73	69.34	54790.58	36262.56	83607.04	81003.9	259.66	257308	TF+O+D	15000	250	17.05

| 98.53 | 1.03 | 99.55 | 99.55 | 98.53 | 73.14 | 83585.87 | 36244.48 | 73255.69 | 62671.98 | 202.35 | 257308 | TF+O+D+C | 15000 | 250 | 17.05 |
| 94.4 | 0.71 | 95.14 | 95.15 | 94.41 | 82.37 | 138577.4 | 34807.61 | 48081.99 | 35015.54 | 115.57 | 257308 | TF+O+D+C+H | 15000 | 250 | 17.05 |

S2 Table 5. Active Release System (Baseflow-first scenario)

BF	OF	SF	SE	BE	RE	AY	AB	AO	AP	ABP	AI	E	S	A	Qb
98.35	1.05	99.39	99.39	98.35	72.51	20436.18	2823.8	14992.95	12980.81	7.37	51461.6	TF	2500	50	6.64
76.95	0.32	76.36	76.32	76.95	91.19	41849.75	2213.68	4802.25	2484.08	1.5	51461.6	TF+O+D	2500	50	6.64
56.78	0.16	54.94	54.84	56.78	95.01	46045.59	1633.87	2718.8	995.62	0.66	51461.6	TF+O+D+C	2500	50	6.64
36.81	0.06	33.51	33.33	36.82	97.4	48541.13	1059.72	1415.55	444.91	0.28	51461.6	TF+O+D+C+H	2500	50	6.64
98.89	1.03	99.93	99.93	98.89	73.17	20546.47	2841.6	14630.73	12967.08	5.22	51461.6	TF	5000	50	6.64
82.75	0.19	82.24	82.2	82.75	94.84	45073.77	2381.69	2813.62	1081.75	0.44	51461.6	TF+O+D	5000	50	6.64
59.9	0.05	58.1	58.02	59.9	98.53	48716.51	1724.24	804.07	149.66	0.06	51461.6	TF+O+D+C	5000	50	6.64
37.79	0.01	34.5	34.32	37.8	99.28	49979.97	1088.25	393.38	0	0	51461.6	TF+O+D+C+H	5000	50	6.64
98.91	1.02	99.93	99.93	98.91	73.94	20546.47	2843.16	14214.59	12882.9	3.99	51461.6	TF	10000	50	6.64
85.2	0.13	84.69	84.68	85.2	96.73	46428.86	2452.37	1782.86	686.96	0.21	51461.6	TF+O+D	10000	50	6.64
60.94	0	59.12	59.05	60.95	100	49575.1	1754.43	0	65	0.01	51461.6	TF+O+D+C	10000	50	6.64
38.06	0	34.76	34.58	38.07	100	50365.63	1095.97	0	0	0	51461.6	TF+O+D+C+H	10000	50	6.64
98.92	1.01	99.93	99.93	98.92	74.24	20546.47	2843.63	14048.94	12548.2	3.85	51461.6	TF	15000	50	6.64

86.07	0.09	85.56	85.54	86.07	97.28	46905.02	2477.47	1484.03	484.58	0.16	51461.6	TF+O+D	15000	50	6.64
61.02	0	59.19	59.12	61.02	100	49637.92	1756.63	0	0	0	51461.6	TF+O+D+C	15000	50	6.64
38.06	0	34.76	34.58	38.07	100	50365.63	1095.97	0	0	0	51461.6	TF+O+D+C+H	15000	50	6.64
97.96	1.39	99.3	99.28	97.96	64.48	20412.85	5593.61	38745.41	37908.13	46.34	102923.2	TF	2500	100	6.64
90.02	0.96	90.69	90.68	90.02	74.27	49720	5155.74	28065.65	19780.81	27.24	102923.2	TF+O+D	2500	100	6.64
78.4	0.69	78.3	78.25	78.4	80.88	65701.61	4496.02	20856.2	11714.4	17.85	102923.2	TF+O+D+C	2500	100	6.64
56.18	0.42	54.68	54.61	56.19	86.89	79536.85	3224.38	14301.67	5790.28	10.47	102923.2	TF+O+D+C+H	2500	100	6.64
98.56	1.36	99.93	99.93	98.56	65.64	20546.47	5645.49	37481.79	38753.53	29.05	102923.2	TF	5000	100	6.64
96.28	0.88	97.12	97.12	96.28	77.44	53251.96	5528.52	24607.61	19198.01	14.89	102923.2	TF+O+D	5000	100	6.64
87.28	0.53	87.47	87.46	87.29	86.43	73431.19	5017.79	14800.69	9407.16	7.51	102923.2	TF+O+D+C	5000	100	6.64
63.4	0.19	62.03	61.99	63.4	94.27	90290.92	3647.84	6254.96	2560.06	2.2	102923.2	TF+O+D+C+H	5000	100	6.64
98.57	1.36	99.93	99.93	98.57	66.12	20546.47	5654.58	36957.81	38777.03	20.45	102923.2	TF	10000	100	6.64
99	0.84	99.83	99.83	99	78.91	54738.02	5689.89	22998.92	18664.13	10.03	102923.2	TF+O+D	10000	100	6.64
93.57	0.36	93.74	93.73	93.57	90	78696.53	5382.96	10912.67	7668.03	4.15	102923.2	TF+O+D+C	10000	100	6.64
66.96	0.09	65.61	65.6	66.96	97.56	95547.64	3854.63	2664.59	688.78	0.35	102923.2	TF+O+D+C+H	10000	100	6.64

98.57	1.35	99.93	99.93	98.57	66.46	20546.47	5655.1	36579.35	38655.26	20.15	102923.2	TF	15000	100	6.64
99.03	0.83	99.86	99.86	99.03	79.36	54753.06	5691.82	22511.04	18635.22	9.85	102923.2	TF+O+D	15000	100	6.64
96.63	0.31	96.85	96.84	96.63	91.61	81307.13	5559.98	9156.42	6351.09	3.33	102923.2	TF+O+D+C	15000	100	6.64
68.19	0.05	66.84	66.81	68.19	98.97	97308.79	3925.63	1118.35	403.03	0.19	102923.2	TF+O+D+C+H	15000	100	6.64
97.04	1.67	98.55	98.39	97.04	60.04	20230.32	8254.54	65376.74	60184.46	125.51	154384.8	TF	2500	150	6.64
92.11	1.24	92.97	92.85	92.12	66.51	50912.08	7854.84	54798.24	40549.09	100.42	154384.8	TF+O+D	2500	150	6.64
83.04	1.06	83.41	83.31	83.05	70.68	69951.09	7090.75	47974.16	29153.63	81.67	154384.8	TF+O+D+C	2500	150	6.64
65.5	0.76	64.78	64.71	65.55	76.76	94244.17	5606.43	38017.83	16406.28	54.19	154384.8	TF+O+D+C+H	2500	150	6.64
98.34	1.58	99.92	99.92	98.34	62.96	20544.8	8419.12	60609.55	64274.28	73.82	154384.8	TF	5000	150	6.64
97.74	1.12	98.83	98.82	97.74	70.38	54183.21	8390.31	48458.48	42881.79	50.88	154384.8	TF+O+D	5000	150	6.64
93	0.91	93.76	93.75	93.01	76.33	78715.34	7996.89	38725.27	28528.77	35.04	154384.8	TF+O+D+C	5000	150	6.64
77.48	0.51	77.14	77.09	77.5	85.98	112285.5	6677.05	22943.02	12157.21	16.13	154384.8	TF+O+D+C+H	5000	150	6.64
98.35	1.58	99.93	99.93	98.35	63.51	20546.47	8443.58	59701.53	64680.09	49.91	154384.8	TF	10000	150	6.64
98.83	1.1	99.93	99.93	98.83	71.4	54790.58	8501.25	46788.39	43350.69	33.76	154384.8	TF+O+D	10000	150	6.64
97.49	0.84	98.3	98.29	97.49	78.6	82527.62	8397.47	35006.52	27740.94	22	154384.8	TF+O+D+C	10000	150	6.64

84.88	0.32	84.61	84.59	84.9	91.06	123199.7	7324.53	14629.07	8865.12	7.33	154384.8	TF+O+D+C+H	10000	150	6.64
98.36	1.57	99.93	99.93	98.36	63.82	20546.47	8445.31	59200.11	64680.92	48.77	154384.8	TF	15000	150	6.64
98.84	1.09	99.93	99.93	98.84	71.64	54790.58	8502.65	46397.74	43240.92	32.78	154384.8	TF+O+D	15000	150	6.64
98.98	0.82	99.79	99.78	98.98	79.35	83779.21	8526.9	33781.82	27085.84	20.8	154384.8	TF+O+D+C	15000	150	6.64
88.27	0.25	88.06	88.05	88.29	92.85	128246.3	7619.34	11697.68	6457.43	5.06	154384.8	TF+O+D+C+H	15000	150	6.64
96.32	1.83	97.92	97.63	96.32	56.39	20074.75	10856.65	95144.43	79326.76	234.22	205846.4	TF	2500	200	6.64
91.88	1.44	92.82	92.6	91.88	61.05	50774.09	10372.98	84961.36	59364.35	207.13	205846.4	TF+O+D	2500	200	6.64
84.61	1.31	85.21	84.99	84.62	64.08	71354.77	9561.85	78364.49	46254.06	181.39	205846.4	TF+O+D+C	2500	200	6.64
69.28	1.09	68.96	68.86	69.28	68.86	100287	7845.47	67930.22	29599.23	132.26	205846.4	TF+O+D+C+H	2500	200	6.64
98.23	1.68	99.86	99.83	98.23	61.12	20526.53	11164.85	84807.66	88742.17	145.6	205846.4	TF	5000	200	6.64
97.61	1.27	98.81	98.79	97.61	66.77	54168.7	11123.75	72490.92	67531.01	115.53	205846.4	TF+O+D	5000	200	6.64
94.84	1.08	95.79	95.75	94.84	70.85	80394.36	10829.22	63580.21	50571.73	91.02	205846.4	TF+O+D+C	5000	200	6.64
82.91	0.79	83.07	83.01	82.91	78.54	120907.3	9491.09	46815.92	28274.02	55.82	205846.4	TF+O+D+C+H	5000	200	6.64
98.27	1.66	99.93	99.93	98.27	62.29	20546.47	11222.08	82253.63	90771.77	92.86	205846.4	TF	10000	200	6.64
98.68	1.24	99.93	99.93	98.68	68.04	54790.58	11291.78	69727.53	69048.78	71.24	205846.4	TF+O+D	10000	200	6.64

98.31	1.04	99.34	99.34	98.31	72.74	83403.84	11266.65	59463.48	50779.48	53.1	205846.4	TF+O+D+C	10000	200	6.64
91.46	0.64	91.87	91.85	91.47	83.44	133774.3	10505.09	36134.22	24855.26	26.78	205846.4	TF+O+D+C+H	10000	200	6.64
98.27	1.66	99.93	99.93	98.27	62.47	20546.47	11225.41	81864.2	90660.98	89.76	205846.4	TF	15000	200	6.64
98.69	1.24	99.93	99.93	98.69	68.33	54790.58	11294.9	69091.03	69184.76	68.64	205846.4	TF+O+D	15000	200	6.64
98.86	1.03	99.89	99.89	98.86	73.28	83866.74	11332.91	58300.2	50915.7	50.99	205846.4	TF+O+D+C	15000	200	6.64
94.87	0.57	95.31	95.31	94.87	85.32	138808.1	10899.5	32018.55	23545.42	24.01	205846.4	TF+O+D+C+H	15000	200	6.64
95.52	1.97	97.25	96.82	95.52	53.04	19908.37	13387.15	128063.5	95381.1	361.89	257308	TF	2500	250	6.64
91.12	1.61	92.17	91.85	91.12	56.59	50363.45	12779.77	118374.6	75291.95	335.4	257308	TF+O+D	2500	250	6.64
84.77	1.48	85.42	85.14	84.77	58.98	71482.05	11895.25	111868.3	61630.37	305.78	257308	TF+O+D+C	2500	250	6.64
70.95	1.31	70.83	70.69	70.95	62.81	102963.4	9964.29	101418.1	42665.76	247.81	257308	TF+O+D+C+H	2500	250	6.64
98.04	1.77	99.7	99.59	98.04	59.6	20476.79	13864.34	110171	112092.9	247.02	257308	TF	5000	250	6.64
97.3	1.38	98.53	98.46	97.3	63.87	53985.68	13792.77	98532.97	90371.48	212.24	257308	TF+O+D	5000	250	6.64
95.32	1.2	96.32	96.25	95.32	67.24	80812.42	13540.92	89343.21	73057.09	178.14	257308	TF+O+D+C	5000	250	6.64
85.18	0.98	85.62	85.63	85.18	73.16	124714.7	12136.57	73200.09	46833.9	124.15	257308	TF+O+D+C+H	5000	250	6.64
98.2	1.73	99.93	99.92	98.2	61.56	20546.21	13983.69	104815.2	116856.3	150.7	257308	TF	10000	250	6.64

98.56	1.34	99.89	99.89	98.56	65.95	54771.98	14062.62	92859.15	94578.23	123.17	257308	TF+O+D	10000	250	6.64
98.26	1.14	99.39	99.39	98.26	69.76	83449.87	14041.12	82462.59	76376.94	101.25	257308	TF+O+D+C	10000	250	6.64
93.94	0.86	94.69	94.69	93.94	77.87	137917.4	13460.76	60336.89	44786.39	60.61	257308	TF+O+D+C+H	10000	250	6.64
98.2	1.73	99.93	99.93	98.2	61.81	20546.47	13989.84	104140.5	117030.5	144.79	257308	TF	15000	250	6.64
98.59	1.34	99.93	99.93	98.59	66.19	54790.58	14073.16	92186.96	94727.07	117.38	257308	TF+O+D	15000	250	6.64
98.77	1.14	99.9	99.9	98.77	70.23	83878.26	14119.96	81192.26	76645.59	95.71	257308	TF+O+D+C	15000	250	6.64
96.58	0.82	97.35	97.35	96.58	79.13	141782.6	13845.65	56904.26	43883.18	55.84	257308	TF+O+D+C+H	15000	250	6.64
98.14	1.02	99.13	99.13	98.14	73.49	20383.51	4300.29	14458.59	12090.15	10.47	51461.6	TF	2500	50	10.12
75.75	0.31	75.09	75.05	75.77	91.62	41148.99	3326.22	4570.59	2305.5	2.15	51461.6	TF+O+D	2500	50	10.12
55.86	0.15	54.03	53.96	55.92	95.11	45304.06	2455.45	2667.29	968.96	0.98	51461.6	TF+O+D+C	2500	50	10.12
36.4	0.06	33.15	32.96	36.49	97.42	48011.8	1602.44	1406.67	440.26	0.42	51461.6	TF+O+D+C+H	2500	50	10.12
98.93	1	99.93	99.93	98.93	74.23	20546.47	4337.93	14052.36	12048.8	7.46	51461.6	TF	5000	50	10.12
81.35	0.17	80.78	80.75	81.36	95.32	44278.91	3572.94	2550.52	950.49	0.59	51461.6	TF+O+D	5000	50	10.12
58.93	0.04	57.1	57.08	58.99	98.63	47921.53	2591.16	749.25	134.71	0.08	51461.6	TF+O+D+C	5000	50	10.12
37.35	0.01	34.11	33.94	37.44	99.28	49424.93	1644.59	392.08	0	0	51461.6	TF+O+D+C+H	5000	50	10.12

98.94	0.99	99.93	99.93	98.94	74.95	20546.47	4340.24	13659.81	11940.91	5.59	51461.6	TF	10000	50	10.12
83.6	0.12	83	82.97	83.6	97.01	45495.6	3672.06	1629.28	556.23	0.27	51461.6	TF+O+D	10000	50	10.12
59.92	0	58.08	58.05	59.98	100	48741.83	2634.56	0	20.34	0.01	51461.6	TF+O+D+C	10000	50	10.12
37.62	0	34.37	34.2	37.71	100	49805.09	1656.51	0	0	0	51461.6	TF+O+D+C+H	10000	50	10.12
98.95	0.98	99.93	99.93	98.95	75.34	20546.47	4340.99	13451.53	11648.59	5.43	51461.6	TF	15000	50	10.12
84.46	0.08	83.84	83.82	84.46	97.59	45959.73	3709.87	1314.18	369.5	0.19	51461.6	TF+O+D	15000	50	10.12
59.94	0	58.1	58.08	60	100	48761.31	2635.43	0	0	0	51461.6	TF+O+D+C	15000	50	10.12
37.62	0	34.37	34.2	37.71	100	49805.09	1656.51	0	0	0	51461.6	TF+O+D+C+H	15000	50	10.12
97.86	1.33	99.16	99.13	97.86	65.51	20383.33	8530.6	37622.56	36107.09	66.57	102923.2	TF	2500	100	10.12
88.73	0.94	89.33	89.34	88.74	75	48987.01	7757.62	27268.22	18702.06	38.36	102923.2	TF+O+D	2500	100	10.12
77.17	0.67	76.99	76.95	77.19	81.44	64611.65	6756.37	20242.21	11154.6	25.08	102923.2	TF+O+D+C	2500	100	10.12
55.27	0.41	53.71	53.69	55.32	87.04	78199.36	4844.69	14136.5	5671.89	15.04	102923.2	TF+O+D+C+H	2500	100	10.12
98.62	1.31	99.93	99.93	98.62	66.68	20546.47	8621.54	36347.92	36901.97	42.25	102923.2	TF	5000	100	10.12
95.68	0.85	96.47	96.48	95.68	78.44	52899.93	8384.24	23517.95	17800.4	21.09	102923.2	TF+O+D	5000	100	10.12
86.06	0.5	86.11	86.1	86.07	87.16	72287.26	7550.22	13999.97	8820.47	10.8	102923.2	TF+O+D+C	5000	100	10.12

62.31	0.18	60.9	60.88	62.35	94.37	88675.22	5474.05	6140.72	2467.2	3.19	102923.2	TF+O+D+C+H	5000	100	10.12
98.63	1.3	99.93	99.93	98.63	67.18	20546.47	8634.81	35799.15	36949.97	29.76	102923.2	TF	10000	100	10.12
98.93	0.8	99.71	99.71	98.93	80	54672.31	8676.62	21819.26	16995.65	13.96	102923.2	TF+O+D	10000	100	10.12
92.54	0.34	92.63	92.62	92.54	90.83	77767.7	8123.88	10001.91	6769.65	5.58	102923.2	TF+O+D+C	10000	100	10.12
65.82	0.08	64.43	64.43	65.85	97.73	93834.3	5784.74	2470.95	669.86	0.53	102923.2	TF+O+D+C+H	10000	100	10.12
98.63	1.29	99.93	99.93	98.63	67.53	20546.47	8635.63	35420.42	36828.35	29.29	102923.2	TF	15000	100	10.12
99.05	0.79	99.83	99.83	99.05	80.46	54737.3	8687.56	21314.85	16924.46	13.63	102923.2	TF+O+D	15000	100	10.12
95.67	0.28	95.79	95.78	95.67	92.53	80417.55	8399.96	8150.49	5486.7	4.34	102923.2	TF+O+D+C	15000	100	10.12
66.98	0.04	65.57	65.55	67.01	99.05	95473	5886.48	1040.16	360.46	0.26	102923.2	TF+O+D+C+H	15000	100	10.12
96.85	1.6	98.32	98.17	96.85	60.94	20185.63	12584.36	63912.12	57316.97	178.22	154384.8	TF	2500	150	10.12
90.76	1.2	91.59	91.49	90.77	67.22	50162.46	11821.38	53624.26	38472.18	140.14	154384.8	TF+O+D	2500	150	10.12
81.56	1.03	81.87	81.82	81.59	71.22	68697.42	10638.44	47086.69	27721.59	112.9	154384.8	TF+O+D+C	2500	150	10.12
64.26	0.75	63.5	63.45	64.32	77.05	92412.33	8401.29	37546.05	15900.21	74.75	154384.8	TF+O+D+C+H	2500	150	10.12
98.42	1.51	99.92	99.92	98.42	63.89	20544.57	12860.75	59087.71	61326.39	107.9	154384.8	TF	5000	150	10.12
97.2	1.08	98.25	98.24	97.2	71.25	53864.92	12734.84	47040.31	40257	73.35	154384.8	TF+O+D	5000	150	10.12

92	0.87	92.65	92.68	92	77.17	77814.1	12073.75	37351.52	26717.53	50.14	154384.8	TF+O+D+C	5000	150	10.12
76.2	0.49	75.81	75.81	76.25	86.45	110411.6	10024.15	22165.28	11460.43	23.14	154384.8	TF+O+D+C+H	5000	150	10.12
98.42	1.5	99.93	99.93	98.42	64.47	20546.47	12896.87	58138.2	61773.03	72.74	154384.8	TF	10000	150	10.12
98.75	1.06	99.8	99.81	98.75	72.41	54724.69	12964.41	45140.36	40592.65	48.3	154384.8	TF+O+D	10000	150	10.12
96.99	0.8	97.74	97.73	96.99	79.65	82054.52	12749.49	33297.02	25680.52	31.13	154384.8	TF+O+D+C	10000	150	10.12
83.53	0.3	83.19	83.21	83.56	91.58	121190.5	11001.23	13778.68	8051.8	10.17	154384.8	TF+O+D+C+H	10000	150	10.12
98.43	1.5	99.93	99.93	98.43	64.77	20546.47	12899.41	57636.2	61774.16	71.08	154384.8	TF	15000	150	10.12
98.88	1.05	99.93	99.93	98.88	72.68	54790.58	12982.58	44701.18	40449.22	46.84	154384.8	TF+O+D	15000	150	10.12
98.87	0.78	99.64	99.64	98.87	80.4	83655.52	12999.44	32070.29	24558.7	28.72	154384.8	TF+O+D+C	15000	150	10.12
86.87	0.24	86.59	86.6	86.88	93.33	126133.8	11442.34	10910.13	5539.48	6.56	154384.8	TF+O+D+C+H	15000	150	10.12
96.03	1.77	97.63	97.35	96.03	57.22	20015.85	16541.09	93330.65	75426.24	330.62	205846.4	TF	2500	200	10.12
90.35	1.41	91.32	91.1	90.35	61.7	49951.92	15589.02	83546.76	56313.7	286.16	205846.4	TF+O+D	2500	200	10.12
82.89	1.29	83.44	83.26	82.9	64.61	69908.48	14318.01	77192.73	44056.91	248.07	205846.4	TF+O+D+C	2500	200	10.12
67.77	1.07	67.46	67.39	67.8	69.23	98145.96	11732.51	67117.01	28626.12	180.18	205846.4	TF+O+D+C+H	2500	200	10.12
98.18	1.62	99.76	99.72	98.18	62.04	20503.31	17038.04	82800.37	84840.74	212	205846.4	TF	5000	200	10.12

97.25	1.23	98.41	98.4	97.25	67.68	53953.21	16919.8	70513.05	63884.78	166.71	205846.4	TF+O+D	5000	200	10.12
93.85	1.06	94.71	94.69	93.85	71.64	79500.58	16359.19	61877.93	47605.86	130.63	205846.4	TF+O+D+C	5000	200	10.12
81.59	0.76	81.69	81.67	81.62	79.18	118947.4	14259.99	45422.73	26841.75	79.93	205846.4	TF+O+D+C+H	5000	200	10.12
98.33	1.59	99.93	99.93	98.33	63.22	20546.47	17141.55	80225.37	86845.44	135.64	205846.4	TF	10000	200	10.12
98.58	1.21	99.79	99.78	98.58	69.02	54713.19	17218.03	67575.88	65327.17	103.29	205846.4	TF+O+D	10000	200	10.12
98.03	1.01	99.02	99.01	98.03	73.78	83132.9	17148.91	57189.03	47427.55	75.8	205846.4	TF+O+D+C	10000	200	10.12
90.38	0.61	90.73	90.75	90.39	84.33	132174.2	15843.01	34192.16	23056.93	38.11	205846.4	TF+O+D+C+H	10000	200	10.12
98.34	1.59	99.93	99.93	98.34	63.42	20546.47	17146.69	79790.75	86779.66	130.9	205846.4	TF	15000	200	10.12
98.73	1.2	99.93	99.93	98.73	69.38	54790.58	17246.92	66798.82	65501.73	99.52	205846.4	TF+O+D	15000	200	10.12
98.78	1	99.78	99.78	98.78	74.36	83771.76	17283.43	55928.24	47418.2	72.57	205846.4	TF+O+D+C	15000	200	10.12
93.94	0.52	94.31	94.3	93.94	86.34	137344.8	16471.48	29808.08	21646.13	33.82	205846.4	TF+O+D+C+H	15000	200	10.12
94.96	1.89	96.69	96.29	94.96	53.76	19798.52	20345.16	126077.6	90378.98	511.36	257308	TF	2500	250	10.12
89.41	1.57	90.52	90.18	89.41	57.25	49449.13	19176.07	116569.1	71499.76	460.62	257308	TF+O+D	2500	250	10.12
82.91	1.46	83.63	83.34	82.92	59.49	69975.79	17797.88	110458.8	58544.69	414.16	257308	TF+O+D+C	2500	250	10.12
69.28	1.29	69.26	69.07	69.32	63.16	100592.8	14892.74	100464.3	40986.44	332.64	257308	TF+O+D+C+H	2500	250	10.12

97.83	1.69	99.43	99.31	97.83	60.41	20419.29	21129.53	107964	106992	356.75	257308	TF	5000	250	10.12
96.89	1.33	98.08	98	96.89	64.78	53736.2	20972.89	96050.57	85838.86	306.18	257308	TF+O+D	5000	250	10.12
94.42	1.17	95.36	95.3	94.42	68.03	80018.24	20480.61	87173.08	69013.59	255.83	257308	TF+O+D+C	5000	250	10.12
83.84	0.95	84.25	84.21	83.86	73.78	122655	18239.88	71490.11	44455.06	178.89	257308	TF+O+D+C+H	5000	250	10.12
98.29	1.64	99.93	99.92	98.29	62.4	20546.21	21365.95	102522.7	111706.4	220.36	257308	TF	10000	250	10.12
98.46	1.29	99.74	99.74	98.46	66.96	54686.12	21444.19	90086.07	90008.64	179.69	257308	TF+O+D	10000	250	10.12
98.21	1.11	99.29	99.29	98.21	70.76	83368.45	21423.82	79728.73	71775.12	145.23	257308	TF+O+D+C	10000	250	10.12
93.03	0.83	93.68	93.69	93.03	78.76	136456.8	20345.73	57906.14	41780.89	86.79	257308	TF+O+D+C+H	10000	250	10.12
98.29	1.64	99.93	99.93	98.29	62.65	20546.47	21375.45	101845.7	111882.8	211.28	257308	TF	15000	250	10.12
98.65	1.28	99.93	99.93	98.65	67.27	54790.58	21494.58	89260.35	90188.37	170.83	257308	TF+O+D	15000	250	10.12
98.68	1.1	99.77	99.77	98.68	71.25	83767.88	21534.2	78408.74	72092.93	137.6	257308	TF+O+D+C	15000	250	10.12
96.05	0.79	96.78	96.78	96.05	80.19	140955.8	21016.83	54031.64	40493.12	78.95	257308	TF+O+D+C+H	15000	250	10.12
97.06	0.94	97.97	97.96	97.08	75.75	20142.59	7166.1	13227.32	10695.06	15.74	51461.6	TF	2500	50	17.05
73.16	0.27	72.55	72.57	73.38	92.53	39790.54	5425.41	4076.66	2062	3.2	51461.6	TF+O+D	2500	50	17.05
53.84	0.14	52.34	52.29	54.26	95.29	43899.58	4013.01	2567.63	919.32	1.55	51461.6	TF+O+D+C	2500	50	17.05

35.05	0.06	32.5	32.27	35.74	97.45	46997.15	2643.74	1388.98	431.02	0.71	51461.6	TF+O+D+C+H	2500	50	17.05
99	0.9	99.9	99.9	99.01	76.91	20541.22	7313.84	12590.4	10540.38	10.97	51461.6	TF	5000	50	17.05
78.3	0.14	77.72	77.74	78.48	96.08	42626.19	5805.53	2139.9	785.37	0.81	51461.6	TF+O+D	5000	50	17.05
56.81	0.04	55.28	55.24	57.21	98.78	46382.64	4232.32	664.82	121.19	0.11	51461.6	TF+O+D+C	5000	50	17.05
36	0.01	33.41	33.2	36.66	99.29	48360.09	2712	389.51	0	0	51461.6	TF+O+D+C+H	5000	50	17.05
99.01	0.89	99.9	99.9	99.02	77.63	20541.22	7317.4	12197.48	10432.44	8.27	51461.6	TF	10000	50	17.05
80.43	0.1	79.81	79.83	80.6	97.65	43772.8	5962.93	1282.87	338.94	0.26	51461.6	TF+O+D	10000	50	17.05
57.69	0	56.15	56.1	58.08	100	47104.1	4296.98	0	0	0	51461.6	TF+O+D+C	10000	50	17.05
36.26	0	33.67	33.46	36.92	100	48729.98	2731.62	0	0	0	51461.6	TF+O+D+C+H	10000	50	17.05
99.02	0.88	99.9	99.9	99.03	78.11	20541.22	7318.73	11936.06	10192.8	8	51461.6	TF	15000	50	17.05
81.26	0.06	80.62	80.64	81.43	98.3	44214.58	6024.02	929.32	189.73	0.15	51461.6	TF+O+D	15000	50	17.05
57.69	0	56.15	56.1	58.08	100	47104.1	4296.98	0	0	0	51461.6	TF+O+D+C	15000	50	17.05
36.26	0	33.67	33.46	36.92	100	48729.98	2731.62	0	0	0	51461.6	TF+O+D+C+H	15000	50	17.05
97.29	1.25	98.5	98.48	97.29	67.38	20249.73	14294.82	35583.98	32488.18	101.04	102923.2	TF	2500	100	17.05
86.27	0.88	86.79	86.78	86.38	76.41	47583.14	12722.95	25728.24	16669.09	57.43	102923.2	TF+O+D	2500	100	17.05

74.6	0.62	74.46	74.45	74.83	82.42	62512.48	11035.13	19178.14	10034.83	36.92	102923.2	TF+O+D+C	2500	100	17.05
53.19	0.4	52.02	51.94	53.63	87.29	75654.72	7912.5	13861.47	5424.18	22.21	102923.2	TF+O+D+C+H	2500	100	17.05
98.61	1.22	99.83	99.83	98.61	68.71	20526.22	14525.78	34125.5	33226.03	64.23	102923.2	TF	5000	100	17.05
94.11	0.78	94.79	94.8	94.16	80.4	51977.8	13900.7	21374.46	15350.13	31.06	102923.2	TF+O+D	5000	100	17.05
83.46	0.45	83.39	83.39	83.6	88.39	70013.57	12354.42	12659.85	7633.75	15.84	102923.2	TF+O+D+C	5000	100	17.05
60	0.18	58.86	58.78	60.35	94.56	85614.61	8924.49	5934.19	2290.7	5.08	102923.2	TF+O+D+C+H	5000	100	17.05
98.71	1.21	99.93	99.93	98.71	69.27	20546.47	14560.66	33515.39	33299.86	45.37	102923.2	TF	10000	100	17.05
98.47	0.71	99.18	99.18	98.48	82.56	54379.34	14551.8	19019.97	14367.63	20.1	102923.2	TF+O+D	10000	100	17.05
90.09	0.28	90.03	90.05	90.15	92.21	75604.23	13331.94	8494.97	5238.93	7.35	102923.2	TF+O+D+C	10000	100	17.05
63.44	0.07	62.28	62.22	63.74	98	90619.48	9430.98	2185.52	532.39	0.71	102923.2	TF+O+D+C+H	10000	100	17.05
98.72	1.21	99.93	99.93	98.72	69.64	20546.47	14561.97	33114.53	33200.21	44.57	102923.2	TF	15000	100	17.05
99.07	0.71	99.77	99.77	99.08	83.16	54707.34	14641	18371.55	14099.61	19.33	102923.2	TF+O+D	15000	100	17.05
93.18	0.23	93.14	93.17	93.24	93.98	78222.29	13791.1	6569.14	4089.4	5.49	102923.2	TF+O+D+C	15000	100	17.05
64.39	0.04	63.23	63.16	64.7	99.17	91996.49	9572.91	905.6	293.71	0.37	102923.2	TF+O+D+C+H	15000	100	17.05
95.96	1.42	97.28	97.13	95.96	62.72	19971.74	21031.46	61002.9	51915.44	267.17	154384.8	TF	2500	150	17.05

87.77	1.15	88.57	88.48	87.86	68.49	48512.62	19296.22	51554.72	34664.19	204.05	154384.8	TF+O+D	2500	150	17.05
78.64	0.99	78.97	78.91	78.83	72.21	66256.57	17334.01	45472.49	25043.24	162.13	154384.8	TF+O+D+C	2500	150	17.05
61.66	0.72	61.12	61	61.98	77.59	88836.84	13645.14	36664.29	15089.66	110.09	154384.8	TF+O+D+C+H	2500	150	17.05
98.28	1.33	99.61	99.6	98.28	65.88	20479.54	21647.53	55821.58	55823.77	166.28	154384.8	TF	5000	150	17.05
96.03	1.02	97.01	97.02	96.04	73	53195	21206.64	44169.76	35300.6	109.81	154384.8	TF+O+D	5000	150	17.05
89.65	0.81	90.23	90.25	89.72	78.77	75775.03	19837.3	34728.05	23602.68	75.38	154384.8	TF+O+D+C	5000	150	17.05
73.57	0.45	73.24	73.23	73.78	87.33	106650.3	16340.84	20732.25	10337.68	34.98	154384.8	TF+O+D+C+H	5000	150	17.05
98.6	1.33	99.93	99.93	98.6	66.51	20546.47	21773.03	54792.98	56215.07	111.16	154384.8	TF	10000	150	17.05
98.6	0.99	99.59	99.59	98.61	74.41	54607.3	21814.38	41864.3	35124.86	70.96	154384.8	TF+O+D	10000	150	17.05
95.81	0.73	96.5	96.49	95.83	81.87	81016.8	21224.53	29657.13	22009.95	45.35	154384.8	TF+O+D+C	10000	150	17.05
80.87	0.26	80.5	80.51	81.02	92.59	117257.7	17968.07	12124.65	6680.73	14.23	154384.8	TF+O+D+C+H	10000	150	17.05
98.61	1.32	99.93	99.93	98.61	66.82	20546.47	21776.66	54289.86	56216.78	108.93	154384.8	TF	15000	150	17.05
98.95	0.98	99.93	99.93	98.95	74.76	54790.57	21892.38	41300.19	34930.36	68.31	154384.8	TF+O+D	15000	150	17.05
98.32	0.69	99.01	99	98.33	83.06	83121.09	21782.64	27718.84	20890.22	41.42	154384.8	TF+O+D+C	15000	150	17.05
84.18	0.2	83.86	83.86	84.29	94.4	122144.5	18699.88	9159.76	4033.21	8.01	154384.8	TF+O+D+C+H	15000	150	17.05

94.43	1.59	95.9	95.64	94.44	58.85	19664.45	27450.68	89767.11	68279.69	497.73	205846.4	TF	2500	200	17.05
87.2	1.36	88.2	87.98	87.28	62.88	48239.64	25415.72	80977.8	50657	412.58	205846.4	TF+O+D	2500	200	17.05
79.44	1.25	80.03	79.88	79.61	65.6	67068.55	23201.78	75034.88	40077.25	356.93	205846.4	TF+O+D+C	2500	200	17.05
64.81	1.04	64.71	64.6	65.07	69.92	94081.18	18995.41	65615.28	26864.94	260.17	205846.4	TF+O+D+C+H	2500	200	17.05
97.98	1.43	99.39	99.34	97.98	63.95	20426.07	28670	78634.22	77352.91	326.45	205846.4	TF	5000	200	17.05
96.27	1.13	97.33	97.31	96.28	69.29	53354.1	28240.9	66988.31	56619.76	249.69	205846.4	TF+O+D	5000	200	17.05
91.54	1	92.32	92.31	91.6	73.23	77500.71	26910.07	58398.57	42484.06	195.97	205846.4	TF+O+D+C	5000	200	17.05
78.98	0.71	79.11	79.08	79.14	80.42	115183.1	23299.61	42705.72	24258.64	119.88	205846.4	TF+O+D+C+H	5000	200	17.05
98.52	1.41	99.93	99.93	98.52	65.14	20546.47	28945.55	76053.27	79155.61	208.75	205846.4	TF	10000	200	17.05
98.44	1.1	99.54	99.54	98.44	70.92	54578.66	28977.19	63430.03	57812.14	154.74	205846.4	TF+O+D	10000	200	17.05
96.9	0.93	97.8	97.8	96.92	76.05	82110.95	28567.5	52252.66	41964.5	114.03	205846.4	TF+O+D+C	10000	200	17.05
88.08	0.55	88.38	88.36	88.16	85.9	128687.8	26033.52	30759.67	19785.23	55.54	205846.4	TF+O+D+C+H	10000	200	17.05
98.52	1.41	99.93	99.93	98.52	65.38	20546.47	28953.7	75529.46	79178.56	201.46	205846.4	TF	15000	200	17.05
98.83	1.09	99.93	99.93	98.83	71.38	54790.58	29098.38	62432.66	57982.2	148.92	205846.4	TF+O+D	15000	200	17.05
98.6	0.9	99.5	99.5	98.61	76.96	83536.68	29074.46	50270.54	41520.36	107.59	205846.4	TF+O+D+C	15000	200	17.05

91.83	0.42	92.1	92.09	91.89	88.16	134124.4	27143.73	25831.95	18173.73	47.97	205846.4	TF+O+D+C+H	15000	200	17.05
92.68	1.76	94.32	93.96	92.7	55.26	19320.56	33520.65	121997.9	81521.5	769.98	257308	TF	2500	250	17.05
85.79	1.52	86.93	86.62	85.87	58.37	47493.2	31096.84	113522.4	64392.44	668.82	257308	TF+O+D	2500	250	17.05
79.14	1.42	79.92	79.67	79.3	60.4	66890.67	28742.6	107982	53003.39	591.63	257308	TF+O+D+C	2500	250	17.05
66.06	1.26	66.23	66.04	66.31	63.82	96178.23	24062.1	98665.43	37915.54	466.61	257308	TF+O+D+C+H	2500	250	17.05
97.49	1.53	98.97	98.84	97.49	62.21	20323.48	35519.16	103039.2	97454.1	544.67	257308	TF	5000	250	17.05
95.84	1.26	96.95	96.87	95.85	66.47	53113.52	34999.88	91445.16	76909.18	455.96	257308	TF+O+D	5000	250	17.05
92.08	1.11	92.94	92.89	92.12	69.49	77989.52	33694	83205.02	61687.99	383.8	257308	TF+O+D+C	5000	250	17.05
81.18	0.91	81.55	81.5	81.33	74.95	118701.6	29818.08	68296.66	39956.82	264.8	257308	TF+O+D+C+H	5000	250	17.05
98.44	1.49	99.93	99.92	98.44	64.26	20546.03	36074.73	97455.84	101964.2	339.83	257308	TF	10000	250	17.05
98.29	1.2	99.49	99.49	98.29	68.9	54549.1	36086.65	84803.53	80710.87	273.54	257308	TF+O+D	10000	250	17.05
97.45	1.04	98.47	98.47	97.46	72.51	82672.53	35835.14	74954.88	62782.64	215.14	257308	TF+O+D+C	10000	250	17.05
91	0.76	91.59	91.59	91.06	80.56	133397.5	33556.25	53006.7	36508.79	128.84	257308	TF+O+D+C+H	10000	250	17.05
98.44	1.49	99.93	99.93	98.44	64.51	20546.47	36090.47	96773.82	102145.1	324.71	257308	TF	15000	250	17.05
98.73	1.2	99.93	99.93	98.73	69.34	54790.58	36262.56	83606.99	81003.9	259.66	257308	TF+O+D	15000	250	17.05

| 98.53 | 1.03 | 99.55 | 99.55 | 98.53 | 73.14 | 83584.9 | 36245.44 | 73255.67 | 62671.98 | 202.35 | 257308 | TF+O+D+C | 15000 | 250 | 17.05 |
| 94.48 | 0.71 | 95.11 | 95.12 | 94.53 | 82.37 | 138533.2 | 34851.78 | 48082.03 | 35015.54 | 115.57 | 257308 | TF+O+D+C+H | 15000 | 250 | 17.05 |

S2 Table 6. Passive Release System (25% Detention Volume)

BF	OF	SF	SE	BE	RE	AY	AB	AO	ABO	AI	D	E	S	A	Qb
66.33	1.9	99.53	99.52	87.13	48.16	20463.96	2508.23	28192.56	77.18	51461.6	0.35	TF	2500	50	6.64
12.95	0.49	78.67	78.66	18.08	85.89	43130.38	520.58	7676.15	19.98	51461.6	0.35	TF+O+D	2500	50	6.64
3.9	0.2	56.65	56.62	5.48	93.23	47538.13	157.71	3686.46	8.07	51461.6	0.35	TF+O+D+C	2500	50	6.64
1.27	0.07	34.26	34.07	1.81	96.71	49614.61	52.18	1792.03	2.78	51461.6	0.35	TF+O+D+C+H	2500	50	6.64
83.53	1.84	99.93	99.93	91.05	49.93	20546.47	3136.38	27234.5	74.94	51461.6	0.29	TF	5000	50	6.64
13.88	0.27	84.75	84.76	19.46	92.1	46476.82	560.31	4299.17	10.8	51461.6	0.29	TF+O+D	5000	50	6.64
1.96	0.06	59.93	59.91	2.82	98.15	50301.78	81.29	1005.01	2.29	51461.6	0.29	TF+O+D+C	5000	50	6.64
0.32	0.01	35.23	35.05	0.46	99.28	51053.89	13.32	394.08	0.32	51461.6	0.29	TF+O+D+C+H	5000	50	6.64
93.41	1.8	99.93	99.93	76.9	51.59	20546.47	3543.56	26329.14	73.29	51461.6	0.25	TF	10000	50	6.64
11.8	0.17	87.99	87.99	15.92	95.16	48248.29	458.19	2633.7	6.91	51461.6	0.25	TF+O+D	10000	50	6.64
0.62	0	61.07	61.05	0.86	99.81	51259.77	24.83	105.62	0.15	51461.6	0.25	TF+O+D+C	10000	50	6.64
0	0	35.5	35.33	0	100	51461.6	0	0	0	51461.6	0.25	TF+O+D+C+H	10000	50	6.64
92.13	1.76	99.93	99.93	76.62	52.52	20546.47	3551.62	25822.62	71.8	51461.6	0.22	TF	15000	50	6.64

13.83	0.11	88.88	88.89	17.72	96.15	48739.73	510.02	2093.01	4.33	51461.6	0.22	TF+O+D	15000	50	6.64
0	0	61.22	61.21	0	100	51390.38	0	0	0	51461.6	0.22	TF+O+D+C	15000	50	6.64
0	0	35.5	35.33	0	100	51461.6	0	0	0	51461.6	0.22	TF+O+D+C+H	15000	50	6.64
74.47	2.68	99.72	99.72	97.47	29.78	20504.55	5611.52	76373.54	218.17	102923.2	0.49	TF	2500	100	6.64
35.28	1.62	93.71	93.7	47.9	55.43	51378.79	2757.57	48480.02	131.56	102923.2	0.49	TF+O+D	2500	100	6.64
19.16	1.09	81.13	81.09	26.48	69.58	68079.85	1524.36	33089.62	88.96	102923.2	0.49	TF+O+D+C	2500	100	6.64
7.14	0.58	56.83	56.74	10	82	82646.6	575.83	19589.37	47.06	102923.2	0.49	TF+O+D+C+H	2500	100	6.64
88.61	2.61	99.93	99.93	84.13	31.02	20546.47	6671.16	75028.33	212.65	102923.2	0.42	TF	5000	100	6.64
51.67	1.5	98.15	98.14	68.29	58.97	53812.52	3931.66	44634.23	122.27	102923.2	0.42	TF+O+D	5000	100	6.64
25.34	0.85	89.8	89.8	34.93	76.85	75392.95	2011.14	25183.07	68.85	102923.2	0.42	TF+O+D+C	5000	100	6.64
5.16	0.25	64.26	64.22	7.36	91.94	93528.99	423.93	8774.26	20.48	102923.2	0.42	TF+O+D+C+H	5000	100	6.64
95.26	2.58	99.93	99.93	73.49	32.04	20546.47	7283.53	73918.63	210.36	102923.2	0.35	TF	10000	100	6.64
67.91	1.43	99.92	99.92	89.82	61.43	54785.07	5171.12	41958.7	116.07	102923.2	0.35	TF+O+D	10000	100	6.64
34.58	0.65	95.63	95.61	44.89	81.85	80275.45	2584.58	19742.94	53.04	102923.2	0.35	TF+O+D+C	10000	100	6.64
3.43	0.1	68.04	67.96	5.05	96.81	98978.32	290.55	3470.74	8.05	102923.2	0.35	TF+O+D+C+H	10000	100	6.64

96.13	2.57	99.93	99.93	69.97	32.68	20546.47	7486.04	73217.13	209.48	102923.2	0.32	TF	15000	100	6.64
78.62	1.4	99.92	99.92	97.16	62.54	54785.07	5920.67	40749.64	113.76	102923.2	0.32	TF+O+D	15000	100	6.64
38.17	0.54	98.72	98.71	50.16	84.88	82881.38	2887.69	16443.54	44.09	102923.2	0.32	TF+O+D+C	15000	100	6.64
2.73	0.06	69.34	69.27	3.98	98.51	100889.2	229.36	1624.41	4.73	102923.2	0.32	TF+O+D+C+H	15000	100	6.64
74.24	3.05	99.8	99.8	97.53	23.46	20520.44	8422.51	124857.9	372.52	154384.8	0.6	TF	2500	150	6.64
41.88	2.18	96.39	96.38	56.58	41.03	52848.61	4886.23	96210.79	266.33	154384.8	0.6	TF+O+D	2500	150	6.64
27.68	1.73	87.42	87.45	37.8	52.6	73421.88	3264.08	77349.08	211.15	154384.8	0.6	TF+O+D+C	2500	150	6.64
13.8	1.12	68.29	68.22	18.89	67.41	99366.32	1631.64	53186.91	136.75	154384.8	0.6	TF+O+D+C+H	2500	150	6.64
88.35	3	99.93	99.93	84.21	24.59	20546.47	9999.52	123012.4	366.48	154384.8	0.51	TF	5000	150	6.64
60.49	2.09	99.27	99.27	79.94	43.38	54431.08	6903.24	92377	255.05	154384.8	0.51	TF+O+D	5000	150	6.64
40.6	1.53	95.73	95.73	54.55	57.88	80378.48	4711.17	68724.58	187.13	154384.8	0.51	TF+O+D+C	5000	150	6.64
16.17	0.8	79.55	79.52	22.42	77.8	115814.2	1936.25	36227.28	97.23	154384.8	0.51	TF+O+D+C+H	5000	150	6.64
94.85	2.97	99.93	99.93	73.97	25.44	20546.47	10883.83	121632.5	362.68	154384.8	0.43	TF	10000	150	6.64
78.92	2.03	99.93	99.93	96.71	45.14	54790.58	8919.96	89509.62	247.71	154384.8	0.43	TF+O+D	10000	150	6.64
56.81	1.43	99.22	99.22	75.03	61.03	83302.5	6479.9	63585.99	174.48	154384.8	0.43	TF+O+D+C	10000	150	6.64

19.44	0.51	87.1	87.09	27.07	84.82	126846	2337.89	24766.94	62.47	154384.8	0.43	TF+O+D+C+H	10000	150	6.64
95.75	2.95	99.93	99.93	70.48	25.93	20546.47	11184.91	120833.4	360.86	154384.8	0.39	TF	15000	150	6.64
87.79	2	99.93	99.93	85.73	46.03	54790.58	9867.95	88066.1	243.71	154384.8	0.39	TF+O+D	15000	150	6.64
66.67	1.39	99.91	99.9	87.78	62.34	83879.3	7580.29	61451.69	169.92	154384.8	0.39	TF+O+D+C	15000	150	6.64
22.44	0.41	90.67	90.66	30.07	88.16	132040.7	2596.94	19325.83	49.86	154384.8	0.39	TF+O+D+C+H	15000	150	6.64
73.17	3.28	99.87	99.86	96.41	20.24	20533.62	11101.09	173469.6	534.41	205846.4	0.7	TF	2500	200	6.64
45.62	2.49	97.09	97.11	61.66	33.38	53245.83	7099.84	144925.5	404.67	205846.4	0.7	TF+O+D	2500	200	6.64
31.8	2.12	90.09	90.13	43.31	42.68	75672.73	4986.47	124705	345.27	205846.4	0.7	TF+O+D+C	2500	200	6.64
18.05	1.56	73.85	73.8	24.56	56.23	107481.3	2828.28	95220.14	254.6	205846.4	0.7	TF+O+D+C+H	2500	200	6.64
88.21	3.24	99.93	99.93	84.86	21.34	20546.47	13257.95	171059.6	526.91	205846.4	0.59	TF	5000	200	6.64
64.75	2.42	99.35	99.35	85.41	35.31	54475.89	9834.64	140727.1	394.27	205846.4	0.59	TF+O+D	5000	200	6.64
46.19	1.95	97.62	97.62	61.96	46.66	81960.25	7134.85	116053.6	317.63	205846.4	0.59	TF+O+D+C	5000	200	6.64
24.36	1.27	85.99	85.94	33.42	64.92	125172.5	3847.71	76311.8	206.63	205846.4	0.59	TF+O+D+C+H	5000	200	6.64
94.46	3.21	99.93	99.93	74.79	22.11	20546.47	14417.98	169405.4	522.04	205846.4	0.49	TF	10000	200	6.64
81.95	2.37	99.93	99.93	92.87	36.83	54790.58	12335.7	137421.3	386.53	205846.4	0.49	TF+O+D	10000	200	6.64

65.27	1.87	99.5	99.5	85.88	48.87	83537.52	9888.65	111239.3	304.42	205846.4	0.49	TF+O+D+C	10000	200	6.64
35.26	1.07	93.71	93.71	47.21	70.96	136486.1	5435.9	63183.3	173.65	205846.4	0.49	TF+O+D+C+H	10000	200	6.64
95.47	3.19	99.93	99.93	71.18	22.52	20546.47	14832.81	168493.3	519.65	205846.4	0.45	TF	15000	200	6.64
89.91	2.35	99.93	99.93	82.9	37.58	54790.58	13483.42	135777.8	382.88	205846.4	0.45	TF+O+D	15000	200	6.64
75.9	1.83	99.93	99.93	99.13	49.96	83898.08	11413.92	108860.1	298.75	205846.4	0.45	TF+O+D+C	15000	200	6.64
40.87	1	96.66	96.65	53.93	73.28	140772.8	6210.14	58133.89	162.12	205846.4	0.45	TF+O+D+C+H	15000	200	6.64
71.74	3.47	99.93	99.93	94.83	18.26	20546.47	13649.58	222200.8	707.01	257308	0.78	TF	2500	250	6.64
47.12	2.71	97.59	97.59	63.67	28.69	53510.76	9163.85	193913.3	551.7	257308	0.78	TF+O+D	2500	250	6.64
34.8	2.36	91.49	91.48	47.11	36.34	76811.24	6781.03	173100.3	480.14	257308	0.78	TF+O+D+C	2500	250	6.64
20.76	1.87	76.96	76.93	28.07	48.23	112041.3	4040.8	140783.7	381.29	257308	0.78	TF+O+D+C+H	2500	250	6.64
87.22	3.41	99.93	99.93	86.1	19.35	20546.47	16393.74	219221.7	694.97	257308	0.66	TF	5000	250	6.64
66.55	2.64	99.43	99.43	87.67	30.41	54516.14	12617.94	189226.9	536.43	257308	0.66	TF+O+D	5000	250	6.64
49.99	2.25	98.11	98.12	67.07	39.53	82384.47	9653.21	164434.9	458.46	257308	0.66	TF+O+D+C	5000	250	6.64
29.23	1.61	89.28	89.26	39.94	55.54	130009.7	5749.02	120915.2	328.36	257308	0.66	TF+O+D+C+H	5000	250	6.64
94.19	3.38	99.93	99.93	75.55	20.09	20546.47	17912.05	217211.3	688.43	257308	0.55	TF	10000	250	6.64

83.23	2.57	99.93	99.93	91.36	31.8	54790.58	15636.86	185449.2	523.55	257308	0.55	TF+O+D	10000	250	6.64
69.67	2.2	99.55	99.55	91.08	41.42	83582.47	13109.72	159296.7	446.91	257308	0.55	TF+O+D+C	10000	250	6.64
42.87	1.45	96.34	96.34	57.24	60.4	140310.7	8239.06	107696	294.39	257308	0.55	TF+O+D+C+H	10000	250	6.64
95.21	3.37	99.93	99.93	71.87	20.47	20546.47	18441.54	216184.9	685.85	257308	0.5	TF	15000	250	6.64
90.4	2.55	99.93	99.93	81.93	32.48	54790.58	16994.03	183597.6	518.82	257308	0.5	TF+O+D	15000	250	6.64
79.82	2.15	99.93	99.93	95.75	42.41	83898.08	15004.58	156597.6	436.82	257308	0.5	TF+O+D+C	15000	250	6.64
52.46	1.39	98.36	98.35	69.49	62.25	143237.6	10001.28	102667.1	282.1	257308	0.5	TF+O+D+C+H	15000	250	6.64
63.25	1.81	99.5	99.5	83.54	50.28	20459.75	3669.48	27002.41	112.56	51461.6	0.43	TF	2500	50	10.12
12.38	0.48	78.57	78.56	17.36	86.23	43075.41	762.64	7479.45	29.6	51461.6	0.43	TF+O+D	2500	50	10.12
3.82	0.19	56.6	56.57	5.38	93.3	47500.24	236.13	3641.94	12.07	51461.6	0.43	TF+O+D+C	2500	50	10.12
1.25	0.07	34.24	34.05	1.79	96.72	49594.43	78.7	1784.25	4.23	51461.6	0.43	TF+O+D+C+H	2500	50	10.12
80.73	1.74	99.93	99.93	94.56	52.66	20546.47	4631.63	25708.57	108.11	51461.6	0.36	TF	5000	50	10.12
12.89	0.25	84.65	84.67	18.36	92.46	46427.16	806.51	4097.63	15.8	51461.6	0.36	TF+O+D	5000	50	10.12
1.9	0.05	59.92	59.89	2.75	98.2	50287.25	120.64	979.16	3.33	51461.6	0.36	TF+O+D+C	5000	50	10.12
0.32	0.01	35.22	35.05	0.45	99.28	51048.01	19.96	393.15	0.48	51461.6	0.36	TF+O+D+C+H	5000	50	10.12

91.86	1.68	99.93	99.93	79.29	54.81	20546.47	5302.19	24542.06	104.34	51461.6	0.3	TF	10000	50	10.12
11.08	0.16	87.93	87.93	15.03	95.47	48214.96	660.19	2461.87	10.08	51461.6	0.3	TF+O+D	10000	50	10.12
0.61	0	61.06	61.04	0.84	99.82	51253.67	36.87	99.66	0.17	51461.6	0.3	TF+O+D+C	10000	50	10.12
0	0	35.5	35.33	0	100	51461.6	0	0	0	51461.6	0.3	TF+O+D+C+H	10000	50	10.12
92.08	1.64	99.93	99.93	77.97	55.83	20546.47	5360.35	23986.29	102.03	51461.6	0.28	TF	15000	50	10.12
13.17	0.1	88.82	88.82	16.88	96.51	48701.96	741.23	1897.79	6.11	51461.6	0.28	TF+O+D	15000	50	10.12
0	0	61.22	61.21	0	100	51390.38	0	0	0	51461.6	0.28	TF+O+D+C	15000	50	10.12
0	0	35.5	35.33	0	100	51461.6	0	0	0	51461.6	0.28	TF+O+D+C+H	15000	50	10.12
70.61	2.55	99.68	99.68	92.63	32.08	20495.59	8137.85	73762.2	316.36	102923.2	0.61	TF	2500	100	10.12
33.6	1.57	93.56	93.55	45.83	56.51	51292.61	4026.35	47235.92	195.61	102923.2	0.61	TF+O+D	2500	100	10.12
18.46	1.07	80.97	80.94	25.55	70.13	67960.56	2244.66	32447.11	132.35	102923.2	0.61	TF+O+D+C	2500	100	10.12
6.99	0.57	56.75	56.66	9.78	82.14	82520.57	859.04	19409.39	71.08	102923.2	0.61	TF+O+D+C+H	2500	100	10.12
85.94	2.48	99.93	99.93	87.89	33.93	20546.47	9848.97	71760.09	307.92	102923.2	0.51	TF	5000	100	10.12
49.61	1.44	98.08	98.07	65.62	60.61	53775.79	5764.79	42790.69	179.19	102923.2	0.51	TF+O+D	5000	100	10.12
24.02	0.81	89.68	89.66	33.4	77.59	75279.87	2934.3	24340.92	100.92	102923.2	0.51	TF+O+D+C	5000	100	10.12

5.05	0.25	64.2	64.15	7.18	92.04	93434.56	630.71	8651.74	30.64	102923.2	0.51	TF+O+D+C+H	5000	100	10.12
94.61	2.44	99.93	99.93	75.55	35.38	20546.47	10932.52	70182.18	302.95	102923.2	0.43	TF	10000	100	10.12
65.59	1.35	99.92	99.92	86.42	63.62	54785.07	7592.41	39513.9	167.49	102923.2	0.43	TF+O+D	10000	100	10.12
32.69	0.61	95.53	95.51	42.81	82.85	80188.53	3760.62	18630.8	76.07	102923.2	0.43	TF+O+D+C	10000	100	10.12
3.3	0.09	68.02	67.93	4.85	96.9	98934.67	426.5	3374.71	11.78	102923.2	0.43	TF+O+D+C+H	10000	100	10.12
96.09	2.42	99.93	99.93	71.36	36.17	20546.47	11300.63	69316.26	300.98	102923.2	0.39	TF	15000	100	10.12
75.28	1.31	99.92	99.92	99.34	65.07	54785.07	8727.09	37936.38	162.63	102923.2	0.39	TF+O+D	15000	100	10.12
36.06	0.49	98.66	98.65	47.44	85.99	82826.06	4167.5	15216.42	61.44	102923.2	0.39	TF+O+D+C	15000	100	10.12
2.55	0.06	69.31	69.23	3.8	98.55	100834.3	334.23	1572.14	6.96	102923.2	0.39	TF+O+D+C+H	15000	100	10.12
69.41	2.88	99.77	99.77	91.59	25.68	20514.79	12068.8	121059.5	536.14	154384.8	0.75	TF	2500	150	10.12
39.48	2.12	96.25	96.25	53.61	42.32	52775.51	7064.52	93980.31	395.17	154384.8	0.75	TF+O+D	2500	150	10.12
26.48	1.69	87.24	87.25	36.25	53.42	73257.13	4776.46	75900.07	315.16	154384.8	0.75	TF+O+D+C	2500	150	10.12
13.4	1.1	68.11	68.06	18.36	67.74	99129.29	2419.77	52568.99	205.32	154384.8	0.75	TF+O+D+C+H	2500	150	10.12
85.03	2.81	99.93	99.93	88.72	27.44	20546.47	14663.84	118198.3	523.21	154384.8	0.63	TF	5000	150	10.12
57.32	2.01	99.25	99.26	76.14	45.29	54423.7	10033.38	89141.62	373.86	154384.8	0.63	TF+O+D	5000	150	10.12

38.59	1.48	95.63	95.63	52.25	59.15	80290.81	6885.13	66554.81	275.8	154384.8	0.63	TF+O+D+C	5000	150	10.12
15.58	0.78	79.43	79.39	21.63	78.24	115629.8	2849.94	35453.9	144.55	154384.8	0.63	TF+O+D+C+H	5000	150	10.12
94.11	2.76	99.93	99.93	76.28	28.74	20546.47	16302.95	116069.9	513.76	154384.8	0.53	TF	10000	150	10.12
76.16	1.92	99.93	99.93	99.43	47.69	54790.58	13102.35	85224.5	357.67	154384.8	0.53	TF+O+D	10000	150	10.12
54.55	1.37	99.17	99.17	72.21	62.84	83259.83	9515.33	60542.41	254.46	154384.8	0.53	TF+O+D+C	10000	150	10.12
18.59	0.49	86.97	86.97	25.86	85.37	126664.6	3408.28	23848.84	91.62	154384.8	0.53	TF+O+D+C+H	10000	150	10.12
95.77	2.72	99.93	99.93	71.99	29.4	20546.47	16868.9	115011.9	506.2	154384.8	0.48	TF	15000	150	10.12
85.12	1.87	99.93	99.93	89	48.93	54790.58	14627.03	83209.54	348.72	154384.8	0.48	TF+O+D	15000	150	10.12
64.19	1.32	99.91	99.9	84.47	64.48	83879.3	11131.61	57866.22	245.09	154384.8	0.48	TF+O+D+C	15000	150	10.12
21.16	0.39	90.51	90.51	28.69	88.75	131822.6	3780.22	18338.24	72.24	154384.8	0.48	TF+O+D+C+H	15000	150	10.12
67.34	3.09	99.84	99.83	89.45	22.35	20527.56	15715.78	168635.2	767.33	205846.4	0.86	TF	2500	200	10.12
42.74	2.42	96.99	96.99	57.91	34.76	53183.38	10175.47	141720.3	600.86	205846.4	0.86	TF+O+D	2500	200	10.12
30.15	2.07	89.88	89.91	41.21	43.63	75491.66	7240.96	122465.1	514.98	205846.4	0.86	TF+O+D+C	2500	200	10.12
17.43	1.54	73.61	73.57	23.77	56.7	107144.7	4175.79	94083.01	383.05	205846.4	0.86	TF+O+D+C+H	2500	200	10.12
84.01	3.01	99.93	99.93	90.19	24.11	20546.47	19292.88	164812.7	747.95	205846.4	0.73	TF	5000	200	10.12

60.93	2.33	99.33	99.33	80.99	37.32	54465.08	14229.35	136166.7	578.74	205846.4	0.73	TF+O+D	5000	200	10.12
43.66	1.89	97.54	97.54	59.01	48.1	81892.19	10368.05	112743.3	469.13	205846.4	0.73	TF+O+D+C	5000	200	10.12
23.33	1.24	85.81	85.77	32.11	65.63	124919.5	5641.38	74673.65	308.23	205846.4	0.73	TF+O+D+C+H	5000	200	10.12
93.47	2.96	99.93	99.93	77.58	25.35	20546.47	21508.95	162110.4	736.07	205846.4	0.61	TF	10000	200	10.12
79.04	2.26	99.93	99.93	96.89	39.47	54790.58	18115.56	131474.9	562.53	205846.4	0.61	TF+O+D	10000	200	10.12
62.28	1.79	99.48	99.48	82.27	50.95	83521.3	14455.08	106558.4	444.1	205846.4	0.61	TF+O+D+C	10000	200	10.12
33.68	1.02	93.63	93.62	45.24	72.05	136347.8	7948.75	60727.82	254.54	205846.4	0.61	TF+O+D+C+H	10000	200	10.12
95.34	2.94	99.93	99.93	73.01	25.95	20546.47	22311.53	160814	730.5	205846.4	0.55	TF	15000	200	10.12
87.58	2.23	99.93	99.93	86.08	40.57	54790.58	20015.12	129084.7	554.26	205846.4	0.55	TF+O+D	15000	200	10.12
72.69	1.74	99.93	99.93	95.48	52.42	83898.08	16776.27	103372.9	433.28	205846.4	0.55	TF+O+D+C	15000	200	10.12
39.19	0.95	96.57	96.56	51.83	74.54	140639.9	9106.45	55297.45	235.08	205846.4	0.55	TF+O+D+C+H	15000	200	10.12
65.3	3.22	99.9	99.9	87.14	20.26	20541.15	19139.14	216433	998.66	257308	0.96	TF	2500	250	10.12
43.92	2.62	97.48	97.48	59.4	30.09	53450.03	13045.38	189833.7	815.12	257308	0.96	TF+O+D	2500	250	10.12
32.63	2.31	91.24	91.24	44.5	37.37	76606.06	9773.79	170077.8	718.76	257308	0.96	TF+O+D+C	2500	250	10.12
19.88	1.84	76.65	76.66	27.04	48.79	111656.6	5938.93	139081.3	572.85	257308	0.96	TF+O+D+C+H	2500	250	10.12

82.4	3.14	99.93	99.93	92.2	22.02	20546.47	23676.31	211668.8	976.37	257308	0.81	TF	5000	250	10.12
62.14	2.52	99.4	99.4	82.8	32.44	54501.22	18184.11	183437.7	783.84	257308	0.81	TF+O+D	5000	250	10.12
46.99	2.19	98.04	98.05	63.44	41.07	82320.61	13932.21	160006.3	679.36	257308	0.81	TF+O+D+C	5000	250	10.12
27.93	1.58	89.06	89.07	38.31	56.41	129725.9	8413.22	118378.7	489.25	257308	0.81	TF+O+D+C+H	5000	250	10.12
92.69	3.09	99.93	99.93	78.84	23.28	20546.47	26610.59	208252.4	961.16	257308	0.68	TF	10000	250	10.12
79.99	2.45	99.93	99.93	95.72	34.46	54790.58	22903.17	177956.7	761.41	257308	0.68	TF+O+D	10000	250	10.12
66.22	2.1	99.53	99.52	87.13	43.62	83561.6	19136.5	153096.8	651.94	257308	0.68	TF+O+D+C	10000	250	10.12
40.89	1.4	96.24	96.25	54.81	61.74	140180	12038.64	103896.6	433.9	257308	0.68	TF+O+D+C+H	10000	250	10.12
94.92	3.07	99.93	99.93	74	23.85	20546.47	27671.91	206698.3	954.75	257308	0.62	TF	15000	250	10.12
87.97	2.42	99.93	99.93	85.31	35.48	54790.58	25189.5	175182.3	751.04	257308	0.62	TF+O+D	15000	250	10.12
77.02	2.03	99.93	99.93	99.61	44.99	83898.08	22048.02	149370.9	632	257308	0.62	TF+O+D+C	15000	250	10.12
50.19	1.32	98.29	98.28	66.78	63.91	143136.9	14667.41	98006.95	411.28	257308	0.62	TF+O+D+C+H	15000	250	10.12
58.1	1.67	99.48	99.48	77.09	53.99	20454.21	5703.55	24916.4	174.33	51461.6	0.56	TF	2500	50	17.05
11.38	0.45	78.4	78.39	16.15	86.85	42982.37	1194.89	7122.99	46.85	51461.6	0.56	TF+O+D	2500	50	17.05
3.66	0.19	56.52	56.49	5.18	93.44	47429.79	383.34	3557.65	19.6	51461.6	0.56	TF+O+D+C	2500	50	17.05

1.22	0.07	34.22	34.03	1.75	96.74	49556.11	129.56	1768.87	7.06	51461.6	0.56	TF+O+D+C+H	2500	50	17.05
75.11	1.55	99.93	99.93	98.95	57.58	20546.47	7320.84	22969.97	162.36	51461.6	0.47	TF	5000	50	17.05
11.17	0.24	84.5	84.51	16.36	93.03	46336.38	1210.48	3775.54	24.69	51461.6	0.47	TF+O+D	5000	50	17.05
1.81	0.05	59.89	59.86	2.61	98.28	50260.91	192.92	931.4	5.14	51461.6	0.47	TF+O+D+C	5000	50	17.05
0.31	0.01	35.21	35.04	0.44	99.28	51036.96	32.53	391.31	0.8	51461.6	0.47	TF+O+D+C+H	5000	50	17.05
89.27	1.46	99.93	99.93	84.27	60.77	20546.47	8561.85	21243.27	153	51461.6	0.4	TF	10000	50	17.05
10	0.14	87.83	87.84	13.47	95.99	48163.05	996.54	2172.38	15.13	51461.6	0.4	TF+O+D	10000	50	17.05
0.6	0	61.04	61.03	0.8	99.84	51242.83	59.25	88.09	0.21	51461.6	0.4	TF+O+D+C	10000	50	17.05
0	0	35.5	35.33	0	100	51461.6	0	0	0	51461.6	0.4	TF+O+D+C+H	10000	50	17.05
90.29	1.41	99.93	99.93	81.06	62.08	20546.47	8799.13	20531.36	147.97	51461.6	0.36	TF	15000	50	17.05
11.56	0.08	88.72	88.73	15.27	97.13	48650.86	1129.85	1558.21	8.18	51461.6	0.36	TF+O+D	15000	50	17.05
0	0	61.22	61.21	0	100	51390.38	0	0	0	51461.6	0.36	TF+O+D+C	15000	50	17.05
0	0	35.5	35.33	0	100	51461.6	0	0	0	51461.6	0.36	TF+O+D+C+H	15000	50	17.05
63.02	2.36	99.63	99.63	84	36	20486.02	12428.63	69310.55	494.37	102923.2	0.79	TF	2500	100	17.05
30.64	1.5	93.29	93.28	42.23	58.41	51146.07	6249.23	45046.43	313.31	102923.2	0.79	TF+O+D	2500	100	17.05

17.24	1.02	80.7	80.68	23.91	71.11	67738.3	3538.2	31298.46	213.12	102923.2	0.79	TF+O+D+C	2500	100	17.05
6.73	0.56	56.6	56.5	9.38	82.41	82285.98	1388.2	19071.37	116.82	102923.2	0.79	TF+O+D+C+H	2500	100	17.05
80.33	2.26	99.93	99.93	95.41	39.08	20546.47	15475.03	65978.18	473.01	102923.2	0.67	TF	5000	100	17.05
45.35	1.33	97.97	97.96	60.68	63.47	53715.27	8978.33	39563.65	278.52	102923.2	0.67	TF+O+D	5000	100	17.05
21.71	0.76	89.45	89.43	30.68	78.88	75081.78	4540	22875.24	158.99	102923.2	0.67	TF+O+D+C	5000	100	17.05
4.83	0.24	64.07	64.03	6.85	92.23	93261.75	1013.87	8422.29	49.75	102923.2	0.67	TF+O+D+C+H	5000	100	17.05
92.62	2.18	99.93	99.93	80.12	41.61	20546.47	17738.62	63232.58	456.48	102923.2	0.56	TF	10000	100	17.05
60.87	1.2	99.92	99.92	80.17	67.5	54785.07	11861.8	35200.09	251.21	102923.2	0.56	TF+O+D	10000	100	17.05
29.27	0.55	95.35	95.33	39.21	84.59	80041.37	5801.68	16698.83	114.12	102923.2	0.56	TF+O+D+C	10000	100	17.05
3.07	0.09	67.96	67.88	4.53	97.05	98859.57	670.19	3199.13	18.77	102923.2	0.56	TF+O+D+C+H	10000	100	17.05
95.57	2.13	99.93	99.93	74.45	42.84	20546.47	18576.69	61905.83	445.62	102923.2	0.51	TF	15000	100	17.05
69.46	1.15	99.92	99.92	92.69	69.59	54785.07	13714.89	32931.19	239.69	102923.2	0.51	TF+O+D	15000	100	17.05
32.93	0.41	98.47	98.46	43.31	87.88	82669.61	6408.59	13135.07	85.08	102923.2	0.51	TF+O+D+C	15000	100	17.05
2.27	0.05	69.24	69.17	3.51	98.64	100743.1	520.05	1473.83	10.66	102923.2	0.51	TF+O+D+C+H	15000	100	17.05
60.67	2.64	99.74	99.74	81.51	29.35	20507.34	18090.02	114761.5	830.15	154384.8	0.97	TF	2500	150	17.05

35.37	2.02	96.01	96.01	48.59	44.51	52645.36	10784.07	90157.81	633.96	154384.8	0.97	TF+O+D	2500	150	17.05
24.37	1.62	86.91	86.92	33.6	54.88	72979.69	7456.66	73307.73	509.26	154384.8	0.97	TF+O+D+C	2500	150	17.05
12.66	1.07	67.8	67.76	17.42	68.36	98694.38	3867.37	51428.71	336.09	154384.8	0.97	TF+O+D+C+H	2500	150	17.05
78.46	2.53	99.93	99.93	97.36	32.39	20546.47	22779.76	109825.5	793.32	154384.8	0.82	TF	5000	150	17.05
51.71	1.87	99.23	99.24	69.44	48.56	54412.29	15413.01	83571.5	587.11	154384.8	0.82	TF+O+D	5000	150	17.05
35.1	1.39	95.45	95.46	48.04	61.37	80144.9	10662.72	62771.56	436.3	154384.8	0.82	TF+O+D+C	5000	150	17.05
14.46	0.74	79.2	79.16	20.21	79.04	115296.5	4486.49	34069.09	232.04	154384.8	0.82	TF+O+D+C+H	5000	150	17.05
91.14	2.43	99.93	99.93	81.63	34.83	20546.47	26272.17	105864.9	764.22	154384.8	0.69	TF	10000	150	17.05
70.2	1.74	99.93	99.93	92.38	52.21	54790.58	20503.88	77647.4	547.16	154384.8	0.69	TF+O+D	10000	150	17.05
50.22	1.24	99.09	99.09	66.97	66.05	83195.76	14864.42	55164.93	388.9	154384.8	0.69	TF+O+D+C	10000	150	17.05
16.99	0.45	86.76	86.74	23.75	86.3	126330.7	5272.02	22267.95	142.63	154384.8	0.69	TF+O+D+C+H	10000	150	17.05
94.72	2.4	99.93	99.93	75.72	35.93	20546.47	27582.31	104065.6	754.22	154384.8	0.62	TF	15000	150	17.05
79.84	1.68	99.93	99.93	95.52	54.15	54790.58	23188	74485.3	526.68	154384.8	0.62	TF+O+D	15000	150	17.05
59.47	1.17	99.91	99.9	78.31	68.27	83879.3	17381.59	51548.06	367.8	154384.8	0.62	TF+O+D+C	15000	150	17.05
19.08	0.35	90.29	90.28	26.13	89.78	131486.7	5799.26	16618.82	108.51	154384.8	0.62	TF+O+D+C+H	15000	150	17.05

57.7	2.81	99.8	99.8	78.21	25.74	20520.77	23145.5	160812.6	1177.79	205846.4	1.12	TF	2500	200	17.05
37.83	2.32	96.77	96.78	51.8	37.06	53063.53	15329.01	136324.1	969.69	205846.4	1.12	TF+O+D	2500	200	17.05
27.26	1.99	89.51	89.53	37.67	45.27	75166.89	11147.62	118570.4	833.21	205846.4	1.12	TF+O+D+C	2500	200	17.05
16.28	1.5	73.17	73.16	22.37	57.54	106553.8	6619.64	91990.16	626.92	205846.4	1.12	TF+O+D+C+H	2500	200	17.05
76.04	2.69	99.93	99.93	99.98	28.82	20546.47	29585.77	154157.8	1126.57	205846.4	0.94	TF	5000	200	17.05
54.54	2.19	99.3	99.31	73.27	40.72	54451.03	21682.38	128404	916.42	205846.4	0.94	TF+O+D	5000	200	17.05
39.52	1.78	97.4	97.39	53.91	50.6	81772.56	15952.23	107012	746.47	205846.4	0.94	TF+O+D+C	5000	200	17.05
21.46	1.18	85.5	85.47	29.83	66.88	124480.9	8826.7	71748	494.61	205846.4	0.94	TF+O+D+C+H	5000	200	17.05
89.2	2.58	99.93	99.93	83.76	31.25	20546.47	34397.89	148895.7	1080.95	205846.4	0.79	TF	10000	200	17.05
73.08	2.08	99.93	99.93	95.58	44.13	54790.58	28285.21	121014.2	871.62	205846.4	0.79	TF+O+D	10000	200	17.05
57.29	1.65	99.45	99.45	75.95	54.61	83500.33	22476.21	98330.68	688.78	205846.4	0.79	TF+O+D+C	10000	200	17.05
30.62	0.94	93.43	93.43	41.72	73.94	136083.8	12345.01	56455.28	394.86	205846.4	0.79	TF+O+D+C+H	10000	200	17.05
93.94	2.54	99.93	99.93	77.23	32.37	20546.47	36331.42	146480.9	1063.67	205846.4	0.72	TF	15000	200	17.05
82.28	1.99	99.93	99.93	92.5	45.97	54790.58	31811.74	117028.8	832.77	205846.4	0.72	TF+O+D	15000	200	17.05
67.65	1.57	99.93	99.93	88.95	56.78	83898.08	26323.39	93620.14	657.57	205846.4	0.72	TF+O+D+C	15000	200	17.05

35.88	0.85	96.41	96.41	47.91	76.77	140419.9	14177.09	50326.97	355	205846.4	0.72	TF+O+D+C+H	15000	200	17.05
54.85	2.93	99.87	99.87	75.03	23.42	20535.13	27755.04	207298.2	1533.72	257308	1.25	TF	2500	250	17.05
38.5	2.5	97.28	97.27	52.62	32.39	53335.58	19464.37	183042.7	1308.53	257308	1.25	TF+O+D	2500	250	17.05
29.2	2.23	90.84	90.83	40.28	39.12	76264.5	14900.93	164848.8	1168.1	257308	1.25	TF+O+D+C	2500	250	17.05
18.34	1.79	76.2	76.21	25.25	49.79	110995	9340.04	135982.8	936.46	257308	1.25	TF+O+D+C+H	2500	250	17.05
73.29	2.8	99.93	99.93	97.02	26.49	20546.47	35888.52	198988.6	1463.89	257308	1.05	TF	5000	250	17.05
55.22	2.37	99.36	99.36	74.33	35.84	54482.89	27495.1	173707.3	1237.61	257308	1.05	TF+O+D	5000	250	17.05
42.03	2.08	97.91	97.91	57.34	43.7	82203.38	21211.76	152448.9	1086.27	257308	1.05	TF+O+D+C	5000	250	17.05
25.65	1.5	88.75	88.73	35.42	57.94	129229.7	13102.98	113897	786.31	257308	1.05	TF+O+D+C+H	5000	250	17.05
87.42	2.71	99.93	99.93	85.95	28.98	20546.47	42186.89	192245	1415.48	257308	0.88	TF	10000	250	17.05
73.77	2.26	99.93	99.93	96.3	39.12	54790.58	35623.99	164838.9	1180.42	257308	0.88	TF+O+D	10000	250	17.05
59.98	1.93	99.5	99.49	79.9	47.42	83536.08	29555.65	142368.5	1007.43	257308	0.88	TF+O+D+C	10000	250	17.05
37.17	1.3	96.1	96.09	50.53	64.09	139956.4	18691.23	97236.99	680.34	257308	0.88	TF+O+D+C+H	10000	250	17.05
93.08	2.65	99.93	99.93	78.89	30.12	20546.47	44798.61	189163.4	1387.43	257308	0.8	TF	15000	250	17.05
82.73	2.2	99.93	99.93	92.21	40.86	54790.58	39873.37	160121.4	1151.77	257308	0.8	TF+O+D	15000	250	17.05

| 70.87 | 1.85 | 99.93 | 99.93 | 93.04 | 49.52 | 83898.08 | 34416.14 | 136689.3 | 968.42 | 257308 | 0.8 | TF+O+D+C | 15000 | 250 | 17.05 |
| 46.05 | 1.21 | 98.16 | 98.15 | 61.81 | 66.83 | 142945 | 22865.01 | 89825.22 | 632.48 | 257308 | 0.8 | TF+O+D+C+H | 15000 | 250 | 17.05 |

S2 Table 7. Passive Release System (75% Detention Volume)

BF	OF	SF	SE	BE	RE	AY	AB	AO	ABO	AI	D	E	S	A	Qb
90.79	1.84	99.44	99.44	81.08	49.81	20446.9	3423.31	27297.32	74.87	51461.6	0.27	TF	2500	50	6.64
36.6	0.46	77.82	77.79	50.17	86.7	42653.64	1444.11	7234.46	18.8	51461.6	0.27	TF+O+D	2500	50	6.64
13.59	0.19	56.2	56.14	22.27	93.36	47131.81	641.16	3612.8	7.88	51461.6	0.27	TF+O+D+C	2500	50	6.64
5.25	0.07	34.1	33.93	8.82	96.73	49423.58	253.91	1781.35	2.77	51461.6	0.27	TF+O+D+C+H	2500	50	6.64
96.63	1.8	99.93	99.93	71.36	50.96	20546.47	3703.07	26669.53	73.44	51461.6	0.22	TF	5000	50	6.64
35.3	0.25	83.87	83.89	49.71	92.81	45996.13	1430.86	3911.31	10.14	51461.6	0.22	TF+O+D	5000	50	6.64
8.87	0.05	59.61	59.59	15.15	98.3	50028.93	436.02	924.18	2.08	51461.6	0.22	TF+O+D+C	5000	50	6.64
1.9	0.01	35.15	34.98	4.23	99.28	50946.14	121.65	393.49	0.32	51461.6	0.22	TF+O+D+C+H	5000	50	6.64
97.4	1.78	99.93	99.93	66.79	52.12	20546.47	3834.61	26039.06	72.42	51461.6	0.19	TF	10000	50	6.64
23.69	0.16	87.16	87.16	38.73	95.53	47793.43	1114.94	2432.07	6.65	51461.6	0.19	TF+O+D	10000	50	6.64
4.11	0	60.86	60.84	8.52	99.88	51081.57	245.3	63.44	0.08	51461.6	0.19	TF+O+D+C	10000	50	6.64
0.62	0	35.48	35.31	1.25	100	51425.52	36.08	0	0	51461.6	0.19	TF+O+D+C+H	10000	50	6.64
97.42	1.75	99.93	99.93	66.96	53.03	20546.47	3829.67	25545.32	71.12	51461.6	0.17	TF	15000	50	6.64

20.27	0.1	88.44	88.44	31.6	96.43	48492.85	909.74	1940.36	4.15	51461.6	0.17	TF+O+D	15000	50	6.64
1.68	0	61.07	61.05	4.49	100	51261	129.38	0	0	51461.6	0.17	TF+O+D+C	15000	50	6.64
0	0	35.49	35.32	0.5	100	51447.12	14.48	0	0	51461.6	0.17	TF+O+D+C+H	15000	50	6.64
94.46	2.61	99.57	99.57	76.06	31.15	20473.46	7135.69	74887.54	212.17	102923.2	0.38	TF	2500	100	6.64
66.17	1.57	92.8	92.8	87.44	57.06	50882.78	5033.92	46706.92	127.7	102923.2	0.38	TF+O+D	2500	100	6.64
46.01	1.05	80.16	80.1	62.22	70.71	67256.18	3582.2	31863.25	85.74	102923.2	0.38	TF+O+D+C	2500	100	6.64
21.05	0.57	56.19	56.09	30.77	82.22	81699.43	1771.45	19345.93	46.48	102923.2	0.38	TF+O+D+C+H	2500	100	6.64
96.21	2.59	99.93	99.93	69.47	31.79	20546.47	7514.97	74186.97	210.7	102923.2	0.32	TF	5000	100	6.64
81.48	1.44	97.73	97.72	93.59	60.7	53581.28	6126.57	42743.77	117.53	102923.2	0.32	TF+O+D	5000	100	6.64
54.79	0.81	88.9	88.88	73.27	78.16	74623.31	4218.15	23757.21	65.6	102923.2	0.32	TF+O+D+C	5000	100	6.64
19.14	0.24	63.59	63.52	29.13	92.15	92513.03	1677.21	8544.8	19.7	102923.2	0.32	TF+O+D+C+H	5000	100	6.64
96.62	2.57	99.93	99.93	66.56	32.4	20546.47	7682.7	73520.55	209.51	102923.2	0.27	TF	10000	100	6.64
92.04	1.37	99.92	99.92	79.69	62.95	54785.07	6926.61	40297.92	111.51	102923.2	0.27	TF+O+D	10000	100	6.64
58.79	0.58	94.89	94.86	81.32	83.19	79644.52	4681.96	18285.35	47.58	102923.2	0.27	TF+O+D+C	10000	100	6.64
13.37	0.09	67.51	67.44	22.01	97.01	98216.34	1267.1	3258.53	7.62	102923.2	0.27	TF+O+D+C+H	10000	100	6.64

96.62	2.57	99.93	99.93	65.49	32.92	20546.47	7743.94	72959.9	208.96	102923.2	0.24	TF	15000	100	6.64
96.55	1.35	99.92	99.92	73.1	63.75	54785.07	7305.8	39434.01	110.2	102923.2	0.24	TF+O+D	15000	100	6.64
64.82	0.48	98.04	98.02	85.61	86.13	82298.16	4929.07	15092.74	38.96	102923.2	0.24	TF+O+D+C	15000	100	6.64
11.54	0.05	68.91	68.85	17.84	98.67	100271.8	1026.93	1444.76	4.13	102923.2	0.24	TF+O+D+C+H	15000	100	6.64
94.1	2.99	99.62	99.62	76.53	24.8	20482.95	10662.53	122664.6	365.2	154384.8	0.46	TF	2500	150	6.64
74.13	2.12	95.45	95.45	96.87	42.84	52336.72	8365.55	93256.28	258.85	154384.8	0.46	TF+O+D	2500	150	6.64
56.94	1.68	86.34	86.36	75.96	54.05	72507.83	6559.67	74980.59	205.05	154384.8	0.46	TF+O+D+C	2500	150	6.64
33.22	1.1	67.32	67.24	46.32	67.97	97930.79	4000.06	52263.22	134.08	154384.8	0.46	TF+O+D+C+H	2500	150	6.64
96.43	2.97	99.93	99.93	69.71	25.36	20546.47	11252.19	121764.4	362.61	154384.8	0.39	TF	5000	150	6.64
88.52	2.01	99.12	99.12	84.85	45.19	54350.01	9944.63	89427.82	245.88	154384.8	0.39	TF+O+D	5000	150	6.64
71.46	1.47	95.05	95.05	94.06	59.62	79807.62	8122.57	65894.3	180.08	154384.8	0.39	TF+O+D+C	5000	150	6.64
40.98	0.76	78.64	78.61	56.59	78.79	114489.6	4887.02	34611.91	92.68	154384.8	0.39	TF+O+D+C+H	5000	150	6.64
96.24	2.95	99.93	99.93	66.71	25.82	20546.47	11510.97	121007.6	360.88	154384.8	0.32	TF	10000	150	6.64
95.55	1.98	99.93	99.93	73.56	46.36	54790.58	10919.22	87517.71	241.26	154384.8	0.32	TF+O+D	10000	150	6.64
85.87	1.37	98.86	98.85	88.6	62.68	82994.3	9620.23	60900.19	167.87	154384.8	0.32	TF+O+D+C	10000	150	6.64

44.46	0.48	86.11	86.11	61.45	85.76	125414	5306.48	23243.26	58.65	154384.8	0.32	TF+O+D+C+H	10000	150	6.64
96.25	2.95	99.93	99.93	65.91	26.17	20546.47	11580.13	120439.6	359.77	154384.8	0.29	TF	15000	150	6.64
96.81	1.96	99.93	99.93	69.73	46.87	54790.58	11250.1	86688.61	239.63	154384.8	0.29	TF+O+D	15000	150	6.64
91.24	1.34	99.91	99.9	80.74	63.91	83879.3	10298.9	58881.1	163.41	154384.8	0.29	TF+O+D+C	15000	150	6.64
45.65	0.38	89.6	89.61	63.26	88.98	130520.4	5463.29	17988.1	46.05	154384.8	0.29	TF+O+D+C+H	15000	150	6.64
93.44	3.22	99.64	99.64	77.48	21.59	20487.33	14107.49	170521.8	524.92	205846.4	0.53	TF	2500	200	6.64
77.03	2.42	96.2	96.21	99.59	35.2	52754.33	11561.97	140972.9	394.2	205846.4	0.53	TF+O+D	2500	200	6.64
61.78	2.06	88.79	88.82	82.13	44.22	74570.86	9456.58	121355.4	335.94	205846.4	0.53	TF+O+D+C	2500	200	6.64
39.68	1.54	72.6	72.54	54.89	56.99	105653.8	6320.02	93568.78	250.36	205846.4	0.53	TF+O+D+C+H	2500	200	6.64
96.17	3.2	99.93	99.93	70.25	22.12	20546.47	14939.75	169384.5	521.55	205846.4	0.45	TF	5000	200	6.64
90.88	2.36	99.24	99.24	81.79	37.01	54416.81	13611.2	137021.7	384.99	205846.4	0.45	TF+O+D	5000	200	6.64
77.92	1.88	96.95	96.96	97.89	48.52	81404.58	11757.88	112001.9	306.43	205846.4	0.45	TF+O+D+C	5000	200	6.64
53.42	1.23	84.99	84.95	71.34	66.26	123723.5	8214.17	73409.99	199.53	205846.4	0.45	TF+O+D+C+H	5000	200	6.64
96.58	3.19	99.93	99.93	67.03	22.51	20546.47	15311.19	168515.6	519.31	205846.4	0.38	TF	10000	200	6.64
95.82	2.34	99.93	99.93	72.18	37.92	54790.58	14718.4	135045	381.41	205846.4	0.38	TF+O+D	10000	200	6.64

90.24	1.81	99.42	99.42	81.88	50.54	83470.06	13601.11	107605.6	295.02	205846.4	0.38	TF+O+D+C	10000	200	6.64
65.09	1.01	93.01	93.01	86.24	72.54	135466.6	9929.84	59734.37	164.97	205846.4	0.38	TF+O+D+C+H	10000	200	6.64
96.02	3.18	99.93	99.93	66.11	22.79	20546.47	15417.39	167910.9	517.86	205846.4	0.34	TF	15000	200	6.64
96.48	2.33	99.93	99.93	69.05	38.31	54790.58	15078.3	134186.9	379.74	205846.4	0.34	TF+O+D	15000	200	6.64
94.68	1.79	99.93	99.93	75.17	51.32	83898.08	14373.2	105909.6	291.11	205846.4	0.34	TF+O+D+C	15000	200	6.64
69.04	0.91	96.05	96.04	93.54	74.95	139872.1	10771.01	54498.3	148.91	205846.4	0.34	TF+O+D+C+H	15000	200	6.64
92.8	3.4	99.67	99.67	78.5	19.64	20493.01	17487.63	218435.5	691.72	257308	0.59	TF	2500	250	6.64
77.76	2.62	96.59	96.6	98.45	30.48	52965.92	14616.66	189032.5	534.28	257308	0.59	TF+O+D	2500	250	6.64
64.82	2.3	90.06	90.04	85.7	37.93	75595.09	12335.61	168785.4	468.34	257308	0.59	TF+O+D+C	2500	250	6.64
44.16	1.84	75.5	75.48	60.28	49.16	109940.5	8675.97	138266.6	374.47	257308	0.59	TF+O+D+C+H	2500	250	6.64
95.91	3.38	99.93	99.93	70.94	20.15	20546.47	18576.36	217048	687.94	257308	0.5	TF	5000	250	6.64
91.2	2.56	99.3	99.3	80.97	32.04	54449.58	17131.92	184798.4	521.17	257308	0.5	TF+O+D	5000	250	6.64
81.16	2.17	97.58	97.6	93.98	41.42	81941.78	15259.65	159293.7	441.91	257308	0.5	TF+O+D+C	5000	250	6.64
59.35	1.56	88.17	88.18	78.78	57	128423.2	11338.65	116933.9	317.34	257308	0.5	TF+O+D+C+H	5000	250	6.64
96.49	3.36	99.93	99.93	67.36	20.52	20546.47	19090.92	216036.9	684.84	257308	0.42	TF	10000	250	6.64

96.21	2.54	99.93	99.93	71.77	32.83	54790.58	18456.69	182637.8	516.86	257308	0.42	TF+O+D	10000	250	6.64
92.97	2.1	99.45	99.45	78.54	42.99	83499.62	17482.18	155028.1	428.35	257308	0.42	TF+O+D+C	10000	250	6.64
72.88	1.39	95.73	95.73	96.72	62.16	139428.4	13921.78	102913.8	283.41	257308	0.42	TF+O+D+C+H	10000	250	6.64
95.93	3.36	99.93	99.93	66.36	20.76	20546.47	19235.01	215394.6	683.28	257308	0.38	TF	15000	250	6.64
96.3	2.53	99.93	99.93	68.8	33.17	54790.58	18884.05	181712.7	514.83	257308	0.38	TF+O+D	15000	250	6.64
95.62	2.09	99.93	99.93	73.23	43.6	83898.08	18245.8	153370	424.7	257308	0.38	TF+O+D+C	15000	250	6.64
82.86	1.33	97.94	97.94	92.62	63.95	142646.7	15455.03	98027.57	271.14	257308	0.38	TF+O+D+C+H	15000	250	6.64
89	1.73	99.38	99.38	84.01	52.85	20435.03	5094.72	25607.99	107.23	51461.6	0.33	TF	2500	50	10.12
35.06	0.43	77.33	77.29	48.28	87.43	42377.67	2120.5	6827.85	26.99	51461.6	0.33	TF+O+D	2500	50	10.12
13.23	0.19	55.94	55.86	21.74	93.51	46898.19	955.03	3530.43	11.66	51461.6	0.33	TF+O+D+C	2500	50	10.12
5.17	0.07	34.02	33.85	8.72	96.75	49306.59	382.85	1767.98	4.18	51461.6	0.33	TF+O+D+C+H	2500	50	10.12
96.18	1.68	99.93	99.93	72.93	54.4	20546.47	5581.42	24763.04	104.22	51461.6	0.28	TF	5000	50	10.12
33.15	0.23	83.33	83.33	47.29	93.44	45692.73	2077.39	3564.73	14.27	51461.6	0.28	TF+O+D	5000	50	10.12
8.48	0.05	59.44	59.41	14.68	98.42	49883.73	645.03	859.97	2.89	51461.6	0.28	TF+O+D+C	5000	50	10.12
1.87	0.01	35.11	34.94	4.18	99.28	50885.37	183.49	392.26	0.48	51461.6	0.28	TF+O+D+C+H	5000	50	10.12

97.53	1.64	99.93	99.93	67.53	55.76	20546.47	5818.64	24027.98	102.14	51461.6	0.23	TF	10000	50	10.12
22.26	0.15	86.73	86.74	37.14	96.05	47559.75	1631.57	2146.63	9.14	51461.6	0.23	TF+O+D	10000	50	10.12
3.82	0	60.76	60.73	8.18	99.93	50993.26	359.52	37.59	0.01	51461.6	0.23	TF+O+D+C	10000	50	10.12
0.6	0	35.46	35.3	1.24	100	51407.16	54.44	0	0	51461.6	0.23	TF+O+D+C+H	10000	50	10.12
97.15	1.61	99.93	99.93	67.44	56.68	20546.47	5822.67	23526.04	100.07	51461.6	0.21	TF	15000	50	10.12
19.98	0.09	88.15	88.16	30.79	96.96	48336.94	1352.26	1652.57	5.33	51461.6	0.21	TF+O+D	15000	50	10.12
1.47	0	61	60.98	4.28	100	51202.38	188	0	0	51461.6	0.21	TF+O+D+C	15000	50	10.12
0	0	35.49	35.32	0.5	100	51439.69	21.91	0	0	51461.6	0.21	TF+O+D+C+H	15000	50	10.12
93.14	2.46	99.47	99.47	78.82	34.34	20452.6	10645.84	71309.36	306.1	102923.2	0.46	TF	2500	100	10.12
64.11	1.5	92.09	92.1	84.74	58.92	50502.07	7444.05	44623.86	186.05	102923.2	0.46	TF+O+D	2500	100	10.12
44.1	1.01	79.48	79.46	60.07	71.77	66717.82	5277.08	30671.86	124.99	102923.2	0.46	TF+O+D+C	2500	100	10.12
20.54	0.56	55.76	55.69	30.08	82.47	81103.78	2642.95	19050.33	69.65	102923.2	0.46	TF+O+D+C+H	2500	100	10.12
96.16	2.44	99.93	99.93	70.88	35.3	20546.47	11343.08	70271.98	302.81	102923.2	0.39	TF	5000	100	10.12
78.72	1.36	97.49	97.48	96.58	63.26	53448.2	9085.25	39909.23	168.49	102923.2	0.39	TF+O+D	5000	100	10.12
52.61	0.75	88.28	88.26	70.35	79.48	74101.21	6180.41	22293.53	93.38	102923.2	0.39	TF+O+D+C	5000	100	10.12

18.31	0.24	63.19	63.1	28.23	92.33	91909.25	2479.65	8340.19	29.29	102923.2	0.39	TF+O+D+C+H	5000	100	10.12
96.77	2.42	99.93	99.93	67.12	36.06	20546.47	11673.88	69443.98	300.22	102923.2	0.33	TF	10000	100	10.12
90.16	1.27	99.89	99.89	82.54	65.98	54772.61	10318.67	36951.99	157.55	102923.2	0.33	TF+O+D	10000	100	10.12
55.66	0.53	94.45	94.43	77.81	84.84	79284.58	6835.58	16475.57	65.43	102923.2	0.33	TF+O+D+C	10000	100	10.12
12.74	0.09	67.24	67.16	21.23	97.19	97821.49	1865.44	3052.74	10.9	102923.2	0.33	TF+O+D+C+H	10000	100	10.12
96.78	2.41	99.93	99.93	65.79	36.62	20546.47	11790.45	68828.47	299.24	102923.2	0.3	TF	15000	100	10.12
95.91	1.24	99.92	99.92	75.18	67.02	54785.07	10965.74	35821.56	154.62	102923.2	0.3	TF+O+D	15000	100	10.12
62.77	0.42	97.6	97.58	82.63	87.87	81926.69	7258.63	13181.01	51.78	102923.2	0.3	TF+O+D+C	15000	100	10.12
11.02	0.05	68.68	68.6	17.1	98.78	99912.25	1502.46	1327.28	5.67	102923.2	0.3	TF+O+D+C+H	15000	100	10.12
92.25	2.79	99.54	99.54	79.75	27.96	20467.44	15845.64	117350.2	519.38	154384.8	0.57	TF	2500	150	10.12
71.14	2.03	94.75	94.75	93.3	45.01	51954.42	12294.93	89597.5	377.44	154384.8	0.57	TF+O+D	2500	150	10.12
54.81	1.61	85.61	85.6	73.33	55.55	71872.66	9662.81	72423.34	300.72	154384.8	0.57	TF+O+D+C	2500	150	10.12
32.1	1.07	66.65	66.57	44.94	68.55	96959.85	5921.98	51251.7	199.54	154384.8	0.57	TF+O+D+C+H	2500	150	10.12
96.45	2.73	99.93	99.93	71.24	28.84	20546.47	16967.93	115910.3	508.79	154384.8	0.48	TF	5000	150	10.12
85.94	1.89	98.88	98.87	87.94	48.05	54214.24	14766.48	84642.12	353.03	154384.8	0.48	TF+O+D	5000	150	10.12

69.18	1.4	94.57	94.56	91.05	61.73	79395.34	11997.76	62357.88	260.92	154384.8	0.48	TF+O+D+C	5000	150	10.12
39	0.72	78.06	78.03	54.52	79.67	113644.6	7184.39	33124.32	134.77	154384.8	0.48	TF+O+D+C+H	5000	150	10.12
96.49	2.71	99.93	99.93	67.29	29.47	20546.47	17488.35	114894.5	504.5	154384.8	0.4	TF	10000	150	10.12
94.46	1.84	99.91	99.91	75.54	49.7	54781.07	16400.15	81951.99	343.4	154384.8	0.4	TF+O+D	10000	150	10.12
84.07	1.28	98.59	98.57	91.37	65.35	82763.91	14315.05	56446.47	238.38	154384.8	0.4	TF+O+D+C	10000	150	10.12
42.48	0.45	85.51	85.51	59.23	86.75	124546.1	7805.43	21592.51	83.14	154384.8	0.4	TF+O+D+C+H	10000	150	10.12
96.5	2.69	99.93	99.93	66.17	29.86	20546.47	17635.6	114249.7	502.2	154384.8	0.36	TF	15000	150	10.12
96.75	1.82	99.93	99.93	71.04	50.38	54790.58	16994.21	80852.16	339.9	154384.8	0.36	TF+O+D	15000	150	10.12
89.34	1.24	99.85	99.85	83.68	66.88	83831.99	15328.08	53950.13	230.32	154384.8	0.36	TF+O+D+C	15000	150	10.12
43.67	0.34	89.04	89.04	60.33	89.99	129690.2	7950.06	16316.3	63.63	154384.8	0.36	TF+O+D+C+H	15000	150	10.12
91.09	2.99	99.56	99.56	81.28	24.68	20471.61	20858.87	163578.7	742.07	205846.4	0.66	TF	2500	200	10.12
73.82	2.32	95.47	95.5	96.37	37.47	52361.45	16932.14	135822.2	576.58	205846.4	0.66	TF+O+D	2500	200	10.12
59.08	2	87.98	87.99	78.75	45.9	73877.19	13837.21	117516.9	495.86	205846.4	0.66	TF+O+D+C	2500	200	10.12
38.22	1.5	71.77	71.71	53.03	57.81	104444.1	9317.96	91663.59	373.46	205846.4	0.66	TF+O+D+C+H	2500	200	10.12
96.04	2.95	99.93	99.93	72.1	25.56	20546.47	22471.34	161651.5	733.18	205846.4	0.55	TF	5000	200	10.12

88.55	2.24	99.08	99.08	84.93	40	54327.45	20217.7	130342.1	557.46	205846.4	0.55	TF+O+D	5000	200	10.12
74.87	1.79	96.51	96.51	98.59	50.89	81030.83	17322.09	106682.4	445.16	205846.4	0.55	TF+O+D+C	5000	200	10.12
51.42	1.18	84.29	84.26	68.97	67.58	122717.4	12117.78	70429.07	291.99	205846.4	0.55	TF+O+D+C+H	5000	200	10.12
96.65	2.93	99.93	99.93	67.77	26.14	20546.47	23232.07	160396.2	728.36	205846.4	0.46	TF	10000	200	10.12
95.36	2.18	99.92	99.91	73.85	41.33	54783.54	22164.6	127457	540.6	205846.4	0.46	TF+O+D	10000	200	10.12
88.48	1.7	99.33	99.33	84.81	53.54	83399.94	20239.64	100920.2	422.2	205846.4	0.46	TF+O+D+C	10000	200	10.12
62.52	0.94	92.54	92.54	83.11	74.36	134775.8	14602.23	55693.31	233.2	205846.4	0.46	TF+O+D+C+H	10000	200	10.12
96.27	2.92	99.93	99.93	66.48	26.47	20546.47	23458.8	159672.1	725.96	205846.4	0.42	TF	15000	200	10.12
96.5	2.16	99.93	99.93	70.15	41.86	54790.58	22813.92	126305.5	536.09	205846.4	0.42	TF+O+D	15000	200	10.12
93.26	1.67	99.88	99.87	77.3	54.59	83854.82	21558.95	98654.79	413.92	205846.4	0.42	TF+O+D+C	15000	200	10.12
66.12	0.82	95.67	95.67	89.81	77	139332.1	15780.43	49980.3	203.46	205846.4	0.42	TF+O+D+C+H	15000	200	10.12
89.85	3.12	99.6	99.6	82.94	22.65	20479.41	25708.34	209963.1	968.86	257308	0.73	TF	2500	250	10.12
74.22	2.51	95.84	95.85	97.09	32.79	52557.49	21323.54	182500.6	778.65	257308	0.73	TF+O+D	2500	250	10.12
61.54	2.23	89.17	89.17	81.91	39.73	74870.74	17988.38	163643.5	691.89	257308	0.73	TF+O+D+C	2500	250	10.12
42.26	1.8	74.52	74.53	58.03	50.14	108553.1	12745.86	135408.2	557.77	257308	0.73	TF+O+D+C+H	2500	250	10.12

95.62	3.08	99.93	99.93	73.08	23.56	20546.47	27874.44	207493	957.55	257308	0.62	TF	5000	250	10.12
88.87	2.43	99.17	99.18	84.32	35.04	54379.59	25406.18	176373.2	754.42	257308	0.62	TF+O+D	5000	250	10.12
78.43	2.06	97.22	97.23	97.73	43.94	81631.03	22460.64	152216.1	641.21	257308	0.62	TF+O+D+C	5000	250	10.12
57.13	1.5	87.44	87.42	76.08	58.56	127316.9	16708.01	112533	466.34	257308	0.62	TF+O+D+C+H	5000	250	10.12
96.62	3.06	99.93	99.93	68.25	24.13	20546.47	28936.67	205938.9	950.3	257308	0.52	TF	10000	250	10.12
95.72	2.4	99.92	99.92	73.55	36.24	54785.58	27770.57	173114.7	743.95	257308	0.52	TF+O+D	10000	250	10.12
91.19	1.98	99.38	99.38	81.38	46.11	83442.64	26051.57	146343.1	613.73	257308	0.52	TF+O+D+C	10000	250	10.12
70.63	1.31	95.28	95.27	93.63	64.34	138757.3	20562.43	96833.78	407.45	257308	0.52	TF+O+D+C+H	10000	250	10.12
96.24	3.05	99.93	99.93	66.8	24.43	20546.47	29253.67	205125.5	946.98	257308	0.47	TF	15000	250	10.12
96.29	2.38	99.93	99.93	69.96	36.72	54790.58	28559.02	171826.1	739.64	257308	0.47	TF+O+D	15000	250	10.12
94.76	1.95	99.88	99.88	75.12	46.95	83858.48	27427.18	144060.8	605.16	257308	0.47	TF+O+D+C	15000	250	10.12
80.07	1.24	97.68	97.67	95.64	66.51	142259.4	22920.4	90949.42	384.83	257308	0.47	TF+O+D+C+H	15000	250	10.12
85.03	1.52	99.11	99.11	89.46	58.39	20378.22	8177.81	22534.8	159.17	51461.6	0.43	TF	2500	50	17.05
31.45	0.39	76.41	76.38	44.66	88.69	41881.69	3304.38	6130.34	40.51	51461.6	0.43	TF+O+D	2500	50	17.05
12.51	0.17	55.39	55.35	20.77	93.78	46470.96	1536.78	3372.55	18.22	51461.6	0.43	TF+O+D+C	2500	50	17.05

5.03	0.07	33.86	33.7	8.51	96.79	49083.23	629.87	1741.58	6.91	51461.6	0.43	TF+O+D+C+H	2500	50	17.05
93.93	1.44	99.93	99.93	76.64	60.85	20546.47	9126.69	21200.78	150.99	51461.6	0.36	TF	5000	50	17.05
29.31	0.2	82.32	82.32	42.69	94.4	45139.68	3158.29	3031.94	20.48	51461.6	0.36	TF+O+D	5000	50	17.05
7.76	0.04	59.09	59.07	13.79	98.57	49594.03	1020.26	773.9	4.25	51461.6	0.36	TF+O+D+C	5000	50	17.05
1.82	0.01	35.02	34.86	4.09	99.28	50768.77	302.22	389.81	0.8	51461.6	0.36	TF+O+D+C+H	5000	50	17.05
97.78	1.39	99.93	99.93	69.47	62.7	20546.47	9656.75	20197.25	145.78	51461.6	0.3	TF	10000	50	17.05
20.14	0.11	86.02	86.04	34.2	96.99	47175.47	2530.35	1629.81	11.47	51461.6	0.3	TF+O+D	10000	50	17.05
3.23	0	60.56	60.55	7.51	100	50835.01	555.37	0	0	51461.6	0.3	TF+O+D+C	10000	50	17.05
0.58	0	35.44	35.27	1.21	100	51371.83	89.77	0	0	51461.6	0.3	TF+O+D+C+H	10000	50	17.05
96.92	1.36	99.93	99.93	68.75	63.7	20546.47	9709.76	19655	142.35	51461.6	0.27	TF	15000	50	17.05
19.44	0.05	87.65	87.65	29.25	97.94	48062.37	2163.83	1115.29	5.61	51461.6	0.27	TF+O+D	15000	50	17.05
1.13	0	60.89	60.87	3.87	100	51103.86	286.52	0	0	51461.6	0.27	TF+O+D+C	15000	50	17.05
0	0	35.48	35.31	0.49	100	51425.33	36.27	0	0	51461.6	0.27	TF+O+D+C+H	15000	50	17.05
89.13	2.22	99.33	99.32	84.62	40.2	20422.94	17071.86	64763.33	465.53	102923.2	0.6	TF	2500	100	17.05
59.99	1.37	90.81	90.83	79.65	62.25	49800.95	11785.46	40891.65	287.05	102923.2	0.6	TF+O+D	2500	100	17.05

40.46	0.93	78.32	78.3	55.95	73.61	65741.57	8277.98	28586.47	194.15	102923.2	0.6	TF+O+D+C	2500	100	17.05
19.61	0.54	55.01	54.93	28.83	82.94	79997.67	4265.77	18496.68	113.04	102923.2	0.6	TF+O+D+C+H	2500	100	17.05
95.62	2.14	99.93	99.93	74.01	41.98	20546.47	18642.48	62837.06	448.6	102923.2	0.51	TF	5000	100	17.05
73.56	1.19	96.87	96.87	97.64	67.86	53114.34	14447.27	34811.25	248.63	102923.2	0.51	TF+O+D	5000	100	17.05
48.42	0.66	87.16	87.15	65.31	81.81	73169.77	9663.47	19705.54	138.06	102923.2	0.51	TF+O+D+C	5000	100	17.05
16.72	0.22	62.42	62.35	26.61	92.65	90812.42	3936.98	7969.49	46.51	102923.2	0.51	TF+O+D+C+H	5000	100	17.05
96.91	2.1	99.93	99.93	68.56	43.18	20546.47	19448.8	61540.03	439.76	102923.2	0.43	TF	10000	100	17.05
84.98	1.08	99.79	99.78	88.95	71.41	54713.25	16431.28	30961.94	225.04	102923.2	0.43	TF+O+D	10000	100	17.05
50.63	0.43	93.54	93.54	71.31	87.55	78535.58	10551.75	13486.87	90.34	102923.2	0.43	TF+O+D+C	10000	100	17.05
11.66	0.08	66.75	66.69	19.82	97.54	97136.65	2932.11	2667.66	16.08	102923.2	0.43	TF+O+D+C+H	10000	100	17.05
97.1	2.09	99.93	99.93	66.61	43.9	20546.47	19736.23	60756.19	436.33	102923.2	0.38	TF	15000	100	17.05
92.92	1.04	99.92	99.92	80.57	73.01	54785.07	17671.77	29218.86	216.74	102923.2	0.38	TF+O+D	15000	100	17.05
55.43	0.33	96.78	96.75	74.72	90.5	81233.53	11056.58	10296.43	69.48	102923.2	0.38	TF+O+D+C	15000	100	17.05
9.68	0.04	68.24	68.16	15.66	98.94	99275.37	2316.5	1147.61	8.18	102923.2	0.38	TF+O+D+C+H	15000	100	17.05
87.08	2.47	99.37	99.37	86.49	33.64	20432.88	25194.13	107794	775.81	154384.8	0.74	TF	2500	150	17.05

65.33	1.88	93.43	93.43	86.81	48.82	51230.48	19268.04	83149.35	589.55	154384.8	0.74	TF+O+D	2500	150	17.05
50.51	1.5	84.22	84.23	68.42	58.21	70716.73	15186.6	67896.99	471.3	154384.8	0.74	TF+O+D+C	2500	150	17.05
30.17	1.02	65.43	65.34	42.47	69.59	95167.84	9426.89	49426.96	320.3	154384.8	0.74	TF+O+D+C+H	2500	150	17.05
95.39	2.42	99.93	99.93	75.03	35.42	20546.47	27736.92	104906.8	758.42	154384.8	0.62	TF	5000	150	17.05
80.76	1.7	98.29	98.3	94.09	53.19	53897.31	23505.47	76053.28	534.49	154384.8	0.62	TF+O+D	5000	150	17.05
64.81	1.26	93.64	93.64	85.57	65.52	78624.71	18992.83	56013.95	394.66	154384.8	0.62	TF+O+D+C	5000	150	17.05
35.69	0.66	77.01	76.96	50.71	81.2	112089.8	11254.05	30550.83	206.67	154384.8	0.62	TF+O+D+C+H	5000	150	17.05
96.46	2.38	99.93	99.93	69.08	36.53	20546.47	29056.48	103098.7	747.87	154384.8	0.52	TF	10000	150	17.05
91.75	1.61	99.77	99.77	79.93	55.91	54702.69	26648.3	71637.04	503.99	154384.8	0.52	TF+O+D	10000	150	17.05
78.52	1.1	98.07	98.06	97.51	70.17	82331.36	22746.61	48456.54	346.8	154384.8	0.52	TF+O+D+C	10000	150	17.05
39.42	0.39	84.46	84.45	55.11	88.5	122995.3	12231.63	18688.46	120.95	154384.8	0.52	TF+O+D+C+H	10000	150	17.05
96.82	2.37	99.93	99.93	67.22	37.09	20546.47	29469.74	102190.2	743.35	154384.8	0.47	TF	15000	150	17.05
95.73	1.56	99.93	99.93	74.1	57.06	54790.58	27942.31	69768.81	490.8	154384.8	0.47	TF+O+D	15000	150	17.05
84	1.04	99.73	99.72	90.3	72.22	83726.15	24347.26	45129.29	327.53	154384.8	0.47	TF+O+D+C	15000	150	17.05
39.84	0.28	88.06	88.07	55.44	91.78	128275.5	12304.21	13358.1	86.8	154384.8	0.47	TF+O+D+C+H	15000	150	17.05

84.88	2.64	99.43	99.43	89.14	30.13	20444.36	32806.75	151313.5	1104.91	205846.4	0.85	TF	2500	200	17.05
67.39	2.16	94.09	94.09	89.01	41.43	51593.32	26340.41	126870.5	904.96	205846.4	0.85	TF+O+D	2500	200	17.05
54.23	1.87	86.5	86.48	72.87	48.86	72612.23	21563.16	110784.6	782.59	205846.4	0.85	TF+O+D+C	2500	200	17.05
35.55	1.43	70.24	70.19	49.75	59.27	102231.1	14723.69	88255.18	600.27	205846.4	0.85	TF+O+D+C+H	2500	200	17.05
94.64	2.55	99.93	99.93	76.38	32.02	20546.47	36583.02	147225.3	1067.58	205846.4	0.72	TF	5000	200	17.05
83.16	2	98.74	98.75	91.34	45.37	54144.15	32154.53	118326.9	838.33	205846.4	0.72	TF+O+D	5000	200	17.05
69.65	1.62	95.73	95.73	92.18	55.15	80371.69	27279.32	97168.75	679.41	205846.4	0.72	TF+O+D+C	5000	200	17.05
47.69	1.08	83.01	82.98	64.58	69.93	120859.8	19110.97	65151.78	451.03	205846.4	0.72	TF+O+D+C+H	5000	200	17.05
96.5	2.52	99.93	99.93	69.85	33.14	20546.47	38514.85	144809	1053.51	205846.4	0.6	TF	10000	200	17.05
93.4	1.91	99.75	99.75	77.98	47.67	54691.95	36109.6	113365.1	799.52	205846.4	0.6	TF+O+D	10000	200	17.05
84.48	1.5	99.01	99.01	90.21	59.03	83126.82	32488.63	88758.45	628.23	205846.4	0.6	TF+O+D+C	10000	200	17.05
57.68	0.82	91.62	91.62	77.13	77.51	133440.1	22823.42	48713.28	344.76	205846.4	0.6	TF+O+D+C+H	10000	200	17.05
96.68	2.5	99.93	99.93	67.7	33.66	20546.47	39152.61	143677.7	1047.52	205846.4	0.54	TF	15000	200	17.05
96.23	1.88	99.93	99.93	73.06	48.61	54790.58	37566.17	111323	787.15	205846.4	0.54	TF+O+D	15000	200	17.05
90.69	1.45	99.75	99.75	81.99	60.62	83747.23	34922.27	85301.87	605.39	205846.4	0.54	TF+O+D+C	15000	200	17.05

60.42	0.7	94.9	94.9	82.94	80.5	138214	24544.1	42258.58	291.11	205846.4	0.54	TF+O+D+C+H	15000	200	17.05
82.63	2.75	99.48	99.49	91.81	27.88	20456.12	40020.48	195228.5	1436.65	257308	0.95	TF	2500	250	17.05
67.22	2.33	94.37	94.35	89.06	36.74	51735.52	32942.42	171281.6	1220.95	257308	0.95	TF+O+D	2500	250	17.05
55.94	2.1	87.51	87.55	75.11	42.82	73504.26	27785.32	154826.4	1096.91	257308	0.95	TF+O+D+C	2500	250	17.05
38.96	1.71	72.83	72.81	54.06	51.87	106043.7	19997.7	130340.9	895.49	257308	0.95	TF+O+D+C+H	2500	250	17.05
93.79	2.66	99.93	99.93	78.04	29.87	20546.47	45114.18	189843.8	1391.5	257308	0.8	TF	5000	250	17.05
83.67	2.21	98.81	98.81	91.15	40.41	54178.88	40263.98	161336.8	1157.41	257308	0.8	TF+O+D	5000	250	17.05
72.47	1.88	96.46	96.47	95.25	48.39	80995.59	35235.04	139755.5	985.84	257308	0.8	TF+O+D+C	5000	250	17.05
52.94	1.39	86.01	86.04	71.15	61.34	125309.8	26320.86	104687.6	727.22	257308	0.8	TF+O+D+C+H	5000	250	17.05
96.69	2.6	99.93	99.93	70.64	31.06	20546.47	47853.31	186636.7	1361.55	257308	0.67	TF	10000	250	17.05
94.15	2.12	99.74	99.74	77.52	42.63	54686.54	45305.41	155341.1	1107.11	257308	0.67	TF+O+D	10000	250	17.05
86.58	1.76	99.27	99.28	87.26	51.81	83353.71	41704.01	130498.5	919.74	257308	0.67	TF+O+D+C	10000	250	17.05
66.74	1.16	94.43	94.42	87.95	68.27	137522.5	32533.17	85923.03	608.6	257308	0.67	TF+O+D+C+H	10000	250	17.05
96.44	2.59	99.93	99.93	68.22	31.57	20546.47	48746.54	185252.8	1352.86	257308	0.61	TF	15000	250	17.05
96.12	2.08	99.93	99.93	72.8	43.49	54790.58	47051.9	153008.3	1090.4	257308	0.61	TF+O+D	15000	250	17.05

| 92.09 | 1.72 | 99.73 | 99.73 | 79.57 | 53.17 | 83734.97 | 44547.79 | 126796.9 | 897.55 | 257308 | 0.61 | TF+O+D+C | 15000 | 250 | 17.05 |
| 74.26 | 1.07 | 97.09 | 97.08 | 97.96 | 71.05 | 141395.3 | 36236.24 | 78378.39 | 559.44 | 257308 | 0.61 | TF+O+D+C+H | 15000 | 250 | 17.05 |

S2 Table 8. Active Release System (no baseflow release function)

OF	SF	SE	RE	AY	AO	AI	E	S	A
1.12	99.58	99.58	70.62	20475.04	16023.75	51461.6	Toilet Flushing	2500	50
0.36	78.77	78.77	90.31	43189.85	5287.11	51461.6	Toilet Flushing, Outdoor and Dishwasher	2500	50
0.16	56.64	56.59	94.82	47517.41	2823.51	51461.6	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	50
0.06	34.23	34.04	97.37	49573.37	1433.98	51461.6	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	50
1.11	99.93	99.93	71.22	20546.47	15694.54	51461.6	Toilet Flushing	5000	50
0.21	84.91	84.94	94.02	46571.96	3262.11	51461.6	Toilet Flushing, Outdoor and Dishwasher	5000	50
0.06	59.92	59.89	98.34	50287.28	906.54	51461.6	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	50
0.01	35.23	35.06	99.27	51063.84	395.84	51461.6	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	50
1.1	99.93	99.93	71.97	20546.47	15284.37	51461.6	Toilet Flushing	10000	50
0.14	88.14	88.15	96.26	48332.41	2040	51461.6	Toilet Flushing, Outdoor and Dishwasher	10000	50
0.01	61.04	61.02	99.89	51233.46	61.43	51461.6	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	50
0	35.5	35.33	100	51461.6	0	51461.6	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	50
1.08	99.93	99.93	72.26	20546.47	15126.9	51461.6	Toilet Flushing	15000	50

0.11	89.05	89.06	96.78	48832.41	1753.47	51461.6	Toilet Flushing, Outdoor and Dishwasher	15000	50
0	61.22	61.21	100	51390.38	0	51461.6	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	50
0	35.5	35.33	100	51461.6	0	51461.6	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	50
1.55	99.56	99.58	62.61	20476.04	40787.28	102923.2	Toilet Flushing	2500	100
1.02	93.15	93.17	72.82	51084.5	29644.65	102923.2	Toilet Flushing, Outdoor and Dishwasher	2500	100
0.74	80.75	80.72	79.73	67772.92	22111.6	102923.2	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	100
0.43	56.52	56.43	86.59	82190.11	14631.31	102923.2	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	100
1.53	99.93	99.93	63.77	20546.38	39520.37	102923.2	Toilet Flushing	5000	100
0.95	98.2	98.19	75.38	53840.37	26855.4	102923.2	Toilet Flushing, Outdoor and Dishwasher	5000	100
0.59	89.9	89.89	84.98	75468.21	16381.28	102923.2	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	100
0.2	64.24	64.16	94.02	93440.97	6527.48	102923.2	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	100
1.52	99.93	99.93	64.2	20546.47	39044.2	102923.2	Toilet Flushing	10000	100
0.92	99.92	99.92	76.47	54785.07	25667.56	102923.2	Toilet Flushing, Outdoor and Dishwasher	10000	100
0.45	95.82	95.79	88.16	80424.5	12909.73	102923.2	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	100
0.09	68.05	67.97	97.29	98990.99	2955.01	102923.2	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	100

1.52	99.93	99.93	64.55	20546.47	38666.19	102923.2	Toilet Flushing	15000	100
0.92	99.92	99.92	76.91	54785.07	25182.54	102923.2	Toilet Flushing, Outdoor and Dishwasher	15000	100
0.4	98.83	98.83	89.7	82974.42	11237.35	102923.2	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	100
0.06	69.37	69.3	98.72	100931.5	1399.73	102923.2	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	100
1.8	98.89	98.97	58.48	20350.51	67924.14	154384.8	Toilet Flushing	2500	150
1.31	94.95	95.04	65.13	52111.53	57057.39	154384.8	Toilet Flushing, Outdoor and Dishwasher	2500	150
1.11	86.07	86.14	69.58	72326.84	49776.6	154384.8	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	150
0.79	67.14	67.13	76.17	97772.45	38986.64	154384.8	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	150
1.72	99.9	99.91	61.29	20543.35	63329.82	154384.8	Toilet Flushing	5000	150
1.2	99.29	99.3	68.7	54445.81	51215.41	154384.8	Toilet Flushing, Outdoor and Dishwasher	5000	150
0.97	95.7	95.72	74.65	80364.02	41470.66	154384.8	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	150
0.55	79.54	79.51	85.05	115800.3	24467.8	154384.8	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	150
1.71	99.93	99.93	61.83	20546.47	62447.21	154384.8	Toilet Flushing	10000	150
1.19	99.93	99.93	69.48	54790.58	49926.91	154384.8	Toilet Flushing, Outdoor and Dishwasher	10000	150
0.92	99.28	99.28	76.49	83352.99	38471.62	154384.8	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	150

0.36	87.27	87.26	90.08	127090.9	16227.45	154384.8	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	150
1.71	99.93	99.93	62.11	20546.47	61999.34	154384.8	Toilet Flushing	15000	150
1.19	99.93	99.93	69.76	54790.58	49472.85	154384.8	Toilet Flushing, Outdoor and Dishwasher	15000	150
0.9	99.91	99.9	77	83879.3	37633.3	154384.8	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	150
0.3	90.91	90.91	91.92	132406.7	13222.26	154384.8	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	150
1.99	98.18	98.36	54.97	20224.42	98238.21	205846.4	Toilet Flushing	2500	200
1.52	94.65	94.86	59.69	52011.19	87942.12	205846.4	Toilet Flushing, Outdoor and Dishwasher	2500	200
1.36	88.01	88.17	63	74030.85	80724.79	205846.4	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	200
1.12	71.63	71.71	68.13	104439.8	69523.61	205846.4	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	200
1.85	99.8	99.82	59.6	20524.11	88126.73	205846.4	Toilet Flushing	5000	200
1.36	99.2	99.22	64.91	54403.16	76540.78	205846.4	Toilet Flushing, Outdoor and Dishwasher	5000	200
1.14	97.33	97.35	69.35	81734.06	66864.72	205846.4	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	200
0.84	85.57	85.53	77.25	124573.2	49620.42	205846.4	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	200
1.83	99.93	99.93	60.77	20546.47	85570.34	205846.4	Toilet Flushing	10000	200
1.34	99.93	99.93	66.06	54790.58	74037.27	205846.4	Toilet Flushing, Outdoor and Dishwasher	10000	200

1.11	99.55	99.55	70.93	83580.49	63409.74	205846.4	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	200
0.72	93.81	93.8	81.57	136615.4	40215.83	205846.4	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	200
1.83	99.93	99.93	60.91	20546.47	85266.68	205846.4	Toilet Flushing	15000	200
1.33	99.93	99.93	66.31	54790.58	73486.09	205846.4	Toilet Flushing, Outdoor and Dishwasher	15000	200
1.1	99.93	99.93	71.38	83898.08	62424.37	205846.4	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	200
0.68	96.8	96.79	83.19	140966.2	36669.01	205846.4	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	200
2.21	97.34	97.61	51.68	20069.66	131758.8	257308	Toilet Flushing	2500	250
1.76	94.07	94.33	55.21	51720.54	122134.3	257308	Toilet Flushing, Outdoor and Dishwasher	2500	250
1.53	88.35	88.57	57.97	74360.55	114598.3	257308	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	250
1.35	73.8	73.94	62.08	107692.9	103404.3	257308	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	250
1.98	99.56	99.59	58.11	20477.96	114216.3	257308	Toilet Flushing	5000	250
1.54	98.87	98.9	62.05	54228.89	103479.2	257308	Toilet Flushing, Outdoor and Dishwasher	5000	250
1.29	97.46	97.5	65.71	81865.4	93493.4	257308	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	250
1.03	88.26	88.28	71.94	128578.8	76510.67	257308	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	250
1.93	99.91	99.91	60.06	20543.93	108913.4	257308	Toilet Flushing	10000	250

1.5	99.91	99.91	64.05	54783.82	98025.19	257308	Toilet Flushing, Outdoor and Dishwasher	10000	250
1.24	99.6	99.6	67.98	83627.2	87312.5	257308	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	250
0.92	96.39	96.38	76.09	140377.3	65192.5	257308	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	250
1.93	99.93	99.93	60.31	20546.47	108240.9	257308	Toilet Flushing	15000	250
1.5	99.93	99.93	64.3	54790.58	97349.71	257308	Toilet Flushing, Outdoor and Dishwasher	15000	250
1.24	99.93	99.93	68.35	83898.08	86302.79	257308	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	250
0.9	98.4	98.4	77.1	143309.5	62440.25	257308	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	250
1.12	99.58	99.58	70.62	20475.04	16023.75	51461.6	Toilet Flushing	2500	50
0.36	78.77	78.77	90.31	43189.85	5287.11	51461.6	Toilet Flushing, Outdoor and Dishwasher	2500	50
0.16	56.64	56.59	94.82	47517.41	2823.51	51461.6	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	50
0.06	34.23	34.04	97.37	49573.37	1433.98	51461.6	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	50
1.11	99.93	99.93	71.22	20546.47	15694.54	51461.6	Toilet Flushing	5000	50
0.21	84.91	84.94	94.02	46571.96	3262.11	51461.6	Toilet Flushing, Outdoor and Dishwasher	5000	50
0.06	59.92	59.89	98.34	50287.28	906.54	51461.6	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	50
0.01	35.23	35.06	99.27	51063.84	395.84	51461.6	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	50

1.1	99.93	99.93	71.97	20546.47	15284.37	51461.6	Toilet Flushing	10000	50
0.14	88.14	88.15	96.26	48332.41	2040	51461.6	Toilet Flushing, Outdoor and Dishwasher	10000	50
0.01	61.04	61.02	99.89	51233.46	61.43	51461.6	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	50
0	35.5	35.33	100	51461.6	0	51461.6	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	50
1.08	99.93	99.93	72.26	20546.47	15126.9	51461.6	Toilet Flushing	15000	50
0.11	89.05	89.06	96.78	48832.41	1753.47	51461.6	Toilet Flushing, Outdoor and Dishwasher	15000	50
0	61.22	61.21	100	51390.38	0	51461.6	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	50
0	35.5	35.33	100	51461.6	0	51461.6	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	50
1.55	99.56	99.58	62.61	20476.04	40787.28	102923.2	Toilet Flushing	2500	100
1.02	93.15	93.17	72.82	51084.5	29644.65	102923.2	Toilet Flushing, Outdoor and Dishwasher	2500	100
0.74	80.75	80.72	79.73	67772.92	22111.6	102923.2	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	100
0.43	56.52	56.43	86.59	82190.11	14631.31	102923.2	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	100
1.53	99.93	99.93	63.77	20546.38	39520.37	102923.2	Toilet Flushing	5000	100
0.95	98.2	98.19	75.38	53840.37	26855.4	102923.2	Toilet Flushing, Outdoor and Dishwasher	5000	100
0.59	89.9	89.89	84.98	75468.21	16381.28	102923.2	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	100

0.2	64.24	64.16	94.02	93440.97	6527.48	102923.2	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	100
1.52	99.93	99.93	64.2	20546.47	39044.2	102923.2	Toilet Flushing	10000	100
0.92	99.92	99.92	76.47	54785.07	25667.56	102923.2	Toilet Flushing, Outdoor and Dishwasher	10000	100
0.45	95.82	95.79	88.16	80424.5	12909.73	102923.2	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	100
0.09	68.05	67.97	97.29	98990.99	2955.01	102923.2	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	100
1.52	99.93	99.93	64.55	20546.47	38666.19	102923.2	Toilet Flushing	15000	100
0.92	99.92	99.92	76.91	54785.07	25182.54	102923.2	Toilet Flushing, Outdoor and Dishwasher	15000	100
0.4	98.83	98.83	89.7	82974.42	11237.35	102923.2	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	100
0.06	69.37	69.3	98.72	100931.5	1399.73	102923.2	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	100
1.8	98.89	98.97	58.48	20350.51	67924.14	154384.8	Toilet Flushing	2500	150
1.31	94.95	95.04	65.13	52111.53	57057.39	154384.8	Toilet Flushing, Outdoor and Dishwasher	2500	150
1.11	86.07	86.14	69.58	72326.84	49776.6	154384.8	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	150
0.79	67.14	67.13	76.17	97772.45	38986.64	154384.8	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	150
1.72	99.9	99.91	61.29	20543.35	63329.82	154384.8	Toilet Flushing	5000	150
1.2	99.29	99.3	68.7	54445.81	51215.41	154384.8	Toilet Flushing, Outdoor and Dishwasher	5000	150

0.97	95.7	95.72	74.65	80364.02	41470.66	154384.8	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	150
0.55	79.54	79.51	85.05	115800.3	24467.8	154384.8	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	150
1.71	99.93	99.93	61.83	20546.47	62447.21	154384.8	Toilet Flushing	10000	150
1.19	99.93	99.93	69.48	54790.58	49926.91	154384.8	Toilet Flushing, Outdoor and Dishwasher	10000	150
0.92	99.28	99.28	76.49	83352.99	38471.62	154384.8	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	150
0.36	87.27	87.26	90.08	127090.9	16227.45	154384.8	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	150
1.71	99.93	99.93	62.11	20546.47	61999.34	154384.8	Toilet Flushing	15000	150
1.19	99.93	99.93	69.76	54790.58	49472.85	154384.8	Toilet Flushing, Outdoor and Dishwasher	15000	150
0.9	99.91	99.9	77	83879.3	37633.3	154384.8	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	150
0.3	90.91	90.91	91.92	132406.7	13222.26	154384.8	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	150
1.99	98.18	98.36	54.97	20224.42	98238.21	205846.4	Toilet Flushing	2500	200
1.52	94.65	94.86	59.69	52011.19	87942.12	205846.4	Toilet Flushing, Outdoor and Dishwasher	2500	200
1.36	88.01	88.17	63	74030.85	80724.79	205846.4	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	200
1.12	71.63	71.71	68.13	104439.8	69523.61	205846.4	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	200
1.85	99.8	99.82	59.6	20524.11	88126.73	205846.4	Toilet Flushing	5000	200

1.36	99.2	99.22	64.91	54403.16	76540.78	205846.4	Toilet Flushing, Outdoor and Dishwasher	5000	200
1.14	97.33	97.35	69.35	81734.06	66864.72	205846.4	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	200
0.84	85.57	85.53	77.25	124573.2	49620.42	205846.4	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	200
1.83	99.93	99.93	60.77	20546.47	85570.34	205846.4	Toilet Flushing	10000	200
1.34	99.93	99.93	66.06	54790.58	74037.27	205846.4	Toilet Flushing, Outdoor and Dishwasher	10000	200
1.11	99.55	99.55	70.93	83580.49	63409.74	205846.4	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	200
0.72	93.81	93.8	81.57	136615.4	40215.83	205846.4	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	200
1.83	99.93	99.93	60.91	20546.47	85266.68	205846.4	Toilet Flushing	15000	200
1.33	99.93	99.93	66.31	54790.58	73486.09	205846.4	Toilet Flushing, Outdoor and Dishwasher	15000	200
1.1	99.93	99.93	71.38	83898.08	62424.37	205846.4	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	200
0.68	96.8	96.79	83.19	140966.2	36669.01	205846.4	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	200
2.21	97.34	97.61	51.68	20069.66	131758.8	257308	Toilet Flushing	2500	250
1.76	94.07	94.33	55.21	51720.54	122134.3	257308	Toilet Flushing, Outdoor and Dishwasher	2500	250
1.53	88.35	88.57	57.97	74360.55	114598.3	257308	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	250
1.35	73.8	73.94	62.08	107692.9	103404.3	257308	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	250

1.98	99.56	99.59	58.11	20477.96	114216.3	257308	Toilet Flushing	5000	250
1.54	98.87	98.9	62.05	54228.89	103479.2	257308	Toilet Flushing, Outdoor and Dishwasher	5000	250
1.29	97.46	97.5	65.71	81865.4	93493.4	257308	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	250
1.03	88.26	88.28	71.94	128578.8	76510.67	257308	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	250
1.93	99.91	99.91	60.06	20543.93	108913.4	257308	Toilet Flushing	10000	250
1.5	99.91	99.91	64.05	54783.82	98025.19	257308	Toilet Flushing, Outdoor and Dishwasher	10000	250
1.24	99.6	99.6	67.98	83627.2	87312.5	257308	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	250
0.92	96.39	96.38	76.09	140377.3	65192.5	257308	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	250
1.93	99.93	99.93	60.31	20546.47	108240.9	257308	Toilet Flushing	15000	250
1.5	99.93	99.93	64.3	54790.58	97349.71	257308	Toilet Flushing, Outdoor and Dishwasher	15000	250
1.24	99.93	99.93	68.35	83898.08	86302.79	257308	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	250
0.9	98.4	98.4	77.1	143309.5	62440.25	257308	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	250
1.12	99.58	99.58	70.62	20475.04	16023.75	51461.6	Toilet Flushing	2500	50
0.36	78.77	78.77	90.31	43189.85	5287.11	51461.6	Toilet Flushing, Outdoor and Dishwasher	2500	50
0.16	56.64	56.59	94.82	47517.41	2823.51	51461.6	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	50

0.06	34.23	34.04	97.37	49573.37	1433.98	51461.6	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	50
1.11	99.93	99.93	71.22	20546.47	15694.54	51461.6	Toilet Flushing	5000	50
0.21	84.91	84.94	94.02	46571.96	3262.11	51461.6	Toilet Flushing, Outdoor and Dishwasher	5000	50
0.06	59.92	59.89	98.34	50287.28	906.54	51461.6	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	50
0.01	35.23	35.06	99.27	51063.84	395.84	51461.6	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	50
1.1	99.93	99.93	71.97	20546.47	15284.37	51461.6	Toilet Flushing	10000	50
0.14	88.14	88.15	96.26	48332.41	2040	51461.6	Toilet Flushing, Outdoor and Dishwasher	10000	50
0.01	61.04	61.02	99.89	51233.46	61.43	51461.6	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	50
0	35.5	35.33	100	51461.6	0	51461.6	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	50
1.08	99.93	99.93	72.26	20546.47	15126.9	51461.6	Toilet Flushing	15000	50
0.11	89.05	89.06	96.78	48832.41	1753.47	51461.6	Toilet Flushing, Outdoor and Dishwasher	15000	50
0	61.22	61.21	100	51390.38	0	51461.6	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	50
0	35.5	35.33	100	51461.6	0	51461.6	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	50
1.55	99.56	99.58	62.61	20476.04	40787.28	102923.2	Toilet Flushing	2500	100
1.02	93.15	93.17	72.82	51084.5	29644.65	102923.2	Toilet Flushing, Outdoor and Dishwasher	2500	100

0.74	80.75	80.72	79.73	67772.92	22111.6	102923.2	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	100
0.43	56.52	56.43	86.59	82190.11	14631.31	102923.2	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	100
1.53	99.93	99.93	63.77	20546.38	39520.37	102923.2	Toilet Flushing	5000	100
0.95	98.2	98.19	75.38	53840.37	26855.4	102923.2	Toilet Flushing, Outdoor and Dishwasher	5000	100
0.59	89.9	89.89	84.98	75468.21	16381.28	102923.2	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	100
0.2	64.24	64.16	94.02	93440.97	6527.48	102923.2	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	100
1.52	99.93	99.93	64.2	20546.47	39044.2	102923.2	Toilet Flushing	10000	100
0.92	99.92	99.92	76.47	54785.07	25667.56	102923.2	Toilet Flushing, Outdoor and Dishwasher	10000	100
0.45	95.82	95.79	88.16	80424.5	12909.73	102923.2	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	100
0.09	68.05	67.97	97.29	98990.99	2955.01	102923.2	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	100
1.52	99.93	99.93	64.55	20546.47	38666.19	102923.2	Toilet Flushing	15000	100
0.92	99.92	99.92	76.91	54785.07	25182.54	102923.2	Toilet Flushing, Outdoor and Dishwasher	15000	100
0.4	98.83	98.83	89.7	82974.42	11237.35	102923.2	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	100
0.06	69.37	69.3	98.72	100931.5	1399.73	102923.2	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	100
1.8	98.89	98.97	58.48	20350.51	67924.14	154384.8	Toilet Flushing	2500	150

1.31	94.95	95.04	65.13	52111.53	57057.39	154384.8	Toilet Flushing, Outdoor and Dishwasher	2500	150
1.11	86.07	86.14	69.58	72326.84	49776.6	154384.8	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	150
0.79	67.14	67.13	76.17	97772.45	38986.64	154384.8	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	150
1.72	99.9	99.91	61.29	20543.35	63329.82	154384.8	Toilet Flushing	5000	150
1.2	99.29	99.3	68.7	54445.81	51215.41	154384.8	Toilet Flushing, Outdoor and Dishwasher	5000	150
0.97	95.7	95.72	74.65	80364.02	41470.66	154384.8	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	150
0.55	79.54	79.51	85.05	115800.3	24467.8	154384.8	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	150
1.71	99.93	99.93	61.83	20546.47	62447.21	154384.8	Toilet Flushing	10000	150
1.19	99.93	99.93	69.48	54790.58	49926.91	154384.8	Toilet Flushing, Outdoor and Dishwasher	10000	150
0.92	99.28	99.28	76.49	83352.99	38471.62	154384.8	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	150
0.36	87.27	87.26	90.08	127090.9	16227.45	154384.8	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	150
1.71	99.93	99.93	62.11	20546.47	61999.34	154384.8	Toilet Flushing	15000	150
1.19	99.93	99.93	69.76	54790.58	49472.85	154384.8	Toilet Flushing, Outdoor and Dishwasher	15000	150
0.9	99.91	99.9	77	83879.3	37633.3	154384.8	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	150
0.3	90.91	90.91	91.92	132406.7	13222.26	154384.8	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	150

1.99	98.18	98.36	54.97	20224.42	98238.21	205846.4	Toilet Flushing	2500	200
1.52	94.65	94.86	59.69	52011.19	87942.12	205846.4	Toilet Flushing, Outdoor and Dishwasher	2500	200
1.36	88.01	88.17	63	74030.85	80724.79	205846.4	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	200
1.12	71.63	71.71	68.13	104439.8	69523.61	205846.4	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	200
1.85	99.8	99.82	59.6	20524.11	88126.73	205846.4	Toilet Flushing	5000	200
1.36	99.2	99.22	64.91	54403.16	76540.78	205846.4	Toilet Flushing, Outdoor and Dishwasher	5000	200
1.14	97.33	97.35	69.35	81734.06	66864.72	205846.4	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	200
0.84	85.57	85.53	77.25	124573.2	49620.42	205846.4	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	200
1.83	99.93	99.93	60.77	20546.47	85570.34	205846.4	Toilet Flushing	10000	200
1.34	99.93	99.93	66.06	54790.58	74037.27	205846.4	Toilet Flushing, Outdoor and Dishwasher	10000	200
1.11	99.55	99.55	70.93	83580.49	63409.74	205846.4	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	200
0.72	93.81	93.8	81.57	136615.4	40215.83	205846.4	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	200
1.83	99.93	99.93	60.91	20546.47	85266.68	205846.4	Toilet Flushing	15000	200
1.33	99.93	99.93	66.31	54790.58	73486.09	205846.4	Toilet Flushing, Outdoor and Dishwasher	15000	200
1.1	99.93	99.93	71.38	83898.08	62424.37	205846.4	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	200

0.68	96.8	96.79	83.19	140966.2	36669.01	205846.4	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	200
2.21	97.34	97.61	51.68	20069.66	131758.8	257308	Toilet Flushing	2500	250
1.76	94.07	94.33	55.21	51720.54	122134.3	257308	Toilet Flushing, Outdoor and Dishwasher	2500	250
1.53	88.35	88.57	57.97	74360.55	114598.3	257308	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	250
1.35	73.8	73.94	62.08	107692.9	103404.3	257308	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	250
1.98	99.56	99.59	58.11	20477.96	114216.3	257308	Toilet Flushing	5000	250
1.54	98.87	98.9	62.05	54228.89	103479.2	257308	Toilet Flushing, Outdoor and Dishwasher	5000	250
1.29	97.46	97.5	65.71	81865.4	93493.4	257308	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	250
1.03	88.26	88.28	71.94	128578.8	76510.67	257308	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	250
1.93	99.91	99.91	60.06	20543.93	108913.4	257308	Toilet Flushing	10000	250
1.5	99.91	99.91	64.05	54783.82	98025.19	257308	Toilet Flushing, Outdoor and Dishwasher	10000	250
1.24	99.6	99.6	67.98	83627.2	87312.5	257308	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	250
0.92	96.39	96.38	76.09	140377.3	65192.5	257308	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	250
1.93	99.93	99.93	60.31	20546.47	108240.9	257308	Toilet Flushing	15000	250
1.5	99.93	99.93	64.3	54790.58	97349.71	257308	Toilet Flushing, Outdoor and Dishwasher	15000	250

1.24	99.93	99.93	68.35	83898.08	86302.79	257308	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	250
0.9	98.4	98.4	77.1	143309.5	62440.25	257308	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	250

S2 Table 9. Conventional System

OF	SF	SE	RE	AY	AO	AI	E	S	A
2.08	99.58	99.58	43.59	20475.13	30762.33	51461.6	Toilet Flushing	2500	50
0.53	78.88	78.87	85.14	43244.73	8102.37	51461.6	Toilet Flushing, Outdoor and Dishwasher	2500	50
0.21	56.75	56.71	93.08	47614.92	3775.46	51461.6	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	50
0.07	34.28	34.09	96.69	49654.55	1807.05	51461.6	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	50
2.07	99.93	99.93	44.18	20546.47	30440.99	51461.6	Toilet Flushing	5000	50
0.3	84.94	84.96	91.26	46582.62	4764.47	51461.6	Toilet Flushing, Outdoor and Dishwasher	5000	50
0.06	59.98	59.95	98.06	50332.3	1058.08	51461.6	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	50
0.01	35.23	35.06	99.27	51065.76	395.84	51461.6	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	50
2.06	99.93	99.93	45.1	20546.47	29940.99	51461.6	Toilet Flushing	10000	50
0.19	88.14	88.15	94.47	48332.79	3014.31	51461.6	Toilet Flushing, Outdoor and Dishwasher	10000	50
0.01	61.08	61.07	99.79	51273.24	117.14	51461.6	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	50
0	35.5	35.33	100	51461.6	0	51461.6	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	50
2.02	99.93	99.93	46.02	20546.47	29440.99	51461.6	Toilet Flushing	15000	50

0.14	89.05	89.06	95.39	48832.79	2514.31	51461.6	Toilet Flushing, Outdoor and Dishwasher	15000	50
0	61.22	61.21	100	51390.38	0	51461.6	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	50
0	35.5	35.33	100	51461.6	0	51461.6	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	50
3.03	99.8	99.8	24.66	20521.21	82177.86	102923.2	Toilet Flushing	2500	100
1.71	94.05	94.05	53.09	51569.97	51172.19	102923.2	Toilet Flushing, Outdoor and Dishwasher	2500	100
1.15	81.42	81.39	68.42	68334.02	34444.78	102923.2	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	100
0.59	57.01	56.92	81.71	82907.73	19948.66	102923.2	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	100
3.02	99.93	99.93	24.91	20546.47	81902.59	102923.2	Toilet Flushing	5000	100
1.62	98.31	98.31	55.45	53902.16	48590	102923.2	Toilet Flushing, Outdoor and Dishwasher	5000	100
0.91	90.08	90.05	75.2	75609.78	27046.23	102923.2	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	100
0.26	64.43	64.35	91.72	93720.19	9027.47	102923.2	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	100
3.01	99.93	99.93	25.37	20546.47	81402.59	102923.2	Toilet Flushing	10000	100
1.58	99.92	99.92	56.72	54785.07	47207.09	102923.2	Toilet Flushing, Outdoor and Dishwasher	10000	100
0.74	95.86	95.83	79.65	80463.39	22192.62	102923.2	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	100
0.11	68.11	68.03	96.64	99078.05	3669.61	102923.2	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	100

3	99.93	99.93	25.83	20546.47	80902.59	102923.2	Toilet Flushing	15000	100
1.58	99.92	99.92	57.18	54785.07	46707.09	102923.2	Toilet Flushing, Outdoor and Dishwasher	15000	100
0.64	98.84	98.84	82.36	82984.05	19239.68	102923.2	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	100
0.06	69.43	69.36	98.41	101018.5	1729.15	102923.2	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	100
3.59	99.89	99.89	18.33	20538.42	133622.2	154384.8	Toilet Flushing	2500	150
2.32	96.64	96.64	38.14	52988.81	101215	154384.8	Toilet Flushing, Outdoor and Dishwasher	2500	150
1.81	87.87	87.89	50.83	73793.55	80446.84	154384.8	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	150
1.16	68.65	68.58	66.73	99876.59	54441.39	154384.8	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	150
3.59	99.93	99.93	18.49	20546.47	133364.2	154384.8	Toilet Flushing	5000	150
2.29	99.31	99.31	39.19	54454.12	99499.64	154384.8	Toilet Flushing, Outdoor and Dishwasher	5000	150
1.64	95.97	95.98	55.13	80581.93	73408.47	154384.8	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	150
0.84	79.82	79.77	76.84	116178.5	37889.46	154384.8	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	150
3.58	99.93	99.93	18.79	20546.47	132864.2	154384.8	Toilet Flushing	10000	150
2.28	99.93	99.93	39.7	54790.58	98663.18	154384.8	Toilet Flushing, Outdoor and Dishwasher	10000	150
1.56	99.31	99.31	57.15	83379.21	70111.18	154384.8	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	150

0.56	87.34	87.33	83.61	127190.5	26822.76	154384.8	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	150
3.57	99.93	99.93	19.1	20546.47	132364.2	154384.8	Toilet Flushing	15000	150
2.27	99.93	99.93	40	54790.58	98163.18	154384.8	Toilet Flushing, Outdoor and Dishwasher	15000	150
1.55	99.91	99.9	57.76	83879.3	69111.1	154384.8	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	150
0.46	90.93	90.93	86.82	132441.4	21571.92	154384.8	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	150
4.03	99.93	99.93	15.16	20546.47	185075.8	205846.4	Toilet Flushing	2500	200
2.65	97.38	97.39	30.2	53402.84	152262.5	205846.4	Toilet Flushing, Outdoor and Dishwasher	2500	200
2.21	90.62	90.63	40.59	76097.08	129604.9	205846.4	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	200
1.61	74.35	74.29	55.27	108197.4	97582.24	205846.4	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	200
4.03	99.93	99.93	15.28	20546.47	184825.8	205846.4	Toilet Flushing	5000	200
2.63	99.42	99.42	30.83	54515.11	150900.3	205846.4	Toilet Flushing, Outdoor and Dishwasher	5000	200
2.09	97.79	97.78	43.45	82098	123354	205846.4	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	200
1.33	86.35	86.31	63.41	125701.4	79828.18	205846.4	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	200
4.02	99.93	99.93	15.51	20546.47	184325.8	205846.4	Toilet Flushing	10000	200
2.62	99.93	99.93	31.18	54790.58	150124.8	205846.4	Toilet Flushing, Outdoor and Dishwasher	10000	200

2.05	99.55	99.55	44.36	83580.85	121371.2	205846.4	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	200
1.16	93.93	93.92	68.6	136786.6	68492.3	205846.4	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	200
4.01	99.93	99.93	15.73	20546.47	183825.8	205846.4	Toilet Flushing	15000	200
2.62	99.93	99.93	31.41	54790.58	149624.8	205846.4	Toilet Flushing, Outdoor and Dishwasher	15000	200
2.05	99.93	99.93	44.74	83898.08	120553.9	205846.4	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	200
1.1	96.88	96.86	70.57	141077	64201.89	205846.4	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	200
4.41	99.93	99.93	13.26	20546.47	236537.4	257308	Toilet Flushing	2500	250
2.96	97.89	97.89	25.39	53672.44	203454.5	257308	Toilet Flushing, Outdoor and Dishwasher	2500	250
2.47	92.08	92.08	34.04	77310.39	179853.2	257308	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	250
1.94	77.52	77.5	47.06	112873.8	144367.4	257308	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	250
4.41	99.93	99.93	13.35	20546.47	236287.4	257308	Toilet Flushing	5000	250
2.94	99.49	99.49	25.8	54550.81	202326.2	257308	Toilet Flushing, Outdoor and Dishwasher	5000	250
2.41	98.3	98.3	36.05	82537.16	174376.4	257308	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	250
1.7	89.71	89.69	53.66	130628.2	126363	257308	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	250
4.4	99.93	99.93	13.53	20546.47	235787.4	257308	Toilet Flushing	10000	250

2.94	99.93	99.93	26.07	54790.58	201586.4	257308	Toilet Flushing, Outdoor and Dishwasher	10000	250
2.39	99.62	99.62	36.64	83642.15	172771.5	257308	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	250
1.56	96.54	96.53	57.49	140594.6	115926.6	257308	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	250
4.4	99.93	99.93	13.72	20546.47	235287.4	257308	Toilet Flushing	15000	250
2.93	99.93	99.93	26.26	54790.58	201086.4	257308	Toilet Flushing, Outdoor and Dishwasher	15000	250
2.39	99.93	99.93	36.92	83898.08	172015.5	257308	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	250
1.52	98.53	98.52	58.7	143489.9	112616.8	257308	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	250
2.08	99.58	99.58	43.59	20475.13	30762.33	51461.6	Toilet Flushing	2500	50
0.53	78.88	78.87	85.14	43244.73	8102.37	51461.6	Toilet Flushing, Outdoor and Dishwasher	2500	50
0.21	56.75	56.71	93.08	47614.92	3775.46	51461.6	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	50
0.07	34.28	34.09	96.69	49654.55	1807.05	51461.6	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	50
2.07	99.93	99.93	44.18	20546.47	30440.99	51461.6	Toilet Flushing	5000	50
0.3	84.94	84.96	91.26	46582.62	4764.47	51461.6	Toilet Flushing, Outdoor and Dishwasher	5000	50
0.06	59.98	59.95	98.06	50332.3	1058.08	51461.6	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	50
0.01	35.23	35.06	99.27	51065.76	395.84	51461.6	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	50

2.06	99.93	99.93	45.1	20546.47	29940.99	51461.6	Toilet Flushing	10000	50
0.19	88.14	88.15	94.47	48332.79	3014.31	51461.6	Toilet Flushing, Outdoor and Dishwasher	10000	50
0.01	61.08	61.07	99.79	51273.24	117.14	51461.6	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	50
0	35.5	35.33	100	51461.6	0	51461.6	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	50
2.02	99.93	99.93	46.02	20546.47	29440.99	51461.6	Toilet Flushing	15000	50
0.14	89.05	89.06	95.39	48832.79	2514.31	51461.6	Toilet Flushing, Outdoor and Dishwasher	15000	50
0	61.22	61.21	100	51390.38	0	51461.6	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	50
0	35.5	35.33	100	51461.6	0	51461.6	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	50
3.03	99.8	99.8	24.66	20521.21	82177.86	102923.2	Toilet Flushing	2500	100
1.71	94.05	94.05	53.09	51569.97	51172.19	102923.2	Toilet Flushing, Outdoor and Dishwasher	2500	100
1.15	81.42	81.39	68.42	68334.02	34444.78	102923.2	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	100
0.59	57.01	56.92	81.71	82907.73	19948.66	102923.2	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	100
3.02	99.93	99.93	24.91	20546.47	81902.59	102923.2	Toilet Flushing	5000	100
1.62	98.31	98.31	55.45	53902.16	48590	102923.2	Toilet Flushing, Outdoor and Dishwasher	5000	100
0.91	90.08	90.05	75.2	75609.78	27046.23	102923.2	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	100

0.26	64.43	64.35	91.72	93720.19	9027.47	102923.2	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	100
3.01	99.93	99.93	25.37	20546.47	81402.59	102923.2	Toilet Flushing	10000	100
1.58	99.92	99.92	56.72	54785.07	47207.09	102923.2	Toilet Flushing, Outdoor and Dishwasher	10000	100
0.74	95.86	95.83	79.65	80463.39	22192.62	102923.2	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	100
0.11	68.11	68.03	96.64	99078.05	3669.61	102923.2	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	100
3	99.93	99.93	25.83	20546.47	80902.59	102923.2	Toilet Flushing	15000	100
1.58	99.92	99.92	57.18	54785.07	46707.09	102923.2	Toilet Flushing, Outdoor and Dishwasher	15000	100
0.64	98.84	98.84	82.36	82984.05	19239.68	102923.2	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	100
0.06	69.43	69.36	98.41	101018.5	1729.15	102923.2	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	100
3.59	99.89	99.89	18.33	20538.42	133622.2	154384.8	Toilet Flushing	2500	150
2.32	96.64	96.64	38.14	52988.81	101215	154384.8	Toilet Flushing, Outdoor and Dishwasher	2500	150
1.81	87.87	87.89	50.83	73793.55	80446.84	154384.8	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	150
1.16	68.65	68.58	66.73	99876.59	54441.39	154384.8	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	150
3.59	99.93	99.93	18.49	20546.47	133364.2	154384.8	Toilet Flushing	5000	150
2.29	99.31	99.31	39.19	54454.12	99499.64	154384.8	Toilet Flushing, Outdoor and Dishwasher	5000	150

1.64	95.97	95.98	55.13	80581.93	73408.47	154384.8	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	150
0.84	79.82	79.77	76.84	116178.5	37889.46	154384.8	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	150
3.58	99.93	99.93	18.79	20546.47	132864.2	154384.8	Toilet Flushing	10000	150
2.28	99.93	99.93	39.7	54790.58	98663.18	154384.8	Toilet Flushing, Outdoor and Dishwasher	10000	150
1.56	99.31	99.31	57.15	83379.21	70111.18	154384.8	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	150
0.56	87.34	87.33	83.61	127190.5	26822.76	154384.8	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	150
3.57	99.93	99.93	19.1	20546.47	132364.2	154384.8	Toilet Flushing	15000	150
2.27	99.93	99.93	40	54790.58	98163.18	154384.8	Toilet Flushing, Outdoor and Dishwasher	15000	150
1.55	99.91	99.9	57.76	83879.3	69111.1	154384.8	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	150
0.46	90.93	90.93	86.82	132441.4	21571.92	154384.8	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	150
4.03	99.93	99.93	15.16	20546.47	185075.8	205846.4	Toilet Flushing	2500	200
2.65	97.38	97.39	30.2	53402.84	152262.5	205846.4	Toilet Flushing, Outdoor and Dishwasher	2500	200
2.21	90.62	90.63	40.59	76097.08	129604.9	205846.4	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	200
1.61	74.35	74.29	55.27	108197.4	97582.24	205846.4	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	200
4.03	99.93	99.93	15.28	20546.47	184825.8	205846.4	Toilet Flushing	5000	200

2.63	99.42	99.42	30.83	54515.11	150900.3	205846.4	Toilet Flushing, Outdoor and Dishwasher	5000	200
2.09	97.79	97.78	43.45	82098	123354	205846.4	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	200
1.33	86.35	86.31	63.41	125701.4	79828.18	205846.4	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	200
4.02	99.93	99.93	15.51	20546.47	184325.8	205846.4	Toilet Flushing	10000	200
2.62	99.93	99.93	31.18	54790.58	150124.8	205846.4	Toilet Flushing, Outdoor and Dishwasher	10000	200
2.05	99.55	99.55	44.36	83580.85	121371.2	205846.4	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	200
1.16	93.93	93.92	68.6	136786.6	68492.3	205846.4	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	200
4.01	99.93	99.93	15.73	20546.47	183825.8	205846.4	Toilet Flushing	15000	200
2.62	99.93	99.93	31.41	54790.58	149624.8	205846.4	Toilet Flushing, Outdoor and Dishwasher	15000	200
2.05	99.93	99.93	44.74	83898.08	120553.9	205846.4	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	200
1.1	96.88	96.86	70.57	141077	64201.89	205846.4	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	200
4.41	99.93	99.93	13.26	20546.47	236537.4	257308	Toilet Flushing	2500	250
2.96	97.89	97.89	25.39	53672.44	203454.5	257308	Toilet Flushing, Outdoor and Dishwasher	2500	250
2.47	92.08	92.08	34.04	77310.39	179853.2	257308	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	250
1.94	77.52	77.5	47.06	112873.8	144367.4	257308	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	250

4.41	99.93	99.93	13.35	20546.47	236287.4	257308	Toilet Flushing	5000	250
2.94	99.49	99.49	25.8	54550.81	202326.2	257308	Toilet Flushing, Outdoor and Dishwasher	5000	250
2.41	98.3	98.3	36.05	82537.16	174376.4	257308	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	250
1.7	89.71	89.69	53.66	130628.2	126363	257308	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	250
4.4	99.93	99.93	13.53	20546.47	235787.4	257308	Toilet Flushing	10000	250
2.94	99.93	99.93	26.07	54790.58	201586.4	257308	Toilet Flushing, Outdoor and Dishwasher	10000	250
2.39	99.62	99.62	36.64	83642.15	172771.5	257308	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	250
1.56	96.54	96.53	57.49	140594.6	115926.6	257308	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	250
4.4	99.93	99.93	13.72	20546.47	235287.4	257308	Toilet Flushing	15000	250
2.93	99.93	99.93	26.26	54790.58	201086.4	257308	Toilet Flushing, Outdoor and Dishwasher	15000	250
2.39	99.93	99.93	36.92	83898.08	172015.5	257308	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	250
1.52	98.53	98.52	58.7	143489.9	112616.8	257308	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	250
2.08	99.58	99.58	43.59	20475.13	30762.33	51461.6	Toilet Flushing	2500	50
0.53	78.88	78.87	85.14	43244.73	8102.37	51461.6	Toilet Flushing, Outdoor and Dishwasher	2500	50
0.21	56.75	56.71	93.08	47614.92	3775.46	51461.6	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	50

0.07	34.28	34.09	96.69	49654.55	1807.05	51461.6	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	50
2.07	99.93	99.93	44.18	20546.47	30440.99	51461.6	Toilet Flushing	5000	50
0.3	84.94	84.96	91.26	46582.62	4764.47	51461.6	Toilet Flushing, Outdoor and Dishwasher	5000	50
0.06	59.98	59.95	98.06	50332.3	1058.08	51461.6	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	50
0.01	35.23	35.06	99.27	51065.76	395.84	51461.6	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	50
2.06	99.93	99.93	45.1	20546.47	29940.99	51461.6	Toilet Flushing	10000	50
0.19	88.14	88.15	94.47	48332.79	3014.31	51461.6	Toilet Flushing, Outdoor and Dishwasher	10000	50
0.01	61.08	61.07	99.79	51273.24	117.14	51461.6	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	50
0	35.5	35.33	100	51461.6	0	51461.6	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	50
2.02	99.93	99.93	46.02	20546.47	29440.99	51461.6	Toilet Flushing	15000	50
0.14	89.05	89.06	95.39	48832.79	2514.31	51461.6	Toilet Flushing, Outdoor and Dishwasher	15000	50
0	61.22	61.21	100	51390.38	0	51461.6	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	50
0	35.5	35.33	100	51461.6	0	51461.6	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	50
3.03	99.8	99.8	24.66	20521.21	82177.86	102923.2	Toilet Flushing	2500	100
1.71	94.05	94.05	53.09	51569.97	51172.19	102923.2	Toilet Flushing, Outdoor and Dishwasher	2500	100

1.15	81.42	81.39	68.42	68334.02	34444.78	102923.2	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	100
0.59	57.01	56.92	81.71	82907.73	19948.66	102923.2	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	100
3.02	99.93	99.93	24.91	20546.47	81902.59	102923.2	Toilet Flushing	5000	100
1.62	98.31	98.31	55.45	53902.16	48590	102923.2	Toilet Flushing, Outdoor and Dishwasher	5000	100
0.91	90.08	90.05	75.2	75609.78	27046.23	102923.2	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	100
0.26	64.43	64.35	91.72	93720.19	9027.47	102923.2	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	100
3.01	99.93	99.93	25.37	20546.47	81402.59	102923.2	Toilet Flushing	10000	100
1.58	99.92	99.92	56.72	54785.07	47207.09	102923.2	Toilet Flushing, Outdoor and Dishwasher	10000	100
0.74	95.86	95.83	79.65	80463.39	22192.62	102923.2	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	100
0.11	68.11	68.03	96.64	99078.05	3669.61	102923.2	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	100
3	99.93	99.93	25.83	20546.47	80902.59	102923.2	Toilet Flushing	15000	100
1.58	99.92	99.92	57.18	54785.07	46707.09	102923.2	Toilet Flushing, Outdoor and Dishwasher	15000	100
0.64	98.84	98.84	82.36	82984.05	19239.68	102923.2	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	100
0.06	69.43	69.36	98.41	101018.5	1729.15	102923.2	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	100
3.59	99.89	99.89	18.33	20538.42	133622.2	154384.8	Toilet Flushing	2500	150

2.32	96.64	96.64	38.14	52988.81	101215	154384.8	Toilet Flushing, Outdoor and Dishwasher	2500	150
1.81	87.87	87.89	50.83	73793.55	80446.84	154384.8	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	150
1.16	68.65	68.58	66.73	99876.59	54441.39	154384.8	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	150
3.59	99.93	99.93	18.49	20546.47	133364.2	154384.8	Toilet Flushing	5000	150
2.29	99.31	99.31	39.19	54454.12	99499.64	154384.8	Toilet Flushing, Outdoor and Dishwasher	5000	150
1.64	95.97	95.98	55.13	80581.93	73408.47	154384.8	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	150
0.84	79.82	79.77	76.84	116178.5	37889.46	154384.8	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	150
3.58	99.93	99.93	18.79	20546.47	132864.2	154384.8	Toilet Flushing	10000	150
2.28	99.93	99.93	39.7	54790.58	98663.18	154384.8	Toilet Flushing, Outdoor and Dishwasher	10000	150
1.56	99.31	99.31	57.15	83379.21	70111.18	154384.8	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	150
0.56	87.34	87.33	83.61	127190.5	26822.76	154384.8	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	150
3.57	99.93	99.93	19.1	20546.47	132364.2	154384.8	Toilet Flushing	15000	150
2.27	99.93	99.93	40	54790.58	98163.18	154384.8	Toilet Flushing, Outdoor and Dishwasher	15000	150
1.55	99.91	99.9	57.76	83879.3	69111.1	154384.8	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	150
0.46	90.93	90.93	86.82	132441.4	21571.92	154384.8	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	150

4.03	99.93	99.93	15.16	20546.47	185075.8	205846.4	Toilet Flushing	2500	200
2.65	97.38	97.39	30.2	53402.84	152262.5	205846.4	Toilet Flushing, Outdoor and Dishwasher	2500	200
2.21	90.62	90.63	40.59	76097.08	129604.9	205846.4	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	200
1.61	74.35	74.29	55.27	108197.4	97582.24	205846.4	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	200
4.03	99.93	99.93	15.28	20546.47	184825.8	205846.4	Toilet Flushing	5000	200
2.63	99.42	99.42	30.83	54515.11	150900.3	205846.4	Toilet Flushing, Outdoor and Dishwasher	5000	200
2.09	97.79	97.78	43.45	82098	123354	205846.4	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	200
1.33	86.35	86.31	63.41	125701.4	79828.18	205846.4	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	200
4.02	99.93	99.93	15.51	20546.47	184325.8	205846.4	Toilet Flushing	10000	200
2.62	99.93	99.93	31.18	54790.58	150124.8	205846.4	Toilet Flushing, Outdoor and Dishwasher	10000	200
2.05	99.55	99.55	44.36	83580.85	121371.2	205846.4	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	200
1.16	93.93	93.92	68.6	136786.6	68492.3	205846.4	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	200
4.01	99.93	99.93	15.73	20546.47	183825.8	205846.4	Toilet Flushing	15000	200
2.62	99.93	99.93	31.41	54790.58	149624.8	205846.4	Toilet Flushing, Outdoor and Dishwasher	15000	200
2.05	99.93	99.93	44.74	83898.08	120553.9	205846.4	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	15000	200

1.1	96.88	96.86	70.57	141077	64201.89	205846.4	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	15000	200
4.41	99.93	99.93	13.26	20546.47	236537.4	257308	Toilet Flushing	2500	250
2.96	97.89	97.89	25.39	53672.44	203454.5	257308	Toilet Flushing, Outdoor and Dishwasher	2500	250
2.47	92.08	92.08	34.04	77310.39	179853.2	257308	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	2500	250
1.94	77.52	77.5	47.06	112873.8	144367.4	257308	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	2500	250
4.41	99.93	99.93	13.35	20546.47	236287.4	257308	Toilet Flushing	5000	250
2.94	99.49	99.49	25.8	54550.81	202326.2	257308	Toilet Flushing, Outdoor and Dishwasher	5000	250
2.41	98.3	98.3	36.05	82537.16	174376.4	257308	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	5000	250
1.7	89.71	89.69	53.66	130628.2	126363	257308	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	5000	250
4.4	99.93	99.93	13.53	20546.47	235787.4	257308	Toilet Flushing	10000	250
2.94	99.93	99.93	26.07	54790.58	201586.4	257308	Toilet Flushing, Outdoor and Dishwasher	10000	250
2.39	99.62	99.62	36.64	83642.15	172771.5	257308	Toilet Flushing, Dishwasher, Outdoor and Cloth washing	10000	250
1.56	96.54	96.53	57.49	140594.6	115926.6	257308	Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing	10000	250
4.4	99.93	99.93	13.72	20546.47	235287.4	257308	Toilet Flushing	15000	250
2.93	99.93	99.93	26.26	54790.58	201086.4	257308	Toilet Flushing, Outdoor and Dishwasher	15000	250

| 2.39 | 99.93 | 99.93 | 36.92 | 83898.08 | 172015.5 | 257308 | Toilet Flushing, Dishwasher, Outdoor and Cloth washing | 15000 | 250 |
| 1.52 | 98.53 | 98.52 | 58.7 | 143489.9 | 112616.8 | 257308 | Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing | 15000 | 250 |

S3 Continuous Simulation Code

The *supplementary material 3* shows the code I constructed in R (using package 'dplyr', 'lubridate' and 'reshape2') to simulate three different RWH systems. Line 11 to 41 list the code to identify a range of simulation scenarios. Line 44 to 101 list the rainwater inflow module. Line 104 to 141 list the end-use demand module. Line 144 to 163 list the code calculating baseflow restoration target to be applied on passive release and active release system. Line 166 to 274 continuously simulate the performance of conventional system. Line 277 to 486 continuously simulate the performance of two passive release system configuration (with 25% detention volume and 75% detention volume respectively). Line 489 to 1607 continuously simulate the performance of three active release system configuration (supply-first configuration, baseflow-first configuration and no-baseflow release configuration respectively).

```r
#####################
#1.identify a range of scenarios
A <- c(50, 100, 150, 200, 250) #roof size in m2
S <- c(2500, 5000, 10000, 15000)#tank size in L
Enduse.type <-
  c(
    "Toilet Flushing",
    "Toilet Flushing, Outdoor and Dishwasher",
    "Toilet Flushing, Dishwasher, Outdoor and Cloth washing",
    "Toilet Flushing, Dishwasher, Outdoor, Hotwater and Cloth washing"
  ) #four combination of end-use
Configuration.metrics <- matrix(nrow = 80, ncol = 3)
n <- c(0)
#loop to create the configuration metrics, this loop is representing the combination process
for (i in 1:5) {
  #loop for 5 roof size
  for (j in 1:4) {
    #loop for 5 tank size
    for (k in 1:4) {
```

```r
30            #loop for 4 combination of connection
31            Enduse.configur <- Enduse.type[k]
32            S.configur <- S[j]
33            A.configur <- A[i]
34            configur_output <- c(Enduse.configur, S.configur, A.configur)
35            n <- n + 1
36            Configuration.metrics[n, ] <- configur_output
37          }
38        }
39      }
40    colnames(Configuration.metrics) <-
41      c("End_use_types", "Tank_Size", "Roof_Size") # name each column in the configuration metrics
42
43
44    #####################
45    #2.rainwater inflow module
46    ###define initial loss function, output roof runoff in mm
47    lose.init <-
48      function(x,
49                   initloss.mm = 1,
50                   ante.t = 1) {
51        #initial loss function
52        #runs through time series vector of rainfall values and removes (converts to zero)
53        #the first initloss.mm in an event. An event is defined as string of records
54        #with >0 rain with no more than ante.t timesteps before or during with 0 rain
55        event <- ifelse(x[1] == 0, FALSE, TRUE)
56        spell <- ifelse(x[1] == 0, 1, 0)
57        loss <- initloss.mm
58        xl <- x
59        xl[1] <-
```

```r
60            max(0, x[1] - initloss.mm)##above four rows are dealing with rainfall in the first timestep
61        for (i in 2:length(x)) {
62          if (!event) {
63            #if there is no event in first time step
64            spell <-   spell + 1 #no event count +1
65          }
66          if (x[i] > 0) {
67            #if this timestep has event (from the second)
68            event <- TRUE
69            spell <- 0#reset the no event count
70            xl[i] <- max(x[i] - loss, 0)#roof runoff volume in mm
71            loss <- max(loss - x[i], 0)#remaining loss volume
72          }
73          if (x[i] == 0 &
74                event) {
75            #if there is no rainfall occured in this timestep while the previous timestep has event
76            spell <- spell + 1 #restart accumulate no event count
77            if (spell >= ante.t) {
78              #if morethan one timestep don't have rainfall, then reset the initial loss
79              event <- FALSE
80              loss <- initloss.mm
81            }
82          }
83        }
84      xl #roof runoff
85    }
86  #get rainfall data in required period
87  rainfall4 <- dbs4rain %>% select(date, rain.mm) %>%
88    filter(between(
89      date,
```

```r
90          ymd_hms("2005-01-01 00:00:00", tz = "EST"),
91          ymd_hms("2016-01-01 00:00:00", tz = "EST")
92       )) %>%
93       mutate(Date.day = date(date)) %>% #create a colume only store date
94       mutate(Day = day(Date.day)) %>% #create column store date number
95       mutate(Hour = (hour(date) + 1)) %>%
96       mutate(Month = month(date))
97    rainfall4 <-
98       rainfall4[-nrow(rainfall4),]#delete the first rainfall data on 01_01_2016
99    Qt.mm_6min <-
100      lose.init(rainfall4$rain.mm, initloss.mm = 0.2, ante.t = 20)#roof runoff in 6 minute considering initial loss is 0.2mm rain in 2 hr
101   rainfall4 <- cbind(rainfall4, Qt.mm_6min)#rainfall with roof runoff
102
103
104   #####################
105   #3.End-use demand module
106   Enduse.mean <-
107      Enduset1 %>% #using new dataset(exclude faulty data) to calculate mean
108      arrange(Date) %>%
109      group_by(variable) %>%
110      mutate(meanUse = mean(value), medianUse = median(value)) %>%
111      summarize(
112         meanL = mean(value),
113         medianL = median(value),
114         sdL = sd(value)
115      ) %>% mutate(hour = c(1:24))
116   ##breakdown by end-use type, summer scenario
117   Enduse.mean1 <- Enduse.mean %>%
118      mutate(Toiletflushing = (meanL * 0.12)) %>%
119      mutate(Dishwasher = (meanL * 0.02)) %>%
```

```r
120        mutate(Clothwashing = (meanL * 0.17)) %>%
121        mutate(Hotwater = (meanL * 0.36)) %>%
122        mutate(Outdoor = (meanL * 0.18))
123    #define consumption loop
124    Consumption <- matrix(nrow = 48, ncol = 80)
125    for (i in 1:80) {
126        #row is the timestep col is the scenario from 1 to 180
127        #the hourly consumption will be equally disaggregate into any 6 minute timestep within that hour
128        #so the consumption in the consumption loop is 6 minute time step
129        if (Configuration.metrics[i, 1] == "Toilet Flushing") {
130            Consumption[, i] <-
131                Enduse.mean1$Toiletflushing / 10 #convert from houly consumption to 6 minute
132        } else if (Configuration.metrics[i, 1] == "Toilet Flushing, Outdoor and Dishwasher") {
133            Consumption[, i] <- Enduse.mean1$Toiletflushing / 10 + Enduse.mean1$Dishwasher / 10 + Enduse.mean1$Outdoor / 10
134        } else if (Configuration.metrics[i, 1] == "Toilet Flushing, Dishwasher, Outdoor and Cloth washing") {
135            Consumption[, i] <-
136                Enduse.mean1$Toiletflushing / 10 + Enduse.mean1$Dishwasher / 10 + Enduse.mean1$Outdoor / 10 + Enduse.mean1$Clothwashing / 10
137        } else {
138            Consumption[,  i]  <-  Enduse.mean1$Toiletflushing  /  10  +  Enduse.mean1$Dishwasher  /  10  +  Enduse.mean1$Outdoor  /  10  +
139    Enduse.mean1$Clothwashing / 10 + Enduse.mean1$Hotwater / 10
140        }
141    }
142
143
144    ######################
145    #4. Baseflow Restoration
146    ###Annual basis median flow, quartile(Q25) and 75percentile(Q75)
147    Q_annual <- flow4 %>% group_by(Year) %>%
148        summarise(
149            Q25 = quantile(flow.L, .25, na.rm = TRUE),
```

```r
           #quartile 25th percentile
           Q50 = quantile(flow.L, .50, na.rm = TRUE),
           #median flow
           Q75 = quantile(flow.L, .75, na.rm = TRUE),
           #75 percentile
           MAR = mean(flow.L, na.rm = TRUE)
       ) #Mean annual runoff
Flow_target_dbs <-
   Q_annual %>% #setting the annually flow target by calculate the mean of each percentile
   summarise(
       Q25 = mean(Q25, na.rm = TRUE),
       Q50 = mean(Q50, na.rm = TRUE),
       Q75 = mean(Q75, na.rm = TRUE)
   )


#####################
#5. conventional system continuous sinulation
#assessment metrics for conventional system
assess_metrics_normaltank <- function(x, A_metrics = A) {
   overflow_frequency <-
       100 * nrow(x[x$Qot > 0, ]) / nrow(x)
       #how many percent of day did the overflow occured
   supply_frequency <-
       100 * nrow(x[x$Yt >= x$Dt, ]) / nrow(x)#how many percent of day did the required water supply is delivered
   Ews <- sum(x$Yt) / sum(x$Dt)#water supply efficiency
   Er = 1 - sum(x$Qot) / (sum(x$rain.mm) * A)#retention efficiency
   annual_yield <- sum(x$Yt) / 10
   annual_overflow <- sum(x$Qot) / 10
   annual_inflow <- sum(x$Tin) / 10
```

```r
180        result <-
181          matrix(round(
182            c(
183              overflow_frequency,
184              supply_frequency,
185              Ews * 100,
186              Er * 100,
187              annual_yield,
188              annual_overflow,
189              annual_inflow,
190              A,
191              S
192            ),
193            digits = 2
194          ), ncol = 9, byrow = TRUE)
195        result
196      }
197
198      #conventional system balance diagnostics
199      balance_diagnostic_normaltank <- function(x) {
200        a <- round(sum(x$Qot, na.rm = TRUE)) +
201          round(sum(x$Yt, na.rm = TRUE)) +
202          round(x$Vt[964080]) ==
203          round(sum(x$Tin, na.rm = TRUE))
204        b <- sum(x$Qot, na.rm = TRUE) +
205          sum(x$Yt, na.rm = TRUE) +
206          x$Vt[964080] -
207          sum(x$Tin, na.rm = TRUE)
208        d <- c(a, b)
209        d
```

```r
210    }
211
212    #loop to simulate the performance of conventional RWH systems, which only provide supply and #stormwater retention
213    for (k in 1:80) {
214      #k in 1:80 represent 80 combination of different configuration
215      S <-
216        Configuration.metrics$Tank_Size[k]#identify the tank size for this scenario
217      A <-
218        Configuration.metrics$Roof_Size[k]#identify the roof size for this scenario
219      Consumptionloop <- vector(length = 48)
220      Consumptionloop <-
221        Consumption[, k]#identify the consumption metrics for this scenario
222      rainfall5 <- rainfall4 %>%
223        mutate(Tin = Qt.mm_6min * A) ## make a new data frame store the tank inflow
224      Vil <- c(0)# the initial volume of the tank
225      Vt <-
226        matrix(nrow = nrow(rainfall5), ncol = 1)#volume in store (L) during time interval t (current)    Qot <-
227        matrix(nrow = nrow(rainfall5), ncol = 1)#Tank Overflow at t time-step(L/6min)
228      Yt <-
229        matrix(nrow = nrow(rainfall5), ncol = 1)#Rainwater Yeild at t time-step (L/ 6min)
230      Dt <-
231        matrix(nrow = nrow(rainfall5), ncol = 1)#Household Demand at t time-step(L/6min)
232      Tin <-
233        matrix(nrow = nrow(rainfall5), ncol = 1)#Tank Inflow (L/timestep)
234      for (i in 1:nrow(rainfall5)) {
235        if (i == 1) {
236          #deal with first row, initial volume of the tank is Vil
237          Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
238          Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
239          if (Tin[i] + Vil >= S) {
```

```
240          #if tank inflow and initial volume exceed the given tank size, the over flow will occur
241          Qot[i] = Tin[i] + Vil - S #overflow volume
242
243          Yt[i] = min(Dt[i], Vil)#tank yield at t timestep
244          Vt[i] = S - Yt[i] #the remaning volume at the end of T timestep is tank size exclude yield if overflow occured
245       } else{
246          #if there is no overflow occured, which means Tin + Vt-1(in this case is initial volume) smaller than tank size
247          Qot[i] = 0 #overflow is 0
248          Yt[i] = min(Dt[i], Vil)#tank yield at t timestep
249          Vt[i] = Vil + Tin[i] - Yt[i] ##the remaning volume at the end of T timestep is initial volume + inflow exclude yield if overflow not occur
250       }
251    } else{
252       #if it's not the first row
253       Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
254       Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
255       if (Tin[i] + Vt[i - 1] >= S) {
256          #if tank inflow and Vt-1previous tank volume exceed the given tank size, the over flow will occur
257          Qot[i] = Tin[i] + Vt[i - 1] - S #overflow volume
258          Yt[i] = min(Dt[i], Vt[i - 1])#tank yield at t timestep
259          Vt[i] = S - Yt[i] #the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
260       } else{
261          #if there is no overflow occured, which means Tin + Vt-1 smaller than tank size
262          Qot[i] = 0 #overflow is 0
263          Yt[i] = min(Dt[i], Vt[i - 1])#tank yield at t timestep
264          #the remaning volume at the end of t timestep is previous tank volume Vt-1 + inflow exclude yield if overflow not occur
265          Vt[i] = Vt[i - 1] + Tin[i] - Yt[i]
266       }
267    }
268 }
269 normal_tank_10years <- cbind(rainfall5, Vt, Qot, Yt, Dt)
```

```r
270      assessment_result_normaltank[k, ] <-
271          assess_metrics_normaltank(normal_tank_10years, A_metrics = A)
272      diag_normaltank[k, ] <-
273          balance_diagnostic_normaltank(normal_tank_10years)
274    }


277    #####################
278    #6. Passive Release System continuous simulation
279    #predicting tricle release orifice size
280    #orifice equation for passive system to determine the required orifice diameter
281    #orifice size in passive system is targeting to deliver the flow rate as required Qx
282    orifice_d_passive <-
283      function(x,
284                   fixedchamber = 1 / 4,
285                   Q = Q_target_dbs,
286                   Cd = 0.7,
287                   g = 9.81,
288                   tank.area = 4) {
289        #x is the tank size and this equation can determine the orifice diameter to deliver the required rate, tank area is m2, diameter output is
290        h = (x * fixedchamber * 1 / 2) / (tank.area * 1000)#h in m
291        Q = Q / (360 * 1000)#Q in m/s/m2
292        orifice.diamm = sqrt((4 * Q) / (sqrt(2 * g * h) * Cd * pi)) * 1000 #diameter in mm
293        orifice.diamm
294      }

296    #calculate tricle release rate using orifice equation
297    orifice_passive <-
298      function(x,
299                   orifice.diamm = 5,
```

```r
300               Cd = 0.7,
301                 g = 9.81,
302                 tank.area = 4) {
303       #x is the tank volume at the start of current timestep(m),orifice.diamm is the diameter of the orifice(mm)
304       #Cd is the orifice discharge co-efficient, g is the gravitational acceceleration m/s2
305       #tank area in m2
306       h = x / (tank.area * 1000) #h in m
307       Q.orifice = Cd * (1 / 4 * pi * ((orifice.diamm / 1000) ^ 2)) * sqrt(2 *
308                                                                          g * h) * 1000 * 60 #L/min
309       Q.orifice
310     }
311
312   #assessment metrics for passive release system
313   assess_metrics_leakytank <-
314     function(x,
315               Qb_target = Q_target,
316               A_metrics = A) {
317       baseflow_frequency <-
318         100 * nrow(x[x$Qbt_total_t >= 0.8 * Qb_target &
319                       x$Qbt_total_t <= 2 * Qb_target, ]) / nrow(x)#how many percent of day did the required baseflow(target +- 20%) is delivered
320       overflow_frequency <-
321         100 * nrow(x[x$Qot > 0, ]) / nrow(x)#how many percent of day did the overflow occured
322       supply_frequency <-
323         100 * nrow(x[x$Yt >= x$Dt, ]) / nrow(x)#how many percent of day did the required water supply is delivered
324       Ews <- sum(x$Yt) / sum(x$Dt)#water supply efficiency
325       if (sum(x$Qbt_total_t) / (Qb_target * nrow(x)) <= 1) {
326         Eb = sum(x$Qbt_total_t) / (Qb_target * nrow(x))
327       } else if (sum(x$Qbt_total_t) / (Qb_target * nrow(x)) > 2) {
328         Eb = 0
329       } else{
```

```r
330            Eb = 2 - (sum(x$Qbt_total_t) / (Qb_target * nrow(x)))
331          }
332        Er = 1 - (sum(x$Qot) + sum(x$Qbt_overflow)) / (sum(x$rain.mm) * A)
333        annual_yield <- sum(x$Yt) / 10
334        annual_baseflow <- sum(x$Qbt_total_t) / 10
335        annual_overflow <- sum(x$Qot) / 10
336        annual_baseflow_overflow <- sum(x$Qbt_overflow, na.rm = TRUE) / 10
337        annual_inflow <- sum(x$Tin) / 10
338        result <-
339          matrix(round(
340            c(
341              baseflow_frequency,
342              overflow_frequency,
343              supply_frequency,
344              Ews * 100,
345              Eb * 100,
346              Er * 100,
347              annual_yield,
348              annual_baseflow,
349              annual_overflow,
350              annual_baseflow_overflow,
351              annual_inflow,
352              A,
353              S,
354              orifice_diamm
355            ),
356            digits = 2
357          ), ncol = 14, byrow = TRUE)
358        result
359      }
```

```r
360
361    #water balance diagnostics
362    balance_diagnostic_leakytank <- function(x) {
363      a <- round(sum(x$Qot, na.rm = TRUE)) +
364         round(sum(x$Yt, na.rm = TRUE)) +
365         round(x$Vt[964080]) +
366         round(sum(x$Qbt_total_t)) +
367         round(sum(x$Qbt_overflow)) ==
368         round(sum(x$Tin, na.rm = TRUE))
369      b <- sum(x$Qot, na.rm = TRUE) +
370         sum(x$Yt, na.rm = TRUE) +
371         sum(x$Qbt_total_t) +
372         sum(x$Qbt_overflow) +
373         x$Vt[964080] -
374         sum(x$Tin, na.rm = TRUE)
375      d <- c(a, b)
376      d
377    }
378
379    #loop to simulate the performance of passive release systems
380    for (l in 1:2) {
381      # to proportion l in 1:2, which represent the detention volume of 25% and 75% passive release system respectively
382      chamber_proportion <- c(1 / 4, 3 / 4)[l]
383      for (j in 1:3) {
384        #j in 1:3 represent 3 baseflow target
385        Q_target_dbs <-
386          (Flow_target_dbs[j] / 4000000) * 360 #convert target to mm/6min
387        for (k in 1:80) {
388          #k in 1:80 represent 80 combination of different configuration
389          S <-
```

```
390            Configuration.metrics$Tank_Size[k]#identify the tank size for this scenario
391        A <-
392            Configuration.metrics$Roof_Size[k]#identify the roof size for this scenario
393        Consumptionloop <- vector(length = 48)
394        Consumptionloop <-
395            Consumption[, k]#identify the consumption metrics for this scenario
396        rainfall5 <- rainfall4 %>%
397            mutate(Tin = Qt.mm_6min * A) ## make a new data frame store the tank inflow
398        Vil <- c(0)# the initial volume of the tank
399        Vt <-
400            matrix(nrow = nrow(rainfall5), ncol = 1)#volume in store (L) during time interval t (current)
401        Qot <-
402            matrix(nrow = nrow(rainfall5), ncol = 1)#Tank Overflow at t time-step(L/6min)
403        Yt <-
404            matrix(nrow = nrow(rainfall5), ncol = 1)#Rainwater Yeild at t time-step (L/ 6min)
405        Dt <-
406            matrix(nrow = nrow(rainfall5), ncol = 1)#Household Demand at t time-step(L/6min)
407        #define the total Baseflow releasing in t time step, including baseflow delivered by pre-releasing and normal release
408        Qbt_total_t <-
409            matrix(nrow = nrow(rainfall5), ncol = 1)
410        #define the total Baseflow releasing in t time step, including baseflow delivered by pre-releasing and normal release
411        Qbt_overflow <-
412            matrix(nrow = nrow(rainfall5), ncol = 1)
413        Tin <-
414            matrix(nrow = nrow(rainfall5), ncol = 1)#Tank Inflow (L/timestep)
415        Q_target <- Q_target_dbs * A#convert target to L/6min
416        diamm <- matrix(nrow = 480, ncol = 1)
417        orifice_diamm <-
418            orifice_d_passive(S, fixedchamber = chamber_proportion, Q = Q_target)
419        diamm[(l - 1) * 240 + (j - 1) * 80 + k, ] <- orifice_diamm
```

```r
420        for (i in 1:nrow(rainfall5)) {
421           ##start the calculation within each scenario
422           Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
423           #assigning demand at t timestep from end-use module
424           Dt[i] = Consumptionloop[rainfall5$Hour[i]]
425           if (i == 1) {
426              #first row
427              Qot[i] = max(Tin[i] + Vil - S, 0) #overflow volume
428              Yt[i] = min(Dt[i], Vil)#tank yield at t timestep
429           #the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
430              Vt[i] = min(Vil + Tin[i] - Yt[i], S - Yt[i])
431              Qbt_total_t[i] = 0
432              Qbt_overflow[i] = 0
433           } else{
434              #not first row
435              if (Vt[i - 1] + Tin[i] > S * (1 - chamber_proportion)) {
436                 #if there is water release from the orifice
437                 if (Tin[i] + Vt[i - 1] >= S) {
438                   #if tank inflow and Vt-1previous tank volume exceed the given tank size, the over flow will occur
439                     Qot[i] = Tin[i] + Vt[i - 1] - S
440                     Qbt_overflow[i] = min(
441                        orifice_passive(
442                          x = S - S * (1 - chamber_proportion),
443                          orifice.diamm = orifice_diamm
444                        ) * 6,
445                        S - S * (1 - chamber_proportion)
446                     )
447                     Qbt_total_t[i] = 0
448                     Yt[i] = min(Dt[i], Vt[i - 1])#tank yield at t timestep
449                     Vt[i] = S - Qbt_overflow[i] - Yt[i]
```

```r
450              } else{
451                  #no overflow but tricle release from orifice
452                  Qot[i] = 0
453                  Qbt_total_t[i] = min(
454                      orifice_passive(
455                          x = Vt[i - 1] + Tin[i] - S * (1 - chamber_proportion),
456                          orifice.diamm = orifice_diamm
457                      ) * 6,
458                      Vt[i - 1] + Tin[i] - S * (1 - chamber_proportion)
459                  )
460                  Qbt_overflow[i] = 0
461                  Yt[i] = min(Dt[i], Vt[i - 1])#tank yield at t timestep
462                  Vt[i] = Vt[i - 1] + Tin[i] - Qbt_total_t[i] - Yt[i]
463              }
464          } else{
465              #no water from orifice, normal tank model
466              Qot[i] = max(Tin[i] + Vt[i - 1] - S, 0) #overflow volume
467              Yt[i] = min(Dt[i], Vt[i - 1])#tank yield at t timestep
468              Vt[i] = min(Vt[i - 1] + Tin[i] - Yt[i], S - Yt[i])#the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
469              Qbt_total_t[i] = 0
470              Qbt_overflow[i] = 0
471          }
472      }
473  }
474  leakytank_result_10years <-
475      cbind(rainfall5, Vt, Qot, Yt, Dt, Qbt_total_t, Qbt_overflow)
476  leakytank_raw_data[[(l - 1) * 240 + (j - 1) * 80 + k]] <-
477      leakytank_result_10years
478  assessment_result_leakytank[(l - 1) * 240 + (j - 1) * 80 + k, ] <-
479      assess_metrics_leakytank(leakytank_result_10years,
```

```
480                                    Qb_target = Q_target,
481                                    A_metrics = A)
482          diag_leakytank[(l - 1) * 240 + (j - 1) * 80 + k, ] <-
483             balance_diagnostic_leakytank(leakytank_result_10years)
484       }
485     }
486   }
487
488
489   ########################
490   #7. Active Release System continuous simulation
491   #define orifice equation,output flow rate in L/min
492   orifice <- function(x,
493                       orifice.diamm = 10,
494                       Cd = 0.7,
495                       g = 9.81,
496                       tank.area = 4) {
497     #x is the tank volume at the start of current timestep(m),orifice.diamm is the diameter of the orifice(mm)
498     #Cd is the orifice discharge co-efficient, g is the gravitational acceceleration m/s2
499     #tank area in m2
500     h = x / (tank.area * 1000) #h in m
501     Q.orifice    =    Cd    *    (1    /    4    *    pi    *    ((orifice.diamm    /    1000)    ^    2))    *    sqrt(2    *
502   g * h) * 1000 #L/s
503     Q.orifice
504   }
505
506   #define assessment metrics
507   ##assessment metrics for active release systems
508   assess_metrics <- function(x,
509                                    Qb_target = Q_target,
```

```r
510                                A_metrics = A) {
511      baseflow_frequency <-
512        100 * nrow(x[x$Qbt_total_t >= Qb_target, ]) / nrow(x)#how many percent of day did the required baseflow is delivered
513      overflow_frequency <-
514        100 * nrow(x[x$Qot > 0, ]) / nrow(x)#how many percent of day did the overflow occured
515      supply_frequency <-
516        100 * nrow(x[x$Yt >= x$Dt, ]) / nrow(x)#how many percent of day did the required water supply is delivered
517      Ews <- sum(x$Yt) / sum(x$Dt)#water supply efficiency
518      if (sum(x$Qbt_total_t) / (Qb_target * nrow(x)) <= 1) {
519        Eb = sum(x$Qbt_total_t) / (Qb_target * nrow(x))
520      } else if (sum(x$Qbt_total_t) / (Qb_target * nrow(x)) > 2) {
521        Eb = 0
522      } else{
523        Eb = 2 - (sum(x$Qbt_total_t) / (Qb_target * nrow(x)))
524      }
525      Er = 1 - sum(x$Qot) / (sum(x$rain.mm) * A)
526      annual_yield <- sum(x$Yt) / 10
527      annual_baseflow <- sum(x$Qbt) / 10
528      annual_overflow <- sum(x$Qot) / 10
529      annual_purge <- sum(x$purge_released, na.rm = TRUE) / 10
530      annual_baseflow_purge <- sum(x$Qbt_p, na.rm = TRUE) / 10
531      annual_inflow <- sum(x$Tin) / 10
532      result <-
533        matrix(round(
534          c(
535            baseflow_frequency,
536            overflow_frequency,
537            supply_frequency,
538            Ews * 100,
539            Eb * 100,
```

```
540            Er * 100,
541               annual_yield,
542               annual_baseflow,
543               annual_overflow,
544               annual_purge,
545               annual_baseflow_purge,
546               annual_inflow
547           ),
548           digits = 2
549         ), ncol = 12, byrow = TRUE)
550      result
551    }
552    #water balancing check
553    #water balancing diagnostic
554    balance_diagnostic <- function(x) {
555      a <-
556         round(sum(x$Q_pre_release, na.rm = TRUE)) == #defined purge volume
557         round(sum(x$purge_released, na.rm = TRUE)) + #release via 25mm outlet
558         round(sum(x$Qbt_p, na.rm = TRUE))#pre-releasing module balancing check
559      e <- sum(x$Q_pre_release, na.rm = TRUE) - #defined purge volume
560         sum(x$purge_released, na.rm = TRUE) -    #release via 25mm outlet
561         sum(x$Qbt_p, na.rm = TRUE)#pre-releasing module balancing check
562      b <- round(sum(x$Q_pre_release, na.rm = TRUE)) +
563         round(sum(x$Qot, na.rm = TRUE)) +
564         round(sum(x$Qbt, na.rm = TRUE)) +
565         round(sum(x$Yt, na.rm = TRUE)) +
566         round(x$Vt[964080]) ==
567         round(sum(x$Tin, na.rm = TRUE))
568      c <- sum(x$purge_released, na.rm = TRUE) +
569         sum(x$Qot, na.rm = TRUE) +
```

```
570        sum(x$Qbt_total_t, na.rm = TRUE) +
571        sum(x$Yt, na.rm = TRUE) +
572        x$Vt[964080] -
573        sum(x$Tin, na.rm = TRUE)
574      d <- c(a, e, b, c)
575      d
576    }
577
578    ##7.1 supply-first configuration
579    ###in this loop, water supply is the priority, the tank volume at the end of each time step is design to supply the consumption in the next timestep
580    ###because the baseflow releasing amount is depend on tank volume exclude next timestep demand
581    for (j in 1:3) {
582      #j in 1:3 represent 3 baseflow target
583      Q_target_dbs <-
584        (Flow_target_dbs[j] / 4000000) * 360 #convert target to mm/6min
585      for (k in 1:80) {
586        #k in 1:80 represent 80 combination of different configuration
587        S <-
588          Configuration.metrics$Tank_Size[k]#identify the tank size for this scenario
589        A <-
590          Configuration.metrics$Roof_Size[k]#identify the roof size for this scenario
591        Consumptionloop <- vector(length = 48)
592        Consumptionloop <-
593          Consumption[, k]#identify the consumption metrics for this scenario
594        rainfall5 <- rainfall4 %>%
595          mutate(Tin = Qt.mm_6min * A) ## make a new data frame store the tank inflow
596        RT_p <-
597          matrix(nrow = nrow(rainfall5), ncol = 1)#predicted rainfall depth mm/d
598        Qt.mm_p <-
599          matrix(nrow = nrow(rainfall5), ncol = 1)#predicted roofrunoff mm/d
```

```r
600     Tin_p <-
601         matrix(nrow = nrow(rainfall5), ncol = 1)#predicted tank inflow L/d
602     Q_pre_release <-
603         matrix(nrow = nrow(rainfall5), ncol = 1)#initial(required) pre-releasing amount L/d
604     Q_purge <-
605         matrix(nrow = nrow(rainfall5), ncol = 1)#remaining required purge release volume
606     purge_released <- matrix(nrow = nrow(rainfall5), ncol = 1)
607     Vil <- c(0)# the initial volume of the tank
608     Vt <-
609         matrix(nrow = nrow(rainfall5), ncol = 1)#volume in store (L) during time interval t (current)
610     Qot <-
611         matrix(nrow = nrow(rainfall5), ncol = 1)#Tank Overflow at t time-step(L/6min)
612     Yt <-
613         matrix(nrow = nrow(rainfall5), ncol = 1)#Rainwater Yeild at t time-step (L/ 6min)
614     Dt <-
615         matrix(nrow = nrow(rainfall5), ncol = 1)#Household Demand at t time-step(L/6min)
616     Qbt_p <-
617         matrix(nrow = nrow(rainfall5), ncol = 1)#define the Baseflow delivered during the pre-releasing process
618     Qbt <-
619         matrix(nrow = nrow(rainfall5), ncol = 1)#define the Baseflow releasing from the baseflow orifice in t time step
620     #define the total Baseflow releasing in t time step, including baseflow delivered by pre-releasing and normal release
621     Qbt_total_t <-
622         matrix(nrow = nrow(rainfall5), ncol = 1)
623     Q_target_t <-
624         matrix(nrow = nrow(rainfall5), ncol = 1)#baseflow target in hourly timestep amount L/hr
625     Tin <-
626         matrix(nrow = nrow(rainfall5), ncol = 1)#Tank Inflow (L/timestep)
627     Q_target <- Q_target_dbs * A#convert target to L/6min
628     for (i in 1:nrow(rainfall5)) {
629         ##start the calculation within each scenario
```

```
630        if (i == 1) {
631            #deal with first row, initial volume of the tank is Vil
632            #to find the corresponding row number in the predicted rainfall dataset which has the same date of this row(in real rainfall dataset)
633            numrow <-
634                match(rainfall5$Date.day[i], rainfall_forecast1$Date)
635            if (rainfall_forecast1$prob[numrow] >= 0.7) {
636                #if probability greater than the threshold, then initiate the pre-releasing algorithm)
637                RT_p[i] = rainfall_forecast1$rain[numrow] #assigning predicted rainfall data from forecastdata setmm/day
638                Qt.mm_p[i] = max(RT_p[i] - Dil, 0) #calculate roof runoff considering initial loss 0.2mm/event(2hr)
639                Tin_p[i] = Qt.mm_p[i] * A#convert predicted roof runoff from mm/event to L/event to form the tank inflow
640                ##code below define pre-releasing volume, which means the pre-releasing won't be greater than the tank volume at the end of previous day
641                #if the predicted tank inflow plus tank volume in the previous timestep(initial volume) is greater than tank size, which means overflowing
642                Q_pre_release[i] = min(max(Tin_p[i] + Vil - S, 0), Vil)
643                Q_purge[i] <-
644                    Q_pre_release[i]#remaining purge volume at the start is equal to initial pre-releasing volume
645                Qbt_p[i] <-
646                    min(Q_target, Q_purge[i])# using remaining purge volume to deliver baseflow
647                Q_purge[i] <-
648                    Q_purge[i] - Qbt_p[i]#either 0 or purge releasing volume exclude baseflow volume
649                purge_released[i] = min(orifice(x = Vt[i - 1]) * 6, Q_purge[i])
650                #how many water can be released by gravity through the orifice within 6 minute
651                Q_purge[i] <-
652                    Q_purge[i] - purge_released[i]
653                #overwrite the remaining purge volume to create the remaining purge volume at the end of this timestep(beggining of next timestep)
654                Q_target_t[i] = Q_target - Qbt_p[i]
655                #assigning the remaining baseflow restoring target at this timestep as there might be some baseflow already delivered
656                Vt[i] = Vil - purge_released[i] - Qbt_p[i]
657                if (Q_target_t[i] <= 0) {
658                    #yes means the baseflow target at this timestep has been satisfied, no need for further releasing baseflow
659                    Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
```

```
660          Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
661          Qot[i] = max(Tin[i] + Vt[i] - S, 0) #overflow volume
662          Yt[i] = min(Dt[i], Vt[i])#tank yield at t timestep
663          Vt[i] = min(Vt[i] + Tin[i] - Yt[i], S - Yt[i])#the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
664          Qbt[i] = 0
665      } else{
666          #if the baseflow target at this timestep hasn't been satisfied
667          Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
668          Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
669          if (Tin[i] + Vt[i] >= S) {
670              #if tank inflow and Vt-1previous tank volume exceed the given tank size, the over flow will occur
671              Qot[i] = Tin[i] + Vt[i] - S #overflow volume
672              Yt[i] = min(Dt[i], Vt[i]) # yield volume
673              Qbt[i] = 0#no baseflow releasing if overflow occur
674              Vt[i] = S - Yt[i] #the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
675          } else{
676              #if there is no overflow occured, which means Tin + Vt-1 smaller than tank size
677              Qot[i] = 0 #overflow is 0
678              Yt[i] = min(Dt[i], Vt[i]) # tank yield
679              Vt[i] = Vt[i] - Yt[i] ##add Tin if want to release more baseflow
680              #the remaning volume at the end of t timestep is previous tank volume Vt-1 + inflow exclude yield if overflow not occur
681              if (Consumptionloop[rainfall5$Hour[i] + 1] < Vt[i]) {
682                  #if the demand in next time step can be satisfied by the tank volume at the end of this time step
683                  Qbt[i] = min(Vt[i] - Consumptionloop[rainfall5$Hour[i] +
684                                              1],   Q_target_t[i]) #baseflow releasing Qbt is equal to the min(Vt - Dt, Q_target)
685              } else{
686                  Qbt[i] = 0 #if the demand in next time step can not be satisfied, then restoration is zero
687              }
688              Vt[i] = Vt[i] + Tin[i] - Qbt[i]#tank volume at the end of this timestep
689          }
```

```
690                          }
691                  } else{
692                     #if there is no need to initiate purge releasing algorithm, then normal tank model
693                     Q_pre_release[i] = 0#no pre-releasing required
694                     Q_purge[i] = 0#no remaining pre-releasing
695                     Qbt_p[i] = 0#no baseflow delivered by purge
696                     Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
697                     Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
698                     Q_target_t[i] = Q_target
699                     if (Tin[i] + Vil >= S) {
700                        #if tank inflow and initial volume exceed the given tank size, the over flow will occur
701                        Qot[i] = Tin[i] + Vil - S #overflow volume
702                        Yt[i] = min(Dt[i], Vil) #tank yield
703                        Qbt[i] = 0 #no baseflow releasing when overflow occured
704                        Vt[i] = S - Yt[i] #the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
705                     } else{
706                        #if there is no overflow occured, which means Tin + Vt-1(in this case is initial volume) smaller than tank size
707                        Qot[i] = 0 #overflow is 0
708                        Yt[i] = min(Dt[i], Vil) # tank yield
709                        Vt[i] = (Vil + Tin[i] - Yt[i]) ##the remaning volume at the end of T timestep is initial volume + inflow exclude yield if overflow not occur
710                        if ((Consumptionloop[rainfall5$Hour[i] + 1]) < Vt[i]) {
711                           #if the demand in next time step can be satisfied by the tank volume at the end of this time step
712                           Qbt[i] = min(Vt[i] - Consumptionloop[rainfall5$Hour[i] + 1], Q_target_t[i])
713                           #baseflow releasing Qbt is equal to the min(Vt - Dt, Q_target)
714                        } else{
715                           Qbt[i] = 0 #if the demand in next time step can not be satisfied, then restoration is zero
716                        }
717                        Vt[i] =    Vt[i] - Qbt[i]
718                     }
719                  }
```

```r
720                  Qbt_total_t[i] = Qbt[i] + Qbt_p[i] #the total baseflow releasing is the baseflow released during purge and released in the normal operation
721             } else{
722               #if it's not the first row
723               if (rainfall5$Day[i] != rainfall5$Day[i - 1]) {
724                 #newday? True means it is new day
725                 numrow <-
726                    match(rainfall5$Date.day[i], rainfall_forecast1$Date)
727                 #to find the corresponding row number in the predicted rainfall dataset which has the same date of this row(in real rainfall dataset)
728                 if (rainfall_forecast1$prob[numrow] >= 0.7) {
729                   #if probability greater than the threshold, then initiate the calculation
730                   RT_p[i] = rainfall_forecast1$rain[numrow] #assigning predicted rainfall data from forecastdata setmm/day
731                   Qt.mm_p[i] = max(RT_p[i] - Dil, 0) #calculate roof runoff considering initial loss mm/day
732                   Tin_p[i] = Qt.mm_p[i] * A#convert predicted roof runoff from mm/day to L/day to form the tank inflow
733                   Q_pre_release[i] = min(max(Tin_p[i] + Vt[i - 1] - S, 0), Vt[i -1])
734                   #if the predicted tank inflow plus tank volume in the previous timestep(initial volume) is greater than tank size, which means overflowing
735                   Q_purge[i] <-
736                      Q_pre_release[i]# remaining purge volume at the beginning of this time step
737                   Qbt_p[i] <-
738                      min(Q_target, Q_purge[i])# using remaining purge volume to deliver baseflow
739                   Q_purge[i] <-
740                      Q_purge[i] - Qbt_p[i]#either 0 or purge releasing volume exclude baseflow volume
741                   purge_released[i] = min(orifice(x = Vt[i - 1]) * 6, Q_purge[i])
742                   #how many water can be released by gravity through the orifice within 6 minute
743                   Q_purge[i] = Q_purge[i] - purge_released[i]#remaining required purge release at the end of this timestep
744                   Q_target_t[i] = Q_target - Qbt_p[i]
745                   #assigning the remaining baseflow restoring target at this timestep as there might be some baseflow already delivered
746                   Vt[i] = Vt[i - 1] - purge_released[i] - Qbt_p[i] #Vt[i] here is not the tank volume at the end of this timestep
747                   #It is adopted to temporarily store the tank volume after purge, which will be used to determine the yield and overflow.
748                   #it is calculated by using tank volume in the previous timestep exclude the release from both purge outlet and baseflow outlet
749                   if (Q_target_t[i] <= 0) {
```

```
750             #yes means the baseflow target at this timestep has been satisfied, no need for further releasing baseflow
751             Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
752             Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
753             Qot[i] = max(Tin[i] + Vt[i] - S, 0) #overflow volume
754             Yt[i] = min(Dt[i], Vt[i])#tank yield at t timestep
755             Vt[i] = min(Vt[i] + Tin[i] - Yt[i], S - Yt[i])#the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
756             Qbt[i] = 0
757         } else{
758             #if the baseflow target at this timestep hasn't been satisfied
759             Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
760             Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
761             if (Tin[i] + Vt[i] >= S) {
762                 #if tank inflow and Vt-1previous tank volume exceed the given tank size, the over flow will occur
763                 Qot[i] = Tin[i] + Vt[i] - S #overflow volume
764                 Yt[i] = min(Dt[i], Vt[i]) # tank yield at t timestep
765                 Qbt[i] = 0#no baseflow releasing if overflow occur
766                 Vt[i] = S - Yt[i] #the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
767             } else{
768                 #if there is no overflow occured, which means Tin + Vt-1 smaller than tank size
769                 Qot[i] = 0 #overflow is 0
770                 Yt[i] = min(Dt[i], Vt[i]) # tank yield at t timestep
771                 Vt[i] = Vt[i] - Yt[i] ##add Tin if want to release more baseflow
772                 #the remaning volume at the end of t timestep is previous tank volume Vt-1 + inflow exclude yield if overflow not occur
773                 if (Consumptionloop[rainfall5$Hour[i] + 1] < Vt[i]) {
774                     #if the demand in next time step can be satisfied by the tank volume at the end of this time step
775                     Qbt[i] = min(Vt[i] - Consumptionloop[rainfall5$Hour[i] +
776                                                         1],   Q_target_t[i]) #baseflow releasing Qbt is equal to the min(Vt - Dt, Q_target)
777                 } else{
778                     Qbt[i] = 0 #if the demand in next time step can not be satisfied, then restoration is zero
779                 }
```

```
780              Vt[i] = Vt[i] + Tin[i] - Qbt[i]#tank volume at the end of this timestep
781                }
782              }
783          } else{
784              #if there is no need to initiate purge releasing algorithm
785              Q_pre_release[i] = 0#no pre-releasing required
786              Q_purge[i] = 0##no remaining pre-releasing
787              Qbt_p[i] = 0#no baseflow delivered by purge
788              Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
789              Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
790              Q_target_t[i] = Q_target#if no pre-releasing, the baseflow target at this timestep is still the originial target in each 6-minute timestep
791              if (Tin[i] + Vt[i - 1] >= S) {
792                  #if tank inflow and Vt-1previous tank volume exceed the given tank size, the over flow will occur
793                  Qot[i] = Tin[i] + Vt[i - 1] - S #overflow volume
794                  Yt[i] = min(Dt[i], Vt[i - 1]) #tank yield at t timestep
795                  Qbt[i] = 0#no baseflow releasing if overflow occur
796                  Vt[i] = S - Yt[i] #the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
797              } else{
798                  #if there is no overflow occured, which means Tin + Vt-1 smaller than tank size
799                  Qot[i] = 0 #overflow is 0
800                  Yt[i] = min(Dt[i], Vt[i - 1]) # tank yield at t timestep
801                  Vt[i] = Vt[i - 1] - Yt[i] ##add Tin if want to release more baseflow
802                  #the remaning volume at the end of t timestep is previous tank volume Vt-1 + inflow exclude yield if overflow not occur
803                  if (Consumptionloop[rainfall5$Hour[i] + 1] < Vt[i]) {
804                      #if the demand in next time step can be satisfied by the tank volume at the end of this time step
805                      Qbt[i] = min(Vt[i] - Consumptionloop[rainfall5$Hour[i] +1], Q_target_t[i])
806                  #baseflow releasing Qbt is equal to the min(Vt - Dt, Q_target)
807                  } else{
808                      Qbt[i] = 0 #if the demand in next time step can not be satisfied, then restoration is zero
809                  }
```

```
810                      Vt[i] = Vt[i] + Tin[i] - Qbt[i]#tank volume at the end of this timestep
811                    }
812                  }
813              } else {
814                #if it's not the newday which means this timestep is not the first timestep of a day
815                if (Q_purge[i - 1] > 0) {
816                  #if the required pre-releasing of the day hasn't been satisfied
817                  Qbt_p[i] <-
818                    min(Q_target, Q_purge[i - 1])# using remaining purge volume to deliver baseflow
819                  Q_purge[i] <-
820                    Q_purge[i - 1] - Qbt_p[i]#the rest of remaining purge release volume will be released from the orifice
821                  purge_released[i] = min(orifice(x = Vt[i - 1]) * 6, Q_purge[i])
822                  #how many water can be released by gravity through the orifice within 6 minute, this will not exceed the remaining purge volume
823                  Q_purge[i] <-
824                    Q_purge[i] - purge_released[i]#remaining required purge release at the end of this timestep
825                  Q_target_t[i] = Q_target - Qbt_p[i]
826                  #assigning the remaining baseflow restoring target at this timestep as there might be some baseflow already delivered
827                  Vt[i] = Vt[i - 1] - purge_released[i] - Qbt_p[i] #Vt[i] here is not the tank volume at the end of this timestep
828                  if (Q_target_t[i] <= 0) {
829                    #yes means the baseflow target at this timestep has been satisfied, no need for further releasing baseflow
830                    Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
831                    Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
832                    Qot[i] = max(Tin[i] + Vt[i] - S, 0) #overflow volume
833                    Yt[i] = min(Dt[i], Vt[i])#tank yield at t timestep
834                    Vt[i] = min(Vt[i] + Tin[i] - Yt[i], S - Yt[i])#the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
835                    Qbt[i] = 0
836                  } else {
837                    #if the baseflow target at this timestep hasn't been satisfied
838                    Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
839                    Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
```

```
840              if (Tin[i] + Vt[i] >= S) {
841                  #if tank inflow and Vt-1previous tank volume exceed the given tank size, the over flow will occur
842                  Qot[i] = Tin[i] + Vt[i] - S #overflow volume
843                  Yt[i] = min(Dt[i], Vt[i]) # tank yield at t timestep
844                  Qbt[i] = 0#no baseflow releasing if overflow occur, but there might still be some baseflow released from the pre-releasing process
845                  Vt[i] = S - Yt[i] #the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
846              } else{
847                  #if there is no overflow occured, which means Tin + Vt-1 smaller than tank size
848                  Qot[i] = 0 #overflow is 0
849                  Yt[i] = min(Dt[i], Vt[i - 1]) #tank yield
850                  Vt[i] = Vt[i - 1] - Yt[i] ##add Tin if want to release more baseflow
851                  #the remaning volume at the end of t timestep is previous tank volume Vt-1 + inflow exclude yield if overflow not occur
852                  if (Consumptionloop[rainfall5$Hour[i] + 1] < Vt[i]) {
853                      #if the demand in next time step can be satisfied by the tank volume at the end of this time step
854                      Qbt[i] = min(Vt[i] - Consumptionloop[rainfall5$Hour[i] +
855                                                          1],   Q_target_t[i]) #baseflow releasing Qbt is equal to the min(Vt - Dt, Q_target)
856                  } else{
857                      #if the demand in next timestep can not be satisfied
858                      Qbt[i] = 0 #then restoration is zero
859                  }
860                  Vt[i] = Vt[i] + Tin[i] - Qbt[i]#tank volume at the end of this timestep
861               }
862            }
863          } else{
864            #if the required pre-releasing of the day has been satisfied
865            Q_purge[i] = 0 #the remaining purge volume is zero
866            Qbt_p[i] = 0
867            Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
868            Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
869            Q_target_t[i] = Q_target
```

```r
870                        if (Tin[i] + Vt[i - 1] >= S) {
871                            #if tank inflow and Vt-1previous tank volume exceed the given tank size, the over flow will occur
872                            Qot[i] = Tin[i] + Vt[i - 1] - S #overflow volume
873                            Yt[i] = min(Dt[i], Vt[i - 1]) # replace the following 5 lines
874                            Qbt[i] = 0#no baseflow releasing if overflow occur
875                            Vt[i] = S - Yt[i] #the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
876                        } else{
877                            #if there is no overflow occured, which means Tin + Vt-1 smaller than tank size
878                            Qot[i] = 0 #overflow is 0
879                            Yt[i] = min(Dt[i], Vt[i - 1]) #
880                            Vt[i] = Vt[i - 1] - Yt[i] ##add Tin if want to release more baseflow
881                            #the remaning volume at the end of t timestep is previous tank volume Vt-1 + inflow exclude yield if overflow not occur
882                            if (Consumptionloop[rainfall5$Hour[i] + 1] < Vt[i]) {
883                                #if the demand in next time step can be satisfied by the tank volume at the end of this time step
884                                Qbt[i] = min(Vt[i] - Consumptionloop[rainfall5$Hour[i] +
885                                                                1], Q_target_t[i]) #baseflow releasing Qbt is equal to the min(Vt - Dt, Q_target)
886                            } else{
887                                Qbt[i] = 0 #if the demand in next time step can not be satisfied, then restoration is zero
888                            }
889                            Vt[i] = Vt[i] + Tin[i] - Qbt[i]#tank volume at the end of this timestep
890                        }
891                    }
892                }
893            Qbt_total_t[i] = Qbt[i] + Qbt_p[i] #the total baseflow releasing is the baseflow released during purge and released in the normal operation
894        }
895    }
896    supply_result_10years <-
897        cbind(
898            rainfall5,
899            Vt,
```

```r
900              Qot,
901              Yt,
902              Dt,
903              Q_target_t,
904              Qbt_p,
905              Qbt,
906              purge_released,
907              Qbt_total_t,
908              RT_p,
909              Qt.mm_p,
910              Tin_p,
911              Q_pre_release,
912              Q_purge
913            ) #result dataframe of this scenario
914        assessment_result_supply[(j - 1) * 80 + k, ] <-
915          assess_metrics(supply_result_10years,
916                          Qb_target = Q_target,
917                          A_metrics = A) #input into assessment metrics
918        diag_supply[(j - 1) * 80 + k, ] <-
919          balance_diagnostic(supply_result_10years)#water balance diagnostic tool
920      }
921    }
922
923    ##7.2 baseflow-first configuration start
924    ###in this loop, baseflow flow restoration is the priority
925    ###tank volume in the previous timestep will deliver the baseflow target first, once the target is satified, the yield will occur
926    for (j in 1:3) {
927      #j in 1:3 represent 3 baseflow target
928      Q_target_dbs <-
929        (Flow_target_dbs[j] / 4000000) * 360 #convert target to mm/6min
```

```
930    for (k in 1:80) {
931      #k in 1:80 represent 80 combination of different configuration
932      S <-
933        Configuration.metrics$Tank_Size[k]#identify the tank size for this scenario
934      A <-
935        Configuration.metrics$Roof_Size[k]#identify the roof size for this scenario
936      Consumptionloop <- vector(length = 48)
937      Consumptionloop <-
938        Consumption[, k]#identify the consumption metrics for this scenario
939      rainfall5 <- rainfall4 %>%
940        mutate(Tin = Qt.mm_6min * A) ## make a new data frame store the tank inflow
941      RT_p <-
942        matrix(nrow = nrow(rainfall5), ncol = 1)#predicted rainfall depth mm/d
943      Qt.mm_p <-
944        matrix(nrow = nrow(rainfall5), ncol = 1)#predicted roofrunoff mm/d
945      Tin_p <-
946        matrix(nrow = nrow(rainfall5), ncol = 1)#predicted tank inflow L/d
947      Q_pre_release <-
948        matrix(nrow = nrow(rainfall5), ncol = 1)#initial(required) pre-releasing amount L/d
949      Q_purge <-
950        matrix(nrow = nrow(rainfall5), ncol = 1)#remaining required purge release volume
951      purge_released <- matrix(nrow = nrow(rainfall5), ncol = 1)
952      Vil <- c(0)# the initial volume of the tank
953      Vt <-
954        matrix(nrow = nrow(rainfall5), ncol = 1)#volume in store (L) during time interval t (current)
955      Qot <-
956        matrix(nrow = nrow(rainfall5), ncol = 1)#Tank Overflow at t time-step(L/6min)
957      Yt <-
958        matrix(nrow = nrow(rainfall5), ncol = 1)#Rainwater Yeild at t time-step (L/ 6min)
959      Dt <-
```

```r
                   matrix(nrow = nrow(rainfall5), ncol = 1)#Household Demand at t time-step(L/6min)
     Qbt_p <-
                   matrix(nrow = nrow(rainfall5), ncol = 1)#define the Baseflow delivered during the pre-releasing process
     Qbt <-
                   matrix(nrow = nrow(rainfall5), ncol = 1)#define the Baseflow releasing from the baseflow orifice in t time step
     Qbt_total_t <-
                   matrix(nrow = nrow(rainfall5), ncol = 1)
     #define the total Baseflow releasing in t time step, including baseflow delivered by pre-releasing and normal release
     Q_target_t <-
                   matrix(nrow = nrow(rainfall5), ncol = 1)#baseflow target in hourly timestep amount L/hr
     Tin <-
                   matrix(nrow = nrow(rainfall5), ncol = 1)#Tank Inflow (L/timestep)
     Q_target <- Q_target_dbs * A#convert target to L/6min
     for (i in 1:nrow(rainfall5)) {
       if (i == 1) {
          #deal with first row, initial volume of the tank is Vil
          numrow <-
              match(rainfall5$Date.day[i], rainfall_forecast1$Date)
          #to find the corresponding row number in the predicted rainfall dataset which has the same date of this row(in real rainfall dataset)
          if (rainfall_forecast1$prob[numrow] >= 0.7) {
            #if probability greater than the threshold, then initiate the pre-releasing algorithm)
            RT_p[i] = rainfall_forecast1$rain[numrow] #assigning predicted rainfall data from forecastdata setmm/day
            Qt.mm_p[i] = max(RT_p[i] - Dil, 0) #calculate roof runoff considering initial loss 0.2mm/event(2hr)
            Tin_p[i] = Qt.mm_p[i] * A#convert predicted roof runoff from mm/event to L/event to form the tank inflow
            Q_pre_release[i] = min(max(Tin_p[i] + Vil - S, 0), Vil)
            #if the predicted tank inflow plus tank volume in the previous timestep(initial volume) is greater than tank size, which means overflowing
            Q_purge[i] <-
                Q_pre_release[i]#remaining purge volume at the start is equal to initial pre-releasing volume
            Qbt_p[i] <-
                min(Q_target, Q_purge[i])# using remaining purge volume to deliver baseflow
```

```
990        Q_purge[i] <-
991            Q_purge[i] - Qbt_p[i]#either 0 or purge releasing volume exclude baseflow volume
992        purge_released[i] = min(orifice(x = Vt[i - 1]) * 6, Q_purge[i])
993        #how many water can be released by gravity through the orifice within 6 minute
994        Q_purge[i] <-
995            Q_purge[i] - purge_released[i]
996        #overwrite the remaining purge volume to create the remaining purge volume at the end of this timestep(beggining of next timestep)
997        Q_target_t[i] = Q_target - Qbt_p[i]
998        #assigning the remaining baseflow restoring target at this timestep as there might be some baseflow already delivered
999        Vt[i] = Vil - purge_released[i] - Qbt_p[i]
1000       if (Q_target_t[i] <= 0) {
1001           #yes means the baseflow target at this timestep has been satisfied, no need for further releasing baseflow
1002           Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
1003           Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
1004           Qot[i] = max(Tin[i] + Vt[i] - S, 0) #overflow volume
1005           Yt[i] = min(Dt[i], Vt[i])#tank yield at t timestep
1006           Vt[i] = min(Vt[i] + Tin[i] - Yt[i], S - Yt[i])#the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
1007           Qbt[i] = 0
1008       } else{
1009           #if the baseflow target at this timestep hasn't been satisfied
1010           Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
1011           Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
1012           if (Tin[i] + Vt[i] >= S) {
1013               #if tank inflow and Vt-1previous tank volume exceed the given tank size, the over flow will occur
1014               Qot[i] = Tin[i] + Vt[i] - S #overflow volume
1015               Yt[i] = min(Dt[i], Vt[i]) # yield volume
1016               Qbt[i] = 0#no baseflow releasing if overflow occur
1017               Vt[i] = S - Yt[i] #the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
1018           } else{
1019               #if there is no overflow occured, which means Tin + Vt-1 smaller than tank size
```

```
1020                        Qot[i] = 0 #overflow is 0
1021                        Qbt[i] = min(Q_target_t[i], Vt[i]) #baseflow target will be satisfied in the first instance
1022                        Vt[i] = Vt[i] - Qbt[i]
1023                        if (Vt[i] > Q_target) {
1024                            #if the baseflow target can be satisfied in the next timestep
1025                            Yt[i] = min(Vt[i] - Q_target , Dt[i]) #yield occur and make sure baseflow in next timestep can be satisfied
1026                        } else{
1027                            # if target baseflow can not be satisfied in the next time step
1028                            Yt[i] = 0 #yield is 0 to preserve the baseflow delivering
1029                        }
1030                        Vt[i] = Vt[i] + Tin[i] - Yt[i]
1031                #the remaning volume at the end of t timestep is initial tank volume + inflow exclude yield, baseflow releasing and purge if overflow not occur
1032                        }
1033                    }
1034                } else{
1035                    #if there is no need to initiate purge releasing algorithm, then normal tank model
1036                    Q_pre_release[i] = 0#no pre-releasing required
1037                    Q_purge[i] = 0#no remaining pre-releasing
1038                    Qbt_p[i] = 0#no baseflow delivered by purge
1039                    Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
1040                    Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
1041                    Q_target_t[i] = Q_target
1042                    if (Tin[i] + Vil >= S) {
1043                        #if tank inflow and initial volume exceed the given tank size, the over flow will occur
1044                        Qot[i] = Tin[i] + Vil - S#overflow volume
1045                        Yt[i] = min(Dt[i], Vil) #tank yield
1046                        Qbt[i] = 0 #no baseflow releasing when overflow occured
1047                        Vt[i] = S - Yt[i] #the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
1048                    } else{
1049                        #if there is no overflow occured, which means Tin + Vt-1(in this case is initial volume) smaller than tank size
```

```
1050                    Qot[i] = 0 #overflow is 0
1051                    Qbt[i] = min(Q_target_t[i], Vil) #baseflow target will be satified in the first instance
1052                    Vt[i] = Vil - Qbt[i]
1053                    if (Vt[i] > Q_target) {
1054                        #if the baseflow target can be satisfied in the next timestep
1055                        Yt[i] = min(Vt[i] - Q_target , Dt[i])#yield occur and make sure baseflow in next timestep can be satisfied
1056                    } else{
1057                        # if target baseflow can not be satified in the next time step
1058                        Yt[i] = 0 #yield is 0 to preserve the baseflow delivering
1059                    }
1060                    Vt[i] = Vt[i] + Tin[i] - Yt[i]
1061    #the remaning volume at the end of t timestep is initial tank volume + inflow exclude yield, baseflow releasing and purge if overflow not occur
1062                }
1063            }
1064        Qbt_total_t[i] = Qbt[i] + Qbt_p[i] #the total baseflow releasing is the baseflow released during purge and released in the normal operation
1065        } else{
1066            #if it's not the first row
1067            if (rainfall5$Day[i] != rainfall5$Day[i - 1]) {
1068                #newday? True means it is new day
1069                numrow <-
1070                    match(rainfall5$Date.day[i], rainfall_forecast1$Date)
1071                #to find the corresponding row number in the predicted rainfall dataset which has the same date of this row(in real rainfall dataset)
1072                if (rainfall_forecast1$prob[numrow] >= 0.7) {
1073                    #if probability greater than the threshold, then initiate the calculation
1074                    RT_p[i] = rainfall_forecast1$rain[numrow] #assigning predicted rainfall data from forecastdata setmm/day
1075                    Qt.mm_p[i] = max(RT_p[i] - Dil, 0) #calculate roof runoff considering initial loss mm/day
1076                    Tin_p[i] = Qt.mm_p[i] * A#convert predicted roof runoff from mm/day to L/day to form the tank inflow
1077                    ##define pre-releasing volume, which means the pre-releasing won't be greater than the tank volume at the end of previous day
1078                    Q_pre_release[i] = min(max(Tin_p[i] + Vt[i - 1] - S, 0), Vt[i - 1])
1079                    #if the predicted tank inflow plus tank volume in the previous timestep(initial volume) is greater than tank size, which means overflowing
```

```
1080            Q_purge[i] <-
1081              Q_pre_release[i]# remaining purge volume at the beginning of this time step
1082            Qbt_p[i] <-
1083              min(Q_target, Q_purge[i])# using remaining purge volume to deliver baseflow
1084            Q_purge[i] <-
1085              Q_purge[i] - Qbt_p[i]#either 0 or purge releasing volume exclude baseflow volume
1086            purge_released[i] = min(orifice(x = Vt[i - 1]) * 6, Q_purge[i])
1087            #how many water can be released by gravity through the orifice within 6 minute
1088            Q_purge[i] = Q_purge[i] - purge_released[i]#remaining required purge release at the end of this timestep
1089            Q_target_t[i] = Q_target - Qbt_p[i]
1090            #assigning the remaining baseflow restoring target at this timestep as there might be some baseflow already delivered
1091            Vt[i] = Vt[i - 1] - purge_released[i] - Qbt_p[i] #Vt[i] here is not the tank volume at the end of this timestep
1092            #It is adopted to temporarily store the tank volume after purge, which will be used to determine the yield and overflow.
1093            #it is calculated by using tank volume in the previous timestep exclude the release from both purge outlet and baseflow outlet
1094            if (Q_target_t[i] <= 0) {
1095              #yes means the baseflow target at this timestep has been satisfied, no need for further releasing baseflow
1096              Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
1097              Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
1098              Qot[i] = max(Tin[i] + Vt[i] - S, 0) #overflow volume
1099              Yt[i] = min(Dt[i], Vt[i])#tank yield at t timestep
1100              Vt[i] = min(Vt[i] + Tin[i] - Yt[i], S - Yt[i])#the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
1101              Qbt[i] = 0
1102            } else{
1103              #if the baseflow target at this timestep hasn't been satisfied
1104              Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
1105              Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
1106              if (Tin[i] + Vt[i] >= S) {
1107                #if tank inflow and Vt-1previous tank volume exceed the given tank size, the over flow will occur
1108                Qot[i] = Tin[i] + Vt[i] - S #overflow volume
1109                Yt[i] = min(Dt[i], Vt[i]) # tank yield at t timestep
```

```
1110              Qbt[i] = 0#no baseflow releasing if overflow occur
1111              Vt[i] = S - Yt[i] #the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
1112          } else{
1113          #if there is no overflow occured, which means Tin + Vt-1 smaller than tank size
1114          Qot[i] = 0 #overflow is 0
1115          Qbt[i] = min(Q_target_t[i], Vt[i]) #baseflow target will be satified in the first instance
1116          Vt[i] = Vt[i] - Qbt[i]
1117          if (Vt[i] > Q_target) {
1118              #if Dt is smaller than Vt-1
1119              Yt[i] = min(Vt[i] - Q_target , Dt[i])
1120          } else{
1121              # if target baseflow can not be satified in the next time step
1122              Yt[i] = 0 #yield is 0
1123          }
1124          Vt[i] = Vt[i] + Tin[i] - Yt[i]
1125          #the remaning volume at the end of t timestep is previous tank volume Vt-1 + inflow exclude yield if overflow not occur
1126          }
1127      }
1128  } else{
1129      #if there is no need to initiate purge releasing algorithm
1130      Q_pre_release[i] = 0#no pre-releasing required
1131      Q_purge[i] = 0##no remaining pre-releasing
1132      Qbt_p[i] = 0#no baseflow delivered by purge
1133      Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
1134      Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
1135      Q_target_t[i] = Q_target#if no pre-releasing, the baseflow target at this timestep is originial target in each 6-minute timestep
1136      if (Tin[i] + Vt[i - 1] >= S) {
1137          #if tank inflow and Vt-1previous tank volume exceed the given tank size, the over flow will occur
1138          Qot[i] = Tin[i] + Vt[i - 1] - S #overflow volume
1139          Yt[i] = min(Dt[i], Vt[i - 1]) #tank yield at t timestep
```

```
1140                    Qbt[i] = 0#no baseflow releasing if overflow occur
1141                    Vt[i] = S - Yt[i] #the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
1142                } else{
1143                    #if there is no overflow occured, which means Tin + Vt-1 smaller than tank size
1144                    Qot[i] = 0 #overflow is 0
1145                    Qbt[i] = min(Q_target_t[i], Vt[i - 1]) #baseflow target will be satified in the first instance
1146                    Vt[i] = Vt[i - 1] - Qbt[i]
1147                    if (Vt[i] > Q_target) {
1148                        #if Dt is smaller than Vt-1
1149                        Yt[i] = min(Vt[i] - Q_target , Dt[i])
1150                    } else{
1151                        # if target baseflow can not be satified in the next time step
1152                        Yt[i] = 0 #yield is 0
1153                    }
1154                    Vt[i] = Vt[i] + Tin[i] - Yt[i]
1155                    #the remaning volume at the end of t timestep is previous tank volume Vt-1 + inflow exclude yield if overflow not occur
1156                }
1157            }
1158        } else{
1159            #if it's not the newday which means this timestep is not the first timestep of a day
1160            if (Q_purge[i - 1] > 0) {
1161                #if the required pre-releasing of the day hasn't been satisfied
1162                Qbt_p[i] <-
1163                    min(Q_target, Q_purge[i - 1])# using remaining purge volume to deliver baseflow
1164                Q_purge[i] <-
1165                    Q_purge[i - 1] - Qbt_p[i]#the rest of remaining purge release volume will be released from the orifice
1166                purge_released[i] = min(orifice(x = Vt[i - 1]) * 6, Q_purge[i])
1167                #how many water can be released by gravity through the orifice within 6 minute, this will not exceed the remaining purge volume
1168                Q_purge[i] <-
1169                    Q_purge[i] - purge_released[i]#remaining required purge release at the end of this timestep
```

```
1170        Q_target_t[i] = Q_target - Qbt_p[i]
1171        #assigning the remaining baseflow restoring target at this timestep as there might be some baseflow already delivered
1172        Vt[i] = Vt[i - 1] - purge_released[i] - Qbt_p[i] #Vt[i] here is not the tank volume at the end of this timestep
1173        #using Vt[i] to replace Vt[i-1] in the following part
1174        if (Q_target_t[i] <= 0) {
1175            #yes means the baseflow target at this timestep has been satisfied, no need for further releasing baseflow
1176            Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
1177            Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
1178            Qot[i] = max(Tin[i] + Vt[i] - S, 0) #overflow volume
1179            Yt[i] = min(Dt[i], Vt[i])#tank yield at t timestep
1180            Vt[i] = min(Vt[i] + Tin[i] - Yt[i], S - Yt[i])#the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
1181            Qbt[i] = 0
1182        } else{
1183            #if the baseflow target at this timestep hasn't been satisfied
1184            Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
1185            Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
1186            if (Tin[i] + Vt[i] >= S) {
1187                #if tank inflow and Vt-1previous tank volume exceed the given tank size, the over flow will occur
1188                Qot[i] = Tin[i] + Vt[i] - S #overflow volume
1189                Yt[i] = min(Dt[i], Vt[i]) # tank yield at t timestep
1190                Qbt[i] = 0#no baseflow releasing if overflow occur, but there might still be some baseflow released from the pre-releasing process
1191                Vt[i] = S - Yt[i] #the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
1192            } else{
1193                #if there is no overflow occured, which means Tin + Vt-1 smaller than tank size
1194                Qot[i] = 0 #overflow is 0
1195                Qbt[i] = min(Q_target_t[i], Vt[i]) #baseflow target will be satified in the first instance
1196                Vt[i] = Vt[i] - Qbt[i]
1197                if (Vt[i] > Q_target) {
1198                    #if Dt is smaller than Vt-1
1199                    Yt[i] = min(Vt[i] - Q_target , Dt[i])
```

```
1200                    } else{
1201                        # if target baseflow can not be satified in the next time step
1202                        Yt[i] = 0 #yield is 0
1203                    }
1204                    Vt[i] = Vt[i] + Tin[i] - Yt[i]
1205                    #the remaning volume at the end of t timestep is previous tank volume Vt-1 + inflow exclude yield if overflow not occur
1206                    }
1207                }
1208            } else{
1209                #if the required pre-releasing of the day has been satisfied
1210                Q_purge[i] = 0 #the remaining purge volume is zero
1211                Qbt_p[i] = 0
1212                Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
1213                Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
1214                Q_target_t[i] = Q_target
1215                if (Tin[i] + Vt[i - 1] >= S) {
1216                    #if tank inflow and Vt-1previous tank volume exceed the given tank size, the over flow will occur
1217                    Qot[i] = Tin[i] + Vt[i - 1] - S#overflow volume
1218                    Yt[i] = min(Dt[i], Vt[i - 1]) # replace the following 5 lines
1219                    Qbt[i] = 0#no baseflow releasing if overflow occur
1220                    Vt[i] = S - Yt[i] #the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
1221                } else{
1222                    #if there is no overflow occured, which means Tin + Vt-1 smaller than tank size
1223                    Qot[i] = 0 #overflow is 0
1224                    Qbt[i] = min(Q_target_t[i], Vt[i - 1]) #baseflow target will be satified in the first instance
1225                    Vt[i] = Vt[i - 1] - Qbt[i]
1226                    if (Vt[i] > Q_target) {
1227                        #if Dt is smaller than Vt-1
1228                        Yt[i] = min(Vt[i] - Q_target , Dt[i])
1229                    } else{
```

```
1230                        # if target baseflow can not be satified in the next time step
1231                           Yt[i] = 0 #yield is 0
1232                        }
1233                     Vt[i] = Vt[i] + Tin[i] - Yt[i]
1234                        #the remaning volume at the end of t timestep is previous tank volume Vt-1 + inflow exclude yield if overflow not occur
1235                     }
1236                  }
1237               }
1238            Qbt_total_t[i] = Qbt[i] + Qbt_p[i] #the total baseflow releasing is the baseflow released during purge and released in the normal operation
1239         }
1240      }
1241      baseflow_result_10years_10mm <-
1242         cbind(
1243            rainfall5,
1244            Vt,
1245            Qot,
1246            Yt,
1247            Dt,
1248            Q_target_t,
1249            Qbt_p,
1250            Qbt,
1251            purge_released,
1252            Qbt_total_t,
1253            RT_p,
1254            Qt.mm_p,
1255            Tin_p,
1256            Q_pre_release,
1257            Q_purge
1258         )#result dataframe of this scenario
1259      assessment_result_baseflow[(j - 1) * 80 + k, ] <-
```

```r
1260          assess_metrics(baseflow_result_10years,
1261                                Qb_target = Q_target,
1262                                A_metrics = A) #input into assessment metrics
1263        diag_baseflow[(j - 1) * 80 + k, ] <-
1264          balance_diagnostic(baseflow_result_10years)#water balance diagnostic tool
1265      }
1266    }
1267
1268    ##7.3 no baseflow release configuration start
1269    ###in this loop, active release system will not release baseflow
1270    ###simply set baseflow target as zero
1271      Q_target_dbs <- c(0)#set target as zero, no baseflow release required
1272      for (k in 1:80) {
1273        #k in 1:80 represent 80 combination of different configuration
1274        S <-
1275          Configuration.metrics$Tank_Size[k]#identify the tank size for this scenario
1276        A <-
1277          Configuration.metrics$Roof_Size[k]#identify the roof size for this scenario
1278        Consumptionloop <- vector(length = 48)
1279        Consumptionloop <-
1280          Consumption[, k]#identify the consumption metrics for this scenario
1281        rainfall5 <- rainfall4 %>%
1282          mutate(Tin = Qt.mm_6min * A) ## make a new data frame store the tank inflow
1283        RT_p <-
1284          matrix(nrow = nrow(rainfall5), ncol = 1)#predicted rainfall depth mm/d
1285        Qt.mm_p <-
1286          matrix(nrow = nrow(rainfall5), ncol = 1)#predicted roofrunoff mm/d
1287        Tin_p <-
1288          matrix(nrow = nrow(rainfall5), ncol = 1)#predicted tank inflow L/d
1289        Q_pre_release <-
```

```r
        matrix(nrow = nrow(rainfall5), ncol = 1)#initial(required) pre-releasing amount L/d
      Q_purge <-
        matrix(nrow = nrow(rainfall5), ncol = 1)#remaining required purge release volume
      purge_released <- matrix(nrow = nrow(rainfall5), ncol = 1)
      Vil <- c(0)# the initial volume of the tank
      Vt <-
        matrix(nrow = nrow(rainfall5), ncol = 1)#volume in store (L) during time interval t (current)
      Qot <-
        matrix(nrow = nrow(rainfall5), ncol = 1)#Tank Overflow at t time-step(L/6min)
      Yt <-
        matrix(nrow = nrow(rainfall5), ncol = 1)#Rainwater Yeild at t time-step (L/ 6min)
      Dt <-
        matrix(nrow = nrow(rainfall5), ncol = 1)#Household Demand at t time-step(L/6min)
      Qbt_p <-
        matrix(nrow = nrow(rainfall5), ncol = 1)#define the Baseflow delivered during the pre-releasing process
      Qbt <-
        matrix(nrow = nrow(rainfall5), ncol = 1)#define the Baseflow releasing from the baseflow orifice in t time step
      Qbt_total_t <-
        matrix(nrow = nrow(rainfall5), ncol = 1)
      #define the total Baseflow releasing in t time step, including baseflow delivered by pre-releasing and normal release
      Q_target_t <-
        matrix(nrow = nrow(rainfall5), ncol = 1)#baseflow target in hourly timestep amount L/hr
      Tin <-
        matrix(nrow = nrow(rainfall5), ncol = 1)#Tank Inflow (L/timestep)
      Q_target <- Q_target_dbs * A#convert target to L/6min
      for (i in 1:nrow(rainfall5)) {
        if (i == 1) {
          #deal with first row, initial volume of the tank is Vil
          numrow <-
            match(rainfall5$Date.day[i], rainfall_forecast1$Date)
```

```
1320        #to find the corresponding row number in the predicted rainfall dataset which has the same date of this row(in real rainfall dataset)
1321        if (rainfall_forecast1$prob[numrow] >= 0.7) {
1322            #if probability greater than the threshold, then initiate the pre-releasing algorithm)
1323            RT_p[i] = rainfall_forecast1$rain[numrow] #assigning predicted rainfall data from forecastdata setmm/day
1324            Qt.mm_p[i] = max(RT_p[i] - Dil, 0) #calculate roof runoff considering initial loss 0.2mm/event(2hr)
1325            Tin_p[i] = Qt.mm_p[i] * A#convert predicted roof runoff from mm/event to L/event to form the tank inflow
1326            Q_pre_release[i] = min(max(Tin_p[i] + Vil - S, 0), Vil)
1327            #if the predicted tank inflow plus tank volume in the previous timestep(initial volume) is greater than tank size, which means overflowing
1328            Q_purge[i] <-
1329                Q_pre_release[i]#remaining purge volume at the start is equal to initial pre-releasing volume
1330            Qbt_p[i] <-
1331                min(Q_target, Q_purge[i])# using remaining purge volume to deliver baseflow
1332            Q_purge[i] <-
1333                Q_purge[i] - Qbt_p[i]#either 0 or purge releasing volume exclude baseflow volume
1334            purge_released[i] = min(orifice(x = Vt[i - 1]) * 6, Q_purge[i])
1335            #how many water can be released by gravity through the orifice within 6 minute
1336            Q_purge[i] <-
1337                Q_purge[i] - purge_released[i]
1338            #overwrite the remaining purge volume to create the remaining purge volume at the end of this timestep(beggining of next timestep)
1339            Q_target_t[i] = Q_target - Qbt_p[i]
1340            #assigning the remaining baseflow restoring target at this timestep as there might be some baseflow already delivered
1341            Vt[i] = Vil - purge_released[i] - Qbt_p[i]
1342            if (Q_target_t[i] <= 0) {
1343                #yes means the baseflow target at this timestep has been satisfied, no need for further releasing baseflow
1344                Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
1345                Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
1346                Qot[i] = max(Tin[i] + Vt[i] - S, 0) #overflow volume
1347                Yt[i] = min(Dt[i], Vt[i])#tank yield at t timestep
1348                Vt[i] = min(Vt[i] + Tin[i] - Yt[i], S - Yt[i])#the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
1349                Qbt[i] = 0
```

```
1350              } else{
1351                  #if the baseflow target at this timestep hasn't been satisfied
1352                  Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
1353                  Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
1354                  if (Tin[i] + Vt[i] >= S) {
1355                      #if tank inflow and Vt-1previous tank volume exceed the given tank size, the over flow will occur
1356                      Qot[i] = Tin[i] + Vt[i] - S #overflow volume
1357                      Yt[i] = min(Dt[i], Vt[i]) # yield volume
1358                      Qbt[i] = 0#no baseflow releasing if overflow occur
1359                      Vt[i] = S - Yt[i] #the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
1360                  } else{
1361                      #if there is no overflow occured, which means Tin + Vt-1 smaller than tank size
1362                      Qot[i] = 0 #overflow is 0
1363                      Qbt[i] = min(Q_target_t[i], Vt[i]) #baseflow target will be satified in the first instance
1364                      Vt[i] = Vt[i] - Qbt[i]
1365                      if (Vt[i] > Q_target) {
1366                          #if the baseflow target can be satisfied in the next timestep
1367                          Yt[i] = min(Vt[i] - Q_target , Dt[i]) #yield occur and make sure baseflow in next timestep can be satisfied
1368                      } else{
1369                          # if target baseflow can not be satified in the next time step
1370                          Yt[i] = 0 #yield is 0 to preserve the baseflow delivering
1371                      }
1372                      Vt[i] = Vt[i] + Tin[i] - Yt[i]
1373                      #the remaning volume at the end of t timestep is initial tank volume + inflow exclude yield, baseflow releasing and purge if overflowing
1374                  }
1375              }
1376          } else{
1377              #if there is no need to initiate purge releasing algorithm, then normal tank model
1378              Q_pre_release[i] = 0#no pre-releasing required
1379              Q_purge[i] = 0#no remaining pre-releasing
```

```
1380                    Qbt_p[i] = 0#no baseflow delivered by purge
1381                    Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
1382                    Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
1383                    Q_target_t[i] = Q_target
1384                    if (Tin[i] + Vil >= S) {
1385                       #if tank inflow and initial volume exceed the given tank size, the over flow will occur
1386                       Qot[i] = Tin[i] + Vil - S#overflow volume
1387                       Yt[i] = min(Dt[i], Vil) #tank yield
1388                       Qbt[i] = 0 #no baseflow releasing when overflow occured
1389                       Vt[i] = S - Yt[i] #the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
1390                    } else{
1391                       #if there is no overflow occured, which means Tin + Vt-1(in this case is initial volume) smaller than tank size
1392                       Qot[i] = 0 #overflow is 0
1393                       Qbt[i] = min(Q_target_t[i], Vil) #baseflow target will be satified in the first instance
1394                       Vt[i] = Vil - Qbt[i]
1395                       if (Vt[i] > Q_target) {
1396                          #if the baseflow target can be satisfied in the next timestep
1397                          Yt[i] = min(Vt[i] - Q_target , Dt[i])#yield occur and make sure baseflow in next timestep can be satisfied
1398                       } else{
1399                          # if target baseflow can not be satified in the next time step
1400                          Yt[i] = 0 #yield is 0 to preserve the baseflow delivering
1401                       }
1402                       Vt[i] = Vt[i] + Tin[i] - Yt[i]
1403                 #the remaning volume at the end of t timestep is initial tank volume + inflow exclude yield, baseflow releasing and purge if overflow not occur
1404                    }
1405                 }
1406                 Qbt_total_t[i] = Qbt[i] + Qbt_p[i] #the total baseflow releasing is the baseflow released during purge and released in the normal operation
1407              } else{
1408                 #if it's not the first row
1409                 if (rainfall5$Day[i] != rainfall5$Day[i - 1]) {
```

```r
1410            #newday? True means it is new day
1411            numrow <-
1412               match(rainfall5$Date.day[i], rainfall_forecast1$Date)
1413             #to find the corresponding row number in the predicted rainfall dataset which has the same date of this row(in real rainfall dataset)
1414            if (rainfall_forecast1$prob[numrow] >= 0.7) {
1415               #if probability greater than the threshold, then initiate the calculation
1416               RT_p[i] = rainfall_forecast1$rain[numrow] #assigning predicted rainfall data from forecastdata setmm/day
1417               Qt.mm_p[i] = max(RT_p[i] - Dil, 0) #calculate roof runoff considering initial loss mm/day
1418               Tin_p[i] = Qt.mm_p[i] * A#convert predicted roof runoff from mm/day to L/day to form the tank inflow
1419               ##define pre-releasing volume, which means the pre-releasing won't be greater than the tank volume at the end of previous day
1420               Q_pre_release[i] = min(max(Tin_p[i] + Vt[i - 1] - S, 0), Vt[i - 1])
1421               #if the predicted tank inflow plus tank volume in the previous timestep(initial volume) is greater than tank size, which means overflowing
1422               Q_purge[i] <-
1423                  Q_pre_release[i]# remaining purge volume at the beginning of this time step
1424               Qbt_p[i] <-
1425                  min(Q_target, Q_purge[i])# using remaining purge volume to deliver baseflow
1426               Q_purge[i] <-
1427                  Q_purge[i] - Qbt_p[i]#either 0 or purge releasing volume exclude baseflow volume
1428               purge_released[i] = min(orifice(x = Vt[i - 1]) * 6, Q_purge[i])
1429               #how many water can be released by gravity through the orifice within 6 minute
1430               Q_purge[i] = Q_purge[i] - purge_released[i]#remaining required purge release at the end of this timestep
1431               Q_target_t[i] = Q_target - Qbt_p[i]
1432               #assigning the remaining baseflow restoring target at this timestep as there might be some baseflow already delivered
1433               Vt[i] = Vt[i - 1] - purge_released[i] - Qbt_p[i] #Vt[i] here is not the tank volume at the end of this timestep
1434               #It is adopted to temporarily store the tank volume after purge, which will be used to determine the yield and overflow.
1435               #it is calculated by using tank volume in the previous timestep exclude the release from both purge outlet and baseflow outlet
1436               if (Q_target_t[i] <= 0) {
1437                  #yes means the baseflow target at this timestep has been satisfied, no need for further releasing baseflow
1438                  Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
1439                  Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
```

```
1440                    Qot[i] = max(Tin[i] + Vt[i] - S, 0) #overflow volume
1441                    Yt[i] = min(Dt[i], Vt[i])#tank yield at t timestep
1442                    Vt[i] = min(Vt[i] + Tin[i] - Yt[i], S - Yt[i])#the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
1443                    Qbt[i] = 0
1444                } else{
1445                    #if the baseflow target at this timestep hasn't been satisfied
1446                    Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
1447                    Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
1448                    if (Tin[i] + Vt[i] >= S) {
1449                        #if tank inflow and Vt-1previous tank volume exceed the given tank size, the over flow will occur
1450                        Qot[i] = Tin[i] + Vt[i] - S #overflow volume
1451                        Yt[i] = min(Dt[i], Vt[i]) # tank yield at t timestep
1452                        Qbt[i] = 0#no baseflow releasing if overflow occur
1453                        Vt[i] = S - Yt[i] #the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
1454                    } else{
1455                        #if there is no overflow occured, which means Tin + Vt-1 smaller than tank size
1456                        Qot[i] = 0 #overflow is 0
1457                        Qbt[i] = min(Q_target_t[i], Vt[i]) #baseflow target will be satified in the first instance
1458                        Vt[i] = Vt[i] - Qbt[i]
1459                        if (Vt[i] > Q_target) {
1460                            #if Dt is smaller than Vt-1
1461                            Yt[i] = min(Vt[i] - Q_target , Dt[i])
1462                        } else{
1463                            # if target baseflow can not be satified in the next time step
1464                            Yt[i] = 0 #yield is 0
1465                        }
1466                        Vt[i] = Vt[i] + Tin[i] - Yt[i]
1467                        #the remaning volume at the end of t timestep is previous tank volume Vt-1 + inflow exclude yield if overflow not occur
1468                    }
1469                }
```

```
1470                    } else{
1471                        #if there is no need to initiate purge releasing algorithm
1472                        Q_pre_release[i] = 0#no pre-releasing required
1473                        Q_purge[i] = 0##no remaining pre-releasing
1474                        Qbt_p[i] = 0#no baseflow delivered by purge
1475                        Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
1476                        Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
1477                        Q_target_t[i] = Q_target#if no pre-releasing, the baseflow target at this timestep is still the originial target in each 6-minute timestep
1478                        if (Tin[i] + Vt[i - 1] >= S) {
1479                            #if tank inflow and Vt-1previous tank volume exceed the given tank size, the over flow will occur
1480                            Qot[i] = Tin[i] + Vt[i - 1] - S #overflow volume
1481                            Yt[i] = min(Dt[i], Vt[i - 1]) #tank yield at t timestep
1482                            Qbt[i] = 0#no baseflow releasing if overflow occur
1483                            Vt[i] = S - Yt[i] #the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
1484                        } else{
1485                            #if there is no overflow occured, which means Tin + Vt-1 smaller than tank size
1486                            Qot[i] = 0 #overflow is 0
1487                            Qbt[i] = min(Q_target_t[i], Vt[i - 1]) #baseflow target will be satified in the first instance
1488                            Vt[i] = Vt[i - 1] - Qbt[i]
1489                            if (Vt[i] > Q_target) {
1490                                #if Dt is smaller than Vt-1
1491                                Yt[i] = min(Vt[i] - Q_target , Dt[i])
1492                            } else{
1493                                # if target baseflow can not be satified in the next time step
1494                                Yt[i] = 0 #yield is 0
1495                            }
1496                            Vt[i] = Vt[i] + Tin[i] - Yt[i]
1497                            #the remaning volume at the end of t timestep is previous tank volume Vt-1 + inflow exclude yield if overflow not occur
1498                        }
1499                    }
```

```
1500          } else{
1501            #if it's not the newday which means this timestep is not the first timestep of a day
1502            if (Q_purge[i - 1] > 0) {
1503              #if the required pre-releasing of the day hasn't been satisfied
1504              Qbt_p[i] <-
1505                min(Q_target, Q_purge[i - 1])# using remaining purge volume to deliver baseflow
1506              Q_purge[i] <-
1507                Q_purge[i - 1] - Qbt_p[i]#the rest of remaining purge release volume will be released from the orifice
1508              purge_released[i] = min(orifice(x = Vt[i - 1]) * 6, Q_purge[i])
1509              #how many water can be released by gravity through the orifice within 6 minute, this will not exceed the remaining purge volume
1510              Q_purge[i] <-
1511                Q_purge[i] - purge_released[i]#remaining required purge release at the end of this timestep
1512              Q_target_t[i] = Q_target - Qbt_p[i]
1513              #assigning the remaining baseflow restoring target at this timestep as there might be some baseflow already delivered
1514              Vt[i] = Vt[i - 1] - purge_released[i] - Qbt_p[i] #Vt[i] here is not the tank volume at the end of this timestep
1515              #using Vt[i] to replace Vt[i-1] in the following part
1516              if (Q_target_t[i] <= 0) {
1517                #yes means the baseflow target at this timestep has been satisfied, no need for further releasing baseflow
1518                Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
1519                Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
1520                Qot[i] = max(Tin[i] + Vt[i] - S, 0) #overflow volume
1521                Yt[i] = min(Dt[i], Vt[i])#tank yield at t timestep
1522                Vt[i] = min(Vt[i] + Tin[i] - Yt[i], S - Yt[i])#the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
1523                Qbt[i] = 0
1524              } else{
1525                #if the baseflow target at this timestep hasn't been satisfied
1526                Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
1527                Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
1528                if (Tin[i] + Vt[i] >= S) {
1529                  #if tank inflow and Vt-1previous tank volume exceed the given tank size, the over flow will occur
```

```
1530             Qot[i] = Tin[i] + Vt[i] - S #overflow volume
1531             Yt[i] = min(Dt[i], Vt[i]) # tank yield at t timestep
1532             Qbt[i] = 0#no baseflow releasing if overflow occur, but there might still be some baseflow released from the pre-releasing process
1533             Vt[i] = S - Yt[i] #the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
1534           } else{
1535             #if there is no overflow occured, which means Tin + Vt-1 smaller than tank size
1536             Qot[i] = 0 #overflow is 0
1537             Qbt[i] = min(Q_target_t[i], Vt[i]) #baseflow target will be satified in the first instance
1538             Vt[i] = Vt[i] - Qbt[i]
1539             if (Vt[i] > Q_target) {
1540               #if Dt is smaller than Vt-1
1541               Yt[i] = min(Vt[i] - Q_target , Dt[i])
1542             } else{
1543               # if target baseflow can not be satified in the next time step
1544               Yt[i] = 0 #yield is 0
1545             }
1546             Vt[i] = Vt[i] + Tin[i] - Yt[i]
1547             #the remaning volume at the end of t timestep is previous tank volume Vt-1 + inflow exclude yield if overflow not occur
1548           }
1549         }
1550       } else{
1551         #if the required pre-releasing of the day has been satisfied
1552         Q_purge[i] = 0 #the remaining purge volume is zero
1553         Qbt_p[i] = 0
1554         Tin[i] = rainfall5$Tin[i] #assigning tank inflow from inflow module
1555         Dt[i] = Consumptionloop[rainfall5$Hour[i]]#assigning demand at t timestep from end-use module
1556         Q_target_t[i] = Q_target
1557         if (Tin[i] + Vt[i - 1] >= S) {
1558           #if tank inflow and Vt-1previous tank volume exceed the given tank size, the over flow will occur
1559           Qot[i] = Tin[i] + Vt[i - 1] - S#overflow volume
```

```
1560                    Yt[i] = min(Dt[i], Vt[i - 1]) # replace the following 5 lines
1561                    Qbt[i] = 0#no baseflow releasing if overflow occur
1562                    Vt[i] = S - Yt[i] #the remaning volume at the end of t timestep is tank size exclude yield if overflow occured
1563                  } else{
1564                    #if there is no overflow occured, which means Tin + Vt-1 smaller than tank size
1565                    Qot[i] = 0 #overflow is 0
1566                    Qbt[i] = min(Q_target_t[i], Vt[i - 1]) #baseflow target will be satified in the first instance
1567                    Vt[i] = Vt[i - 1] - Qbt[i]
1568                    if (Vt[i] > Q_target) {
1569                       #if Dt is smaller than Vt-1
1570                       Yt[i] = min(Vt[i] - Q_target , Dt[i])
1571                    } else{
1572                       # if target baseflow can not be satified in the next time step
1573                       Yt[i] = 0 #yield is 0
1574                    }
1575                    Vt[i] = Vt[i] + Tin[i] - Yt[i]
1576                    #the remaning volume at the end of t timestep is previous tank volume Vt-1 + inflow exclude yield if overflow not occur
1577                   }
1578                }
1579              }
1580           Qbt_total_t[i] = Qbt[i] + Qbt_p[i] #the total baseflow releasing is the baseflow released during purge and released in the normal operation
1581        }
1582     }
1583   baseflow_result_10years_10mm <-
1584      cbind(
1585        rainfall5,
1586        Vt,
1587        Qot,
1588        Yt,
1589        Dt,
```

```r
                    Q_target_t,
                    Qbt_p,
                    Qbt,
                    purge_released,
                    Qbt_total_t,
                    RT_p,
                    Qt.mm_p,
                    Tin_p,
                    Q_pre_release,
                    Q_purge
             )#result dataframe of this scenario
         assessment_result_baseflow[(j - 1) * 80 + k, ] <-
             assess_metrics(baseflow_result_10years,
                                 Qb_target = Q_target,
                                 A_metrics = A) #input into assessment metrics
         diag_baseflow[(j - 1) * 80 + k, ] <-
             balance_diagnostic(baseflow_result_10years)#water balance diagnostic tool
    }
```