

Uncertainty in trunk balances

Water UK Annual Leakage Conference

3rd December 2024

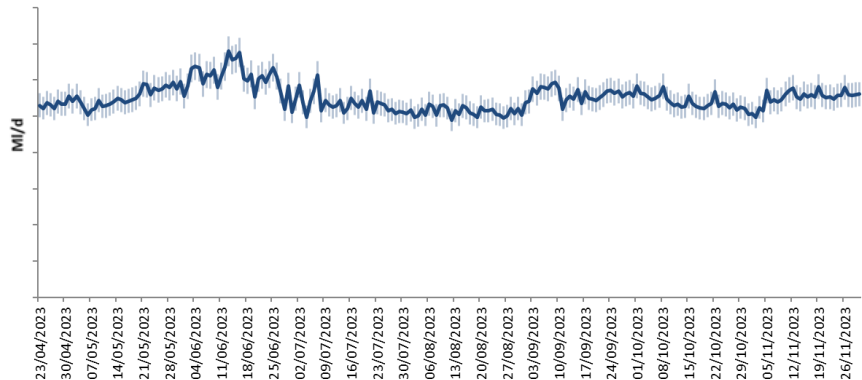




Daily Losses



Estimated daily losses, with 90% confidence interval

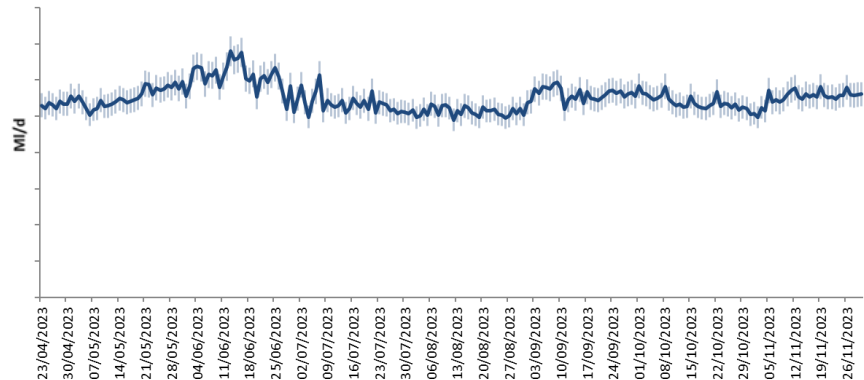


Component	Volume (ML/d)	Uncertainty
Unaccounted for water (UFW)	5	
Leakage		

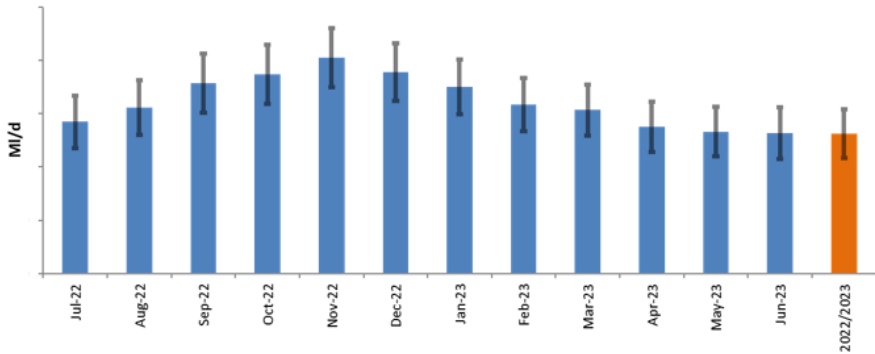
Meter Uncertainty



Estimated daily losses, with 90% confidence interval



Estimated monthly and annual losses, with 90% confidence interval

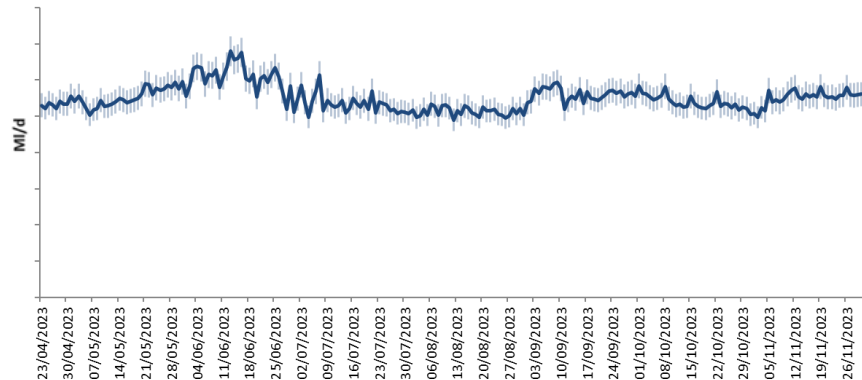


Component	Volume (ML/d)	Uncertainty
UFW	5	1%
Leakage		

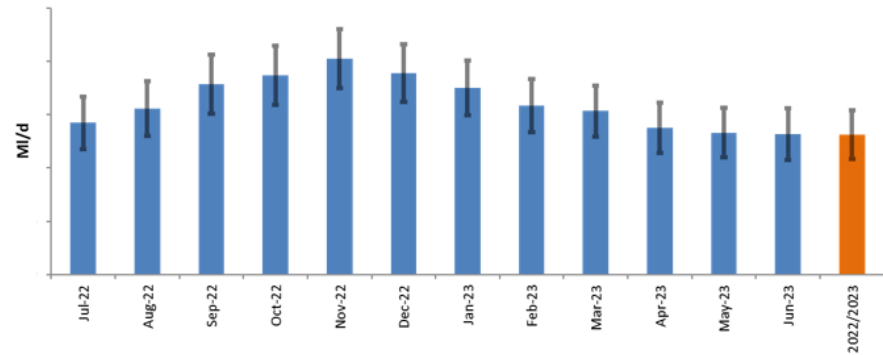
Meter Uncertainty



Estimated daily losses, with 90% confidence interval



Estimated monthly and annual losses, with 90% confidence interval

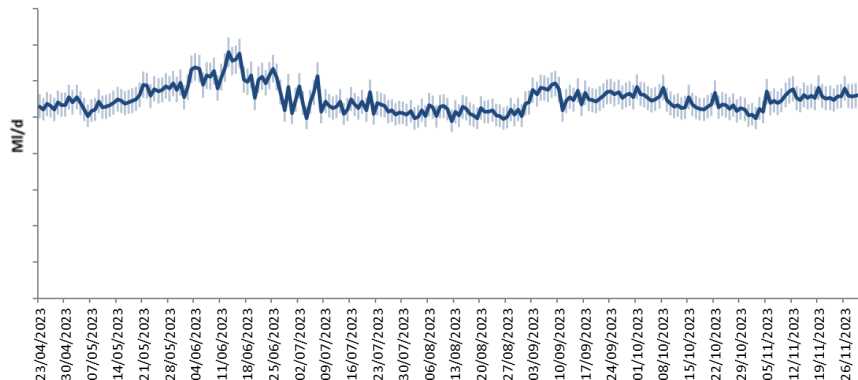


Component	Volume (ML/d)	Uncertainty
UFW	5	1%
Leakage	5	1%

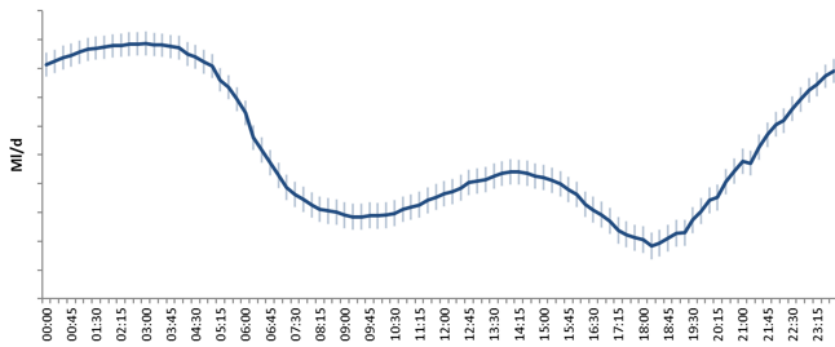
Non Household Consumption



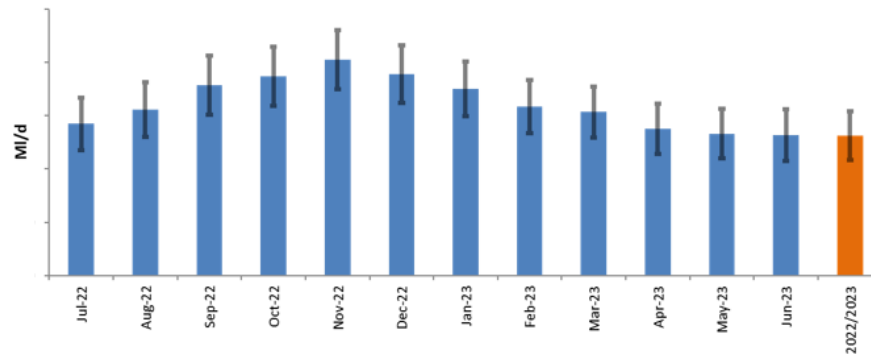
Estimated daily losses, with 90% confidence interval



Estimated diurnal pattern of losses, with 90% confidence interval



Estimated monthly and annual losses, with 90% confidence interval

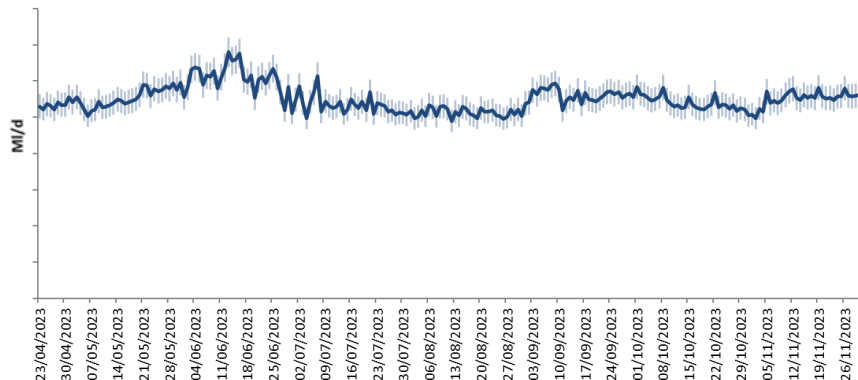


Component	Volume (ML/d)	Uncertainty
UFW	5	1%
Leakage	5	1%

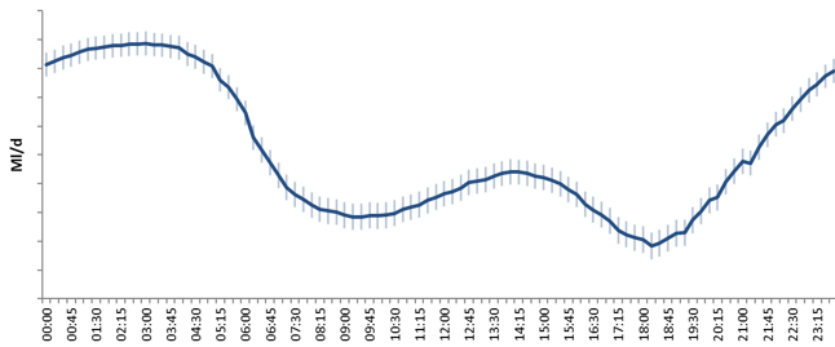
Household Consumption



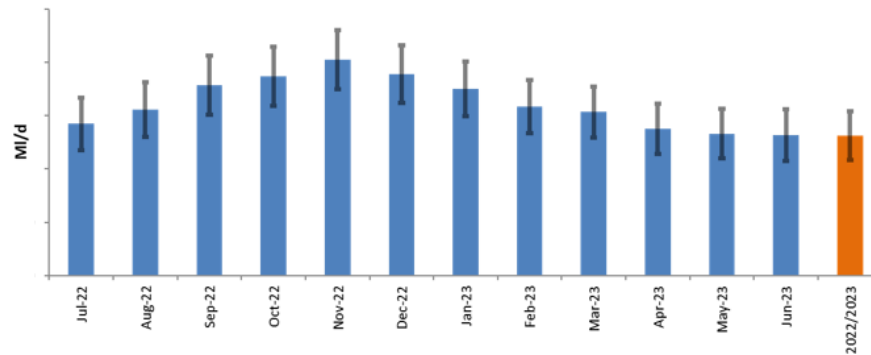
Estimated daily losses, with 90% confidence interval



Estimated diurnal pattern of losses, with 90% confidence interval



Estimated monthly and annual losses, with 90% confidence interval

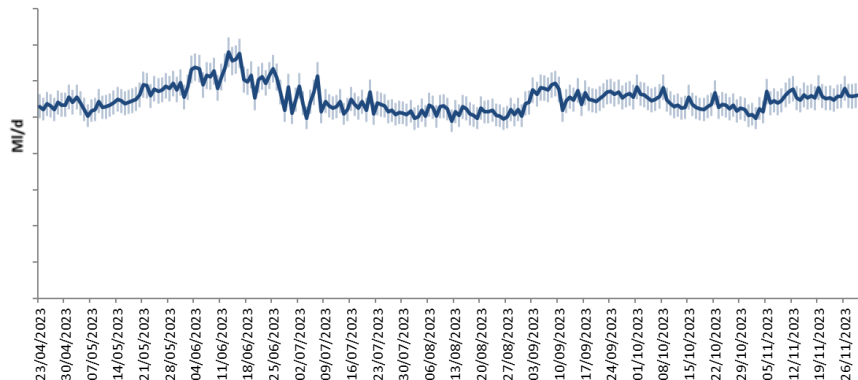


Component	Volume (ML/d)	Uncertainty
UFW	5	1%
NHH Consumption	3	5%
Leakage	2	7.91%

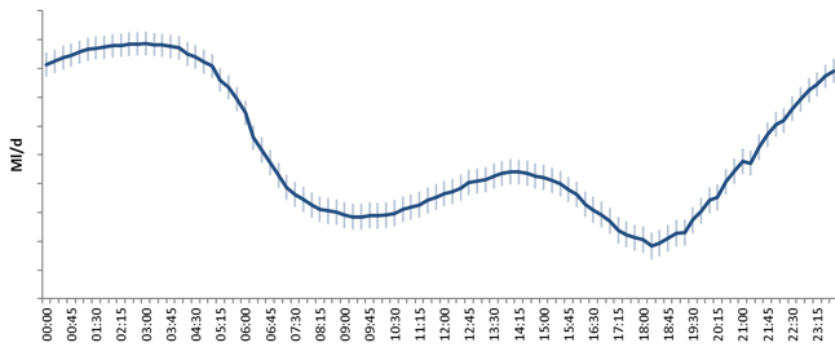
Household Consumption



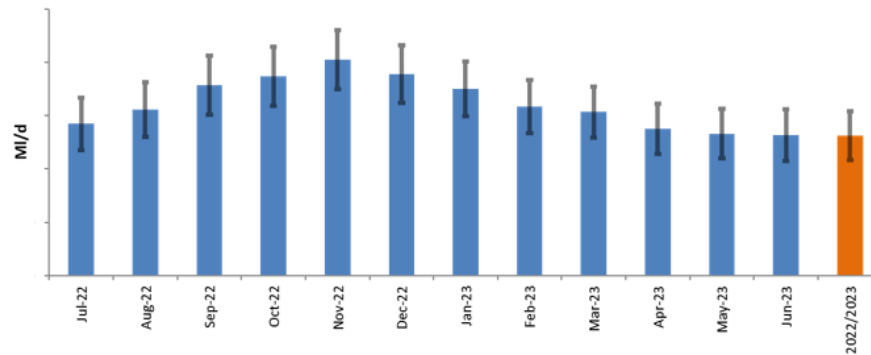
Estimated daily losses, with 90% confidence interval



Estimated diurnal pattern of losses, with 90% confidence interval



Estimated monthly and annual losses, with 90% confidence interval

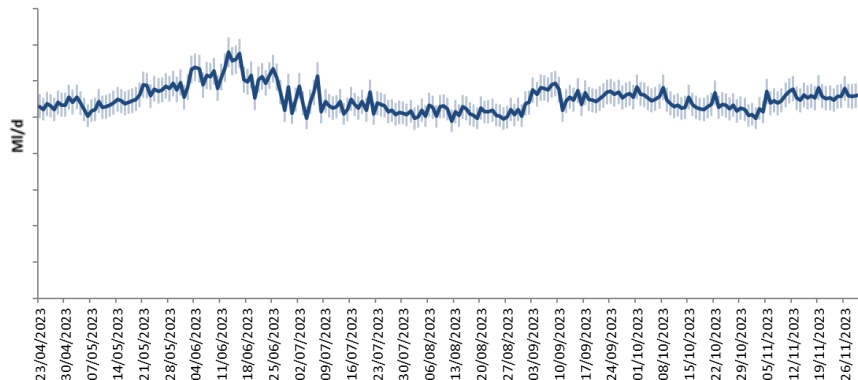


Component	Volume (ML/d)	Uncertainty
UFW	5	1%
NHH Consumption	3	5%
Measured HH	0.5	2.5%
Leakage	1.5	10.57%

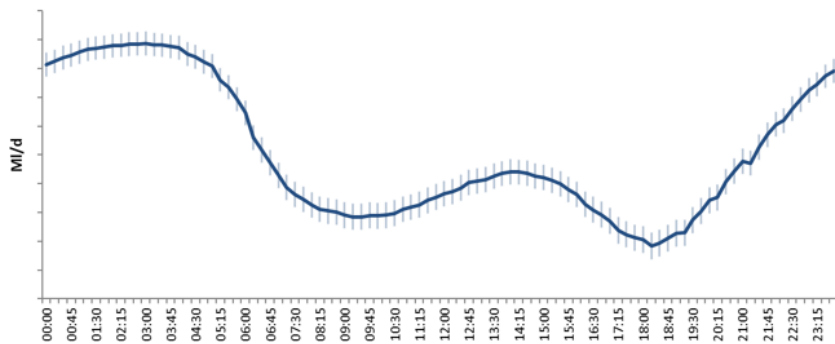
Household Consumption



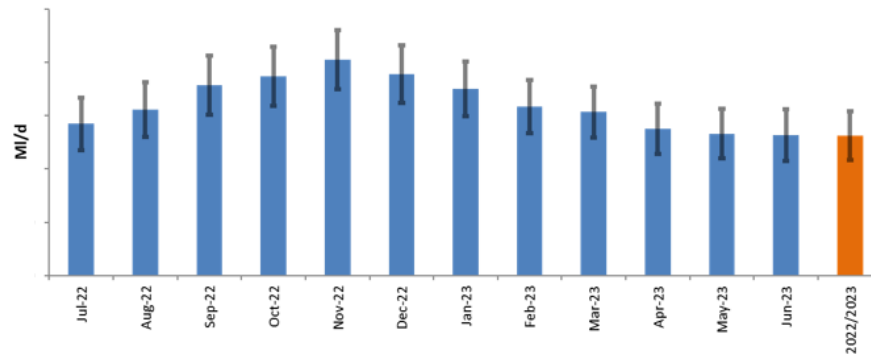
Estimated daily losses, with 90% confidence interval



Estimated diurnal pattern of losses, with 90% confidence interval



Estimated monthly and annual losses, with 90% confidence interval



Component	Volume (ML/d)	Uncertainty
UFW	5	1%
NHH Consumption	3	5%
Measured HH	0.5	2.5%
Unmeasured HH	0.8	12%
Leakage	0.7	26.49%

Company Level Uncertainty



Component	Volume (MI/d)	Uncertainty
Balanced UFW	50	0.8%
Unbalanced UFW	10	100%
NHH	10	5%
Measured HH	5	2.5%
Unmeasured HH	3	12%
Illegal Use	0.4	50%
Operational Use (DSOU)	0.7	50%
Leakage	40.92	24.53%

Company Level Uncertainty



Component	Volume (Ml/d)	Uncertainty
Balanced UFW	50	0.8%
Unbalanced UFW	10	100%
NHH	10	5%
Measured HH	5	2.5%
Unmeasured HH	3	12%
Illegal Use	0.4	50%
Operational Use (DSOU)	0.7	50%
Leakage	40.92	24.53%

Component	Volume (Ml/d)	Uncertainty
Distribution Input	120	2.5%
DMA	60	3%
Measured HH	5	2.5%
Unmeasured HH	3	12%
NHH	10	5%
Illegal	0.36	50%
Operational Use (DSOU)	0.72	50%
Leakage	40.92	8.74%

Thank you

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