



Australian Government  
Bureau of Meteorology



# Johnstone River Floods

February 2009



1
2

1. Aquilina Meuibah Creek Flood Damage.
2. D'Urso Liverpool Creek Damage 06/02/09.

Photos courtesy of the Cassowary Coast Regional Council.

**Note:**

1. Data in this report has been operationally quality controlled but errors may still exist.
2. This product includes data made available to the Bureau by other agencies. Separate approval may be required to use the data for other purposes. See Appendix 1 for DNRW Usage Agreement.
3. This report is not a complete set of all data that is available. It is a representation of some of the key information.

# Table of Contents

<b>1. Introduction</b> .....	<b>1</b>
<b>2. Meteorological Summary</b> .....	<b>1</b>
<b>3. Hydrology</b> .....	<b>2</b>
Table 3.1 Peak Height Comparison to Records for the 06/02/09.....	2
Figure 3.1 Peak Height Map for the 48 hours to 9am on the 07/02/09.....	3
Figure 3.2 Radar imagery for the period from 10am to 1pm on the 06/02/09.....	4
Figure 3.3 Radar imagery for the period from 2pm to 5pm on the 06/02/09.....	5
<b>3.1. Rainfall Maps</b> .....	<b>6</b>
Figure 3.1.1 Rainfall Map for the 6 hour period to 3pm on the 06/02/09.....	6
Figure 3.1.2 Rainfall Map for the 48 hour period to 9am on the 07/02/09.....	7
<b>3.2. Rainfall Intensity</b> .....	<b>8</b>
Figure 3.2.1 Hyetographs for Nerada AL and Tung Oil TM for the 48 hours to 9am on the 07/02/09.....	9
Figure 3.2.2 IFD Analysis for Nerada AL and Tung Oil TM for the 48 hours to 9am on the 07/02/09.....	10
Figure 3.2.3 Hyetographs for Corsis AL and Central Mill AL for the 48 hours to 9am on the 07/02/09.....	11
Figure 3.2.4 IFD Analysis for Corsis AL and Central Mill AL for the 48 hours to 9am on the 07/02/09.....	12
Figure 3.2.5 Hyetographs for McAvoy Bridge AL and Innisfail Wharf AL for the 48 hours to 9am on the 07/02/09.....	13
Figure 3.2.6 IFD Analysis for McAvoy Bridge AL and Innisfail Wharf AL for the 48 hours to 9am on the 07/02/09.....	14
<b>3.3. Rainfall Totals</b> .....	<b>15</b>
Table 3.3.1 Rainfall Totals between 26/01/09 and 31/01/09.....	15
Table 3.3.2 Rainfall Totals between 01/02/09 and 09/02/09.....	16
<b>3.4. Peak Heights</b> .....	<b>17</b>
Table 3.4.1 Peak Flood Heights recorded between 06/02/2009 and 07/02/2009.....	17
<b>3.5. Flood Hydrographs for the Johnstone River</b> .....	<b>18</b>
Figure 3.5.1 Hydrographs for the 02/02/09 to the 10/02/09.....	18
Figure 3.5.2 Hydrographs for the 02/02/09 to the 10/02/09.....	19
Figure 3.5.3 Hydrographs for the 02/02/09 to the 10/02/09.....	20
Figure 3.5.4 Hydrographs for the 02/02/09 to the 10/02/09.....	21
<b>3.6. Warning Services for the Johnstone River</b> .....	<b>22</b>
Table 3.6.1 Flood Warnings and Predictions issued between 06/02/2009 and 07/02/2009.....	22
Table 3.6.2 River Height Predictions issued for the Johnstone River Catchment.....	22
Table 3.6.3 Severe Weather Warnings issued between 06/02/2009 and 07/02/2009.....	22
<b>Appendix 1. DNRW Usage Agreement</b> .....	<b>23</b>

# Johnstone River Floods

## February 2009

### 1. Introduction

The North and South Johnstone Rivers rise in the tablelands of the north tropical coast and flow through steep narrow gorges to their junction on the coastal plain at Innisfail. The headwaters of the catchments are located in high rainfall areas and the rivers are capable of producing severe flooding, especially in the Innisfail area. The North and South Johnstone Rivers have a combined catchment area of about 1,600 square kilometres at Innisfail.

During the 6<sup>th</sup> of February very heavy rainfall was recorded in the Johnstone River catchment. Rainfalls in excess of 350mm were recorded throughout the more coastal areas of the Johnstone catchment. This intense rainfall caused both the North and South Johnstone River level to rise, causing moderate to major flooding. A moderate flood peak of 5.68 metres was recorded at Innisfail Wharf at 20:27 on the 6<sup>th</sup> February. At this level, flooding affected Coronation Drive and the Bruce Highway into the town centre and McAvoy Bridge was also closed.

This report provides a technical summary and analysis of the hydrology of the Johnstone River Floods of January and February 2009. For a full meteorological analysis of the rainfall events discussed in this report refer to the [Queensland Floods: January and February 2009](#).

A [Flood Warning Network Map for the Johnstone River](#) catchment shows the location of flood warning stations referred to in this report.

### 2. Meteorological Summary

An active monsoon trough and a series of low pressure systems caused widespread above average rainfall across the northern half of the state for the month of January 2009 and many monthly records were broken as discussed in the [January 2009 Climate Monthly Summary](#).

The month of January provided much of the north tropical coast with very much above average rainfall. In the second week of January a low pressure system was identified on the monsoon trough over the Northern Territory which then moved into the Gulf of Carpentaria where it intensified to become Tropical Cyclone Charlotte on the 11<sup>th</sup> January. Charlotte tracked east-southeast through the Gulf of Carpentaria and crossed the Queensland coast near the Gilbert River Mouth on the 12<sup>th</sup> January. Charlotte in combination with the onshore winds along the north Queensland coast produced heavy rainfall over the Johnstone River Catchment.

The heaviest falls during this crossing were not sufficiently intense to cause river rises to flood levels. Widespread showers and thunderstorms developing about the monsoon trough brought further moderate falls to the region through the remainder of January and, by the end of the month, many sites in the catchment had recorded more than 1000mm of rainfall.

Tropical Cyclone Ellie crossed the coast to the north of Cardwell on the 2<sup>nd</sup> of February and produced further heavy rainfall over the north and central Queensland coasts including the Johnstone River catchment, although river rises remained below flood level.

The most significant flooding in the Johnstone River catchment was associated with a weak tropical low which was embedded in the monsoon trough. As this low crossed the coast at Innisfail on the 6<sup>th</sup> February, it slowly tracked through the more coastal areas of the catchment and rainfall totals of over 475mm were recorded in some areas to 9am on the 7<sup>th</sup> February as shown in Figure 3.1.1.

For a more detailed discussion of the meteorology of the event and a summary of flooding in Queensland throughout January and February 2009, refer to the [Queensland Floods: January and February 2009](#).

### 3. Hydrology

On 4<sup>th</sup> February, a weak low was identifiable on the monsoon trough to the east of Cairns, which produced heavy rainfall in the Johnstone catchment during the afternoon of the 6<sup>th</sup> February, causing rises in both the North and South Johnstone Rivers. The movement of this system can be viewed in radar images shown in Figures 3.2 and 3.3. The weak low centered itself over Innisfail and slowly tracked southwestward with rainfall totals being recorded in excess of 100 mm in an hour in some areas.

As seen in Figure 4.1, rainfall totals for the 48 hours to 9am on the 7<sup>th</sup> February range from 486 mm at McAvoy Bridge to falls of around 50 mm in the upper reaches of the North Johnstone River. Generally, rainfall totals were higher in the more coastal areas as the weak low tracked southwestward with much lower falls recorded away from the path of the system.

Shown below in Table 3.1 are the peak heights that were recorded during the February 6-7<sup>th</sup> event in the Johnstone River. Also shown is the peak height map in Figure 3.1 for the same period.

**Table 3.1 Peak Height Comparison to Records for the 06/02/09.**

Gauging Station	Jan - Feb 2009 Peak (metres)	Start of Record	Ranking	Highest Since	Highest on Record
Nerada Alert	7.43	1990	10 <sup>th</sup>	Feb 2007 (2 years)	11.35m February 1999
Fisher Creek TM	3.36	2009	1 <sup>st</sup>	New Record	New Record
Tung Oil TM	8.39	1967	12 <sup>th</sup>	Mar 1999 (10 years)	10.81m February 1999
McAvoy Bridge Alert	7.25	1967	5 <sup>th</sup>	Feb 1999 (10 years)	9.4m March 1967
Saltwater Creek Alert	4.06	2004	1 <sup>st</sup>	New Record	New Record
Corsis Alert	7.99	1990	2 <sup>nd</sup>	Jan 1994 (15 years)	8.68m January 1994
Central Mill Alert	10.48	1916	5 <sup>th</sup>	Mar 1994 (15 years)	11.13m March 1967
Mourilyan Mill Alert	11.32	2001	1 <sup>st</sup>	New Record	New Record
Sweeny Creek U/S Alert	3.23	2004	2 <sup>nd</sup>	Mar 2004 (5years)	3.48m March 2004
Sweeny Creek D/S Alert	4.40	2004	1 <sup>st</sup>	New Record	New Record
Innisfail Wharf Alert	5.68	1913	15 <sup>th</sup>	March 1999 (10 years)	8.09m Jan 1913

Table 3.1 shows the highest flood peaks recorded during the 6<sup>th</sup> February. Four locations have recorded new record levels. This flood recorded the 15<sup>th</sup> on the Innisfail Wharf's record since records began in 1913.

**Figure 3.1 Peak Height Map for the 48 hours to 9am on the 07/02/09.**

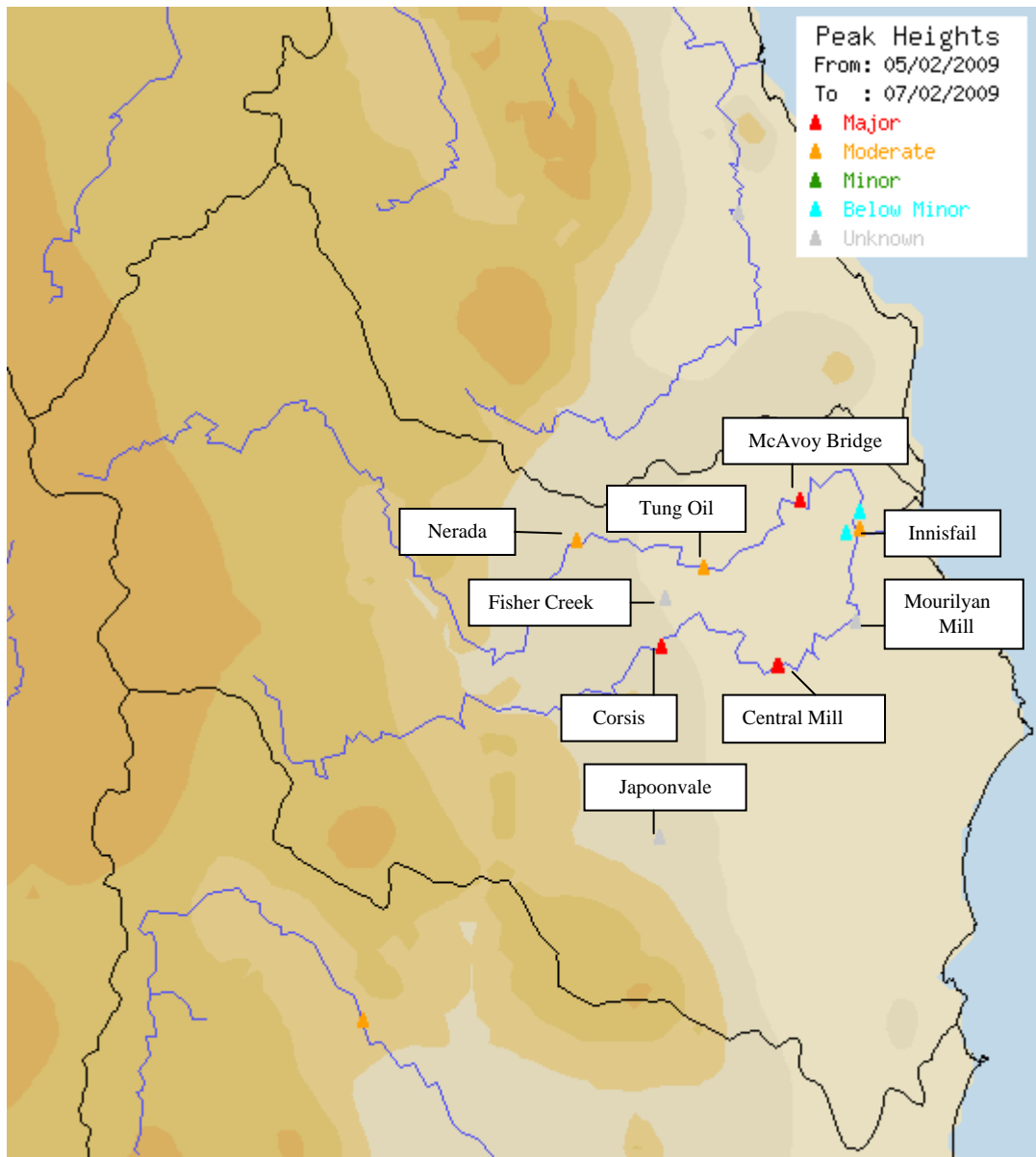


Figure 3.1 shows the peak flood classifications for the flood during the 6<sup>th</sup> of February. For the location of Sweeney Creek and Saltwater Creek, please refer to the [Flood Warning Network Map for the Johnstone River](#).

**Figure 3.2 Radar imagery for the period from 10am to 1pm on the 06/02/09.**

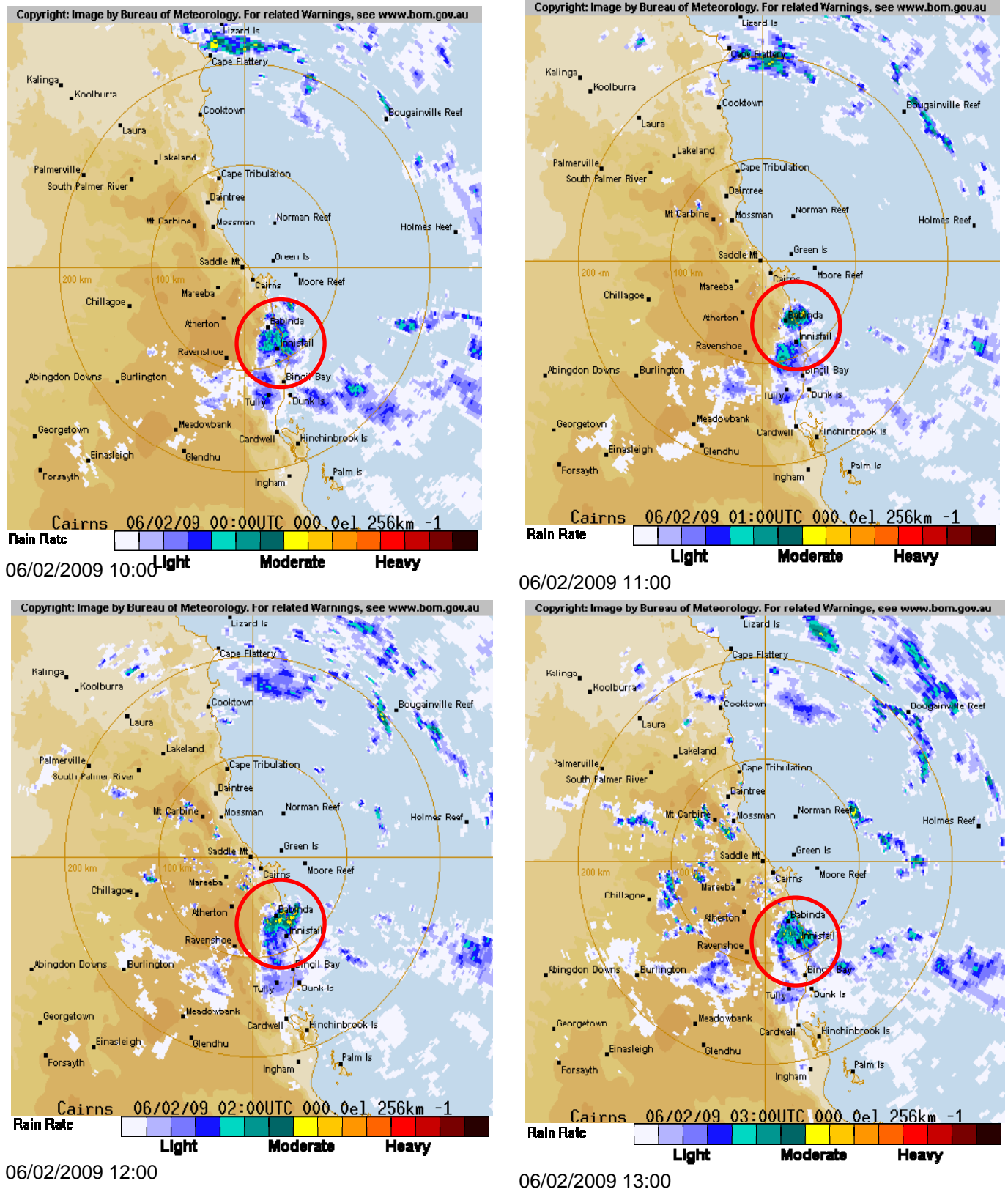
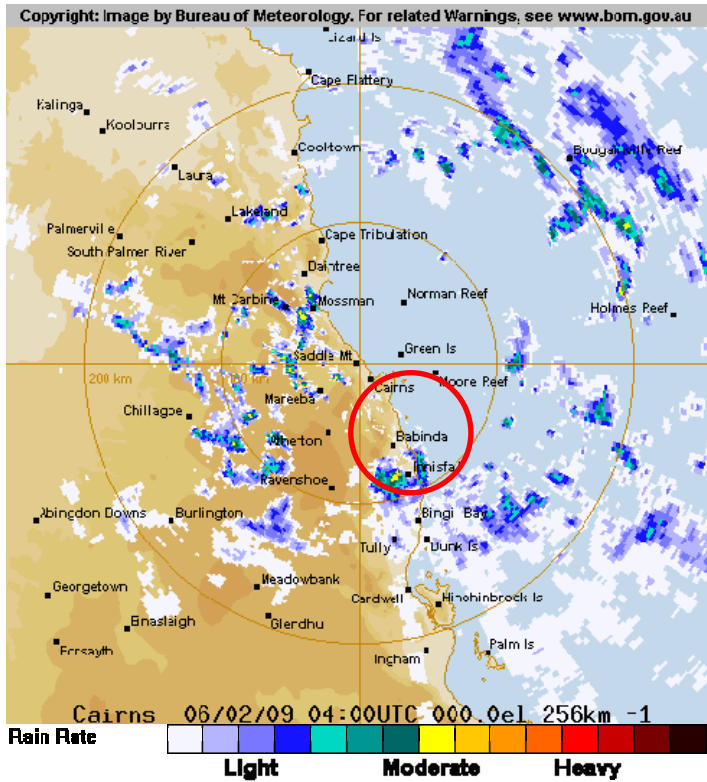
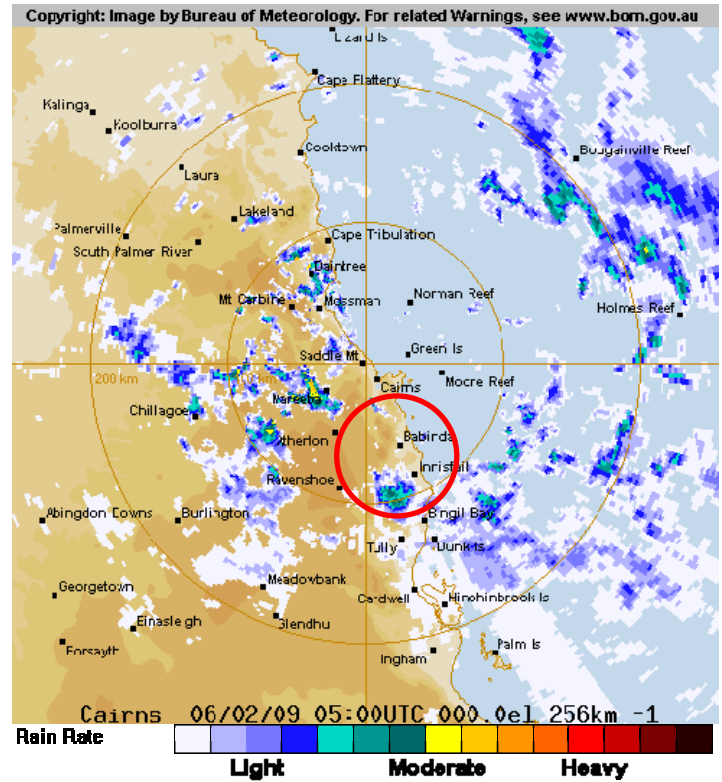


Figure 3.2 Circled is the track of the weak low that crossed the coast around the Innisfail area and caused the North and South Johnstone Rivers to rise, causing moderate flooding at Innisfail.

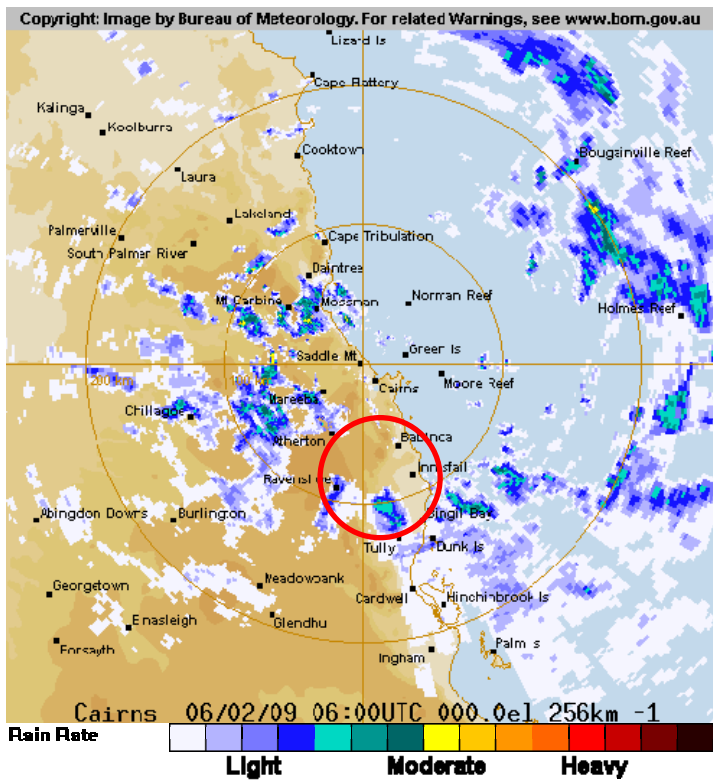
**Figure 3.3 Radar imagery for the period from 2pm to 5pm on the 06/02/09.**



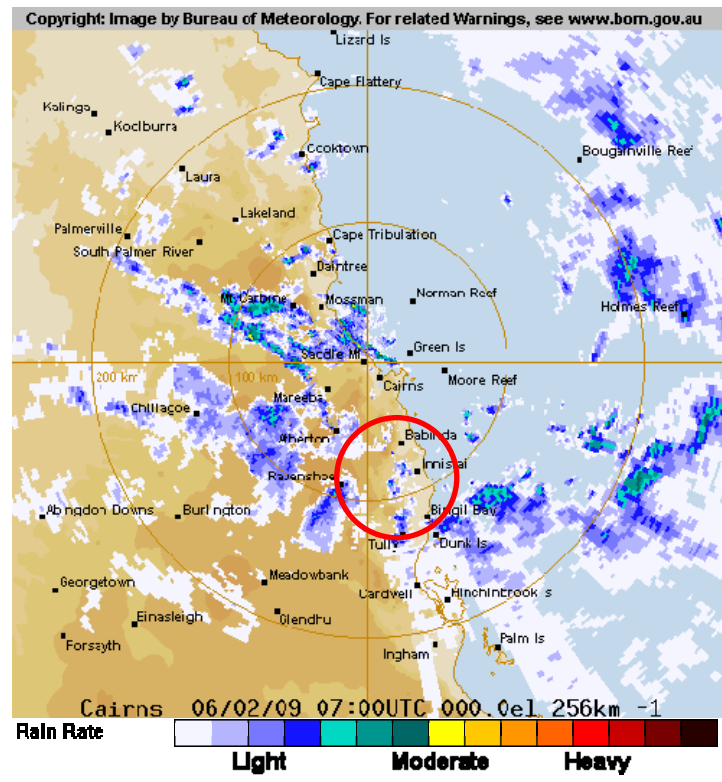
06/02/2009 14:00



06/02/2009 15:00



06/02/2009 16:00



06/02/2009 17:00

Figure 3.3 Circled is the track of the weak low that crossed the coast around the Innisfail area and caused the North and South Johnstone Rivers to rise, causing moderate flooding at Innisfail.

### 3.1. Rainfall Maps

The following two rainfall maps show the 6 hour period of heaviest rainfall in (the 6 hours to 3pm on the 06/02/09) Figure 3.1.1 and the total of the amount of rain for the 48 hours to 9am on the 07/02/09 in Figure 3.1.2.

**Figure 3.1.1 Rainfall Map for the 6 hour period to 3pm on the 06/02/09.**

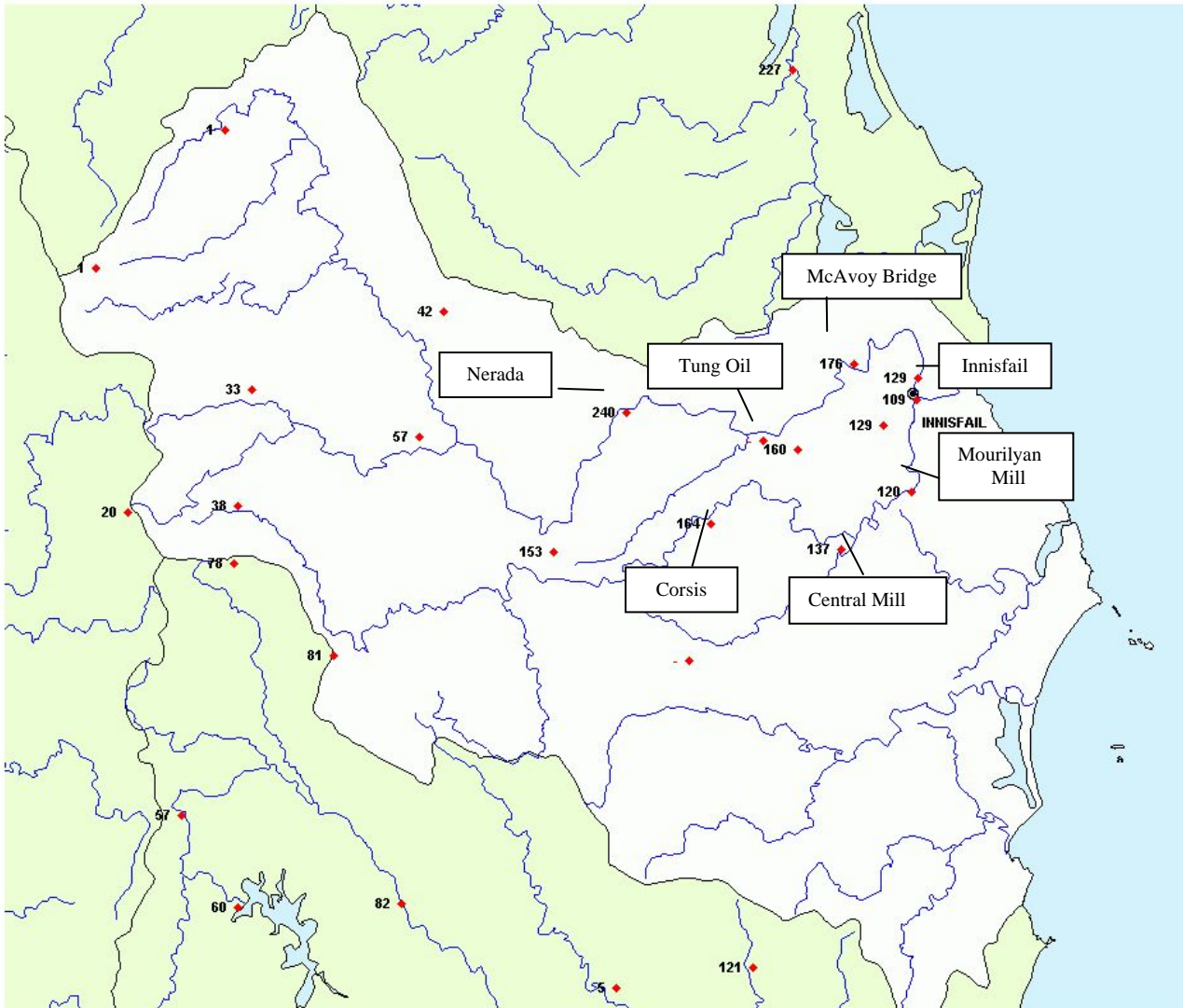


Figure 3.1.1 shows the rain distribution for the 6 hours to 3pm on the 6<sup>th</sup> February. It can be seen that significant rainfall fell over the late morning to early afternoon. Nerada AL, which recorded 424mm in the 48 hours to 9am on the 7th February, recorded 240mm in the 6 hour period to 3pm, which shows the intensity that was responsible for the Johnstone River rises.

**Figure 3.1.2 Rainfall Map for the 48 hour period to 9am on the 07/02/09.**

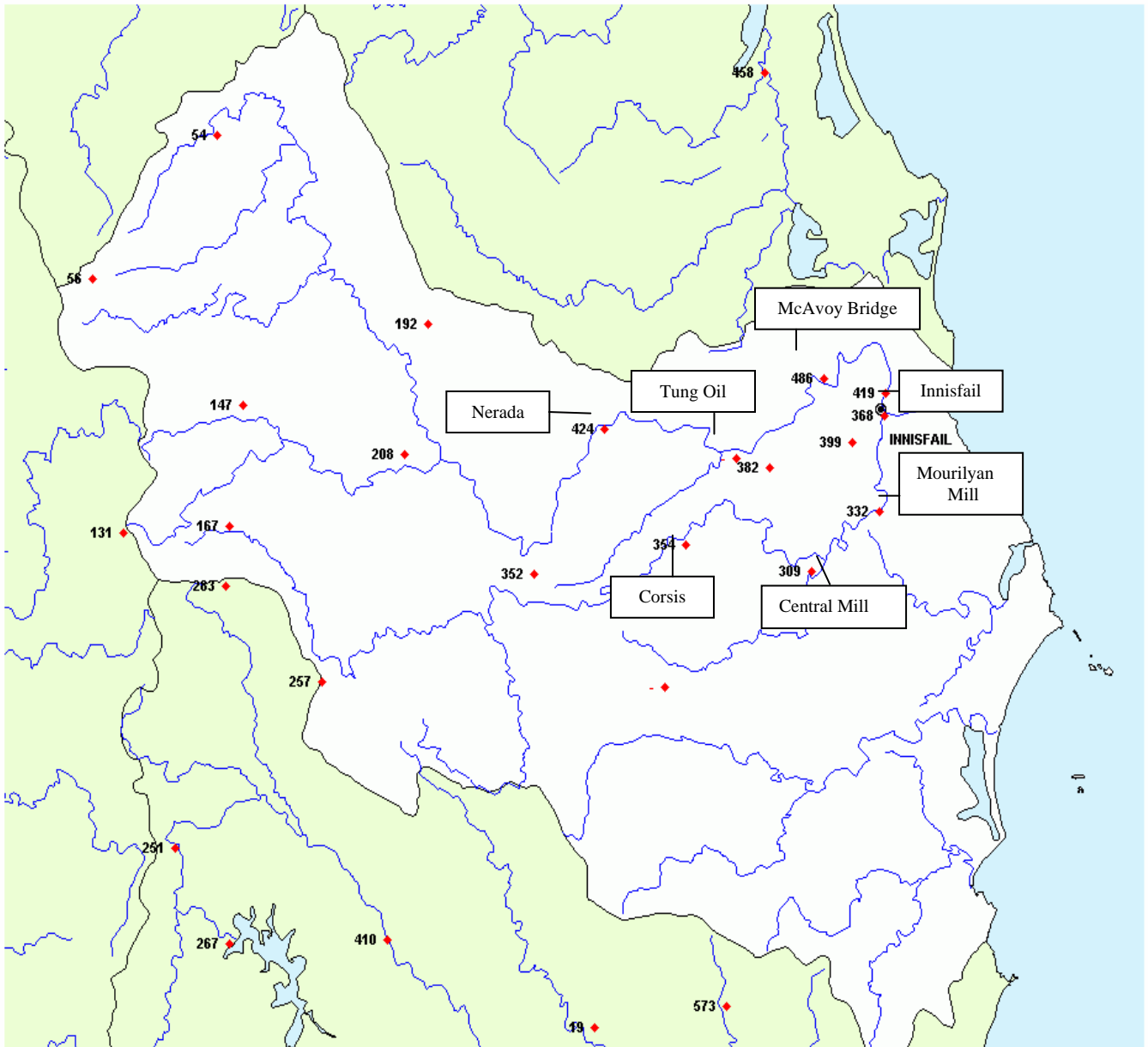


Figure 3.1.2 shows the rain distribution for the 48 hours to 9am on the 7<sup>th</sup> February. It can be seen that significant rainfall fell over the entire catchment with falls as much as 486 mm at McAvoy Bridge. Rainfall was concentrated more to the coastal region of the catchment. Falls in the top of the North Johnstone River were only around 50mm therefore the more local rainfall was responsible for the flood event.

## 3.2. Rainfall Intensity

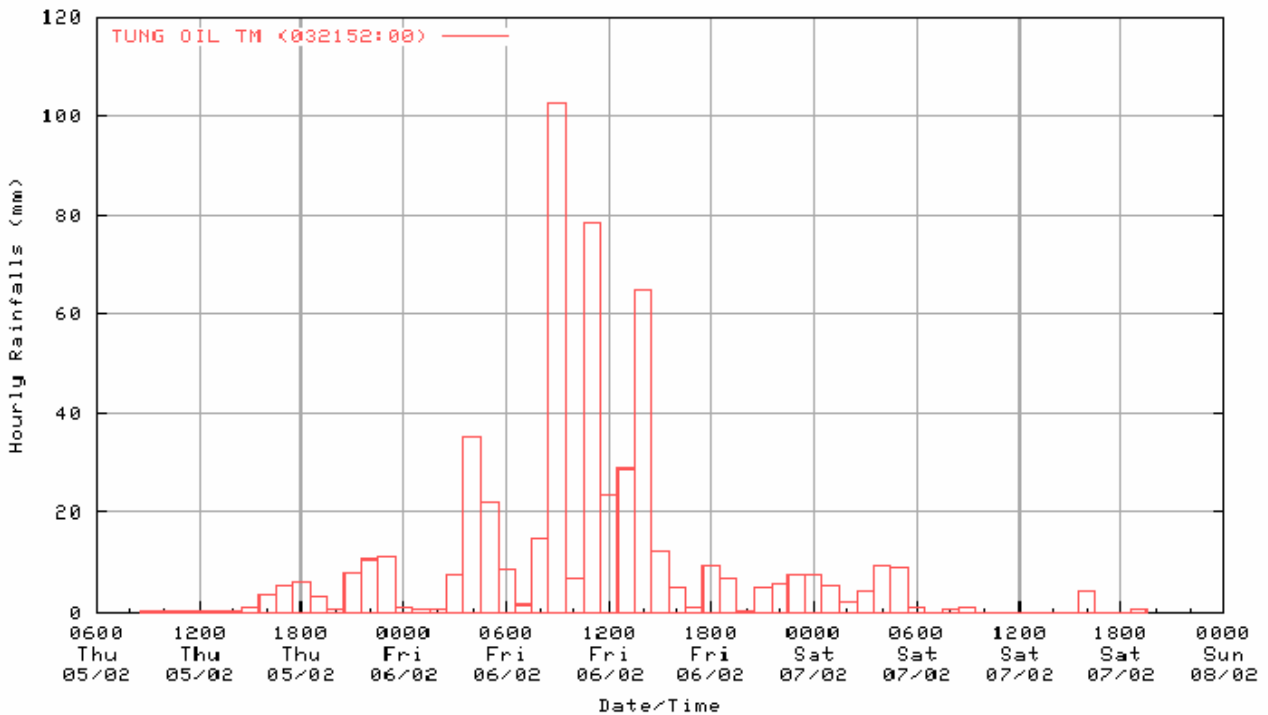
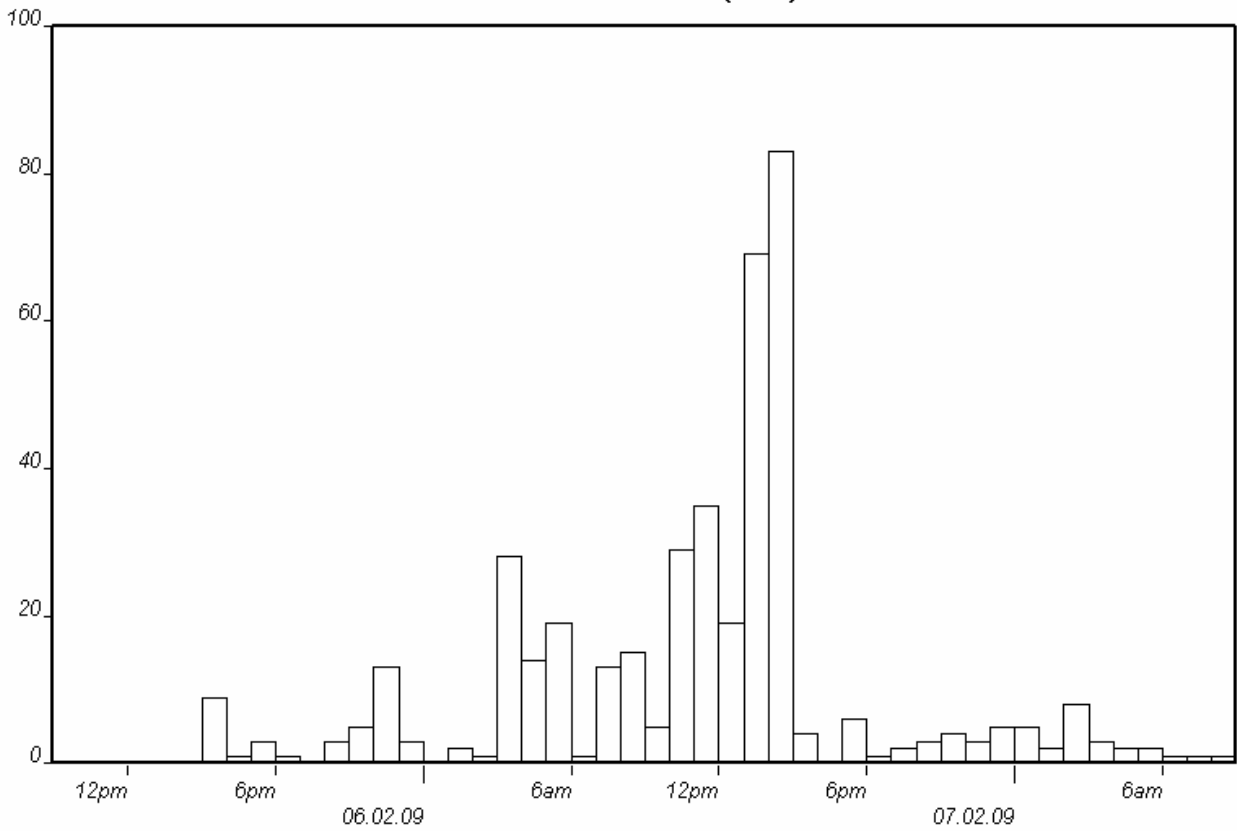
Nerada AL, Tung Oil TM and McAvoy Bridge AL in the North Johnstone River and Corsis AL and Cental Mill AL in the South Johnstone River Catchment as well as Innisfail Wharf AL (where the two rivers meet) have been selected for Intensity Frequency Duration (IFD) analysis and the results can be found in Figures 3.2.2, 3.2.4 and 3.2.6. Hourly hyetographs, displaying the distribution of rainfall for the same period, have also been shown in Figures 3.2.1, 3.2.3 and 3.2.5.

The observed rainfall intensities in the Johnstone River catchment during 6<sup>th</sup> February did not generally produce high Average Recurrence Intervals, however, high ARI values were recorded at Nerada AL. Nerada AL's IFD analysis indicated that it exceeded 1% AEP (100 year ARI) intensities for 60 minutes and 2% to 5% AEP (20 to 50 ARI) intensities for 30 minutes and 2 and 3 hour durations, as shown in Figure 3.2.2.

**Note: A flood frequency analysis would be required to assess the probability of flood levels reached at each location. The frequency analysis in this report is for rainfall only.**

**Figure 3.2.1 Hyetographs for Nerada AL and Tung Oil TM for the 48 hours to 9am on the 07/02/09.**

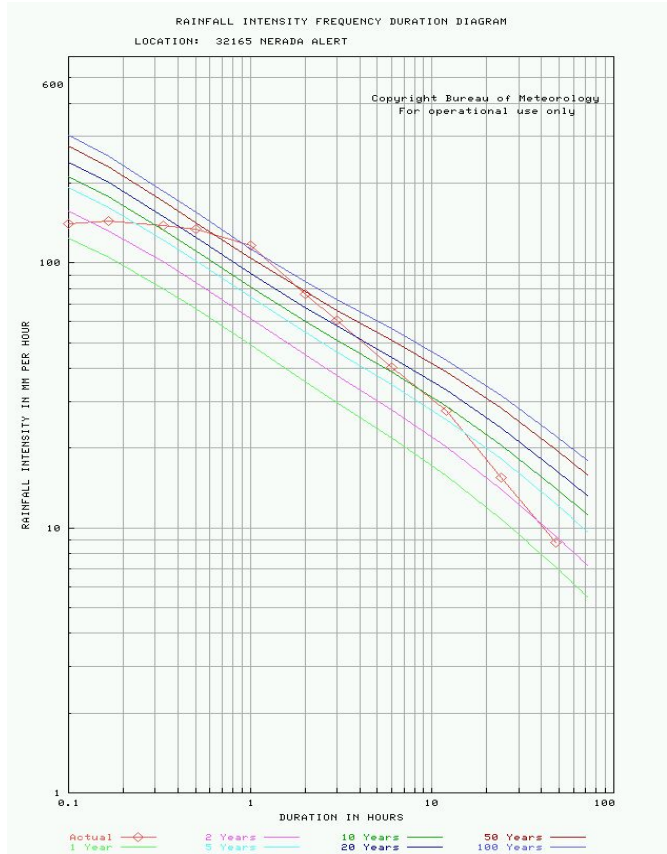
**2560 - Nerada AL  
Period Rainfall (mm)**



**Figure 3.2.2 IFD Analysis for Nerada AL and Tung Oil TM for the 48 hours to 9am on the 07/02/09.**

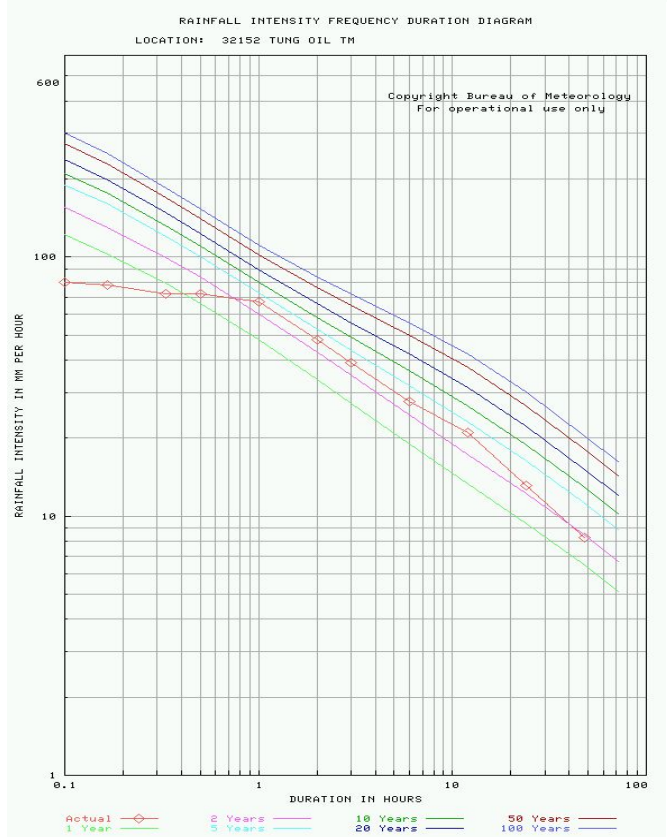
**RAINFALL INTENSITY FREQUENCY DURATION ANALYSIS**  
**LOCATION: 032165 NERADA ALERT**  
 Analysis of the rainfall for the 48 hours to Sat Feb 7 09:00:00 2009

Rain (mm)	Period Ending	ARI (years)
12	5 mins ending at 14:20:00 06/02/2009	1-2
14	6 mins ending at 14:21:00 06/02/2009	1-2
24	10 mins ending at 14:20:00 06/02/2009	2-5
46	20 mins ending at 14:25:00 06/02/2009	10-20
67	30 mins ending at 14:30:00 06/02/2009	20-50
116	60 mins ending at 14:35:00 06/02/2009	> 100
152	2 hours ending at 15:00:00 06/02/2009	20-50
182	3 hours ending at 14:35:00 06/02/2009	20-50
242	6 hours ending at 15:20:00 06/02/2009	10-20
331	12 hours ending at 15:05:00 06/02/2009	5-10
372	24 hours ending at 15:15:00 06/02/2009	2-5
423	48 hours ending at 09:00:00 07/02/2009	1-2



**RAINFALL INTENSITY FREQUENCY DURATION ANALYSIS**  
**LOCATION: 032152 TUNG OIL TM**  
 Analysis of the rainfall for the 48 hours to Sat Feb 7 09:00:00 2009

Rain (mm)	Period Ending	ARI (years)
7	5 mins ending at 13:20:00 06/02/2009	< 1
8	6 mins ending at 13:21:00 06/02/2009	< 1
13	10 mins ending at 13:25:00 06/02/2009	< 1
24	20 mins ending at 13:25:00 06/02/2009	< 1
36	30 mins ending at 13:45:00 06/02/2009	1-2
67	60 mins ending at 13:55:00 06/02/2009	2-5
96	2 hours ending at 14:05:00 06/02/2009	2-5
117	3 hours ending at 14:00:00 06/02/2009	2-5
166	6 hours ending at 15:25:00 06/02/2009	2-5
253	12 hours ending at 14:55:00 06/02/2009	2-5
316	24 hours ending at 02:45:00 07/02/2009	2-5
395	48 hours ending at 09:00:00 07/02/2009	1-2

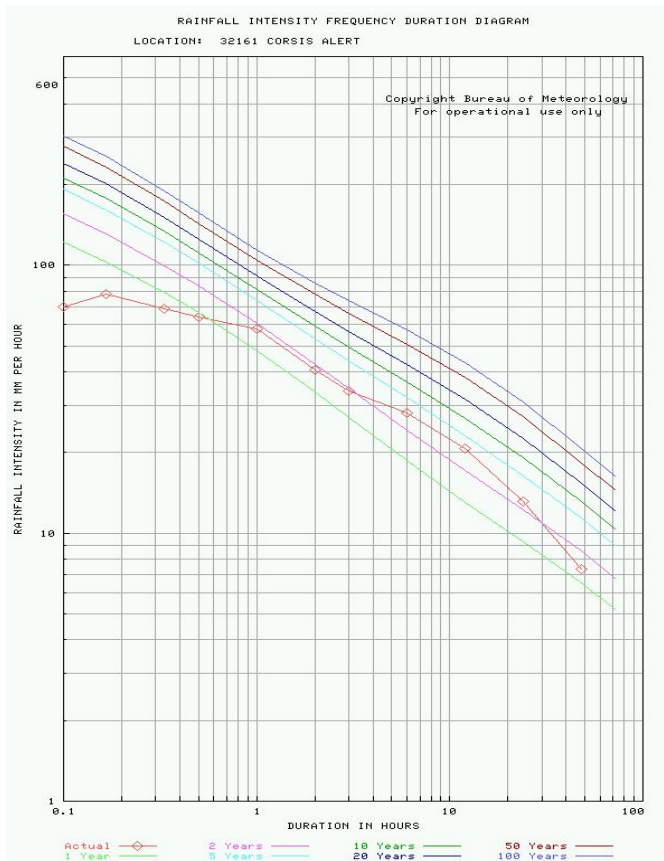




**Figure 3.2.4 IFD Analysis for Corsis AL and Central Mill AL for the 48 hours to 9am on the 07/02/09.**

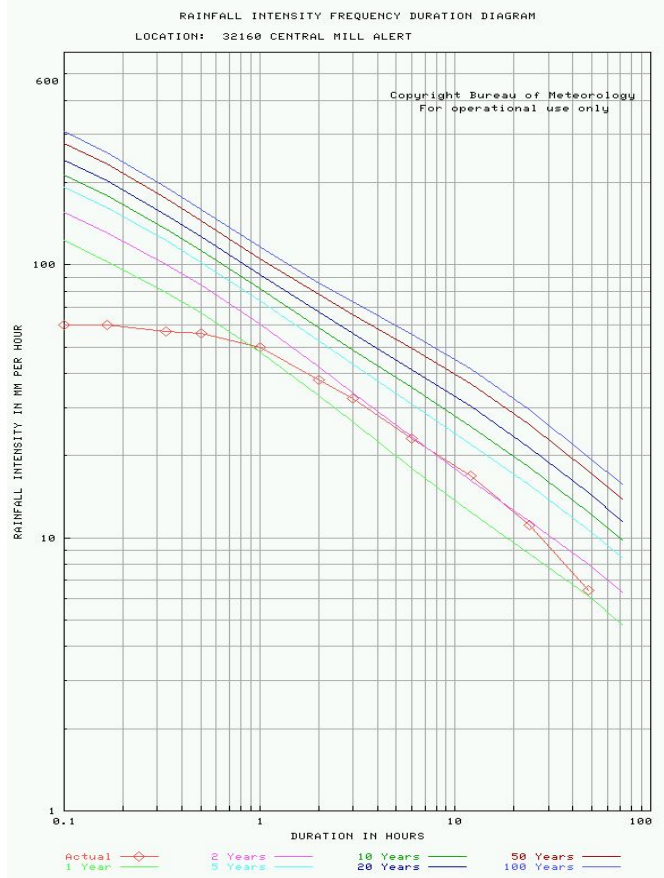
RAINFALL INTENSITY FREQUENCY DURATION ANALYSIS  
LOCATION: 032161 CORSIS ALERT  
Analysis of the rainfall for the 48 hours to Sat Feb 7 09:00:00 2009

Rain (mm)	Period Ending	ARI (years)
6	5 mins ending at 04:05:00 06/02/2009	< 1
7	6 mins ending at 04:01:00 06/02/2009	< 1
13	10 mins ending at 04:05:00 06/02/2009	< 1
23	20 mins ending at 13:50:00 06/02/2009	< 1
32	30 mins ending at 14:00:00 06/02/2009	< 1
58	60 mins ending at 14:20:00 06/02/2009	1-2
81	2 hours ending at 15:10:00 06/02/2009	1-2
102	3 hours ending at 14:25:00 06/02/2009	1-2
169	6 hours ending at 15:30:00 06/02/2009	2-5
248	12 hours ending at 15:05:00 06/02/2009	2-5
315	24 hours ending at 03:00:00 07/02/2009	2-5
353	48 hours ending at 09:00:00 07/02/2009	1-2



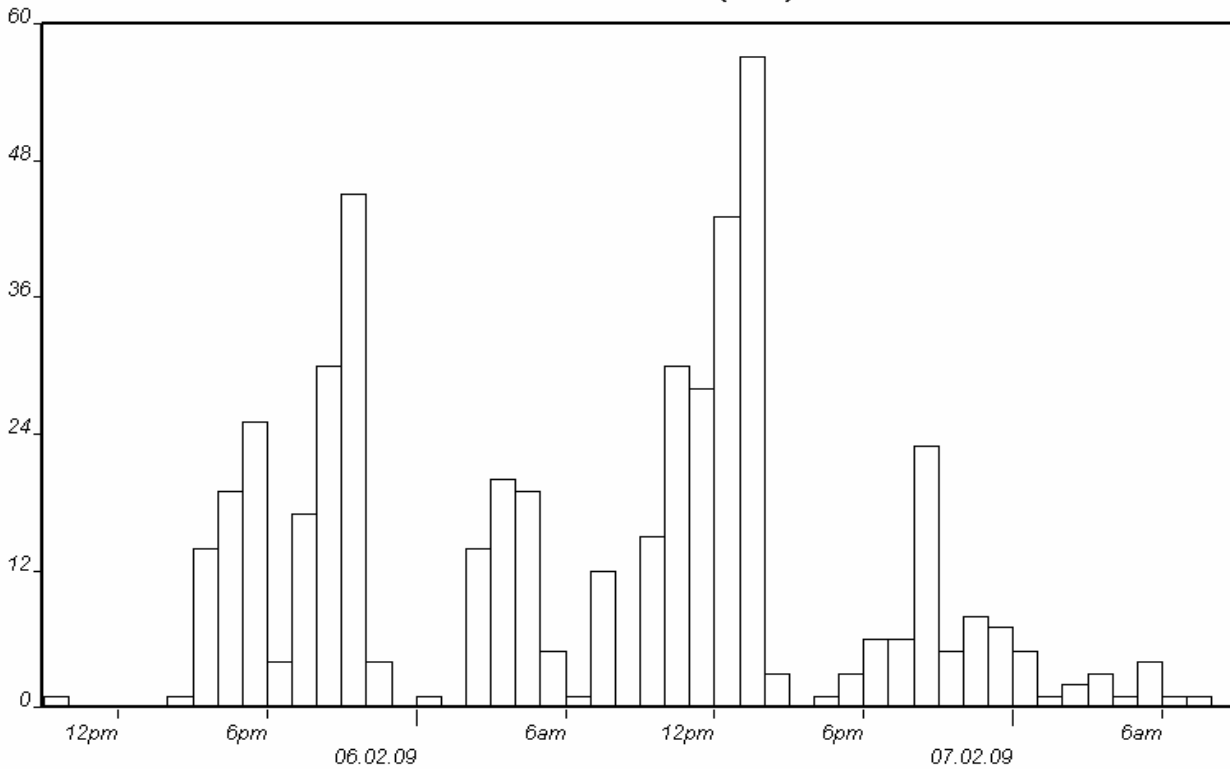
RAINFALL INTENSITY FREQUENCY DURATION ANALYSIS  
LOCATION: 032160 CENTRAL MILL ALERT  
Analysis of the rainfall for the 48 hours to Sat Feb 7 09:00:00 2009

Rain (mm)	Period Ending	ARI (years)
5	5 mins ending at 13:40:00 06/02/2009	< 1
6	6 mins ending at 13:41:00 06/02/2009	< 1
10	10 mins ending at 13:40:00 06/02/2009	< 1
19	20 mins ending at 13:40:00 06/02/2009	< 1
28	30 mins ending at 13:50:00 06/02/2009	< 1
50	60 mins ending at 14:00:00 06/02/2009	1-2
76	2 hours ending at 14:00:00 06/02/2009	1-2
97	3 hours ending at 14:00:00 06/02/2009	1-2
139	6 hours ending at 15:40:00 06/02/2009	1-2
203	12 hours ending at 14:45:00 06/02/2009	2-5
268	24 hours ending at 02:40:00 07/02/2009	1-2
309	48 hours ending at 09:00:00 07/02/2009	1-2

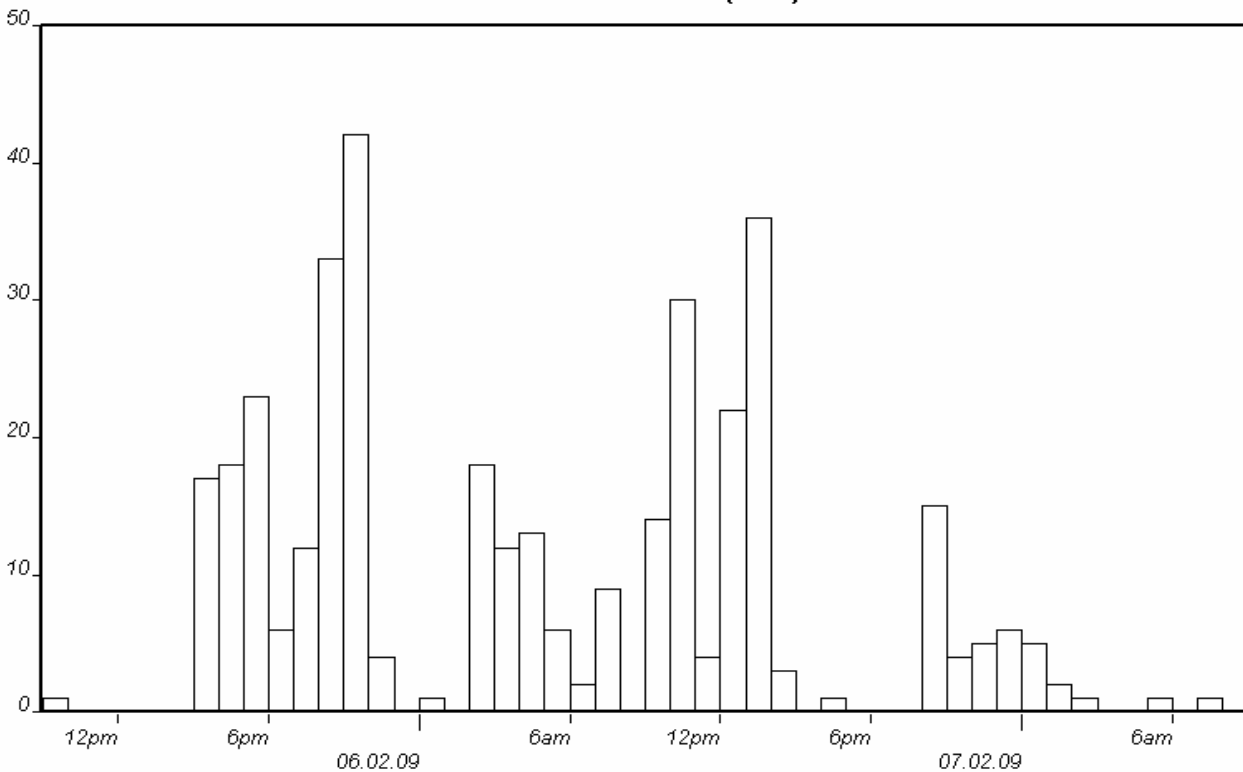


**Figure 3.2.5 Hyetographs for McAvoy Bridge AL and Innisfail Wharf AL for the 48 hours to 9am on the 07/02/09.**

**2574 - McAvoy Bridge AL  
Period Rainfall (mm)**



**2570 - Innisfail Wharf AL  
Period Rainfall (mm)**



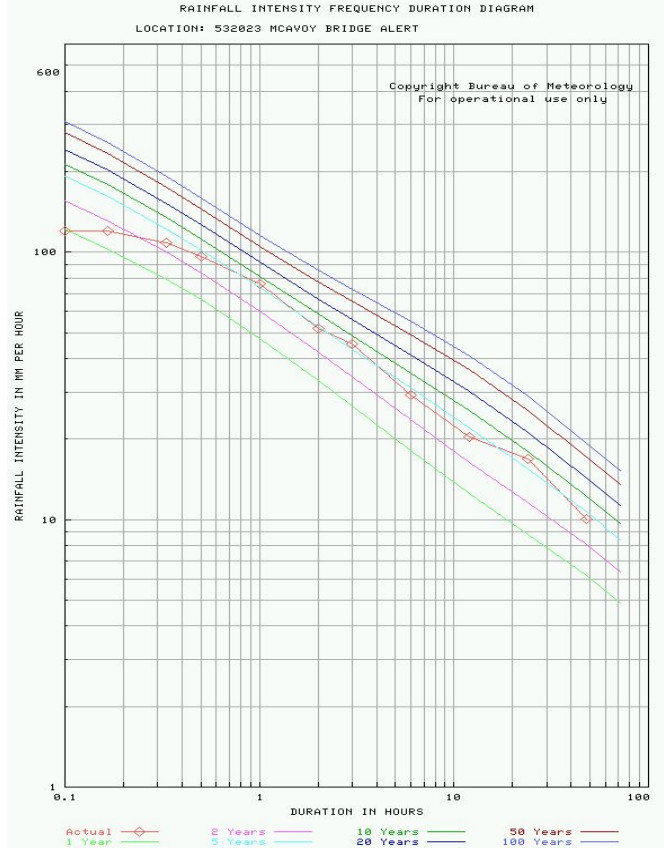
**Figure 3.2.6 IFD Analysis for McAvoy Bridge AL and Innisfail Wharf AL for the 48 hours to 9am on the 07/02/09.**

**RAINFALL INTENSITY FREQUENCY DURATION ANALYSIS**

LOCATION: 532023 MCAVOY BRIDGE ALERT

Analysis of the rainfall for the 48 hours to Sat Feb 7 09:00:00 2009

Rain (mm)	Period Ending	ARI (years)
10	5 mins ending at 13:25:00 06/02/2009	1
12	6 mins ending at 13:26:00 06/02/2009	1
20	10 mins ending at 13:30:00 06/02/2009	1-2
36	20 mins ending at 13:30:00 06/02/2009	2-5
48	30 mins ending at 13:30:00 06/02/2009	2-5
76	60 mins ending at 13:30:00 06/02/2009	5-10
104	2 hours ending at 13:50:00 06/02/2009	2-5
136	3 hours ending at 13:30:00 06/02/2009	5-10
175	6 hours ending at 14:55:00 06/02/2009	2-5
244	12 hours ending at 14:20:00 06/02/2009	2-5
405	24 hours ending at 14:55:00 06/02/2009	5-10
484	48 hours ending at 09:00:00 07/02/2009	2-5

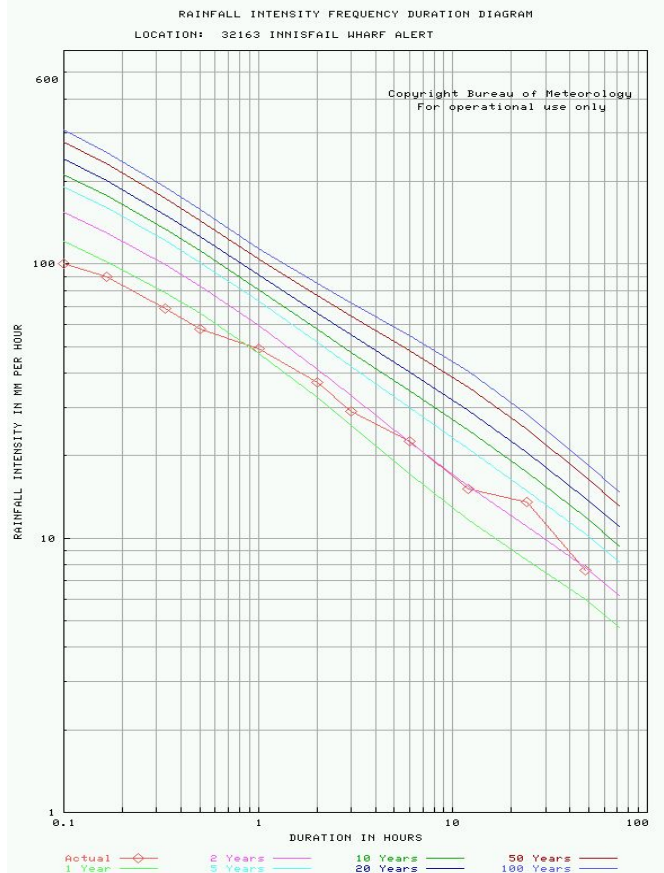


**RAINFALL INTENSITY FREQUENCY DURATION ANALYSIS**

LOCATION: 032163 INNISFAIL WHARF ALERT

Analysis of the rainfall for the 48 hours to Sat Feb 7 09:00:00 2009

Rain (mm)	Period Ending	ARI (years)
10	5 mins ending at 21:10:00 05/02/2009	1
10	6 mins ending at 21:11:00 05/02/2009	< 1
15	10 mins ending at 21:10:00 05/02/2009	< 1
23	20 mins ending at 21:15:00 05/02/2009	< 1
29	30 mins ending at 13:20:00 06/02/2009	< 1
49	60 mins ending at 21:15:00 05/02/2009	1-2
74	2 hours ending at 22:10:00 05/02/2009	1-2
87	3 hours ending at 22:15:00 05/02/2009	1-2
135	6 hours ending at 21:55:00 05/02/2009	2-5
182	12 hours ending at 03:25:00 06/02/2009	1-2
324	24 hours ending at 15:20:00 06/02/2009	2-5
366	48 hours ending at 09:00:00 07/02/2009	1-2



### 3.3. Rainfall Totals

The abbreviations used in the following tables include: AL - ALERT Radio Telemetry, TM - Telephone Telemetry, AWS - Automatic Weather Station, SYN - Bureau Synoptic Station

Note: \* signifies automatic station,

Refer to the [Flood Warning Network Map for the Johnstone River](#) for the station names of the rainfall locations used in Figure 3.3.1 and 3.3.2.

**Table 3.3.1 Rainfall Totals between 26/01/09 and 31/01/09.**

Station Name	24 Hours to 9am						Total (mm)
	26	27	28	29	30	31	
Malanda AL *	0	2	1	20	0	26	49
McKell Road AL *	19	2	0	8	2	11	42
Topaz AL *	1	12	3	35	24	117	192
Bartle View AL *	2	1	2	28	18	102	153
Greenhaven AL *	3	2	2	25	25	71	128
Millaa Millaa AL *	3	2	2	15	11	50	83
Crawfords Lookout AL *	12	0	2	28	44	105	191
Fisher Creek TM *	13	6	9	43	24	203	298
Nerada AL *	10	7	6	48	38	143	252
Tung Oil TM *	8	16	11	42	13	249	339
McAvoy Bridge AL *	9	58	11	63	20	213	374
Daradgee	7	16	23	76	35	209	366
Saltwater Creek AL *	31	33	29	66	36	218	413
Sutties Creek AL *	40	5	4	16	52	89	206
Menavale AL *	26	1	2	68	96	93	286
Corsis AL *	34	3	5	46	39	159	286
Central Mill TM *	10	5	5	53	39	243	355
Central Mill AL *	10	5	4	57	55	207	338
Mourilyan Mill AL *	5	11	10	87	30	207	350
South Johnstone AWS *	7	6	6	71	53	191	334
Sweeney Creek U/s AL *	24	42	23	63	26	223	401
Marco Street AL *	12	10	14	61	33	211	341
Innisfail SYN	45	45	25	68	27	207	417
Innisfail Wharf AI *	39	43	24	66	30	220	422
Japoonvale TM *	22	1	7	61	67	232	390
<b>Numerical Average</b>	<b>16</b>	<b>13</b>	<b>9</b>	<b>49</b>	<b>33</b>	<b>160</b>	<b>280</b>
<b>Maximum</b>	<b>45</b>	<b>58</b>	<b>29</b>	<b>87</b>	<b>96</b>	<b>249</b>	<b>422</b>

**Table 3.3.2 Rainfall Totals between 01/02/09 and 09/02/09.**

Station Name	24 Hours to 9am									Total (mm)
	1	2	3	4	5	6	7	8	9	
Malanda AL *	53	70	2	55	79	44	10	38	5	<b>356</b>
McKell Road AL *	31	82	13	64	40	41	15	32	22	<b>340</b>
Topaz AL *	75	95	0	58	63	123	69	14	11	<b>508</b>
Bartle View AL *	61	91	1	34	82	108	100	40	35	<b>552</b>
Greenhaven AL *	50	96	8	42	70	90	87	42	36	<b>521</b>
Millaa Millaa AL *	43	61	4	35	42	83	64	27	28	<b>387</b>
Crawfords Lookout AL *	53	161	1	45	112	120	232	85	37	<b>846</b>
Fisher Creek TM *	73	377	0	25	76	237	372	22	42	<b>1224</b>
Nerada AL *	70	140	0	28	86	131	293	32	41	<b>821</b>
Tung Oil TM *	64	181	0	24	71	247	297	23	44	<b>951</b>
McAvoy Bridge AL *	57	191	0	29	59	232	253	27	4	<b>852</b>
Daradgee	59	204		35	60	240	229	35	8	<b>870</b>
Saltwater Creek AL *	56	237	0	28	62	243	176	36	5	<b>843</b>
Sutties Creek AL *	50	155	5	35	35	75	182	33	35	<b>605</b>
Menavale AL *	45			6						<b>51</b>
Corsis AL *	71	218	0	25	86	116	238	19	57	<b>830</b>
Central Mill TM *	52	254	0	18	52	108	186	20	24	<b>714</b>
Central Mill AL *	51	253	0	20	54	97	212	21	23	<b>731</b>
Mourilyan Mill AL *	58	248	0	21	54	147	185	37	4	<b>754</b>
South Johnstone AWS *	49	248	0	23	53	108				<b>481</b>
Sweeney Creek U/s AL *	56	205	0	30	62	221	177	36	3	<b>790</b>
Marco Street AL *	61	195	0	27	64	142	241	27	27	<b>784</b>
Innisfail SYN	67	212	0	26	55	202	160	33	5	<b>760</b>
Innisfail Wharf AI *	57	226	0	28	60	217	149	33	2	<b>772</b>
Japoonvale TM *	37	227	0	16	66	225	348	190	35	<b>1144</b>
<b>Numerical Average</b>	<b>56</b>	<b>184</b>	<b>1</b>	<b>31</b>	<b>64</b>	<b>150</b>	<b>186</b>	<b>39</b>	<b>23</b>	<b>734</b>
<b>Maximum</b>	<b>75</b>	<b>377</b>	<b>13</b>	<b>64</b>	<b>112</b>	<b>247</b>	<b>348</b>	<b>190</b>	<b>57</b>	<b>1224</b>

## 3.4. Peak Heights

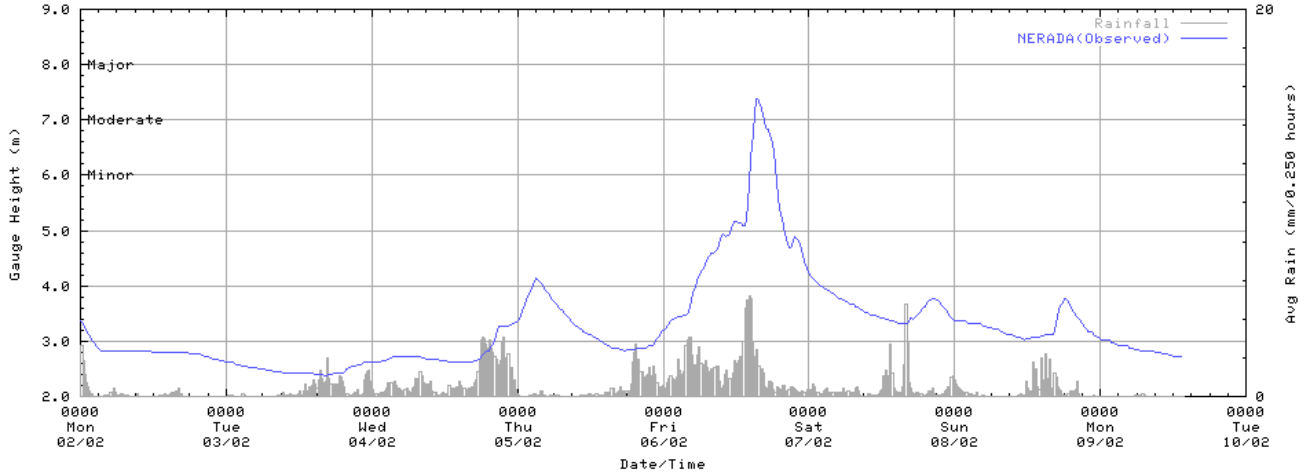
**Table 3.4.1 Peak Flood Heights recorded between 06/02/2009 and 07/02/2009.**

Station No.	Station Name	Date	Height	Flood Class
32165	NERADA ALERT	06/02/2009 15:22	7.43	Moderate
532070	FISHER CREEK TM	06/02/2009 14:40	3.36	Unknown
32152	TUNG OIL TM	06/02/2009 16:00	8.39	Moderate
532023	MCAVOY BRIDGE ALERT	06/02/2009 18:05	7.25	Major
532014	SALTWATER CREEK ALERT	06/02/2009 19:54	4.06	Below Minor
32161	CORSIS ALERT	06/02/2009 17:47	7.99	Major
32160	CENTRAL MILL ALERT	06/02/2009 21:03	10.42	Major
532025	MOURILYAN MILL ALERT	06/02/2009 22:03	11.32	Unknown
532009	SWEENEY CREEK U/S ALERT	07/02/2009 04:43	3.23	Below Minor
532013	SWEENEY CREEK D/S ALERT	06/02/2009 21:51	4.4	Below Minor
32163	INNISFAIL WHARF ALERT	06/02/2009 20:27	5.68	Moderate

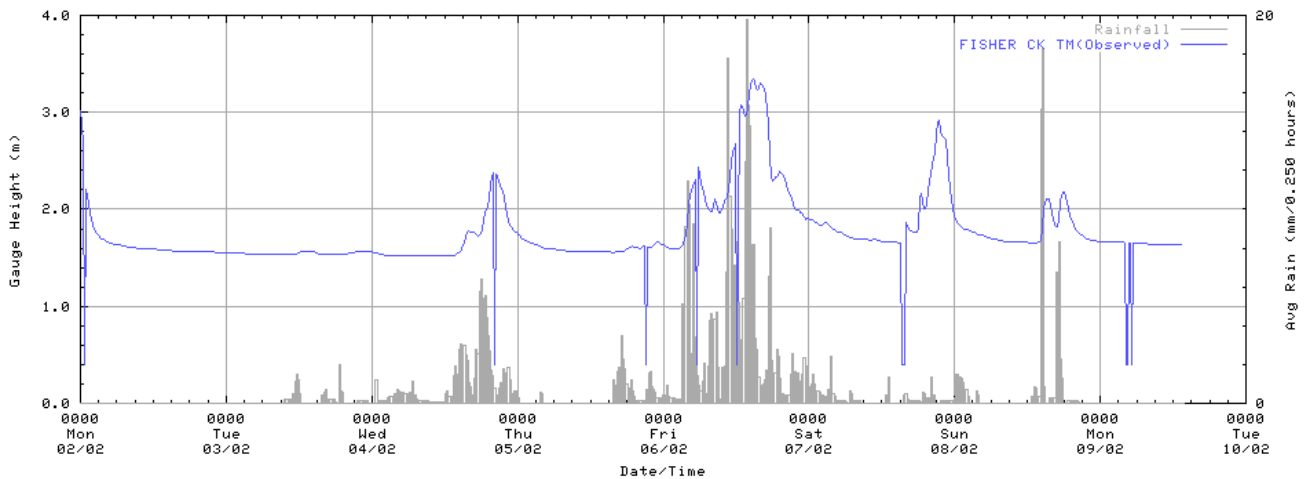
### 3.5. Flood Hydrographs for the Johnstone River

Figure 3.5.1 Hydrographs for the 02/02/09 to the 10/02/09.

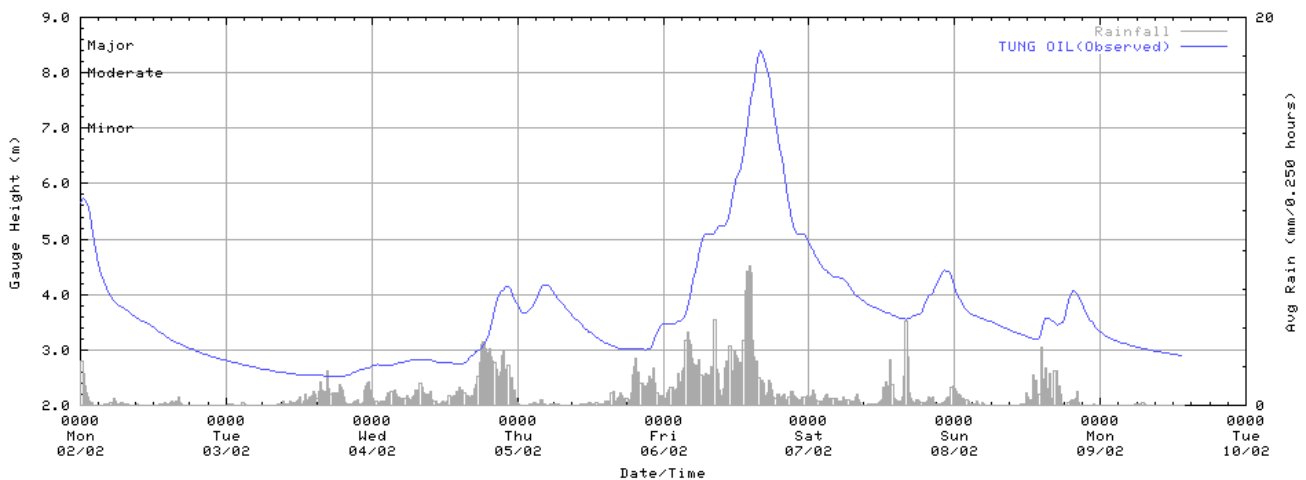
#### North Johnstone River – Nerada Alert



#### North Johnstone River – Fisher Creek TM

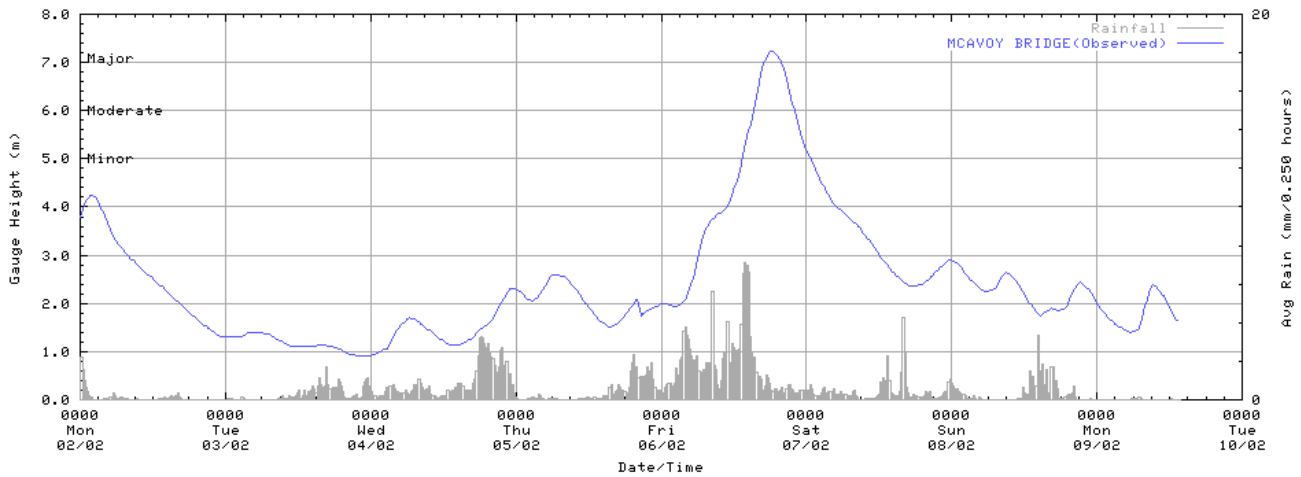


#### North Johnstone River – Tung Oil TM

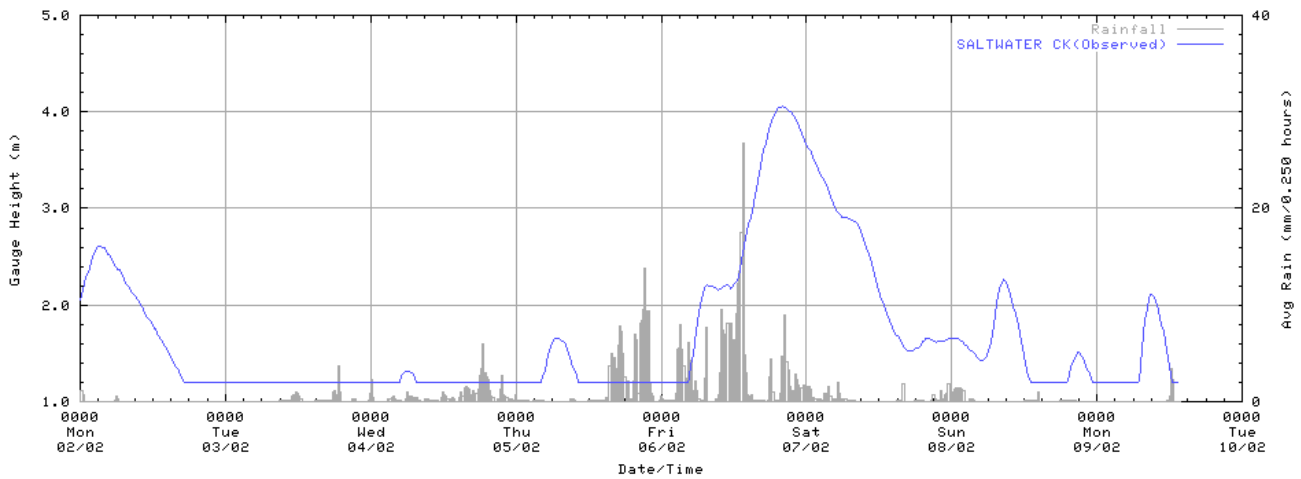


**Figure 3.5.2 Hydrographs for the 02/02/09 to the 10/02/09.**

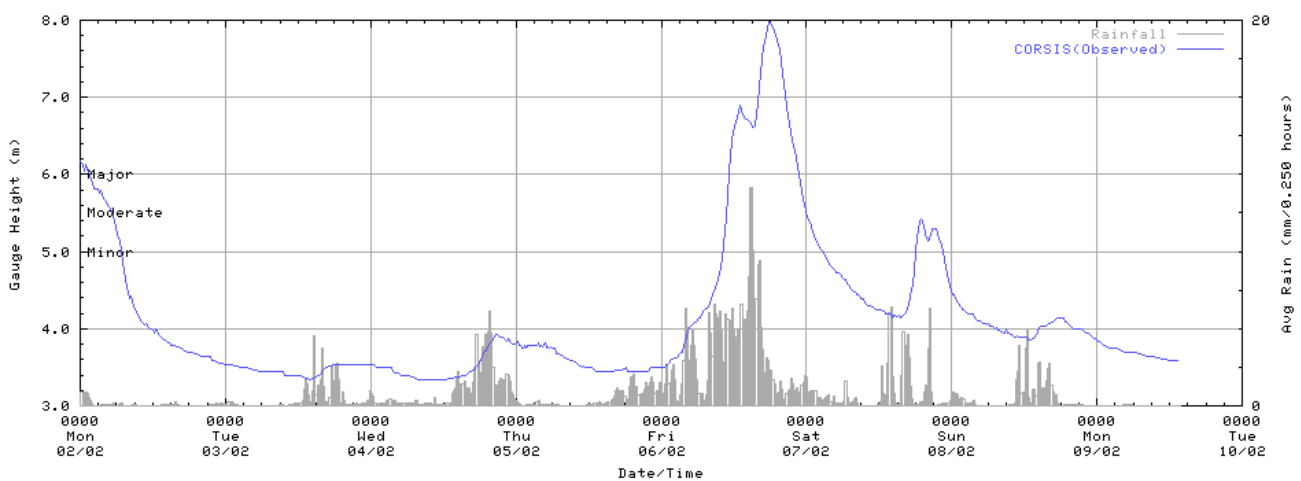
**North Johnstone River – McAvoy Bridge Alert**



**Saltwater Creek – Saltwater Creek Alert**

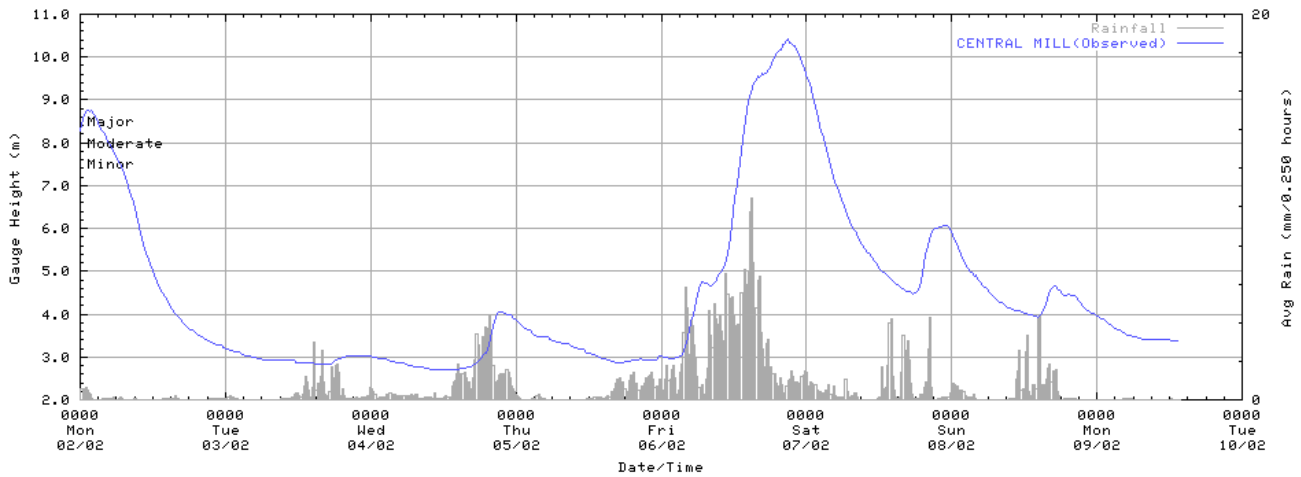


**South Johnstone River – Corsis Alert**

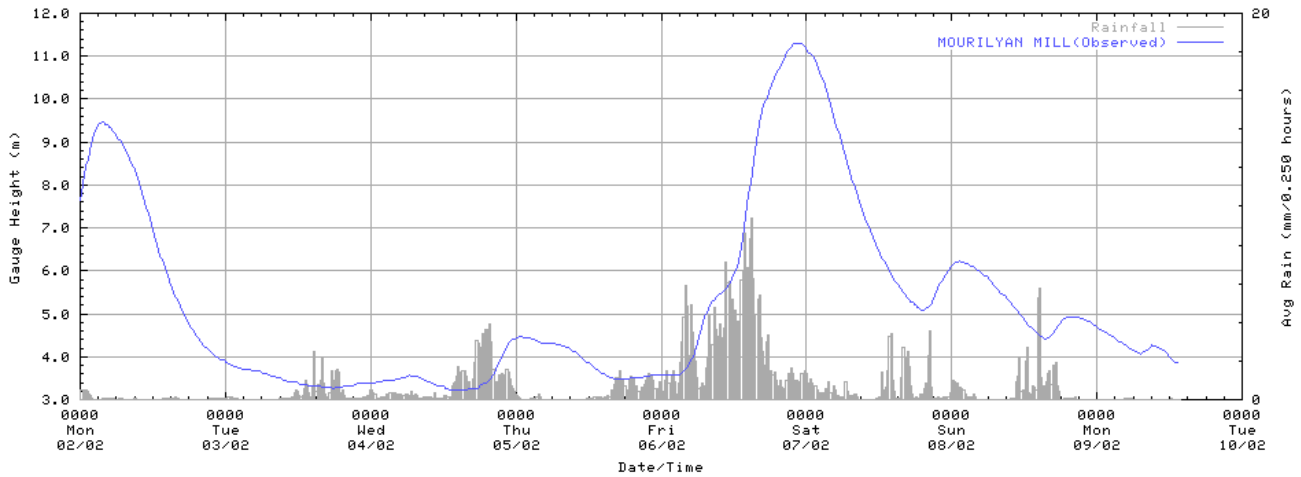


**Figure 3.5.3 Hydrographs for the 02/02/09 to the 10/02/09.**

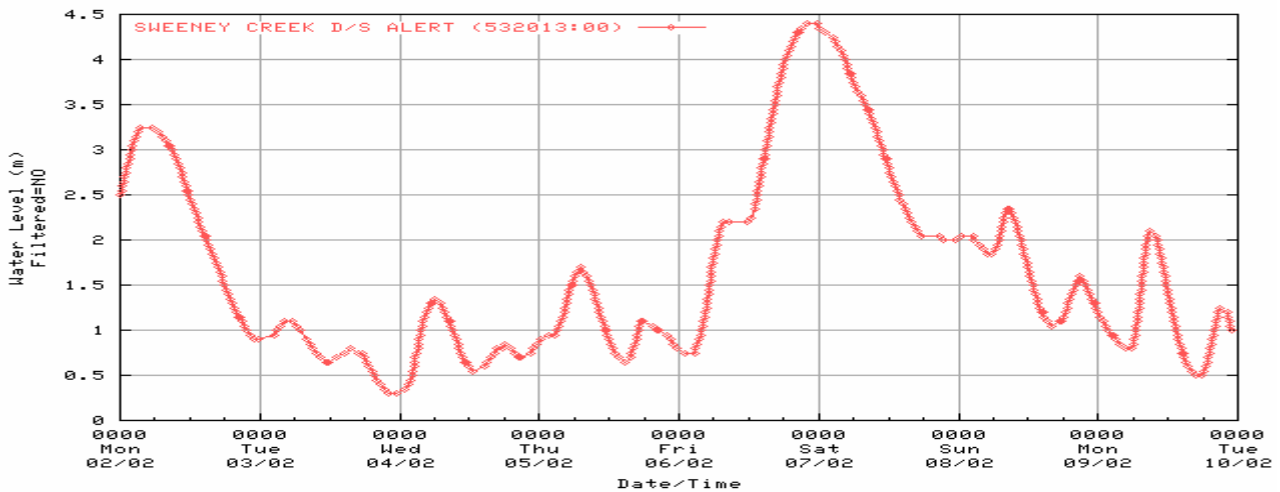
**Johnstone River – Central Mill Alert**



**Johnstone River – Mourilyan Mill Alert**

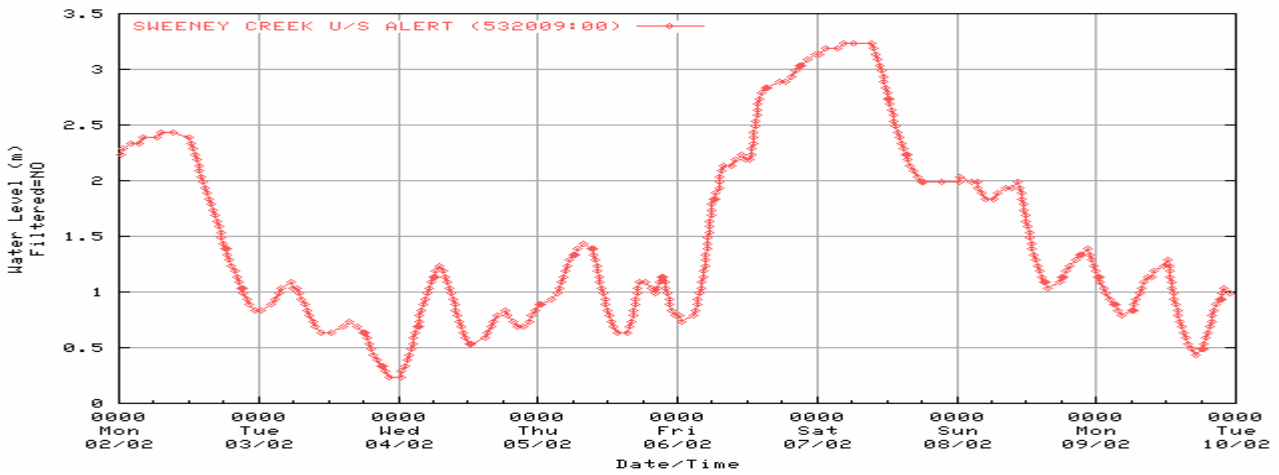


**Sweeney Creek – Sweeney Creek U/S Alert**

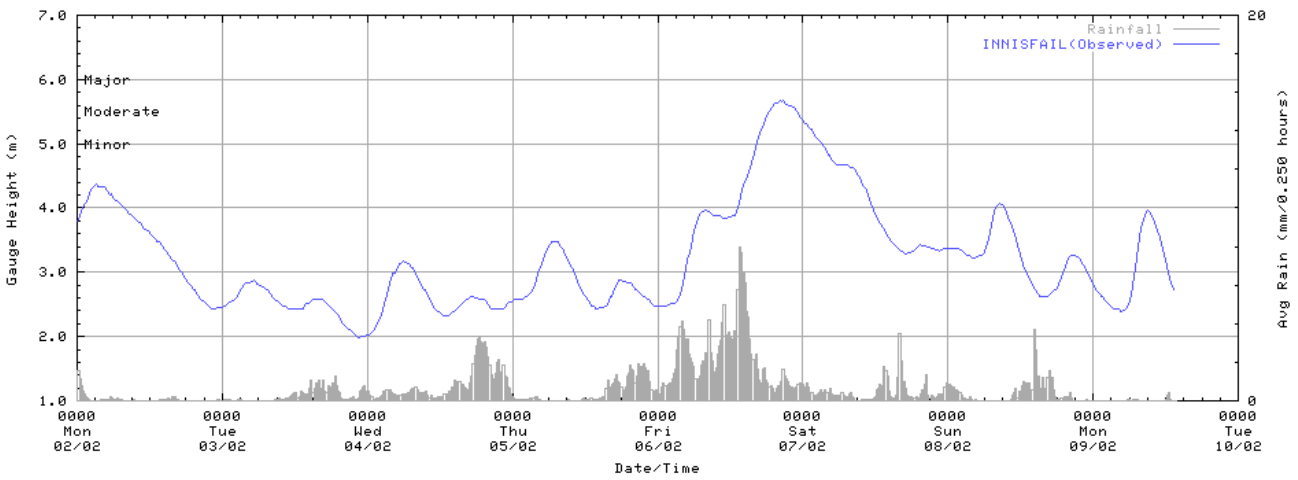


**Figure 3.5.4 Hydrographs for the 02/02/09 to the 10/02/09.**

**Sweeney Creek – Sweeney Creek D/S Alert**



**Johnstone River – Innisfail Wharf Alert**



### 3.6. Warning Services for the Johnstone River

**Table 3.6.1 Flood Warnings and Predictions issued between 06/02/2009 and 07/02/2009.**

Number of Warnings	Number of Major Warnings	Number of Predictions	Number of Locations	First Warning	Last Warning
5	4	2	1	11.50am Fri 6/02/2009	6:26am Sat 7/02/2009

**Table 3.6.2 River Height Predictions issued for the Johnstone River Catchment.**

Location	Issued	Predicted		Actual	
		Height	Time	Height	Time
Innisfail Wharf	06/02/2009 14:54	5.50	6 pm 06/02	5.68	06/02/2009 20:27
	06/02/2009 17:55	5.90	8 pm 06/02		

**Table 3.6.3 Severe Weather Warnings issued between 06/02/2009 and 07/02/2009.**

Severe Weather Warning Title	Number of Warnings Issued
Severe Weather Warning for flash flooding.	3
Severe Weather Warning for areas of heavy rain worsening an existing major flood situation.	7
<b>TOTAL</b>	<b>10</b>

# Appendix 1. DNRW Usage Agreement

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