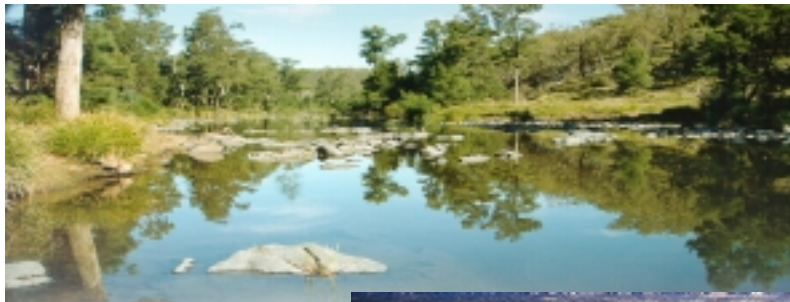




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CONSERVATION

NSW Department of Land and Water Conservation

Surface Water Quality Assessment of the Hawkesbury-Nepean Catchment 1995-1999 Data Information Report



January 2001

NSW Department of Land and Water Conservation©

Surface Water Quality Assessment of the Hawkesbury-Nepean Catchment 1995-1999

Data Information Report

Prepared by

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ACRONYMS

Organisation	Code
NSW Environment Protection Authority	EPA
Hawkesbury Nepean Catchment Management Trust (Streamwatch)	HNCMT
Berowra Catchment Management Committee	BCMC
Department of Land and Water Conservation	DLWC
Sydney Water Corporation	SWC
Sydney Catchment Authority	SCA
Blacktown City Council	BCC
Blue Mountains City Council	BMCC
Camden City Council	CmCC
Fairfield City Council	FCC
Gosford City Council	GoCC
Goulburn City Council	GuCC
Hawkesbury City Council	HCC
Hornsby Shire Council	HnCC
Lithgow City Council	LCC
Penrith City Council	PCC
Wingecarribee Council	WiC
Baulkham Hills Shire Council	BHSC
Kuring-gai City Council	KCC

1 Introduction

1.1 Background

The Department of Land and Water Conservation (DLWC) is facilitating a river assessment and monitoring program within the Hawkesbury-Nepean Catchment as a part of the NSW State Government's Water Reform Agenda. The assessment program will assist Water Management Committees (consisting of representatives from government agencies, the community, water users) to develop Water Management Plans (WMPs) as part of the implementation of water reforms within the Hawkesbury-Nepean River catchment.

As part of this process water quality data for the Hawkesbury-Nepean catchment was compiled and assessed against the environmental values for the catchment which were identified by the community and listed in the Healthy Rivers Commission Inquiry into the Hawkesbury Nepean River (1998).

This report is the technical data report, which is to be used as an appendix to the main report, Surface Water Quality Assessment of the Hawkesbury-Nepean catchment 1995-1999 (DLWC 2001).

2 Sub-catchment Data Information

2.1 Site and Data information

In the following section, information on the data collected is presented for each of the sub-catchments. The information has been divided into three sections:

- Details on the data owner and program name and objectives;
- Site information details, provides the site code, site description and site co-ordinates; and
- Data information provides details on the date range of data available at each site and variables measured as well as the number of observations for each variable.

Abbreviations in the data information tables used in this data report are listed below.

pH	pH
Temp	Temperature
DO	Dissolved oxygen
DO Sat	Dissolved oxygen % saturation
Cond	Conductivity
Turb	Turbidity
SS	Suspended solids
Secchi	Secchi depth
TN	Total nitrogen
TP	Total phosphorus
Chl-a	Chlorophyll-a
BGA	Blue green algae
FC	Faecal coliforms
Ent	Enterococci
Al	Aluminium
Fe	Iron
Mn	Manganese
F.Al	Filterable aluminium
F.Fe	Filterable iron

F.Mn	Filterable manganese
Sal	Salinity
Sodium	Sodium
TKN	Total Kjeldahl Nitrogen
NOx	Oxidised Nitrogen
TUA	Total Uncombined Ammonia

Within each sub-catchment section there is a table containing site details. This table includes two site code columns, one site code (provided) column and the other is site code (unique). The site code (provided) column generally has the site code as provided by the data holder when the data was supplied for this project. The site code (unique) column contains a modified site code. This modified site code was used to identify each site when the data was combined on the basis of latitude and longitude during the data processing phase of the project and is the code used in Appendix 4 of the main report (DLWC 2000).

2.2 Site Selection

One of the objectives of this project was to develop a list of key sites to represent and show the overall catchment condition by using a compliance assessment approach. The method developed for this project was one that allowed electronic processing of the data to obtain a consistency of approach. This methodology used the following steps, taking into account:

- Step 1 - data quality, by assessing the analytical methods;
- Step 2 - sampling frequency, to ensure that there were a sufficient number of observations at a site to adequately represent the quality and variability in quality of a site; and
- Step 3 - site location to assess whether the water quality at a site was influenced by point sources and dominant land-use.

Coding of Sites

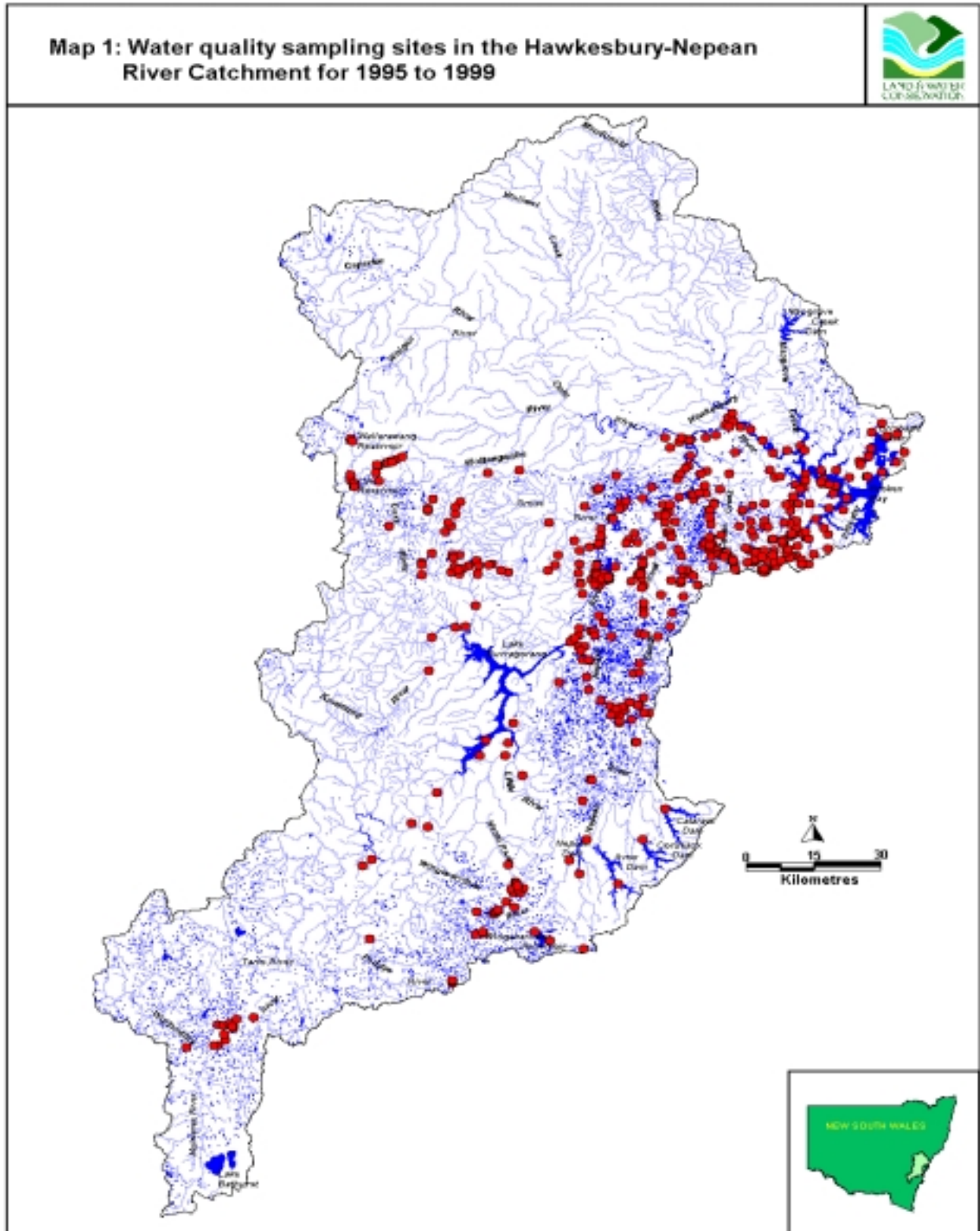
Data quality based upon the sampling and analytical methodology was an important issue for the selection of key sites. Sites were coded according to the criteria listed in Table 1. The data quality code for each site is provided in the site information tables in each sub-catchment section in this report.

Table 1: Coding for sampling sites

Category	Code
Sample analysis procedures	
Professionally sampled and analysed in accordance with NATA Certifications and / or established field measurement protocols exist.	1
Sampled and / or analysed by professional staff without NATA Certification using laboratory based methods	2
Sampled by professional staff and analysed using field based kits.	3
Sampled by community groups and analysed by field kits (no quality control/assurance).	4

3 Sampling Sites

The following map (Map 1) shows all sampling sites presented in this report.



Map 1: Water quality sampling sites in the Hawkesbury-Nepean River Catchment for 1995 to 1999

4 Sub-catchment Sites Information and Data Details

Brisbane Water

Gosford Council undertakes water quality sampling in the Brisbane Water sub-catchment. The program commenced in 1995 and includes sampling in Brisbane Water and its main tributaries. Data is also collected from the lagoons north of Gosford, however these are outside the study area. Sampling is undertaken on a monthly basis. In 1999 the contract for sample collection changed from Laxton to UTS (University of Technology) and included wet weather sampling and biological assessment of the state of Brisbane Water. Data was provided for the period 1996 to 1998. To complete the data collation process for the Hawkesbury-Nepean catchment the data up to the end of 1999 needs to be obtained.

Data quality has been classified as 2 as the samples are not analysed by a NATA registered laboratory

There was generally a good coverage of data across the Brisbane Water estuary. However there is inadequate spatial coverage of the freshwater sections of Narara and Erina Creeks. Additional sites may provide greater understanding of the impact of land use on water quality in the estuary and assist with the identification of pollutant sources in these waterways. At the time of writing, a pilot study had been initiated by Gosford City Council to rectify some of these data gaps.

Table 2: Data owner and contact details for Brisbane Water

Organisation code	Organisation	Study code	Study name	Contact	Reason for collection
GoCC	Gosford City Council	GoCCWQ	Gosford Creeks Water Quality Program	Gary Chestnut	Assessment of water quality in Brisbane Water and its tributaries

Table 3: Site information for Brisbane Water

Site Code (provided)	Site code (unique)	Study code	Organisation	Site description	Longitude	Latitude	Data quality
GL26	GL26	GoCCWQ	GoCC	Woy Woy Creek u/s of Woy Woy Bay Rd. and the un-named Ck	151.2915	-33.4941	2
GL21	GL21	GoCCWQ	GoCC	Woy Woy Bay Lara St.	151.3123	-33.4839	2
GL19	GL19	GoCCWQ	GoCC	Koolewong Couche Cr.	151.3189	-33.4662	2
GL20	GL20	GoCCWQ	GoCC	Koolewong Couche Cr.	151.3189	-33.4662	2
GL15	GL15	GoCCWQ	GoCC	Lower Narara Creek Pacific Hwy	151.3219	-33.4288	2
GL22	GL22	GoCCWQ	GoCC	Booker Bay PW Under the bridge	151.3448	-33.5193	2
GL23	GL23	GoCCWQ	GoCC	Booker Bay PW Under the bridge	151.3448	-33.5193	2
GL15a	GL15a	GoCCWQ	GoCC	Upper Narara Creek Showground Rd	151.3454	-33.4078	2
GL16	GL16	GoCCWQ	GoCC	Lower Erina Creek Waratah Rd	151.3589	-33.4373	2
GL18	GL18	GoCCWQ	GoCC	Cockle Creek Hastings Wharf	151.3779	-33.4974	2

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Site Code (provided)	Site code (unique)	Study code	Organisation	Site description	Longitude	Latitude	Data quality
GL16a	GL16a	GoCCWQ	GoCC	Upper Erina Creek Corner of Winani Rd and River St.	151.3823	-33.4338	2
GL17	GL17	GoCCWQ	GoCC	Kincumber Creek NW Dundulla Rd and Cullens Rd	151.3983	-33.4744	2

Table 4: Data information for Brisbane Water

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
GL15	GoCC	03/01/1996	06/10/1998		33		34	34	34	33		33	34		34	33	33	33									33	33
GL15a	GoCC	08/02/1997	06/10/1998		21		21	21	21	21		21	22		21	21	21	21									21	21
GL16	GoCC	03/01/1996	06/10/1998		33		34	34	34	33		33	34		34	33	33	33									33	33
GL16a	GoCC	08/02/1997	06/10/1998		21		21	21	21	21		21	22		21	21	21	21									21	21
GL17	GoCC	03/01/1996	06/10/1998		33		34	34	34	33		33	34		34	33	33	33									33	33
GL18	GoCC	03/01/1996	06/10/1998		33		34	34	34	33		33	34		34	33	33	33									33	33
GL19	GoCC	03/01/1996	06/10/1998		33		34	34	34	33		33	34		34	33	33	33									33	33
GL20	GoCC	03/01/1996	06/10/1998		33										34	33	33										33	33
GL21	GoCC	03/01/1996	06/10/1998		33		34	34	34	33		33	34		34	33	33	33									33	33
GL22	GoCC	03/01/1996	06/10/1998		33		34	34	34	33		33	34		34	33	33	33									33	33
GL23	GoCC	03/01/1996	06/10/1998		33										34	33	33										33	33
GL26	GoCC	11/05/1997	06/10/1998		12		12	12	12	12		12	13		12	12	12	12									12	12

Lower Hawkesbury River

Sampling in the Lower Hawkesbury River sub-catchment over the past five years has been undertaken by a range of organisations (Table 5). The scope of these programs is as follows:

PAM – Performance Assessment Monitoring and Reporting Program is undertaken for Sydney Water. This program is part of their overall Environmental Indicators program and is part of Sydney Water's Licence conditions. The programs aimed to assess the impact of Sydney Water's activities on the environment. The program includes monthly routine sampling and three wet weather event sampling per year when there is greater than 25mm of rainfall in the catchment over a twenty-four hour period. The results of this program are reported annually in Sydney Water's annual environment report. This program started in 1995 and is currently ongoing. In the Lower Hawkesbury River there are four sites monitored under the PAM project.

RRH02 and HNMMain - These two programs are essentially the same with RRH02 an earlier version of the HNMmain program. RRH02 sites are no longer sampled under this program. In the Lower Hawkesbury River sampling is currently conducted on a bi-monthly basis at six locations (HNMMain) for the SCA. This program was originally initiated by Sydney Water and was transferred to the SCA upon its creation. The program was undertaken to assess the wastewater strategy in the Hawkesbury-Nepean River.

HSC-This program is run by Hornsby Shire Council and is part of their extensive monitoring program in the Hornsby Shire. There are six sites sampled in this sub-catchment on a monthly basis. The program is a routine sampling program and does not have a special wet weather sampling component.

EPAWQ - This program was conducted by the EPA as part of its water quality assessment program of the Hawkesbury-Nepean River up to June 1996. This program had seven sampling locations in this sub-catchment with sampling conducted on a monthly basis. Sampling was conducted as a routine program with no special wet weather sampling undertaken. Samples were analysed by the EPA labs at Lidcombe.

RecWat - This program is undertaken by DLWC as part of its recreational water quality program and monitors 4 sites at bathing locations. Sampling is conducted during the swimming season in summer from October to March on a six day basis the same as beachwatch program to meet the ANZECC 1992 guideline requirement of recreational sampling. Sites have been added at different times to this program depending. Data is analysed by NATA registered labs and collected by professional sampling staff. Samples are analysed for faecal bacteria and physical parameters.

BHSCWQ - This program is undertaken by Baulkham Hills Council of which there are two sites within this sub-catchment. Sampling at these sites commenced in 1995 and continued until the end of 1997. Sampling frequency was roughly on a monthly basis.

GoCCWQ- Gosford creeks program run by Gosford Council with two sites in the Lower Hawkesbury River sub-catchment. Additional information on this program is provided in the Brisbane Water sub-catchment section.

Data Gaps

Many of the smaller creeks draining the sub-catchment are poorly represented in the currently available data set. Additional emphasis on these creek systems should be considered in future monitoring programs. Current monitoring programs provide a good coverage in the lower Hawkesbury and it is recommended that these programs continue. Additional information needs to be collected in these programs to assess visual amenity such as scums, litter and debris and the presence of nuisance macrophyte/algae.

Table 5: Data owner and contact details for Lower Hawkesbury River

Org code	Organisation	Study code	Study name	Contact	Reason for collection
SWC	Sydney Water Corporation	PAM	Performance Monitoring Assessment and Reporting	Andrew Kasmarik	Assess performance of Sydney Water's activities on the environment
SWC	Sydney Water Corporation	RRH02	Hawkesbury-Nepean River water quality monitoring program	Amir Deen	Data for modelling and assessment of wastewater strategies
SCA	Sydney Catchment Authority	HNMain	Water quality in Hawkesbury Nepean River catchment	Amir Deen	Data for modelling wastewater strategies
HnCC	Hornsby Shire Council	HSC	Water Quality in Berowra Creek Catchment	Ros Mc Pherson /Jacqui Grove	Assess water quality in streams in Hornsby Shire Council area for SOE reporting
DLWC	Department of Land and Water Conservation	RecWat	Recreational Water Quality Study	Adam Boey	Summer sampling for faecal bacteria to determine recreational quality
EPA	Environment Protection Authority	EPAWQ	Hawkesbury Monitoring program	William Hall	SOE and assessment of health of waterways.
BHSC	Baulkham Hills Shire Council	BHSCWQ	Clean Waters Program	Andrea Horan	Recreational water quality monitoring as part of DLWC program and phys chem for SOE reporting
GoCC	Gosford City Council	GoCCWQ	Gosford Creeks Water Quality Program	Brad Snedden	Assessment of water quality in Brisbane Water and its tributaries

Table 6: Site information for Lower Hawkesbury River

Site code (provided)	Site code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
HAW3	HAW3	BHSCWQ	BHSC	Hawkesbury River River Rd, Cliftonville	150.923889	-33.434444	1
HAW4	HAW4	BHSCWQ	BHSC	Hawkesbury River at Wisemans Ferry, Webbs Creek	150.979455	-33.390213	1
RWQ25	RWQ25	RecWat	DLWC	Gibberagong Waterholes, Cockle Ck	151.081	-33.4112	1
RWQ40	RWQ40	RecWat	DLWC	Hawkesbury River at One Tree Reach	151.031	-33.419	1
RWQ-P1-03	RWQ-P1-03	RecWat	DLWC	Brooklyn Baths Hawkesbury River side	151.230728	-33.548051	1
RWQ-P2-03	RWQ-P2-03	RecWat	DLWC	Hawkesbury River at Wisemans Ferry, Webbs Creek	150.979455	-33.390213	1
104	104	EPAWQ	EPA	Hawkesbury River at Flat Rock Point	151.233133	-33.549179	1
175	175	EPAWQ	EPA	Hawkesbury River at Peats Ferry	151.199244	-33.543132	1
244	244	EPAWQ	EPA	Hawkesbury River at Bar Point	151.162222	-33.52	1

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Site code (provided)	Site code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
422	422	EPAWQ	EPA	Hawkesbury River at Sentry Box Reach	151.085	-33.471667	1
527	527	EPAWQ	EPA	Hawkesbury River at One Tree Reach	151.031	-33.419	1
662	662	EPAWQ	EPA	Hawkesbury River at Bathurst Reach	150.97	-33.407	1
70023	70023	EPAWQ	EPA	Mullet Creek	151.233333	-33.512778	1
GL24	GL24	GoCCWQ	GoCC	Upper Ettalong Ck. Etta Rd. and Mt. Ettalong Rd.	151.306059	-33.529504	2
GL25	GL25	GoCCWQ	GoCC	Lower Ettalong Ck. Carawa Cl. and end of Melbourne Ave.	151.308763	-33.528288	2
38	HSC38	HSC	HnCC	Hawkesbury River Sandbrook Inlet, Brooklyn, Centre of Inlet. Between Rock Outcrop and Green Boatshed	151.216276	-33.546438	1
54	HSC54	HSC	HnCC	Laughton Dale Gully Ck Pool opposite big rock cave, Wisemans Ferry	151.007	-33.411	1
56	HSC56	HSC	HnCC	Leachate Pond, Wisemans Ferry Tip Old Northern Rd, Wisemans Ferry	150.98	-33.411	1
70	HSC70	HSC	HnCC	Mooney Mooney creek at workers club wharf (midstream)	151.202778	-33.533333	1
72	HSC72	HSC	HnCC	Mullet Creek	151.233333	-33.512778	1
76	HSC76	HSC	HnCC	Porto Bay	151.224722	-33.566667	1
N04	N04	HNMain	SCA	Hawkesbury River at Peats Ferry Bridge	151.196389	-33.539194	1
N06	N06	HNMain	SCA	Hawkesbury River off Marlowe Creek	151.160324	-33.467807	1
N08	N08	HNMain	SCA	Hawkesbury River Courangra Point	151.117841	-33.467132	1
N11	N11	HNMain	SCA	Hawkesbury River at Gunderman	151.061389	-33.443889	1
N14	N14	HNMain	SCA	Hawkesbury River at Wisemans Ferry	150.988056	-33.381417	1
N18	N18	RRH02	SCA	Hawkesbury River at Leetsvale	150.948611	-33.429167	1
N21	N21	HNMain	SCA	Hawkesbury River at Lower Portland D/S Colo River	150.886403	-33.438487	1
N03	N03	RRH02	SWC	Hawkesbury River at Junio Point	151.256845	-33.576039	1
N04	N04-SW	PAM	SWC	Hawkesbury River at Peats Ferry Bridge	151.196389	-33.539194	1
N06	N06-SW	PAM	SWC	Hawkesbury River off Marlowe Creek	151.160324	-33.467807	1
N14	N14-SW	PAM	SWC	Hawkesbury River at Wisemans Ferry	150.988056	-33.381417	1
N18	N18-SW	PAM	SWC	Hawkesbury River at Leetsvale	150.948611	-33.429167	1

Table 7: Data information for Lower Hawkesbury River

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.AI	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
HAW3	BHSC	01/02/1995	19/03/1997			25	25	25	25			24					24	23			25					24	24	
HAW4	BHSC	01/02/1995	06/12/1997			29	29	29	29			29					28	27			29					24	27	
RWQ-P1-03	DLWC	09/12/1996	21/12/1999	30		2	45	46	3		48	48		14				29										
RWQ-P2-03	DLWC	04/01/1995	29/12/1999	25		78	103	103	78		107	107	75	99				73										
RWQ25	DLWC	23/03/1998	16/03/1999	10			9	9			10	10		5														
RWQ40	DLWC	04/01/1995	22/04/1998	5		73	77	80	75		81	81	73	78				71										
104	EPA	03/01/1995	02/07/1996		39	39	40	40	39				38	37	39		40	37								40	40	40
175	EPA	03/01/1995	02/07/1996		39	39	40	40	39				38	37	39		40	39								40	40	40
244	EPA	03/01/1995	02/07/1996		39	40	40	40	39				39	27	39		40	38								40	40	40
422	EPA	03/01/1995	02/07/1996		38	39	39	39	39				38	38	39		40	38								40	40	40
527	EPA	03/01/1995	02/07/1996		38	39	39	39	39				38	38	39		40	39								40	40	40
662	EPA	03/01/1995	02/07/1996		39	39	39	39	39				38	38	40		40	38								40	40	40
70023	EPA	03/01/1995	02/07/1996		39	38	39	39	38				37	38	39		40	38								40	40	40
GL24	GoCC	08/02/1997	06/10/1998		20		20	20	20	20		20	21		20	21	21	20									21	21
GL25	GoCC	08/02/1997	06/10/1998		21		21	21	21	21		21	22		21	21	21	21									21	21
38	HnCC	05/01/1995	09/12/1999		4	60	60	60	59	42		60	60		60	60	60	60								60	60	
54	HnCC	02/04/1996	08/12/1999		1	44	43	44	43	41		44	44		44	44	44	44								44	44	
56	HnCC	02/05/1996	08/12/1999		3	43	42	43	42	41		43	43		43	43	43	43								43	43	
70	HnCC	09/01/1997	09/12/1999			29	29	29	28	28		27	29					29										

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SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
72	HnCC	05/06/1997	09/12/1999			29	29	29	28	28		27	29					29										
76	HnCC	04/01/1999	09/12/1999			12	12	12	12	12		12	12					12										
N04	SCA	17/01/1995	21/12/1999	1		76	76	76	76	76	65	111		59	76	76	76	75									76	76
N06	SCA	16/07/1996	21/12/1999			76	76	76	76	76	65	76		61	76	76	76	76									76	76
N08	SCA	16/07/1996	21/12/1999			76	76	75	76	76	65	76		60	76	76	76	76									76	76
N11	SCA	16/07/1996	21/12/1999			76	76	76	76	76	65	77		61	77	77	77	76									77	77
N14	SCA	03/01/1995	21/12/1999	17	26	116	115	116	115	77	65	116		94	116	116	116	116									116	116
N18	SCA	16/01/1996	02/06/1998	11		23	23	23	11	23	15	23		6	2	23	23	8									23	23
N21	SCA	03/01/1995	21/12/1999	90	26	115	116	116	115	77	64	115		98	116	115	115	114									115	115
N03	SWC	22/01/1999	06/12/1999		5	12	12	12	12	12	6	6				6	6										6	6
N04	SWC	03/01/1995	06/12/1999		74	58	80	81	80	36	53	80				83	83	8									83	83
N06	SWC	10/10/1995	06/12/1999		53	54	55	55	55	36	53	60				61	61	8									61	61
N14	SWC	03/01/1995	06/12/1999		73	81	82	82	80	36	54	82				83	83	11									83	83
N18	SWC	29/08/1995	06/12/1999		53	63	63	64	64	36	53	61				64	64	14									64	64

Cowan and Pittwater

Within the Cowan and Pittwater sub-catchment there are also a number of monitoring programs currently being conducted by different organisations. These are listed in Table 8 and described below.

HSC- this program is run by Hornsby Shire Council and is part of their extensive monitoring program in the Hornsby Shire. There are two sites sampled in this sub-catchment on a fortnightly and monthly basis. The program is a routine sampling program and does not have special wet weather sampling component. Sampling commenced in 1995 and is currently ongoing.

EPAWQ - This program was conducted by the EPA as part of its water quality assessment program of the Hawkesbury-Nepean River. This program had three sampling locations in this sub-catchment with sampling conducted on a monthly basis. Sampling was conducted as a routine program with no special wet weather sampling undertaken. Samples were analysed by the EPA labs at Lidcombe.

RecWat - This program is undertaken by DLWC as part of its recreational water quality program and one site at Bobbin Head is sampled. Sampling is conducted during the swimming season in summer from October to March on a six day basis the same as beachwatch program to meet the ANZECC 1992 guideline requirement of recreational sampling. Data is analysed by a NATA registered lab and collected by professional sampling staff. Samples are analysed for faecal bacteria and physical parameters and blue green algae.

KCC - Kuring-gai Municipal Council have been undertaking a water quality monitoring program since August 1995. Samples are collected from four sites within this sub-catchment on a monthly basis.

STWCH - The streamwatch program collects water quality samples from ten sites within this sub-catchment. Data from these sites varies in sampling frequency and duration with the longest period of sampling undertaken at Asquith Girls High School Creek (1995 to 1999). The data quality is rated as '4' poor quality and has not been included in the compliance assessment or summary statistics for this program.

Data Gaps

Hornsby Shire Council, Ku-ring-gai Municipal Council, EPA, DLWC and Hawkesbury-Nepean Catchment Management Trust (Streamwatch) supplied water quality data from the Cowan Creek catchment.

The largest gap at this stage is data for the Pittwater catchment area. Pittwater Council did not respond to a request for water quality data from the Pittwater catchment. Reference to water quality data in the Pittwater Cowan Stormwater Management plan indicates that water quality data is available. Further attempts should be made to contact council to obtain this data.

Table 8: Data owner and contact details for Cowan and Pittwater

Org code	Organisation	Study code	Study name	Contact	Reason for collection
HnCC	Hornsby Shire Council	HSC	Water Quality in Berowra Creek Catchment	Ros McPherson /Jacqui Grove	Assess Water quality in streams in Hornsby Shire Council area for SOE reporting
DLWC	Department of Land and Water Conservation	RecWat	Recreational Water Quality Study	Adam Boey	Summer sampling for faecal bacteria to determine recreational quality
EPA	Environment Protection Authority	EPAWQ	Hawkesbury Monitoring program	William Hall	SOE and assessment of health of waterways.

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Org code	Organisation	Study code	Study name	Contact	Reason for collection
KCC	Kuring-gai City Council	KCCWQ	Water Quality for Cowan Catchment	Louise Hardy	Provision of baseline data for SOE report
HNCMT	Hawkesbury Nepean Catchment Management Trust	STWCH	Streamwatch program	Avtar Singh	Community/Schools based assessment of streams

Table 9: Site information for Cowan and Pittwater

Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
RWQ-P2-06	RWQ-P2-06	RecWat	DLWC	Cowan Ck Bobbin Head	151.166389	-33.668056	1
30046	30046	EPAWQ	EPA	Cowan Creek at Jerusalem Bay	151.216	-33.599	1
30088	30088	EPAWQ	EPA	Cowan Creek at Cottage Point	151.184	-33.622	1
30135	30135	EPAWQ	EPA	Cowan Creek at Bobbin Head	151.158	-33.652	1
12	HSC12	HSC	HnCC	Hornsby Ck Leighton Place Bridge, east side	151.111115	-33.698198	1
36	HSC36	HSC	HnCC	Murray Anderson Ck off Smiths Ck Cowan Catchment	151.203056	-33.644167	1
BC1	BC1	KCCWQ	KCC	Branch of Cowan ck via Sandford rd St Ives	151.164236	-33.723701	1
KC	KC	KCCWQ	KCC	Kuring-gai Ck via Kitchener St firetrail	151.175833	-33.702222	1
LJ16	LJ16	KCCWQ	KCC	Lovers Jump Ck end of Clissold Rd firetrail	151.147778	-33.714722	1
SG	SG	KCCWQ	KCC	Spring Gully Ck Coonanbarra Rd Wahroonga	151.118333	-33.71	1
AGHS1	AGHS1	STWCH	HNCMT	AGHS* Ck, Asquith	151.115	-33.691666	4
AGHS2	AGHS2	STWCH	HNCMT	Hornsby Ck at Leighton Place Bridge, Hornsby	151.111666	-33.698055	4
AGHS3	AGHS3	STWCH	HNCMT	AGHS Pond, Asquith	151.115	-33.691666	4
BRIG1	BRIG1	STWCH	HNCMT	Cowan Ck at Burns Rd Bridge, Turramurra	151.147777	-33.724722	4
GFSC1	GFSC1	STWCH	HNCMT	Cockle Ck, Kuring-gai NP	151.158888	-33.662777	4
GFSC3	GFSC3	STWCH	HNCMT	Neverfail Ck, Kuring-gai NP	151.21	-33.690555	4

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Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
GFSC4	GFSC4	STWCH	HNCMT	Spring Gully at Carrington Pk, Kuring-gai NP	151.116944	-33.706111	4
GFSC5	GFSC5	STWCH	HNCMT	Caley Brook Site at Tamar Pl, Kuring-gai NP	151.134166	-33.705555	4
GFSC6	GFSC6	STWCH	HNCMT	Fraser Brook at Boundary Rd, Kuring-gai NP	151.125555	-33.707222	4
GFSC7	GFSC7	STWCH	HNCMT	Apple Tree Ck, Kuring-gai NP	151.151388	-33.655277	4

*Tributary of Cockle Creek, named AGHS Creek by Asquith Girls High School for the purposes of streamwatch sampling.

Table 10: Data information for Cowan and Pittwater

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.AI	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
RWQ-P2-06	DLWC	09/12/1996	29/12/1999	12		4	30	30	4		30	30	1	16				9										
30046	EPA	03/01/1995	02/07/1996		39	39	40	40	37				38	37	39		40	32								40	40	40
30088	EPA	29/08/1995	02/07/1996		22	22	22	22	20				21	20	22		23	21								23	23	23
30135	EPA	29/08/1995	02/07/1996		22	22	22	22	20				21	20	22		23	20								23	22	22
12	HnCC	04/01/1995	20/12/1999		2	121	120	121	119	83		121	121		121	121	121	121								121	121	
36	HnCC	05/01/1995	09/12/1999		12	60	60	59	59	42		60	60		60	60	60	60								60	60	
BC1	KCC	19/02/1995	22/12/1999			40	40	40	40	30		36	36			40	40	40										38
KC	KCC	20/02/1995	22/12/1999			40	40	40	40	30		35	36			40	40	40										38
LJ16	KCC	20/02/1995	22/12/1999			40	40	40	40	30		35	36			40	40	40										38
SG	KCC	19/02/1995	22/12/1999			40	40	40	39	29		36	36			40	40	40										38
AGHS1	HNCMT	13/02/1995	25/10/1999			49	49	49	49	49		49				49	49	49										
AGHS2	HNCMT	07/02/1995	08/02/1998			35	35	35	35	35		35				35	35	35										
AGHS3	HNCMT	15/05/1995	23/03/1998			11	11	11	11	11		11				11	11	11										
BRIG1	HNCMT	08/02/1996	23/08/1996			6	6	6	6	6		6				6	6	6										
GFSC1	HNCMT	18/01/1995	15/07/1997			8	8	8	8	8		8				8	8	8										
GFSC3	HNCMT	07/02/1995	14/08/1998			10	10	10	10	10		10				10	10	10										
GFSC4	HNCMT	23/11/1995	10/02/1998			16	16	16	16	16		16				16	16	16										
GFSC5	HNCMT	10/12/1995	22/06/1996			5	5	5	5	5		5				5	5	5										
GFSC6	HNCMT	10/12/1995	23/06/1996			9	9	9	9	9		9				9	9	9										
GFSC7	HNCMT	03/02/1995	05/11/1996			26	26	26	26	26		26				26	26	26										

Berowra Creek

The following studies are being conducted in the Berowra Creek sub-catchment (Table 11).

PAM – Performance Assessment Monitoring and Reporting Program is undertaken for Sydney Water. This program is part of their overall Environmental Indicators program and is part of Sydney Water's Licence conditions. The programs aimed to assess the impact of Sydney Water's activities on the environment. The program includes monthly routine sampling and three wet weather event sampling per year when there is greater than 25mm of rainfall in the catchment over a twenty-four hour period. The results of this program are reported annually in Sydney Water's annual environment report. This program started in 1995 and is currently ongoing. In this sub-catchment there are five sites monitored under the PAM project, upstream and downstream of the two major STPs discharging to Berowra Creek, West Hornsby and Hornsby Heights STPs and one site in the lower estuary.

HNTribs - This program is being conducted for the SCA and assesses the impact of STP effluent on Berowra Creek and the upper estuary of Berowra Creek. An autosampler is also installed at Galston Gorge to assess pollutant loads exported from the catchment. Sampling is undertaken on a bi-monthly basis at eight locations for the SCA. This program was originally initiated by Sydney Water and was transferred to the SCA upon its creation.

HSC- This program is run by Hornsby Shire Council and is part of their extensive monitoring program in the Hornsby Shire. There are 38 sites sampled in this sub-catchment on a fortnightly or monthly basis. The program is a routine sampling program and does not have a special wet weather sampling component. A number of special short-term studies are also undertaken by Hornsby Shire Council and data information for these are also included (Table 12 and Table 13 study code HSCBC). Sampling commenced in 1995 and is currently ongoing.

HSCBC - This program was a short term wet and dry weather study. Autosamplers were installed at three locations and pollutant loads determined from catchments with differing land uses.

EPAWQ - This program was conducted by the EPA as part of its water quality assessment program of the Hawkesbury-Nepean River. This program had 5 sampling locations in this sub-catchment with sampling conducted on a monthly basis. Sampling was conducted as a routine program with no special wet weather sampling undertaken. Samples were analysed by the EPA labs at Lidcombe.

RecWat - This program is undertaken by DLWC as part of its recreational water quality program with three sites sampled in this sub-catchment. Sampling is conducted during the swimming season in summer from October to March on a six day basis the same as beachwatch program to meet the ANZECC 1992 guideline requirement of recreational sampling. Data is analysed by a NATA registered lab and collected by professional sampling staff. Samples are analysed for faecal bacteria and physical parameters and blue green algae.

STWCH - The streamwatch program collects water quality samples from twelve sites within this sub-catchment. Data from these sites varies in sampling frequency and duration with the longest period of sampling undertaken at Asquith Girls High School Creek (1995 to 1999)

QUACK - The QUACK program was undertaken as a short-term study to assess water quality data within the Berowra Creek sub-catchment by the Berowra Creek Catchment Management Committee. Data was collected from 19 sites between the end of 1995 and mid 1997 on a monthly basis.

Data Gaps

Extensive monitoring is undertaken within this catchment however if a full compliance assessment is to be undertaken then additional sampling for blue green algae, toxic marine dinoflagellates, diatoms and metals is required.

Table 11: Data owner and contact details for Berowra Creek

Org code	Organisation	Study code	Study name	Contact	Reason for collection
SWC	Sydney Water Corporation	PAM	Performance Monitoring Assessment and Reporting	Andrew Kasmarik	Assess performance of Sydney Water's activities on the environment
HnCC	Hornsby Shire Council	HSC	Water Quality in Berowra Creek Catchment	Ros McPherson /Jacqui Grove	Assess water quality in streams in Hornsby Shire Council area for SOE reporting
DLWC	Department of Land and Water Conservation	RecWat	Recreational Water Quality Study	Adam Boey	Summer sampling for faecal bacteria to determine recreational quality
EPA	Environment Protection Authority	EPAWQ	Hawkesbury Monitoring program	William Hall	SOE and assessment of health of waterways.
BCMC	Berowra Creek Catchment Management Committee	QUACK	QUACK	Daylan Cameron	Water Quality survey of creeks in the Berowra Creek catchment
SCA	Sydney Catchment Authority	HNTribs	Water Quality Monitoring in Hawkesbury-Nepean Tributaries	Amir Deen	Water quality and pollutant loads in South, Cattai, Berowra and Matahil and Stonequarry Creeks
HNCMT	Hawkesbury Nepean Catchment Management Trust	STWCH	Streamwatch program	Avtar Singh	Community/Schools based assessment of streams

Table 12: Site information for Berowra Creek

Site code (provided)	Site code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
1	BCMC1	QUACK	BCMC	Waitara Ck U/S of West Hornsby STP	151.079254	-33.703736	1
2	BCMC2	QUACK	BCMC	Lyrebird - upper Lyrebird Gully, Mt Kuring-gai - u/s (0.8km d/s off Pacific Hwy @ Glenview Rd)	151.128913	-33.656434	1
3	BCMC3	QUACK	BCMC	Lyrebird - lower Lyrebird Gully, Mt Kuring-gai - d/s (800m d/s from the u/s site)	151.12881	-33.656597	1
4	BCMC4	QUACK	BCMC	Canoelands un-named ck, tributary of Marramorra Ck, Sth of Marra Ave	151.076824	-33.509847	1
5	BCMC5	QUACK	BCMC	Bujwa Sth un-named ck, Bujwa Bay Rd. East of	151.169329	-33.588151	1

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Site code (provided)	Site code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
				Glendale Farm Orchard and the University Field Station.			
6	BCMC6	QUACK	BCMC	Bujwa Nth un-named ck, Bujwa Bay Rd. 2km d/s from Pacific Hwy	151.169766	-33.587489	1
7	BCMC7	QUACK	BCMC	Glenorie un-named tributary, east of Pacific Hwy, Tecoma Dr.	151.009076	-33.600001	1
8	BCMC8	QUACK	BCMC	Joe Crafts Ck Boating limit above confluence with Berowra Ck	151.143152	-33.588064	1
10	BCMC10	QUACK	BCMC	Colah at Ben Bullen Colah ck at Ben Bullen Rd., Glenorie	151.032129	-33.590107	1
11	BCMC11	QUACK	BCMC	Tunks - Odette East end of Odette Rd., Vineys Rd, Dural	151.040127	-33.693515	1
12	BCMC12	QUACK	BCMC	Fiddletown Bloodwood Rd., end of a 4x4w trail	151.061881	-33.585638	1
13	BCMC13	QUACK	BCMC	Colah at Salaway Between Salaway Rd and Mid Dural Rd.	151.029951	-33.647812	1
C1	C1	QUACK	BCMC	GeorgesCk Off Fallon Dr., NW Pyes Ck	151.043412	-33.709606	1
C2	C2	QUACK	BCMC	Stills Ck Mansfield Rd, Galston	151.058357	-33.63792	1
C3	C3	QUACK	BCMC	Sams Ck, d/s Berowra Ck (SE)	151.129002	-33.625961	1
C4	C4	QUACK	BCMC	Colah Creek at Wylds Bridge, Wylds Rd	151.026631	-33.627011	1
C5	C5	QUACK	BCMC	Tunks - Glaston Vineys Rd (lower), Dural	151.038514	-33.695746	1
C6	C6	QUACK	BCMC	Smugglers Ck Off Marramarra Ck	151.087616	-33.527228	1
C7	C7	QUACK	BCMC	Calna Ck 300m U/S Hornsby Heights STP.	151.10189	-33.67458	1
RWQ23	RWQ23	RecWat	DLWC	Berowra Creek Fishponds Waterhole	151.082142	-33.692947	1
RWQ4	RWQ4	RecWat	DLWC	Berowra Ck Ferry 50m Downstream	151.121446	-33.604428	1
RWQ-P1-01	RWQ-P1-01	RecWat	DLWC	Berowra Creek at Crosslands	151.107637	-33.629938	1
130001	130001	EPAWQ	EPA	Berowra Creek at Ants Nest	151.148	-33.555	1
130033	130033	EPAWQ	EPA	Berowra Creek at Oaky Point	151.131	-33.571	1
130059	130059	EPAWQ	EPA	Berowra Creek Cunio Point	151.121512	-33.586931	1

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Site code (provided)	Site code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
130077	130077	EPAWQ	EPA	Berowra Creek at Ants Nest	151.148	-33.555	1
130127	130127	EPAWQ	EPA	Berowra Creek at Crosslands	151.107637	-33.629938	1
1	HSC1	HSC	HnCC	Berowra Creek Galston Gorge	151.07907	-33.666467	1
2	HSC2	HSC	HnCC	Tunks Ck Galston Gorge, under bridge	151.078165	-33.66731	1
4	HSC4	HSC	HnCC	Berowra Ck Westleigh. (500m down Track)	151.063361	-33.712256	1
5	HSC5	HSC	HnCC	Pyes Ck Cherrybrook. End, Kristine Place	151.036826	-33.714303	1
6	HSC6	HSC	HnCC	Georges Ck End, Jenner Rd., Cherrybrook	151.035639	-33.711529	1
10	HSC10	HSC	HnCC	Larool Ck Sefton Rd, Thornleigh	151.0809	-33.720154	1
13	HSC13	HSC	HnCC	Sam's Ck End, Hamley Rd, Mt Kuring-gai	151.134521	-33.643002	1
18	HSC18	HSC	HnCC	Arcadia Tip Leachate Pond, Main Pond	151.06	-33.626	1
19	HSC19	HSC	HnCC	Calna Creek outfall HH STP, End, Pike Rd	151.102059	-33.670705	1
20	HSC20	HSC	HnCC	Calna Ck U/S Hornsby Heights STP	151.101382	-33.671973	1
21	HSC21	HSC	HnCC	Calna Ck D/S Hornsby Heights STP	151.103075	-33.669296	1
22	HSC22	HSC	HnCC	Waitara Ck outfall WH STP,effluent	151.079829	-33.702315	1
23	HSC23	HSC	HnCC	Waitara Ck U/S of West Hornsby STP	151.079254	-33.703736	1
24	HSC24	HSC	HnCC	Waitara Ck D/S West Hornsby STP	151.08	-33.702	1
37	HSC37	HSC	HnCC	Smugglers Ck Off Marramarra Ck	151.087616	-33.527228	1
39	HSC39	HSC	HnCC	Joe Crafts Ck Boating limit above confluence with Berowra Ck	151.143152	-33.588064	1
41	HSC41	HSC	HnCC	Sams Ck Boating limit above confluence with Berowra Ck	151.129043	-33.625224	1
42	HSC42	HSC	HnCC	Colah Creek at Wylids Bridge, Wylids Rd	151.026631	-33.627011	1
43	HSC43	HSC	HnCC	Calna Ck 500m up from confluence with Berowra Ck.	151.119414	-33.631786	1

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Site code (provided)	Site code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
45	HSC45	HSC	HnCC	Berowra Creek Fishponds Waterhole	151.082142	-33.692947	1
48	HSC48	HSC	HnCC	Marramarra Ck Up from Bar Island.	151.100391	-33.525012	1
49	HSC49	HSC	HnCC	Still Ck Mansfield Rd, Galston	151.067	-33.639	1
50	HSC50	HSC	HnCC	Berowra Creek Boundary Road wetland	151.062	-33.739	1
51	HSC51	HSC	HnCC	Berowra Creek d/s Pennant Hills wetland Laurence St	151.063	-33.734	1
52	HSC52	HSC	HnCC	Calna Creek 300m U/S Hornsby Heights STP.	151.10189	-33.67458	1
57	HSC57	HSC	HnCC	Berowra Creek 100m u/s Pennant Hills High School wetland	151.062	-33.735	1
60	HSC60	HSC	HnCC	Berowra Ck Ferry 50m Downstream	151.121446	-33.604428	1
61	HSC61	HSC	HnCC	Berowra Creek Cunio Point	151.121512	-33.586931	1
67	HSC67	HSC	HnCC	Berowra Creek Kimmerong Bay (fc only)	151.156111	-33.551667	1
68	HSC68	HSC	HnCC	Berowra Creek Cobra Bay (fc only)	151.136389	-33.545278	1
69	HSC69	HSC	HnCC	Berowra Creek Peats Bite (fc only)	151.16	-33.534444	1
73	HSC73	HSC	HnCC	U/S Sedimentation basins at Kalang Road Asquith	151.106384	-33.677885	1
74	HSC74	HSC	HnCC	D/S Sedimentation basins at Kalang Road Asquith	151.104981	-33.677817	1
75	HSC75	HSC	HnCC	Berowra Creek Directly below boundary road wetland	151.055278	-33.741389	1
77	HSC77	HSC	HnCC	Gleeson Creek end of Oxley Drive u/s of fire trial causeway	151.124444	-33.653889	1
78	HSC78	HSC	HnCC	Stormwater drain at southern End of Foxglove Oval	151.121723	-33.661217	1
79	HSC79	HSC	HnCC	Stormwater drain at northern End of Foxglove Oval	151.121722	-33.658659	1
80	HSC80	HSC	HnCC	Glenorie Creek upstream of GPT at Tekopa Dr Glenorie	151.008909	-33.599902	1
NB72	NB72	HSCBC	HnCC	Tunks Ck at end of Mitchell Road	151.058258	-33.69219	1
NB91	NB91	HSCBC	HnCC	Pyes Ck Off Quarry road	151.052042	-33.705614	1

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Site code (provided)	Site code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
NB83	NB83-HSC	HSCBC	HnCC	Waitara Ck U/S of West Hornsby STP	151.079254	-33.703736	1
NB06	NB06	HNTribs	SCA	Berowra Creek at Crosslands	151.107637	-33.629938	1
NB07	NB07	HNTribs	SCA	Berowra Creek Galston Gorge	151.07907	-33.666467	1
NB11	NB11-SCA	PAM	SCA	Berowra Creek at Ants Nest	151.148	-33.555	1
NB13	NB13	HNTribs	SCA	Berowra Creek Cunio Point	151.121512	-33.586931	1
NB42	NB42	HNTribs	SCA	Calna Ck D/S Hornsby Heights STP	151.103075	-33.669296	1
NB43	NB43	HNTribs	SCA	Calna Ck U/S Hornsby Heights STP	151.101382	-33.671973	1
NB801	NB801	HNTribs	SCA	Berowra Creek Fishponds Waterhole	151.082142	-33.692947	1
NB825	NB825	HNTribs	SCA	Waitara Ck D/S West Hornsby STP	151.08	-33.702	1
NB83	NB83	HNTribs	SCA	Waitara Ck U/S of West Hornsby STP	151.079254	-33.703736	1
BARK1	BARK1	STWCH	HNCMT	Waitara Ck at Malsbury Rd, Hornsby	151.098333	-33.715833	4
BWPA1	BWPA1	STWCH	HNCMT	Berowra Ck at Calabash Pt, Berowra Waters	151.113888	-33.588888	4
CROS1	CROS1	STWCH	HNCMT	Berowra Ck at Crosslands Rd, Galston	151.106666	-33.630277	4
CTHS1	CTHS1	STWCH	HNCMT	Pyes Ck at Woodglen Place, Cherrybrook	151.0325	-33.719166	4
GALS1	GALS1	STWCH	HNCMT	Colah Ck at Fire Trail Causeway, Galston	151.033888	-33.659722	4
GLEN3	GLEN3	STWCH	HNCMT	Glenorie Ck at Tekapo Rd, Glenorie	151.009166	-33.6	4
GLEN4	GLEN4	STWCH	HNCMT	Glenorie Ck (pipe outlet) at Tekopa Rd, Glenorie	151.008055	-33.6	4
GLEN6	GLEN6	STWCH	HNCMT	Glenorie Ck at Wirra Pl, Glenorie	151.008055	-33.6025	4
GLEN7	GLEN7	STWCH	HNCMT	Glenorie Ck (tributary) at Wirra Pl, Glenorie	151.008055	-33.601666	4
MSBC1	MSBC1	STWCH	HNCMT	Berowra Ck, West Pennant Hills	151.0525	-33.735	4
PHHS1	PHHS1	STWCH	HNCMT	Tedbury Ck behind the School, Pennant Hills	151.061111	-33.735	4
PHHS2	PHHS2	STWCH	HNCMT	Berowra Ck at Bushland Pk, Cherrybrook	151.056944	-33.733333	4

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Site code (provided)	Site code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
NB11	NB11	PAM	SWC	Berowra Creek at Ants Nest	151.148	-33.555	1
NB42	NB42-SW	PAM	SWC	Calna Ck D/S Hornsby Heights STP	151.103075	-33.669296	1
NB43	NB43-SW	PAM	SWC	Calna Ck U/S Hornsby Heights STP	151.101382	-33.671973	1
NB825	NB825-SW	PAM	SWC	Waitara Ck D/S West Hornsby STP	151.08	-33.702	1
NB83	NB83-SW	PAM	SWC	Waitara Ck U/S of West Hornsby STP	151.079254	-33.703736	1

Table 13: Data information for Berowra Creek

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
1	BCMC	11/11/1995	11/05/1997			12	13	13	13	13		13			13	13	13	13									13	13
10	BCMC	11/11/1995	10/05/1997			12	13	13	13	13		13			13	13	13	13									13	13
11	BCMC	11/11/1995	10/05/1997			13	13	13	13	13		13			13	13	13	13									13	13
12	BCMC	02/12/1995	10/05/1997			11	12	12	12	12		12			12	12	12	12									12	12
13	BCMC	06/01/1996	10/05/1997			10	11	11	11	11		11			11	11	11	11									11	11
2	BCMC	12/11/1995	11/05/1997			13	13	13	13	13		13			13	13	13	13									13	13
3	BCMC	12/11/1995	11/05/1997			13	13	13	13	13		13			13	13	13	13									13	13
4	BCMC	11/11/1995	10/05/1997			12	13	13	13	13		13			13	13	13	13									13	13
5	BCMC	11/11/1995	11/05/1997			12	13	13	13	13		13			13	13	13	13									13	13
6	BCMC	12/11/1995	11/05/1997			13	13	12	13	13		13			13	13	13	13									13	13
7	BCMC	11/11/1995	10/05/1997			12	13	13	13	13		13			13	13	13	13									13	13
8	BCMC	12/11/1995	11/05/1997			11	13	13	13	13		13			13	13	13	13									13	13
C1	BCMC	04/12/1995	06/05/1997			12	12	12	12	6		12			12	12	12	12									12	12
C2	BCMC	04/12/1995	06/05/1997			12	12	12	12	6		12			12	12	12	12									12	12
C3	BCMC	06/12/1995	07/05/1997			11	12	12	12	6		12			12	12	12	12									12	12
C4	BCMC	04/12/1995	06/05/1997			12	12	12	12	6		12			12	12	12	12									12	12
C5	BCMC	04/12/1995	06/05/1997			11	12	12	12	6		12			12	12	12	12									12	12
C6	BCMC	06/12/1995	07/05/1997			10	12	12	12	6		12			12	12	12	12									12	12
C7	BCMC	04/12/1995	06/05/1997			10	12	12	12	6		12			12	12	12	12									12	12
RWQ-P1-01	DLWC	04/01/1998	21/12/1999	26		2	29	30	3		30	30						28										

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SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
RWQ23	DLWC	23/03/1998	09/03/1999	8			9	10			10	10		4				5										
RWQ4	DLWC	04/01/1995	31/03/1997			73	89	90	70		92	92	73	64				73										
130001	EPA	03/01/1995	02/07/1996		39	38	38	38	35				38	23	39		40	36								40	40	40
130033	EPA	03/01/1995	02/07/1996		39	39	39	39	36				39	23	40		40	38								40	40	40
130059	EPA	03/01/1995	02/07/1996		37	39	39	39	37				39	22	38		40	38								40	40	40
130077	EPA	03/01/1995	02/07/1996		39	39	39	39	37				39	21	39		40	36								40	40	40
130127	EPA	03/01/1995	02/07/1996		39	38	38	38	37				38	6	39		40	35								40	40	40
1	HnCC	04/01/1995	08/12/1999		8	62	61	62	61	43		62	62		62	62	62	62									62	62
10	HnCC	06/01/1995	20/12/1999		9	121	120	121	119	83		121	121		121	121	121	121									121	121
13	HnCC	04/01/1995	20/12/1999		10	122	121	122	119	83		122	122		122	122	121	122									122	122
18	HnCC	04/01/1995	07/12/1999		4	58	58	58	57	40		58	58		58	58	58	58									58	58
19	HnCC	04/01/1995	20/12/1999		17	122	121	122	121	85		122	122		122	122	122	122									122	122
2	HnCC	04/01/1995	08/12/1999		12	60	59	60	59	42		60	60		60	60	60	60									60	60
20	HnCC	04/01/1995	20/12/1999		12	118	121	122	121	85		122	122		122	122	122	122									122	122
21	HnCC	04/01/1995	20/12/1999		18	121	120	121	120	84		121	121		121	121	121	121									121	121
22	HnCC	06/01/1995	20/12/1999		15	122	121	121	120	84		122	122		122	122	122	122									122	122
23	HnCC	06/01/1995	20/12/1999		9	122	121	121	120	84		122	122		122	122	122	122									122	122
24	HnCC	06/01/1995	20/12/1999		11	121	120	120	119	83		121	121		121	121	121	121									121	121
37	HnCC	05/01/1995	09/12/1999		4	60	59	59	57	33		59	59		59	59	59	58									59	59
39	HnCC	05/01/1995	09/12/1999		12	59	59	59	58	41		59	59		59	59	59	59									59	59
4	HnCC	06/01/1995	08/12/1999		4	60	59	60	58	41		60	60		60	60	60	60									60	60

Surface Water Quality Assessment of the Hawkesbury-Nepean Catchment 1995-1999. Data Information Report

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
41	HnCC	06/01/1995	09/12/1999		11	60	60	60	59	42		60	60		60	60	60	60									60	60
42	HnCC	04/01/1995	07/12/1999		1	60	59	60	59	35		60	60		60	60	60	60									60	60
43	HnCC	06/01/1995	06/12/1999		8	59	58	59	58	41		59	59		59	59	59	58									59	59
45	HnCC	06/01/1995	08/12/1999		8	60	59	60	58	40		60	60		60	60	60	60									60	60
48	HnCC	05/01/1995	09/12/1999		4	60	60	60	59	35		60	60		60	60	60	60									60	60
49	HnCC	04/01/1995	07/12/1999		9	60	59	60	59	42		60	60		60	60	60	60									60	60
5	HnCC	04/01/1995	07/12/1999		4	61	60	61	60	42		61	61		61	61	61	61									61	61
50	HnCC	24/04/1995	20/12/1999		2	112	110	111	108	81		111	111		111	111	111	111									111	111
51	HnCC	06/06/1995	20/12/1999		9	111	110	111	109	84		111	111		111	111	111	111									111	111
52	HnCC	06/11/1995	20/12/1999		14	101	100	101	100	84		101	101		101	101	101	101									101	101
57	HnCC	02/04/1996	20/12/1999		11	90	89	90	88	84		90	90		90	90	90	90									90	90
6	HnCC	04/01/1995	07/12/1999		6	61	60	61	60	42		61	61		61	61	61	61									61	61
60	HnCC	08/01/1997	09/12/1999		1	35	35	35	34	34		35	35		35	35	35	35									35	35
61	HnCC	07/03/1997	09/12/1999		1	34	34	34	33	33		34	34		34	34	34	34									34	34
67	HnCC	05/06/1997	09/12/1999			29	29	29	28	28		27	29					29										
68	HnCC	05/06/1997	09/12/1999			29	29	29	28	28		27	29					29										
69	HnCC	05/06/1997	09/12/1999			29	29	29	28	28		27	29					29										
73	HnCC	08/01/1998	06/12/1999		2	25	24	25	24	24		24	25		24	24	24	25									24	24
74	HnCC	08/01/1998	06/12/1999			24	23	24	23	23		24	24		24	24	24	24									24	24
75	HnCC	05/08/1998	20/12/1999		1	33	33	33	31	31		33	33		33	33	33	33									33	33
77	HnCC	22/07/1999	06/12/1999			6	6	6	6	6		6	6		6	6	6	6									6	6

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SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.AI	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
78	HnCC	22/07/1999	06/12/1999		2	6	6	6	6	6		6	6		6	6	6	6									6	6
79	HnCC	22/07/1999	06/12/1999			6	6	6	6	6		6	6		6	6	6	6									6	6
80	HnCC	04/08/1999	08/12/1999			5	5	5	5	5		5	5		5	5	5	5									5	5
NB91	HnCC	15/8/1995	27/5/1997									19			43	43	43										43	43
NB72	HnCC	25/9/1995	27/5/1997									19			21	21	21										21	21
NB83	HnCC	15/8/1995	27/5/1997									19			37	37	37										37	37
NB06	SCA	18/12/1996	08/12/1999	21		63	63	63	63	63	63	64			64	64	64	61									64	64
NB07	SCA	18/12/1996	20/08/1999			106	106	64	64	64	104	105			105	105	105	106									105	105
NB11	SCA	16/01/1996	02/06/1998	6		24	22	24	3	24	16	24			1	23	23	1									23	23
NB13	SCA	14/08/1996	13/09/1999	1		75	75	75	75	75	65	75		61	75	75	75	75									75	75
NB42	SCA	18/12/1996	20/08/1999		1	65	65	65	64	65	64	66			65	66	66	64									66	66
NB43	SCA	18/12/1996	20/08/1999		1	65	65	65	64	65	64	66			65	66	66	64									66	66
NB801	SCA	18/12/1996	20/08/1999			64	63	62	64	64	64	65			65	65	65	64									65	65
NB825	SCA	18/12/1996	20/08/1999	1	1	65	65	65	64	65	64	66			65	66	66	64									66	66
NB83	SCA	18/12/1996	20/08/1999		1	65	65	65	64	65	65	66			65	66	66	64									66	66
NB11	SWC	03/01/1995	06/12/1999		74	58	80	80	79	36	53	59				83	83	7									83	83
NB42	SWC	16/01/1996	30/12/1999		49	60	60	60	59	38	56	60				60	60	23									60	60
NB43	SWC	16/01/1996	30/12/1999		49	60	60	60	59	38	56	60				60	60	23									60	60
NB825	SWC	16/01/1996	30/12/1999		49	60	60	60	60	38	56	60				60	60	23									60	60
NB83	SWC	16/01/1996	30/12/1999		49	60	60	59	59	38	56	60				60	60	23									60	60
BARK1	HNCMT	28/02/1996	26/11/1998			57	57	57	57	57		57				57	57	57										

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SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.AI	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
BWPA1	HNCMT	01/01/1995	01/04/1997			44	44	44	44	44		44				44	44	44										
CROS1	HNCMT	28/02/1995	03/11/1995			32	32	32	32	32		32				32	32	32										
CTHS1	HNCMT	20/07/1995	01/09/1999			15	15	15	15	15		15				15	15	15										
GALS1	HNCMT	17/05/1995	13/12/1995			9	9	9	9	9		9				9	9	9										
GLEN3	HNCMT	22/04/1996	23/09/1998			39	39	39	39	39		39				39	39	39										
GLEN4	HNCMT	03/03/1997	01/09/1998			16	16	16	16	16		16				16	16	16										
GLEN6	HNCMT	18/04/1997	01/09/1998			29	29	29	29	29		29				29	29	29										
GLEN7	HNCMT	18/04/1997	01/09/1998			27	27	27	27	27		27				27	27	27										
MSBC1	HNCMT	01/05/1996	15/10/1997			27	27	27	27	27		27				27	27	27										
PHHS1	HNCMT	24/08/1995	08/09/1999			35	35	35	35	35		35				35	35	35										
PHHS2	HNCMT	12/09/1995	12/12/1998			8	8	8	8	8		8				8	8	8										

Mooney Mooney Creek

Sampling in the Mooney Mooney Creek sub-catchment is very limited with only two programs providing data for this catchment (Table 14).

HSC- this program is run by Hornsby Shire Council and is part of their extensive monitoring program in the Hornsby Shire. There is one site sampled in this sub-catchment on an infrequent basis Sampling commenced in 1995 and is currently ongoing.

EPAWQ - This program was conducted by the EPA as part of its water quality assessment program of the Hawkesbury-Nepean River. This program had one sampling location in this sub-catchment with sampling conducted on a fortnightly basis. Sampling was conducted as a routine program with no special wet weather sampling undertaken. Samples were analysed by the EPA labs at Lidcombe.

Data Gaps

All water quality data from Mooney Mooney Creek is sourced from two locations in the lower end of the tidal estuary off the village of Mooney Mooney. This data was provided by the EPA (discontinued in 1997) and Hornsby Shire Council. Gosford City Council routinely collects water quality data from sites within the Mooney Mooney Creek catchment. However, at the time of writing, Council had not released any data or site information to the project team due to a review of management procedures in conjunction with DLWC Hunter Region.

Additional water quality monitoring sites are necessary to provide further information regarding water quality in the Mooney Mooney Creek catchment. Recommended sites include each of the three inflows to Mooney Dam, Floods Creek (at Somersby Falls), Piles Creek (at Girrakool) and Mooney Mooney Creek (at Old Pacific Highway Bridge). Calverts Creek at Mount White may also be worthy of consideration.

Table 14: Data owner and contact details for Mooney Mooney Creek

Org code	Organisation	Study code	Study name	Contact	Reason for collection
HnCC	Hornsby Shire Council	HSC	Water Quality in Berowra Creek Catchment	Ros McPherson/ Jacqui Grove	Assess WQ in streams in Hornsby Shire Council area for SOE reporting
EPA	Environment Protection Authority	EPAWQ	Hawkesbury Monitoring program	William Hall	SOE and assessment of health of waterways.

Table 15: Site information for Mooney Mooney Creek

Site code (provided)	Site code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
80038	80038	EPAWQ	EPA	Mooney Mooney Creek at Snake Island	151.197919	-33.513490	1
71	HSC71	HSC	HnCC	Mooney Mooney Creek at Snake Island	151.197919	-33.513490	1

Table 16: Data information for Mooney Mooney Creek

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA	
80038	EPA	03/01/1995	02/07/1996		39	39	40	40	39				38	37	39		40	39									40	40	40
71	HnCC	06/08/1995	09/12/1999			22	22	22	22	22		22	22					22											

Mangrove Creek

The EPA is the only organisation that undertook water quality sampling in this sub-catchment. There is no current monitoring occurring (Table 17).

Data Gaps

Sydney Water (until 1988) and the EPA sampled one site, at the mouth of Mangrove Creek near the village of Spencer, until about 1996. However, there is no recent data for this site. The EPA data set does not include faecal coliforms, enterococci or blue green algal/marine algal counts and identification. As there is no current monitoring occurring in this creek it is recommended that monitoring recommence in this system and faecal bacteria and algal sampling are included.

It should be noted that Gosford City Council routinely collects water quality data from sites within the Mangrove Creek catchment. However, at the time of writing, Council had not released any data or site information to the project team due to a review of management procedures in conjunction with DLWC Hunter Region.

Additional water quality monitoring sites are necessary to provide further information regarding water quality in the Mangrove Creek catchment. Recommended sites include each of the five inflows to Mangrove Creek Dam, Mangrove Creek (at Upper Mangrove, Mangrove Creek and Lower Mangrove), Bedlam Creek (at Mangrove Mountain) and Popran Creek (at Glenworth Valley). Additional sites at the mouths of Bedlam and Popran Creeks may also be worthy of consideration.

Table 17: Data owner and contact details for Mangrove Creek

Org code	Organisation	Study code	Study name	Contact	Reason for collection
EPA	Environment Protection Authority	EPAWQ	Hawkesbury Monitoring program	William Hall	SOE and assessment of health of waterways.

Table 18: Site information for Mangrove Creek

Site code (provided)	Site code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
170014	170014	EPAWQ	EPA	Hawkesbury River Entrance of Mangrove Creek	151.150871	-33.456053	1

Table 19: Data information for Mangrove Creek

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
170014	EPA	03/01/1995	02/07/1996		38	40	40	40	40				39	38	39		40	40								40	40	40

Macdonald River

Data Gaps

There is no available water quality data for this catchment.

Water quality monitoring sites are necessary to provide further information regarding water quality in the Macdonald River catchment. Recommended sites include three sites on the Macdonald River (at Howes Valley, Higher Macdonald and St Albans). Additional sites on Mogo Creek at St Albans Common and the mouth of Wrights Creek may also be worthy of consideration.

Wollemi Creek, Capertee River and Wolgan River

Data Gaps

No water quality data were available for these three catchment areas.

Water quality monitoring sites are necessary to provide further information regarding water quality in these river catchments. Recommended sites include:

- Wollemi Creek - Putty Creek at Putty;
- Capertee River at Glen Davis and additional sites along the Capertee River (eg at Glen Alice, “Port Macquarie” downstream of Ulumbra Creek) may also be worthy of consideration; and
- Wolgan River at Newnes.

Colo River

Water quality data have been collected by a range of organisations in the Colo River sub-catchment (Table 20).

EPAWQ - This program was conducted by the EPA as part of its water quality assessment program of the Hawkesbury-Nepean River. This program had one sampling location in this sub-catchment with sampling conducted on a fortnightly basis. Sampling was conducted as a routine program with no special wet weather sampling undertaken. Samples were analysed by the EPA labs at Lidcombe.

RecWat - This program is undertaken by DLWC as part of its recreational water quality program with one site sampled in this sub-catchment. Sampling was only conducted during the 1998-1999 swimming season from October to March on a six day basis, to meet the ANZECC 1992 guideline requirement of recreational sampling. Data is analysed by a NATA registered lab and collected by professional sampling staff. Samples are analysed for faecal bacteria and physical parameters and blue green algae.

STWCH - The streamwatch program collects water quality samples from four sites within this sub-catchment. Data from these sites varies in sampling frequency and duration with the last samples collected in 1998.

HCCWQ - The Hawkesbury Council monitoring program is an ‘adopt a creek’ program with samples analysed by field kits. Two sites are sampled in this sub-catchment under this program.

Data Gaps

Water quality data for the catchment was received from the EPA, DLWC, HNCMT and Hawkesbury Council.

Additional water quality monitoring sites are necessary to provide further information regarding water quality in the Colo River catchment. Recommended sites include Colo River at Upper Colo, Wheeny Creek at Comleroy Road and Bowens Creek at Bowen Creek Road. These sites may provide additional information regarding the impact of human activities on water quality in the Colo River and its tributaries. The data used for this report is old and no sampling is currently being undertaken which meets the data quality criteria. It is recommended that monitoring recommence for the range of indicators required to satisfy environmental value compliance.

Table 20: Data owner and contact details for Colo River

Org code	Organisation	Study code	Study name	Contact	Reason for collection
EPA	Environment Protection Authority	EPAWQ	Hawkesbury Monitoring program	William Hall	SOE and assessment of health of waterways.
DLWC	Department of Land and Water Conservation	RecWat	Recreational Water Quality Study	Adam Boey	Summer sampling for faecal bacteria to determine recreational quality
HCC	Hawkesbury City Council	HCCWQ	Hawkesbury River Water Quality Program	Adriana Genova	Water Quality sampling for Hawkesbury Nepean River and Tributaries for SOE reporting
HNCMT	Hawkesbury Nepean Catchment Management Trust	STWCH	Streamwatch program	Avtar Singh	Community/Schools based assessment of streams

Table 21: Site information for Colo River

Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
RWQ-SS-14	RWQ-SS-14	RecWat	DLWC	Colo River at Putty Road	150.827675	-33.433683	1
320128	320128	EPAWQ	EPA	Colo River at Putty Road	150.827675	-33.433683	1
HACC3	HACC3	STWCH	HNCMT	Little Wheeny Ck at Mill Rd, North Richmond	150.665833	-33.544444	4
TALG1	TALG1	STWCH	HNCMT	Turnbulls Arm at Gleeson's Bridge, Lower Portland	150.861111	-33.445	4
TALG2	TALG2	STWCH	HNCMT	Turnbulls Arm below Sewage Ponds, Lower Portland	150.837222	-33.456388	4
TALG4	TALG4	STWCH	HNCMT	Hermitages Top Waterhole, Lower Portland	150.864722	-33.434166	4
HCC5	HCC5	HCCWQ	HCC	Colo River Lower Colo Rd	150.880658	-33.438546	4
HCC4	HCC4	HCCWQ	HCC	Little Wheeny Ck Mill Rd, Kurrajong	150.661097	-33.547987	4

Table 22: Data information for Colo River

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
RWQ-SS-14	DLWC	08/03/1998	29/12/1999	8		4	9	9	4		9	9	1	5				4										
320128	EPA	03/01/1995	02/07/1996		33	32	34	34	34				10		34		36	10								34	34	34
HACC3	HNCMT	03/06/1996	27/11/1996			22	22	22	22	22		22				22	22	22										
TALG1	HNCMT	09/04/1997	23/05/1998			15	15	15	15	15		15				15	15	15										
TALG2	HNCMT	10/05/1997	01/11/1997			25	25	25	25	25		25				25	25	25										
TALG4	HNCMT	08/11/1997	23/05/1998			5	5	5	5	5		5				5	5	5										
HCC4	HCC	14/06/1998	16/12/1999			35**	35	35				35					35*	35									35***	
HCC5	HCC	21/04/1999	16/12/1999			34**	34	34				34					34*	34									34***	

* ortho phosphorus

** as TDS

*** as nitrates

Webbs Creek

Data Gaps

There were no water quality data available for this catchment.

Water quality monitoring sites are necessary to provide further information regarding water quality in the Webbs Creek catchment. Recommended sites include Webbs Creek at Bicentennial Road Bridge and Webbs Creek upstream of Hollow Creek (above the tidal limit).

Upper Hawkesbury River

The Upper Hawkesbury River sub-catchment has water quality data obtained from a number of long and short-term programs over the past five years. These are listed in Table 23 and described below.

PAM - Performance Assessment Monitoring and Reporting Program is undertaken for Sydney Water. This program is part of their overall Environmental Indicators program as is part of Sydney Water's Licence conditions. The programs aimed to assess the impact of Sydney Water's activities on the environment. The program includes monthly routine sampling and three wet weather event sampling per year when there is greater than 25mm of rainfall in the catchment over a twenty-four hour period. The results of this program are reported annually in Sydney Water's annual environment report. This program started in 1995 and is currently ongoing. In this sub-catchment there are five sites monitored under the PAM project in this sub-catchment.

HNMain - This program in the Upper Hawkesbury River sub-catchment consists of sampling on a bi-monthly basis at six locations for the SCA. This program was originally initiated by Sydney Water and was transferred to the SCA upon its creation. The program was undertaken to assess the wastewater strategy in the Hawkesbury-Nepean River.

EPAWQ - This program was conducted by the EPA as part of its water quality assessment program of the Hawkesbury-Nepean River. This program had twelve sampling locations in this sub-catchment with sampling conducted on a fortnightly basis. Sampling was conducted as a routine program with no special wet weather sampling undertaken. Samples were analysed by the EPA labs at Lidcombe.

RecWat - This program is undertaken by DLWC as part of its recreational water quality program with four sites sampled in this sub-catchment. Sampling is conducted during the swimming season in summer from October to March on a six day basis the same as beachwatch program to meet the ANZECC 1992 guideline requirement of recreational sampling. Data is analysed by a NATA registered lab and collected by professional sampling staff. Samples are analysed for faecal bacteria and physical parameters and blue green algae.

STWCH - The streamwatch program collects water quality samples from seven sites within this sub-catchment. Data from these sites varies in sampling frequency and duration.

HCCWQ - The Hawkesbury Council monitoring program is an 'adopt a creek' program with samples analysed by field kits. Three sites are sampled in this sub-catchment under this program.

BHSCWQ - This program is undertaken by Baulkham Hills Council of which there are two sites within this sub-catchment. Sampling at these sites commenced in 1995 and continued until the end of 1998. Sampling frequency was roughly on a monthly basis.

PCCWQ - Four sites were sampled by Penrith City Council for two month period in 1999.

Data Gaps

Water quality data was provided by Sydney Water, SCA, Hawkesbury Council, the EPA, Penrith Council, HNCMT, Baulkham Hills Shire Council and DLWC for this section of the river. There is currently good data coverage of this area, however the impact of the Currency Creek catchment on Sackville Reach would be a useful exercise due to intensive farming in the catchment. In addition monitoring in Redbank and Rickabys creeks should be recommenced with the complete suite of analytes so that an assessment of compliance to environmental values is possible.

Table 23: Data owner and contact details for Upper Hawkesbury River

Org code	Organisation	Study code	Study name	Contact	Reason for collection
SWC	Sydney Water Corporation	PAM	Performance Monitoring Assessment and Reporting	Andrew Kasmarik	Assess performance of Sydney Water's activities on the environment
SCA	Sydney Catchment Authority	HNMain	Water quality in Hawkesbury Nepean River catchment	Amir Deen	Data for modelling wastewater strategies
DLWC	Department of Land and Water Conservation	RecWat	Recreational Water Quality Study	Adam Boey	Summer sampling for faecal bacteria to determine recreational quality
EPA	Environment Protection Authority	EPAWQ	Hawkesbury Monitoring program	William Hall	SOE and assessment of health of waterways.
BHSC	Baulkham Hills Shire Council	BHSCWQ	Clean Waters Program	Andrea Horan	Recreational water quality monitoring as part of DLWC program and phys chem for SOE reporting
HCC	Hawkesbury City Council	HCCWQ	Hawkesbury River Water Quality Program	Adriana Genova	Water Quality sampling for Hawkesbury Nepean River and Tributaries for SOE reporting
PCC	Penrith City Council	PCCWQ	Londonderry & Luddenham Water Quality Program	Helen Bakker	SOE reporting
HNCMT	Hawkesbury Nepean Catchment Management Trust	STWCH	Streamwatch program	Avtar Singh	Community/Schools based assessment of streams

Table 24: Site information for Upper Hawkesbury River

Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
HAW1	HAW1	BHSCWQ	BHSC	Hawkesbury River at Sackville Ferry	150.872996	-33.503082	1
HAW2	HAW2	BHSCWQ	BHSC	Hawkesbury River at Lower Portland	150.885153	-33.441576	1
RWQ-P1-02	RWQ-P1-02	RecWat	DLWC	Hawkesbury River at Cattai National Park	150.887951	-33.561547	1

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Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
RWQ-P1-04	RWQ-P1-04	RecWat	DLWC	Hawkesbury River at Sackville Ferry	150.872996	-33.503082	1
RWQ-P1-05	RWQ-P1-05	RecWat	DLWC	Hawkesbury River at Windsor Bridge	150.821117	-33.604683	1
RWQ-PR-04	RWQ-PR-04	RecWat	DLWC	Hawkesbury River at Lower Portland	150.885153	-33.441576	1
830	830	EPAWQ	EPA	Hawkesbury River at Lower Portland	150.885153	-33.441576	1
912	912	EPAWQ	EPA	Hawkesbury River at Cumberland Reach	150.886	-33.475	1
979	979	EPAWQ	EPA	Hawkesbury River at Sackville Reach	150.88	-33.497	1
1043	1043	EPAWQ	EPA	Hawkesbury River at Lower Crescent Reach	150.925	-33.511	1
1081	1081	EPAWQ	EPA	Hawkesbury River at Upper Crescent Reach	150.909687	-33.516343	1
1126	1126	EPAWQ	EPA	Hawkesbury River at Downstream Cattai Creek	150.88797	-33.56156	1
1187	1187	EPAWQ	EPA	Hawkesbury River at York Reach	150.858	-33.569	1
1288	1288	EPAWQ	EPA	Hawkesbury River at Freemans Reach	150.819	-33.584	1
1393	1393	EPAWQ	EPA	Hawkesbury River at North Richmond Bridge	150.723004	-33.58646	1
360046	360046	EPAWQ	EPA	Currency Creek at Stannix Park Road	150.853	-33.526	1
430010	430010	EPAWQ	EPA	Rickabys Creek at Cornwallis Road	150.808232	-33.608424	1
450009	450009	EPAWQ	EPA	Redbank Ck Terrace Rd, Bridge	150.729504	-33.574456	1
C1	PCC-C1	PCCWQ	PCC	Unnamed Creek The Northern Road 150m North of Whitegates rd Londonderry	150.75398	-33.66945	3
R1	PCC-R1	PCCWQ	PCC	Rickaby's creek Carrington Road Londonderry	150.747308	-33.648188	3
R2	PCC-R2	PCCWQ	PCC	Rickaby's Creek, Londonderry Road Londonderry	150.732343	-33.662468	3
R3	PCC-R3	PCCWQ	PCC	Rickaby's creek , Boscobel Road Londonderry	150.72691	-33.671354	3
N26	N26	HNMain	SCA	Hawkesbury River at Sackville Ferry	150.872996	-33.503082	1

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Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
N3001	N3001	HNMain	SCA	Hawkesbury River at Cattai National Park	150.887951	-33.561547	1
N35	N35	HNMain	SCA	Hawkesbury River at Wilberforce Reach	150.836	-33.585	1
N38	N38	HNMain	SCA	Hawkesbury River at Windsor Bridge	150.821117	-33.604683	1
N39	N39	HNMain	SCA	Hawkesbury River D/S South Richmond STP	150.768333	-33.568333	1
N42	N42	HNMain	SCA	Hawkesbury River at North Richmond WTP (U/S North Richmond STP)	150.711667	-33.5925	1
COLO1	COLO1	STWCH	HNCMT	Redbank Ck at Bells Line of Rd, North Richmond	150.714722	-33.577777	4
HACC4	HACC4	STWCH	HNCMT	Redbank Ck at Terrace Rd, North Richmond	150.729722	-33.574444	4
HACC5	HACC5	STWCH	HNCMT	Roberts Ck at Roberts Creek Rd, East Kurrajong	150.706388	-33.517222	4
HAWK1	HAWK1	STWCH	HNCMT	Currency Ck at Glossodia Park, Glossodia	150.791944	-33.545833	4
MIDD1	MIDD1	STWCH	HNCMT	Currency Ck at Stannix Park Rd, Ebenezer	150.853611	-33.526944	4
MIDD2	MIDD2	STWCH	HNCMT	Howes Ck at Royerdale Pl, East Kurrajong	150.861666	-33.515277	4
TALG3	TALG3	STWCH	HNCMT	Colo River at Boat Ramp, Lower Portland	150.885	-33.44	4
N26	N26-SW	PAM	SWC	Hawkesbury River at Sackville Ferry	150.872996	-33.503082	1
N35	N35-SW	PAM	SWC	Hawkesbury River at Wilberforce Reach	150.836	-33.585	1
N38	N38-SW	PAM	SWC	Hawkesbury River at Windsor Bridge	150.821117	-33.604683	1
N39	N39-SW	PAM	SWC	Hawkesbury River D/S South Richmond STP	150.768333	-33.568333	1
N42	N42-SW	PAM	SWC	Hawkesbury River at North Richmond WTP (U/S North Richmond STP)	150.711667	-33.5925	1
HCC6	HCC6	HCCWQ	HCC	Hawkesbury River at Windsor Bridge	150.821117	-33.604683	4
HCC3	HCC3	HCCWQ	HCC	Redbank Ck Terrace Rd, Bridge	150.729504	-33.574456	4
HCC7	HCC7	HCCWQ	HCC	Hawkesbury River Governor Phillip Pk u/s South Creek confluence.	150.831627	-33.600434	4

Table 25: Data information for Upper Hawkesbury River

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.AI	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
HAW1	BHSC	01/02/1995	22/10/1998			35	35	35	35				35	6		6	6	35	34			29					24	28
HAW2	BHSC	01/02/1995	22/10/1998			34	34	34	34				34	6		6	6	34	33			28					23	27
RWQ-P1-02	DLWC	04/01/1995	29/12/1999	151		77	121	123	76		127	127	74	119				73										
RWQ-P1-04	DLWC	03/02/1995	29/12/1999	157		73	115	119	72		121	121	70	114				68										
RWQ-P1-05	DLWC	04/01/1995	21/12/1999	40		75	116	121	57		123	123	75	116				68										
RWQ-PR-04	DLWC	04/01/1995	29/12/1999	117		78	82	83	78		85	85	75	76				69										
1043	EPA	03/01/1995	02/07/1996		39	39	39	39	39				39	38	40		40	39								40	40	40
1081	EPA	03/01/1995	02/07/1996		39	39	39	39	39				39	38	40		40	39								40	40	40
1126	EPA	03/01/1995	02/07/1996		38	39	39	39	39				39	38	39		40	39								40	39	39
1187	EPA	03/01/1995	02/07/1996		39	39	39	39	39				39	33	40		40	39								40	39	39
1288	EPA	03/01/1995	02/07/1996		38	38	39	40	40				13		39		40	14								40	40	40
1393	EPA	03/01/1995	02/07/1996		38	38	39	40	40				13		39		40	14								40	40	40
360046	EPA	04/07/1995	02/07/1996		24	25	26	26	26				11		25		27	11								25	26	26
430010	EPA	03/01/1995	02/07/1996		39	37	39	40	40			1	12		40		40	13								40	40	40
450009	EPA	03/01/1995	02/07/1996		37	37	37	38	38				13		38		39	14								38	38	38
830	EPA	03/01/1995	02/07/1996		38	39	39	39	39				38	37	39		40	38								40	40	40
912	EPA	03/01/1995	02/07/1996		38	39	39	39	39				39	38	39		40	38								40	40	40
979	EPA	03/01/1995	02/07/1996		38	39	39	39	39				39	37	39		40	39								40	40	40
C1	PCC	07/10/1999	24/11/1999				7	7	7				7	7		7	7	7									7	7

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SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.AI	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
R1	PCC	07/10/1999	24/11/1999				7	7	7			7	7		7	7	7	7									7	7
R2	PCC	07/10/1999	24/11/1999				7	7	7			7	7		7	7	7	7									7	7
R3	PCC	07/10/1999	24/11/1999				7	7	7			7	7		7	7	7	7									7	7
N26	SCA	03/01/1995	21/12/1999	109	26	116	116	116	116	77	65	117		94	117	117	117	116									117	117
N3001	SCA	03/01/1995	21/12/1999	87	26	115	116	116	116	77	64	115		97	116	116	116	116									116	116
N35	SCA	03/01/1995	21/12/1999	29	26	116	115	116	116	77	65	116		94	116	116	116	116									116	116
N38	SCA	03/01/1995	02/06/1998	47	26	62	62	62	50	23	15	62		39	41	62	62	48									62	62
N39	SCA	02/07/1996	21/12/1999	51		77	77	77	77	77	65	77		3	77	77	77	76									77	77
N42	SCA	03/01/1995	29/12/1999	240	51	243	243	245	246	167	140	246		14	246	246	245	246									246	246
N26	SWC	03/01/1995	06/12/1999		73	81	82	82	82	36	54	83					83	83	21								83	83
N35	SWC	03/01/1995	06/12/1999		73	82	82	82	82	36	54	83					83	83	21								83	83
N38	SWC	03/01/1995	06/12/1999		73	82	82	82	82	36	54	83					83	83	21								83	83
N39	SWC	29/08/1995	06/12/1999		53	62	63	63	61	36	54	61					64	64	19								64	64
N42	SWC	03/01/1995	06/12/1999		95	101	100	101	101	36	54	105					105	105	21								105	105
COLO1	HNCMT	16/06/1995	16/06/1995			1	1	1	1	1		1				1	1	1										
HACC4	HNCMT	03/06/1996	28/11/1996			22	22	22	22	22		22				22	22	22										
HACC5	HNCMT	14/08/1996	29/11/1996			13	13	13	13	13		13				13	13	13										
HAWK1	HNCMT	25/07/1995	05/02/1996			5	5	5	5	5		5				5	5	5										
MIDD1	HNCMT	21/04/1997	18/12/1998			53	53	53	53	53		53				53	53	53										
MIDD2	HNCMT	25/04/1997	21/12/1997			4	4	4	4	4		4				4	4	4										
TALG3	HNCMT	18/05/1997	22/03/1998			4	4	4	4	4		4				4	4	4										

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SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
HCC3	HCC	21/04/1999	16/12/1999			35**	35	35				35					34*	35										35***
HCC6	HCC	21/04/1999	16/12/1999														34*											
HCC7	HCC	21/04/1999	16/12/1999														34*											

* ortho phosphorus

** as TDS

*** as nitrates

Cattai Creek

Water quality monitoring in the Cattai Creek sub-catchment has been occurring for many years. Information regarding sampling programs within this sub-catchment are listed in Table 26. These programs are further detailed below.

PAM – Performance Assessment Monitoring and Reporting Program is undertaken for Sydney Water. This program is part of their overall Environmental Indicators program and is part of Sydney Water's Licence conditions. The programs aimed to assess the impact of Sydney Water's activities on the environment. The program includes monthly routine sampling and three wet weather event sampling per year when there is greater than 25mm of rainfall in the catchment over a twenty-four hour period. The results of this program are reported annually in Sydney Water's annual environment report. This program started in 1995 and is currently ongoing. In this sub-catchment there are eight sites monitored under the PAM project, upstream and downstream of the major STPs of Rouse Hill, Castle Hill and Round Corner.

RUD03 - This program was conducted for Sydney Water to assess the impact of urban development at Rouse Hill. The data includes wet weather information collected from autosamplers to assess the effectiveness of detention basins as pollution control measures. Sampling frequency for this program varied between fortnightly to monthly sampling with the major program ceasing in 1997. The number of sites sampled in this program varied with up to 22 sites sampled.

HNTribs - This program is being conducted for the SCA and assesses the impact of STP effluent on Cattai Creek. An autosampler is also installed at Maraylya on Cattai Creek to assess pollutant loads exported from the catchment. Sampling is undertaken on a bi-monthly basis at nine locations for the SCA. This program was originally initiated by Sydney Water and was transferred to the SCA upon its creation.

EPAWQ - This program was conducted by the EPA as part of its water quality assessment program of the Hawkesbury-Nepean River. This program had two sampling locations in this sub-catchment with sampling conducted on a fortnightly basis. Sampling was conducted as a routine program with no special wet weather sampling undertaken. Samples were analysed by the EPA labs at Lidcombe.

RecWat -This program is undertaken by DLWC as part of its recreational water quality program with four sites sampled in this sub-catchment. Sampling is conducted during the swimming season in summer from October to March on a six day basis the same as beachwatch program to meet the ANZECC 1992 guideline requirement of recreational sampling. Data is analysed by a NATA registered lab and collected by professional sampling staff. Samples are analysed for faecal bacteria and physical parameters and blue green algae.

STWCH - The streamwatch program collects water quality samples from five sites within this sub-catchment. Data from these sites varies in sampling frequency and duration.

BHSCWQ - This program is undertaken by Baulkham Hills Council of which there are 18 sites within this sub-catchment. The majority of Baulkham Hills Councils sampling is undertaken in this sub-catchment. Sampling commenced in 1995 and at the majority of sites sampling is still being undertaken. Sampling frequency was roughly on a monthly basis.

HCCWQ - The Hawkesbury Council monitoring program is an 'adopt a creek' program with samples analysed by field kits. Three sites are sampled in this sub-catchment under this program.

Data Gaps

Water quality data for the Cattai Creek catchment was received from Sydney Water, SCA, Baulkham Hills Council, HNCMT and the EPA. There is generally good coverage of data in the Cattai Creek system except in the Glenorie area. The Rouse Hill development has been the driver for numerous water quality and quantity programs undertaken over the years. Good quality data is available for the catchment for the whole period of 1995 to 1999. At this stage there is no recommendation for additional monitoring.

Table 26: Data owner and contact details for Cattai Creek

Org code	Organisation	Study code	Study name	Contact	Reason for collection
SWC	Sydney Water Corporation	PAM	Performance Monitoring Assessment and Reporting	Andrew Kasmarik	Assess performance of Sydney Water's activities on the environment
DLWC	Department of Land and Water Conservation	RecWat	Recreational Water Quality Study	Adam Boey	Summer sampling for faecal bacteria to determine recreational quality
EPA	Environment Protection Authority	EPAWQ	Hawkesbury Monitoring program	William Hall	SOE and assessment of health of waterways.
BHSC	Baulkham Hills Shire Council	BHSCWQ	Clean Waters Program	Andrea Horan	Recreational water quality monitoring as part of DLWC program and phys-chem for SOE reporting
SCA	Sydney Catchment Authority	HNTribs	Water Quality Monitoring in Hawkesbury-Nepean Tributaries	Amir Deen	Water quality and pollutant loads in South, Cattai, Berowra and Matahil and Stonequarry Creeks
SWC	Sydney Water Corporation	RUD03	Cattai Creek Water Quality study	Robyn Sim	Pollutant loads and water quality to assess impact of Rouse Hill development
HNCMT	Hawkesbury Nepean Catchment Management Trust	STWCH	Streamwatch program	Avtar Singh	Community/Schools based assessment of streams
HCC	Hawkesbury City Council	HCCWQ	Hawkesbury River Water Quality Program	Adriana Genova	Water Quality sampling for Hawkesbury Nepean River and Tributaries for SOE reporting

Table 27: Site information for Cattai Creek

Site code (provided)	Site code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
BLU1	BLU1	BHSCWQ	BHSC	Blue Gum Creek at Blue Gum Rd	150.954389	-33.655583	1
CAD1	CAD1	BHSCWQ	BHSC	Caddies Ck Withers Rd	150.927152	-33.68304	1
CAD2	CAD2	BHSCWQ	BHSC	Caddies Creek Windsor Road	150.93052	-33.705616	1
CAT	CAT	BHSCWQ	BHSC	Cattai Creek James Place Castle Hill	150.988635	-33.734509	1
CAT1	CAT1	BHSCWQ	BHSC	Cattai Ck Fred Caterson Reserve	150.981616	-33.71632	1
CAT2	CAT2	BHSCWQ	BHSC	Cattai Creek U/S Castle Hill STP	150.982464	-33.713464	1

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Site code (provided)	Site code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
CAT4	CAT4	BHSCWQ	BHSC	Cattai Creek at Pitt Town Road	150.929232	-33.600811	1
CAT5	CAT5	BHSCWQ	BHSC	Cattai Creek at Cattai Road	150.907036	-33.558957	1
CAT6	CAT6	BHSCWQ	BHSC	Cattai Creek at Glenhaven Rd	150.96759	-33.694496	1
LIC1	LIC1	BHSCWQ	BHSC	Little Cattai Ck Wisemans Ferry Rd, Cattai	150.918983	-33.542263	1
LIC2	LIC2	BHSCWQ	BHSC	Little Cattai Idlewild Rd, Glenorie	150.95422	-33.551366	1
OHA1	OHA1	BHSCWQ	BHSC	O'Haras Ck O'Hara's Ck Rd	151.000352	-33.637	1
OHA2	OHA2	BHSCWQ	BHSC	O'Haras Creek Crn Maple St & Pelitt Lane	151.022417	-33.692032	1
OHA3	OHA3	BHSCWQ	BHSC	O'Haras Creek D/S Round Corner STP	151.018855	-33.687592	1
SEC1	SEC1	BHSCWQ	BHSC	Second Ponds Creek at Withers Rd	150.916312	-33.673104	1
SEC2	SEC2	BHSCWQ	BHSC	Second Ponds Ck Sewage treatment plant	150.922778	-33.667778	1
SMA1	SMA1	BHSCWQ	BHSC	Smalls Creek at Withers Rd	150.942754	-33.689455	1
SMA2	SMA2	BHSCWQ	BHSC	Smalls Ck Commercial Rd Kellyville	150.93512	-33.682144	1
390089	390089	EPAWQ	EPA	Cattai Creek at Cattai Ridge Road	150.941049	-33.582563	1
390123	390123	EPAWQ	EPA	Cattai Creek at Pitt Town Road	150.929232	-33.600811	1
HCC2	HCC2	HCCWQ	HCC	McKenzie Ck Pitt town Rd, Maraylya	150.926217	-33.598609	4
NC2	NC2	HNTribs	SCA	Cattai Creek at Cattai Ridge Road	150.941049	-33.582563	1
NC3	NC3	HNTribs	SCA	Cattai Creek at Pitt Town Road	150.929232	-33.600811	1
NC4	NC4-SW	HNTribs	SCA	Cattai Creek at McClymonts Road, Kenthurst	150.929056	-33.615645	1
NC5	NC5	HNTribs	SCA	Cattai Creek at Annangrove Road	150.92944	-33.660272	1
NC50	NC50	HNTribs	SCA	Second Ponds Creek below Ross Place	150.931912	-33.662592	1
NC51	NC51	HNTribs	SCA	Second Ponds Creek, Mile End Rd (D/S Rouse Hill STP)	150.927222	-33.665556	1
NC7	NC7	HNTribs	SWC	Cattai Creek at Glenhaven Rd	150.96759	-33.694496	1
NC8	NC8	HNTribs	SWC	Cattai Creek U/S Castle Hill STP	150.982464	-33.713464	1
NCB28O	NCB28O	HNTribs	SWC	Outflow Basin 28 Second Ponds Creek	150.916463	-33.673002	1

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Site code (provided)	Site code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
NC2	NC2-SW	PAM	SWC	Cattai Creek at Cattai Ridge Road	150.941049	-33.582563	1
NC22	NC22	PAM	SWC	O'Haras Creek D/S Round Corner STP	151.018855	-33.687592	1
NC24	NC24	PAM	SWC	O'Haras Creek U/S Round Corner STP	151.019744	-33.689077	1
NC5	NC5-SW	PAM	SWC	Cattai Creek at Annangrove Road	150.92944	-33.660272	1
NC51	NC51-SW	PAM	SWC	Second Ponds Creek, Mile End Rd (D/S Rouse Hill STP)	150.927222	-33.665556	1
NC53	NC53	PAM	SWC	Second Ponds Creek U/S Rouse Hill STP	150.911944	-33.680278	1
NC75	NC75	PAM	SWC	Cattai Creek D/S Castle Hill STP	150.98179	-33.7099	1
NC8	NC8-SW	PAM	SWC	Cattai Creek U/S Castle Hill STP	150.982464	-33.713464	1
RWQ24	RWQ24	RecWat	DLWC	Cattai Ck Fred Caterson Reserve	150.981616	-33.71632	1
RWQ26	RWQ26	RecWat	DLWC	Longneck Lagoon, Longneck Ck	150.5317	-33.35	1
RWQ33	RWQ33	RecWat	DLWC	Little Cattai Creek	150.552	-33.3252	1
RWQ49	RWQ49	RecWat	DLWC	Mitchell Park, Cattai Creek	150.5515	-33.3356	1
NC53	NC53-SW	RUD03	SWC	Second Ponds Creek U/S Rouse Hill STP	150.911944	-33.680278	1
NC61	NC61	RUD03	SWC	Caddies Creek at Hillview Rd, Kellyville	150.933392	-33.673144	1
NC63	NC63	RUD03	SWC	Smalls Creek at Withers Rd	150.942754	-33.689455	1
NC64	NC64	RUD03	SWC	Smalls Creek at Gumnut Close, Kellyville	150.950008	-33.69932	1
NC66	NC66	RUD03	SWC	Smalls Creek at Hezlett Rd, Kellyville	150.958728	-33.703368	1
NC67	NC67	RUD03	SWC	Caddies Creek at Commercial Rd, Kellyville	150.925743	-33.687257	1
NC671	NC671	RUD03	SWC	Caddies Ck Withers Rd	150.927152	-33.68304	1
NC68	NC68	RUD03	SWC	Caddies Creek Windsor Road	150.93052	-33.705616	1
NC11	NC11	RUD03	SWC	Cattai Creek at Cattai Road	150.907036	-33.558957	1
NC20	NC20	RUD03	SWC	O'Haras Creek U/S confluence of Cattai Creek	150.939953	-33.586693	1
NC3	NC3-SW	RUD03	SWC	Cattai Creek at Pitt Town Road	150.929232	-33.600811	1
NC4	NC4	RUD03	SWC	Cattai Creek at McClymonts Road, Kenthurst	150.929056	-33.615645	1

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Site code (provided)	Site code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
NC41	NC41	RUD03	SWC	Blue Gum Creek at Blue Gum Rd	150.954389	-33.655583	1
NC45	NC45	RUD03	SWC	Cattai Creek Upstream of Blue Gum Creek confluence Shortland Road	150.932136	-33.630928	1
NC50	NC50-SW	RUD03	SWC	Second Ponds Creek below Ross Place	150.931912	-33.662592	1
NC7	NC7-SW	RUD03	SWC	Cattai Creek at Glenhaven Rd	150.96759	-33.694496	1
NCB13I	NCB13I	RUD03	SWC	Caddies Creek Basin 13 Inflow	150.934248	-33.72708	1
NCB13O	NCB13O	RUD03	SWC	Caddies Creek Basin 13 Outflow	150.934416	-33.726432	1
NCB28O	NCB28O-SW	RUD03	SWC	Outflow Basin 28 Second Ponds Creek	150.916463	-33.673002	1
NCB29O	NCB29O	RUD03	SWC	Caddies Creek Basin 29 Outflow	150.929088	-33.678416	1
NCB9DS	NCB9DS	RUD03	SWC	Smalls Creek at Hezlett Rd, Kellyville	150.958728	-33.703368	1
NCB9US	NCB9US	RUD03	SWC	Smalls Creek Upstream Basin 9	150.9614272	-33.704608	1
ANNA1	ANNA1	STWCH	HNCMT	Cattai Ck at Murphy's Bridge, Annangrove	150.9280556	-33.658888	4
CHHS1	CHHS1	STWCH	HNCMT	Cattai Ck at Fred Caterson Reserve, Castle Hill	150.9858333	-33.723055	4
GLEN1	GLEN1	STWCH	HNCMT	Little Cattai Ck, Maroota	150.995	-33.468888	4
GLEN2	GLEN2	STWCH	HNCMT	Little Cattai Ck at Pulls Rd, Maroota	150.9777778	-33.517222	4
THGS1	THGS1	STWCH	HNCMT	O'Haras Ck behind the School, Kenthurst	151.0127778	-33.685555	4

Table 28: Data information for Cattai Creek

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
BLU1	BHSC	15/02/1995	29/08/1997			29	29	29	28			28						28	28			28					22	27
CAD1	BHSC	24/01/1995	28/07/1999			23	26	26	22			23	6		10	10	25	23				16					15	16
CAD2	BHSC	22/01/1996	28/07/1999			23	26	26	22			26	6		10	10	26	24				16					15	16
CAT	BHSC	24/01/1995	20/07/1999			17	18	18	16			18	5		8	8	18	18				11					11	11
CAT1	BHSC	24/01/1996	20/07/1999			14	14	14	10			15			5	5	15	12				10					10	10
CAT2	BHSC	24/01/1995	20/07/1999			31	33	32	30			30	6		10	10	32	31				23					21	22
CAT4	BHSC	01/02/1995	28/07/1999			28	28	29	27			30			4	4	31	26				27					27	27
CAT5	BHSC	01/02/1995	28/07/1999			35	36	36	33			37	6		11	11	38	34				27					22	26
CAT6	BHSC	24/01/1996	03/12/1997			10	10	10	10			10					10	9				10					9	10
LIC1	BHSC	01/02/1995	28/07/1999			39	39	39	36			39	6		11	11	40	36				29					23	28
LIC2	BHSC	01/02/1995	18/02/1997			24	24	24	24			22					23	22				24					24	23
OHA1	BHSC	01/02/1995	19/03/1997			26	26	26	26			26					25	24				26					25	25
OHA2	BHSC	09/03/1995	20/07/1999			38	38	38	34			39	6		11	11	39	34				28					22	27
OHA3	BHSC	01/02/1995	20/07/1999			37	37	37	33			38	6		11	11	37	35				27					27	26
SEC1	BHSC	24/01/1995	28/07/1999			26	27	26	24			27	5		10	10	28	26				19					19	19
SEC2	BHSC	24/01/1996	02/09/1998			14	13	14	14			13	3		3	3	13	14				10					10	10
SMA1	BHSC	24/01/1995	28/07/1999			26	26	26	24			27	5		10	10	28	25				19					16	19
SMA2	BHSC	24/01/1995	28/07/1999			26	27	27	25			28	6		11	11	29	26				19					18	19
RWQ24	DLWC	15/04/1998	09/03/1999	9			10	9			10	10		5														
390089	EPA	03/01/1995	02/07/1996		37	39	39	38	37			19	6		37		39	6								39	39	39

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SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
390123	EPA	03/01/1995	12/09/1995		19	19	19	19	19			19	2				19	2								19	19	19
NC2	SCA	01/02/1995	24/12/1999	30		66	66	66	66	66	64	84			83	82	82	66									82	82
NC3	SCA	01/02/1995	20/08/1999			123	123	67	67	67	116	135			140	140	140	123									136	136
NC4	SCA	01/02/1995	20/08/1999			67	67	67	67	67	63	83			82	82	82	67									82	82
NC5	SCA	01/02/1995	20/08/1999	3		67	67	67	67	67	64	86			86	85	85	67									84	84
NC50	SCA	01/02/1995	20/07/1998			38	38	38	38	38	36	66			66	65	65	38									65	66
NC51	SCA	01/02/1995	20/08/1999			66	66	66	66	66	64	95			95	93	93	66									93	93
NC53	SWC	25/01/1995	15/04/1998	11								6			19	17	17				2						8	8
NC61	SWC	01/02/1995	16/05/1996									25			25	24	24										24	24
NC63	SWC	01/02/1995	16/05/1996									20			28	27	27										20	20
NC64	SWC	01/02/1995	17/08/1995									10			10	10	10										10	10
NC66	SWC	03/03/1995	16/05/1996									9			10	9	9										8	8
NC67	SWC	01/02/1995	16/05/1996									26			39	38	38				5						28	28
NC671	SWC	08/05/1996	08/05/1996									1			1	1	1										1	1
NC68	SWC	24/05/1995	18/04/1996									12			12	12	12										12	12
NC7	SCA	01/02/1995	20/08/1999			67	67	67	67	67	64	85			85	85	85	67									84	84
NC8	SCA	01/02/1995	20/08/1999	2		67	67	67	67	67	64	86			86	85	85	67									84	84
NCB13I	SWC	01/02/1995	16/05/1996									26			36	35	35				5						27	27
NCB13O	SWC	03/03/1995	08/05/1996									8			13	13	13				3						9	9
NCB28O	SCA	03/03/1995	20/08/1999			55	55	55	55	55	54	63			72	73	73	55			4						66	66
NCB29O	SWC	01/02/1995	16/05/1996									30			39	38	38				5						30	30

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SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
NC11	SWC	01/02/1995	19/06/1995		8	7	7	7	7	7		8			8	8	8	8									8	8
NC2	SWC	01/02/1995	30/12/1999		64	77	77	77	74	57	56	77			22	77	77	45									77	77
NC20	SWC	11/04/1995	19/06/1995		6	6	6	6	6	5		7			7	7	7	7									7	7
NC22	SWC	17/08/1995	30/12/1999	1	52	64	65	65	64	37	56	65				65	65	22									65	65
NC24	SWC	17/08/1995	30/12/1999	1	50	62	63	63	62	36	55	63				63	63	21									63	63
NC3	SWC	01/02/1995	16/02/1999		21	29	25	74	73	72		121			140	136	136	31									124	124
NC4	SWC	01/02/1995	20/09/1996		21	20	20	20	19	18		21			21	21	21	21									21	21
NC41	SWC	06/01/1995	24/07/1997		25	39	39	27	27	26		28			51	51	51	39			3						29	29
NC45	SWC	01/02/1995	19/06/1995		8	7	7	7	7	7		8			8	8	8	8									8	8
NC5	SWC	01/02/1995	30/12/1999		63	77	77	77	76	58	56	78			25	78	78	47									78	78
NC50	SWC	01/02/1995	23/12/1997		57	61	61	61	60	59		63			63	63	63	61									63	63
NC51	SWC	01/02/1995	30/12/1999		98	114	113	139	138	127	56	139			109	139	139	84									139	139
NC53	SWC	06/01/1995	30/12/1999		49	85	83	62	62	48	38	61			72	103	103	67			3						71	71
NC61	SWC	01/02/1995	23/12/1997		50	54	54	54	54	53		55			55	55	55	54									55	55
NC63	SWC	04/01/1995	27/11/1997		41	55	54	43	43	42		45			91	89	91	56									48	48
NC64	SWC	01/02/1995	17/08/1995		8	9	9	9	9	8		10			10	10	10	10									10	10
NC66	SWC	17/05/1995	19/12/1997		30	33	32	33	32	32		35			35	35	35	33									35	35
NC67	SWC	03/01/1995	23/12/1997		47	79	76	50	49	48		51			113	113	113	79			7						58	58
NC671	SWC	08/05/1996	08/05/1996		1							1			1	1	1										1	1
NC68	SWC	24/05/1995	30/10/1997		34	36	36	36	36	35		37			37	37	37	36									37	37
NC7	SWC	01/02/1995	20/09/1996		21	23	23	23	21	20		24			24	24	24	24									24	24

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SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.AI	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
NC75	SWC	17/08/1995	30/12/1999		52	65	65	65	65	37	53	65				65	65	22									65	65
NC8	SWC	01/02/1995	30/12/1999		63	77	77	77	75	58	56	78			25	78	78	47									78	78
NCB13I	SWC	01/02/1995	23/12/1997		55	81	75	57	53	55		59			111	111	111	81			4						67	67
NCB13O	SWC	24/05/1995	30/10/1997		20	32	32	21	21	20		22			58	58	58	33			2						28	28
NCB28O	SWC	18/05/1995	30/10/1997		18	41	37	19	19	19		20			65	65	65	42			6						29	29
NCB29O	SWC	01/02/1995	23/12/1997		54	80	77	55	54	53		58			107	107	107	80			6						67	67
NCB9DS	SWC	13/05/1997	28/05/1997		6							6			6	6	6										6	6
NCB9US	SWC	13/05/1997	28/05/1997		6							6			6	6	6										6	6
ANNA1	HNCMT	16/03/1995	16/03/1999			85	85	85	85	85		85				85	85	85										
CHHS1	HNCMT	23/05/1997	02/09/1999			21	21	21	21	21		21				21	21	21										
GLEN1	HNCMT	13/11/1995	15/05/1996			12	12	12	12	12		12				12	12	12										
GLEN2	HNCMT	05/02/1996	24/09/1998			9	9	9	9	9		9				9	9	9										
THGS1	HNCMT	14/02/1995	21/09/1999			135	135	135	135	135		135				135	135	135										
HCC2	HCC	14/06/1998	16/12/1999			35**	35	35				35					35*	35									35***	
RWQ33	DLWC	08/03/1998	19/04/1998	5			5	5			5	5		6														
RWQ49	DLWC	08/03/1998	19/04/1998	5			5	4			5	5		1														
RWQ26	DLWC	08/03/1998	19/04/1998	5			5	5			6	6		5														

* ortho phosphorus

** as TDS

*** as nitrates

South Creek

The sampling programs undertaken in the South Creek sub-catchment are listed in Table 29 and detailed below.

PAM – Performance Assessment Monitoring and Reporting Program is undertaken for Sydney Water. This program is part of their overall Environmental Indicators program as is part of Sydney Water's Licence conditions. The programs aimed to assess the impact of Sydney Water's activities on the environment. The program includes monthly routine sampling and three wet weather event sampling per year when there is greater than 25mm of rainfall in the catchment over a twenty-four hour period. The results of this program are reported annually in Sydney Water's annual environment report. This program started in 1995 and is currently ongoing. In this sub-catchment there are seven sites monitored under the PAM project, upstream and downstream of the major STPs.

RUD02 - This program was undertaken by Sydney Water between 1990 and 1995 finishing in June 1995. Thirteen sites were sampled on a fortnightly basis.

HNTribs - This program is being conducted for the SCA and assesses the impact of STP effluent on South Creek. Autosamplers are installed at five locations on South and Eastern creeks to assess pollutant loads exported from the catchment. Sampling is undertaken on a bi-monthly basis at fifteen locations for the SCA. This program was originally initiated by Sydney Water and was transferred to the SCA upon its creation.

EPAWQ - This program was conducted by the EPA as part of its water quality assessment program of the Hawkesbury-Nepean River. This program had nineteen sampling locations in this sub-catchment with sampling conducted on a fortnightly basis. Sampling was conducted as a routine program with no special wet weather sampling undertaken. Samples were analysed by the EPA labs at Lidcombe.

RecWat - This program is undertaken by DLWC as part of its recreational water quality program with four sites sampled in this sub-catchment. Sampling is conducted during the swimming season in summer from October to March on a six day basis the same as beachwatch program to meet the ANZECC 1992 guideline requirement of recreational sampling. Data is analysed by a NATA registered lab and collected by professional sampling staff. Samples are analysed for faecal bacteria and physical parameters and blue green algae.

STWCH - The streamwatch program collects water quality samples from five sites within this sub-catchment. Data from these sites varies in sampling frequency and duration.

BCCWQ - Blacktown City Council's Water Analysis Program is conducted to assess the quality of waterways in the local government area to assist Council in setting priorities in environmental management. Sampling is conducted once every six weeks since 1996 from eleven sites.

FCCWQ - Fairfield City Council undertake a seasonal water quality testing program at two sites to assess compliance with ANZECC 1992 water quality guidelines for fresh and marine waters for the protection of aquatic ecosystems and secondary contact recreation. Sampling is undertaken once every six days.

Data Gaps

Water quality data for South Creek was obtained from a range of councils, DLWC, Sydney Water, the SCA and EPA. There is a good coverage of sampling locations and data, however due to the number of organisations collecting data a co-ordination of effort and consistency in water quality parameters is required. Blue-green algae and chlorophyll-a data is generally not collected at an adequate frequency and site coverage. No additional sites are recommended.

Intensive monitoring of wet weather events has been undertaken at 5 sites on South and Eastern creeks by the SCA (formerly SWC) from 1997 to end 1999 at sites. This monitoring will continue until 2001.

Table 29: Data owner and contact details for South Creek

Org code	Organisation	Study code	Study name	Contact	Reason for collection
SWC	Sydney Water Corporation	PAM	Performance Monitoring Assessment and Reporting	Andrew Kasmarik	Assess performance of Sydney Water's activities on the environment
DLWC	Department of Land and Water Conservation	RecWat	Recreational Water Quality Study	Adam Boey	Summer sampling for faecal bacteria to determine recreational quality
BCC	Blacktown City Council	BCCWQ	Blacktown Council Water Analysis Program	Amanda Lokys	Assess water quality of waterways for council to set environmental management priorities
EPA	Environment Protection Authority	EPAWQ	Hawkesbury Monitoring program	William Hall	SOE and assessment of health of waterways.
FCC	Fairfield City Council	FCCWQ	Seasonal Water quality Assessment Program	Lesley Corkill	Program to assess compliance to ANZECC guidelines.
SCA	Sydney Catchment Authority	HNTribs	Water Quality Monitoring in Hawkesbury-Nepean Tributaries	Amir Deen	Water quality and pollutant loads in South, Cattai, Berowra and Matahil and Stonequarry Creeks
SWC	Sydney Water Corporation	RUD02	South Creek Water Quality study	Robyn Sim	Pollutant loads and water quality in South Creek Historical study
HNCMT	Hawkesbury Nepean Catchment Management Trust	STWCH	Streamwatch program	Avtar Singh	Community/Schools based assessment of streams

Table 30: Site information for South Creek

Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
B1	BCC-B1	BCCWQ	BCC	Breakfast Creek U/S Quakers Hill STP	150.881032	-33.74352	2
B2	BCC-B2	BCCWQ	BCC	Breakfast Creek D/S Quakers Hill STP	150.872603	-33.736901	2
B3	BCC-B3	BCCWQ	BCC	Breakfast Ck junction with Eastern Ck	150.870272	-33.732656	2
E1	E1	BCCWQ	BCC	Eastern Creek at Great Western Highway	150.861883	-33.792351	2
E2	E2	BCCWQ	BCC	Eastern Ck Grange Ave	150.859064	-33.701456	2
E3	E3	BCCWQ	BCC	Eastern Creek at Garfield Road	150.850989	-33.686287	2
E4	E4	BCCWQ	BCC	Eastern Creek D/S Riverstone STP	150.835544	-33.65412	2

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Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
R1	BCC-R1	BCCWQ	BCC	Ropes Ck Carlisle Ave	150.80848	-33.787864	2
R2	BCC-R2	BCCWQ	BCC	Ropes Ck above junction of South Ck	150.76656	-33.716104	2
S1	S1	BCCWQ	BCC	South Creek at Richmond Road	150.810904	-33.67903	2
WA	WA	BCCWQ	BCC	Plumpton Wetlands 4 sites	150.857222	-33.731667	2
RWQ-P2-05	RWQ-P2-05	RecWat	DLWC	South Ck Governor Phillip Park	150.8321	-33.600548	1
420053	420053	EPAWQ	EPA	South Creek at Chisholm Place	150.82176	-33.6256	1
420072	420072	EPAWQ	EPA	South Creek at Sanctuary Drive	150.825699	-33.647652	1
420084	420084	EPAWQ	EPA	Eastern Creek at Level Crossing Road	150.833112	-33.646256	1
420131	420131	EPAWQ	EPA	South Creek at Richmond Road	150.810904	-33.67903	1
420141	420141	EPAWQ	EPA	Eastern Creek at Garfield Road	150.850989	-33.686287	1
420177	420177	EPAWQ	EPA	South Creek at Stoney Creek Road	150.785136	-33.692696	1
420211	420211	EPAWQ	EPA	South Creek at Sixth Avenue	150.76528	-33.708136	1
420226	420226	EPAWQ	EPA	South Creek at Ninth Avenue	150.764728	-33.720272	1
420234	420234	EPAWQ	EPA	South Creek D/S St Marys STP	150.760405	-33.73342	1
420243	420243	EPAWQ	EPA	Eastern Creek at Richmond Road	150.8646	-33.742816	1
420261	420261	EPAWQ	EPA	Eastern Creek at Power Street	150.857912	-33.755848	1
420265	420265	EPAWQ	EPA	South Creek at Hartog Drive	150.751608	-33.742744	1
420289	420289	EPAWQ	EPA	South Creek at Christie Street	150.76218	-33.750985	1
420379	420379	EPAWQ	EPA	South Creek at Luddenham Road Bridge	150.765633	-33.806756	1
420408	420408	EPAWQ	EPA	South Creek Opposite Erskine Park Road	150.765003	-33.82088	1
420421	420421	EPAWQ	EPA	South Creek at Water supply pipeline	150.765224	-33.830264	1
420497	420497	EPAWQ	EPA	Badgerys Creek at Elizabeth Drive	150.753895	-33.875539	1
420501	420501	EPAWQ	EPA	South Creek at Elizabeth Drive	150.766836	-33.877295	1

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Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
420511	420511	EPAWQ	EPA	Kemp's Ck Elizabeth Dr	150.797649	-33.882462	1
REC1	REC1	FCCWQ	FCC	Reedy Creek Upper reach, Lincoln Road, Cecil Park	150.834037	-33.830478	2
ROC1	ROC1	FCCWQ	FCC	Ropes Creek Upper reach, Lincoln Road, Horsley Park	150.829104	-33.860264	2
NS04	NS04	HNTribs	SCA	South Creek at Fitzroy Bridge	150.824334	-33.608395	1
NS081	NS081	HNTribs	SCA	Eastern Creek D/S Riverstone STP	150.835544	-33.65412	1
NS082	NS082	HNTribs	SCA	Eastern Creek U/S Riverstone STP	150.834664	-33.658616	1
NS083	NS083	HNTribs	SCA	Eastern Creek at Garfield Road	150.850989	-33.686287	1
NS085	NS08	HNTribs	SCA	Eastern Creek @ Douglas Road	150.8646	-33.742826	1
NS087	NS087	HNTribs	SCA	Breakfast Creek D/S Quakers Hill STP	150.872603	-33.736901	1
NS090	NS090	HNTribs	SCA	Breakfast Creek U/S Quakers Hill STP	150.881032	-33.74352	1
NS094	NS094	HNTribs	SCA	Eastern Creek at Richmond Road	150.8646	-33.742816	1
NS14	NS14	HNTribs	SCA	South Creek at Richmond Road	150.810904	-33.67903	1
NS23	NS23	HNTribs	SCA	South Creek D/S St Marys STP	150.760405	-33.73342	1
NS26	NS26	HNTribs	SCA	South Creek U/S St Marys STP (Golf Course)	150.75936	-33.74144	1
NS37	NS37	HNTribs	SCA	South Creek Opposite Erskine Park Road	150.765003	-33.82088	1
NS38	NS38	HNTribs	SCA	South Creek at Sydney Water pipeline	150.765724	-33.830264	1
NS440	NS440	HNTribs	SCA	Badgerys Creek at Elizabeth Drive	150.753895	-33.875539	1
NS45	NS45	HNTribs	SCA	South Creek at Elizabeth Drive	150.766836	-33.877295	1
ANDR1	ANDR1	STWCH	HNCMT	Breakfast Ck at Harvey Pk, Marayong	150.886111	-33.746666	4
CPHS1	CPHS1	STWCH	HNCMT	Werrington Ck at William St, Werrington	150.736944	-33.755833	4
DTHS1	DTHS1	STWCH	HNCMT	Eastern Ck at Nurragingy Reserve, Doonside	150.857777	-33.760833	4

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Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
HACC2	HACC2	STWCH	HNCMT	Killarney Chain Of Ponds at Colbee Park, McGraths Hill	150.846111	-33.6225	4
SHAL1	SHAL1	STWCH	HNCMT	South Ck at Eighth Ave, Shanes Park	150.766111	-33.715555	4
NS04	NS04-SW	RUD02	SWC	South Creek at Fitzroy Bridge	150.824334	-33.608395	1
NS081	NS081-SW	PAM	SWC	Eastern Creek D/S Riverstone STP	150.835544	-33.65412	1
NS082	NS082-SW	PAM	SWC	Eastern Creek U/S Riverstone STP	150.834664	-33.658616	1
NS083	NS083-SW	RUD02	SWC	Eastern Creek at Garfield Road	150.850989	-33.686287	1
NS087	NS087-SW	PAM	SWC	Breakfast Creek D/S Quakers Hill STP	150.872603	-33.736901	1
NS090	NS090-SW	PAM	SWC	Breakfast Creek U/S Quakers Hill STP	150.881032	-33.74352	1
NS21	NS21	RUD02	SWC	South Creek at Eight Ave Bridge, Shane's Park	150.76638	-33.715746	1
NS211	NS211	RUD02	SWC	Ropes Ck above junction of South Ck	150.76656	-33.716104	1
NS23	NS23-SW	PAM	SWC	South Creek D/S St Marys STP	150.760405	-33.73342	1
NS24	NS24	PAM	SWC	South Creek U/S St Marys STP 50m	150.760496	-33.737472	1
NS26	NS26-SW	PAM	SWC	South Creek U/S St Marys STP (Golf Course)	150.75936	-33.74144	1
NS35	NS35	RUD02	SWC	South Creek at Luddenham Road Bridge	150.765633	-33.806756	1
NS37	NS37-SW	RUD02	SWC	South Creek Opposite Erskine Park Road	150.765003	-33.82088	1
NS440	NS440-SW	RUD02	SWC	Badgerys Creek at Elisabeth Drive	150.753895	-33.875539	1
NS45	NS45-SW	RUD02	SWC	South Creek at Elisabeth Drive	150.766836	-33.877295	1
NS450	NS450	RUD02	SWC	Kemp's Ck Elisabeth Dr	150.797649	-33.882462	1
NS55	NS55	RUD02	SWC	South Ck Bringelly Rd	150.7526	-33.94296	1
NS600	NS600	RUD02	SWC	Lowes Creek at The Northern Road Bridge	150.737384	-33.963984	1
NS62	NS62	RUD02	SWC	South Creek off Robens Cr, Catherine Field	150.752368	-33.963288	1
NS65	NS65	RUD02	SWC	South Creek at Camden Valley Way, Catherine Field	150.761397	-34.019391	1

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Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
RWQ35	RWQ35	RecWat	DLWC	Bells Creek, Plumpton Park, Blacktown	150.4948	-33.4545	1
RWQ39	RWQ39	RecWat	DLWC	Eastern Creek Nurragingy Reserve, Doonside	150.512	-33.4516	1
RWQ31	RWQ31	RecWaT	DLWC	South Creek Park, Werrington	150.4554	-33.4614	1

Table 31: Data information for South Creek

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
B1	BCC	10/05/1996	10/11/1999			21	26	28	28			25						28										
B2	BCC	10/05/1996	10/11/1999			28	26	28	28			26						28										
B3	BCC	10/05/1996	10/11/1999			27	26	27	27			25						27										
E1	BCC	10/05/1996	10/11/1999			21	25	27	27			24						27										
E2	BCC	10/05/1996	10/11/1999			23	26	28	28			25						28										
E3	BCC	10/05/1996	10/11/1999			21	26	28	28			25						28										
E4	BCC	06/12/1996	10/11/1999			16	20	22	22			19						22										
R1	BCC	07/06/1996	01/12/1999			20	24	26	24			17						26										
R2	BCC	26/03/1996	01/12/1999			19	22	24	21			17						24										
S1	BCC	07/06/1996	01/12/1999			20	24	26	23			19						26										
WA	BCC	17/05/1996	22/12/1999			22	78	84	79			6			84			66									83	
RWQ-P2-05	DLWC	04/01/1995	21/12/1999	24		75	99	103	58		102	102	75	99				67										
420053	EPA	03/01/1995	26/09/1995		20	20	20	20	20			19	2				20	2								20	20	20
420072	EPA	03/01/1995	12/09/1995		19	18	19	19	19			17	2		1		19	2								19	19	19
420084	EPA	03/01/1995	26/09/1995		20	19	20	20	20			20	2				20	1								20	19	20
420131	EPA	03/01/1995	02/07/1996		38	39	40	40	39			20	14		38		40	14								40	40	40
420141	EPA	03/01/1995	02/07/1996		38	39	40	40	39			20	14		38		40	14								40	40	40
420177	EPA	03/01/1995	26/09/1995		20	19	20	20	20			20	2		1		20	2								20	20	20
420211	EPA	03/01/1995	26/09/1995		20	19	20	20	20			19	2		1		20	2								20	20	20
420226	EPA	03/01/1995	26/09/1995		20	19	20	20	20			20	2		1		20	2								20	20	20

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SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
420234	EPA	03/01/1995	26/09/1995		19	19	19	19	19			18	1				20	2								19	19	19
420243	EPA	31/01/1995	26/09/1995		18	17	18	18	18			18	2				18	2								18	18	18
420261	EPA	31/01/1995	26/09/1995		18	17	18	18	18			18	2				18	2								18	18	18
420265	EPA	03/01/1995	26/09/1995		20	20	20	20	20			20	1				20	2								20	20	20
420289	EPA	03/01/1995	26/09/1995		20	20	20	20	20			20	1				20	2								20	20	20
420379	EPA	03/01/1995	26/09/1995		20	20	20	20	20			20	1				20	2								20	20	20
420408	EPA	03/01/1995	26/09/1995		20	20	20	20	20			20	1				20	2								20	20	20
420421	EPA	03/01/1995	26/09/1995		20	20	20	20	20			19	1				20	2								20	20	20
420497	EPA	03/01/1995	26/09/1995		20	20	20	20	20			20	1				20	2								20	20	20
420501	EPA	03/01/1995	26/09/1995		20	20	20	20	20			20	1				20	2								20	20	20
420511	EPA	03/01/1995	26/09/1995		20	20	20	20	20			20	1				20	2								20	20	20
REC1	FCC	31/07/1997	30/12/1999				28	25	25	25		23					26	28										20
ROC1	FCC	07/12/1999	30/12/1999				4	2	2	2		4					4	4										4
NS04	SCA	16/12/1996	17/12/1999			65	65	65	65	65	64	65			65	65	65	65									65	65
NS081	SCA	16/12/1996	17/12/1999		1	66	66	66	66	66	61	66			66	65	66	66									66	66
NS082	SCA	16/12/1996	17/12/1999		1	65	64	65	65	65	60	65			65	64	64	65									65	65
NS083	SCA	16/12/1996	17/12/1999			95	95	65	65	65	86	87			91	91	91	95									91	91
NS085	SCA	16/12/1996	17/12/1999			65	65	65	65	65	64	65			65	65	65	65									65	65
NS087	SCA	16/12/1996	17/12/1999		1	64	64	64	64	64	60	65			65	64	65	64									65	65
NS090	SCA	16/12/1996	17/12/1999		1	65	65	65	65	65	60	65			65	64	65	65									65	65
NS094	SCA	17/01/1997	17/12/1999			111	111	64	64	64	106	106			108	108	108	111									108	108

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SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
NS14	SCA	16/12/1996	17/12/1999			116	116	65	65	65	108	109			111	111	111	116									111	111
NS23	SCA	16/12/1996	17/12/1999		1	65	65	65	65	65	60	65			65	64	65	65									65	65
NS26	SCA	16/12/1996	17/12/1999		1	65	65	65	65	65	61	65			65	64	65	65									65	65
NS37	SCA	16/12/1996	17/12/1999			68	68	54	54	54	66	67			68	68	68	68									68	68
NS38	SCA	08/08/1998	08/08/1998		1	1												1										
NS440	SCA	30/01/1997	29/10/1997			12	12	12	12	12	12	12			12	12	12	12									12	12
NS45	SCA	30/01/1997	19/05/1997			4	4	4	4	4	4	4			4	4	4	4									4	4
NS04	SWC	12/01/1995	14/06/1995		6	9	9	9	9	9		9			9	9	9	9									9	9
NS081	SWC	17/08/1995	17/12/1999		52	65	65	65	65	37	55	65				65	65	22									65	65
NS082	SWC	17/08/1995	17/12/1999		52	65	64	65	65	37	55	65				65	65	22									65	65
NS083	SWC	12/01/1995	23/10/1998		6	9	9	9	9	9		55			56	56	56	9									9	9
NS087	SWC	17/08/1995	17/12/1999		52	65	65	64	65	37	55	65				65	65	22									65	65
NS090	SWC	17/08/1995	17/12/1999		52	65	65	65	65	37	55	65				65	65	22									65	65
NS21	SWC	12/01/1995	14/06/1995		6	9	9	9	9	9		9			9	9	9	9									9	9
NS211	SWC	12/01/1995	14/06/1995		10	12	12	12	12	12		12			12	12	12	12									12	12
NS23	SWC	12/01/1995	17/12/1999		62	77	77	77	77	49	55	77			12	77	77	34									77	77
NS24	SWC	19/05/1997	17/12/1999		32	39	39	39	39	37	39	39				39	39	19									39	39
NS26	SWC	12/01/1995	17/12/1999		62	77	76	77	77	49	55	77			12	77	77	34									77	77
NS35	SWC	12/01/1995	14/06/1995		5	8	8	8	8	8		8			8	8	8	7									8	8
NS37	SWC	06/03/1995	22/05/1995			10	10								10	10	10	10									10	10
NS440	SWC	12/01/1995	14/06/1995		6	9	9	9	9	8		9			9	9	9	9									9	9

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SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
NS45	SWC	12/01/1995	19/05/1997		6	9	9	13	13	13		13			13	13	13	9									13	13
NS450	SWC	12/01/1995	14/06/1995		4	7	7	7	7	7		7			7	7	7	7									7	7
NS55	SWC	12/01/1995	18/05/1995		1	4	4	4	4	4		4			4	4	4	4									4	4
NS600	SWC	18/05/1995	18/05/1995			1	1	1	1	1		1			1	1	1	1									1	1
NS62	SWC	12/01/1995	14/06/1995		5	7	7	7	7	7		7			7	7	7	7									7	7
NS65	SWC	18/05/1995	18/05/1995			1	1	1	1	1		1			1	1	1	1									1	1
ANDR1	HNCMT	29/05/1998	23/03/1999			7	7	7	7	7		7				7	7	7										
CPHS1	HNCMT	20/05/1996	24/06/1996			3	3	3	3	3		3				3	3	3										
DTHS1	HNCMT	23/09/1997	03/04/1999			6	6	6	6	6		6				6	6	6										
HACC2	HNCMT	03/06/1996	26/11/1996			22	22	22	22	22		22				22	22	22										
SHAL1	HNCMT	17/07/1996	25/09/1996			4	4	4	4	4		4				4	4	4										
RWQ39	DLWC	24/02/1998	09/03/1999	8			10	10			9	9						6										
RWQ31	DLWC	15/04/1998	09/03/1999	7			10	9			10	10		5														
RWQ35	DLWC	15/04/1998	09/03/1999	10			10	9			10	10		1				5										

Lower Nepean River

Water quality data from the Lower Nepean River sub-catchment have been obtained from the following programs (Table 32).

PAM - Performance Assessment Monitoring and Reporting Program is undertaken for Sydney Water. This program is part of their overall Environmental Indicators program as is part of Sydney Water's Licence conditions. The programs aimed to assess the impact of Sydney Water's activities on the environment. The program includes monthly routine sampling and three wet weather event sampling per year when there is greater than 25mm of rainfall in the catchment over a twenty-four hour period. The results of this program are reported annually in Sydney Water's annual environment report. This program started in 1995 and is currently ongoing. In this sub-catchment there are three sites monitored under the PAM project.

RRH02 - This program was essentially an earlier version of the HNMain program with more sites. In this sub-catchment sampling was conducted on a weekly to fortnightly basis at two locations.

HNMain - This program in the Lower Nepean River sub-catchment consists of sampling on a weekly basis at four locations for the SCA. This program was originally initiated by Sydney Water and was transferred to the SCA upon its creation. The program was undertaken to assess the wastewater strategy in the Hawkesbury-Nepean River.

EPAWQ - This program was conducted by the EPA as part of its water quality assessment program of the Hawkesbury-Nepean River. This program had two sampling locations in this sub-catchment with sampling conducted on a fortnightly basis. Sampling was conducted as a routine program with no special wet weather sampling undertaken. Samples were analysed by the EPA labs at Lidcombe.

RecWat - This program is undertaken by DLWC as part of its recreational water quality program with four sites sampled in this sub-catchment. Sampling is conducted during the swimming season in summer from October to March on a six day basis the same as beachwatch program to meet the ANZECC 1992 guideline requirement of recreational sampling. Data is analysed by a NATA registered lab and collected by professional sampling staff. Samples are analysed for faecal bacteria and physical parameters and blue green algae.

STWCH - The streamwatch program collects water quality samples from five sites within this sub-catchment. Data from these sites varies in sampling frequency and duration.

PSP01 - This program was undertaken as part of Sydney Water's priority sewage program which conducted an assessment of the impact of septic systems on waterways. The program was a short-term study conducted over a 13 month period.

Data Gaps

Overall there is good data coverage for this sub-catchment for the main river, however additional tributary sampling is recommended to assess the impact of continuing urban development in the catchment.

Table 32: Data owner and contact details for Lower Nepean River

Org code	Organisation	Study code	Study name	Contact	Reason for collection
SWC	Sydney Water Corporation	PAM	Performance Monitoring Assessment and Reporting	Andrew Kasmarik	Assess performance of Sydney Water's activities on the environment
SCA	Sydney Catchment Authority	HNMain	Water quality in Hawkesbury Nepean River catchment	Amir Deen	Data for modelling wastewater strategies

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Org code	Organisation	Study code	Study name	Contact	Reason for collection
DLWC	Department of Land and Water Conservation	RecWat	Recreational Water Quality Study	Adam Boey	Summer sampling for faecal bacteria to determine recreational quality
EPA	Environment Protection Authority	EPAWQ	Hawkesbury Monitoring program	William Hall	SOE and assessment of health of waterways.
HNCMT	Hawkesbury Nepean Catchment Management Trust	STWCH	Streamwatch program	Avtar Singh	Community/Schools based assessment of streams
SCA	Sydney Catchment Authority	RRH02	Hawkesbury-Nepean River water quality monitoring program	Amir Deen	Data for modelling and assessment of wastewater strategies
SWC	Sydney Water Corporation	PSP01	Priority Sewage Program -Oaks to Warragamba	Sue Shaw	Impact of septic leakage on local stream water quality

Table 33: Site information for Lower Nepean River

Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
CRAN1	CRAN1	STWCH	HNCMT	McCarthys Ck at Nepean St Bridge, Mt Pleasant	150.698888	-33.7225	4
NEPE3	NEPE3	STWCH	HNCMT	Nepean River at Jacksons Lane, Castlereagh	150.655833	-33.717222	4
PENR1	PENR1	STWCH	HNCMT	Peach Tree Ck at Great Western Hwy Bridge, Penrith	150.683055	-33.751111	4
PENR2	PENR2	STWCH	HNCMT	Jamison Pk Drains at Great Western Hwy, Penrith	150.683055	-33.750277	4
PENR3	PENR3	STWCH	HNCMT	Peach Tree Ck at Rail Bridge, Penrith	150.684166	-33.749444	4
RWQ12	RWQ12	RecWat	DLWC	Nepean River Penrith Weir	150.68377	-33.74311	1
RWQ-P1-06	RWQ-P1-06	RecWat	DLWC	Nepean River Tench's Reserve	150.659958	-33.765266	1
1512	1512	EPAWQ	EPA	Nepean River at Smith Street	150.662778	-33.670028	1
1654	1654	EPAWQ	EPA	Nepean River Tench's Reserve	150.659958	-33.765266	1
N44	N44	HNMain	SCA	Nepean River at Yarramundi Bridge	150.698038	-33.614759	1
N46	N46	RRH02	SCA	Nepean River at Devlin Rd	150.666819	-33.655133	1
N48	N48	HNMain	SCA	Nepean River at Smith Street	150.662778	-33.670028	1

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N491	N491	RRH02	SCA	Cranebrook Ck 100m U/S Nepean River	150.660633	-33.672579	1
N53	N53	HNMain	SCA	Nepean River at BMG Causeway	150.672266	-33.736105	1
N57	N57	HNMain	SCA	Nepean River Penrith Weir	150.68377	-33.74311	1
N48	N48-SW	PAM	SWC	Nepean River at Smith Street	150.662778	-33.670028	1
N53	N53-SW	PAM	SWC	Nepean River at BMG Causeway	150.672266	-33.736105	1
N57	N57-SW	PAM	SWC	Nepean River Penrith Weir	150.68377	-33.74311	1
N664	N664	PSP01	SWC	Mulgoa Creek St Thomas Rd	150.65741	-33.832913	1
N665	N665	PSP01	SWC	Mulgoa Creek Upstream of pipeline Garden Hill Rd	150.668991	-33.848959	1
RWQ36	RWQ36	RecWat	DLWC	Yarramundi Bridge, Rivatts Ck	150.4155	-33.3652	1
RWQ28	RWQ28	RecWat	DLWC	Nepean River at Devlin Road	150.666819	-33.655133	1

Table 34: Data information for Lower Nepean River

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
RWQ-P1-06	DLWC	04/01/1995	29/12/1999	36		79	124	121	62		122	122	76	98				102										
RWQ12	DLWC	09/12/1996	13/04/1999	28			45	41			43	43		28				27										
1512	EPA	03/01/1995	02/07/1996		38	38	39	40	40				13		39		40	14								40	40	40
1654	EPA	03/01/1995	02/07/1996		38	39	40	40	40				13		39		40	14								40	40	40
N44	SCA	03/01/1995	29/12/1999	137	51	245	243	245	246	167	140	246		4	246	246	245	246									246	246
N46	SCA	18/09/1996	14/07/1999	36		45	46	47	47	45		46			47	47	47	47									46	46
N48	SCA	03/01/1995	29/12/1999	123	51	245	243	245	245	166	140	246		5	246	246	245	246									246	246
N491	SCA	24/01/1995	09/01/1996	1	15	17	17	17	17			17			17	17	17	17									17	17
N53	SCA	03/01/1995	29/12/1999	1	51	246	244	246	246	168	141	248		6	247	248	247	246									248	248
N57	SCA	03/01/1995	29/12/1999	93	51	244	244	245	245	166	141	247		6	247	247	247	246									247	247
N48	SWC	03/01/1995	06/12/1999		95	101	100	101	99	36	54	105				105	105	21									105	105
N53	SWC	03/01/1995	06/12/1999		95	101	100	101	101	36	54	105				105	105	21									105	105
N57	SWC	03/01/1995	06/12/1999		95	100	101	101	100	35	54	105				105	104	21									105	105
N664	SWC	20/04/1998	15/10/1998		13							17			13	13	13										13	13
N665	SWC	07/04/1998	15/10/1998		11							18			11	11	11										11	11
CRAN1	HNCMT	11/12/1996	15/09/1999			8	8	8	8	8		8				8	8	8										
NEPE3	HNCMT	14/03/1995	14/03/1995			1	1	1	1	1		1				1	1	1										
PENR1	HNCMT	23/02/1995	15/09/1999			81	81	81	81	81		81				81	81	81										
PENR2	HNCMT	09/03/1995	11/05/1997			30	30	30	30	30		30				30	30	30										
PENR3	HNCMT	10/05/1995	15/09/1999			77	77	77	77	77		77				77	77	77										

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SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
RWQ36	DLWC	04/01/1995	09/03/1999	1		75	77	80	59		81	81	75	5				70										
RWQ28	DLWC	09/02/1999	29/12/1999	4		4	9	9	4		9	9	1					9										

Grose River

Water quality data from the Grose River sub-catchment have been obtained from the range of studies listed below (Table 35).

PAM - Performance Assessment Monitoring and Reporting Program is undertaken for Sydney Water. This program is part of their overall Environmental Indicators program as is part of Sydney Water's Licence conditions. The programs aimed to assess the impact of Sydney Water's activities on the environment. The program includes monthly routine sampling and three wet weather event sampling per year when there is greater than 25mm of rainfall in the catchment over a twenty-four hour period. The results of this program are reported annually in Sydney Water's annual environment report. This program started in 1995 and is currently ongoing. In this sub-catchment there are six sites monitored under the PAM project, upstream and downstream of the Blue Mountains STPs.

HNMain - This program in the Lower Nepean River sub-catchment consists of sampling on a weekly basis at one location for the SCA. This program was originally initiated by Sydney Water and was transferred to the SCA upon its creation. The program was undertaken to assess the wastewater strategy in the Hawkesbury-Nepean River.

RecWat - This program is undertaken by DLWC as part of its recreational water quality program with one site sampled in this sub-catchment. Sampling is conducted during the swimming season in summer from October to March on a six day basis the same as beachwatch program to meet the ANZECC 1992 guideline requirement of recreational sampling. Data is analysed by a NATA registered lab and collected by professional sampling staff. Samples are analysed for faecal bacteria and physical parameters and blue green algae.

STWCH - The streamwatch program collects water quality samples from two sites within this sub-catchment. Data from these sites varies in sampling frequency and duration.

BMCCREC - Blue Mountains City Council undertakes a recreational water quality monitoring program at seven locations in this sub-catchment. Sampling appears to be adhoc.

HCCWQ - The Hawkesbury Council monitoring program is an 'adopt a creek' program with samples analysed by field kits. One site is sampled in this sub-catchment under this program.

Table 35: Data owner and contact details for Grose River

Org code	Organisation	Study code	Study name	Contact	Reason for collection
SWC	Sydney Water Corporation	PAM	Performance Monitoring Assessment and Reporting	Andrew Kasmarik	Assess performance of Sydney Water's activities on the environment
SCA	Sydney Catchment Authority	HNMain	Water quality in Hawkesbury Nepean River catchment	Amir Deen	Data for modelling wastewater strategies
DLWC	Department of Land and Water Conservation	RecWat	Recreational Water Quality Study	Adam Boey	Summer sampling for faecal bacteria to determine recreational quality
HCC	Hawkesbury City Council	HCCWQ	Hawkesbury River Water Quality Program	Adriana Genova	Water Quality sampling for Hawkesbury Nepean River and Tributaries for SOE reporting
BMCC	Blue Mountains City Council	BMCCREC	Blue Mountains Recreational Study	Amanda Kotlash	Measurement of faecal coliforms and physical parameters for recreational assessment.

Org code	Organisation	Study code	Study name	Contact	Reason for collection
HNCMT	Hawkesbury Nepean Catchment Management Trust	STWCH	Streamwatch program	Avtar Singh	Community/Schools based assessment of streams

Table 36: Site information for Grose River

Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
G02	G02	BMCCREC	BMCC	Popes Glen u/s Horseshoe Falls, Blackheath	150.309215	-33.623487	3
G03	G03	BMCCREC	BMCC	Yosemite Creek below Minnehaha Falls, North Katoomba	150.325559	-33.68899	3
G05	G05	BMCCREC	BMCC	Springwood Ck Down Trail at the end of Norton St.	150.564171	-33.694322	3
G06	G06	BMCCREC	BMCC	Pierces Ck Off Hungerford Trucke Fairy Grotto	150.333611	-33.568333	3
BMC-B01	BMC-B01	BMCCREC	BMCC	Waterfall Creek	150.4	-33.504722	3
BMC-B02	BMC-B02	BMCCREC	BMCC	Bowens Creek Mt Bowen	150.631087	-33.58437	3
CE01	CE01	BMCCREC	BMCC	Cedar Creek	150.476667	-33.499167	3
RWQ22	RWQ22	RecWat	DLWC	Grose River at Yarramundi	150.694444	-33.611111	1
GR4301	GR4301	HNMain	SCA	Grose River at Yarramundi	150.694444	-33.611111	1
HACC1	HACC1	STWCH	HNCMT	Grose River at Navua Reserve, Grose Wold	150.693333	-33.611666	4
REPS2	REPS2	STWCH	HNCMT	Doudles Folly Ck at Tourist Rd, Robertson	150.543333	-33.619444	4
GS4338	GS4338	PAM	SWC	D/S Wentworth Falls STP	150.404	-33.7115	1
GS4339	GS4339	PAM	SWC	U/S Wentworth Falls STP	150.396	-33.7134	1
GS4348	GS4348	PAM	SWC	d/s north Katoomba STP	150.309971	-33.68839	1
GS4349	GS4349	PAM	SWC	u/s North Katoomba STP	150.310904	-33.694576	1
GS4358	GS4358	PAM	SWC	Hat Hill Ck, downstream Blackheath STP	150.319916	-33.597088	1
GS4359	GS4359	PAM	SWC	Hat Hill Ck upstream Blackheath STP	150.303151	-33.613982	1
HCC1	HCC1	HCCWQ	HCC	Grose River at Yarramundi	150.694444	-33.611111	4

Table 37: Data information for Grose River

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.AI	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
G02	BMCC	03/12/1998	03/12/1998					1				1																
G03	BMCC	03/12/1998	03/12/1998			1	1	1	1	1			1					1										
G05	BMCC	04/12/1998	04/12/1998			1	1	1	1	1			1	1				1										
G06	BMCC	01/12/1998	01/12/1998					1				1																
BMC-B02	BMCC	03/10/1996	03/10/1996			1	1	1	1									1										
BMC-B01	BMCC	01/12/1998	01/12/1998					1				1																
CE01	BMCC	03/12/1998	03/12/1998			1	1	1	1	1			1					1										
RWQ22	DLWC	09/03/1998	19/04/1998	5			5	5				5	5		5													
GR4301	SCA	03/01/1995	29/12/1999	14	51	245	243	245	246	167	140	246		6	246	246	245	246									246	246
GS4338	SWC	18/07/1997	17/12/1999		30	36	36	36	36	36	36	36					36	36	21								36	36
GS4339	SWC	18/07/1997	17/12/1999		30	36	36	36	36	36	36	36					36	36	21								36	36
GS4348	SWC	18/07/1997	17/12/1999	3	30	37	37	37	37	37	37	37					37	37	22								37	37
GS4349	SWC	18/07/1997	17/12/1999		30	37	37	37	37	37	37	37					37	37	22								37	37
GS4358	SWC	18/07/1997	17/12/1999	5	30	37	37	37	37	37	37	37					37	37	22								37	37
GS4359	SWC	18/07/1997	17/12/1999		30	37	37	37	37	37	37	37					37	37	22								37	37
HACC1	HNCMT	03/06/1996	25/11/1996			22	22	22	22	22		22					22	22	22									
REPS2	HNCMT	11/06/1995	11/06/1995			1	1	1	1	1		1					1	1	1									
HCC1	HCC	14/07/98	16/12/99			35**	35	35					35					35*	35								35***	

* ortho phosphorus
 ** as TDS
 *** as nitrates

Erskine and Sassafras Creeks

PAM - Performance Assessment Monitoring and Reporting Program is undertaken for Sydney Water. This program is part of their overall Environmental Indicators program as is part of Sydney Water's Licence conditions. The programs aimed to assess the impact of Sydney Water's activities on the environment. The program includes monthly routine sampling and three wet weather event sampling per year when there is greater than 25mm of rainfall in the catchment over a twenty-four hour period. The results of this program are reported annually in Sydney Water's annual environment report. This program started in 1995 and is currently ongoing. In this sub-catchment there are five sites monitored under the PAM project, upstream and downstream of the Blue Mountains STPs.

RRH02 - This program was essentially an earlier version of the HNMMain program with more sites. In this sub-catchment sampling was conducted on a weekly to fortnightly basis at two locations.

HNMain - This program in the Lower Nepean River sub-catchment consists of sampling on a weekly basis at one location for the SCA. This program was originally initiated by Sydney Water and was transferred to the SCA upon its creation. The program was undertaken to assess the wastewater strategy in the Hawkesbury-Nepean River.

RecWat - This program is undertaken by DLWC as part of its recreational water quality program with two sites sampled in this sub-catchment. Sampling is conducted during the swimming season in summer from October to March on a six day basis the same as beachwatch program to meet the ANZECC 1992 guideline requirement of recreational sampling. Data is analysed by a NATA registered lab and collected by professional sampling staff. Samples are analysed for faecal bacteria and physical parameters and blue green algae.

EPAWQ - This program was conducted by the EPA as part of its water quality assessment program of the Hawkesbury-Nepean River. This program had two sampling locations in this sub-catchment with sampling conducted on a fortnightly basis. Sampling was conducted as a routine program with no special wet weather sampling undertaken. Samples were analysed by the EPA labs at Lidcombe.

STWCH - The streamwatch program collects water quality samples from nine sites within this sub-catchment. Data from these sites varies in sampling frequency and duration.

BMCCREC - Blue Mountains City Council undertakes a recreational water quality monitoring program at six locations in this sub-catchment. Sampling appears to be adhoc.

Data Gaps

Many of the small creeks draining the urban areas of the Blue Mountains are poorly represented in the currently available data set. Additional emphasis on these creek and stormwater systems should be considered in the future.

Table 38: Data owner and contact details for Erskine and Sassafras Creeks

Org code	Organisation	Study code	Study name	Contact	Reason for collection
SWC	Sydney Water Corporation	PAM	Performance Monitoring Assessment and Reporting	Andrew Kasmarik	Assess performance of Sydney Water's activities on the environment
SCA	Sydney Catchment Authority	HNMain	Water quality in Hawkesbury Nepean River catchment	Amir Deen	Data for modelling wastewater strategies
SCA	Sydney Catchment Authority	RRH02	Hawkesbury-Nepean River water quality monitoring program	Amir Deen	Data for modelling and assessment of wastewater strategies

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Org code	Organisation	Study code	Study name	Contact	Reason for collection
DLWC	Department of Land and Water Conservation	RecWat	Recreational Water Quality Study	Adam Boey	Summer sampling for faecal bacteria to determine recreational quality
EPA	Environment Protection Authority	EPAWQ	Hawkesbury Monitoring program	William Hall	SOE and assessment of health of waterways.
BMCC	Blue Mountains City Council	BMCCREC	Blue Mountains Recreational Study	Amanda Kotlash	Measurement of faecal coliforms and physical parameters for recreational assessment.
HNCMT	Hawkesbury Nepean Catchment Management Trust	STWCH	Streamwatch program	Avtar Singh	Community/Schools based assessment of streams

Table 39: Site information for Erskine and Sassafras Creeks

Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
BATH1-24	BATH1-24	BMCCREC	BMCC	Cataract Ck u/s of causeway on Baths Rd.	150.443056	-33.729722	3
BMC-N03	BMC-N03	BMCCREC	BMCC	Blue Pool, Glenbrook Ck	150.539167	-33.7275	3
FITZC	FITZC	BMCCREC	BMCC	Fitzgerald Creek near confluence with Nepean	150.611529	-33.735032	3
GLS	GLS	BMCCREC	BMCC	Glenbrook Lagoon	150.615376	-33.75751	3
LC01	LC01	BMCCREC	BMCC	Lapstone Creek at Lennox Bridge	150.615208	-33.760038	3
TFALL	TFALL	BMCCREC	BMCC	Terrace falls	150.425833	-33.725278	3
RWQ44	RWQ44	RecWat	DLWC	Glenbrook Lagoon	150.615376	-33.75751	1
RWQ-P1-07	RWQ-P1-07	RecWat	DLWC	Glenbrook Creek at Jellybean Pool	150.61844	-33.783088	1
1565	1565	EPAWQ	EPA	Nepean River at Jacksons Lane	150.556	-33.716	1
530001	530001	EPAWQ	EPA	Fitzgeralds Creek	150.654823	-33.71596	1
540008	540008	EPAWQ	EPA	Lapstone Creek	150.651512	-33.732528	1
N461	N461	RRH02	SCA	Winmalee Creek upstream of Nepean River, Yarramundi	150.664566	-33.665838	1
N462	N462	RRH02	SCA	Nepean River D/S Winmalee STP	150.640833	-33.676667	1
N464	N464	HNMain	SCA	Nepean River Winmalee Lagoon	150.666232	-33.664216	1
JWCS1	JWCS1	STWCH	HNCMT	Fitzgerald Ck at Warrimoo Oval, Warrimoo	150.613888	-33.714722	4

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Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
NEPE1	NEPE1	STWCH	HNCMT	Lapstone Ck at Russell St, Emu Plains	150.655277	-33.740555	4
NEPE2	NEPE2	STWCH	HNCMT	Nepean River at Francis Ave, Emu Plains	150.671111	-33.754444	4
NEPE4	NEPE4	STWCH	HNCMT	School Pond, Emu Plains	150.668055	-33.748055	4
NEPE5	NEPE5	STWCH	HNCMT	Knapsack Ck at Leonay Golf Course, Emu Plains	150.649166	-33.762222	4
PENR4	PENR4	STWCH	HNCMT	Nepean River at Rowing Club, Penrith	150.680833	-33.7475	4
WINM1	WINM1	STWCH	HNCMT	Blue Gum Swamp Ck at Picnic area, Winmalee	150.604444	-33.661388	4
WINM2	WINM2	STWCH	HNCMT	Frasers Ck at Shakespeare Dr, Winmalee	150.615833	-33.683888	4
WINM3	WINM3	STWCH	HNCMT	Lynchs Ck at Yarrowood College Camp, Castlereagh	150.666388	-33.6525	4
N462	N462-SW	PAM	SWC	Nepean River D/S Winmalee STP	150.640833	-33.676667	1
N464	N464-SW	PAM	SWC	Nepean River Winmalee Lagoon	150.666232	-33.664216	1
N5211	N5211	PAM	SWC	Downstream Mt Riverview STP	150.649	-33.7391	1
N525	N525	PAM	SWC	Downstream Glenbrook STP	150.652	-33.7501	1
N526	N526-SW	PAM	SWC	Upstream Glenbrook STP	150.643	-33.751	1

Table 40: Data information for Erskine and Sassafras Creeks

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.AI	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
BATH1-24	BMCC	11/10/1996	14/07/1998			25	25	25	25	24			24					24										
BMC-N03	BMCC	12/12/1996	14/04/1998			24	31	32	22		29	30	14	30				24										
FITZC	BMCC	04/12/1998	04/12/1998			1	1	1	1	1		1	1					1										
GLS	BMCC	16/12/1996	13/12/1998			20	28	29	21		13	14	9	16				21										
LC01	BMCC	04/12/1998	04/12/1998			1	1	1	1	1		1	1					1										
TFALL	BMCC	24/02/1998	14/07/1998			23	23	23	23	23			23					23										
RWQ-P1-07	DLWC	04/01/1995	22/12/1999	30		77	115	119	59		125	125	75	102				99										
RWQ44	DLWC	09/12/1996	09/03/1999	9			22	22			25	25		19				2										
1565	EPA	03/01/1995	02/07/1996		39	39	40	40	40			1	13		40		40	14								40	40	40
530001	EPA	03/01/1995	03/01/1995														1											
540008	EPA	03/01/1995	02/07/1996		36	37	38	38	38			1	12		37		39	12								38	38	38
N461	SCA	03/01/1995	14/07/1999	4	51	103	103	105	105	46		105			105	104	104	105									103	103
N462	SCA	15/10/1996	24/03/1997	1		3	3	3	3	3	1	3			3	3	3	3									3	3
N464	SCA	06/02/1996	29/12/1999	43		187	186	188	189	167	140	189		5	188	189	188	189									189	189
N462	SWC	18/07/1997	17/12/1999		30	37	37	37	37	37	37	37				37	37	22									37	37
N464	SWC	21/05/1996	06/12/1999		44	51	51	51	50	36	51	51				51	51	17									51	51
N5211	SWC	18/07/1997	17/12/1999		30	37	37	37	37	37	37	37				37	37	22									37	37
N525	SWC	18/07/1997	17/12/1999		30	37	37	37	37	37	37	37				37	37	22									37	37
N526	SWC	18/07/1997	17/12/1999	2	27	34	34	34	34	34	34	34				34	34	22									34	34
JWCS1	HNCMT	08/05/1995	21/06/1996			17	17	17	17	17		17						17										

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SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
NEPE1	HNCMT	28/03/1995	14/03/1996		3	3	3	3	3	3		3				3	3	3										
NEPE2	HNCMT	21/03/1995	28/11/1997		33	33	33	33	33	33		33				33	33	33										
NEPE4	HNCMT	28/02/1995	15/10/1997		9	9	9	9	9	9		9				9	9	9										
NEPE5	HNCMT	17/11/1998	04/12/1998		3	3	3	3	3	3		3				3	3	3										
PENR4	HNCMT	28/04/1999	08/09/1999		3	3	3	3	3	3		3				3	3	3										
WINM1	HNCMT	14/08/1997	28/06/1998		4	4	4	4	4	4		4				4	4	4										
WINM2	HNCMT	28/06/1998	09/08/1998		2	2	2	2	2	2		2				2	2	2										
WINM3	HNCMT	25/05/1999	21/07/1999		2	2	2	2	2	2		2				2	2	2										

Coxs River (Upper, Mid and Lower)

Water quality data from the Coxs River sub-catchments have been obtained from the following monitoring programs (Table 41).

PAM - Performance Assessment Monitoring and Reporting Program is undertaken for Sydney Water. This program is part of their overall Environmental Indicators program and is part of Sydney Water's Licence conditions. The programs aimed to assess the impact of Sydney Water's activities on the environment. The program includes monthly routine sampling and three wet weather event sampling per year when there is greater than 25mm of rainfall in the catchment over a twenty-four hour period. The results of this program are reported annually in Sydney Water's annual environment report. This program started in 1995 and is currently ongoing. In the Mid Coxs River sub-catchment there are two sites monitored upstream and downstream of Mt Victoria STP and in the Lower Coxs River sub-catchment there are also two sites upstream and downstream of South Katoomba STP.

RecWat - This program is undertaken by DLWC as part of its recreational water quality program with one site sampled in the Upper Coxs River sub-catchment and another in the Lower coxs River sub-catchment. Sampling is conducted during the swimming season in summer from October to March on a six day basis the same as beachwatch program to meet the ANZECC 1992 guideline requirement of recreational sampling. Data is analysed by a NATA registered lab and collected by professional sampling staff. Samples are analysed for faecal bacteria and physical parameters and blue green algae.

STWCH - The streamwatch program collects water quality samples from twelve sites within these sub-catchments. Four in the Upper Coxs River, three in the Mid Coxs River and five in the Lower Coxs River. Data from these sites varies in sampling frequency and duration.

BMCCREC - Blue Mountains City Council undertakes a recreational water quality monitoring program at eleven locations, five in the Mid Coxs River sub-catchment and six in the Lower Coxs River sub-catchment. Sampling appears to be adhoc.

Catchin - This program is conducted for the SCA (previously Sydney Water) to assess water quality and pollutant loads entering the Lake Burragorang. In the Mid Coxs River and Lower Coxs River sub-catchments, one site in each sub-catchment are sampled on a four or six weekly basis. In addition, these sites have automatic samplers and flow gauging installed to assess pollutant loads from the catchment. In 1999 a new study was commenced to measure loads of cryptosporidium and giardia coming from the catchment. Due to the low rainfall period little data has been collected to date.

LCCBG - This program is run in the Upper Coxs River sub-catchment by Lithgow council to measure levels of Blue green algae in the inflows of and within Lake Lyall and Lake Wallace. Sampling is conducted on a seasonal basis from xx sites.

LCCREC - This program is run by Lithgow council to measure levels of faecal coliforms in the inflows of and within Lake Lyall and Lake Wallace. Sampling is conducted on a seasonal basis.

DAMS-This program is conducted for the SCA (previously Sydney Water) for operational and long-term management purposes of the Dams. Sampling is conducted on a fortnightly basis in Lake Burragorang and on a monthly basis in Lakes Nepean, Cataract, Cordeaux and Avon. Sampling occurs at two locations in the Lower Coxs River sub-catchment.

Data Gaps

There is an obvious need to improve the physical and chemical assessment of the waterways of the upper Coxs catchment in relation to land use. There are also few wet-weather water quality data for the waterways that drain the urban areas of the Blue Mountains middle and lower sections.

Table 41: Data owner and contact details for Coxs River (Upper, Mid and Lower)

Org code	Organisation	Study code	Study name	Contact	Reason for collection
SWC	Sydney Water Corporation	PAM	Performance Monitoring Assessment and Reporting	Andrew Kasmarik	Assess performance of Sydney Water's activities on the environment
SCA	Sydney Catchment Authority	Catchin	Catchment inflow, water quality and loads	Amir Deen	Measure water quality in inflows to water storages, long term trends
SCA	Sydney Catchment Authority	DAMS	Warragamba and metropolitan Dams, water quality monitoring	Amir Deen	Water quality measurements in Lake Burragorang for operational, long term storage management and environmental purposes
DLWC	Department of Land and Water Conservation	RecWat	Recreational Water Quality Study	Adam Boey	Summer sampling for faecal bacteria to determine recreational quality
LCC	Lithgow City Council	LCCBG	Blue Green Algae Program	Amanda Muir	Assess Blue Green algal levels in Lakes Lyall and Wallace and major inflows
LCC	Lithgow City Council	LCCREC	Recreational Assessment	Amanda Muir	Assess recreational quality (faecal coliforms) of lake
BMCC	Blue Mountains City Council	BMCCREC	Blue Mountains Recreational Study	Amanda Kotlash	Measurement of faecal coliforms and physical parameters for recreational assessment.
HNCMT	Hawkesbury Nepean Catchment Management Trust	STWCH	Streamwatch program	Avtar Singh	Community/Schools based assessment of streams

Table 42: Site information for Upper Coxs River

Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
RWQ42	RWQ42	RecWat	DLWC	Megalong Ck.	150.1432	-33.4356	1
FC-AS	FC-AS	LCCREC	LCC	Farmers Creek Albert St	150.156944	-33.477779	1
FCCB	FCCB	LCCREC/BG	LCC	Farmers Creek Coerwull Bridge	150.168673	-33.473332	1
FC-GS	FC-GS	LCCBG	LCC	Farmers Creek Geordie St	150.140278	-33.482778	1
FC-MS	FC-MS	LCCREC	LCC	Farmers Creek Mills St	150.182114	-33.469144	1
FC-TS	FC-TS	LCCREC	LCC	Farmers Creek Tank St	150.156944	-33.477778	1
FC-WP	FC-WP	LCCREC/BG	LCC	Farmers Creek Water Plant	150.19793	-33.462622	1
LL-B	LL-B	LCCBG	LCC	Lake Lyell Beach	150.078861	-33.527703	1
LL-BR	LL-BR	LCCREC	LCC	Lake Lyell Boat Ramp	150.078319	-33.527252	1

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Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
LL-BRN	LL-BRN	LCCBG	LCC	Lake Lyell New Boat Ramp	150.07019	-33.513514	1
LL-FA	LL-FA	LCCBG	LCC	Lake Lyell Farmers Arm	150.071544	-33.500676	1
LL-FC	LL-FC	LCCREC	LCC	Lake Lyell Farmers Arm	150.071544	-33.500676	1
LL-M2	LL-M2	LCCBG	LCC	Lake Lyell Middle 2	150.079404	-33.519144	1
LL-Wall	LL-Wall	LCCBG	LCC	Lake Lyell Wall	150.081165	-33.528604	1
LW-FP	LW-FP	LCCREC	LCC	Lake Wallace Fishing Point	150.073171	-33.419595	1
LW-OR	LW-OR	LCCREC	LCC	Lake Wallace Opposite Rotunda	150.078591	-33.426126	1
LW-S1	LW-S1	LCCBG	LCC	Lake Wallace Site 1	150.073789	-33.420906	1
LW-SBC	LW-SBC	LCCREC	LCC	Lake Wallace Sailing Boat Club	150.078312	-33.425017	1
LASA1	LASA1	STWCH	HNCMT	Good Luck Hollow Ck, Lithgow	150.1333333	-33.498888	4
LCOT1	LCOT1	STWCH	HNCMT	Farmers Ck at Geordie St, Lithgow	150.1361111	-33.48	4
LITH1	LITH1	STWCH	HNCMT	Farmers Ck at Tank St, Lithgow	150.16	-33.4761111	4
LITH2	LITH2	STWCH	HNCMT	Lake Pillans, Lithgow	150.1719444	-33.4744444	4

Table 43: Site information for Mid Coxs River

Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
C01DS	C01DS	BMCCREC	BMCC	Megalong Ck North Ridge DS causeway	150.233611	-33.732778	3
C01US	C01US	BMCCREC	BMCC	Megalong Ck Causeway. (Megalong Valley Rd)	150.26	-33.683889	3
GVIEW0-9	GVIEW0-9	BMCCREC	BMCC	Grandview Road Mt Victoria	150.254598	-33.587978	3
PHDS	PHDS	BMCCREC	BMCC	Pulpit Hill Ck 20m along Five Mile Ck, Rd, from Megalong Valley Rd	150.236819	-33.704088	3
PHUS	PHUS	BMCCREC	BMCC	Pulpit Hill Ck Megalong Valley. Kurrانبurrock Reserve	150.23436	-33.710236	3
E083	E083	Catchin	SCA	Kelpie Point	150.253869	-33.87267	1
LCOT2	LCOT2	STWCH	HNCMT	Whites Ck at top Spring, Lithgow	150.139166	-33.518055	4
LCOT3	LCOT3	STWCH	HNCMT	Whites Ck below Dam, Lithgow	150.138055	-33.517777	4

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Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
MKLG1	MKLG1	STWCH	HNCMT	Coxs River at Duddawarra Bridge, Little Hartley	150.159722	-33.619444	4
E0101	E0101	PAM	SWC	U/S Mt Victoria STP	150.254167	-33.581111	1
E099	E099	PAM	SWC	D/S Mt Victoria STP	150.254444	-33.584444	1

Table 44: Site information for Lower Coxs River

Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
BMX0-10	BMX0-10	BMCCREC	BMCC	Lawson Creek BMX Track	150.367164	-33.70513	3
JAM2	JAM2	BMCCREC	BMCC	Jamison Ck Falls Rd, take Darwins Walk to 1st Bridge.	150.369444	-33.73305	3
K01	K01	BMCCREC	BMCC	Kedumba River Katoomba Falls Ck, Cliff Dv	150.304655	-33.72701	3
K02	K02	BMCCREC	BMCC	Gordon Ck Gordon Falls	150.332222	-33.720556	3
K04	K04	BMCCREC	BMCC	Leura, Falls Ck Vale St. Wetland	150.313741	-33.715769	3
WFLW	WFLW	BMCCREC	BMCC	Wentworth Falls Lake Weir	150.364436	-33.706945	3
RWQ19	RWQ19	RecWat	DLWC	Wentworth Falls Lake	150.367778	-33.703056	1
DWA19	DWA19	DAMS	SCA	Lake Burragorang Kedumba Creek inflow	150.337	-33.8508	1
DWA21	DWA21	DAMS	SCA	Lake Burragorang Coxs River inflow	150.311	-33.8523	1
E157	E157	Catchin	SCA	Kedumba River at Maxwells Crossing	150.362674	-33.803935	1
BMGS1	BMGS1	STWCH	HNCMT	Jamison Ck at Dalrymple Ave Bridge, Wentworth Falls	150.373333	-33.715277	4
INTE1	INTE1	STWCH	HNCMT	Lake, Wentworth Falls	150.366944	-33.706111	4
KATO1	KATO1	STWCH	HNCMT	Katoomba Falls Ck, Katoomba	150.305	-33.727222	4
KATO3	KATO3	STWCH	HNCMT	Leura Falls Ck, Leura	150.320277	-33.723055	4
KORO1	KORO1	STWCH	HNCMT	Valley Of Waters at Morven Rd, Leura	150.348611	-33.714722	4
E153	E153	PAM	SWC	D/S South Katoomba STP Leura Falls Creek	150.325499	-33.732497	1
E161	E161	PAM	SWC	U/S South Katoomba STP Leura Falls Creek	150.322233	-33.7206	1

Table 45: Data information for Upper Coxs River

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.AI	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
RWQ42	DLWC	06/12/1999	22/12/1999	3		2	2	2				3	3					2										
FC-AS	LCC	14/01/1997	26/10/1999									10																
FC-GS	LCC	24/01/1995	15/12/1999	43																								
FC-MS	LCC	14/01/1997	15/12/1999									18																
FC-TS	LCC	14/01/1997	15/12/1999									19																
FC-WP	LCC	24/01/1995	15/12/1999	23								17																
FCCB	LCC	24/01/1995	15/12/1999	43								26																
LL-B	LCC	24/01/1995	15/12/1999	37																								
LL-BR	LCC	07/02/1995	14/12/1999									24																
LL-BRN	LCC	24/01/1995	15/12/1999	35																								
LL-FA	LCC	24/01/1995	15/12/1999	39																								
LL-FC	LCC	07/02/1995	14/12/1999									24																
LL-M2	LCC	24/01/1995	15/12/1999	34																								
LL-Wall	LCC	24/01/1995	15/12/1999	34																								
LW-FP	LCC	07/02/1995	14/12/1999									24																
LW-OR	LCC	07/02/1995	14/12/1999									24																
LW-S1	LCC	29/04/1998	15/12/1999	11																								
LW-SBC	LCC	07/02/1995	14/12/1999									24																
LASA1	HNCMT	23/03/1999	24/11/1999			4	4	4	4	4		4				4	4	4										
LCOT1	HNCMT	18/03/1997	18/03/1997			1	1	1	1	1		1				1	1	1										

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SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.AI	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
LITH1	HNCMT	20/10/1995	04/09/1996			4	4	4	4	4		4				4	4	4										
LITH2	HNCMT	08/04/1995	06/08/1997			10	10	10	10	10		10				10	10	10										

Table 46: Data information for Mid Coxs River

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.AI	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
C01DS	BMCC	03/10/1996	03/10/1996			1	1	1	1									1										
C01US	BMCC	03/10/1996	03/10/1996			1	1	1	1									1										
GVIEW0-9	BMCC	12/05/1998	14/07/1998			10	10	9	9	9		9						10										
PHDS	BMCC	03/10/1996	03/10/1996			1	1	1	1									1										
PHUS	BMCC	03/10/1996	03/10/1996			1	1	1	1									1										
E083	SCA	30/01/1995	30/12/1999		41	120	50	50	49			44			39	77	77	123	76	71	76	50	76	71		70	70	
E0101	SWC	18/07/1997	17/12/1999		30	37	37	37	37	37	37	37				37	37	22								37	37	
E099	SWC	18/07/1997	17/12/1999	2	30	37	37	37	37	37	37	37				37	37	22								37	37	
LCOT2	SCA	19/05/1999	12/10/1999			5	5	5	5	5		5				5	5	5										
LCOT3	SCA	19/05/1999	12/10/1999			5	5	5	5	5		5				5	5	5										
MKLG1	SCA	05/10/1998	01/03/1999			5	5	5	5	5		5				5	5	5										

Table 47: Data information for Lower Coxs River

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
BMX0-10	BMCC	05/05/1998	14/07/1998			9	9	9	9	9			9					9										
JAM2	BMCC	04/03/1998	04/03/1998			1	1	1	1	1			1					1										
K01	BMCC	21/04/1998	14/07/1998			13	13	13	13	13			13					13										
K02	BMCC	03/12/1998	03/12/1998			1	1	1	1	1			1					1										
K04	BMCC	31/03/1998	09/04/1998			2	2	2	2	2			2					2										
WFLW	BMCC	06/01/1997	30/12/1998			25	31	32	25		14	15	14	14				25										
RWQ19	DLWC	09/12/1996	12/04/1999	18			28	29			35	35		16				9										
DWA19	SCA	04/01/1995	29/12/1999		103	62	117	93	90	46		119		16		86	86	43	117	117	117	102	117	117	25	86	86	
DWA21	SCA	04/01/1995	29/12/1999		100	63	117	96	92	48		117		19		90	90	44	117	117	117	102	117	117	24	90	90	
E157	SCA	30/01/1995	31/12/1999		42	121	49	49	49			46			53	86	86	123	83	74	83	73	83	74		73	73	
E153	SWC	18/07/1997	17/12/1999		30	37	37	37	37	37	37	37				37	37	22								37	37	
E161	SWC	18/07/1997	17/12/1999		30	37	37	37	37	37	37	37				37	37	22								37	37	
BMGS1	HNCMT	22/03/1995	03/05/1995			2	2	2	2	2		2				2	2	2										
INTE1	HNCMT	22/03/1995	30/07/1996			14	14	14	14	14		14				14	14	14										
KATO1	SCA	27/03/1995	26/02/1997			13	13	13	13	13		13				13	13	13										
KATO3	SCA	22/03/1995	24/04/1996			4	4	4	4	4		4				4	4	4										
KORO1	HNCMT	03/05/1995	22/02/1996			3	3	3	3	3		3				3	3	3										

Lake Burragorang

Water quality data for the Lake Burragorang sub-catchment have been obtained from the following monitoring programs (Table 48).

DAMS - This program is conducted for the SCA (previously Sydney Water) for operational and long-term management purposes of the Dams. Sampling is conducted on a fortnightly basis in Lake Burragorang and on a monthly basis in Lakes Nepean, Cataract, Cordeaux, Avon and Wingecarribee Reservoir. For this study two sites are reported from this program.

HNMain - This program in the Lower Nepean River sub-catchment consists of sampling on a weekly basis at one location for the SCA. This program was originally initiated by Sydney Water and was transferred to the SCA upon its creation. The program was undertaken to assess the wastewater strategy in the Hawkesbury-Nepean River.

PSP01 - This program was undertaken as part of Sydney Water's priority sewage program that conducted an assessment of the impact of septic systems on waterways. The program was a short-term study conducted over a 13-month period. In the lake Burragorang sub-catchment there were three sampling locations.

Data Gaps

There is currently no monitoring occurring at the upstream site on Warragamba River at the weir. It is recommended that sampling at this site be recommenced as the downstream site is influenced by water quality in the Nepean River.

Table 48: Data owner and contact details for Lake Burragorang

Org code	Organisation	Study code	Study name	Contact	Reason for collection
SCA	Sydney Catchment Authority	HNMain	Water quality in Hawkesbury Nepean River catchment	Amir Deen	Data for modelling wastewater strategies
SCA	Sydney Catchment Authority	DAMS	Warragamba and metropolitan Dams water quality monitoring	Amir Deen	Water quality in Lake Burragorang for operational, long term storage management and environmental purposes
SWC	Sydney Water Corporation	PSP01	Priority Sewage Program -Oaks to Warragamba	Sue Shaw	Impact of septic leakage on local stream water quality

Table 49: Site information for Lake Burragorang

Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
DWA2	DWA2	DAMS	SCA	Lake Burragorang at dam wall	150.588000	-33.889400	1
DWA39	DWA39	DAMS	SCA	Lake Burragorang Wollondilly River Inflow	150.378000	-34.108300	1
N641	N641	HNMain	SCA	Warragamba River Nortons Basin	150.609930	-33.860818	1
N6403	N6403	PSP01	SWC	Megarrity's Creek Warradale Road	150.605832	-33.900920	1
N642	N642	PSP01	SWC	Warragamba River at weir	150.607604	-33.876315	1
N643	N643	PSP01	SWC	Warragamba River D/S of Spillway	150.596138	-33.883220	1

Table 50: Data information for Lake Burragorang

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
DWA2	SCA	04/01/1995	29/12/1999		128	184	146	424	340	240		154		55		130	130	71	141	139	141	124	141	139	61		130	130
DWA39	SCA	04/01/1995	29/12/1999		100	62	117	93	88	42		117		19		88	88	44	117	117	117	102	117	117	24		88	88
N641	SCA	03/01/1995	13/09/1999	5	50	239	240	241	235	157	137	242		1	242	242	242	241									242	242
N6403	SWC	07/04/1998	15/10/1998		16							16			16	16	16										16	16
N642	SWC	07/04/1998	15/10/1998		15							15			15	15	15										15	15
N643	SWC	07/04/1998	15/10/1998		15							15			15	15	15										14	15

Mid Nepean River

Water quality data for the Mid Nepean River sub-catchment have been obtained from the following monitoring programs (Table 51).

HNMain - This program in the Lower Nepean River sub-catchment consists of sampling on a weekly basis at five locations for the SCA. This program was originally initiated by Sydney Water and was transferred to the SCA upon its creation. The program was undertaken to assess the wastewater strategy in the Hawkesbury-Nepean River.

PSP01 - This program was undertaken as part of Sydney Water's priority sewage program, which conducted an assessment of the impact of septic systems on waterways. The program was a short-term study conducted over a 13-month period. There are six sites sampled in the Mid Nepean River sub-catchment for this program.

PAM – Performance Assessment Monitoring and Reporting Program is undertaken for Sydney Water. This program is part of their overall Environmental Indicators program as is part of Sydney Water's Licence conditions. The programs aimed to assess the impact of Sydney Water's activities on the environment. The program includes monthly routine sampling and three wet weather event sampling per year when there is greater than 25mm of rainfall in the catchment over a twenty-four hour period. The results of this program are reported annually in Sydney Water's annual environment report. This program started in 1995 and is currently ongoing. In this sub-catchment there are four sites monitored under the PAM project.

RecWat -This program is undertaken by DLWC as part of its recreational water quality program with eight sites sampled in this sub-catchment. Sampling is conducted during the swimming season in summer from October to March on a six day basis the same as beachwatch program to meet the ANZECC 1992 guideline requirement of recreational sampling. Data is analysed by a NATA registered lab and collected by professional sampling staff. Samples are analysed for faecal bacteria and physical parameters and blue green algae.

HNTribs - This program is being conducted for the SCA and assesses the impact of STP effluent on Matahil and Stonequarry creeks. Autosamplers are installed at sampling locations downstream of the STPs to assess pollutant loads exported from the catchment. Sampling is currently undertaken on a bi-monthly basis at two locations for the SCA. A third site was sampled early on in the program but was discontinued due to lack of flow at the site. This program was originally initiated by Sydney Water and was transferred to the SCA upon its creation.

STWCH - The streamwatch program collects water quality samples from eleven sites within this sub-catchment. Data from these sites varies in sampling frequency and duration.

CmCCNAR - This program is conducted by Camden Council. No data was received from Camden Council for this project, however data from 1995 to 1996 was available. This program assesses water quality in Narellan Creek and is currently ongoing.

PCCWQ - Penrith City Council program samples at one location in Luddenham in this sub-catchment area.

Data Gaps

Currently there is good spatial and temporal coverage of the sub-catchment. No recent water quality data was received from Camden City Council.

Table 51: Data owner and contact details for Mid Nepean River

Org code	Organisation	Study code	Study name	Contact	Reason for collection
SWC	Sydney Water Corporation	PAM	Performance Monitoring Assessment and Reporting	Andrew Kasmarik	Assess performance of Sydney Water's activities on the environment
SCA	Sydney Catchment Authority	HNMain	Water quality in Hawkesbury Nepean River catchment	Amir Deen	Data for modelling wastewater strategies
DLWC	Department of Land and Water Conservation	RecWat	Recreational Water Quality Study	Adam Boey	Summer sampling for faecal bacteria to determine recreational quality
CmCC	Camden City Council	CmCCNAR	Water quality in Narellan Creek	Geoff Green	Assessment of urbanisation in Narellan Creek
SCA	Sydney Catchment Authority	HNTribs	Water Quality Monitoring in Hawkesbury-Nepean Tributaries	Amir Deen	Water quality and pollutant loads in South, Cattai, Berowra and Matahil and Stonequarry Creeks
PCC	Penrith City Council	PCCWQ	Londonderry & Luddenham Water Quality Program	Helen Bakker	SOE reporting
SWC	Sydney Water Corporation	PSP01	Priority Sewage Program -Oaks to Warragamba	Sue Shaw	Impact of septic leakage on local stream water quality
HNCMT	Hawkesbury Nepean Catchment Management Trust	STWCH	Streamwatch program	Avtar Singh	Community/Schools based assessment of streams

Table 52: Site information for Mid Nepean River

Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
BENT1	BENT1	STWCH	HNCMT	Nepean River at Bents Basin, Greendale	150.630555	-33.933055	4
CACC1	CACC1	STWCH	HNCMT	Nepean River at Menangle Bridge, Menangle Park	150.739166	-34.119166	4
CAMC1	CAMC1	STWCH	HNCMT	Narellan Ck at Kirkham Lane Bridge, Kirkham	150.708888	-34.039166	4
CAMC2	CAMC2	STWCH	HNCMT	Narellan Ck at The Northern Rd, Harrington Park	150.726388	-34.029722	4
CAMC3	CAMC3	STWCH	HNCMT	Narellan Ck at Mount Annan Dr, Mount Annan	150.771111	-34.055555	4
CAMC4	CAMC4	STWCH	HNCMT	Narellan Ck at Camden Valley Way, Smeaton Grange	150.748888	-34.039166	4

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Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
CAMD2	CAMD2	STWCH	HNCMT	Nepean River at Macquarie Grove Rd, Camden	150.694722	-34.043333	4
ELDE2	ELDE2	STWCH	HNCMT	Nepean River at Bike Track, Elderslie	150.699444	-34.0625	4
ELDE3	ELDE3	STWCH	HNCMT	Nepean River at Cowpasture Bridge, Elderslie	150.703888	-34.055277	4
ELDE4	ELDE4	STWCH	HNCMT	Narellan Ck at Kirkham Lane, Kirkham	150.711944	-34.045555	4
EMHS1	EMHS1	STWCH	HNCMT	Creek opp.Nepean Quarries at Richardson Rd, Narellan	150.729722	-34.069444	4
NC1	NN1	CmCCNAR	CmCC	Narellan Creek Mount Annan Drive	150.771105	-34.055757	1
NC2	NN2	CmCCNAR	CmCC	Smeaton Grange Camden Valley Way, Smeaton Grange	150.746004	-34.037114	1
NC3	NN3	CmCCNAR	CmCC	Narellan Creek The Northern Rd, Harrington Park	150.726396	-34.030344	1
NC4	NN4	CmCCNAR	CmCC	Narellan Creek at Kirkham Lane	150.709222	-34.039214	1
NR2	NR2	CmCCNAR	CmCC	Nepean River Macquarie Grove Road	150.694144	-34.043147	1
NR4	NR4	CmCCNAR	CmCC	Nepean River Elisabeth Macarthur Reserve	150.700568	-34.077232	1
RWQ15	RWQ15	RecWat	DLWC	Nepean River at Wallacia Bridge	150.636117	-33.866794	1
RWQ50	RWQ50	RecWat	DLWC	Nepean River at Wallacia Bridge	150.636117	-33.866794	1
RWQ9	RWQ9	RecWat	DLWC	Lake Annan	150.759837	-34.055589	1
RWQ-P1-08	RWQ-P1-08	RecWat	DLWC	Nepean River Macquarie Grove Road	150.694144	-34.043147	1
RWQ-P1-09	RWQ-P1-09	RecWat	DLWC	Nepean River at Menangle Weir	150.740672	-34.120424	1
RWQ-P1-10	RWQ-P1-10	RecWat	DLWC	Nepean River at Bents Basin	150.632192	-33.933432	1
RWQ-P2-02	RWQ-P2-02	RecWat	DLWC	Nepean River Belgenny Reserve boat ramp	150.69924	-34.072272	1
RWQ47	RWQ47	RecWat	DLWC	Menangle Road Bridge, Nepean River	150.443500	-34.071200	1
D1	PCC-D1	PCCWQ	PCC	Stormwater Drain Campbell Street Luddenham	150.68659	-33.879141	3
N67	N67	HNMain	SCA	Nepean River at Wallacia Bridge	150.636117	-33.866794	1

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Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
N72	N72	HNMain	SCA	Nepean River Cobbitty Bridge	150.656088	-34.023728	1
N75	N75	HNMain	SCA	Nepean River at Sharpes Weir	150.67891	-34.03758	1
N78	N78	HNMain	SCA	Nepean River Macquarie Grove Road	150.694144	-34.043147	1
N7822	N7822	HNTribs	SCA	Matahil Creek, D/S West Camden STP	150.687664	-34.054168	1
N7823	N7823	HNTribs	SCA	Matahil Creek, No2 Camden	150.681734	-34.057383	1
N91	N91	HNMain	SCA	Nepean River at Maldon Bridge	150.631192	-34.203501	1
N911	N911	HNTribs	SCA	Stonequarry Creek	150.628496	-34.2026	1
N92	N92	HNMain	SCA	Nepean River at Maldon Weir	150.628919	-34.204484	1
N662	N662	PSP01	SWC	Jerry's Creek Park Road Wallacia	150.644007	-33.867926	1
N663	N663	PSP01	SWC	Jerry's Creek at Kadiera Close Wallacia	150.647336	-33.876608	1
N674	N674	PSP01	SWC	Scotchcys Creek, End of Glenhaven Place Silverdale	150.620336	-33.90024	1
N675	N675	PSP01	SWC	Scotchcys Creek, Taylors Road Silverdale	150.611835	-33.911716	1
N684	N684	PSP01	SWC	Bushrangers Creek Eltons Road	150.616064	-33.931312	1
N703	N703	PSP01	SWC	Eagle Creek McKee Road	150.623128	-33.971304	1
N75	N75-SW	PAM	SWC	Nepean River at Sharpes Weir	150.67891	-34.03758	1
N78	N78-SW	PAM	SWC	Nepean River Macquarie Grove Road	150.694144	-34.043147	1
N91	N91-SW	PAM	SWC	Nepean River at Maldon Bridge	150.631192	-34.203501	1
N92	N92-SW	PAM	SWC	Nepean River at Maldon Weir	150.628919	-34.204484	1

Table 53: Data information for Mid Nepean River

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.AI	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
NC1	CmCC	24/01/1995	27/06/1996			8	15	10	15			14			5	1	15	10									5	
NC2	CmCC	24/01/1995	27/06/1996			8	15	10	15			14			5	1	15	10									5	
NC3	CmCC	24/01/1995	27/06/1996			8	15	10	15			15			5	1	15	10									5	
NC4	CmCC	24/01/1995	27/06/1996			8	15	10	15			15			5	1	15	10									5	
NR2	CmCC	24/01/1995	27/06/1996			8	15	10	15			15			5	1	15	10									5	
NR4	CmCC	24/01/1995	27/06/1996			8	15	10	15			14			5	1	15	10									5	
RWQ-P1-08	DLWC	09/12/1996	13/04/1999	28			38	39			37	33		36				15										
RWQ-P1-09	DLWC	09/12/1996	29/12/1999	31		4	42	43	3	4	41	37	1															
RWQ-P1-10	DLWC	04/01/1995	29/12/1999	33		78	117	120	63		116	116	76	114				73										
RWQ-P2-02	DLWC	09/12/1996	29/12/1999	30		4	36	37	4		34	36		30				19										
RWQ15	DLWC	09/12/1996	31/03/1997	9			15	14			12	12		15														
RWQ50	DLWC	10/02/1998	09/03/1999	6			11	11			10	10		5				11										
RWQ9	DLWC	09/12/1996	17/03/1997	3			10	11			10	10		11														
RWQ47	DLWC	04/01/1995	13/04/1999	14		75	116	116	60		104	117	75	98				97										
D1	PCC	07/10/1999	24/11/1999				7	7	7			7	7		7	7	7	7									7	7
N67	SCA	03/01/1995	13/12/1999	6	50	243	245	243	238	160	140	246		1	246	246	246	243									246	246
N72	SCA	03/01/1995	13/09/1999	41	51	244	244	245	240	162	140	246			245	246	246	243									246	246
N75	SCA	03/01/1995	29/12/1999	157	50	243	244	245	240	163	140	246		3	246	246	246	244									246	246
N78	SCA	03/01/1995	13/09/1999	13	51	244	244	245	240	163	140	246		2	246	246	246	245									246	246
N7822	SCA	14/01/1997	25/10/1999	6		70	71	63	62	62	69	69			69	71	71	70									71	71

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SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA	
N7823	SCA	12/02/1997	11/11/1998	1		13	13	13	13	13	16	16			16	16	16	13									16	16	
N91	SCA	16/01/1996	13/09/1999	4		190	190	190	189	166	140	191		1	191	192	192	190									192	192	
N911	SCA	14/01/1997	06/12/1999	17		77	78	64	63	63	78	78			76	77	77	76									77	77	
N92	SCA	03/01/1995	29/12/1999	80	51	243	244	245	238	162	141	247		4	246	247	247	244									247	247	
N662	SWC	07/04/1998	15/10/1998		15							16			15	15	15										15	15	
N663	SWC	10/04/1998	15/10/1998		6							10			6	6	6										5	6	
N674	SWC	07/04/1998	15/10/1998		14							15			14	14	14										14	14	
N675	SWC	10/04/1998	15/10/1998		14							14			14	14	14										14	14	
N684	SWC	07/04/1998	15/10/1998		13							16			13	13	13										13	13	
N703	SWC	10/04/1998	15/10/1998		9							12			13	13	13										13	13	
N75	SWC	03/01/1995	06/12/1999		95	101	99	101	101	36	54	105				105	105	21									105	105	
N78	SWC	03/01/1995	06/12/1999		95	101	100	101	101	36	54	105				105	105	21									105	105	
N91	SWC	29/08/1995	06/12/1999		53	64	64	64	64	36	54	61				64	64	21									64	64	
N92	SWC	03/01/1995	06/12/1999		95	101	100	101	100	36	54	105				105	105	21									105	105	
BENT1	HNCMT	14/12/1995	16/07/1996			17	17	17	17	17		17				17	17	17											
CACC1	HNCMT	24/01/1995	10/07/1996			7	7	7	7	7		7				7	7	7											
CAMC1	HNCMT	24/01/1995	26/05/1995			4	4	4	4	4		4				4	4	4											
CAMC2	HNCMT	24/01/1995	26/05/1995			4	4	4	4	4		4				4	4	4											
CAMC3	HNCMT	24/01/1995	26/05/1995			4	4	4	4	4		4				4	4	4											
CAMC4	HNCMT	24/01/1995	26/05/1995			4	4	4	4	4		4				4	4	4											
CAMD2	HNCMT	21/08/1996	16/06/1999			35	35	35	35	35		35				35	35	35											

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SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
ELDE2	HNCMT	15/02/1995	13/10/1999			29	29	29	29	29		29				29	29	29										
ELDE3	HNCMT	22/02/1995	25/02/1998			16	16	16	16	16		16				16	16	16										
ELDE4	HNCMT	22/05/1996	22/09/1999			16	16	16	16	16		16				16	16	16										
EMHS1	HNCMT	24/02/1995	23/07/1997			21	21	21	21	21		21				21	21	21										

Kowmung River

Water quality data in the Kowmung sub-catchment is only collected under one monitoring program (Table 54). This is the Catchin program conducted for the SCA (previously Sydney Water) to assess water quality and pollutant loads entering the Lake Burragorang. In this sub-catchment, one site is sampled on a four or six weekly basis. In addition these sites have automatic samplers and flow gauging installed to assess pollutant loads in the catchment. In 1999 a new study was commenced to measure loads of cryptosporidium and giardia coming from the catchment. Due to the low rainfall period little data has been collected to date.

Data Gaps

The Kowmung River is classified as a drinking water catchment and as such is allocated the environmental values of protection of aquatic ecosystems, disinfected drinking water, visual amenity and groundwater drinking supply. A site in the upper part of the sub-catchment would be useful in assessing the impacts of the land uses there. It may be possible to install a site near Morong Falls. However, such a site would be difficult to access.

Table 54: Data owner and contact details for Kowmung River

Org code	Organisation	Study code	Study name	Contact	Reason for collection
SCA	Sydney Catchment Authority	Catchin	Catchment inflow, water quality and loads	Amir Deen	Measure water quality in inflows to water storages, long term trends

Table 55: Site information for Kowmung River

Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
E130	E130	Catchin	SCA	Kowmung Cedar Ford	150.243778	-33.947992	1

Table 56: Data information for Kowmung River

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	PH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
E130	SCA	24/01/1995	30/12/1999		40	135	49	49	48			43			53	93	93	146	87	71	87	51	87	71			70	70

Wollondilly River, Upper Wollondilly River and Mulwaree River

Four main programs (Table 56) have collected water quality data from the Wollondilly and Mulwaree River sub-catchments. These are detailed below.

Catchin - This program is conducted for the SCA (previously Sydney Water) to assess water quality and pollutant loads entering the Lake Burragorang. In the Wollondilly River sub-catchment, three sites are sampled whereas in the Mulwaree sub-catchment there is only one site. Samples are collected on a four or six weekly basis. In addition these sites have automatic samplers and flow gauging installed to assess pollutant loads in the catchment. In 1999 a new study was commenced to measure loads of cryptosporidium and giardia coming from the catchment. Due to the low rainfall period little data has been collected to date.

RecWat - This program is undertaken by DLWC as part of its recreational water quality program with six sites sampled in these sub-catchments, four in the Wollondilly River sub-catchment and two in the Upper Wollondilly River sub-catchment. Sampling is conducted during the swimming season in summer from October to March on a six day basis the same as beachwatch program to meet the ANZECC 1992 guideline requirement of recreational sampling. Data is analysed by a NATA registered lab and collected by professional sampling staff. Samples are analysed for faecal bacteria and physical parameters and blue green algae.

GuCCWQ - Goulburn City Council undertake this water quality monitoring program to assess water quality in the Wollondilly River and Mulwaree Ponds system for the purposes of management and State of Environment Reporting. Twelve locations are sampled on a roughly a monthly basis. Three in the Wollondilly River sub-catchment, four in the Upper Wollondilly River sub-catchment and five sites in the Mulwaree River sub-catchment.

WiCWQ - Wingecarribee Council undertakes a water quality monitoring program to meet EPA licence requirements for the discharge of effluent from the STPs in its council area. Three sites are sampled as part of this program in the Wollondilly River sub-catchment area.

Data Gaps

Good data is being collected for both dry and wet weather at strategic sites within the catchment. The wet weather water quality of the Wollondilly River above Goulburn is not well sampled. The recent (past five years) increase in poultry farms in the catchment requires additional sites in the upper Mulwaree River to monitor the impact of changing activities within the catchment.

Table 57: Data owner and contact details for Wollondilly River, Upper Wollondilly River and Mulwaree River

Org code	Organisation	Study code	Study name	Contact	Reason for collection
SCA	Sydney Catchment Authority	Catchin	Catchment inflow water quality and loads	Amir Deen	Measure water quality in inflows to water storages, long term trends
DLWC	Department of Land and Water Conservation	RecWat	Recreational Water Quality Study	Adam Boey	Summer sampling for faecal bacteria to determine recreational quality
WiC	Wingecarribee City Council	WiCWQ	Water Quality Assessment survey	Barry Arthur	EPA licence requirements and assessment of impact of STPs on creeks and impact of STP pgrades.
GuCC	Goulburn City Council	GuCCWQ	Wollondilly & Mulwaree Ponds Water Quality Survey	Louisa Stephens	Assessment of water quality in Wollondilly and Mulwaree Ponds for management and SOE purposes

Table 58: Site information for Wollondilly River

Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
RWQ27	RWQ27	RecWat	DLWC	Wingecaribee River Railway Bridge	150.2309	-34.3009	1
RWQ41	RWQ41	RecWat	DLWC	Paddys River	150.0711	-34.3857	1
RWQ53	RWQ53	RecWat	DLWC	Wingecaribee River at Berrima Camping Ground	150.1919	-34.293	1
RWQ54	RWQ54	RecWat	DLWC	Wollondilly Rv at Goodmans Ford	149.0358	-34.1852	1
GCC10	GCC10	GuCCWQ	GuCC	Sewerage Treatment 2 Northern side of Treatment works, parallel to railway line	149.744161	-34.739054	2
GCC11	GCC11	GuCCWQ	GuCC	Wollondilly River End of Wollondilly Ave	149.752612	-34.725543	2
GCC12	GCC12	GuCCWQ	GuCC	Wollondilly River Murray's Flat	149.794599	-34.722544	2
E409	E409	Catchin	SCA	Wollondilly River Murray's Flat	149.794599	-34.722544	1
E450	E450	Catchin	SCA	Golden Valley	150.080976	-34.551733	1
E488	E488	Catchin	SCA	Fowler's Flat	150.255782	-34.224464	1
BUSTP	BUSTP	WiCWQ	WiC	Bundanoon STP	150.279152	-34.652641	2
REEDDN	REEDDN	WiCWQ	WiC	Reedy Creek d/s Bundanoon STP	150.277664	-34.65574	2
REEDUP	REEDUP	WiCWQ	WiC	Reedy Creek u/s Bundanoon STP	150.279754	-34.649395	2

Table 59: Site information for Upper Wollondilly River

Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
RWQ37	RWQ37	RecWat	DLWC	Pejar Dam	145.1244	-34.3554	1
RWQ46	RWQ46	RecWat	DLWC	Wollondilly River Marsden Weir	149.706289	-34.73638	1
GCC6	GCC6	GuCCWQ	GuCC	Wollondilly River Marsden Weir	149.706289	-34.73638	2
GCC7	GCC7	GuCCWQ	GuCC	Wollondilly River Goodhew Park	149.71815	-34.73838	2
GCC8	GCC8	GuCCWQ	GuCC	Wollondilly River Tully Pk	149.734271	-34.735214	2
GCC9	GCC9	GuCCWQ	GuCC	Sewerage Treatment 1 end of Cemetery St adjacent to correctional centre	149.74171	-34.741385	2

Table 60: Site information for Mulwaree River

Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
GCC1	GCC1	GuCCWQ	GuCC	Run of Water ck	149.627451	-34.784044	2
GCC2	GCC2	GuCCWQ	GuCC	Mulwaree River Thornes Bridge	149.705634	-34.782977	2
GCC3	GCC3	GuCCWQ	GuCC	Mulwaree River Landsdowne Br	149.722344	-34.770642	2
GCC4	GCC4	GuCCWQ	GuCC	Mulwaree River, Blackshaw Rd	149.722045	-34.758309	2
GCC5	GCC5	GuCCWQ	GuCC	Mulwaree Ponds Cemetery St	149.743039	-34.743905	2
E457	E457	Catchin	SCA	Towers Weir	149.695966	-34.783006	1

Table 61: Data information for Wollondilly River

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.AI	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
RWQ27	DLWC	14/04/1998	30/03/1999	9			11	10			11	11		1				5										
RWQ41	DLWC	14/04/1998	30/03/1999	9			10	10			10	10		1				5										
RWQ53	DLWC	14/04/1998	13/05/1998	5			5	5			5	5		5														
RWQ54	DLWC	14/04/1998	13/05/1998	5			5	5			5	5		4														
GCC10	GuCC	09/01/1996	14/07/1998			30	29	29	29			29					29	29										29
GCC11	GuCC	09/01/1996	14/07/1998			30	31	31	31			30					31	31										30
GCC12	GuCC	09/01/1996	14/07/1998			31	31	31	31			30					31	31										31
E409	SCA	17/01/1995	31/12/1999		39	146	46	46	44			39			77	82	82	149	48	44	48	40	48	44			46	47
E450	SCA	04/01/1995	31/12/1999		37	174	45	45	45			38			77	101	101	189	61	44	61	44	61	44			45	45
E488	SCA	24/01/1995	31/12/1999		38	119	47	47	45			40			51	85	85	125	85	79	85	77	85	79			79	81
BUSTP	WiC	09/11/1998	06/12/1999			11	11	11	11			11			11	11	11	11			11					11	11	11
REEDDN	WiC	09/11/1998	06/12/1999			11	11	11	11			11			11	11	11	11			11					11	11	11
REEDUP	WiC	09/11/1998	06/12/1999			11	11	11	11			11			11	11	11	11			11					11	11	11

Table 62: Data information for Upper Wollondilly River

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.AI	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
RWQ37	DLWC	14/04/1998	13/05/1998	5			5	5			5	5		5														
RWQ46	DLWC	14/04/1998	13/05/1998	5			5	5			5	5		5														
GCC6	GuCC	09/01/1996	14/07/1998			31	31	31	31			31					31	31										31
GCC7	GuCC	09/01/1996	14/07/1998			31	31	31	31			31					31	31										31
GCC8	GuCC	09/01/1996	14/07/1998			30	31	31	31			30					31	31										30
GCC9	GuCC	09/01/1996	14/07/1998			29	29	29	29			29					29	29										28

Table 63: Data information for Mulwaree River

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.AI	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
GCC1	GuCC	09/01/1996	14/07/1998			31	31	31	31			31					31	31										31
GCC2	GuCC	09/01/1996	14/07/1998			31	30	31	31			29					31	31										31
GCC3	GuCC	09/01/1996	14/07/1998			31	30	31	31			31					31	31										31
GCC4	GuCC	09/01/1996	14/07/1998			31	31	31	31			30					31	31										31
GCC5	GuCC	09/01/1996	14/07/1998			31	31	31	31			31					31	31										31
E457	SCA	17/01/1995	29/12/1999		19	67	30	31	28			19			48	48	48	66	24	23	24	22	24	23			23	23

Wingecarribee River

Water quality data was obtained from a range of programs (Table 64) in the Wingecarribee River sub-catchment. These are detailed below.

Catchin - This program is conducted for the SCA (previously Sydney Water) to assess water quality and pollutant loads entering Lake Burragorang. In this sub-catchment, two sites are sampled on a four or six weekly basis. In addition these sites have automatic samplers and flow gauging installed to assess pollutant loads in the catchment.

STWCH - The streamwatch program collects water quality samples from four sites within this sub-catchment. Data from these sites varies in sampling frequency and duration.

WiCWQ - Wingecarribee Council undertakes a water quality monitoring program to meet EPA licence requirements for the discharge of effluent from the STPs in its council area. Eight sites are sampled as part of this program in the Wingecarribee River sub-catchment area.

DAMS - This program is conducted for the SCA (previously Sydney Water) for operational and long term management purposes of the Dams. Sampling is conducted on a fortnightly basis in Lake Burragorang and on a monthly basis in Lakes Nepean, Cataract, Cordeaux, Avon and Wingecarribee Reservoir. One site is sampled on a monthly basis at the dam wall in Wingecarribee Reservoir.

Data Gaps

Data are available only for a small section of the river in the central part of this catchment. Wet-weather sampling is limited to the one site at Berrima Weir. Additional wet weather sampling should be considered and perhaps a site further downstream and closer to the dam inflow area.

Table 64: Data owner and contact details for Wingecarribee River

Org code	Organisation	Study code	Study name	Contact	Reason for collection
WiC	Wingecarribee City Council	WiCWQ	Water Quality Assessment survey	Barry Arthur	EPA licence requirements and assessment of impact of STPs on creeks and impact of STP upgrades.
SCA	Sydney Catchment Authority	Catchin	Catchment inflow water quality and loads	Amir Deen	Measure water quality in inflows to water storages, long term trends
SCA	Sydney Catchment Authority	DAMS	Warragamba and metro Dams water quality monitoring	Amir Deen	Water quality in Lake Burragorang for operational long term storage management and environmental purposes
HNCMT	Hawkesbury Nepean Catchment Management Trust	STWCH	Streamwatch program	Avtar Singh	Community/Schools based assessment of streams

Table 65: Site information for Wingecarribee River

Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
DW11	DW11	DAMS	SCA	Wingecarribee Reservoir at wall	150.483244	-34.544633	1
E302	E302	Catchin	SCA	Wingecarribee River d/s Wingecarribee swamp	150.51863	-34.565259	1
E332	E332	Catchin	SCA	Wingecarribee River at Berrima weir	150.342	-34.4956	1
CHEV1	CHEV1	STWCH	HNCMT	Mittagong Creek, Bowral	150.415	-34.475	4
CHEV3	CHEV3	STWCH	HNCMT	Mittagong Rivulet at Bowling Club, Bowral	150.434166	-34.4872222	4
OXLE1	OXLE1	STWCH	HNCMT	Mittagong Creek at Minnows, Bowral	150.385833	-34.4997222	4
REPS1	REPS1	STWCH	HNCMT	Caalang Creek at Caalang St Bridge, Robertson	150.599166	-34.5844444	4
BOSTP	BOSTP	WiCWQ	WiC	Bowral STP effluent	150.395833	-34.494444	2
MITTDN	MITTDN	WiCWQ	WiC	Mittagong Creek d/s Bowral STP	150.387801	-34.497949	2
MITTUP	MITTUP	WiCWQ	WiC	Mittagong Creek u/s Bowral STP	150.395975	-34.493131	2
MOSSTP	MOSSTP	WiCWQ	WiC	Moss Vale STP	150.355556	-34.540278	2
WHYDN	WHYDN	WiCWQ	WiC	Whytes Creek Moss Vale downstream of STP	150.338889	-34.547222	2
WHYUP	WHYUP	WiCWQ	WiC	Whytes Creek Moss Vale upstream of STP	150.359578	-34.544462	2
WINGDN	WINGDN	WiCWQ	WiC	Wingecarribee River d/s Mittagong Creek	150.382843	-34.500347	2
WINGUP	WINGUP	WiCWQ	WiC	Wingecarribee River u/s Mittagong Creek	150.386111	-34.50194	2

Table 66: Data information for Wingecarribee River

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
DWI1	SCA	12/01/1995	30/12/1999		53	2	64					57		4		44	44	2	101	100	57	33	57	56	15		44	44
E302	SCA	06/12/1999	28/12/1999	5																								
E332	SCA	27/01/1995	07/12/1999		23	78	42	43	42			23			50	55	55	84	55	31	55	30	55	31			31	31
BOSTP	WiC	25/08/1997	13/10/1999		31	31	31	31				30			31	31	31	31								31	31	31
MITTDN	WiC	25/08/1997	13/10/1999		31	31	31	31				29			31	31	31	31								31	31	31
MITTUP	WiC	25/08/1997	13/10/1999		30	30	30	30				29			30	30	30	30								30	30	30
MOSSTP	WiC	14/01/1999	18/12/1999		14	14	14	14				14			14	14	14	14			13					14	14	14
WHYDN	WiC	14/01/1999	18/12/1999		14	13	12	12				12			14	14	14	14			13					14	14	14
WHYUP	WiC	14/01/1999	18/12/1999		14	14	14	14				14			14	14	14	14			13					14	14	14
WINGDN	WiC	25/08/1997	13/10/1999		29	29	29	29				28			29	29	29	29								29	29	29
WINGUP	WiC	25/08/1997	13/10/1999		29	29	29	29				28			29	29	29	29								29	29	29
CHEV1	HNCMT	15/02/1995	21/02/1996		8	8	8	8	8			8				8	8	8										
CHEV3	HNCMT	07/03/1995	17/11/1999		38	38	38	38	38			38				38	38	38										
OXLE1	HNCMT	14/02/1995	15/11/1999		22	22	22	22	22			22				22	22	22										
REPS1	HNCMT	08/01/1995	28/06/1997		10	10	10	10	10			10				10	10	10										

Nattai River

Water quality data was obtained from a range of programs (Table 67) in the Nattai River sub-catchment. These are detailed below.

Catchin - This program is conducted for the SCA (previously Sydney Water) to assess water quality and pollutant loads entering the Lake Burragorang. In this sub-catchment, two sites are sampled on a four or six weekly basis. In addition these sites have automatic samplers and flow gauging installed to assess pollutant loads in the catchment. In 1999 a new study was commenced to measure loads of cryptosporidium and giardia coming from the catchment. Due to the low rainfall period little data has been collected to date.

STWCH - The streamwatch program collects water quality samples from five sites within this sub-catchment. Data from these sites varies in sampling frequency and duration.

WiCWQ - Wingecarribee Council undertakes a water quality monitoring program to meet EPA licence requirements for the discharge of effluent from the STPs in its council area. Four sites are sampled as part of this program in the Nattai River sub-catchment area.

Data Gaps

There is no secchi depth data to allow rating for aesthetic quality. Turbidity data could be adopted for this purpose. The two sites with automated sampling give good baseline data. Wollondilly Council is collecting data at sites downstream of Mittagong, however the data did not meet the selection criteria for this project due to insufficient sampling frequency.

Table 67: Data owner and contact details for Nattai River

Org code	Organisation	Study code	Study name	Contact	Reason for collection
SCA	Sydney Catchment Authority	Catchin	Catchment inflow water quality and loads	Amir Deen	Measure water quality in inflows to water storages, long term trends
WiC	Wingecarribee City Council	WiCWQ	Water Quality Assessment survey	Barry Arthur	EPA licence requirements and assessment of impact of STPs on creeks and impact of STP upgrades.
HNCMT	Hawkesbury Nepean Catchment Management Trust	SWCTH	Streamwatch program	Avtar Singh	Community/Schools based assessment of streams

Table 68: Site information for Nattai River

Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
E206	E206	Catchin	SCA	Nattai River - The Craggs	150.422192	-34.390808	1
E210	E210	Catchin	SCA	Nattai River at causeway	150.423401	-34.144287	1
FREN1	FREN1	STWCH	HNCMT	Frensham Weir at Range Rd, Mittagong	150.451388	-34.456111	4

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Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
NPAM1	NPAM1	STWCH	HNCMT	Nattai River 1km below Swimming Pool, Mittagong	150.458333	-34.445277	4
NPAM2	NPAM2	STWCH	HNCMT	Gibbergunyah Ck at Hume Hwy, Mittagong	150.427777	-34.446666	4
NPAM3	NPAM3	STWCH	HNCMT	Lake Alexandra, Mittagong	150.446388	-34.446944	4
NPAM4	NPAM4	STWCH	HNCMT	Chinamens Ck at Old Bowral Rd, Mittagong	150.433055	-34.454722	4
GIBBDN	GIBBDN	WiCWQ	WiC	Gibbergunyah Creek upstream of Nattai River confluence and d/s of Mittagong STP	150.43866	-34.432984	2
MISTP	MISTP	WiCWQ	WiC	Mittagong STP effluent	150.44251	-34.439368	2
NATTDN	NATTDN	WiCWQ	WiC	Nattai River downstream of Gibbergunyah confluence	150.439161	-34.431548	2
NATTUP	NATTUP	WiCWQ	WiC	Nattai River Upstream of Gibbergunyah confluence	150.440935	-34.432754	2

Table 69: Data information for Nattai River

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
E206	SCA	27/01/1995	07/12/1999		34	101	46	46	45			34			52	74	74	104	45	39	45	39	45	39			39	39
E210	SCA	25/01/1995	30/12/1999		27	77	46	46	45			27			25	58	58	81	58	53	58	53	58	53			52	52
GIBBDN	WiC	16/10/1998	22/11/1999			13	13	13	13			13			13	13	13	13								13	13	13
MISTP	WiC	16/10/1998	22/11/1999			13	13	13	13			13			13	13	13	13								13	13	13
NATTDN	WiC	16/10/1998	22/11/1999			13	13	13	13			13			13	13	13	13								13	13	13
NATTUP	WiC	16/10/1998	22/11/1999			13	13	13	13			13			13	13	13	13								13	13	13
FREN1	HNCMT	08/03/1995	18/08/1998			14	14	14	14	14		14				14	14	14										
NPAM1	HNCMT	20/01/1995	23/11/1995			6	6	6	6	6		6				6	6	6										
NPAM2	HNCMT	27/01/1995	07/04/1995			2	2	2	2	2		2				2	2	2										
NPAM3	HNCMT	19/05/1995	19/05/1995			1	1	1	1	1		1				1	1	1										
NPAM4	HNCMT	06/03/1995	09/01/1996			5	5	5	5	5		5				5	5	5										

Little River

Water quality data was obtained from one program (Table 70) in the Little River sub-catchment. The Catchin program is conducted for the SCA (previously Sydney Water) to assess water quality and pollutant loads entering the Lake Burragorang. In this sub-catchment, one site is sampled on a four or six weekly basis. In addition these sites have automatic samplers and flow gauging installed to assess pollutant loads in the catchment.

Data Gaps

Because there is only one site in this catchment, there are no data to assess differences between the upper and lower catchment areas. As the water quality is good, the addition of sites in the upper catchment is a low priority.

Table 70: Data owner and contact details for Little River

Org code	Organisation	Study code	Study name	Contact	Reason for collection
SCA	Sydney Catchment Authority	Catchin	Catchment inflow water quality and loads	Amir Deen	Measure water quality in inflows to water storages, long term trends

Table 71: Site information for Little River

Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
E243	E243	Catchin	SCA	Little River at fire road W41	150.463880	-34.190135	1

Table 72: Data information for Little River

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
E243	SCA	25/01/1995	02/12/1999		29	67	47	47	45			29			16	56	55	72	56	53	56	42	56	53			52	52

Werriberri Creek (Monkey Creek)

Water quality data was obtained from one program (Table 70) in the Little River sub-catchment. The Catchin program is conducted for the SCA (previously Sydney Water) to assess water quality and pollutant loads entering the Lake Burragorang. In this sub-catchment, one site is sampled on a four or six weekly basis. In addition these sites have automatic samplers and flow gauging installed to assess pollutant loads in the catchment. In 1999 a new study was commenced to measure loads of cryptosporidium and giardia coming from the catchment. Due to the low rainfall period little data has been collected to date.

Data Gaps

There is no ongoing sampling in the upper catchment of Werriberri Creek. A continuation of the environmental impact assessment work done in the past would be prudent, to assess likely changes in the sub-catchment's faecal and nutrient sources and inputs.

It is recommended that the current site be maintained as a good indicator of water quality flowing into Lake Burragorang. Additional monitoring can be undertaken further upstream to assess the impact of the implementation of management options.

Table 73: Data owner and contact details for Werriberri Creek (Monkey Creek)

Org code	Organisation	Study code	Study name	Contact	Reason for collection
SCA	Sydney Catchment Authority	Catchin	Catchment inflow water quality and loads	Amir Deen	Measure water quality in inflows to water storages, long term trends

Table 74: Site information for Werriberri Creek (Monkey Creek)

Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
E531	E531	Catchin	SCA	Werriberri Creek at Werombi	150.557894	-33.980726	1

Table 75: Data information for Werriberri Creek (Monkey Creek)

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
E531	SCA	04/01/1995	29/12/1999		39	128	46	46	46			39			56	80	80	146	79	72	79	70	79	72			71	71

Bargo River

There is little water quality data available from the Bargo River sub-catchment in recent times (1995-1999) The RecWat program, undertaken by DLWC as part of its recreational water quality program is the only current program in the sub-catchment. One site sampled in this sub-catchment with sampling conducted during the swimming season in summer from October to March on a six day basis the same as beachwatch program to meet the ANZECC 1992 guideline requirement of recreational sampling. Data is analysed by a NATA registered lab and collected by professional sampling staff. Samples are analysed for faecal bacteria and physical parameters and blue green algae.

Data gaps

There is currently little water quality monitoring being undertaken in the catchment. Sydney Water undertook sampling in the catchment at one location in 1986. Sampling at this site should possibly be recommenced. Streamwatch data is also available from this site, however the last streamwatch sampling was undertaken in 1993.

Table 76: Data owner and contact details for Bargo River

Org code	Organisation	Study code	Study name	Contact	Reason for collection
DLWC	Department of Land and Water Conservation	RecWat	Recreational Water Quality Study	Adam Boey	Summer sampling for faecal bacteria to determine recreational quality

Table 77: Site information for Bargo River

Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
RWQ48	RWQ48	RecWat	DLWC	Mermaid Pools, Bargo River	150.362000	-34.142800	1

Table 78: Data information for Bargo River

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
RWQ48	DLWC	07/05/1998	01/06/1998	5			5	4			5	5		5														

Upper Nepean River

Water quality data was obtained from a range of programs (Table 79) in the Upper Nepean River sub-catchment. These are detailed below.

Catchin - This program is conducted for the SCA (previously Sydney Water) to assess water quality and pollutant loads entering the Lake Burragorang. In this sub-catchment, two sites are sampled on a four or six weekly basis. In addition these sites have automatic samplers and flow gauging installed to assess pollutant loads in the catchment.

RecWat -This program is undertaken by DLWC as part of its recreational water quality program with two sites sampled in this sub-catchment. Sampling is conducted during the swimming season in summer from October to March on a six day basis the same as beachwatch program to meet the ANZECC 1992 guideline requirement of recreational sampling. Data is analysed by a NATA registered lab and collected by professional sampling staff. Samples are analysed for faecal bacteria and physical parameters and blue green algae.

DAMS - This program is conducted for the SCA (previously Sydney Water) for operational and long term management purposes of the Dams. Sampling is conducted on a fortnightly basis in Lake Burragorang and on a monthly basis in Lakes Nepean, Cataract, Cordeaux, Avon and Wingecarribee Reservoir.

Table 79: Data owner and contact details for Upper Nepean River

Org code	Organisation	Study code	Study name	Contact	Reason for collection
SCA	Sydney Catchment Authority	Catchin	Catchment inflow water quality and loads	Amir Deen	Measure water quality in inflows to water storages, long term trends
SCA	Sydney Catchment Authority	DAMS	Warragamba and metropolitan Dams water quality monitoring	Amir Deen	Water quality in Lake Burragorang for operational, long term management and environmental purposes
DLWC	Department of Land and Water Conservation	RecWat	Recreational Water Quality Study	Adam Boey	Summer sampling for faecal bacteria to determine recreational quality

Table 80: Site information for Upper Nepean River

Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
DAV7	DAV7	DAMS	SCA	Off take at Avon dam	150.687000	-34.440700	1
DCA1	DCA1	DAMS	SCA	Cataract Dam at wall	150.806000	-34.272300	1
DCO1	DCO1	DAMS	SCA	Cordeaux Dam at wall	150.749000	-34.340600	1
DNE2	DNE2	DAMS	SCA	Nepean Dam near wall	150.614000	-34.338300	1
E601	E601	Catchin	SCA	Nepean River Inflow to Lake Nepean	150.569669	-34.385267	1

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Site Code (provided)	Site Code (unique)	Study code	Org code	Description	Longitude	Latitude	Data quality
E602	E602	Catchin	SCA	Burke River Inflow to Lake Nepean	150.594331	-34.415824	1
RWQ57	RWQ57	RecWat	DLWC	Dredge Avenue, Cataract River	150.431500	-34.115000	1
RWQ29	RWQ29	RecWat	DLWC	The Narrows, Nepean River	150.3808	-33.4639	1

Table 81: Data information for Upper Nepean River

SITE CODE	ORG CODE	Min Date	Max Date	BGA	Chl-a	Cond	pH	Temp	DO	DO Sat	Ent	FC	Sal	Secchi	SS	TN	TP	Turb	Al	F.Al	Fe	F.Fe	Mn	F.Mn	Sodium	TKN	NOx	TUA
DCA1	SCA	04/01/1995	29/11/1999		54	49	67	76	69	43		77		6		34	34	36	66	66	66	37	66	66	33		34	34
DAV7	SCA	04/01/1995	22/12/1999		65	71	94	77	77	26		95		2		39	39	37	94	93	94	38	94	94	24		39	39
DCO1	SCA	02/02/1995	20/12/1999		54	70	66	121	105	77		68		5		34	34	20	67	67	67	36	67	67	24		34	34
DNE2	SCA	24/01/1995	20/12/1999		54	42	72	53	52	25		71		6		31	31	21	72	72	72	39	72	72	22		31	31
E601	SCA	27/01/1995	08/12/1999		28	127	45	46	46			29			47	72	72	131	72	41	72	40	72	41			40	40
E602	SCA	27/01/1995	08/12/1999		27	155	45	46	46			33			38	86	86	163	83	49	83	48	83	49			48	48
RWQ57	DLWC	15/04/1998	18/05/1998	5			4	3				5	5		4													
RWQ29	DLWC	15/04/1998	12/05/1998	5			5	4				5	5		5													

5 References

- ANZECC (1992) *Australian Water Quality Guidelines for Fresh and Marine Waters*, National Water Quality Management Strategy. Australian and New Zealand Environment and Conservation Council, Canberra.
- DLWC (2001). *Surface Water Quality Assessment of the Hawkesbury-Nepean River Catchment: Final Report*. Report No 2000/0408.
- Healthy Rivers Commission 1998. *Independent Inquiry into the Hawkesbury Nepean River System Final Report*.