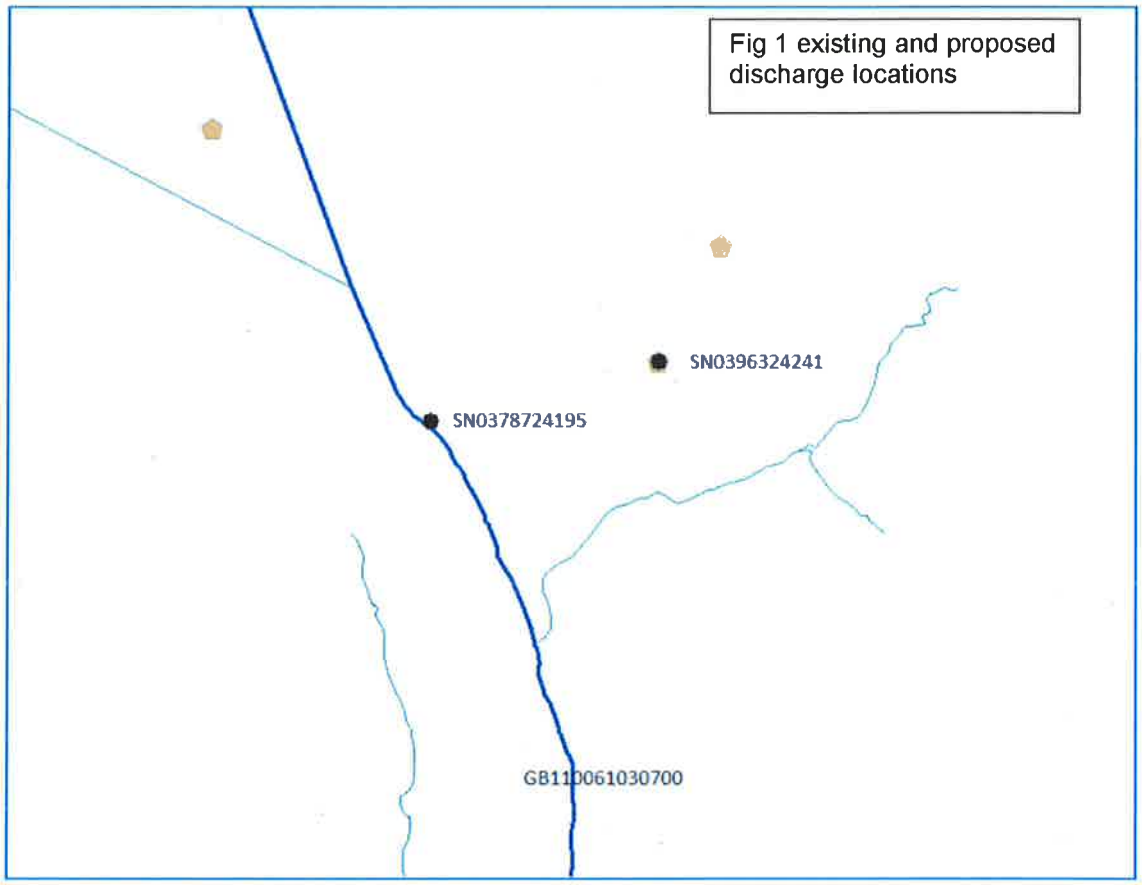
Dŵr Cymru
Welsh Water

Llys Y Fran

RQP Indicative permit limits report

LLYS Y FRAN- BP0366401

GB110061030700 | Syfynwy - Llys-y-fran to conf with E Cleddau | 2015 Status HIGH



During PR19 NEP Negotiations, NRW provided river flows for the unnamed tributary of the Afon Syfynwy as well as flow figures for the blue line river. An extract of the NRW resource spreadsheet is below – Table 1.

Water Body ID	Water Body Name	STW_NAME	PERMIT_NUM	Permit Holder	path to blue-line	modelling required	RIVER FLOW mean ADF (l/s)	RIVER FLOW Q95 (l/s)	Ammonia Type	BOD Type
GB110061030700	Syfynwy - Llys-y-fran to conf with E Cleddau	LLYS Y FRAN	BP0366401	Dwr Cymru Cyfyngedig	indirect	model BOD to unnamed trib	9	1	1	1
GB110061030700	Syfynwy - Llys-y-fran to conf with E Cleddau	LLYS Y FRAN	BP0366401	Dwr Cymru Cyfyngedig	indirect	model Ammonia to blue-line Afon Syfynwy	166	157	1	1

Following surveys by DCWW capital teams it has been confirmed that the discharge currently does not run south to the tributary but west through a culvert/stream to the blue line river. The new discharge point will also be to the blue line river.

Building calculation data-

River flow		
	ADF (l/s)	Q95 (l/s)
Blueline river flow	166	157

U/S River Quality			
BOD 2015 WFD	BOD Typology	Ammonia 2015 WFD	Ammonia Typology
High	1	High	1

U/S River Quality			
BOD		Ammonia	
Mean	0.86	Mean	0.06
SD	0.52	SD	0.03
90%ile	1.5	90%ile	0.1

Discharge Flow			
	DWF m3/d	Mean l/s	SD l/s
Current	9.9	0.14	0.05
Future	14.5	0.21	0.07

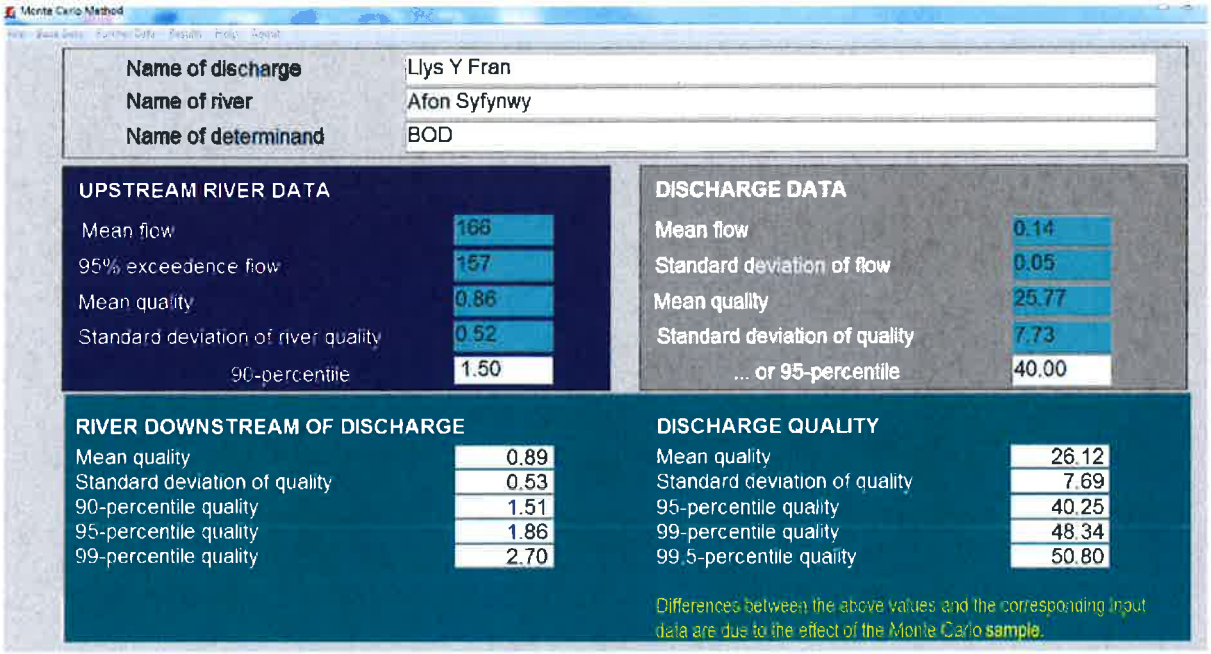
Discharge quality			
	Permitted 90%ile	Mean	SD
Ammonia	20	7.19	7.19
BOD	40	25.77	7.73

D/S Targets mg/l as an existing discharge			
	Existing Impact D/S 90%ile	Existing impact + 10% 90%ile	Class boundary 90%ile
BOD	1.51	1.661	3
Ammonia	0.1	0.11	0.2

D/S Targets mg/l as a new discharge		
	10% of extant U/S quality mean	Class Boundary 90%ile
BOD	0.946mg/l	3
Ammonia	0.066mg/l	0.2

Limits calculated	
	mg/l 95%ile
BOD	40
SS	60
Ammonia	20

Existing impact calculation BOD



Name of discharge	Llys Y Fran
Name of river	Afon Syfynwy
Name of determinand	BOD

UPSTREAM RIVER DATA

Mean flow	166
95% exceedence flow	157
Mean quality	0.86
Standard deviation of river quality	0.52
90-percentile	1.50

DISCHARGE DATA

Mean flow	0.14
Standard deviation of flow	0.05
Mean quality	25.77
Standard deviation of quality	7.73
... or 95-percentile	40.00

RIVER DOWNSTREAM OF DISCHARGE

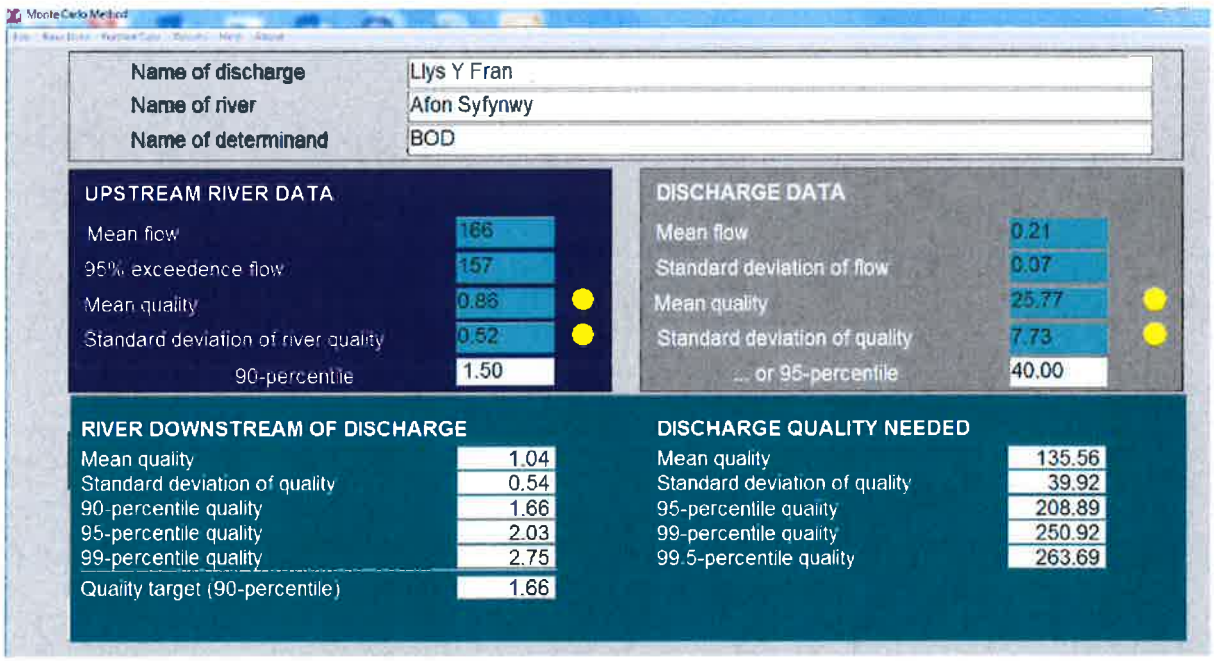
Mean quality	0.89
Standard deviation of quality	0.53
90-percentile quality	1.51
95-percentile quality	1.86
99-percentile quality	2.70

DISCHARGE QUALITY

Mean quality	26.12
Standard deviation of quality	7.69
95-percentile quality	40.25
99-percentile quality	48.34
99.5-percentile quality	50.80

Differences between the above values and the corresponding input data are due to the effect of the Monte Carlo sample.

Existing discharge 10% det target of 1.661mg/l D/S BOD



Name of discharge	Llys Y Fran
Name of river	Afon Syfynwy
Name of determinand	BOD

UPSTREAM RIVER DATA

Mean flow	166
95% exceedence flow	157
Mean quality	0.86
Standard deviation of river quality	0.52
90-percentile	1.50

DISCHARGE DATA

Mean flow	0.21
Standard deviation of flow	0.07
Mean quality	25.77
Standard deviation of quality	7.73
... or 95-percentile	40.00

RIVER DOWNSTREAM OF DISCHARGE

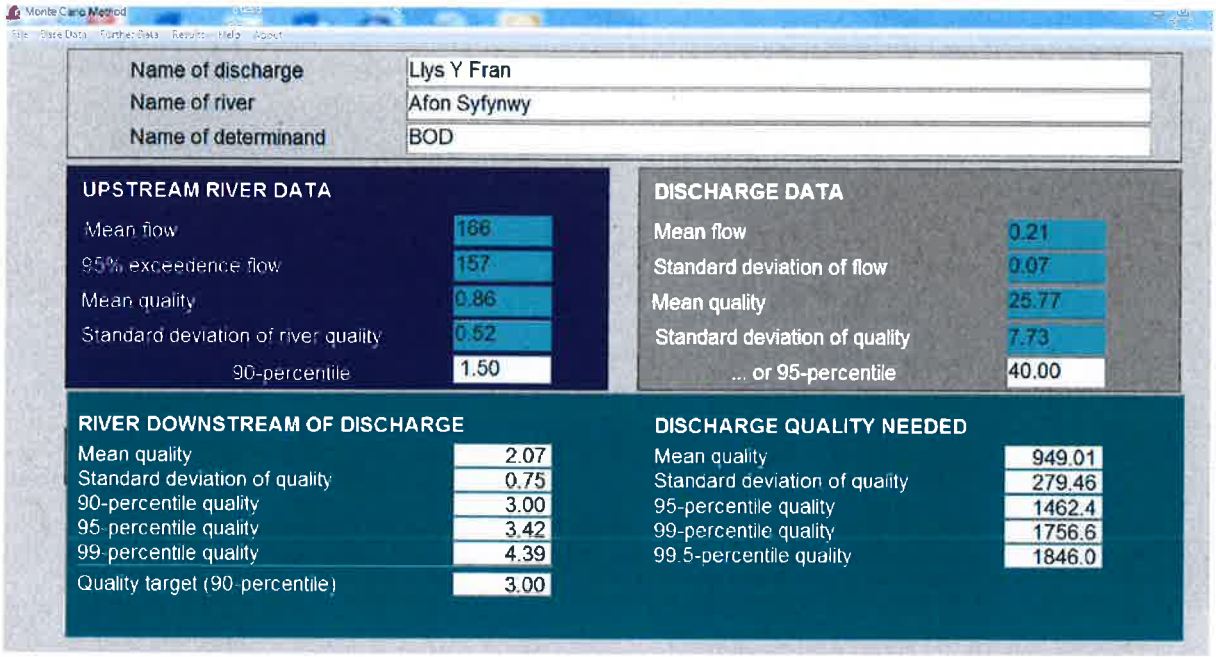
Mean quality	1.04
Standard deviation of quality	0.54
90-percentile quality	1.66
95-percentile quality	2.03
99-percentile quality	2.75
Quality target (90-percentile)	1.66

DISCHARGE QUALITY NEEDED

Mean quality	135.56
Standard deviation of quality	39.92
95-percentile quality	208.89
99-percentile quality	250.92
99.5-percentile quality	263.69

Limit of 208 mg/l

Class boundary target 3mg/l D/S BOD



Name of discharge	Llys Y Fran
Name of river	Afon Syfynwy
Name of determinand	BOD

UPSTREAM RIVER DATA	
Mean flow	166
95% exceedence flow	157
Mean quality	0.86
Standard deviation of river quality	0.52
90-percentile	1.50

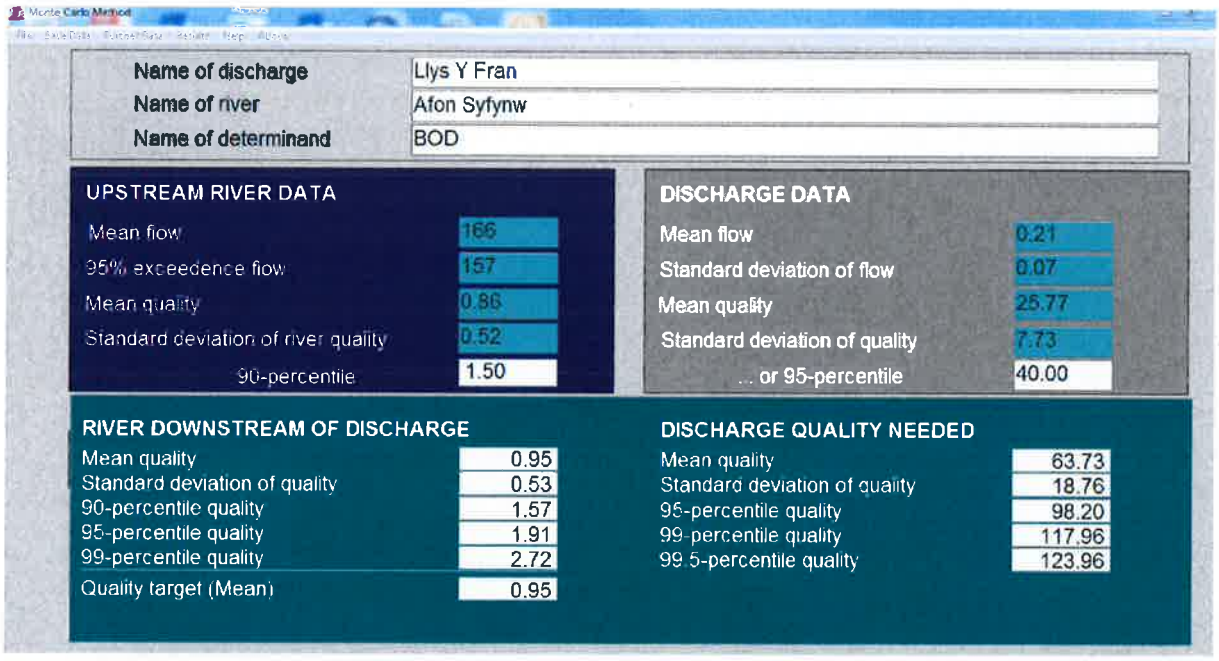
DISCHARGE DATA	
Mean flow	0.21
Standard deviation of flow	0.07
Mean quality	25.77
Standard deviation of quality	7.73
... or 95-percentile	40.00

RIVER DOWNSTREAM OF DISCHARGE	
Mean quality	2.07
Standard deviation of quality	0.75
90-percentile quality	3.00
95-percentile quality	3.42
99-percentile quality	4.39
Quality target (90-percentile)	3.00

DISCHARGE QUALITY NEEDED	
Mean quality	949.01
Standard deviation of quality	279.46
95-percentile quality	1462.4
99-percentile quality	1756.6
99.5-percentile quality	1846.0

Limit of 1462 mg/l

As a NEW discharge- Target set as 10% of existing U/S quality as a mean 0.946 mg/l MEAN BOD



Name of discharge	Llys Y Fran
Name of river	Afon Syfynw
Name of determinand	BOD

UPSTREAM RIVER DATA	
Mean flow	166
95% exceedence flow	157
Mean quality	0.86
Standard deviation of river quality	0.52
90-percentile	1.50

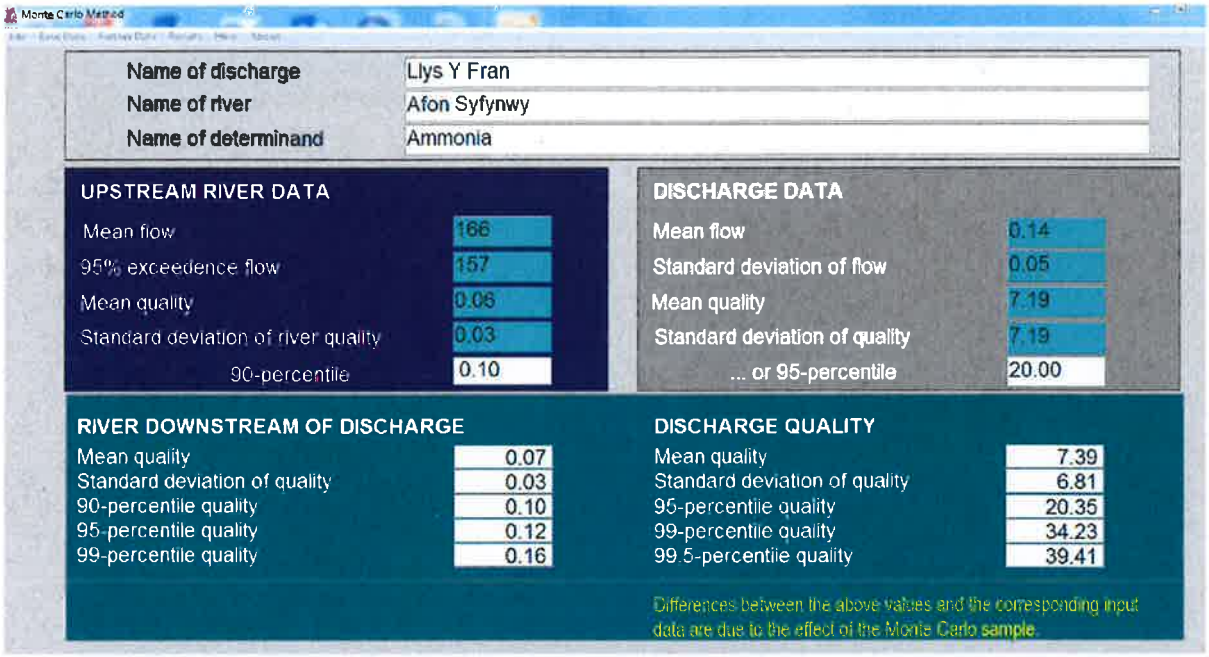
DISCHARGE DATA	
Mean flow	0.21
Standard deviation of flow	0.07
Mean quality	25.77
Standard deviation of quality	7.73
... or 95-percentile	40.00

RIVER DOWNSTREAM OF DISCHARGE	
Mean quality	0.95
Standard deviation of quality	0.53
90-percentile quality	1.57
95-percentile quality	1.91
99-percentile quality	2.72
Quality target (Mean)	0.95

DISCHARGE QUALITY NEEDED	
Mean quality	63.73
Standard deviation of quality	18.76
95-percentile quality	98.20
99-percentile quality	117.96
99.5-percentile quality	123.96

Limit of 98mg/l

Existing impact calculation Ammonia



Name of discharge	Llys Y Fran
Name of river	Afon Syfynwy
Name of determinand	Ammonia

UPSTREAM RIVER DATA

Mean flow	166
95% exceedence flow	157
Mean quality	0.06
Standard deviation of river quality	0.03
90-percentile	0.10

DISCHARGE DATA

Mean flow	0.14
Standard deviation of flow	0.05
Mean quality	7.19
Standard deviation of quality	7.19
... or 95-percentile	20.00

RIVER DOWNSTREAM OF DISCHARGE

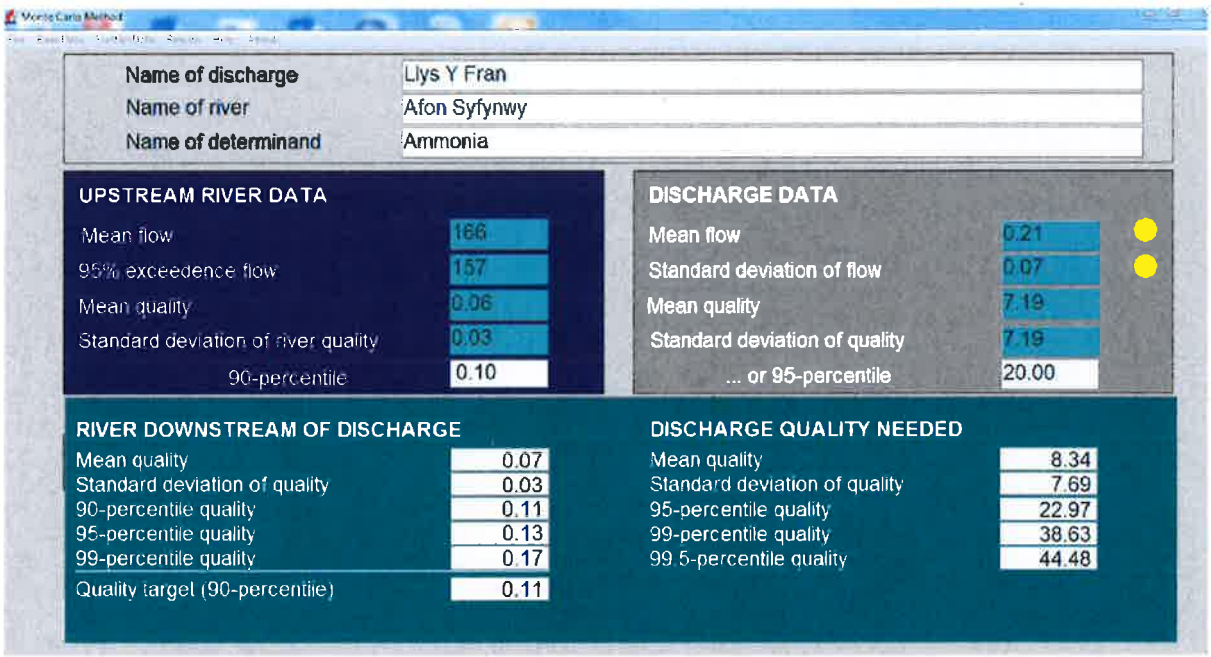
Mean quality	0.07
Standard deviation of quality	0.03
90-percentile quality	0.10
95-percentile quality	0.12
99-percentile quality	0.16

DISCHARGE QUALITY

Mean quality	7.39
Standard deviation of quality	6.81
95-percentile quality	20.35
99-percentile quality	34.23
99.5-percentile quality	39.41

Differences between the above values and the corresponding input data are due to the effect of the Monte Carlo sample.

Existing discharge 10% det target of 0.11mg/l D/S Ammonia



Name of discharge	Llys Y Fran
Name of river	Afon Syfynwy
Name of determinand	Ammonia

UPSTREAM RIVER DATA

Mean flow	166
95% exceedence flow	157
Mean quality	0.06
Standard deviation of river quality	0.03
90-percentile	0.10

DISCHARGE DATA

Mean flow	0.21
Standard deviation of flow	0.07
Mean quality	7.19
Standard deviation of quality	7.19
... or 95-percentile	20.00

RIVER DOWNSTREAM OF DISCHARGE

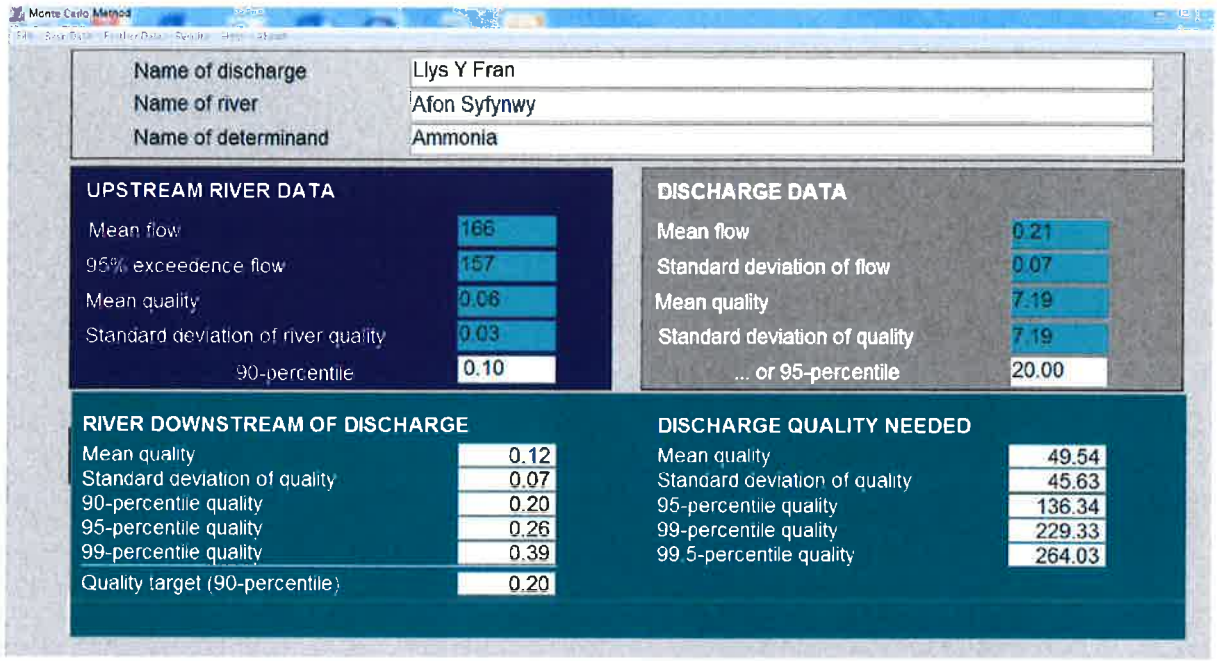
Mean quality	0.07
Standard deviation of quality	0.03
90-percentile quality	0.11
95-percentile quality	0.13
99-percentile quality	0.17
Quality target (90-percentile)	0.11

DISCHARGE QUALITY NEEDED

Mean quality	8.34
Standard deviation of quality	7.69
95-percentile quality	22.97
99-percentile quality	38.63
99.5-percentile quality	44.48

Limit of 22mg/l

Class boundary target 0.2mg/l D/S Ammonia



Name of discharge	Llys Y Fran
Name of river	Afon Syfynwy
Name of determinand	Ammonia

UPSTREAM RIVER DATA	
Mean flow	166
95% exceedence flow	157
Mean quality	0.06
Standard deviation of river quality	0.03
90-percentile	0.10

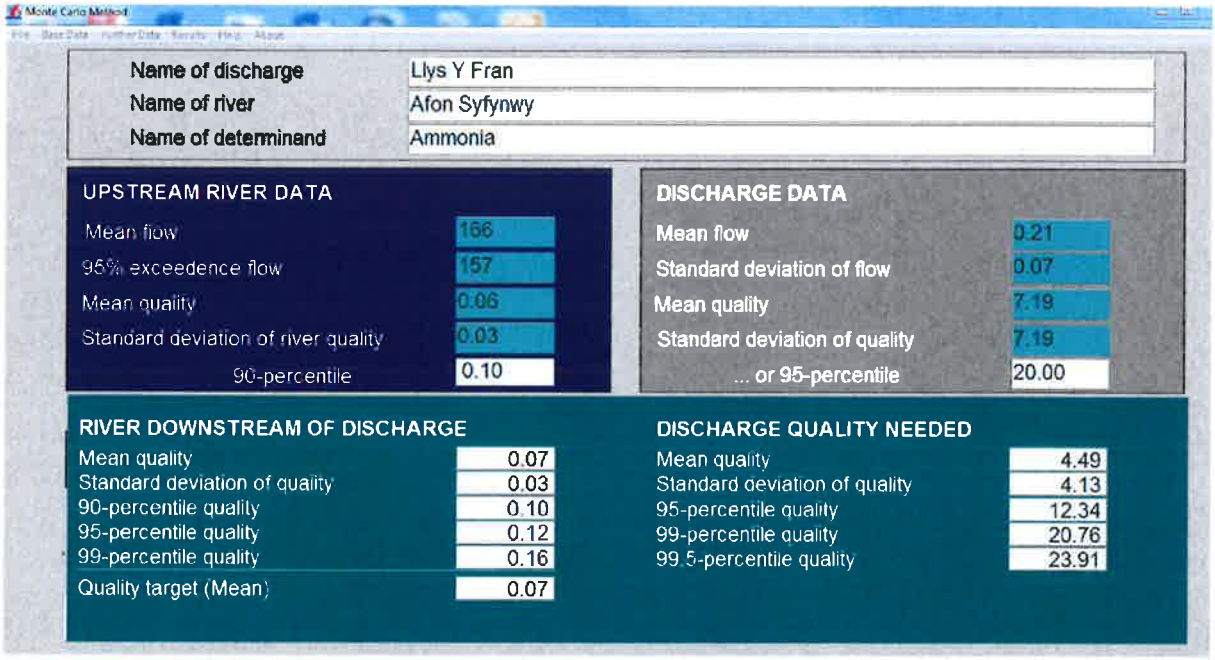
DISCHARGE DATA	
Mean flow	0.21
Standard deviation of flow	0.07
Mean quality	7.19
Standard deviation of quality	7.19
... or 95-percentile	20.00

RIVER DOWNSTREAM OF DISCHARGE	
Mean quality	0.12
Standard deviation of quality	0.07
90-percentile quality	0.20
95-percentile quality	0.26
99-percentile quality	0.39
Quality target (90-percentile)	0.20

DISCHARGE QUALITY NEEDED	
Mean quality	49.54
Standard deviation of quality	45.63
95-percentile quality	136.34
99-percentile quality	229.33
99.5-percentile quality	264.03

Limit of 136mg/l

As a NEW discharge- Target set as 10% of existing U/S quality as a mean 0.066 mg/l MEAN Ammonia



Name of discharge	Llys Y Fran
Name of river	Afon Syfynwy
Name of determinand	Ammonia

UPSTREAM RIVER DATA	
Mean flow	166
95% exceedence flow	157
Mean quality	0.06
Standard deviation of river quality	0.03
90-percentile	0.10

DISCHARGE DATA	
Mean flow	0.21
Standard deviation of flow	0.07
Mean quality	7.19
Standard deviation of quality	7.19
... or 95-percentile	20.00

RIVER DOWNSTREAM OF DISCHARGE	
Mean quality	0.07
Standard deviation of quality	0.03
90-percentile quality	0.10
95-percentile quality	0.12
99-percentile quality	0.16
Quality target (Mean)	0.07

DISCHARGE QUALITY NEEDED	
Mean quality	4.49
Standard deviation of quality	4.13
95-percentile quality	12.34
99-percentile quality	20.76
99.5-percentile quality	23.91

Limit of 12mg/l (this results in a 90%ile D/S exactly the same as U/S quality = 0.1mg/l) as RQP cannot take 3 decimal places difference in D/S quality target cannot be accounted for.