Article to media 31/01/11

Ross Kapitzke, Toowong;

Weather reports and river flooding: Authoritative data, popular opinion and public response

The community is understandably now reflecting on hot topics such as dam operation, early warning, flood zoning and other flood mitigation measures in relation to the Brisbane and Ipswich floods. This raises the tension between published authoritative data (e.g. rainfall, river heights), popular opinion (e.g. how Wivenhoe was perceived to protect Brisbane), and public response (e.g. understanding flood levels on individual properties and what to do about it)

How this played out in January's floods is instructive on what data is available and how the resource authorities (BOM, SEQWATER) provide it, how the media (ABC radio, TV, newspapers) publish it, and how local authorities (BCC) and the community interpret it and respond.

I have long been interested in this issue, as an informed lay person with 40 years professional experience in water resources, river management and environmental engineering. In an era of enhanced technology, increased community awareness and instant experts, I offer the following contribution to help us deal with crisis situations such as this (and to also benefit during everyday weather conditions).

My main comments relate to vital BOM data that is already publicly available at http://www.bom.gov.au/qld/, but which I believe could be better interpreted by BOM / media outlets, and communicated to users. I know there are arguments about quality control of published data, packaging information for publication, and perceived competence levels of the public to interpret data. Nevertheless, the extent to which significant primary data on rainfall and river conditions is available in real-time but not packaged and published for public information, should be an area of major attention now and in forthcoming government reviews.

Like many SE Queenslanders, during that flood week in January i listened and watched intently to weather information, flood interpretations, evacuation advice and flood disasters conveyed through the media to the people of Brisbane and Ipswich. Whereas the images were visually graphic on TV, it was clear that ABC radio was the leader in authoritative, up-to-date and practical information sourced and broadcast regularly for public service and assistance.

It also became clear to me that authority representatives (BOM, SEQWATER, BCC) were struggling to convey the Brisbane and Bremer River and Wivenhoe Dam information in a meaningful way either through news bulletins or interviews. Many times I listened to ABC radio journalists and those from TV media talk to BOM hydrologists, SEQWATER managers and the Brisbane and Ipswich mayors who were exemplary in their competence, openness and grasp of the situation.

But I also listened to many interviews with the public, and experienced first-hand in discussions with others, the shortcomings of the information flow that could so easily be improved if only the rain and river data were more readily available for reasoned use by the public.

I use the BOM website data extensively for my work, but also rate it as one of the top websites for personal everyday use. Hence I am familiar with the capacity of this website and the rapidly increasing extent of valuable user friendly information available to the public. I made a case 4 years ago (article attached) when Brisbane was in the grip of a drought to have the weather story told in terms of the

meaningful quantitative data on rainfall probabilities that is already available online at http://www.bom.gov.au/jsp/watl/rainfall/pme.jsp, instead of the banal musings of media weather reports that are more akin to cake recipes than public advice.

This case is more critical now in time of flood. Many thousands of residents in Brisbane and parts of Ipswich would have benefited if information on river heights *throughout* the Brisbane River reaches were conveyed through the media instead of relying *almost solely* on information for the Brisbane River City Gauge in the largely tide affected lower reaches of the river where flood level fluctuations were of the order of 2-3 m. The Ipswich gauge on the Bremer River, where river heights fluctuate in the order of 10-15 m was well reported, but it was not made clear to the public how to use this information other than at these immediate locations on the Brisbane and Bremer Rivers.

Whereas the City Gauge is a valid and meaningful reference point for the City and adjoining suburbs, the western suburbs of Brisbane and much of Ipswich is affected by much greater river height fluctuation. Information that is already available for the Jindalee and Moggill Gauges on the Brisbane River was not packaged for use by the authorities or by the media. Adjoining suburbs in these Brisbane River reaches were not subject to the tidal fluctuations and the associated relatively small flood height increases experienced in lower reaches, and extensively publicised in the weather reports and through the media. These suburbs were facing flood level fluctuations of the order of 8 – 10 m, and the Jindalee and Moggill Gauge data were showing this. But this was not grasped by the authorities or the media and, during the many days of listening and watching that I did, was not conveyed meaningfully to the public

Residents of Rocklea, Graceville, Jindalee and Goodna would no doubt have benefited if they were to look out from their properties at water levels in the river or in an adjoining park and understand that these levels were expected to rise by 8-10 m (based on river gauges in their proximity at Jindalee and Moggill), and not by 2-3 m (based on the City Gauge). This information is available in real time via telemetry from the river gauges, is evident to the informed user, and is published on the BOM site at http://www.bom.gov.au/cgi-bin/wrap fwo.pl?IDQ60286.html

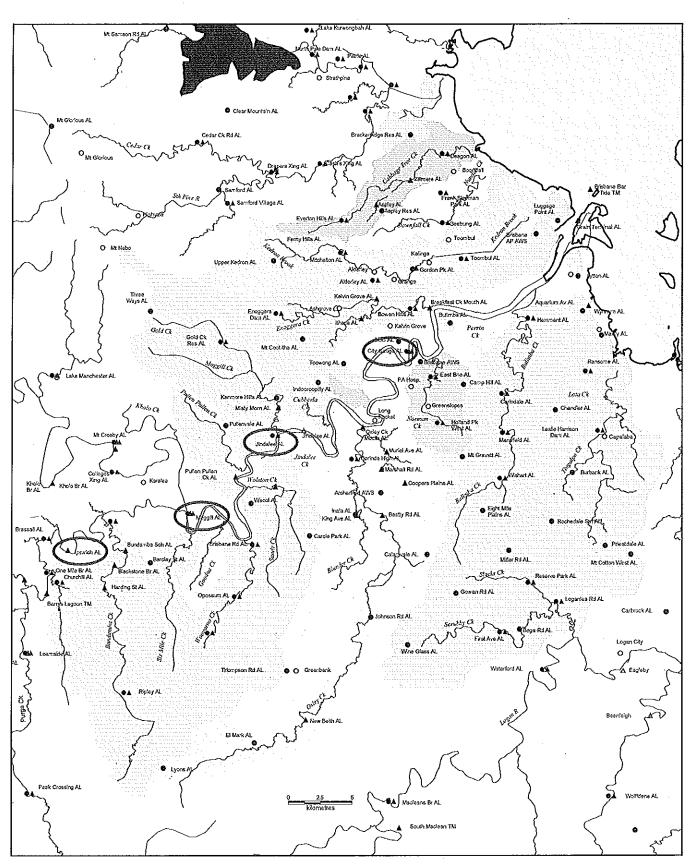
I have attached a document with extracts from the data for January's flood obtained from the BOM site (map of BOM stations with lower Brisbane and Ipswich gauges highlighted; river height plots for Ipswich, Moggill, Jindalee, City gauges; basic data for the river height / gauging stations)

Whereas information presented for future flood events will most likely be supported by enhanced technology providing graphic mapping of inundated areas, significant vital information on rain and river conditions is already publicly available on the BOM website. The case that I would like explored now and through the forthcoming government reviews is to have this information packaged and presented for use by the authorities and media to better inform a public that is mostly competent to embrace this information and benefit from it:

- real time river height data and flood level plots at http://www.bom.gov.au/cgi-bin/wrap-fwo.pl?IDQ60286.html
- rainfall forecast probability of precipitation data at http://www.bom.gov.au/jsp/watl/rainfall/pme.jsp

Sincerely

Ross



- Daily Reporting Rainfall Station
- △ Manual River Station
- Telemetry Rainfall Station
- Telemetry River Station

LOWER BRISBANE RIVER

FLOOD WARNING NETWORK

— Major Roads → → → Railway

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IDQ65389

Latest River Heights for Bremer R at Ipswich

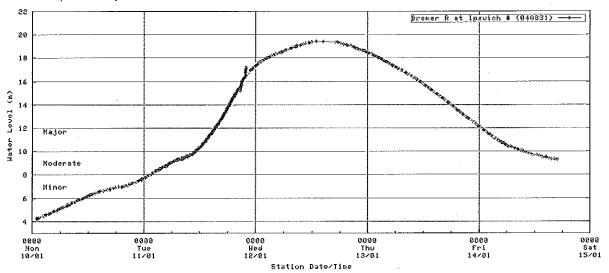
Issued at 5:15 pm EST Friday 14 January 2011

About river heights plots | About this Plot

Station details: Station Number: 040831 Name: Bremer R at Ipswich # Owner: CBM/ICC:143954

Flood levels: Minor: 7.00 Moderate: 9.00 Major: 11.70

Data from the previous 4 days.



Australian Government Bureau of Meteorology

(Generated: 14/01/2011 17:15:17)

Data as Table | Previous Station | Next Station | Back to Bulletin

About this plot

- The river height data is the latest available operational data provided for flood warning purposes and has not been quality
- Stations marked with * or # indicate that the data is provided from automatic equipment.
- Stations marked with * are Telephone Telemetry Devices and are nominally polled once a day and more often during
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 All river height reports are in metres and are shown in local time.
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- For other Station details: Flood Classifications, Road Crossings, Survey/AHD Details, Maps



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Latest River Heights for Brisbane R at Moggill

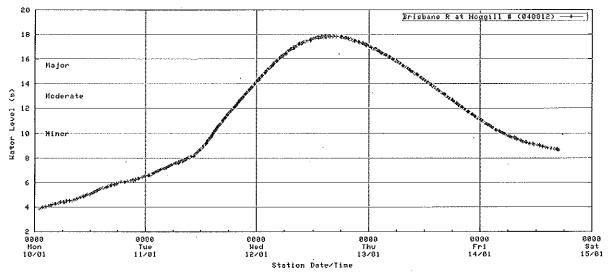
Issued at 5:15 pm EST Friday 14 January 2011

About river heights plots | About this Plot

Station details: Station Number: 040812 Name: Brisbane R at Moggill # Owner: CBM:143951

Flood levels: Minor: 10.00 Moderate: 13.00 Major: 15.50

Data from the previous 4 days.



Australian Government Bureau of Neteorology

(Generated: 14/01/2011 17:15:21)

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Latest River Heights for Brisbane R at Jindalee Br#

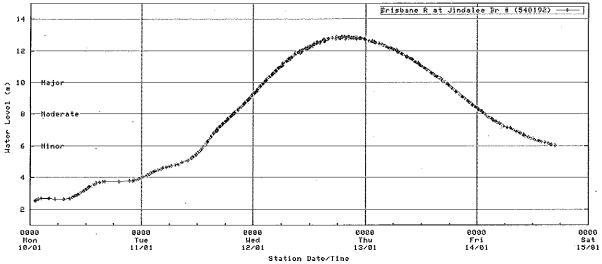
Issued at 5:15 pm EST Friday 14 January 2011

About river heights plots | About this Plot

Station details: Station Number: 540192 Name: Brisbane R at Jindalee Br # Owner: SEQWCO:143832

Flood levels: Minor: 6.00 Moderate: 8.00 Major: 10.00

Data from the previous 4 days.



Australian Government Bureau of Meteorology

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Latest River Heights for Brisbane R at City Gauge

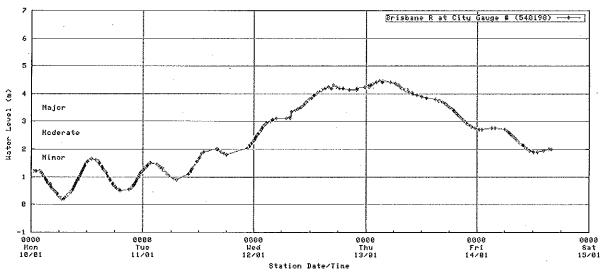
Issued at 5:45 pm EST Friday 14 January 2011

About river heights plots | About this Plot

Station details: Station Number: 540198 Name: Brisbane R at City Gauge # Owner: SEQWCO:143838

Flood levels: Minor: 1.70 Moderate: 2.60 Major: 3.50

Data from the previous 4 days.



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About this plot

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540402	TRAMWAY LANE TM											
040714	ROUND MOUNTAIN TM	124.7	44.281	STATE	7/ 1/1957	1270	6.0		9.5		13.0	
040945	ROUND MOUNTAIN ALERT	124.7	44.281	STATE	7/ 1/1957	1270	6.0		9.5		13.0	
540270	BROMELTON WEIR HW TM	115.1	0.000	AHD	6/ 4/1998	98						
540271	BROMELTON WEIR TW TM	113,0	36.697	AHD	31/ 3/1996	98						
040939	BEAUDESERT ALERT	104.4	29.447	STATE	19/ 3/1993	1475	5.5		7.8		8.3	
540481	BROMELTON DAM ALERT					1.0	•					
040841	CROFTBY TM	82.3	161.815	STATE	2/ 7/1966	82	3.0		4.5		6,0	
040947	CROFTBY ALERT	82.3	161.815	STATE	2/ 7/1966	82	3.0		4.5		6.0	
040729	BOONAH	52.0	79.387	AHD	1/ 9/1986	- 330	4.0	4.0	5.0	7.0	6.0	
040949	BOONAH ALERT	52.0	79.387	AHD	15/ 6/1992	330	4.0	4.0	5.0	7.0	6.0	
040762	YARRAHAPPINI TM	77.7	10.589	STATE	21/ 4/1969	2435	10.0	12.0	14.0		16.0	
040940	YARRAHAPPINI ALERT	77.7	10.589	STATE	21/ 4/1969	2435	10.0	12.0	14.0		16.0	
040710	JIMBOOMBA	77.7	10.562	AHD	1/ 9/1983	2435	10.0	12.0	14.0		16.0	
540214	SOUTH MACLEAN TM	22.0	0.000	ASSUM	28/ 7/1994	2500	8.0		12.0		14.0	
040542	MACLEAN BRIDGE	64.2	3.310	AHD	1/12/1982	2580	10.0		13.5	15.2	16.0	
040935	MACLEAN BRIDGE ALERT	64.2	3.310	AHD	1/12/1982	2580	10.0		13.5	15.2	16.0	
-040665	WATERFORD		0.000	AHD	25/11/1993	2764	6.0		7.5	9.0	9.0	
040878	WATERFORD ALERT		0.000	AHD	25/11/1993	2764	6.0		7.5	9.0	9.0	
540079	SLACKS CK(RESERVE PK) AL		0.000	AHD	15/ 4/1993	20	8.0		9.0		10.0	
540078	MARSDEN (FIRST AVE) AL		0.000	AHD	24/ 3/1993	68	9.0		10.0		11.0	
540091	SLACKS CK(LOGANLEA RD)AL		0.000	AHD	14/ 4/1993	108	4.00		6.00		7.50	
040709	EAGLEBY		0.000	AHD	1/ 9/1983	3000	3.0	3.5	4.0	7.0	5.0	
540236	CARBROOK (RIEDEL ROAD) AL		0.000	AHD	18/ 3/1998		2.0		3.0		4.0	
540384	LESLIE HARRISON DAM ALER					87						

Date: 15/12/2010

SECTION 6

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QUEENSLAND FLOOD WARNING RIVER HEIGHT STATIONS SURVEY DETAILS

CBM No	STATION NAME	AMTD	RL of GZ I	MUTAC	DATES FROM/TO	AREA km2	MIN	CROPS	MOD	TOWNS	MAJ
540046	PEACHESTER WRC TM PEACHESTER ALERT WOODFORD TM WOODFORD ALERT-P WOODFORD ALERT-B WOODFORD MT KILCOY WEIR TM MT KILCOY WEIR ALERT SOMPERST DAM WA ALERT-D	89.2	125.026	STATE	7/ 1/1927	104	5.0		8.0		9.0
540059	PEACHESTER ALERT	89.2	125.026	STATE	7/ 1/1927	104	5.0		8.0		9.0
540485	WOODFORD TM					250	5.0	5.0	6.0	10.7	8.0
540337	WOODFORD ALERT-P	64.1	107.514	AHD	15/ 5/2002	250	5.0	5.0	6.0	10.7	8.0
540338	WOODFORD ALERT-B	64.1	107.514	AHD	15/ 5/2002	250	5.0	5.0	6.0	10.7	8.0
040627	WOODFORD	64.1	107.514	AHD	1/ 9/1918	250	5.0	5.0	6.0	10.7	8.0
540373	MT KILCOY WEIR TM					131					
540482	MT KILCOY WEIR ALERT					-					
540159	SOMERSET DAM HW ALERT-P SOMERSET DAM HW ALERT-P2	7.2	0.000	AHD		1330					
540471	SOMERSET DAM HW ALERT-P2				•	1330					
540160	SOMERSET DAM HW ALERT-B										
540301	SOMERSET DAM HW ALERT-B2					1330					
540044	COOYAR CREEK TM	12.2	158,880	STATE	10/ 1/1968	965	5.0		6.5		8.0
540146	COOYAR CREEK ALERT	12.2	158-880	STATE	10/ 1/1968	965	5.0		6.5		8.0
540040	LINVILLE TM	282.4	115.300	AHD	10/ 1/1964	2005	2.0		5.5		6.5
540261	LINVILLE ALERT	282.4	115.300	AHD	16/10/1964	2005	2.0		5.5		6.5
040387	LINVILLE	278.2	110 995	STATE	1/ 9/1956	2005	3.0	9.0	7 0		8 0
540188	DEVON HILLS ALERT	2.012	99.000	AHD	1/10/1994	2160	2.0	3.0	6.0		7.0
540045	BOAT MOUNTAIN TM	9.3	107.842	STATE	10/ 1/1976	920	4 5		6.0		7.5
540141	BOAT MOINTAIN ALERT	9.3	107.042	STATE	10/ 1/1076	920	4.5		6.0		7.5
540446	SOMERSET DAM HW ALERT-BS SOMERSET DAM HW ALERT-BS SOMERSET DAM HW ALERT-B2 COOYAR CREEK TM COOYAR CREEK ALERT LINVILLE TW LINVILLE TW LINVILLE ALERT BOAT MOUNTAIN TM BOAT MOUNTAIN TM BOAT MOUNTAIN ALERT GLENDALE TM GREGOR CKEK TM GREGOR CK ALERT-P GREGOR CK ALERT-P GREGOR CK ALERT-B UPPER CRESSBROOK ALERT	2.3	107.012	CIMIL	10/ 1/15/0	520	1.5	9.0	0.0		,
040822	GREGOR CREEK TM	251 7	82 305	ZHD	2/ 7/1062	3005	3.5		15		7.5
540139	GREGOR CK ALERT-P	251.7	92 305	VIII	2/ 7/1902	3005	3.5		4.5		7.5
540133	CRECOR CK ALERT-P	251.7	02.333	AHD	7/ 2/1062	3005	3.5		4.5		7.5
540276	HIDDED CORCEDDOON MINDS	231.5	02.333	Anu	17 2/1902	3003	3.3		4.5		7.5
540270	LITTLE OAKEY CREEK ALERT										
540142	LITTLE OAKEY CREEK ALERT CRESSBROOK DAM ALERT ROSENTRETERS BRIDGE IM ROSENTRETERS BRIDGE AL					216					
040000	DOCEMEDE DELICE TM	25 1	102 000	z DD	20/ 0/1006	313	2 0		4.0		E 0
540140	BOCKWEDEREDS BRIDGE IN	23.4	102.000	ADD	20/ 0/1900	477	3.0		4.0		5.0
540441	FALLS ROAD TM	23.4	102.000	And	20/ 8/1986	4/1	3.0		4.0		5.0
540260	SPLITYARD CREEK DAM AL										
	WIVENHOE DAM					7020					
040703 E40177	WIVENHOE DAM HW ALERT-B					7020					
540202	WIVENROE DAM NW ALERT-B					7020					
540302	WIVENRUE DAM HW ALERT-BZ	150.0	0 000	****	E4 041006	7020					
540069	WIVENHOE DAM IN IM	150.0	0.000	AHD	5/ 2/1986	7020					
240176	WIVENHUE DAM TW ALERT-P	150.0	0.000	AHD.	5/ 2/1986	7020					
34U119	WIVENROE DAM TW ALERT-B		0.000	AHD	104114000	7020					
U4U0Z9	HELIDON IM	99.0	128.651	AHD	19/11/1987	350	4.0		6.5		8.0
540143	HELITON ALEKT	99.0	128.651	AHD	19/11/1987	350	4.0		6.5		8.0
540405	FLAGSTONE CK TM	6.8	140,350	AHD	1/ 6/1993						
540386	SANDY CREEK ROAD ALERT		0.000	ASSUM	25/ 5/2006		2.0		3.0		4.0
540406	MA MA CREEK TM	13.6	146.713	AHD	25/ 8/1995						
540067	TENTHILL TM	14.6	123.845	AHD	18/ 3/1968	455	4.5		5.0		6.5
540152	TENTHILL ALERT	14.6	123.845	AHD	18/ 3/1968	455	4.5		5.0		6.5
540363	GATTON TM	72.0	29.270	ASSUM	4/ 2/2000						
040444	GATTON	72.0	87.539	AHD	1/ 9/1929	1550	7.0	13.0			
540156	GATTON ALERT	72.0	87.539	AHD	1/ 9/1929	1550	7.0		10.0		15.0
040751	THORNTON		162.841	AHD	24/ 1/1994		4.5	5.3			5.3
040835	MULGOWIE TM	30.9	132,707	STATE	3/ 6/1967	179	5.0	7.0			
040716	LAIDLEY		101.495	AHD	1/ 1/1982	285	5.0	8.5	6.0	9.0	
540047	WIVENHOE DAM HW ALERT-B WIVENHOE DAM HW ALERT-B2 WIVENHOE DAM TW TM WIVENHOE DAM TW ALERT-P WIVENHOE DAM TW ALERT-P HELIDON TM HELIDON TM HELIDON ALERT FLAGSTONE CK TM SANDY CREEK ROAD ALERT MA MA CREEK TM TENTHILL TM TENTHILL ALERT GATTON TM GATTON ALERT THORNTON GATTON ALERT THORNTON WILGOWIE TM LAIDLEY SHOWGROUND WEIR HW TM SHOWGROUND WEIR ALERT BILL GUNN DAM ALERT	17.6	97.000	AHD	20/ 9/1984	241	6.0		7.0		7.8
540158	SHOWGROUND WEIR ALERT	17.6	97.000	AHD	20/ 9/1984	241	6.0		7.0		7.8

Date: 15/12/2010

SECTION 6

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QUEENSLAND FLOOD WARNING RIVER HEIGHT STATIONS SURVEY DETAILS

CBM No STATION NAME AMTD RL of GZ DATUM DATES FROM/TO AREA km2 MIN CROPS MOD TOWNS MAJ

540050 540473	WARREGO HIGHWAY TM LAKE CLARENDON DAM ALERT GLENORE GROVE ALERT LYONS BRIDGE	r 0										
540473		5.0	76.339	AHD	11/ 8/1990		445	4.5		5.2		5.5
	LAKE CLARENDON DAM ALERT											
540149	GLENORE GROVE ALERT	51.8	67.115	AHD	1/ 1/1955	1/ 3/1975	2230	8.0		11 D		13.0
040662	LYONS BRIDGE	29.1	48,528	AHD	1/ 1/1955	1/ 3/1975	2530	***				13.0
			47.528	AHD	1/ 3/1975	1, 3,15,10	2530	10.0		11 5		13.0
540174	LYONS BRIDGE ALERT-P LYONS BRIDGE ALERT-B RIFLE RANGE ROAD TM ATKINSON DAM ALERT	29.1	47.528	AHD	1/10/1994		2530	10.0		11.5		13.0
540175	LYONS BRIDGE ALERT-B	۵,۰۰	47.020	trib	1/10/1999		2530	10.0		11.5		13.0
040817	RIFLE PANCE POAD TM	26.2	44 425	MID	1 / 2 /1 000		2330	10.0		11.5		13.0
540470	ATKINGON DAW VIEDE	20.2	44.433	MILL	1/ 2/1900		2541	10.5		12.0		13.5
540250	DIIADADA COPEV ATERT		00 504	200104			33					
540233	RIFLE RANGE ROAD TM ATKINSON DAM ALERT BUARABA CREEK ALERT O'REILLY'S WEIR TM O'REILLY'S WEIR ALERT LOWOOD PUMP STN ALERT-B LOWOOD ALERT-P SAVAGES CROSSING TM SAVAGES CROSSING ALERT MARBURG ALERT BURTONS BRIDGE ALERT LAKE MANCHESTER ALERT		92.504	ASSUM	1 /10 /1010	·	0.000					
540031	O KEILLI S WEIK IM	1.4	23.620	AHD	1/12/1948		2980	12.0		14.0		16.0
540153	O'REILLI'S WEIR ALERT	1.4	23.620	AHD	1/12/1948		2980	12.0		14.0		16.0
540183	LOWOOD PUMP STN ALERT-B		23.074	AHD	1/ 1/1992		10062					
040441	FOMOOD	140.4.	23.683	AHD	1/ 9/1909		10062	8.0	18.0	15.0	21.0	20.0
540182	LOWOOD ALERT-P	139.9	22.743	STATE	1/10/1994	•	10062	8.6		15.9		21.2
540066	SAVAGES CROSSING TM	130.8	18.430	AHD	10/ 1/1958		10180	9.0		16.0		21.0
- 540150	SAVAGES CROSSING ALERT	130.8	18.430	AHD	10/ 1/1958		10180	9.0		16.0		21.0
540312	MARBURG ALERT		79.140	$\mathbf{A}\mathbf{H}\mathbf{D}$	1/ 9/2005							
540257	BURTONS BRIDGE ALERT		15.060	AHD	30/ 7/2002							
540028	LAKE MANCHESTER ALERT											
540256	KHOLO BRIDGE ALERT		0.000	AHD	30/ 7/2002							
040142	MT CROSBY	90.2	6.904	AHD	1/ 9/1864	1/ 1/1975	10600					
		30.2	0 000	AHD	1/ 1/1075	#/ 1/17/5	10600	11 0	12 0	12.0		21.0
040818	MT CROSBY TM	90.2	0.000	AND	7/ 2/1075		10000	11.0	13.0	13.0		21.0
540199	MT CDOODI III	00.2	0.000	AND	1/10/1004		10000	11.0	13.0	13.0		21.0
540250	MT CROSDI ALERT	90.2	0.000	Ano	1/10/1994		10600	11.0	13.0	13.0		21.0
540250	COLLECTS CHOSELING ALBERT		0 000	****	07/ 0/1000		10000	11.0	13.0	13.0		21.0
540060	ADAMS DRIDGE EN	77.3	0.000	AHD	21/ 8/1999							
540000	ADAMS BRIDGE IM	77.1	75.500	AHU	30/ 9/1968		130	4.0		5.0		6.0
340137	ADAMS BRIDGE ALERT	//.1	/5.500	AHD	30/ 9/1968		130	4.0		5.0		6.0
040702	STOKES CROSSING		56.666	AHD	1/ 2/1982		180	4.0		5,0		6.0
540315	STOKES CROSSING ALERT		56.666	AHD	1/ 2/1982		180	4.0		5.0		6.0
540314	SPRESSERS BRIDGE ALERT		35.000	AHD	11/ 2/2004			4.0		4.4		4.8
540317	GREY'S PLAINS ROAD ALERT		0.000	ASSUM								
540064	GRANDCHESTER ALERT		0.000	AHD	27/ 8/1999	30/10/2002						
			82.300	AHD	30/10/2002			3.0		4.0		5.0
040701	KUSS ROAD		45,060	AHD	1/ 2/1982		200	6.0		7.0		8.0
540194	KUSS ROAD ALERT		45.060	AHD	1/ 2/1982		200	6.0		7.0		8 0
540313	ROSEWOOD WWTP ALERT		35.420	AHD	15/ 2/2001		200	7 25		8 25	9 25	0.25
540503	ROSEWOOD DETENTION BASIN				-0, 2,2001			1.23		0.23	7.20	3.23
040549	ROSEWOOD	49 9	32 829	STATE	17 071000		542	4.0	c 0	E 0		6.0
540388	ROSEWOOD ALERT-R	13.3	32.023	DIMIL	1/ //1909		243	4.0	5.0	5.0		6.0
540193	POSEROOD ALERT	40.0	22 020	CHARR	1/10/1004		545	4.0	2.0	5.0		6.0
540147	MATION AIRPED	43.3	32.023	DIMIE	1/10/1994		59.5	4.0	5.0	5.0		6.0
540197	MATION ALERT-P	41.0	22.970	AND	1/10/1994		585	3.5		5.5		7.0
540190	WALLOON ALEKI-B	91.0	22.970	AHD	1/10/1994		585	3.5		5.5		7.0
240081	WALLOON IM	36.9	16.400	AHD	1/10/1961		620	5.0		6.5		8.5
040838	THREE MILE BRIDGE ALERT		0.000	AHD	24/10/1990		1870	14.0		16.0		18.0
040135	MOOGERAH DAM	15.3	100.000	AHD	10/ 1/1967		225	1.0		2.0		3.0
540364	MOOGERAH DAM HW TM	15.3	154.930	AHD	1/10/1967		226					
540474	MARBURG ALERT BURTONS BRIDGE ALERT LAKE MANCHESTER ALERT KHOLO BRIDGE ALERT MT CROSBY MT CROSBY TM MT CROSBY TM MT CROSBY ALERT MT CROSBY ALERT MT CROSBY ALERT MT CROSBY ALERT ADAMS BRIDGE TM ADAMS BRIDGE TM ADAMS BRIDGE ALERT STOKES CROSSING STOKES CROSSING ALERT SPRESSERS BRIDGE ALERT GREY'S PLAINS ROAD ALERT GREY'S PLAINS ROAD ALERT GREY'S PLAINS ROAD KUSS ROAD KUSS ROAD KUSS ROAD KUSS ROAD ALERT ROSEWOOD DETENTION BASIN ROSEWOOD ALERT-B ROSEWOOD ALERT-B WALLOON ALERT-B WALLOON ALERT-B WALLOON TM THREE MILE BRIDGE ALERT MOOGERAH DAM MOOGERAH MOOGERAH MOOGERAH MOOGERAH MOOGERAH MOOGERAH MOOGERAH MOOGERAH MOOGERAH MOOGER						228					
540365	TOOHILLS CROSSING IM											
540151	KALBAR WEIR ALERT	51.4	74.600	AHD	11/ 9/1998	15/ 8/2010	470					
			0.000	AHD	16/ 8/2010		470	76.8		77.8		78.8
540058	KALBAR WEIR HW TM	51.4	74.600	AHD	11/ 9/1998		470	76.8		77.8		78.8
540057	MOOGERAH DAM ALERT TOOHILLS CROSSING TM KALBAR WEIR ALERT KALBAR WEIR HW TM KALBAR WEIR TW TM	51.4	0.000	AHD	17/ 7/1997			6.0		7.5		9.0
					, ., ., .,			V•V				2.0

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AMTD RL of GZ DATUM DATES FROM/TO AREA km2 MIN CROPS MOD TOWNS 1/ 9/1958 1/ 9/1956 040440 66.720 AHD 7.0 7.0 45.688 45.688 040445 HÄRRISVILLE 30.5 STATE HARRISVILLE ALERT 1/10/1994 STATE 725 3.0 5.0 4.0 5.0 5.0 3/ 8/2006 5/ 9/1953 5/ 9/1953 HARRISVILLE ALERT-B CHURCHBANK WEIR TM 540387 45.688 STATE 540217 2.0 3.0 38.611 AHD 740 CHURCHBANK WEIR ALERT AMBERLEY ALERT-P AMBERLEY ALERT-B AMBERLEY (DNR) TM 540316 38.611 1.0 540180 10.0 19.870 AHD 1/10/1994 850 4.0 540181 040816 19.870 AHD 850 4.0 6.5 7.5 17.608 STATE 1/10/1961 540195 540065 PEAK CROSSING ALERT 0.000 AHD 27/ 8/1999 30/10/2002 30/10/2002 45,320 AHD 2.0 3.5 6.5 5.0 8.0 LOAMSIDE ALERT LOAMSIDE TM 540062 6.8 18.385 AHD 23/11/1973 5.0 540210 6.8 18.385 AHD 23/11/1973 8.0 540216 540502 BERRY'S LAGOON TM BERRYS LAGOON AL 040836 ONE MILE BRIDGE ALERT 0.000 AHD 24/10/1990 10.0 12.0 14.0 16.8 1.020 1/ 3/1967 AHD 9/ 1/1975 1850 0.000 AHD 7.0 IPSWICH ALERT 16.8 24/10/1990 0.000 7.0 10.0 9.0 13.0 AHD 1850 11.7 1/ 1/1977 1/ 1/1977 040812 540200 MOGGILL ALERT MOGGILL ALERT-P 0.000 12600 15.5 AHD AHD 10.0 0.000 12600 JINDALEE ALERT JINDALEE BRIDGE 540192 0.000 1/10/1994 12915 8.0 10.0 040713 12915 6.0 10.0 30/ 6/1992 30/ 6/1992 BRISBANE CITY TM 0.000 AHD 13559 1.7 540198 BRISBANE CITY ALERT 0.000 540248 CHURCHILL ALERT RIPLEY ALERT 4.0 53.0 6.0 1/ 6/1989 22/ 1/1993 1/ 1/1993 3/ 2/1993 0.000 AHD 35 52.0 040873 HARDING STREET ALERT 0.000 AHD 96 24.0 26.0 25.0 AHD AHD 040872 BLACKSTONE BRIDGE ALERT 0.000 97 BUNDAMBA SCHOOL ALERT 0.000 102

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540249 540501 040985	BUNDAMBA (HANLON ST) AL SPRINGFIELD LAKES AL BELLBIRD PARK AL		0.000 43.128	AHD	29/ 8/1996 25/ 7/2007		109			
040795	OPOSSUM ALERT		0.000	AHD	24/ 5/1989			01 0	00.0	
040874	BRISBANE ROAD ALERT	1.2	0.000	AHD	8/ 2/2005			21.0 4.0	22.0	23.0
540378	WOLSTON CREEK ALERT		0.000	1010	07 272005			4.0	5.0	6.0
040719	NEW BEITH TM						49	4.0	5.0	6.0
540097	NEW BEITH ALERT		48.850	AHD		9/11/2005		4.0	5.0	0.0
			0.000	AHD	9/11/2005	.,,		4.0	5.0	6.0
040796	BEATTY ROAD ALERT						155	3.5	4.5	5.5
040789	DURACK KING AVE ALERT						28	8.0	8.7	9.4
040791	COOPERS PLAINS ALERT						21	6.9	7.3	7.8
540432	MARSHALL RD AL									
540071	CORINDA HIGH ALERT		0.000	AHD	6/ 4/1992			3.8	5.0	5.6
540433	MURIEL AVE AL							5.6	6.8	7.4
540274	OXLEY CREEK MOUTH ALERT		0.000	AHD	1/ 9/1999			2.0	2.5	3.0
540134 540132	HOLLAND PARK WEST ALERT							17.5	18.0	18.4
540132	EAST BRISBANE ALERT		0.000	AHD	1/ 1/1994			2.4	3.0	3.5
540127	WISHART (GREENWOOD ST) AL							22.5	23.0	23.5
540126	MANSFIELD ALERT CARINDALE ALERT					•		11.5	12.0	12.3
2401Z0	CARTINDALE MEERT							6.5	7.0	7.5

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CBM No	STATION NAME	AMTD	RL of GZ	DATUM	DATES FROM/TO	O ARE	A km2	MIN	CROPS MOD	TOWNS	MAJ
540129	HEMMANT ALERT		0.000	AHD	1/ 1/1994			1.9	2.3		2.5
	RANSOME ALERT							3.0	3.4		3.8
540278	WYNNUM(BYRNESIDE TCE) AL							4.0	4.5		5.0
	PULLEN PULLEN CREEK AL										
	GOLD CK RESERVOIR ALERT										
	MISTY MORN ALERT						62	9.6	10.1		10.6
540119	ENOGGERA DAM ALERT							75.5	77.0 4.5		79.0
	KELVIN GROVE ALERT ALDERLEY ALERT							3.5	4.5		5.5
540116											
								14.0	14.5		15.0
540130	ITHACA CREEK TM BOWEN HILLS ALERT BREAKFAST CREEK MOUTH AL		0.000	* ***	1 / 1 /100 /		10				
540286	BREAKEAST CAPER MOUTH AT		0.000	AHU	1/ 1/1994			2.3	2.9 1.9		3.5
PINE	DIEGINITIST CHEEK MOOTH ME		0.000	AHD	1/ 9/1999			1.8	1.9		2.0
	MITCHELTON (OSBORNE RD) AL							20 5			
	KEDRON (QUT) ALERT							32.6	33.4		34.0
	TOOMBUL (NUDGEE RD) ALERT		0.000	חמע	1/ 1/1994			9.8	33.4 10.8 2.9		11.7
	FRANK SLEEMAN PARK AL		0.000	Мір	1/ 1/1554			2.5	2.9		3.3
	GEEBUNG ALERT							8.5	9.0		9.8
	EVERTON HILLS ALERT							44.0	44.5		45.0
540113	ASPLEY (STRINGYBARK DR) AL							28.5	44.5 29.0 12.5 2.5		29.8
								12 0	12.5		13.0
540124	ZILLMERE (PINEAPPLE ST) AL DEAGON ALERT CEDAR CK RD ALERT SAMFORD VILLAGE ALERT DRADERS CROSSING FM		0.000	AHD	1/ 1/1994			2.0	2.5		3.0
540444	CEDAR CK RD ALERT		62.248	AHD	17/ 6/2008			2.0	2.0		3.0
540416	SAMFORD VILLAGE ALERT		45.237	AHD	1/ 3/2007			4.76	5.26		5.76
540398	DRAPERS CROSSING TM										
540205	DRAPERS CROSSING TM DRAPERS CROSSING ALERT CASH'S CROSSING ALERT NORMANRY WAY ALERT	21.0	17.592	AHD	1/10/1965 1/ 3/2007 1/ 3/2007		156	4.0	5.0 6.67 3.90	•	6.0
540415	CASH'S CROSSING ALERT		6.525	AHD	1/ 3/2007			6.27 3.70	6.67		8.07
			0.000	AHD	1/ 3/2007			3.70	3.90		4.60
	BAXTERS CREEK ALERT										
	DAYBORO TM										
	DAYBORO WWTP ALERT					4.1					
	KOBBLE CK ALERT KOBBLE CK TM										
	NORTH PINE DAM ALERT										
	NORTH PINE DAM ALERT-B										
540204	LAKE KURWONGBAH ALERT										
540412	YOUNGS CROSSING ALERT		0.000	31175	17.7/0007		53	~ ~~			
540203	PETRIE ALERT		2 600	AHD	1/ 3/2007	17.070001		6.00	7.50		9.50
	TETTIAN THISITI		-1.000	אווע מונע	1/10/1994	1/ 8/2001		2.5			
540439	LAWNTON ALERT		2.070	MID	1/ 0/2001			3.5	5.5 _.		7.1
540413	JOHN BRAY PARK ALERT		0.000	AUD	1/ 2/2000			3.4	3.7		
540417	MURRUMBA DOWNS ALERT		0.000	AHD	1/ 3/2007			2.25			4.3
540445	LIPSCOMBE RD ALERT		6.364	AHD	17/ 6/2008			4.23	2.50		4.10
540245	BURPENGARY (ROWLEY RD) AL		0.000	AHD	117 0/2000		20	15.0	20.0		20.5
540242	BURPENGARY (DALE ST) AL		0.000	AHD			46				10.5
540244	WAMURAN ALERT		0.000	AHD	30/ 9/1998		37	29.0	30 N		30.5
540208	UPPER CABOOLTURE TM		7,135	STATE	11/10/1965		94	8.5	10.0		12.0
540357	UPPER CABOOLTURE ALERT		7.135	STATE	11/10/1965		94	8.5	10.0 10.0 8.0		12.0
540243	CABOOLTURE WIP ALERT		0.000	AHD	,		187	7.0	8.0		9.5
MAROOCH	LAKE KURWONGBAH ALERT YOUNGS CROSSING ALERT PETRIE ALERT LAWNTON ALERT JOHN BRAY PARK ALERT MURRUMBA DOWNS ALERT LIPSCOMBE RD ALERT BURPENGARY (ROWLEY RD) AL BURPENGARY (ROWLEY RD) AL WAMURAN ALERT UPPER CABOOLTURE TM UPPER CABOOLTURE ALERT CABOOLTURE WIP ALERT Y										
540345	MOOLOOLAH ALERT MOOLOOLAH TM	33.0	19.995	STATE	15/12/1971		39	4.5	5.0 5.0		5.8
540300	MOOLOOLAH TM	33.2	19.995	STATE	15/12/1971		39	4.5	5.0		5.8
540346	EWEN MADDOCK DAM ALERT		25.375	AHD	22/ 4/2005			0.5	1.0		1.5

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CBM No	STATION NAME	AMTD	RL of GZ 1	DATUM	DATES FROM/TO	AREA km2	MIN	CROPS	MOD	TOWNS	MAJ
540344 540350 540351	JORDAN ST ALERT PALMVIEW ALERT MERIDAN WAY ALERT		5.158 -0.014 0.613	AHD AHD AHD	22/ 4/2005 22/ 4/2005 22/ 4/2005		3.0 4.7 2.80		4.0 5.0 2.85		5.0 5.5 3.5