In 2021 & 2022 Severn Trent Water received 4* ratings and it awarded executive bonuses.

WASP analysis suggests that 50 STWs made illegal sewage spills on 802 days in 2021-2022.

Should the 4* ratings be downgraded and the executive bonuses be clawed back?

Peter Hammond, Windrush Against Sewage Pollution (WASP), 09/10/2024 (version 3)

SUMMARY

Every year since 2019, the Environment Agency (EA) has awarded Severn Trent Water (SvT) the top rating of 4* in its annual Environment Performance Assessment exercise (EPA)[1]. The EPA uses multiple metrics to assess water company performance, but surprisingly discharges of untreated sewage, despite being monitored since 2019, will not be in the EPA before 2026[2].

WASP's analysis of data provided by the EA for 2021-2022 suggests the following:

Severn Trent Water

- made illegal sewage spills on 803 days at 50 STWs serving a population of 1 M (Table 1)
- provided such unreliable event duration monitoring (EDM) data for 85 STWs serving 1.43 M that WASP could not disentangle all legal and illegal sewage spills (Table 2)[5].

The EPA rating contributes to Ofwat's negotiation with water companies of customer price increases and refunds. It also influences the pay of top water company executives. For example, SvT's remuneration scheme says that 5% of bonus is based on a 4* EPA rating with nothing for 3* or less[3]. Also, 50% of the bonuses is in shares deferred for 3 years so that malus or clawback clauses allow SvT's Remuneration Committee *to reduce or recoup any past incentive payments from individual executives*[3] should adverse material arise causing *reputational damage*[4].

WASP's analysis reported here and previously[5] suggests that SvT may have repeatedly broken the law and submitted unreliable data to the Environmental Regulator in 2021 and 2022. Yet, the EA has continued to rate SvT as 4*, or "industry leading".

On Sept 26th 2024, on BBC Newsnight[6], Secretary of State, Steve Reed, was repeatedly asked

"How many times will [water companies] be allowed to illegally dump sewage into rivers before their bonus is taken away?"

Eventually, his answer was "*Well it may be zero*".

In light of evidence presented here, WASP suggests the Secretary of State at DEFRA should

- request the EA to review its EPA ratings
- instruct Severn Trent Water to claw back executive bonuses
- replace EDM devices with more reliable flow meters that also measure spill volume

[1] https://www.gov.uk/government/publications/water-and-sewerage-companies-in-england-environmental-performance-report-2023/severn-trent-water-epa-data-report-2023

[2] https://www.gov.uk/government/publications/water-and-sewerage-companies-in-england-environmental-performance-report-2022/water-and-sewerage-companies-in-england-environmental-performance-report-2022

[3] https://www.stwater.co.uk/content/dam/stw/about_us/pr24/sve04-main-plan.pdf, p 165.

[4] https://www.severntrent.com/content/dam/stw-plc/about-us/2021-remuneration-policy.pdf p 147.

[5] https://drive.google.com/file/d/1eKCR4BIhY2RVoP59UMX5tD4gnsw6X1kJ/view

[6] https://x.com/BBCNewsnight/status/1838683232143077593

CONTENTS

TABLE 1: 50 Severn Trent STWs may have illegally spilled sewage on 803 days

STW	NGR	Watercourse	Population served	Illegal spill days		
				2021	2022	TOTAL
Colwall	SO7368042960	Cradley Brook	2,235	38	34	72
Chipping Campden	SP1634739222	Cam Brook	2,269	32	30	62
Tideswell	SK1542074490	Tideswell Brook	2,041	30	18	48
Derby	SK3904034740	River Derwent	284,138	28	7	35
Blockley	SP1817936324	Blockley Brook	1,971	7	26	33
Great Washbourne	SO9835034420	Washbourne Brook	83	16	14	30
Southwell	SK7265052630	Halloughton Dumble	9,893	28	0	28
Balsall Common	SP2218177829	Trib Of River Blythe	7,292	17	9	26
Heage	SK3650350405	Downmeadow Brook	2,682	11	12	23
Matlock Lea	SK3150055994	River Derwent	21,857	23	0	23
Thorpe Satchville	SK7301010840	Trib Of Gaddesby Brook	518	16	6	22
Claymills	SK2685025510	River Trent	94,268	0	22	22
Hodsock	SK5976086420	Langold Stream	8,706	21	0	21
Alfreton	SK4121856847	Alfreton Brook	17,441	3	16	19
Kilburn	SK3734544954	Bottle Brook	10,966	19	0	19
Little Aston	SK0922501949	Footherley Brook	22,888	9	8	17
Stoke Orchard	SO9247026890	Hyde Brook	857	17	0	17
Bridgnorth Slads	SO7350891062	River Severn	14,176	4	12	16
Endon	SJ9377354135	Endon Brook	3,808	9	6	15
Stanley Downton	SO7933004970	River Frome	66,234	13	2	15
Edgmond	SJ7043319700	Pipe Strine	2,619	8	6	14
Ashover	SK3460062880	River Amber	671	1	12	13
Bilsthorpe	SK6412061530	Rainworth Water	3,637	13	0	13
Hixon	SK0016024500	Pasturefields Brook	6,447	13	0	13
Alkborough	SE8793022120	Trib Of River Humber	277	4	8	12
Overseal	SK2901014905	Trib Of River Mease	2,404	12	0	12
Bradwell	SK1799082230	Bradwell Brook	4,312	6	4	10
Pirehill	SJ9072032740	River Trent	18,326	8	2	10
Coaley	SO7562002170	The River Cam	18,071	10	0	10
Edwinstowe	SK6402066940	River Maun	14,947	0	9	9
Much Wenlock	SJ6296300596	Farley Brook	2,230	0	9	9
Frankton	SP4332069411	Trib Of River Leam	2,463	9	0	9
Leek	SJ9811053970	River Churnet	22,242	9	0	9
Shenstone	SK1203004320	Black Brook	3,648	9	0	9
Ambergate	SK3547351622	River Amber	1,929	6	2	8
Belper	SK3457346678	River Derwent	22,330	2	6	8
Rushmoor	SJ6130013540	River Tern	83,067	8	0	8
Clay Cross	SK3875062150	Press Brook	2,932	0	7	7
Alvechurch	SP0325071710	River Arrow	9,078	7	0	7
Dunchurch	SP4724069931	Trib Of River Leam	2,787	4	3	7
Hurley	SP2351096590	Kingsbury Brook	3,216	1	5	6
Brancote	SJ9543822415	River Sow	72,314	6	0	6
Nether Broughton	SK6889025287	Dalby Brook	1,326	0	5	5
Kegworth	SK4920027850	River Soar	3,774	2	3	5
Balderton	SK8121150901	Trib Of Middle Beck	10,715	4	0	4
Creswell	SK5369074319	Millwood Brook	5,644	4	0	4
Cropwell Bishop	SK6890936033	Cropwell Bishop Brook	2,135	4	0	4
Broughton Astley	SP5253294748	Broughton Astley Brook	10,870	0	3	3
Newent	SO7327326180	Ell Brook	5,573	3	0	3
Worcester	SO8462053410	River Severn	97,789	0	3	3
		TOTAL	1,012,096	494	309	803

These 50 STWs operated by Severn Trent Water appear to have made more than 800 illegal spills of untreated sewage to 43 different watercourses some of which are part of, or are, a SSSI:

Humber Estuary, Allscott Settling Ponds

Of the 803 days with potential illegal discharges of untreated sewage by Severn Trent Water:

114 (14%) involved “dry” spills (with no or negligible rainfall)

651 (81%) involved “early” spills (with treatment below permitted storm overflow rate)

38 (5%) involved spills that were both “early” and “dry”

TABLE 2: 85 SvT STWs with EDM data not reliable enough to disentangle all legal & illegal spills

STW	NGR	WATERCOURSE	Population served	Illegal spill days if data were reliable
Crowle (Worcestershire)	SO9348055680	Bow Brook	942	226
Shrewsbury	SJ5240013420	River Severn	82,287	150
Westwood Brook	SK4203059620	Westwood Brook	7,235	120
Wirksworth	SK2845052264	River Ecclesbourne	6,132	110
Bomere Heath	SJ4731018260	Leaton Brook	1,279	110
Ilkeston	SK4836039290	River Erewash	48,453	104
Penkridge	SJ9375816242	River Penk	14,156	89
Frampton	SO7361008630	R Severn (Tidal)	2,811	89
Twyning	SO9084036910	Trib of River Avon	1,383	88
Ibstock	SK3994709081	Ibstock Brook	7,660	86
Countesthorpe	SP5933096280	Trib of River Sence	6,268	86
Albrighton	SJ8012004710	Albrighton Brook	5,577	73
East Leake	SK5383326369	Trib of Kingston Brook	9,256	72
Weston-under-Wetherley	SP3717068650	River Leam	895	70
Buxton	SK06682728	River Wye	22,836	67
Huthwaite	SK4678558185	Nunn Brook	5,659	66
Stoney Stanton	SP5056795110	River Soar	12,247	63
Alton	SK0744042620	River Churnet	1,607	63
Shardlow	SK4552030680	Trent and Mersey Canal	4,608	62
Rainworth	SK5976059200	Rainworth Water	22,224	57
Lydney	SO6365000550	River Severn Estuary	19,718	57
Finningley	SK6822098520	Trib of Snow Sewer	1,830	55
Arnesby	SP6088891599	Countesthorpe Brook	1,402	54
Nether Langwith	SK5448070251	River Poulter	2,982	51
Wheaton Aston	SJ8560312647	Longnor Brook	2,280	50
Snarrows	SK4344018490	Grace Dieu Brook	38,702	48
Elford	SK1895610294	River Tame	560	47
Abbots Bromley	SK0789023990	Mires Brook	1,414	43
Cleobury Mortimer	SO6815076150	River Rea	2,858	39
Etwall	SK2660031310	Etwall Brook	2,792	37
Bulkington	SP3803986433	Wem Brook	5,880	36
Newport	SJ7355819248	Strine Brook	12,988	35
Althorpe	SE8301011030	River Trent New Idle	1,983	35
Tewkesbury	SO8812031860	The Mill Avon	19,070	34
Keyworth	SK6051430296	Trib of Fairham Brook	7,006	34
Powick	SO8394050940	Careys Brook	11,585	33
Hinckley	SP4213092830	Sketchley Brook	43,344	32
Ravenstone	SK3955313137	Trib of Blower's Brook	2,300	32
Wellesbourne	SP2710055780	River Dene	6,422	31
Farndon	SK7813051620	River Devon	2,462	31
Snarestone	SK3369009480	River Mease	1,930	31
Hartington	SK1217060300	Digmer Brook	251	31
Hathersage	SK2363080620	River Derwent	1,763	30
Netherseal	SK2830012470	River Mease	836	30
Collingham	SK8264062790	River Fleet	2,851	29
South Normanton	SK4485057680	Alfreton Brook	7,158	28
Highley	SO7400482602	Trib Of Borle Brook	3,845	28
Kilsby	SP5540471291	Rains Brook	2,153	28
Claverley	SO7951093720	Danford Brook	762	28
East Bridgford	SK6832043410	River Trent	2,057	27
Waterhouses	SK0936950247	Groundwater	1,217	27
Ludlow	SO5178673272	River Teme	12,506	26
Marehay	SK3981048200	Bottle Brook	5,831	26
Gloucester	SO8083016120	River Severn Estuary	157,365	24
Loughborough	SK5314021500	Wood Brook	65,643	23
Brockhampton	SO9462325931	Hyde Brook	14,549	23
Clowne	SK5026375421	Millwood Brook	6,660	23
Market Bosworth	SK3907404253	Carlton Brook	2,420	23
Woodsetts	SK5620083450	Owland Wood Dyke	1,734	22
Ashby Folville	SK7021012340	Gaddesby Brook	697	19
Bassetts Pole	SP1448098650	Colletts Brook	223	19
Coleshill	SP1938091390	River Tame	208,530	17

Fritchley	SK3614052550	Trib River Amber	2,243	16
Yelvertoft	SP5985975993	Yelvertoft Brook	789	15
Wootton Wawen	SP1493062350	River Alne	4,426	14
Milton	SK3319227862	River Trent	16,713	13
Church Warsop	SK5830669083	Trib Of River Meden	12,157	13
Calverton	SK6306048980	Grimesmoor Dyke	9,073	13
Barston	SP1912680058	Eastcote Brook	61,300	12
Weston Underwood	SK2889042460	Green Lane Brook	257	12
Whetstone	SP5543098350	River Sence	24,157	9
Alveley	SO7596085070	Lakehouse Dingle Brook	1,662	9
Itchen Bank	SP4068962839	River Itchen	14,773	2
Derrington	SJ8924023023	Derrington Brook	692	1
Roundhill	SO8532782749	Gallows Brook	249,737	0
Checkley	SK0319937501	River Tean	50,840	0
Polesworth	SK2695102470	River Anker	9,103	0
Swanwick	SK4016052269	Hartshay Brook	6,598	0
Crowle (Scunthorpe)	SE7657012590	Old River Drain	4,748	0
Kempsey	SO8422048180	River Severn	3,281	0
Froghall	SK0255046950	River Churnet	3,200	0
Upton On Severn	SO8505040810	River Severn	2,656	0
Cherington	SP2885036910	River Stour	1,335	0
Sedgeberrow	SP0233039040	River Isbourne	884	0
Cheswardine	SJ7190428802	Trib Of Ellerton Brook	706	0
		TOTAL	**1,433,404**	**3,356**

These 85 STWs had such unreliable EDM data for both 2021 and 2022 that WASP could not disentangle all legal and illegal spills. If it were assumed that all of the EDM data was reliable and correct then the number of illegal spills would be over 3,000.

Detailed analysis of some of these STWs was provided in an earlier WASP report[7].

[7] https://drive.google.com/file/d/1eKCR4BIhY2RVoP59UMX5tD4gnsw6X1kJ/view

DATA SOURCES AND METHODOLOGY FOR DETERMINING LEGAL AND ILLEGAL SPILLING

Rainfall

The daily rainfall data was purchased from the website https://www.visualcrossing.com/weather-data.

Sewage treatment and individual spill start and stop times recorded by EDM devices

When previously presented with EIR (Environmental Information Regulation) requests by WASP to supply sewage treatment and EDM data, Severn Trent Water ignored or, typically, refused the request citing the EA's ongoing investigation that began in late 2021. More recently, the EA provided WASP with data received from Severn Trent as part of the same EA investigation.

Severn Trent's refusal to provide data has been challenged by several NGOs through appeals to the Information Commissioner's Office and the First Tier Tribunal. As a result, Severn Trent has been forced to co-operate and provide the data requested.

Permitted vs unpermitted spills of untreated sewage

The EA's permits governing discharges of untreated sewage from STWs typically include clauses stating that such spills are permitted, and hence legal, provided they are due to rainfall (or snowmelt) and that, throughout the spill, treatment is maintained at or above a specified storm overflow rate. Otherwise, the spills are unpermitted and hence illegal.

Rainfall threshold

The European Court of Justice has previously used the phrase "exceptional circumstances" in relation to permitted sewage spills. Judging by the EA's own records of unpermitted spilling, it is unclear to WASP if the EA has previously employed a specific rainfall threshold consistently.

There appears to be an assumption now that the EA uses a threshold of 0.25 mm of rainfall both on the day before and on the day of a spill to determine if a spill is within permit. National Resources Wales, the Welsh environmental regulator, has recently introduced a requirement of 4mm in any hour of the previous 24 hours for a spill to be permitted. WASP has typically employed a conservative approach, requiring no rainfall on the day before nor on the day of a spill for it to be within permit.

Continued sewage treatment during a spill

The EA allows an 8% error for certified flow meters. Therefore, WASP uses 92% of the stated storm overflow rate for the minimum treatment threshold or capacity before spills can start and while they continue if they are to be considered within permit and hence legal. Some very recent revisions to EA permits appear to be weakening this to require only a high percentage (e.g. 95%) of treatment flow records to be above the threshold throughout the spill.

If the sewage treatment data is measured at the final effluent outfall rather than at the entry to full treatment, then WASP uses a much lower threshold, often as low as 50%. Size and "plumbing" complexity of an STW can influence estimation of an appropriate threshold.

Dry and early spilling

The terms "dry spill" or "early spill" are generally used now for illegal spills that contravene the rainfall or sewage treatment related conditions related to permitted discharges of untreated sewage. Of course, some spills can be both early and dry.

EXAMPLES OF WASP'S DETAILED ANALYSIS

STWs which may have illegally discharged untreated sewage

1 Colwall STW Population Equivalent (PE) = 2,235 Capacity flow = 17.4 litres/sec

2021 (1,756 spilling hours; EDM 82%) 38 spilling days: 4 dry only 32 early only 2 both
The overview chart for 2021 for Colwall STW is shown in **Fig.** 1.

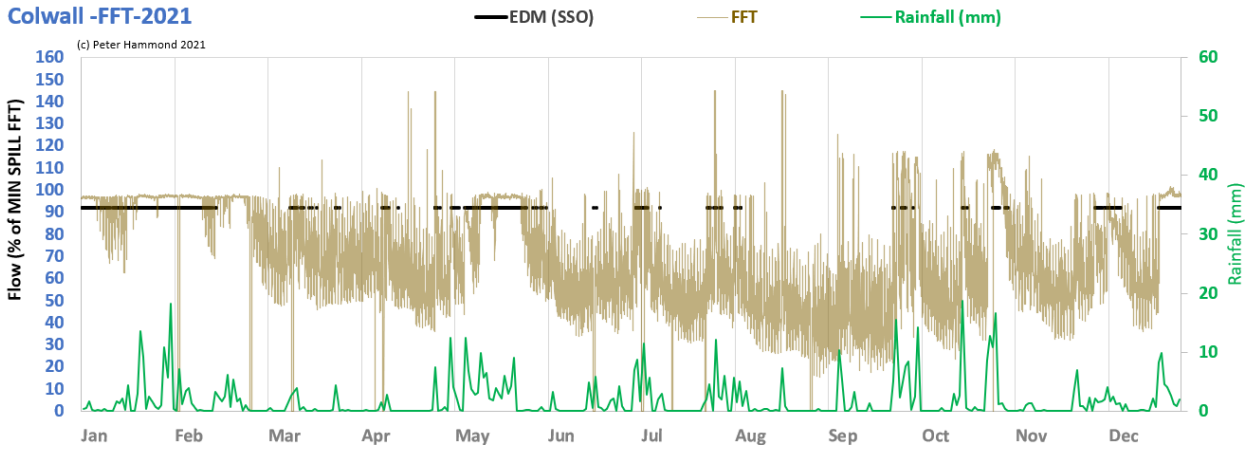


Figure 1: Colwall STW annual overview for 2021

Colwall STW generates reliable EDM data flagging many spills in Jan and Feb 2021 with crisply defined intervals and sewage flow to full treatment (FFT) well flow above 92% of the STW capacity flow specified in the permit for storm overflow operation.

WASP believes there are 3 **"dry" only spill days** (e.g., Feb 10-13; labelled **D** in **Fig.** 2**)** and **false negative spills** (e.g., Feb 19-24 without EDM detection; **Fig**. 2) immediately followed by a dramatic loss of sewage treatment for almost 24 hours on Feb 26. An estimated 144 hours may need to be added to the reported annual spilling total.

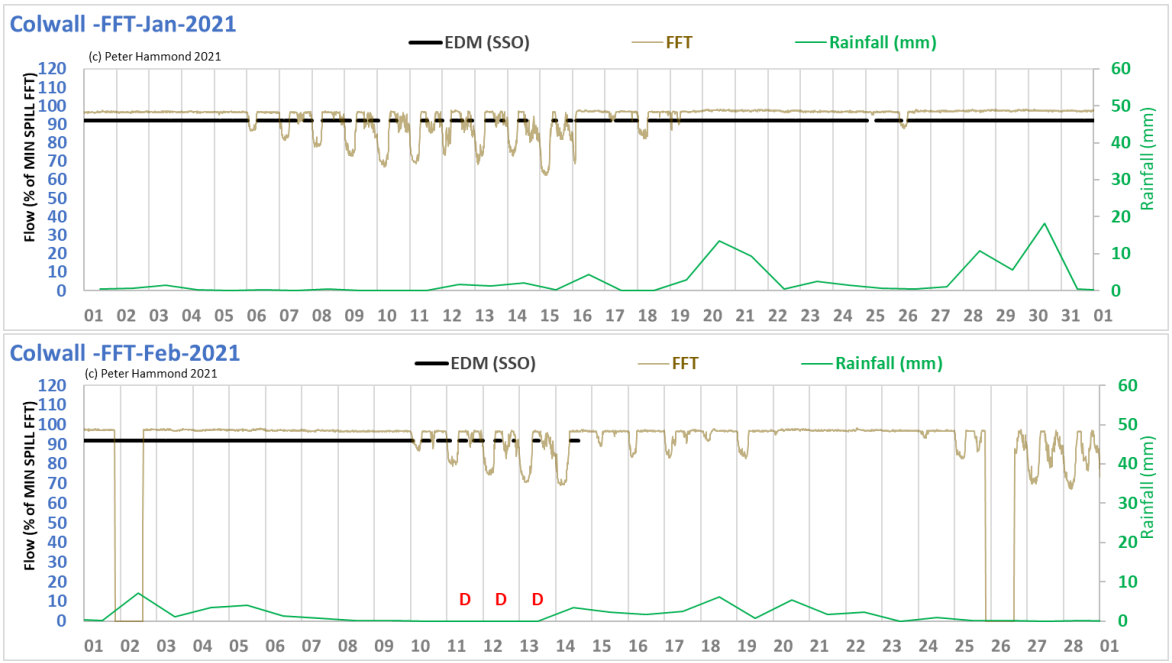


Figure 2: dry spills (Feb 11-13 2021); false negatives (Feb 19-24 2021; Dec 23-29 2022)
EDM (SSO)=EDM spill detection via the Settled Storm Overflow; FFT=sewage flow to full treatment; MIN SPILL FFT= minimum flow to full treatment rate at the start and throughout a sewage spill

WASP's analysis suggests a further 3 days with "dry" and 34 days with "early" spills (**Fig**. 3) of which 2 were both "dry" and "early".

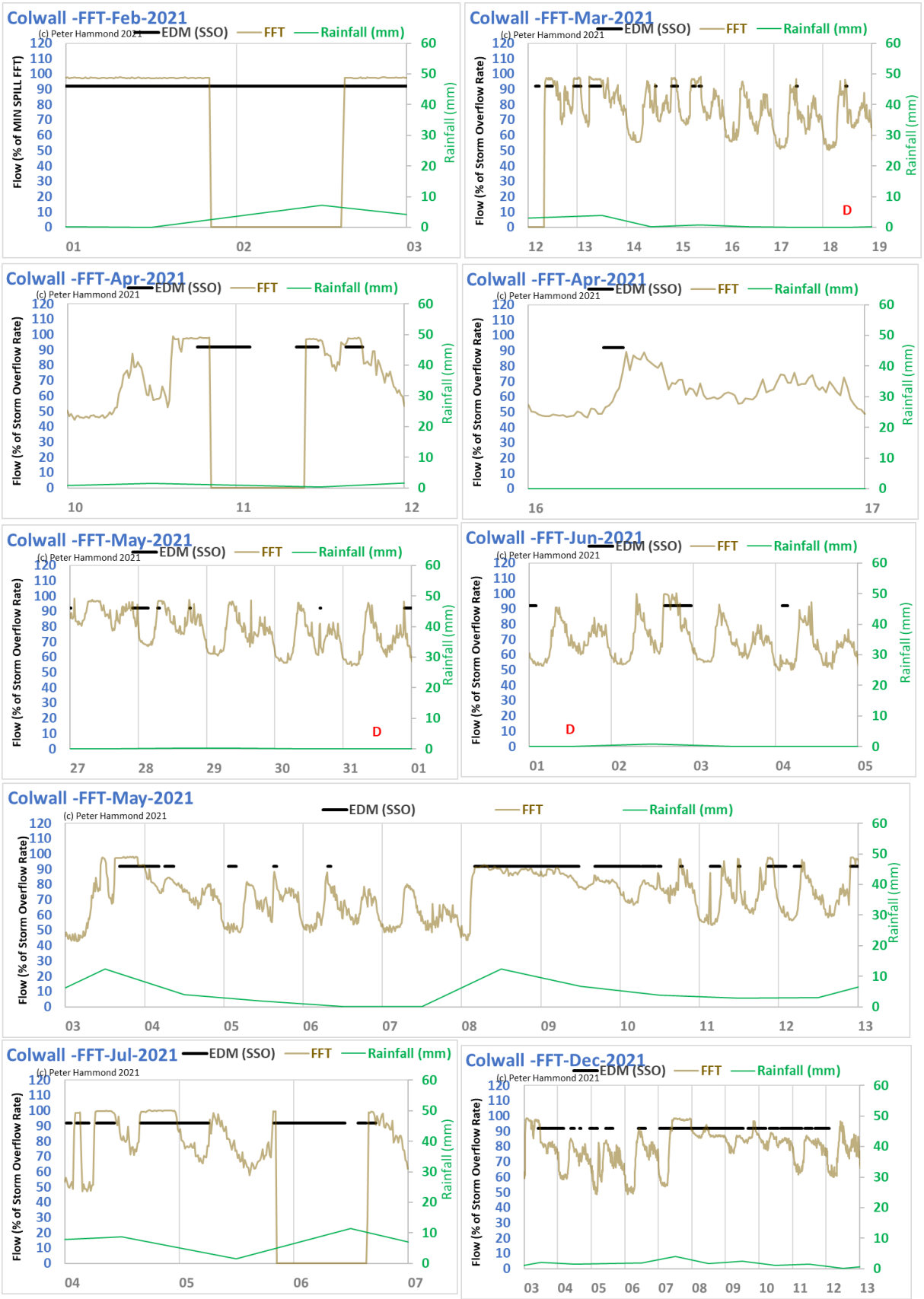


Figure 3: WASP's analysis suggests 34 days with "early" spills (Feb 1,2; Mar 12; Apr 10,11,16; May 4-6,8-12,27,28,30,31; Jun 1,2,4; Jul 4-6; Dec 3-12); 2 are both "dry" and "early"; and 1 "dry" only (Mar 18)

2022 (1,361 spilling hours; EDM 85%) 34 spilling days: 2 dry only 30 early only 2 both

The overview chart for 2021 for Colwall STW is shown in **Fig.** 4.

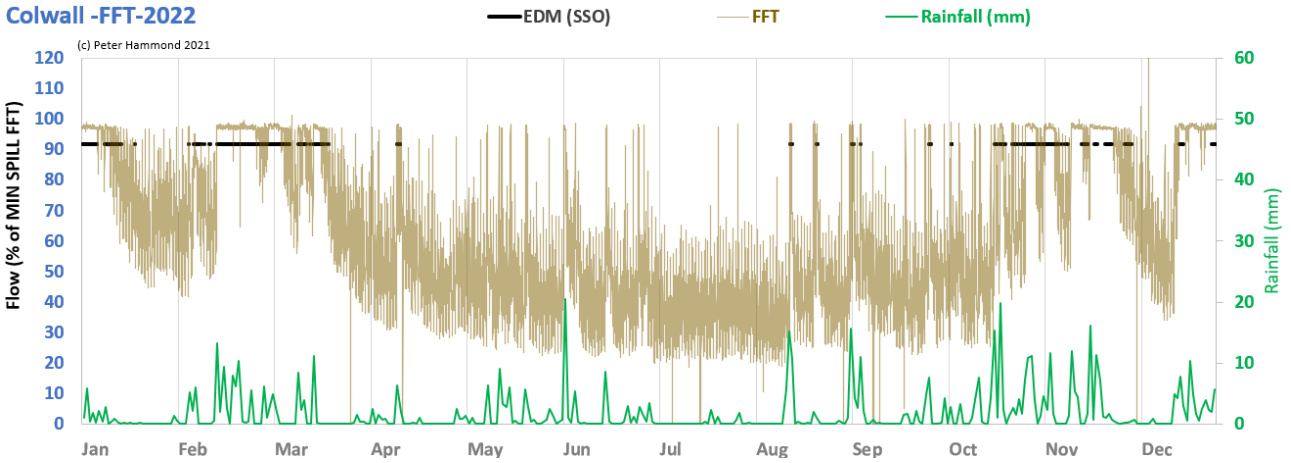


Figure 4: Colwall STW annual overview for 2022

A "comms failure/issue" in 2022 reduced EDM operation to 84.5% which may explain some of the **false negative spills** e.g., Dec 23-29. WASP's analysis suggests there were at least 32 days with illegal spilling: 2 "dry", 32 "early" and 2 both (**Figs**. 5 and 6).

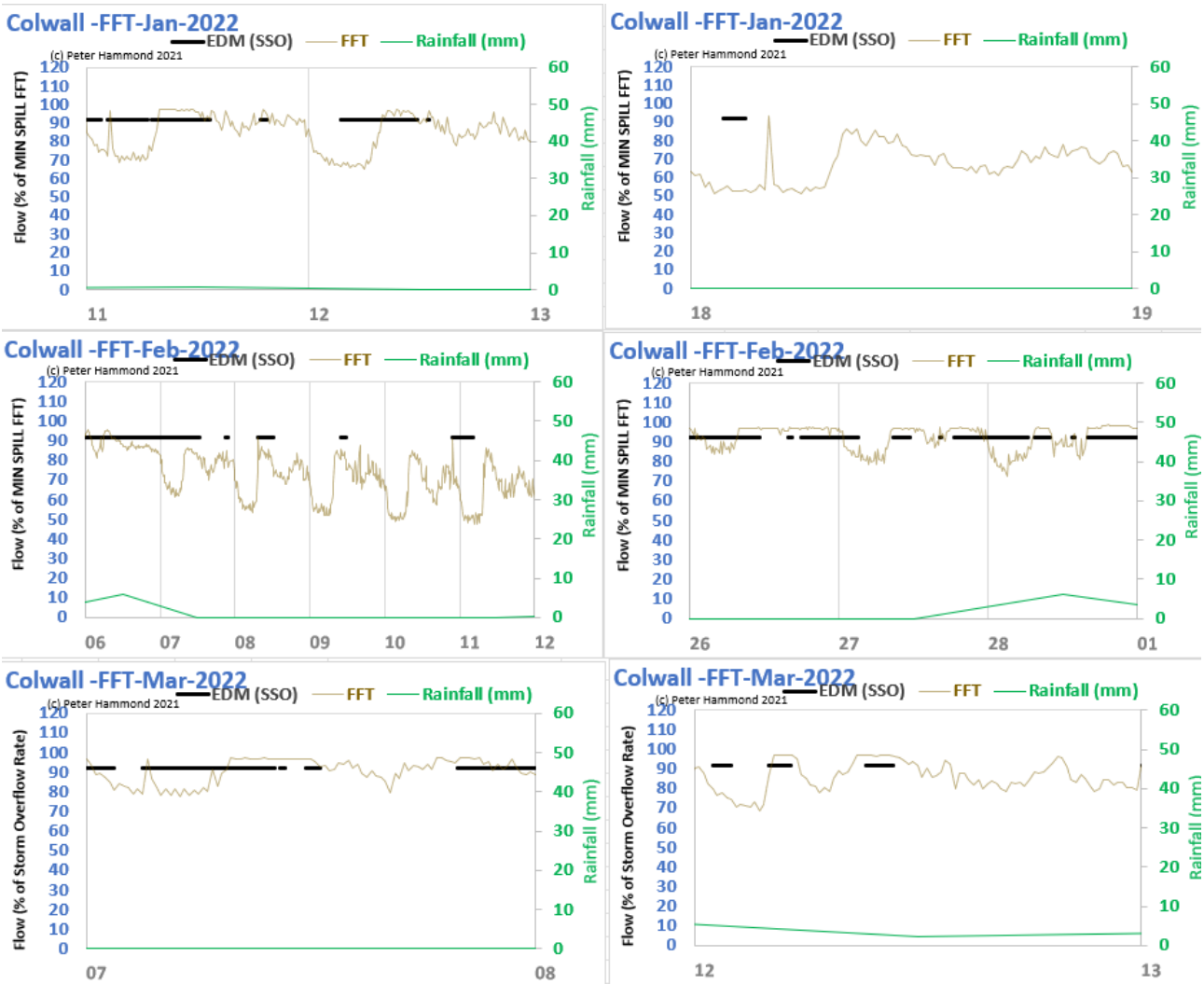


Figure 5: WASP's analysis suggests 14 "early" spilling days (Jan 11,12,18; Feb 6-11,26-28; Mar 7,12)

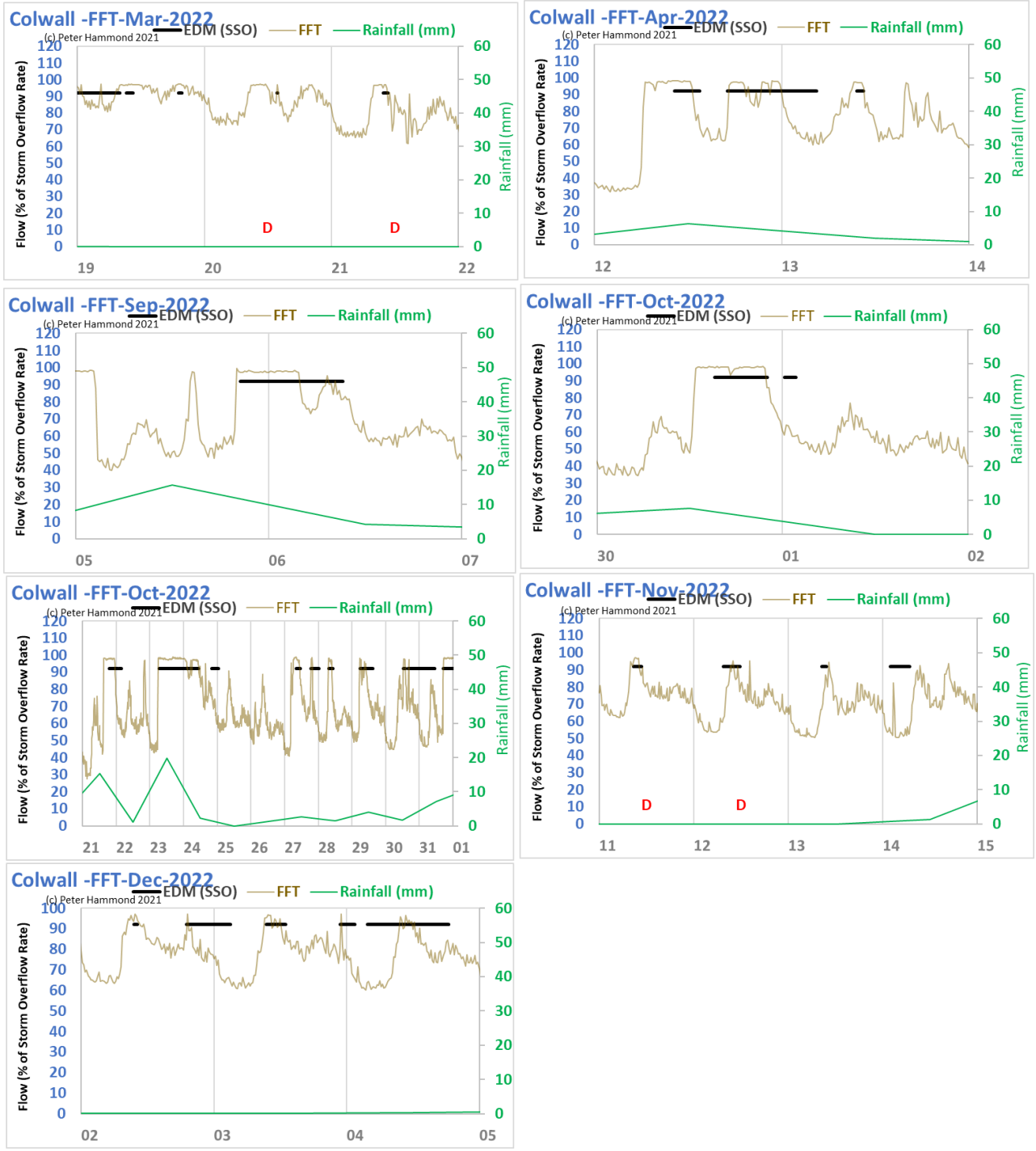


Figure 6: WASP's analysis suggests 18 "early" spilling days (Mar 19; Apr 12-13; Sep 6; Oct 1,22,24,27,29,30,31; Nov 11-14; Dec 2-4) of which 2 are both "early" and "dry" (Nov 11,12), and 2 are "dry" only (Mar 20,21)

2 Thorpe Satchville STW Population Equivalent (PE) = 518 Capacity flow = 5.4 litres/sec

2021 (300 spilling hours; EDM 99.4%) 16 spilling days: 16 early

The overview chart for 2021 for Thorpe Satchville STW is shown in **Fig.** 7.

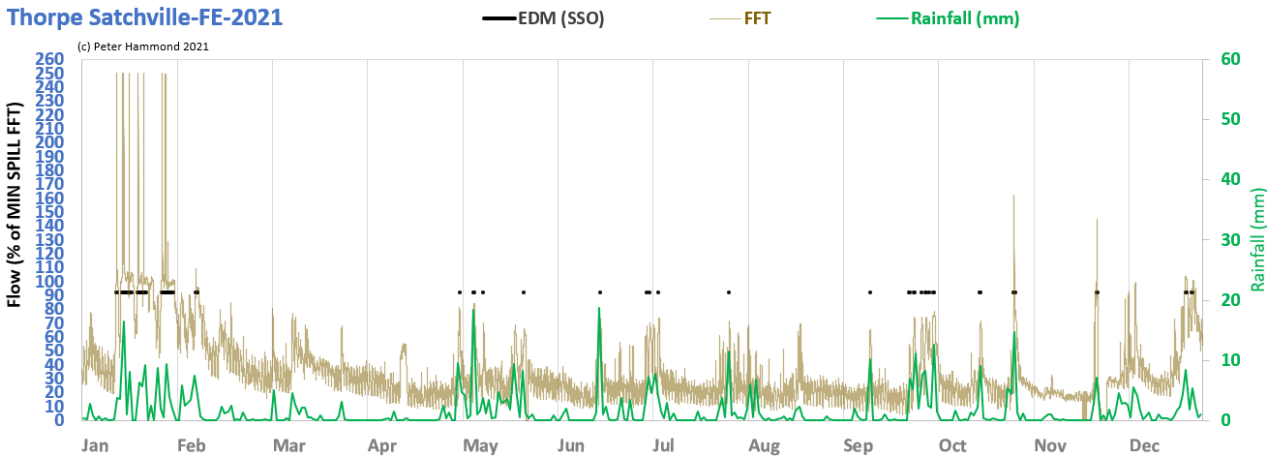


Figure 7: Thorpe Satchville STW annual overview for 2021

WASP's analysis suggests there were at least 16 days with illegal "early" spilling (**Fig**. 8)

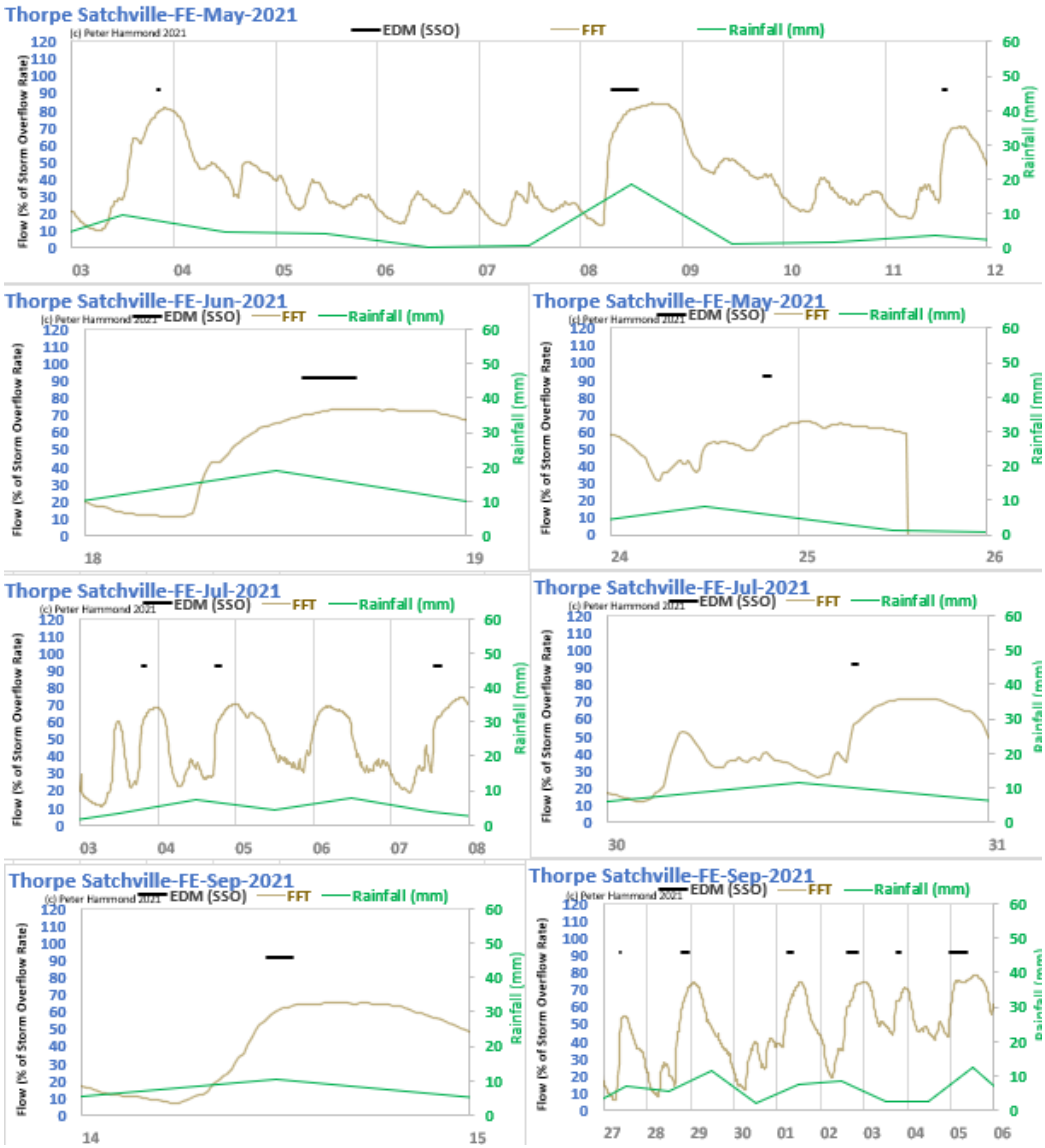


Figure 8:analysis suggests 16 "early" spilling days (May 3,8,11,24;Jun 18;Jul 3,4,7,30;Sep 14,27,28;Oct 1-3,5)

2022 (228 spilling hours; EDM 100.0%) 6 spilling days: 6 early

The overview chart for 2022 for Thorpe Satchville STW is shown in **Fig.** 9.

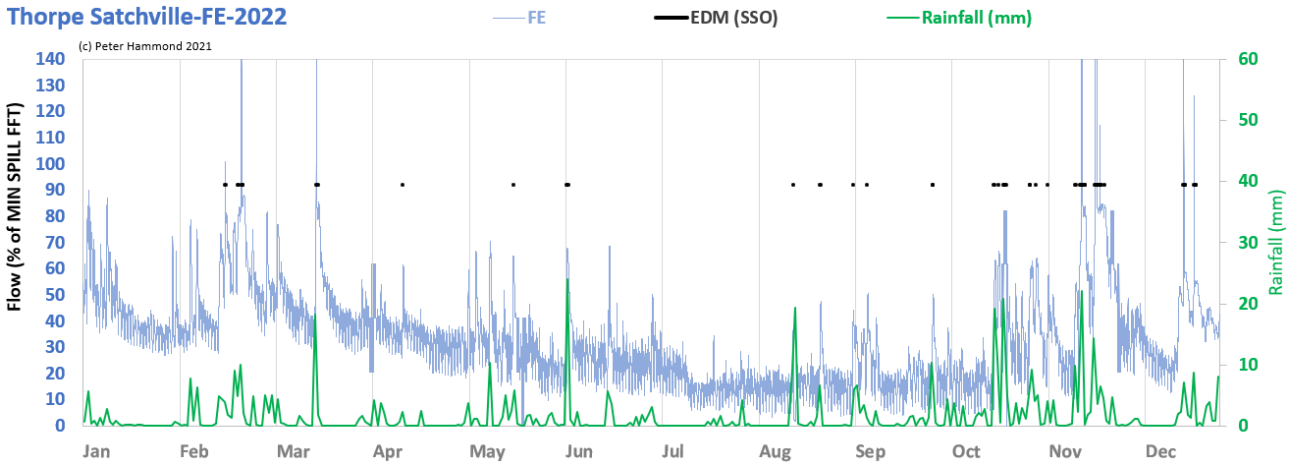


Figure 9: Thorpe Satchville STW annual overview for 2022

WASP's analysis suggests there were at least 6 days with illegal "early" spilling (**Figs**. 10)

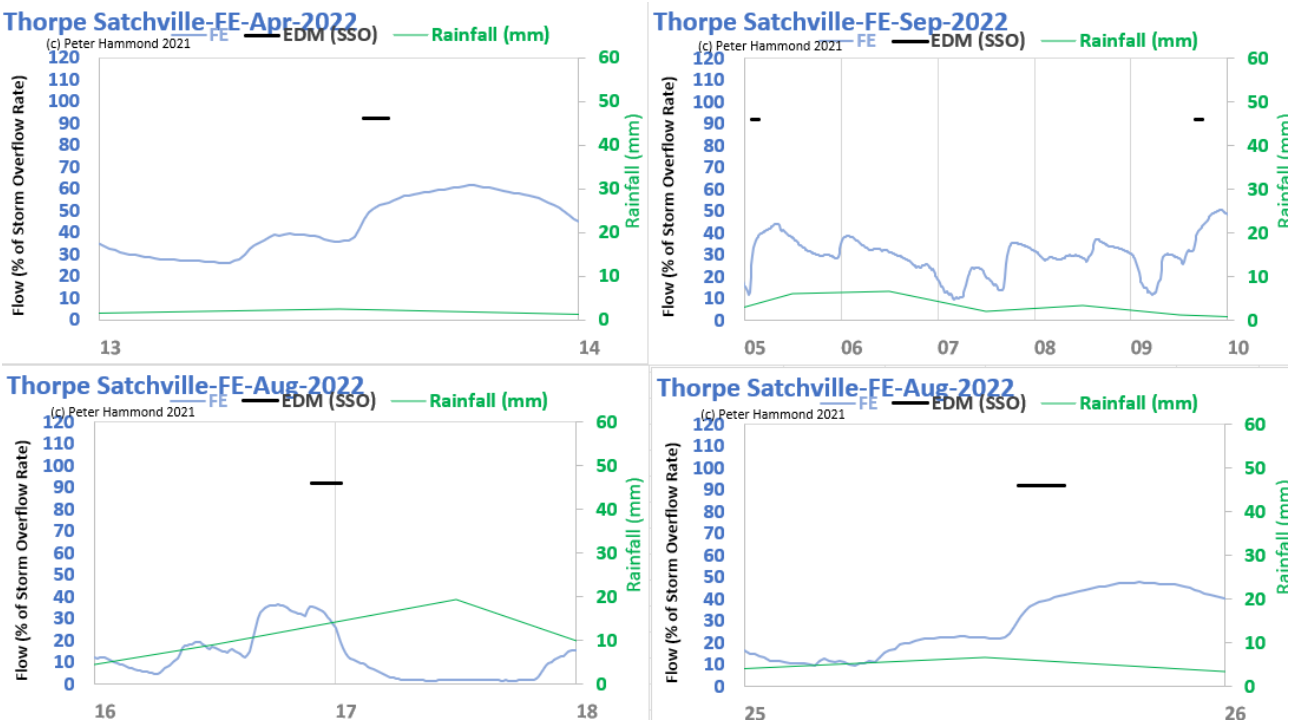


Figure 10: WASP's analysis suggests 6 "early" spilling days (Apr 13; Aug 16-17,25; Sep 5,9)

3 **Derby STW** Population Equivalent (PE) = 284,138 Capacity flow = 2,105 litres/sec

2021 (685 spilling hours; EDM 99.5%) 28 spilling days: 28 early

The overview chart for 2021 for Derby STW is shown in **Fig.** 11.

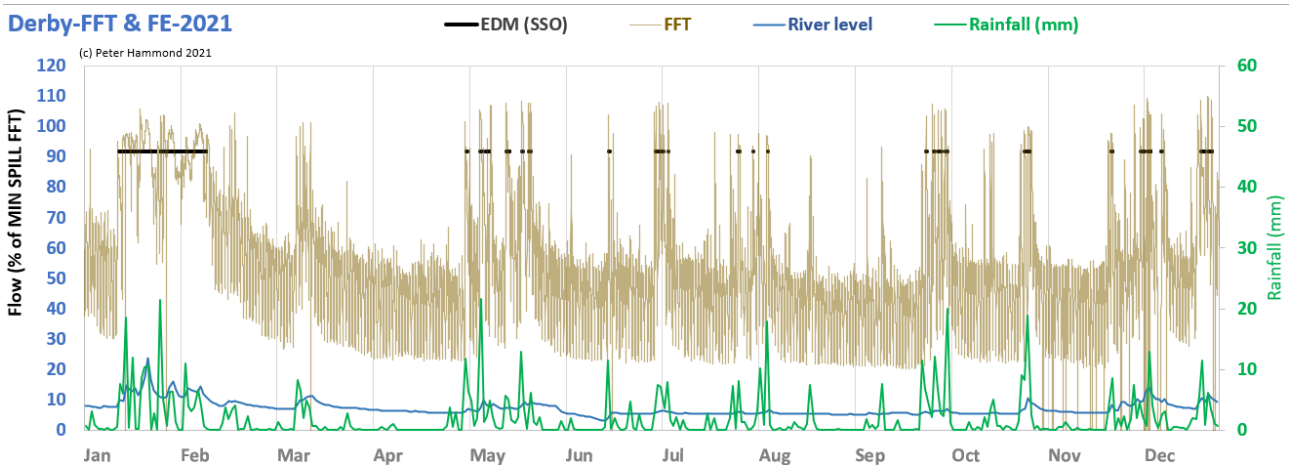


Figure 11: Derny STW annual overview for 2021

WASP's analysis suggests there were at least 28 days with illegal "early" spilling (**Figs**. 12 and 13)

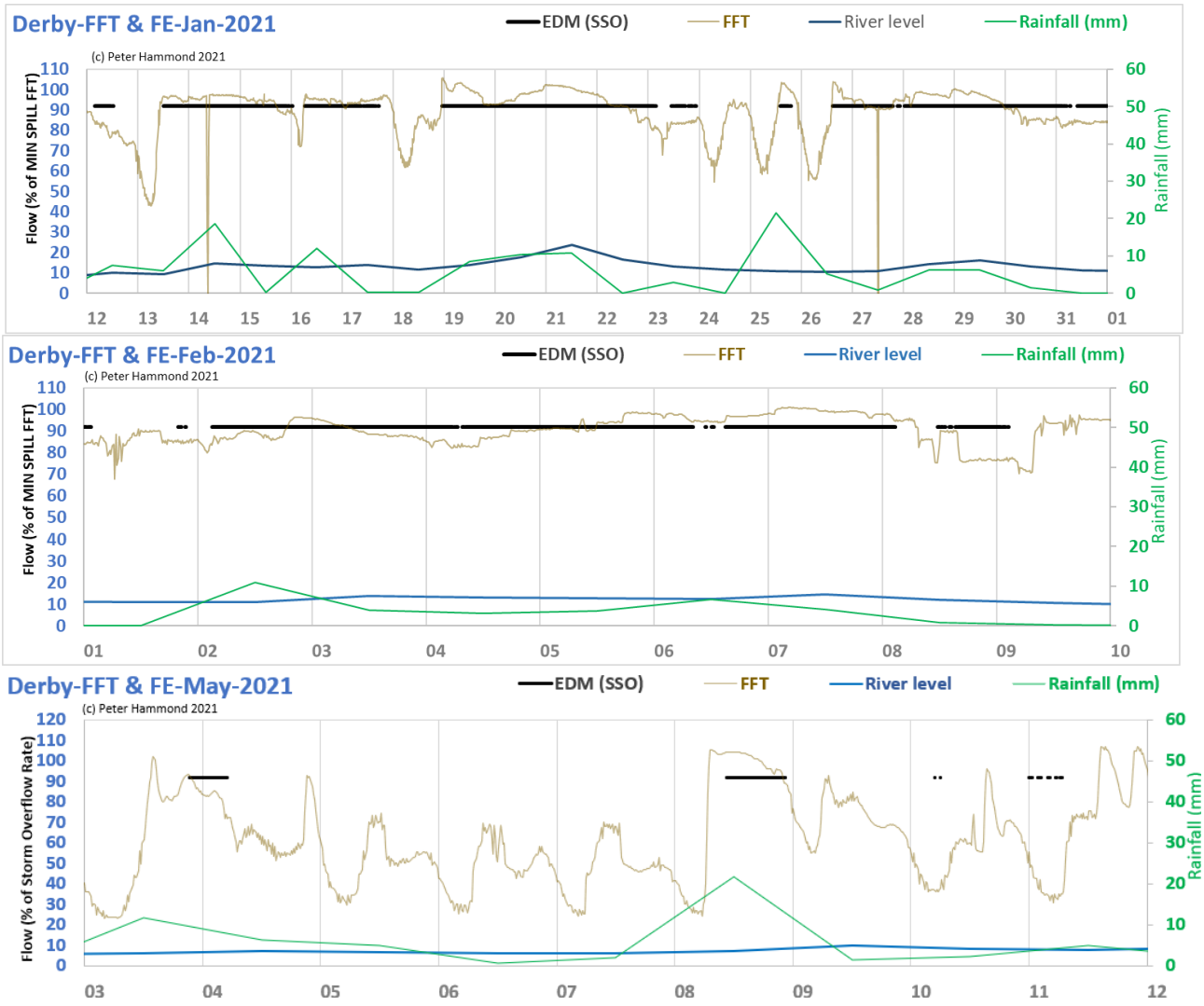


Figure 12: WASP's analysis suggests 16 "early" spilling days (Jan 12,15,22,23,30,31; Feb 1-4,8,9; May 3-4,10-11)

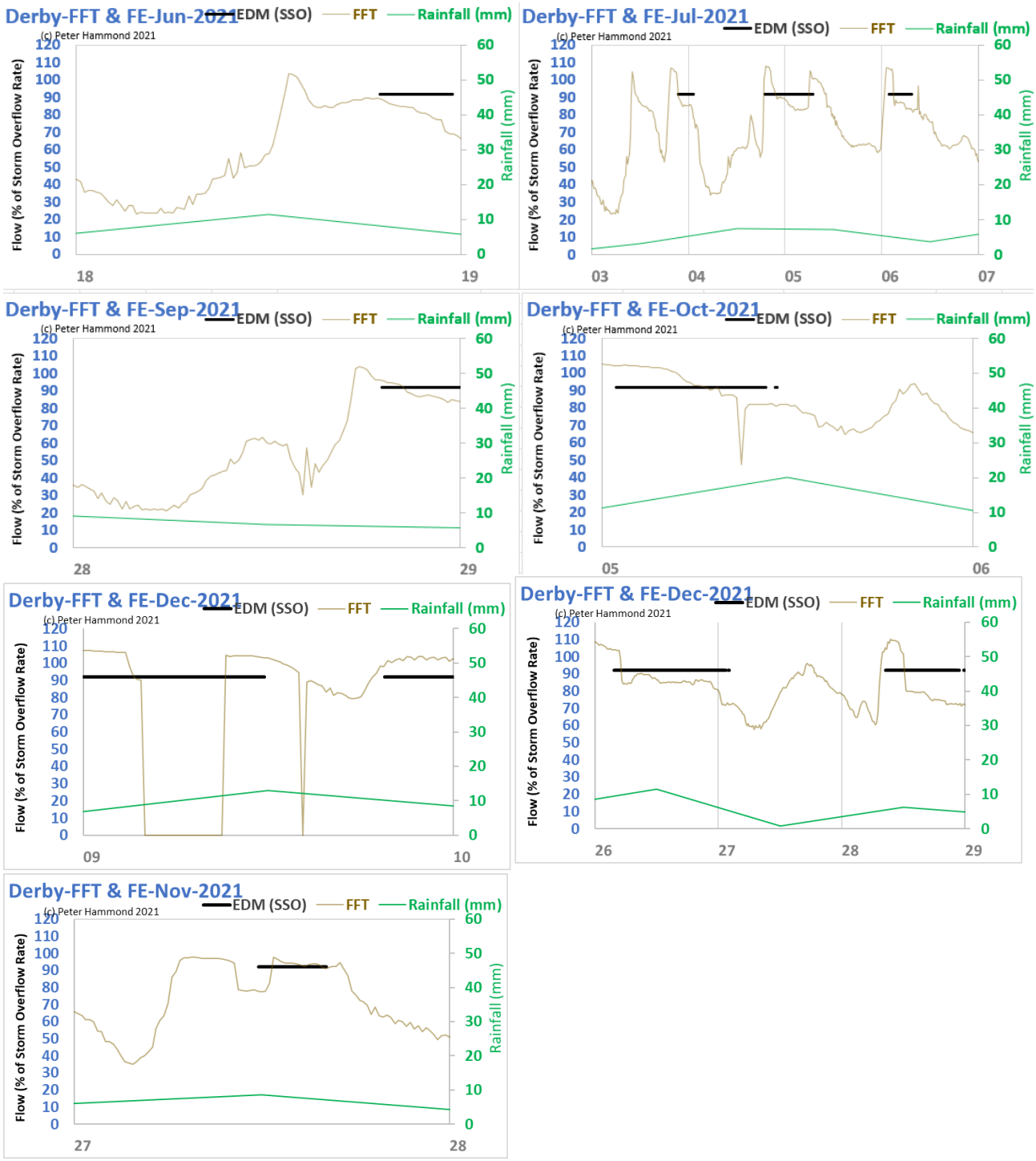


Figure 13: WASP's analysis suggests 12 "early" spilling days (Jun 18; Jul 3-6; Sep 28; Oct 5; Nov 27; Dec 9,26-28)

2022 (367 spilling hours; EDM 100.0%) 7 spilling days: 7 early

The overview chart for 2022 for Derby STW is shown in **Fig.** 14.

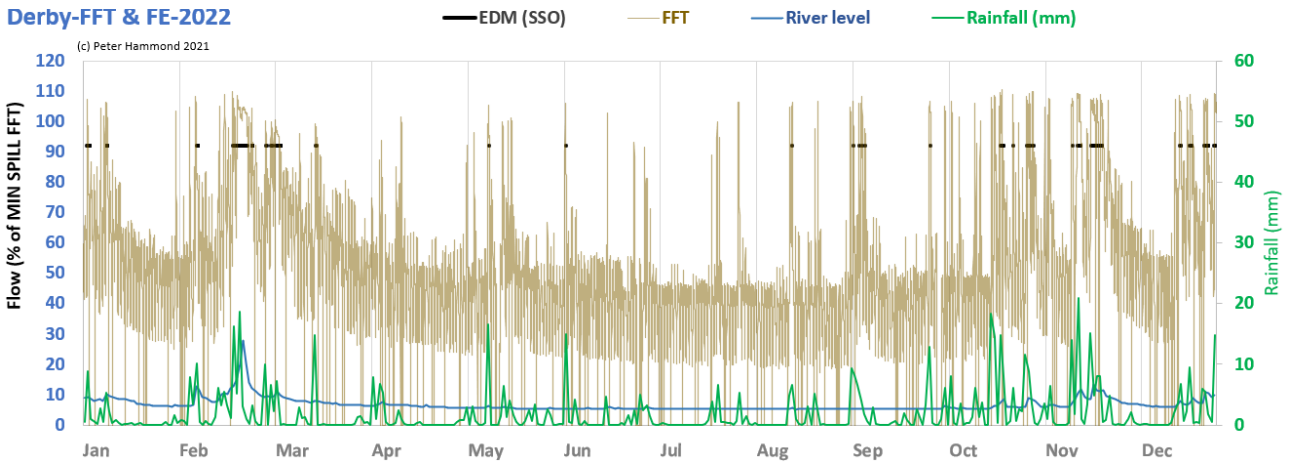


Figure 14: Derby STW annual overview for 2022

WASP's analysis suggests there were at least 7 days with illegal "early" spilling (**Fig**. 15)

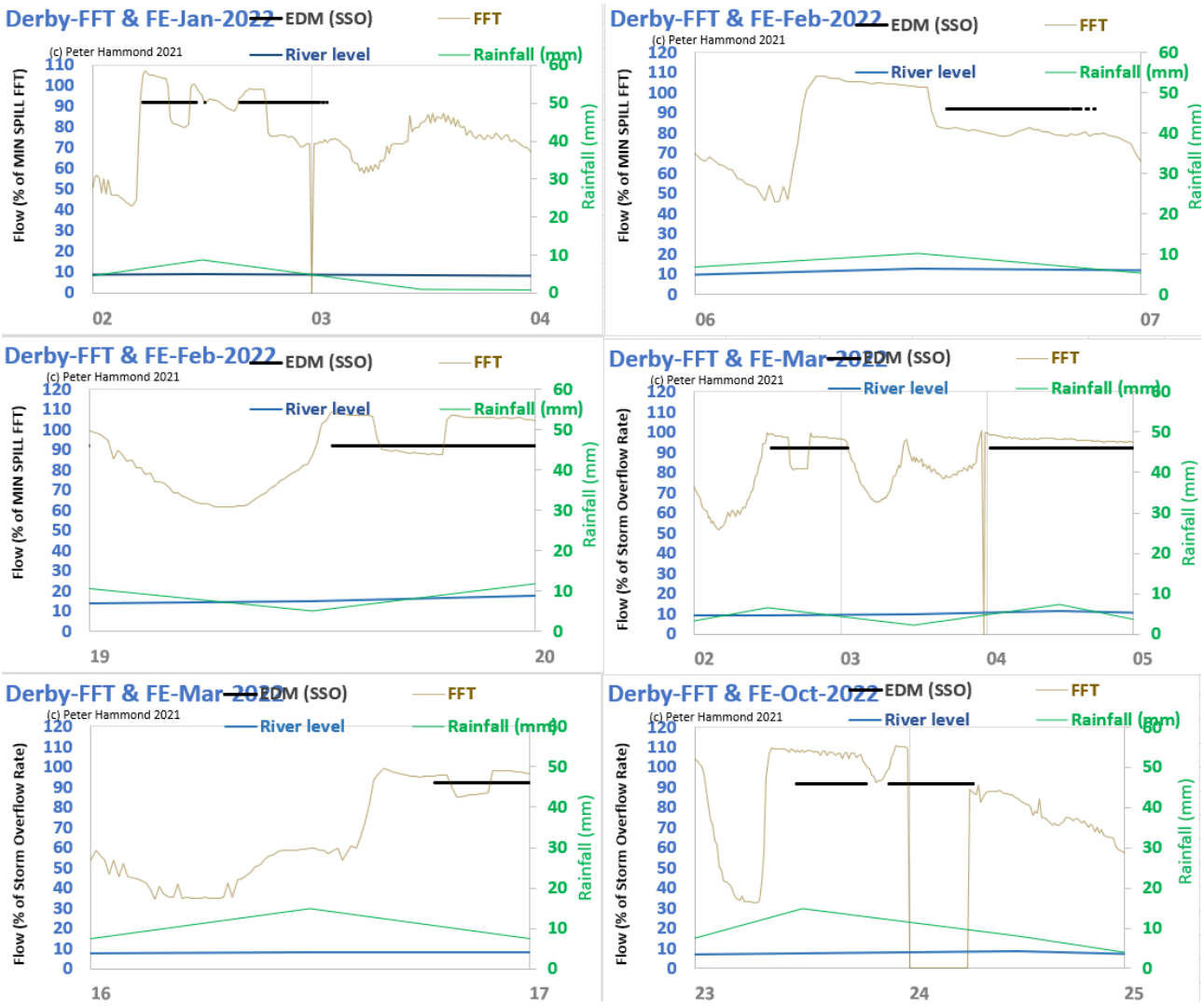


Figure 15: WASP's analysis suggests 7 "early" spilling days (Jan 2-3; Feb 6,19; Mar 2,16; Oct 24)

4 Worcester STW Population Equivalent (PE) = 122,193 Capacity flow = 667 litres/sec

2021 (1,053 spilling hours; EDM 99.6%) 0 spilling days

The overview chart for 2021 for Worcester STW is shown in **Fig.** 16.

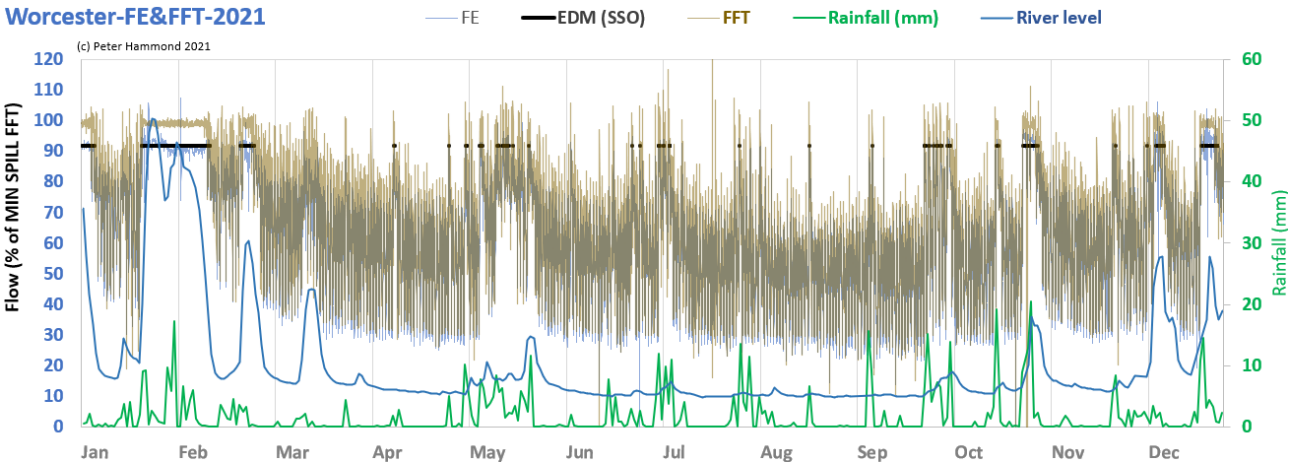


Figure 16: Worcester STW annual overview for 2021

In 2021, Worcester STW behaved well with well demarcated EDM intervals and no illegal spills. While FFT is at or above 100% of capacity during spills, FE (Final Effluent) is generally at 92%. Notice that river level is not always at full spate at the beginning of spills or for shorter spills.

2022 (751 spilling hours; EDM 93.5%) 3 spilling days: 1 dry 2 early 0 both
The overview chart for 2022 for Worcester STW is shown in **Fig.** 17.

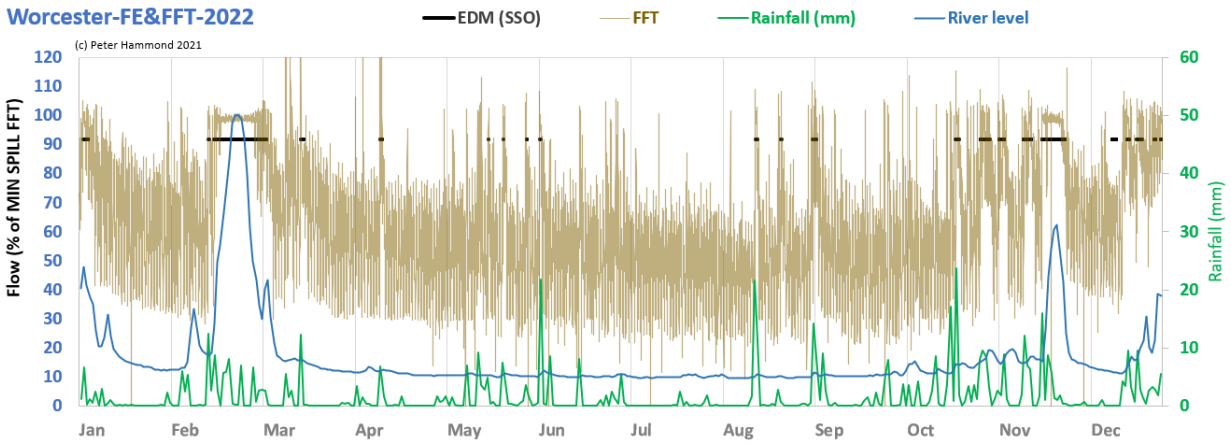


Figure 17: Worcester STW annual overview for 2022

WASP's analysis suggests there were 2 days with illegal "early" spills (**Fig** 18) and 1 "dry" spill.

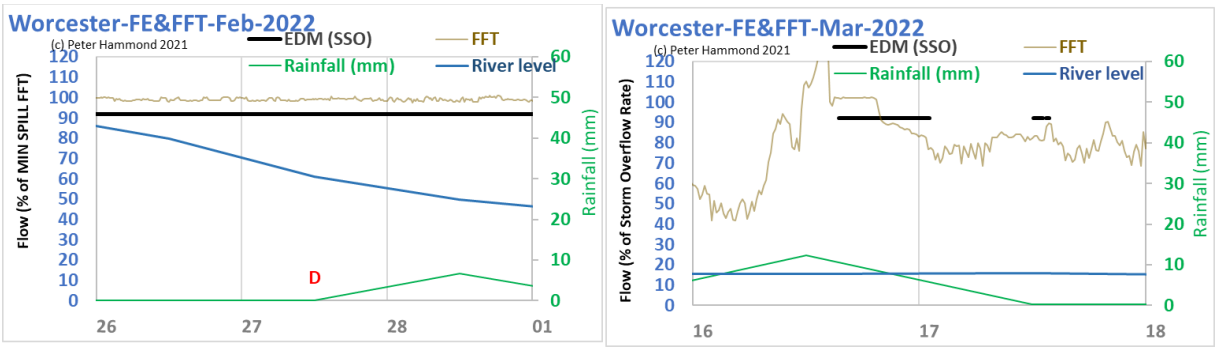


Figure 18: WASP's analysis suggests 2 "early" spills (Mar 16-17) and 1 "dry" spill (Feb 27)

5 Alkborough STW Population Equivalent (PE) = 277 Capacity flow = 5.3 l/s Inlet = 10.1 l/s

Alkborough STW discharges to a tributary of the Humber Estuary, a SSSI, at the confluence of the Rivers Trent and Ouse.

2021 (941 SSO spilling hours; 258 Inlet spilling hours; EDM 98.6%) 4 spilling days: 4 dry

The overview chart for 2021 for Alkborough STW is shown in **Fig.** 19.

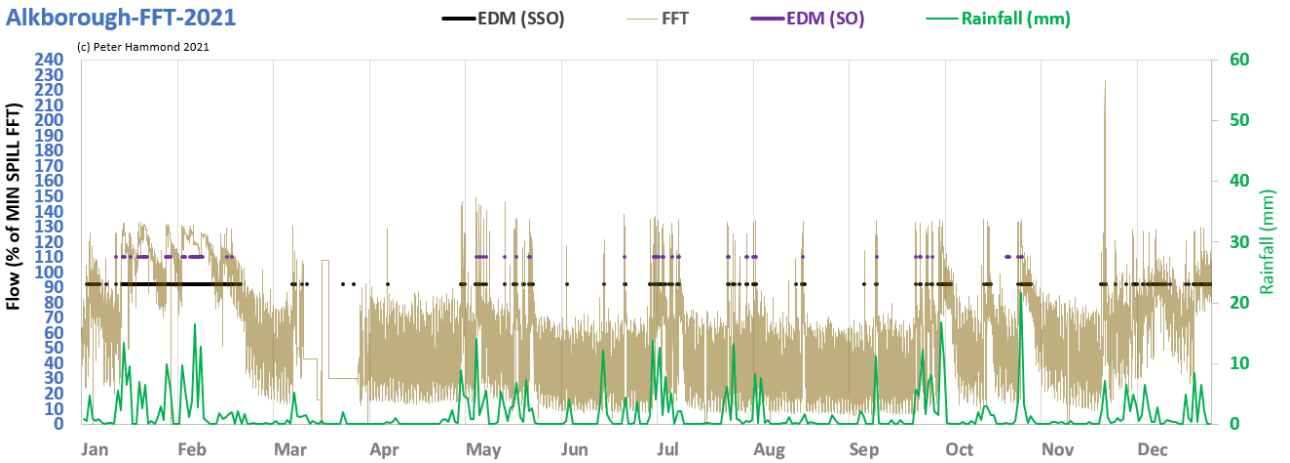


Figure 19: Alkborough STW annual overview for 2021

When both the inlet and storm tank overflows are both in operation, we know that 4.8 l/sec (10.1 – 5.3) is being passed into treatment. Subtracting treated sewage during the spill produces an estimate of the volume spilled via the storm tank overflow. In 2021, the estimated volume of storm tank overflow discharges was 2.3 million litres to the Humber Estuary SSSI over 194 hours.

WASP's analysis suggests there were 4 "dry" spills.

2022 (724 spilling hours; EDM 98.2%; 89 Inlet spilling hours ; EDM 100%) 8 spilling days: 8 dry

The overview chart for 2022 for Alkborough STW is shown in **Fig.** 20.

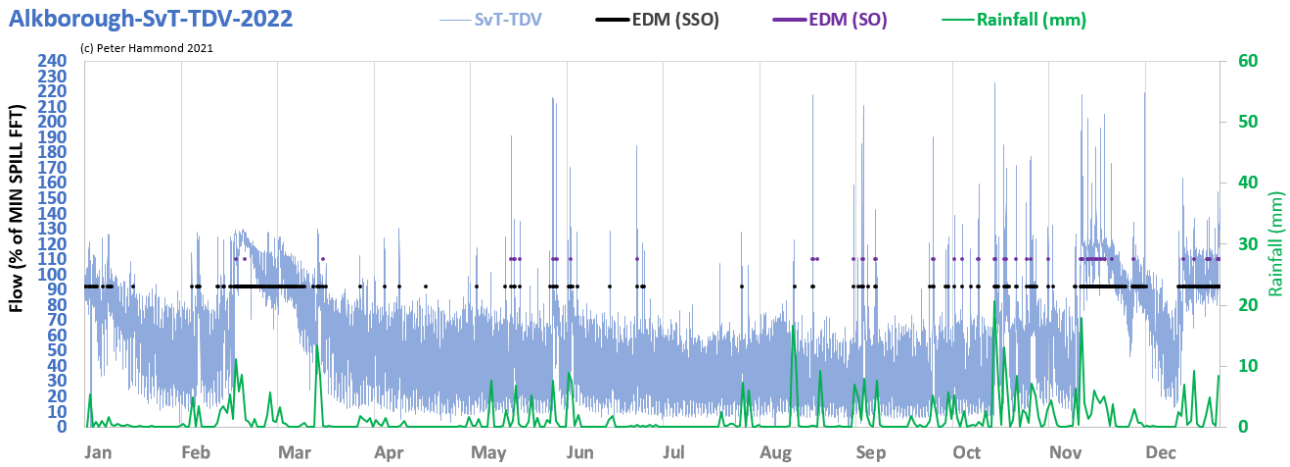


Figure 20: Alkborough STW annual overview for 2021

In 2022, the estimated volume of storm tank overflow discharges was 435,000 litres to the Humber Estuary SSSI over 88 hours.

WASP's analysis suggests there were 8 "dry" spills.

6 Tideswell STW Population Equivalent (PE) = 2,041 Capacity flow = 17.4 litres/sec

2021 (1,629 spilling hours; EDM 99.3%) 30 spilling days: 30 early

The overview chart for 2021 for Tideswell STW is shown in **Fig.** 21.

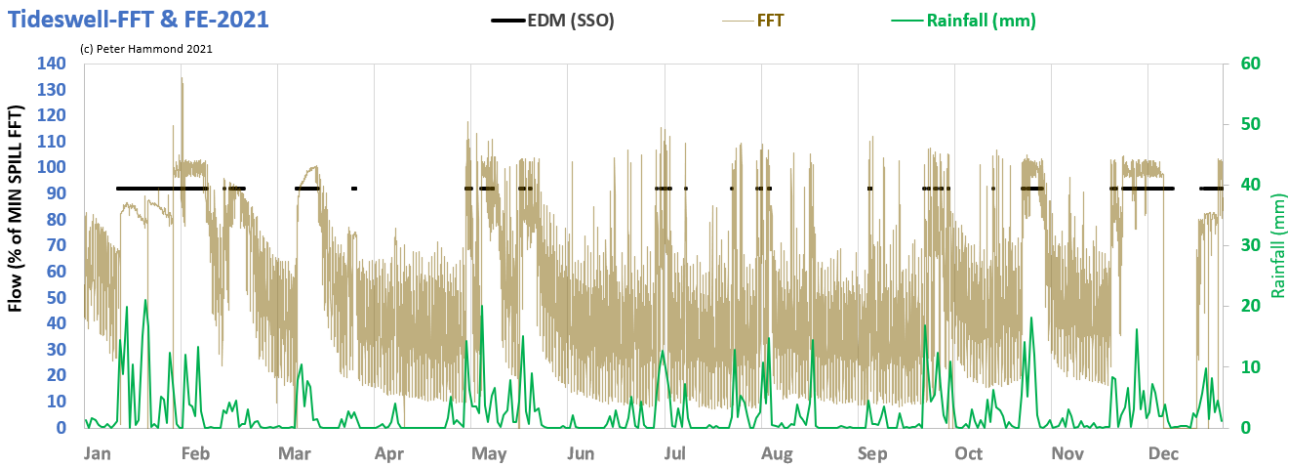


Figure 21: Tideswell STW annual overview for 2021

WASP's analysis suggests there were at least 30 days with illegal "early spills (**Figs**. 22 and 23).

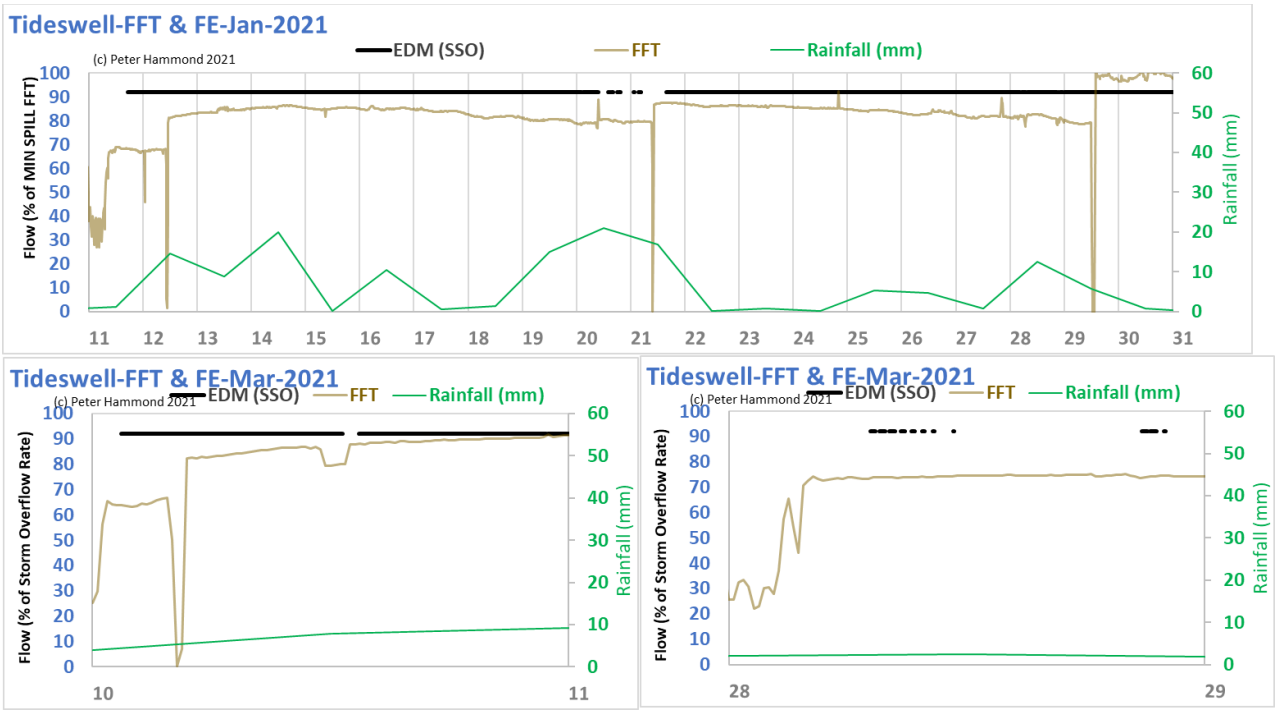


Figure 22: WASP's analysis suggests 21 "early" spilling days (Jan 11-29; Mar 10,28)

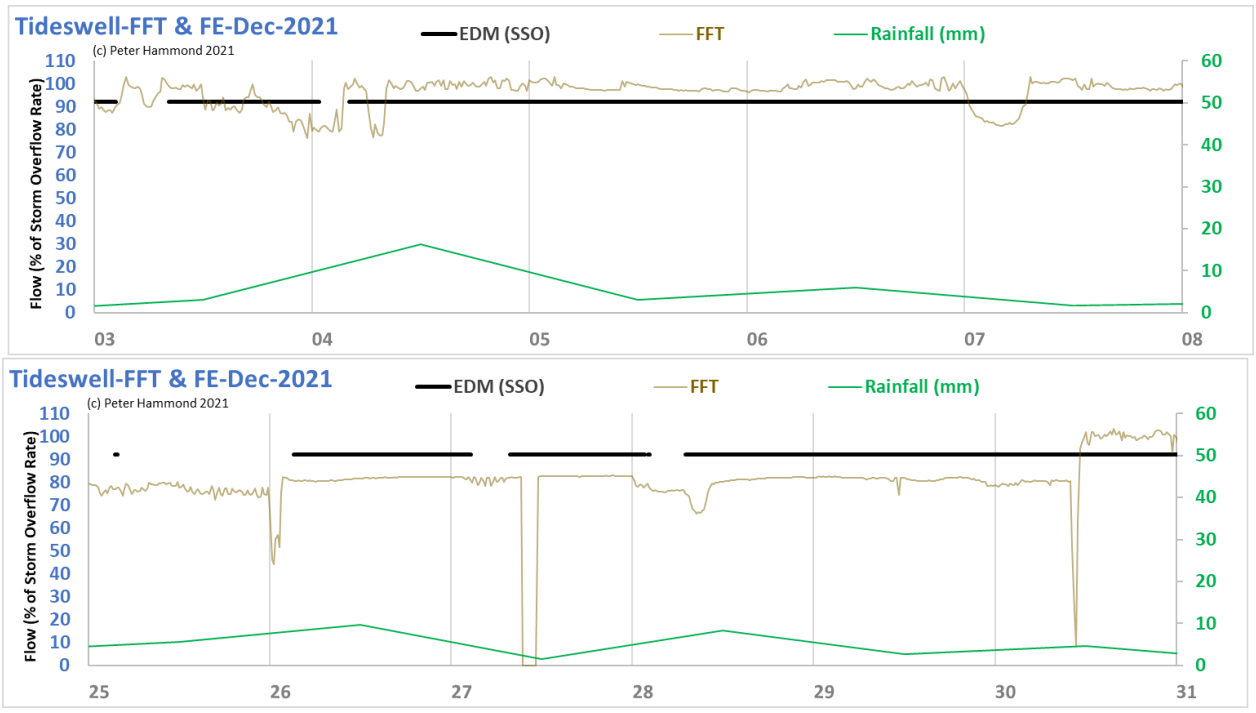


Figure 23: WASP's analysis suggests 9 "early" spilling days (Dec 3,4,7,25-30)

2022 (1166.05 spilling hours; EDM 100.0%) 18 spilling days (1 dry 17 early)

The overview chart for 2022 for Tideswell STW is shown in **Fig.** 24.

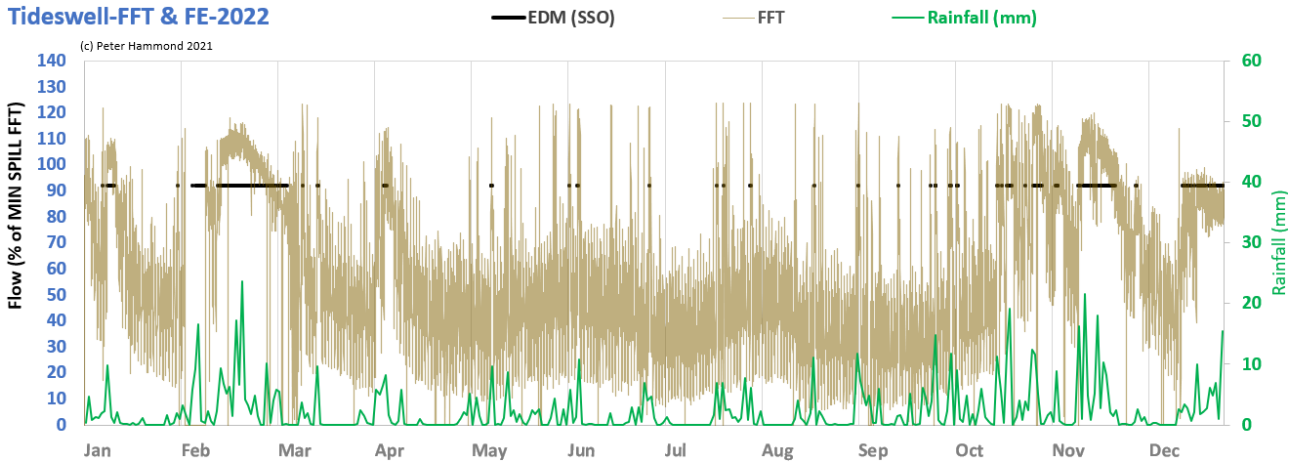


Figure 24: Tideswell STW annual overview for 2022

WASP's analysis suggests there were at least 18 days with illegal "early spills 1 "dry" and 17 "early" (**Fig**. 25).

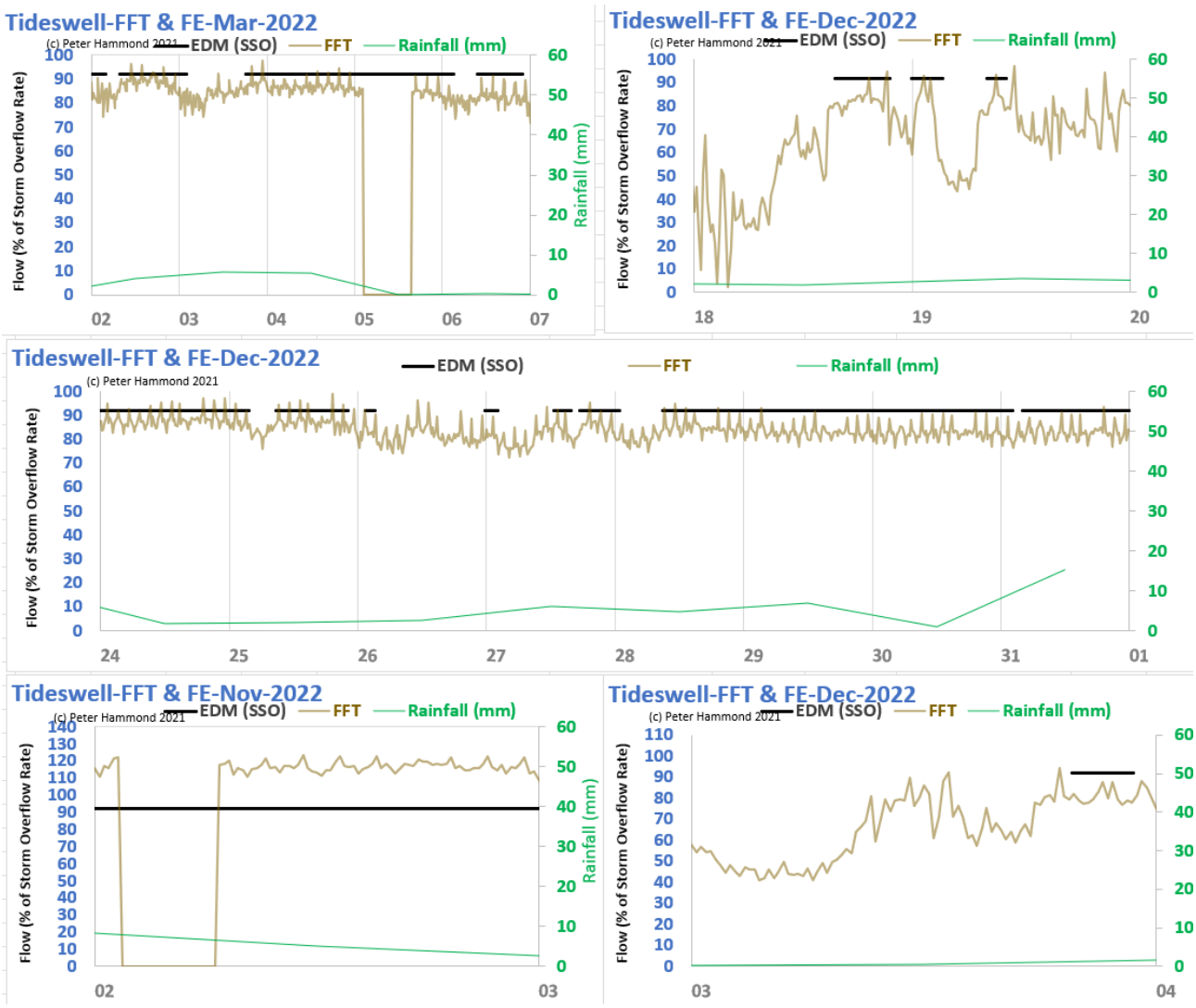


Figure 25: WASP's analysis suggests 17 "early" spilling days (Mar 2-6; Nov 2; Dec 3,18-19,24-31)

7 Bridgnorth Slads STW Population Equivalent (PE) = 14,176 Capacity flow = 102.5 litres/sec

2021 (439 spilling hours; EDM 99.6%) 4 spilling days: 3 dry 1 early

The overview chart for 2021 for Bridgenorth Slads STW is shown in **Fig.** 26.

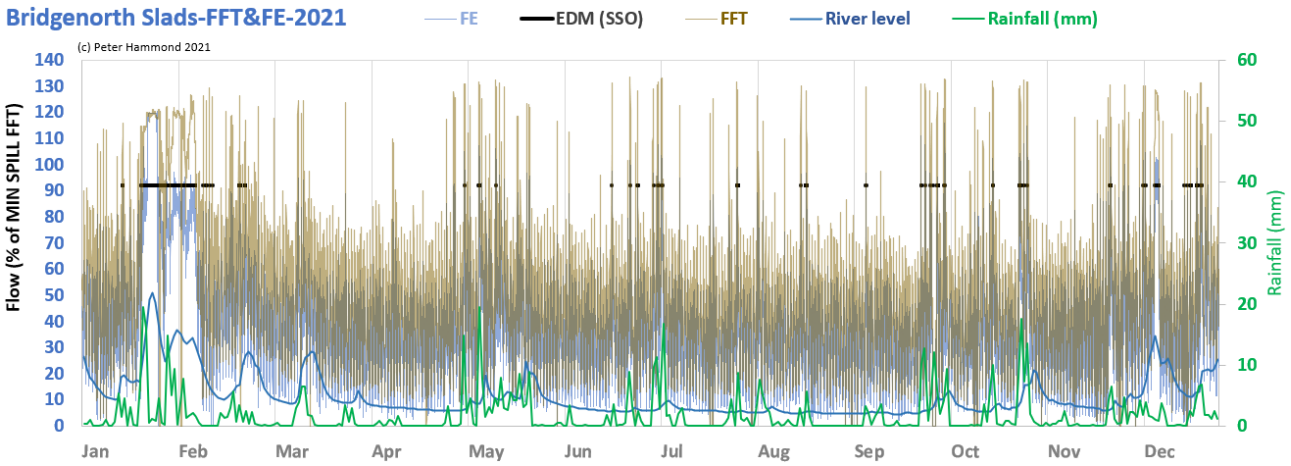


Figure 26: Bridgenorth Slads STW annual overview for 2021

WASP's analysis suggests there were at least 4 days with illegal "early spills (**Fig**. 27): 3 "dry" and 1 "early".

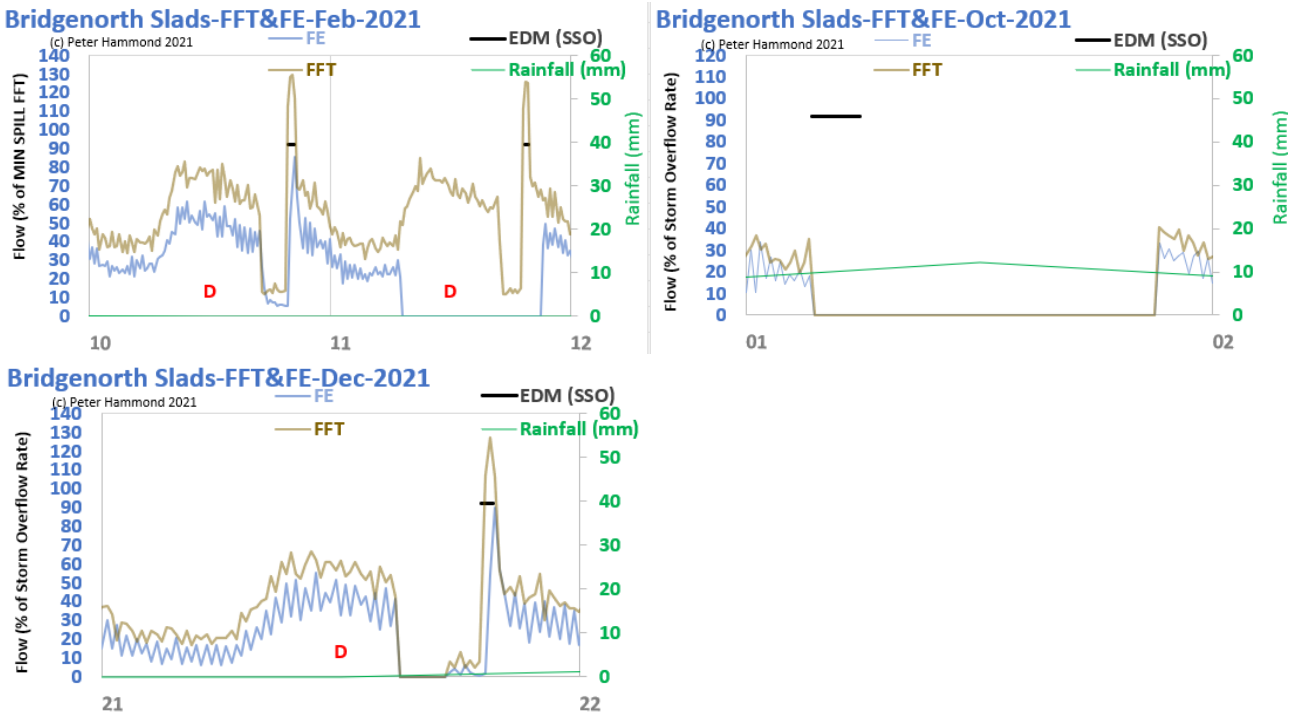


Figure 27: WASP's analysis suggests 4 illegal spilling days (Feb 10-11; Oct 1; Dec 21)

2022 (345 spilling hours; EDM 99.95%) 12 spilling days: 0 dry 11 early 1 both

There was no FFT data provided for Bridgnorth Slads. In 2021, the difference between FFT and FE was less than 35% for 98% of the time. Therefore, it seems reasonable to use a settled storm overflow minimum rate as 57% for FE rather than 92% for FFT.

The overview chart for 2022 for Bridgenorth Slads STW is shown in **Fig.** 28.

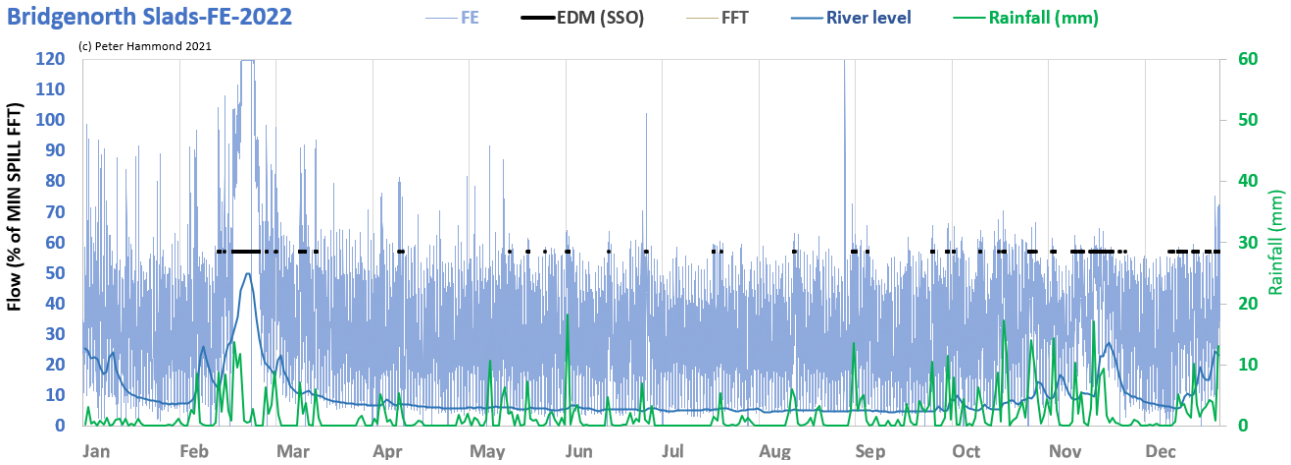


Figure 28: Bridgenorth Slads STW annual overview for 2022

WASP's analysis suggests there were at least 12 days with illegal "early spills (**Fig**. 29): 11 "early" and 1 both "dry" and "early".

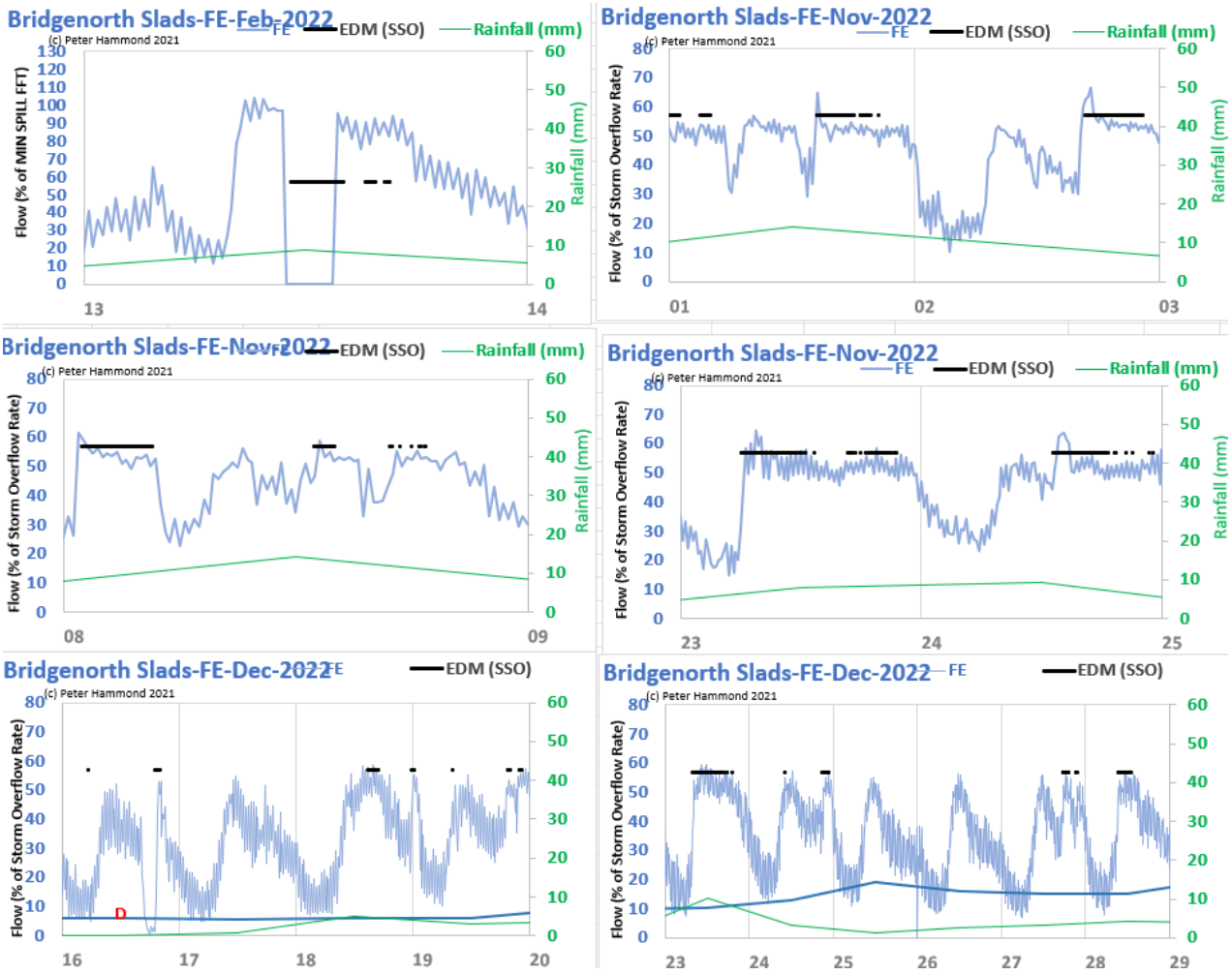


Figure 29: WASP's analysis suggests 12 illegal spilling days (Feb 13; Nov 1,2,8,23,24; Dec 16,18,19,24,27,28)

8 Chipping Camden STW Population Equivalent (PE) = 2,269 Capacity flow = 31.6 litres/sec

2021 (485 spilling hours; EDM 99.6%) 32 spilling days: 32 early

The overview chart for 2021 for Chipping Camden STW is shown in **Fig.** 30.

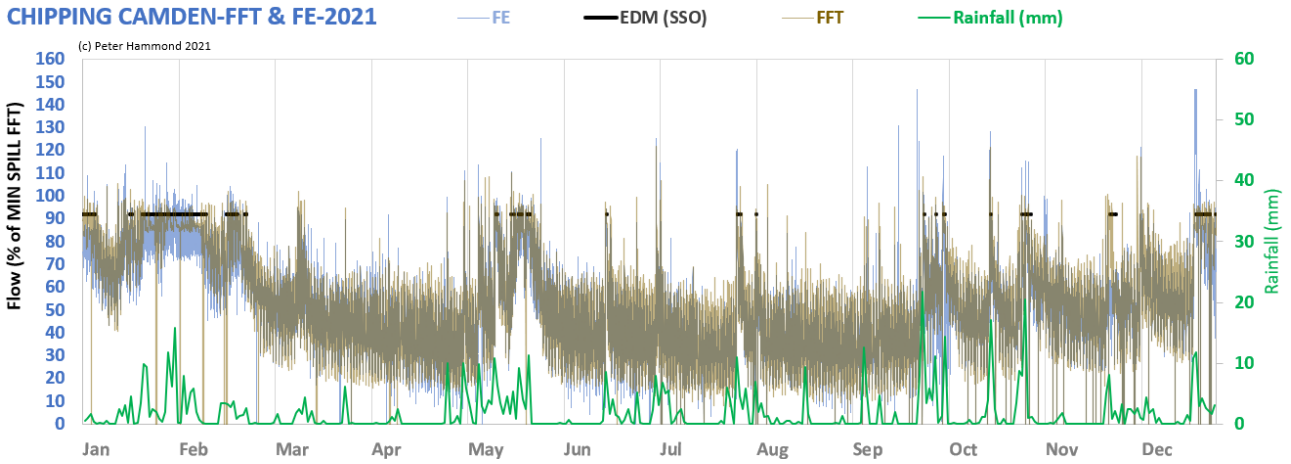


Figure 30: Chipping Camden STW annual overview for 2021

WASP's analysis suggests there were at least 32 days with illegal "early" spills (**Fig**. 31 & 32).

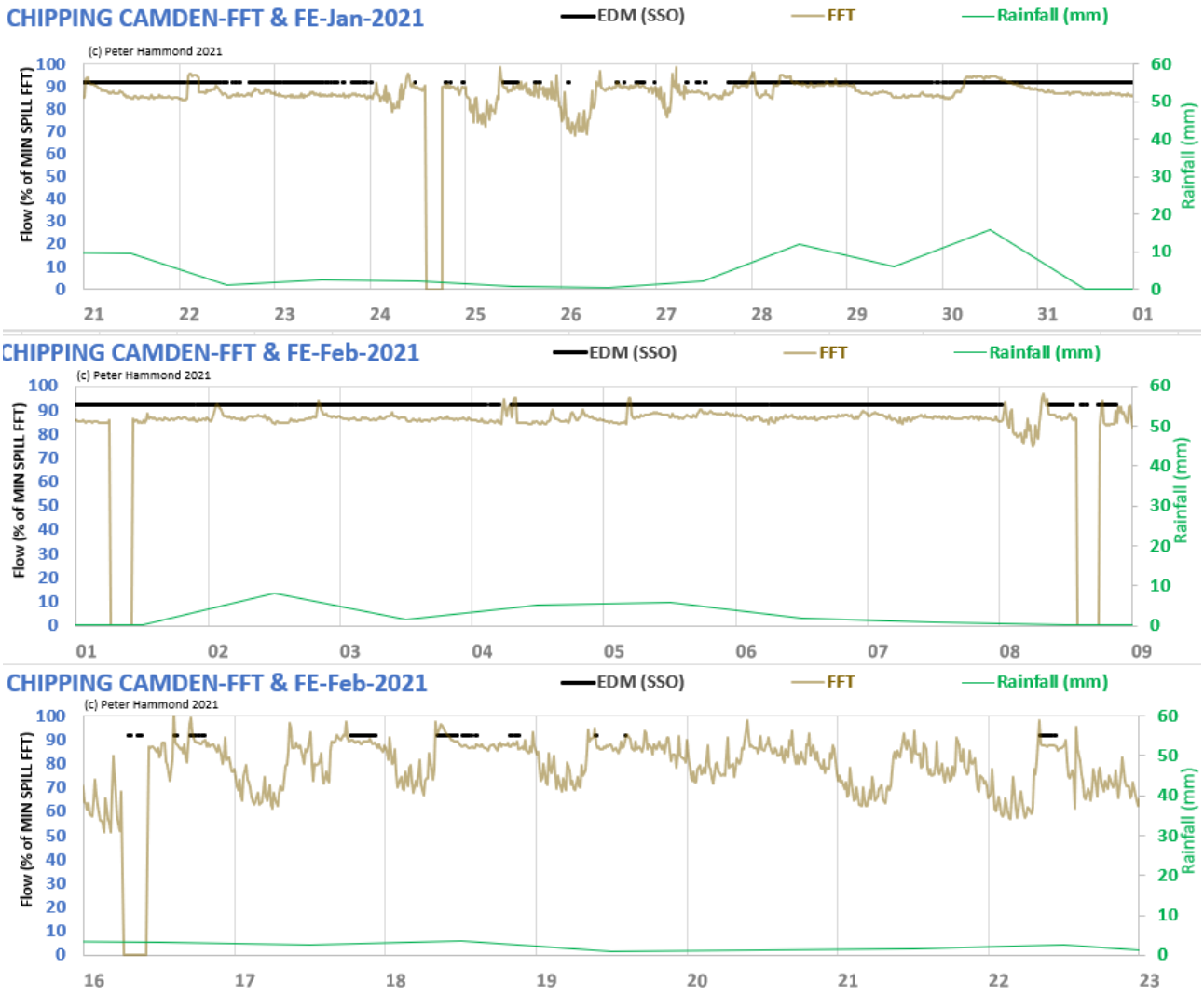


Figure 31: WASP's analysis suggests 20 "early" spilling days (Jan 21-23, 25-31; Feb 1-8,16-18, 22)

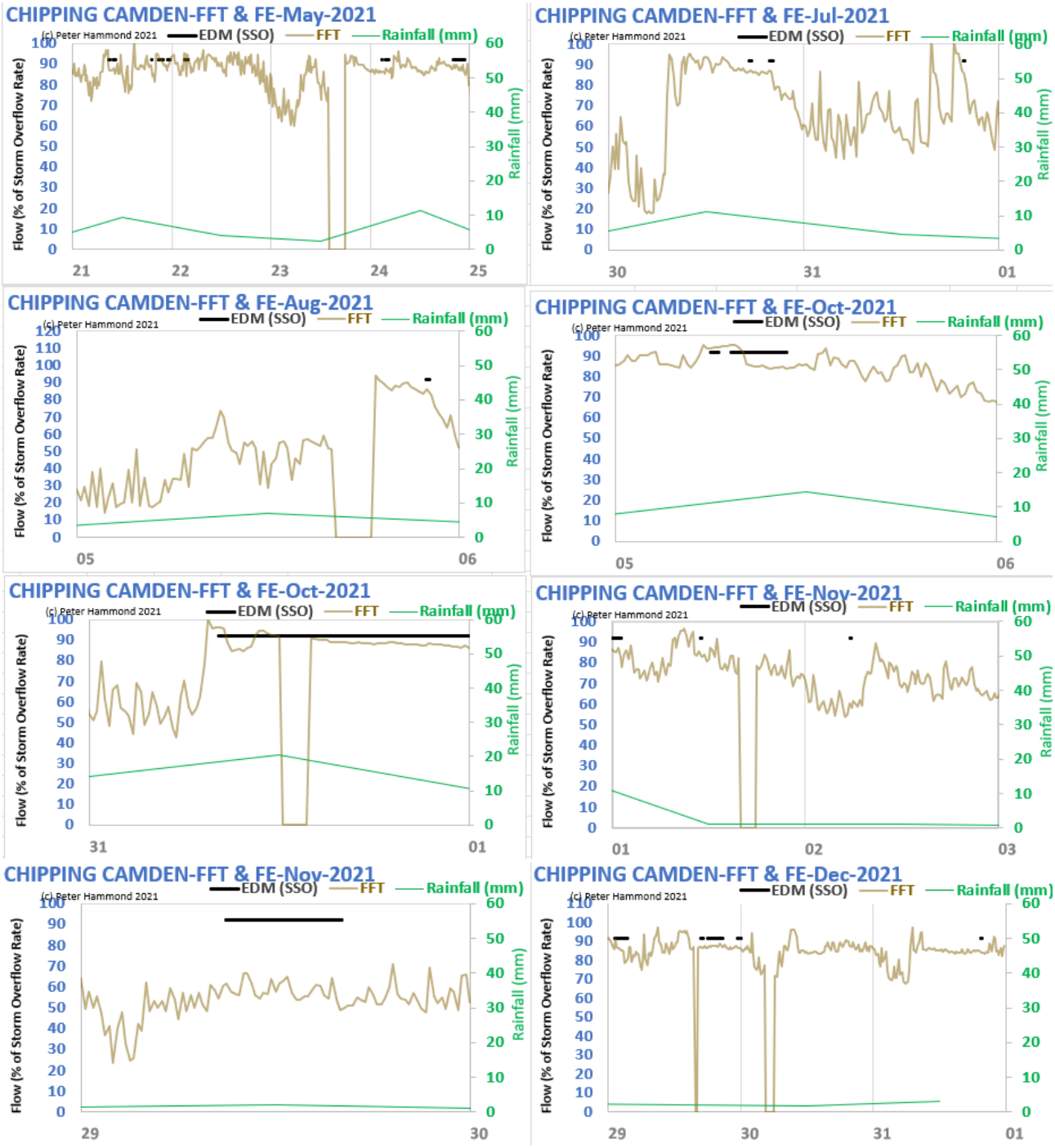


Figure 32: WASP's analysis suggests 12 "early" spilling days
(May 21,24; Jul 30-31; Aug 5; Oct 5,31; Nov 1,2,29; Dec 29,31)

2022 (367.36spilling hours; EDM 99.97%) 30 spilling days: 1 dry 29 early

The overview chart for 2022 for Chipping Camden STW is shown in **Fig.** 33.

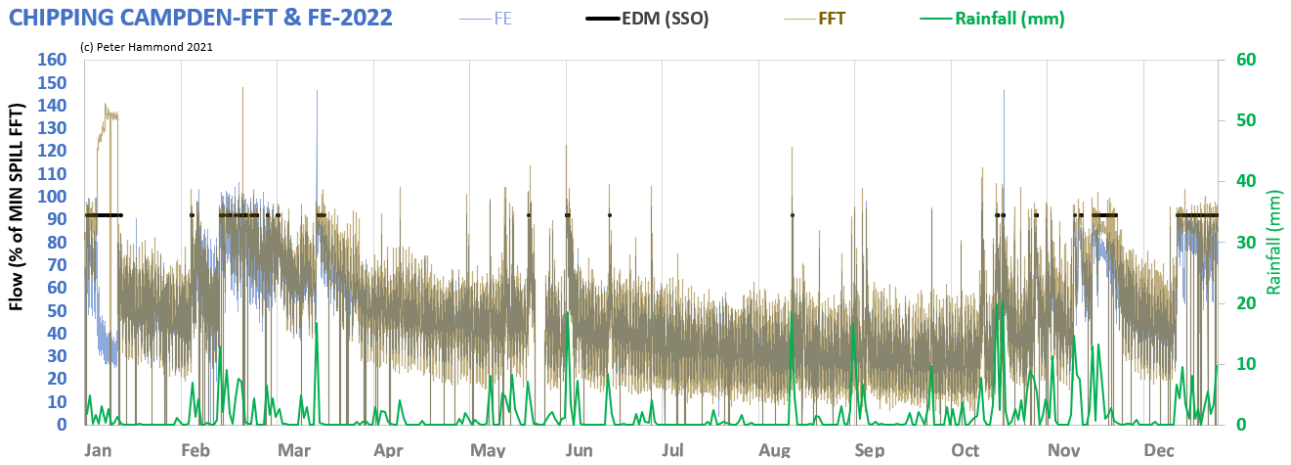


Figure 33: Chipping Camden STW annual overview for 2022

WASP's analysis suggests there were at least 29 days with illegal "early" spills and 1 with a "dry" spill (**Figs**. 34 & 35).

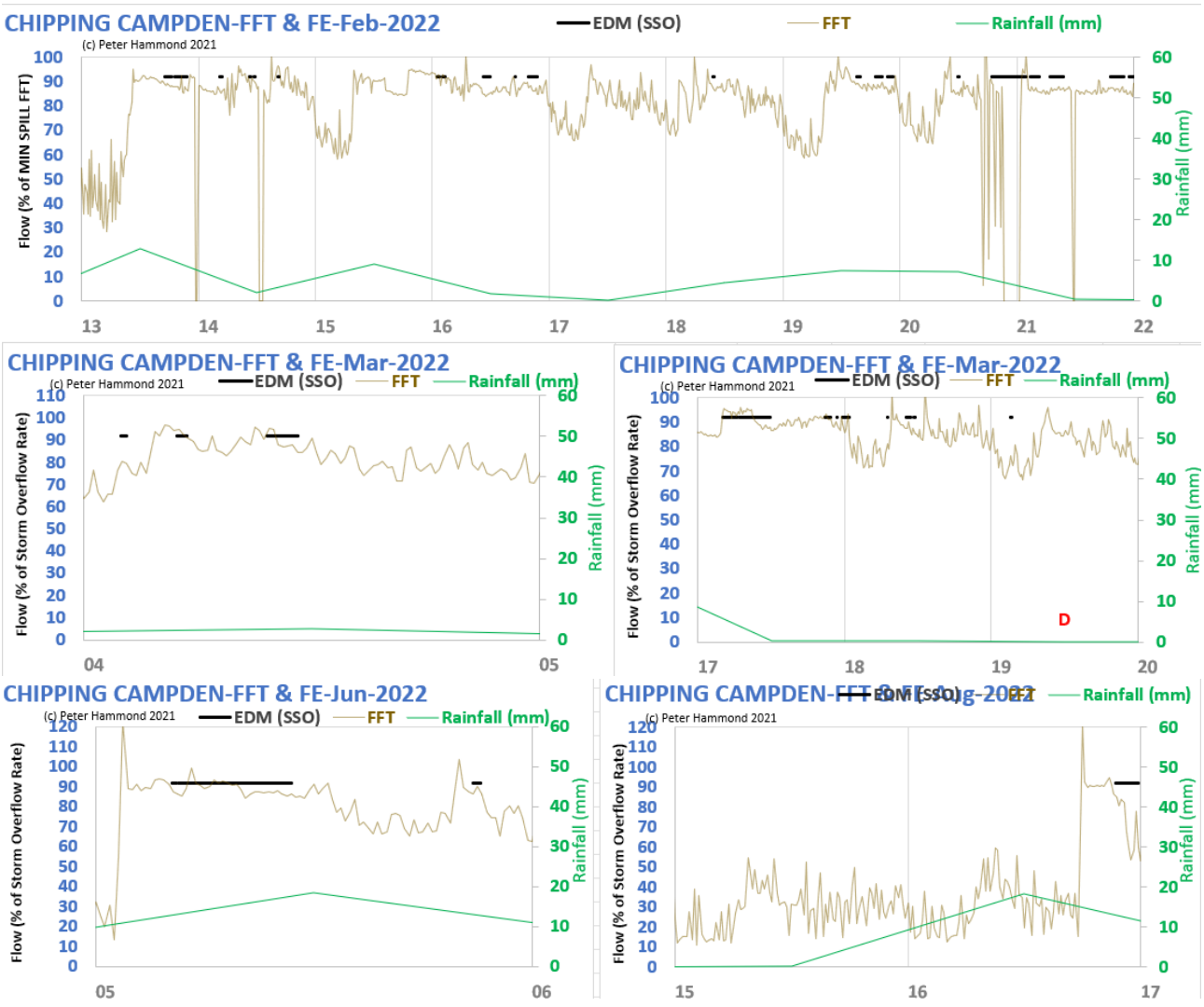


Figure 34: WASP's analysis suggests 13 "early" spilling days
(Feb 13,14,16,18-21; Mar 4,17-19; Jun 5; Aug 16)

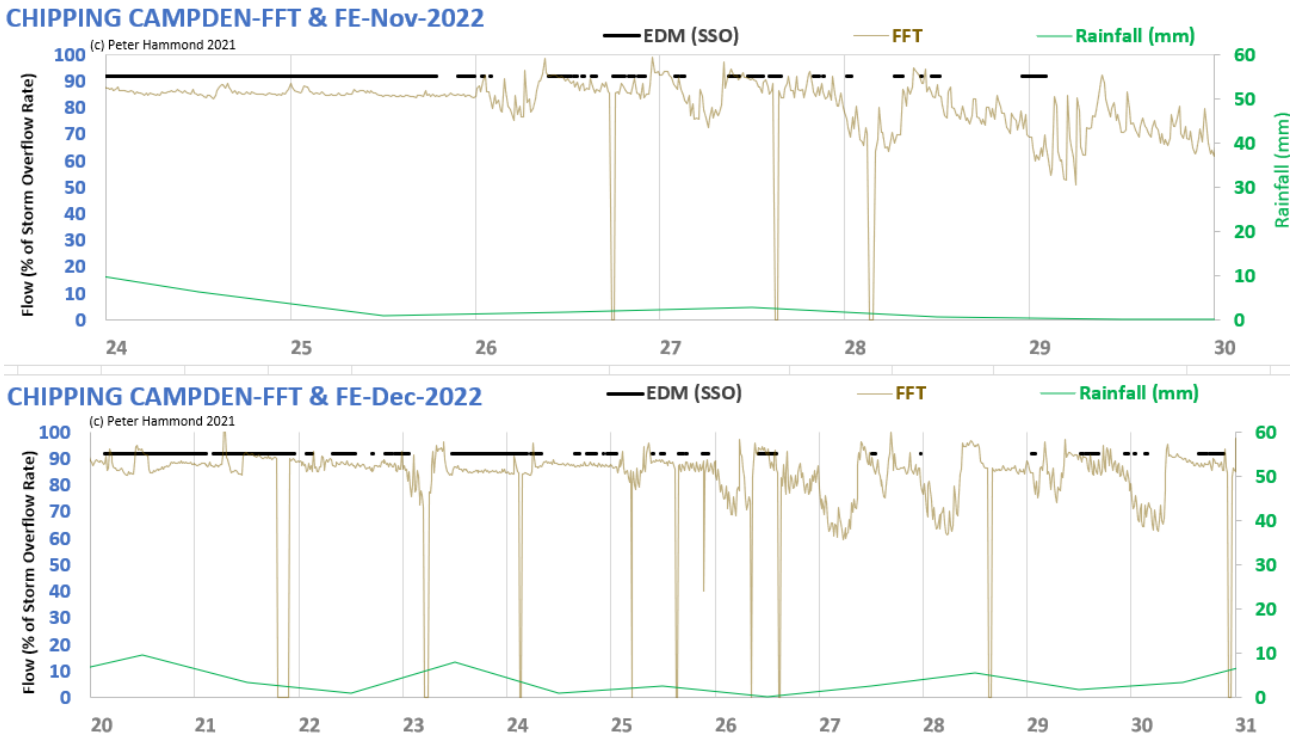


Figure 35: WASP's analysis suggests 16 "early" spilling days (Nov 24-29; Dec 20-27,29,30)

9 Kilburn STW Population Equivalent (PE) = 10,966 Capacity flow = 74.9 litres/sec

2021 (838 spilling hours; EDM 99.5%) 19 spilling days: 19 early

The overview chart for 2021 for Kilburn STW is shown in **Fig.** 36.

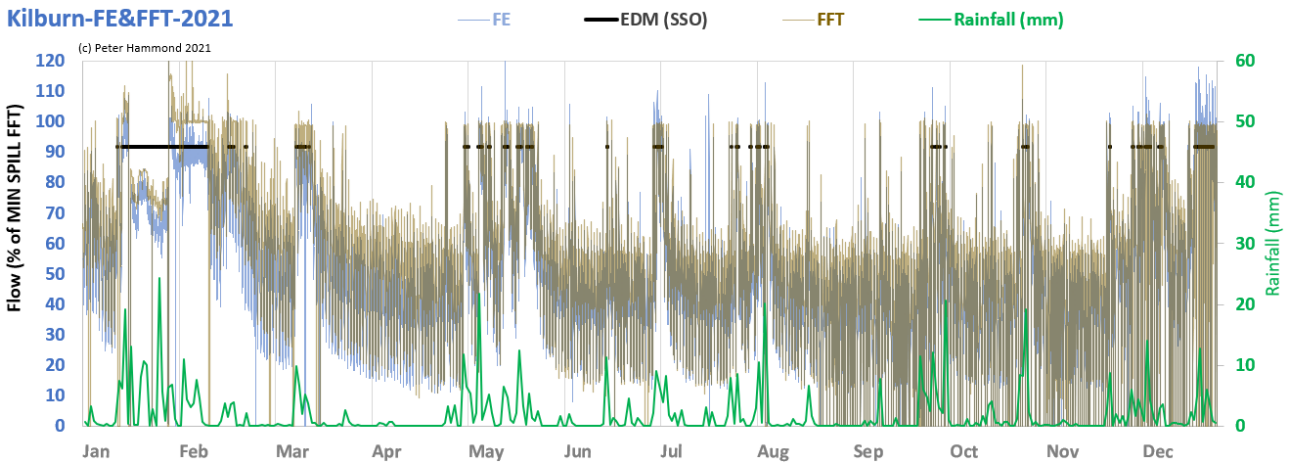


Figure 36: Kilburn STW annual overview for 2021

WASP's analysis suggests there were at least 19 days with illegal "early" spills (**Fig**. 37).

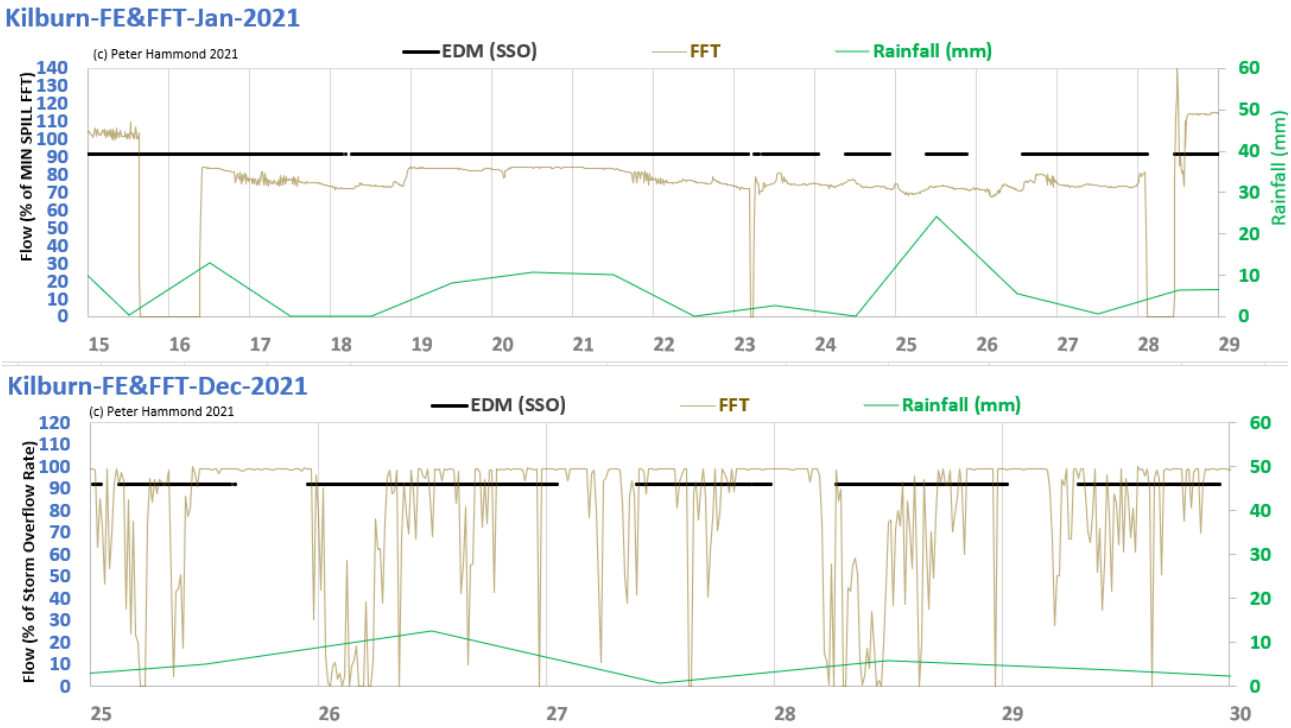


Figure 37: WASP's analysis suggests 19 "early" spilling days (Jan 15-28; Dec 25-29)

10 Leek STW Population Equivalent (PE) = 22,242 Capacity flow = 380 litres/sec

2021 (189 spilling hours; EDM 97.4%) 9 spilling days: 9 early

The overview chart for 2021 for Leek STW is shown in **Fig.** 38.

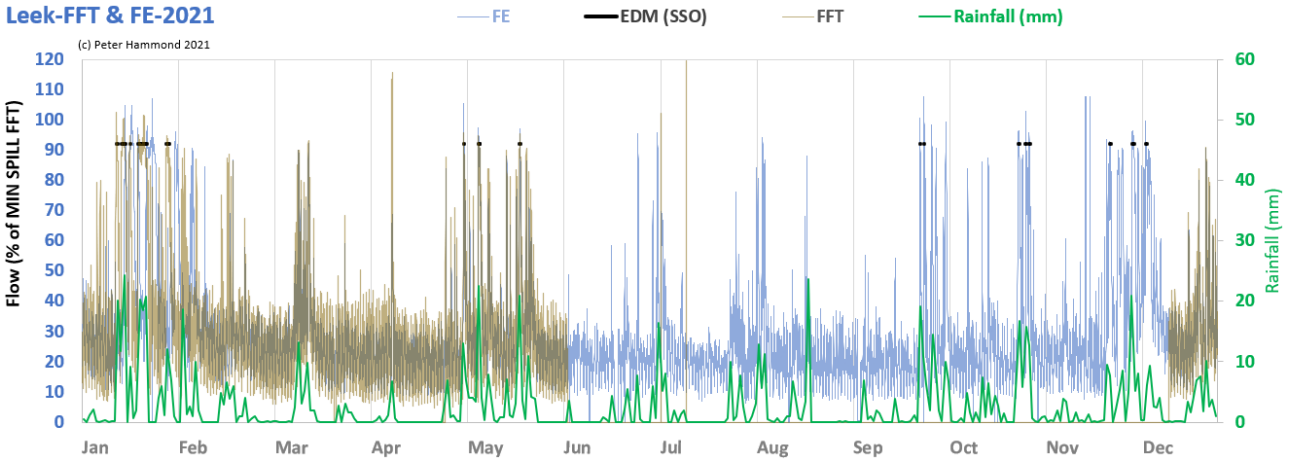


Figure 38: Leek STW annual overview for 2021

More than 6 months of FFT data are missing but there is a strong correlation between FE and FFT.

WASP's analysis suggests there were at least 9 days with illegal "early" spills (**Fig**. 39).

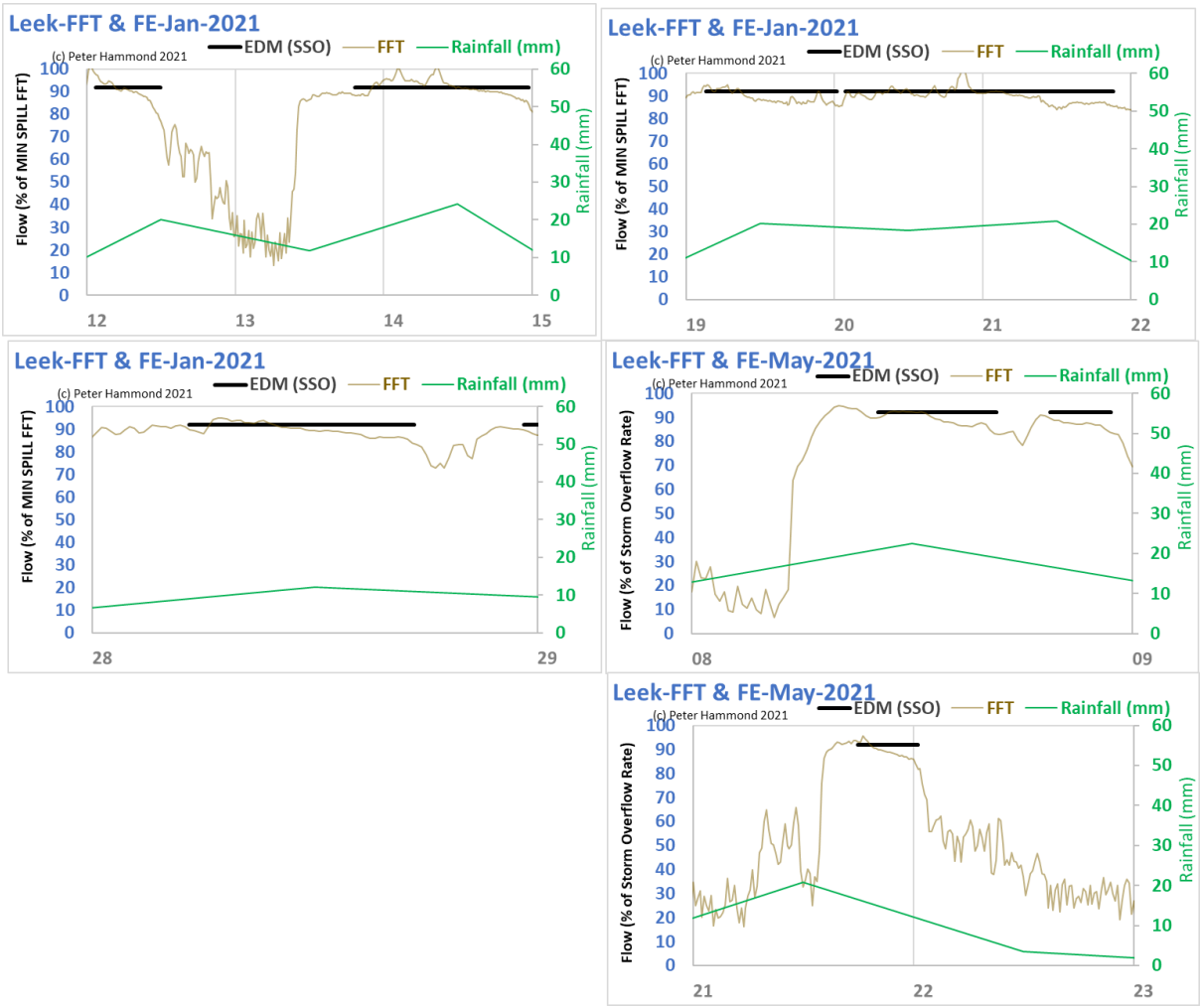


Figure 39: WASP's analysis suggests 9 "early" spill days (Jan 12-14,19-21,28; May 8,21-22)

11 **Coaley STW** Population Equivalent (PE) = 18,071 Capacity flow = 158 litres/sec

2021 (661 spilling hours; EDM 99.2%) 10 spilling days: 0 dry 9 early 1 both
The overview chart for 2021 for Coaley STW is shown in **Fig.** 40.

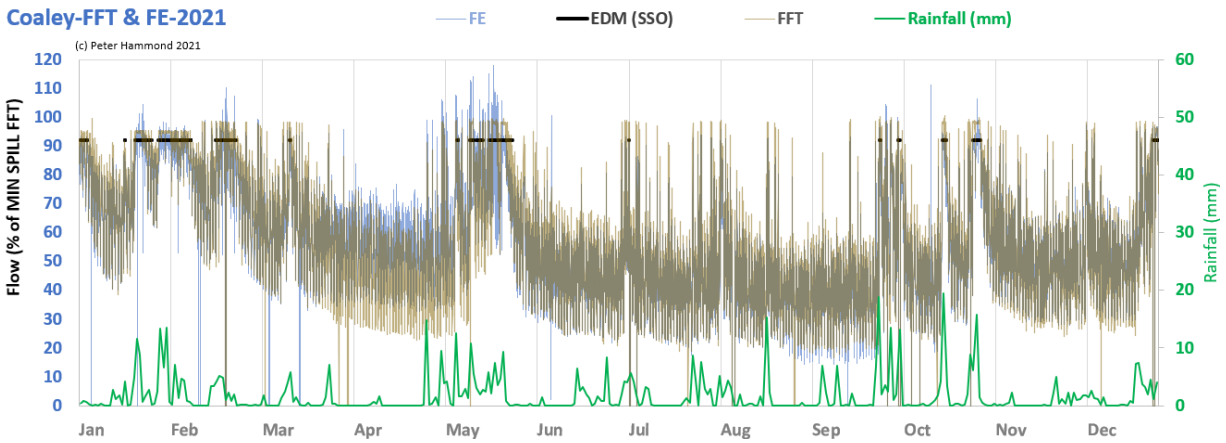


Figure 40: Coaley STW annual overview for 2021

WASP's analysis suggests there were at least 10 days with illegal "early" spills (**Fig**. 41).

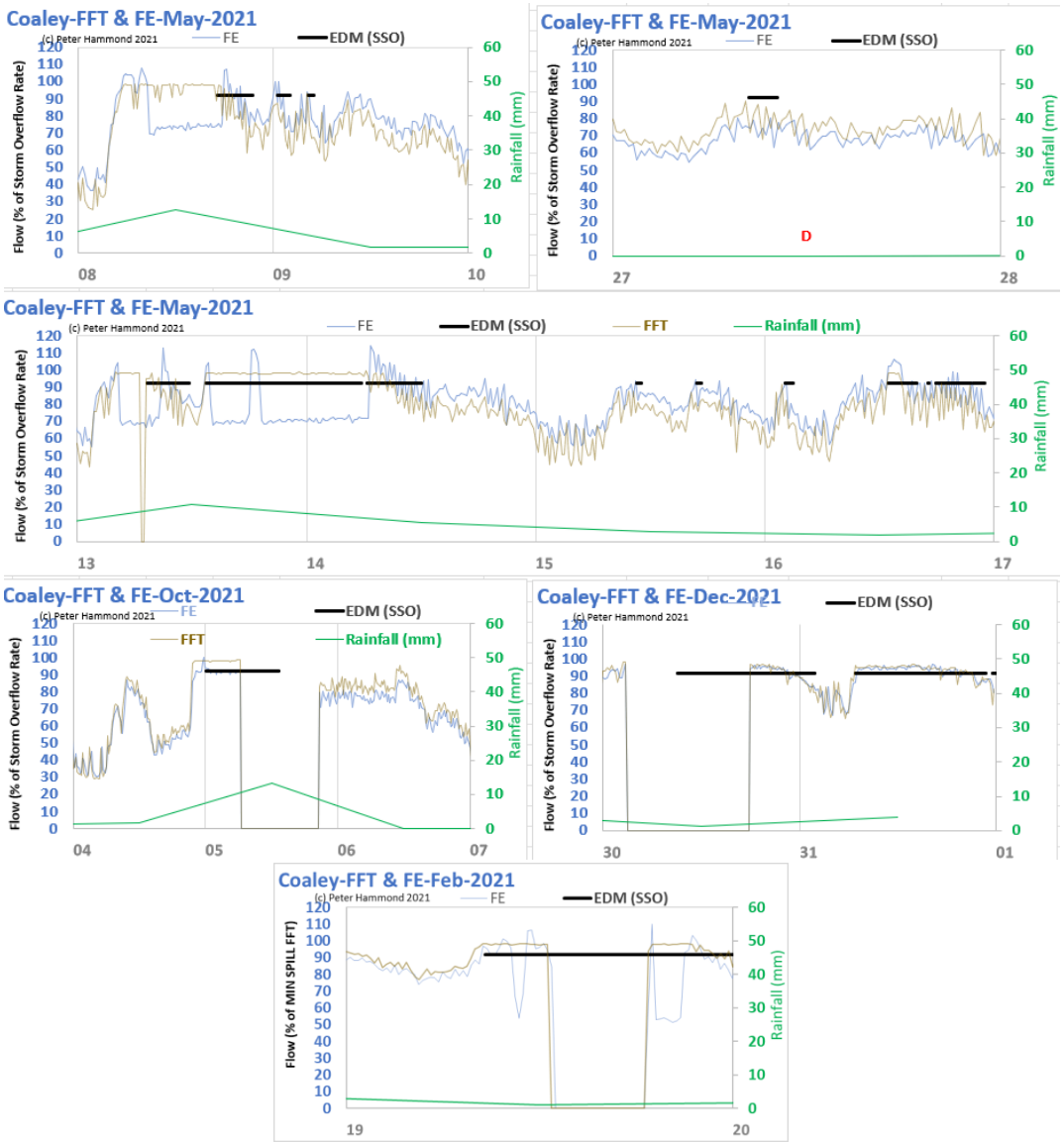


Figure 41: WASP's analysis suggests 10 illegal spill days (Feb 19; May 8,9,13,15,16,27; Oct 5;Dec 30-31)

12 Heage STW Population Equivalent (PE) = 2,682 Storm Tank = 30 l/s Inlet overflow = 50 l/s

Heage STW has an inlet overflow and a storm tank overflow. When both are in operation, 50 l/s is entering the works and if we know the flow to full treatment then the difference is being spilled via the storm tank. So at times when both overflows are in operation we can estimate the volume of the spill.

2021 (storm tank: 1007 spill hrs; EDM 99.52%; inlet 931 spill hrs; EDM 99.6%) 11 early spilling days

In 2021, the inlet and storm tank overflows were in operation for 529 hours and more than 40 million litres or 16 Olympic Pools of untreated sewage were dumped via the storm tank overflow.

The overview chart for 2021 for Heage STW is shown in **Fig.** 42.

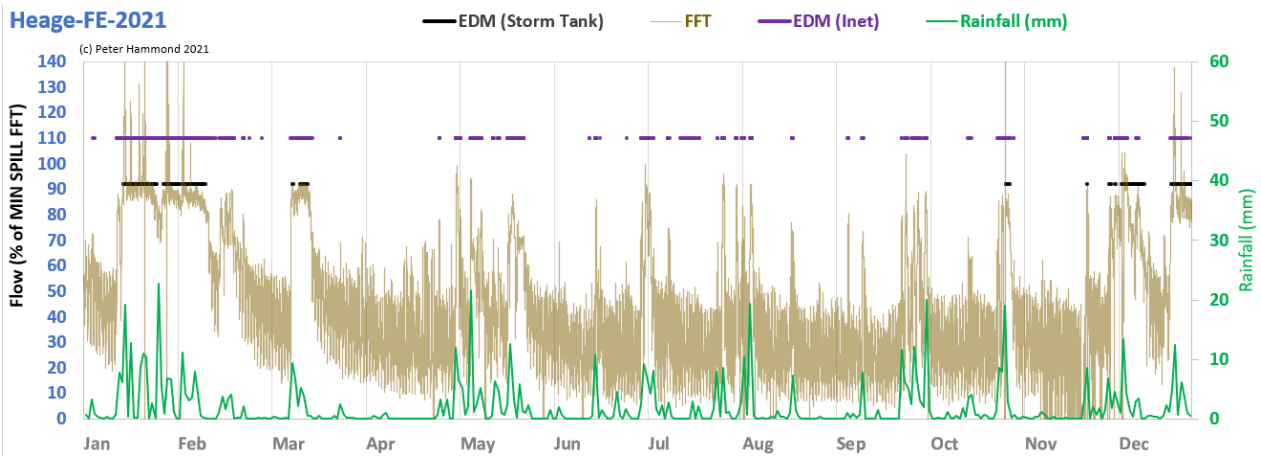


Figure 42: Heage STW annual overview for 2021 (FFT=sewage flow passed into full treatment)

During some spills, Heage STW appears to treat sewage at its capacity (**Fig**. 43) if the 8% meter error allowance is taken into account and therefore it spills within the terms of its permit.

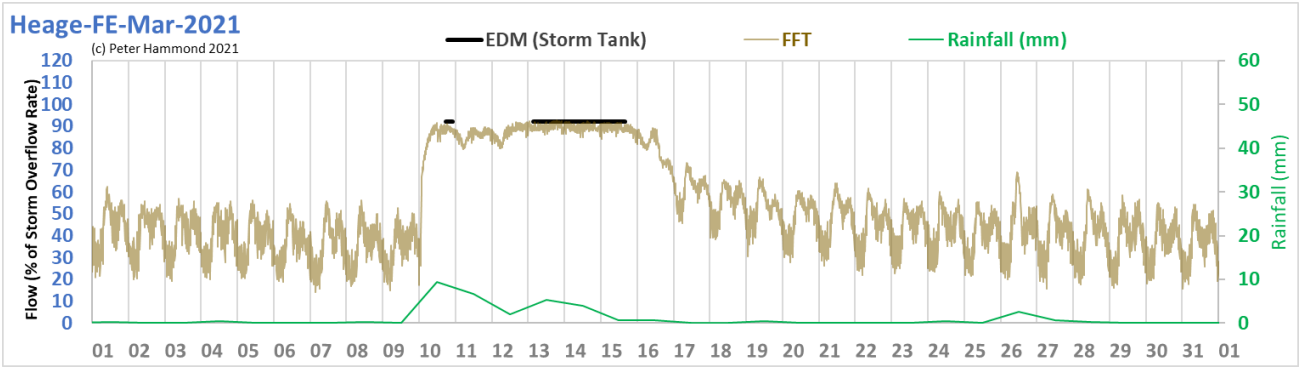


Figure 43: Example of Heage STW achieving the required level of treatment during a spill

But at other times, it spills "early" and hence illegally. For example, WASP's analysis suggests there were at least 11 days with illegal "early" spills in 2021(**Fig**. 44).

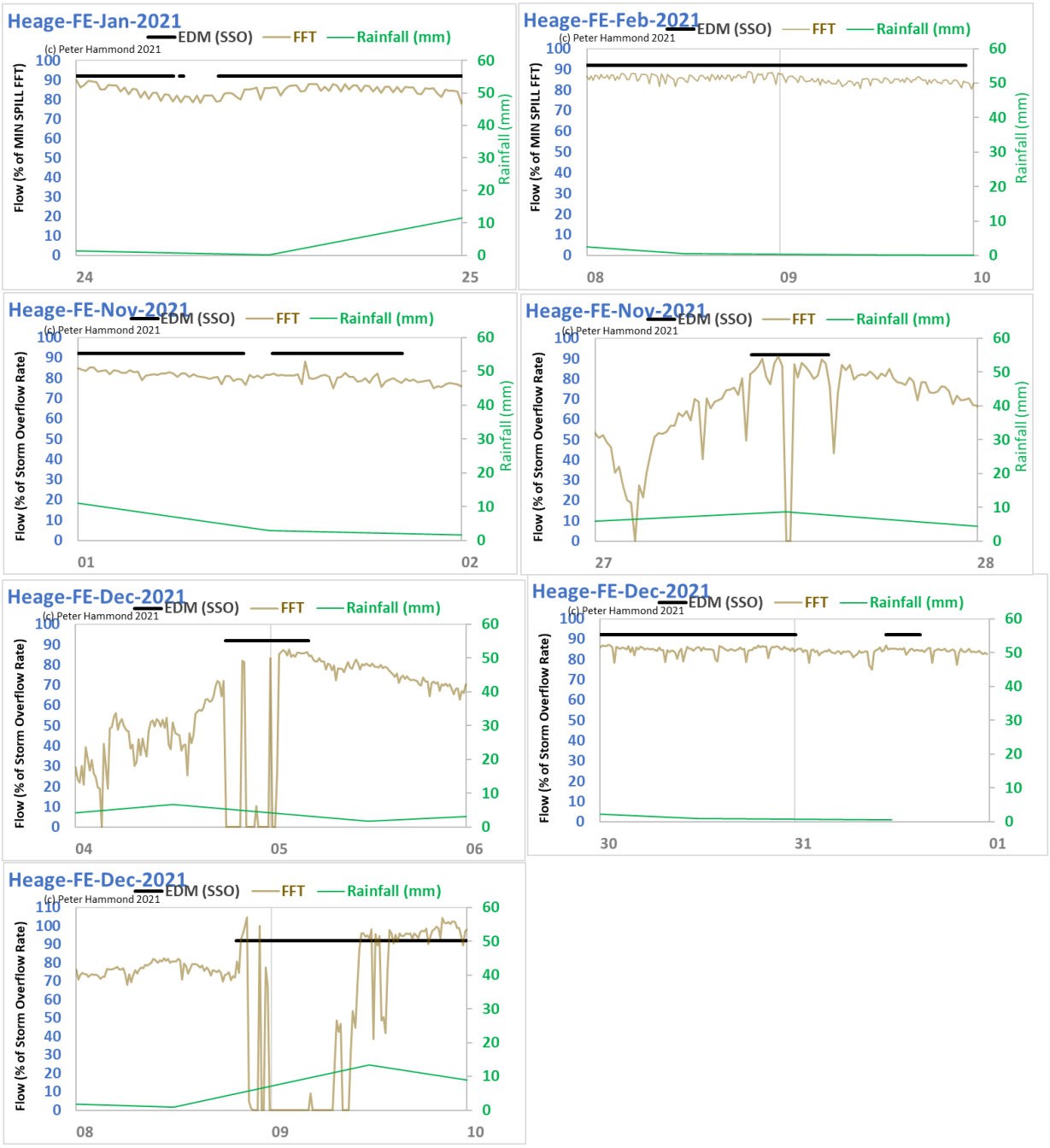


Figure 44: analysis suggests 11 days with early spills at Heage STW in 2021
(Jan 24; Feb 8,9; Nov 1,27; Dec 4,5,8,9,30,31; SSO=Settled Storm Overflow at Storm Tank)

2022 (storm tank: 797 spill hrs; EDM 100%; inlet 714 spill hrs; EDM 95.88%) 12 early spilling days

In 2022, the inlet and storm tank overflows were in operation simultaneously for 504 hours when more than 35 million litres or 14 Olympic Pools of untreated sewage were discharged via the storm tank overflow.

The overview chart for 2022 for Heage STW is shown in **Fig.** 45.

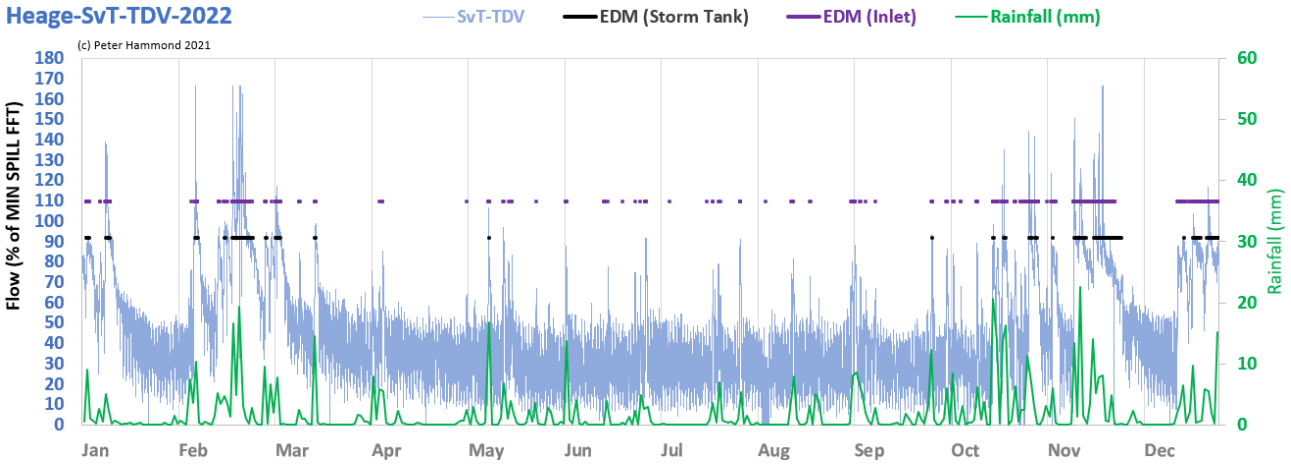


Figure 45: Heage STW annual overview for 2022

As in 2021, Heage STW often continues to treat above the storm overflow threshold of 30 l/s while spilling untreated sewage from its storm tank. However, WASP's analysis also suggests that it made early spills on at least 12 days in 2022 (**Fig**. 46).

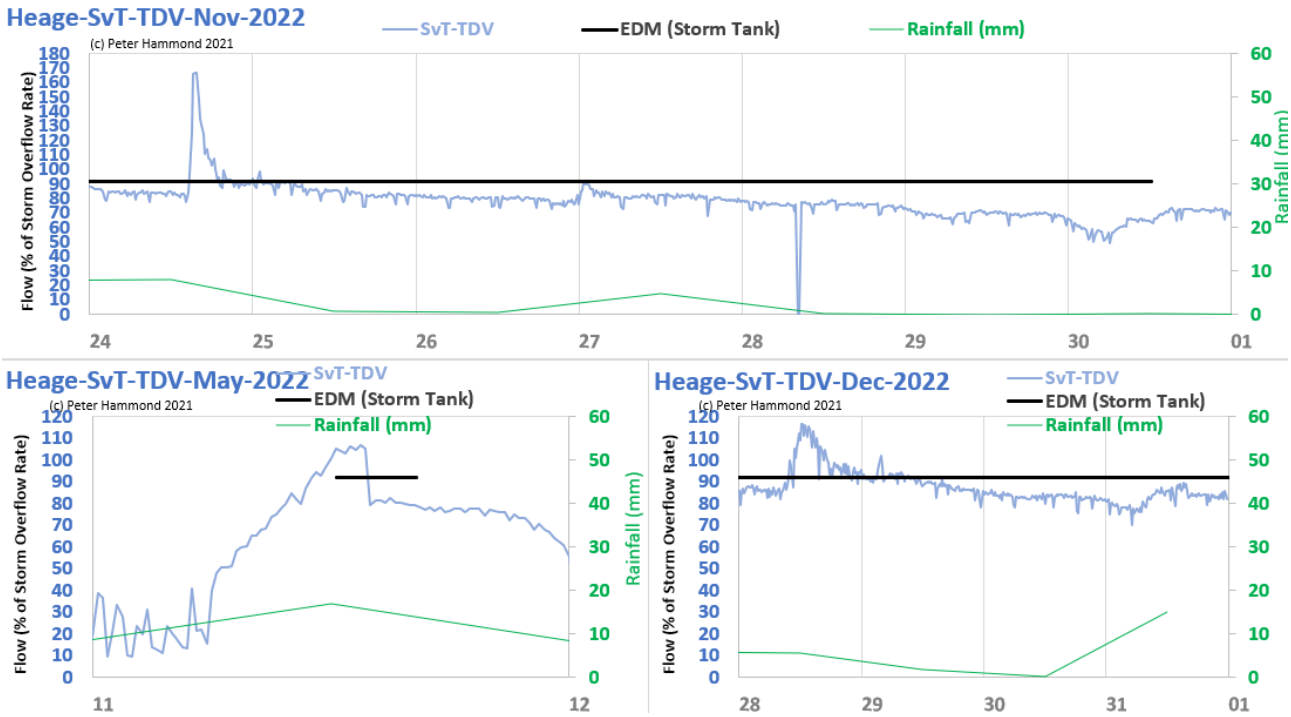


Figure 46: analysis suggests Heage STW made early spills on at least 12 days in 2022 (May 11; Nov 24-30; Dec 28-31)

13 Great Washbourne STW Population Equivalent (PE) = 83 Capacity flow = 0.9 litres/sec

2021 (441.1 spilling hours; EDM % Sensor Failure/Issue) 16 spilling days: 1 dry 11 early 4 both

The overview chart for 2021 for Great Washbourne STW is shown in **Fig.** 47.

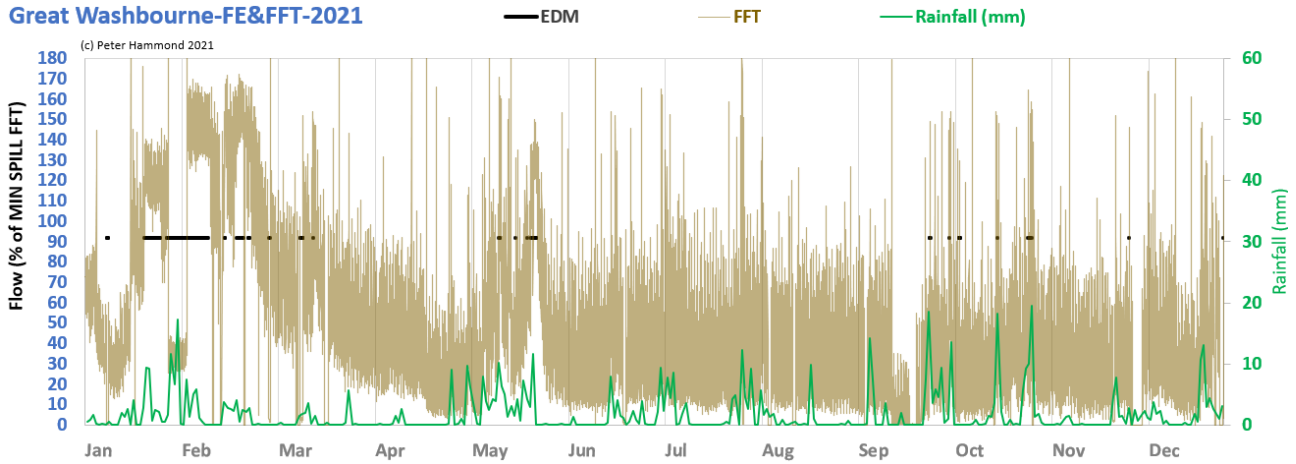
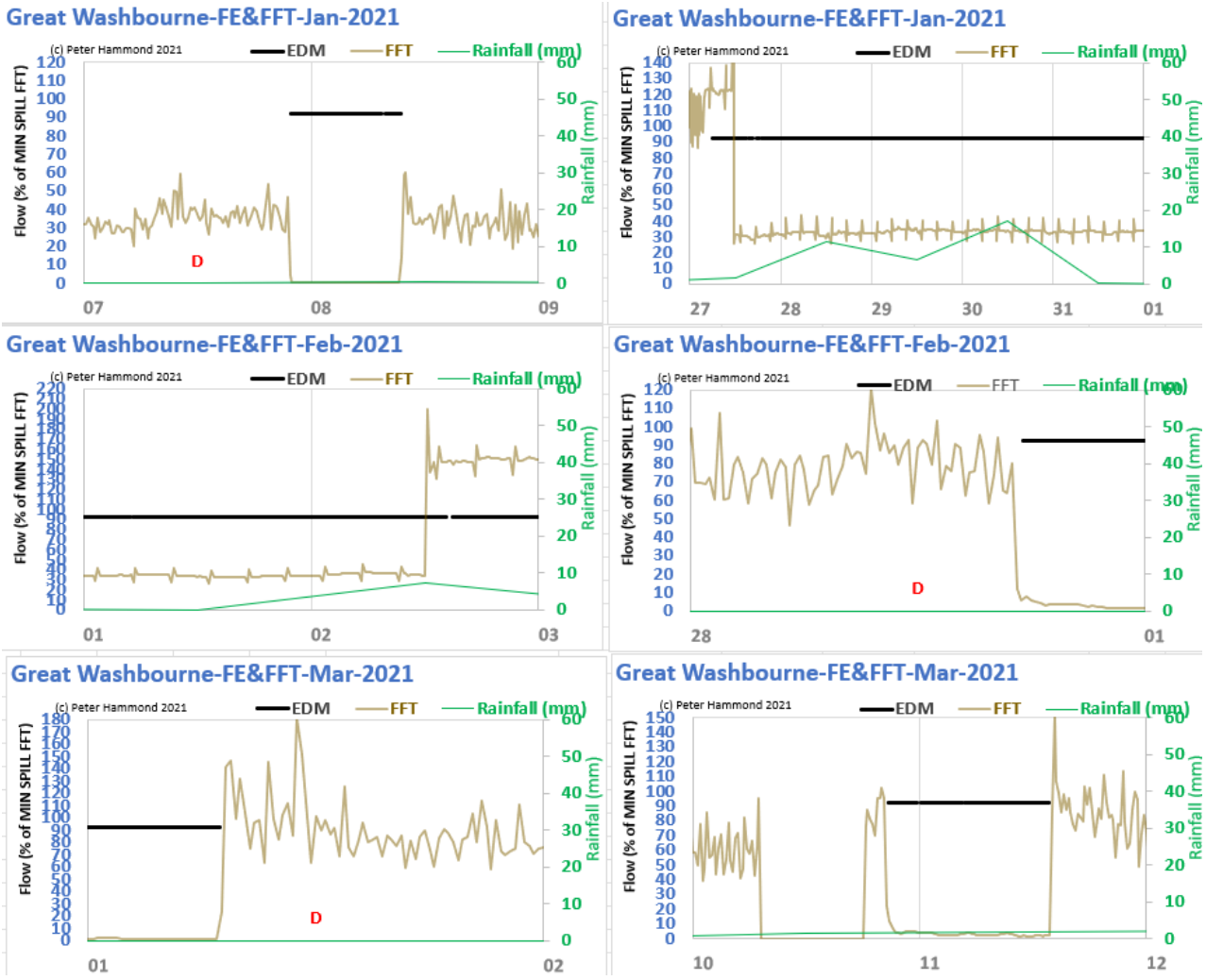


Figure 47: Great Washbourne STW annual overview for 2021

WASP's analysis suggests there were at least 16 days with illegal spills in 2021: 1 "dry", 11 "early" and 4 both "dry" and "early" (**Fig**. 48).



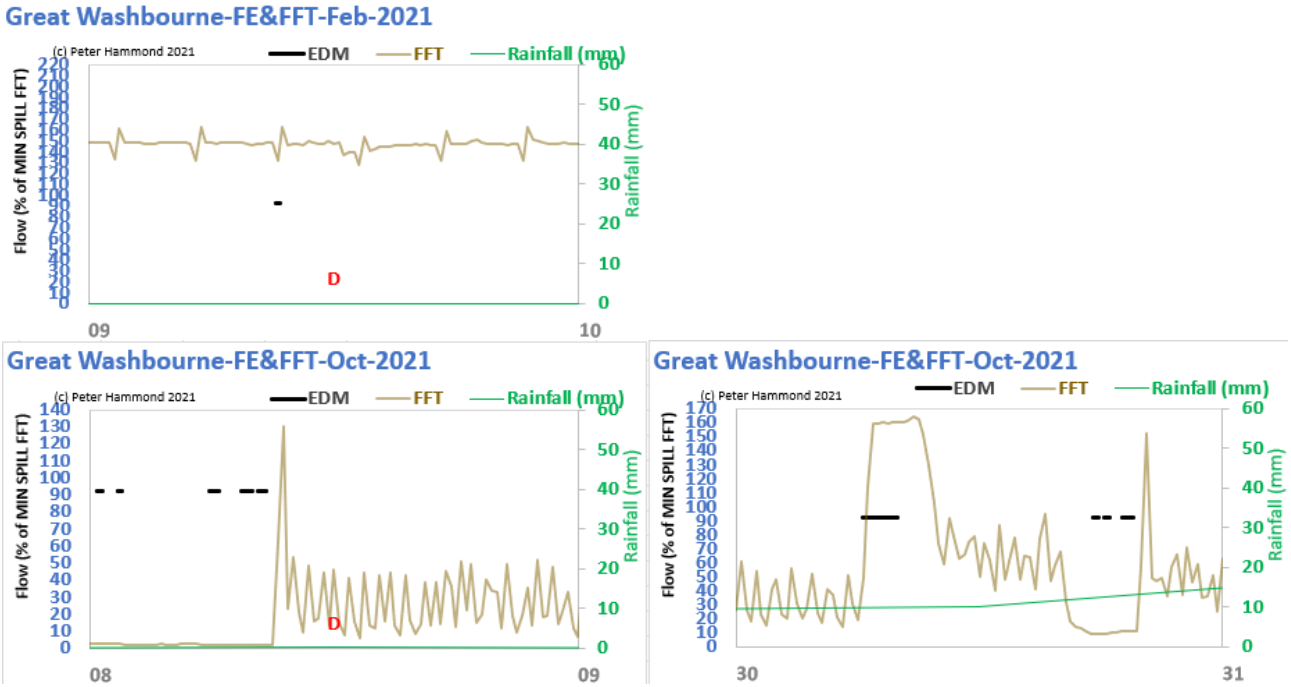


Figure 48: WASP's analysis suggests there were 16 days with illegal spills in 2021 (Jan 7-8,27-31; Feb 1-2,9,28; Mar 1,10-11; Oct 8,30)

2022 (178 spilling hours; EDM 92.9%) 14 spilling days: 0 dry 13 early 1 both

The overview chart for 2022 for Great Washbourne STW is shown in **Fig.** 49.

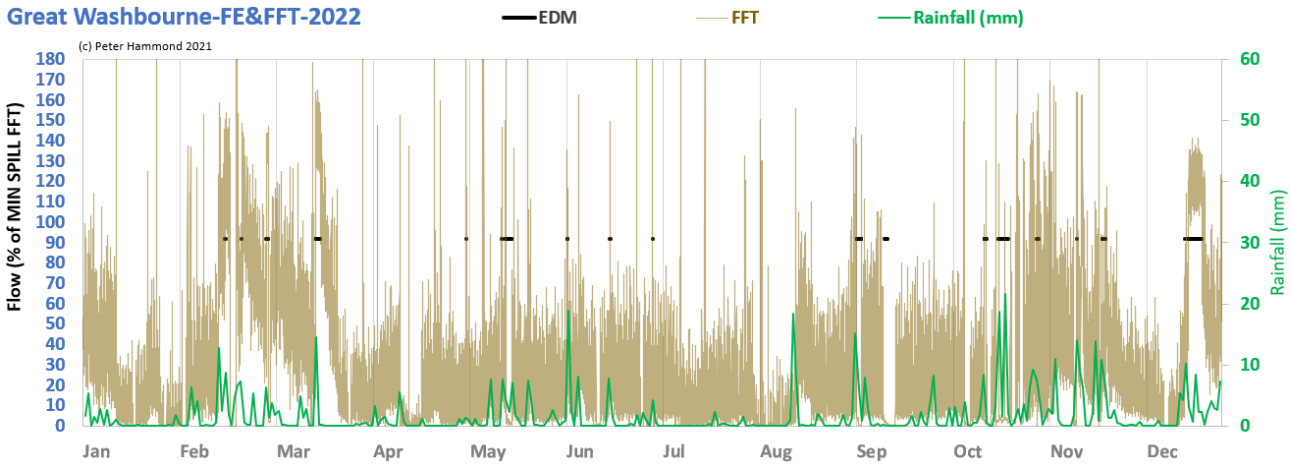


Figure 49: Great Washbourne STW annual overview for 2022

WASP's analysis suggests there were at least 14 days with illegal spills in 2022: 13 "early" and 1 both "dry" and "early" (**Fig**. 50).

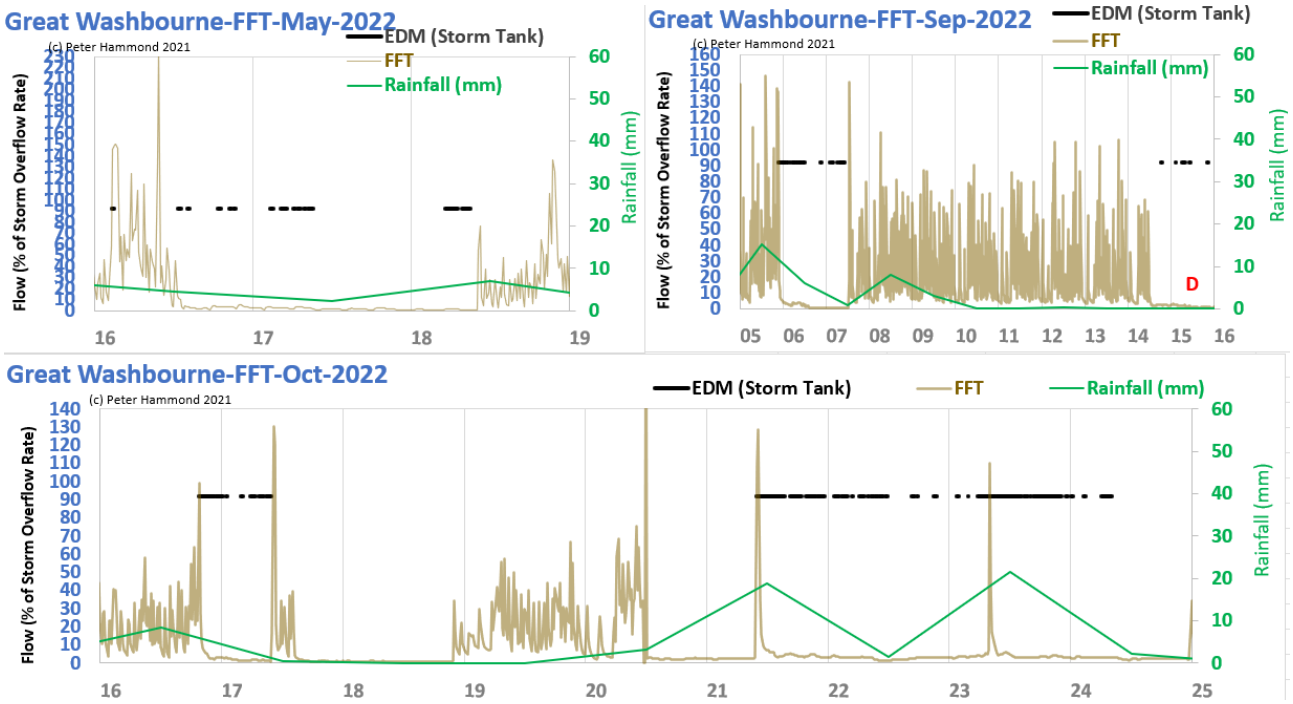
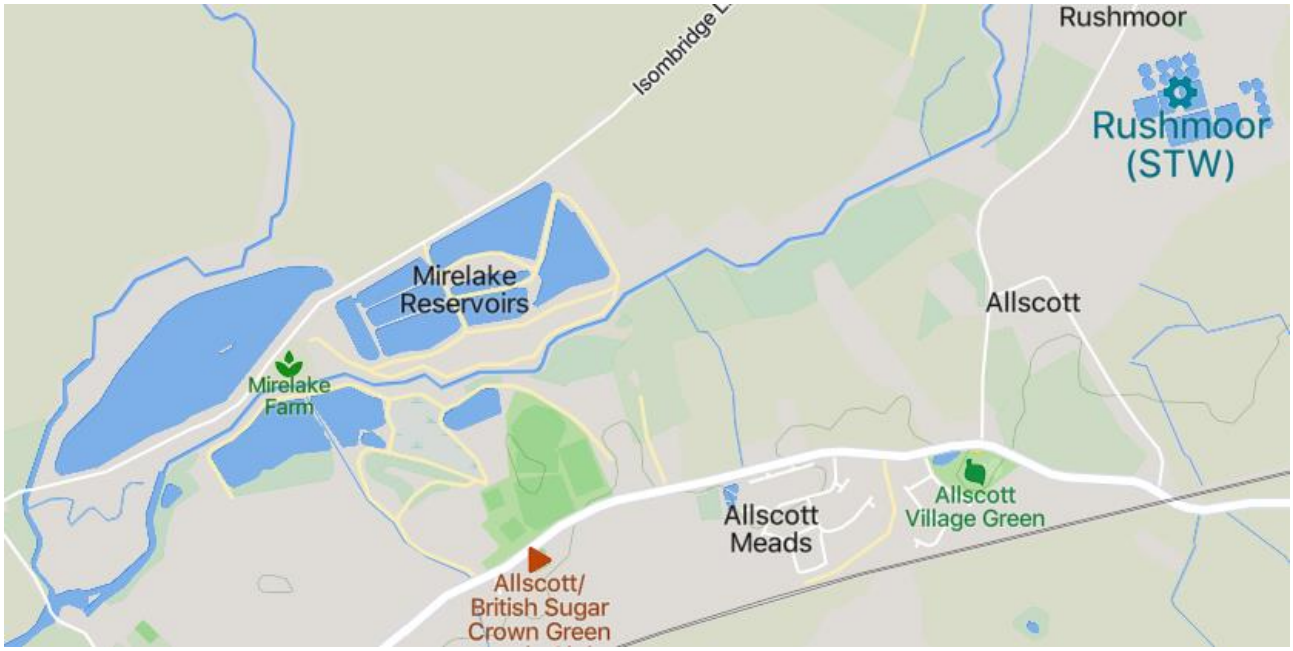


Figure 50: WASP's analysis suggests there were 14 days with illegal spills in 2022 (May 16-18; Sep 5-7,14-15; Oct 16-17,21-24)

14 **Rushmoor STW** Population Equivalent (PE) = 83,067 Storm tank min size: 5,705 m^3

Storm tank overflow rate : 712.3 l/s Inlet overflow rate : 1620 l/s

Rushmoor STW discharges to the River Tern upstream of the SSSI Allscott Settling Ponds previously used industrially by British Sugar and now a major reserve for waterfowl.



Between 2021 and 2022, Rushmoor STW discharged at least 230 million litres of untreated sewage to the River Tern via its Storm Tank Overflow, about 94 Olympic sized swimming pools worth.

2021 Storm tank spilling hours: 335; EDM 100% 8 spilling days: 0 dry 7 early 1 both
Inlet spilling hours: 104 hours; EDM100%
Simultaneous operaion of both overflow: 33 hours

The overview chart for 2021 for Rushmoor STW is shown in **Fig.** 51.

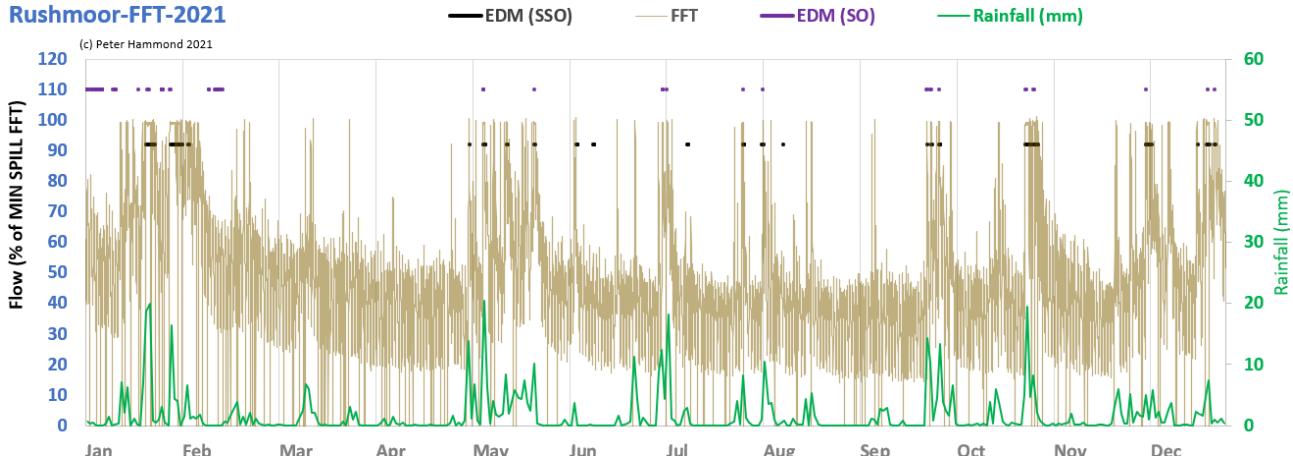


Figure 51: Rushmoor STW annual overview for 2021

As can be seen in **Fig**. 52, Rushmoor STW began 2021 with clearly separated EDM intervals with sewage treatment rates generally well above the storm tank overflow rate. This is mostly the case at other times but there are 8 days where the sewage treatment rate is below the storm overflow rate during spills which are therefore in breach of permit and hence illegal (**Fig**. 52).

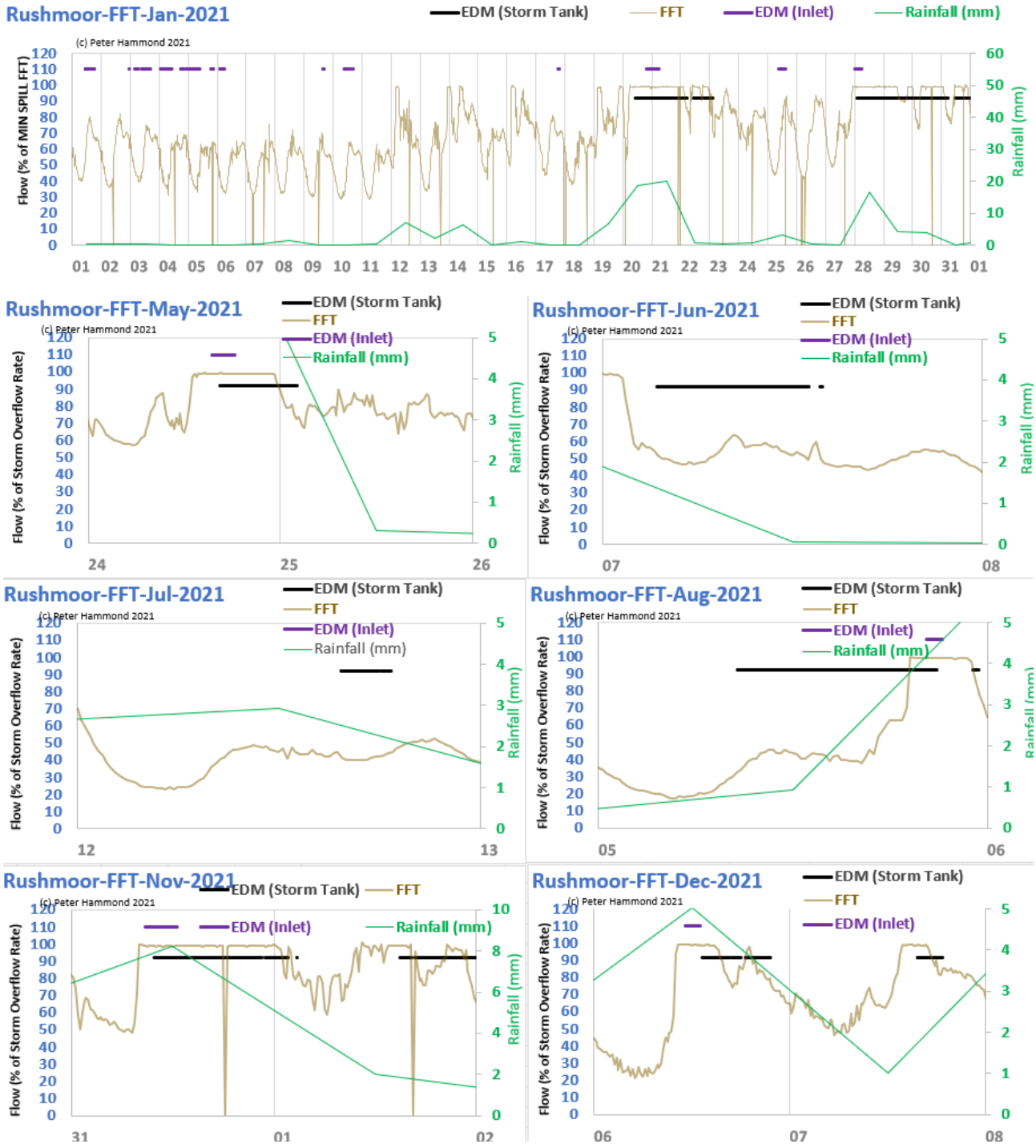


Figure 52: WASP's analysis suggests Rushmoor STW made legal spills from its storm tank in January 2021 but later on there were 7 days with "early" spills (Jan 30,31; May 25; Jun 7; Jul 12; Aug 5; Nov 1; Dec 6) and 1 "dry"

PREVIOUS WASP REPORTS

2021

Mar

Detection of untreated sewage discharges to watercourses using machine learning

WASP publishes first AI research on automated detection of sewage spills

Nov

Wasp Review Of Unpermitted Spills From Sewage Treatment Works – Part 1 Thames Water

WASP reveals 700+ illegal spills by Thames Water

2022

Jan

Wasp Review Of Unpermitted Spills From Sewage Treatment Works – Part 2

WASP reveals 2,400 illegal spills by 7 water companies: Southern, South West, Thames, United Utilities, Welsh, Wessex & Yorkshire.

Sept

Wasp Review of Unpermitted Spills From Sewage Treatment Works – Part 3 EDM Submissions

WASP reveals dodgy sewage spill monitoring data submitted to EA by Water Companies.

2023

Feb

The failure of Operator Self-Monitoring

WASP shows how self-testing of sewage treatment quality has failed and how the system can be manipulated by Water Companies.

May

Effective regulation of untreated sewage discharges needs volumetric and catchment-based monitoring

WASP estimates volumes of sewage spills and shows how pollution exposure progresses down a river catchment from the headwaters.

Aug

Sewage spills and infrastructure: don't blame the Victorians

WASP dispels the myth about Victorian sewerage networks.
Only 12 % of all sewers in England are Victorian in age.

Oct

Illegal sewage discharges to 11 Welsh rivers 2018 to 2023

WASP shows 2,274 days with illegal sewage discharges to 11 Welsh rivers from 2018 to 2023 and reveals that one, Cardigan STW, has been in breach of its permit for a decade without criminal prosecution.

2024

Jun

Event duration monitors are not fit for purpose

WASP demonstrates that even when sewage spill monitors are working they often generate inaccurate data. In 2026, such data is planned to be a metric for the EA's annual review of water companies – "a system built on sand".