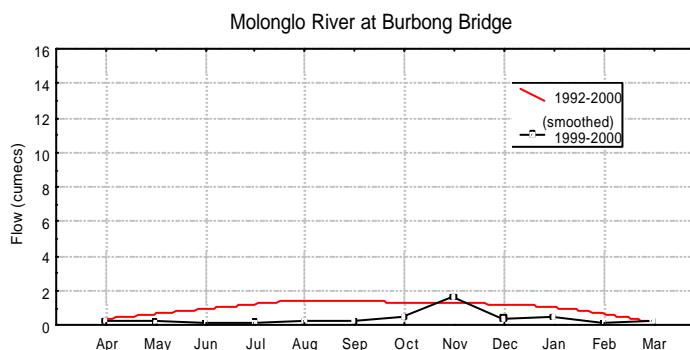
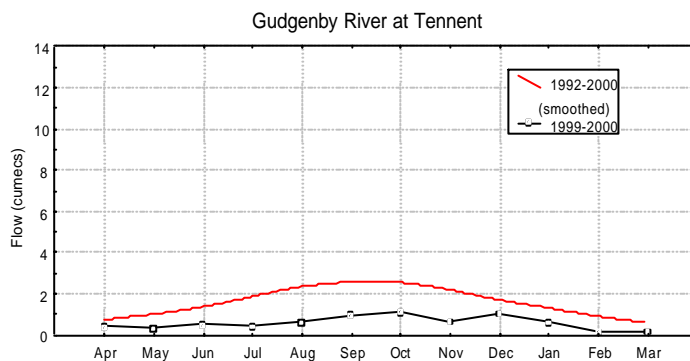
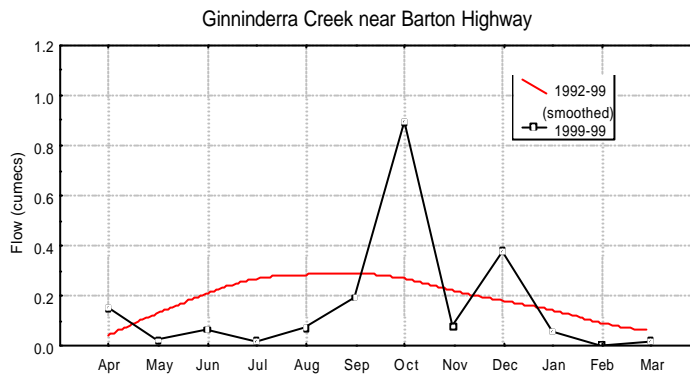


# APPENDIX 1—CHARTS ILLUSTRATING RIVER FLOW IN THREE CLIMATIC REGIONS

The charts below illustrate the flow from three different climatic regions. Within each chart are the mean monthly flow and the mean monthly flow for the eight year period 1992–2000 for the sampling station.



## APPENDIX 2—AUSRIVAS MONITORING RESULTS

This section contains the tabulated results of the AUSRIVAS monitoring program.

Key:

- A Equivalent to reference
- B Below reference
- C Well below reference
- D Impoverished
- X Above reference
- \* Outside the experience of the model

Site	River	Location	Autumn 99 Edge	Spring 99 Edge
3	Cotter River	Vanitys Crossing	B	B
16	Tidbinbilla River	Ring Road causeway, Tidbinbilla Nature Reserve	B	A
18	Gibraltar Creek	Gibraltar Falls	A	A
28	Gudgenby River	Glendale Crossing	A	X
41	Murrumbidgee River	Tharwa Bridge	B	A
80	Molonglo River	Downstream of junction with Copper Creek	B	B
81	Molonglo River	Queanbeyan—Captains Flat Road bridge	B	A
82	Molonglo River	Downstream of Captains Flat Reservoir	B	B
129	Goodradigbee River	Swinging Bridge Reserve	A	A
130	Micalong Creek	Micalong Creek Reserve	A	X
138	McDonald Creek	off Brindabella Road	X	A
139	Oaks Creek	Brindabella Road	X	B
175	Nungar Creek	Tantangara Road bridge	A	B
298	Banjo Creek	Yass Valley Way bridge	A	A
299	O'Briens Creek	Yass Valley Way bridge	B	B
300	Mantons Creek	'Hardwicke Stud'	A	A
301	Kitty's Creek	Kirketon Road bridge	X	A
302	Warroo Creek	Wee Jasper - Yass Road bridge	B	A
303	Sapling Creek	Boambolo Road causeway	B	A
304	Murrumbidgee River	'Boambolo'	B	*
305	Unamed Creek	Cavans Road causeway	A	B
306	Mountain Creek	Sawyers Gully Road causeway	B	A
307	Ledgers Creek	Mountain Creek Road causeway	B	A
308	Mullion Creek	Mountain Creek Road bridge	A	A
309	Nottingham Creek	Nottingham Road bridge	A	A
310	Swamp Creek	Fairlight Road bridge	A	B
311	Swamp Creek	Mountain Creek Road bridge	B	B
312	Uriarra Creek	Mountain Creek Road bridge	B	A
313	Condor Creek	Warks Road bridge	A	A
314	Lees Creek	Bullock Paddock Road bridge	A	X
315	Bull Flat Creek	Crace Lane bridge	A	A
316	Cooleman Creek	Crace Lane bridge	A	X
317	Bushrangers Creek	Bendora Road bridge	B	A
318	Collins Creek	Bendora Road bridge	A	A

319	Unamed Creek	Opposite Blewitts picnic area, Tidbinbilla Nature Reserve	A	A
320	Mountain Creek	Ring Road causeway, Tidbinbilla Nature Reserve	B	A
321	Murrumbateman Creek	Downstream of quarry, Murrumbateman—Gundaroo Road	C	B
322	Gooromon Ponds Creek	Wallaroo Road bridge	B	C
323	Amungula Creek	Sutton Road bridge	B	A
324	Yass River	Woodfield Road crossing	B	A
325	Reedy Creek	Sutton Road bridge	C	B
326	Holden Creek	Uriarra Road bridge	B	B
327	Reedy Creek	Sutton Road bridge	B	A
328	Unamed Creek	Kowen Pine Forest	B	B
329	Glen Burn Creek	Kowen Pine Forest	B	A
330	Molonglo River	'Banjo" bridge	B	B
331	Whiskers Creek	Queanbeyan—Captains Flat Road bridge	A	A
332	Woden Creek	'Stonyhurst'	B	B
333	Jerrabomberra Creek	Fernleigh Drive bridge	B	A
334	Yaouk Creek	Yaouk Road bridge	A	B
335	Urialla Creek	Urialla Road causeway	A	A
336	Copper Creek	Upstream of junction with Molonglo River	B	B
337	Ballallaba Creek	Harolds Cross Road causeway	A	A
338	Molonglo River	Wild Cattle Flat Road causeway	A	A
339	Tinderry Creek	Urilla Road bridge, 'Tinderry Station'	A	A
340	Ballinafad Creek	Wild Cattle Flat Road causeway	A	X
341	Michelago Creek	Monaro Highway bridge	A	A
342	Michelago Creek	off Michelago Road	B	B
343	Ryries Creek	off Michelago Road	B	A
344	Michelago Creek	Tindery Road bridge	B	A
345	Roberts Creek	'Old Hillside'	A	A
346	Queanbeyan River	Captains Flat—Jerrangle Road bridge	A	A
347	Wangrah River	'Bundarra'	B	A
348	Spring Vale Creek	Bumbalong Fire Trail crossing	A	B
349	Murrumbidgee River	1 km west of Bredbo	B	A
350	Bredbo River	6.25 km south of "Good Good Station'	A	X
351	Frogs Hole Creek	Jerangle—Numeralla Road causeway	A	A
352	Bredbo River	Jerangle—Numeralla Road causeway	B	A
353	Murrumbucca Creek	Billilingra Road causeway	B	B
354	Rock Flat Creek	'Cottage Hill'	B	B
355	Peak Creek	Dry Plains Road causeway	B	A
356	Bridle Creek	Dry Plains Road causeway	B	X
357	Cooma Creek	off Mulach Street, Cooma	C	C
358	Cooma Creek	off Church Road, Cooma	B	A
359	Rock Flat Creek	Carlaminda Road bridge	A	B

Edge refers to the habitat sampled. In the Upper Murrumbidgee catchment there are two habitats generally sampled, these include edge and riffle.

## APPENDIX 3–ASSESSMENT METHODOLOGY

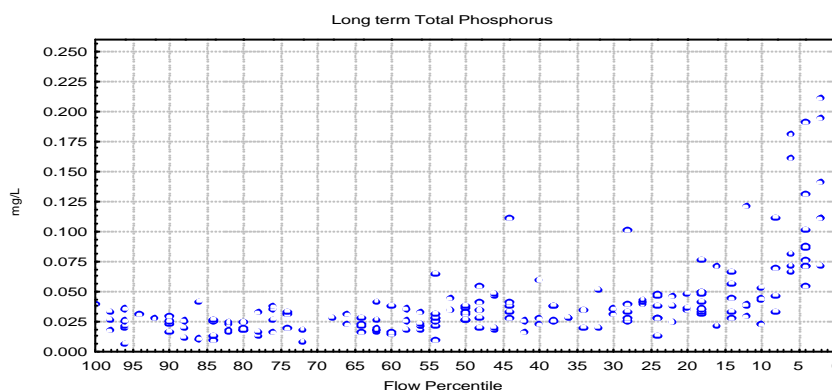
### Introduction

Some water quality indicators such as suspended solids, turbidity, total phosphorus and total nitrogen normally vary in direct proportion with streamflow. The following method has been used to compare current year levels of these indicators with past trends corrected for different flows.

### Current Status

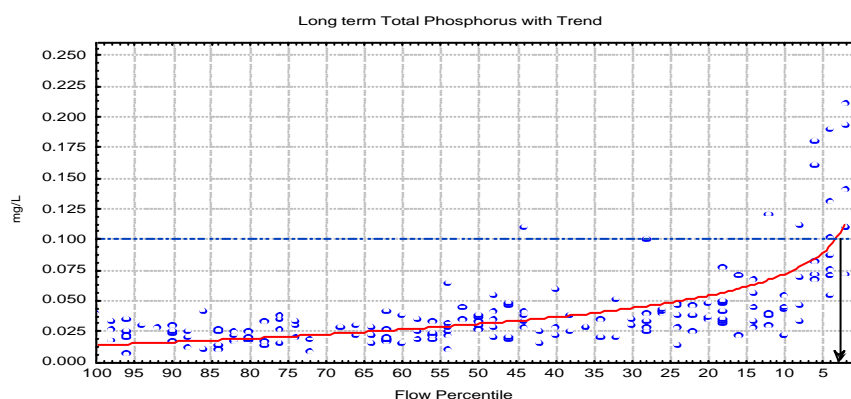
Determining the proportion of time an indicator would appear to exceed the standard is a four-step process.

The first step involves plotting the long term indicator value against the flow percentile at the time of sampling.



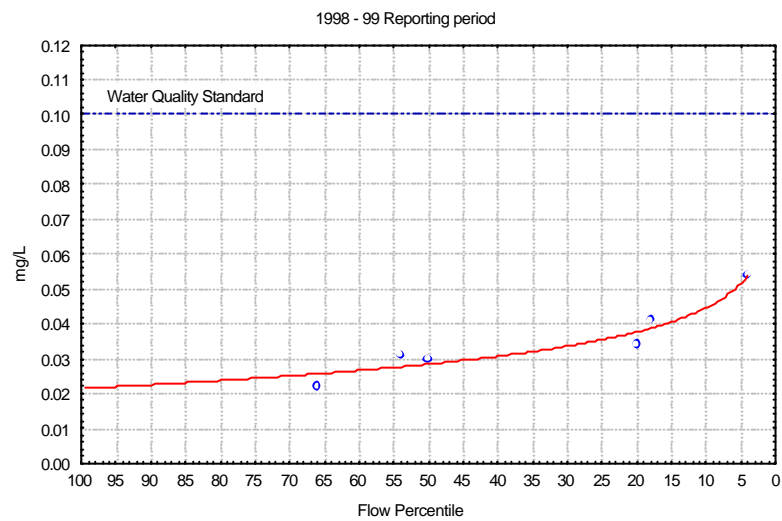
The scatter plot shows a general trend that as flow increases (lower flow percentile number) the concentration of the indicator, in this case total phosphorus, increases.

When we fit a logarithmic curve to this trend we can then see at what point the line crosses the water quality standard (step two).

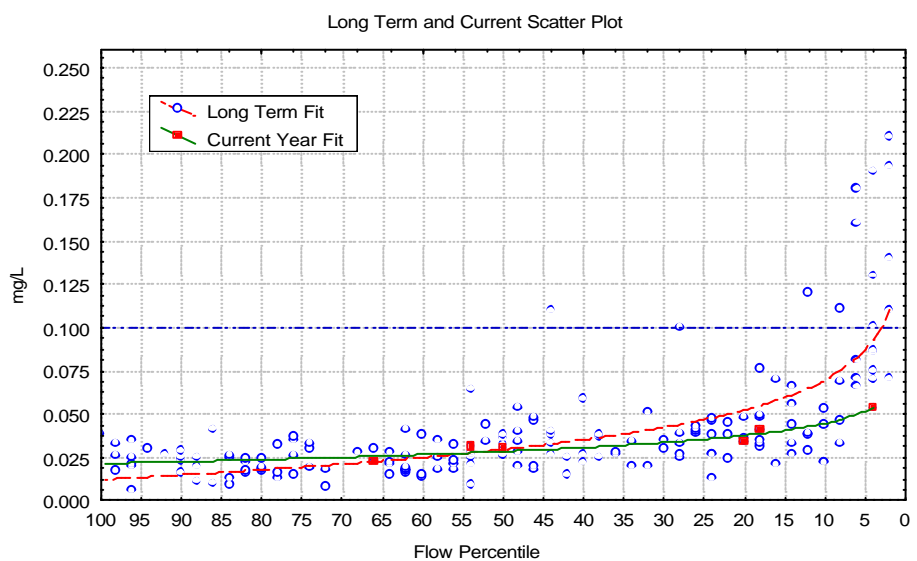


With this particular example, the line of fit crosses the standard at a flow percentile of 3. Generalising, we can say that for total phosphorus at this site, the standard is only exceeded when the flow gets above the 3<sup>rd</sup> percentile i.e. the flow that is exceeded only 3 percent of the time (very high flow).

The third step involves looking at the previous 12 months data and fitting a similar curve. The flow exceedance for the indicator can again be determined by looking at where the line crosses the standard. In this example the line does not cross the standard so we would say that based on the samples taken during the period, the standard would not be exceeded at any part of the flow regime.



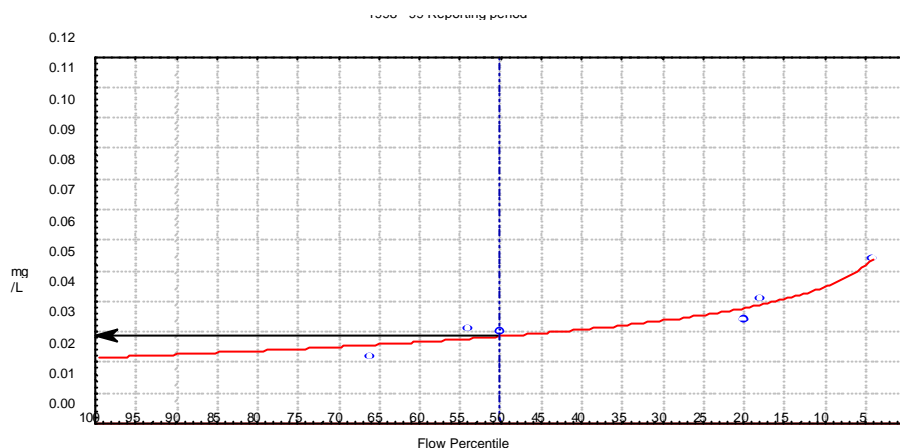
The final step involves putting the long term and short term data together. This allows us to see how the past 12 months compares with the longer term data.



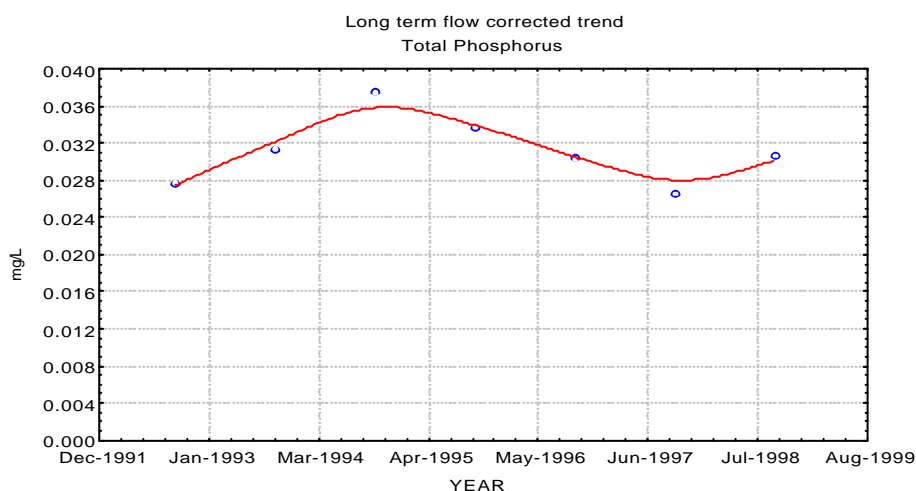
This graph shows, that for the current reporting period, the concentration of total phosphorus not only was below the standard, but was also lower than the long term situation.

### Long Term Trend

Trend analysis for the flow dependent indicators was conducted in a similar manner but instead of looking at where the line crossed the water quality standard, the point at which the line met the 50<sup>th</sup> percentile (median flow) was determined.



For this example the 50<sup>th</sup> percentile flow would have a concentration of total phosphorus of 0.03 mg/L . This is calculated for each year to enable a determination of what the flow corrected water quality would be for this indicator over the trend reporting period.



Flow correction is important in assessing the performance of an indicator as it allows us to remove this dependency and see how the indicator would have otherwise performed.

## APPENDIX 4—RESULTS FROM ALL SAMPLING SITES

This section contains the scatterplots of data for all sites sampled and the indicators discussed in this report.