APPENDIX A: INFRASTRUCTURE DATA ASSESSMENT REPORT

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MORETON BAY REGIONAL COUNCIL

Infrastructure Data Assessment Report

Package 1

301001-01156 – EN-REP-0001

14 October 2010

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PROJECT 301001-01156 - INFRASTRUCTURE DATA ASSESSMENT REPORT

REV	DESCRIPTION	ORIG	REVIEW	WORLEY-PARSONS APPROVAL	DATE	CLIENT APPROVAL	DATE
A	Issued for Internal Review	R.Stewart/L Cheung	K.Hegerty		13-Oct-10	N/A	
0	Issue for use	R.Stewart/L Cheung	K.Hegerty	E.Reid	14-Oct-10		

CONTENTS

1. INTRODUCTION

WorleyParsons Services Pty Ltd has been engaged by Moreton Bay Regional Council (MBRC) to carry out detailed surface water modelling over two of the regional catchments in their Local Government Area (LGA). The two catchments are Upper Pine River (UPR) and Sidling Creek (SID). These make up 'Package 1' of MBRC's Regional Floodplain Database Project (RFD Project) and are referred to as 'minor basins' in the GIS data provided by MBRC.

At the commencement of this project, MBRC handed over an extensive data set including established 'broad scale' models and results. The purpose of this report is to identify and prioritise any additional floodplain infrastructure data which is necessary to complete the detailed modelling associated with the current project.

Due to the expansive catchment study areas of the project, it is difficult to convey the necessary level of data detail on Figures. For this reason an electronic copy of the GIS data associated with the findings of this report has been provided. The following electronic GIS data layers have been provided with this report:

1. "Existing Structure Junctions" (provided by MBRC). A data capture priority rating has been assigned to each of these structures;
2. "Identified Hydraulic Structures". This includes all additional structures identified by WorleyParsons including an associated data capture priority rating;
3. "Identified Basins/Dams". This includes all detention basins and dams significant enough to warrant incorporating into the modelling;
4. "Additional Buildings Identified in Floodplain". Includes buildings in the PMF flood extent that are not already included in MBRC's '"buildings" GIS layer.
5. "Miscellaneous Comments". Includes general comments relating data capture and modelling.

Figures provided with this report are for overview purposes only.

A fee proposal for WorleyParsons to carry out the data capture tasks identified in this report will be provided separately to MBRC for consideration.

2. AVAILABLE DATA AND GAP ANALYSIS

Floodplain Infrastructure Data provided by MBRC has been reviewed. Details of the available data and a gap analysis are provided below for each class of infrastructure data.

2.1 Bridges

Bridge design drawings have been supplied by MBRC for 7 locations. These will be useful for defining geometry of the bridge however it is noted that generally these drawings do not have elevation data on AHD.

In addition to these bridges numerous road crossings have also been identified within the proposed hydraulic modelling area using aerial imagery, digital elevation modes (DEMs), and the supplied hydrography. Identifying road crossings in this manner makes it difficult to distinguish between culverts and bridges. Consequently, when reviewing the catchment data to identify additional waterway crossings we have not distinguished between bridges and culverts.

Each waterway crossing has been assigned a priority rating of A, B or C. This is discussed further in Section 3.1.

The SID and UPR broadscale TUFLOW models provided by MBRC already have some bridges included (2d_lfcsh TUFLOW layer). The UPR TUFLOW has 10 established bridges and the SID model has 2 established bridges included. As these structures where incorporated at an earlier modelling phase, where a lower level of accuracy was acceptable, it is expected that these structures will need to be revisited to ensure a suitable level of accuracy for the current detailed modelling stage.

2.2 Culverts

The SID and UPR broadscale TUFLOW models provided by MBRC already have some culvert included (1d_NWK TUFLOW layer). The UPR TUFLOW has 82 established culverts and the SID model has 24 established culverts included. As these structures where incorporated at an earlier modelling phase, where a lower level of accuracy was acceptable, it is expected that these structures will need to be revisited to ensure a suitable level of accuracy for the current detailed modelling stage. For example it is understood that current culvert invert details are not based on ground survey, but rather on an inspection of the LiDAR DEM.

Potential culvert crossings within the proposed hydraulic modelling area have been identified in the same manner as for bridge crossings, as discussed in the previous section. The location of these structures is shown generally on the figure provided in Appendix 1 and they are also included in the electronic GIS data provided with this report.

It is also noted that the location of some culverts may only become apparent with a field inspection. This is likely to be the case for high level floodplain crossings which do not tie in directly with a defined waterway.

2.3 Trunk Underground Drainage

A review of the supplied aerial imagery over the proposed hydraulic modelling area has found no evidence of underground trunk drainage. This is to be expected in these rural Package 1 catchments.

2.4 Detention Basins / Farm Dams

No regional scale detention basins have been identified in any of the Package 1 basins.
There are numerous farm dams that are large enough to warrant incorporation into the modelling. . The location of these dams are shown generally on the Appendix figures and they are also included in the electronic GIS data provided with this report.

2.5 Terrain

Topography

The primary topographic data to be used for this project is Aerial LiDAR survey capture in 2009. This has been provided as raw xyz data points and also as a 2.5m grid digital elevation model (DEM**).**

The LiDAR survey has been filtered for ground elevation points and is considered to be of high quality and suitable for use in this study. However, some long and narrow gaps have been identified in the DEM near the western boundary of the UPR basin.

Bathymetry

For the purpose of this report bathymetry is defined as ground elevation level data in areas beneath standing water.

No bathymetry data has been provided for any of the Package 1 catchments.

One potential source of bathymetric data is old LiDAR data captured while water supply levels in the North Pine and Sidling Dams where very low. This older LiDAR would give a better representation of each of the dams bathymetry compared to the 2009 LiDAR survey which was carried out when the dams where relatively full.

2.6 Miscellaneous

Details of the Sideling Creek Dam and North Pine Dam are also available through various reports that have been provided by MBRC. Details include full supply level, spillway rating curves (including North Pine Spillway with various combinations of gate functioning), spillway and embankment crest levels. This data will be sufficient for the current project.

It is noted that some floodplain infrastructure is difficult to identify by studying aerial imagery and a DEM. One such example is in-stream weirs. No in-stream weirs were identified however it is worth confirming with the relevant authority as to whether any exist in these catchments.

Some buildings have also been identified in the floodplain that are not included in the MBRC supplied 'buildings' land-use layer. These additional buildings are also supplied in this report's GIS data layers.

3. PROPOSED DATA CAPTURE

The key additional data capture required for this project is survey of the numerous hydraulic structures including bridges and culverts.

No regional scale detention basins or trunk drainage works were identified and hence no data capture is required for these structure classes.

Data capture tasks have been assigned a priority rating. Details are provided in the following sections.

3.1 Prioritisation Methodology

Hydraulic Structure Overall Priority

Each identified road crossing has been assigned a high, medium or low data capture priority. Prioritisation of the hydraulic structures has been based on the following criteria:

1. Likely impact on flooding characteristics;
2. Proximity to urban areas;
3. Class of road associated with the infrastructure; and
4. Catchment Size.

Based on these criteria each hydraulic structure that has been identified has been assigned a priority class or A (high), B (medium), or C (low). The priority has been assigned by reviewing aerial imagery, DEMS and the supplied hydrography.

By way of example, a dirt road with a minor causeway crossing and no significant road embankment would be assigned a 'C' priority. A significant road crossing in an urban area or on a major road would be assigned an 'A' priority. An example of a 'B' priority structure is a rural road crossing with no surrounding residential properties.

The priority rating of each structure is provided in the GIS data provided with this report ('priority' field).

Priority of Hydraulic Structure Elements

In addition to assigning each structure a priority, a further breakdown in priority has also been assigned to the various elements of data capture associated with each hydraulic structure. This relates to the priority High (or A) and Low (or B) data capture tasks referenced in the project brief whereby priority High tasks are considered critical for a high quality modelling outcome and priority Low tasks could potentially be incorporated with desktop techniques and assumptions.

3.2 Data Prioritisation

Culverts

Each structure has been assigned an overall priority as discussed in Section 3.1. The priority for each structure is provided in the GIS data provided with this report.

In addition to this, each element of data associated with capture of structures can further be prioritised as follows:

Priority High Elements of Culvert Data Capture

Capture of these elements is considered critical to a high quality modelling outcome:

1. Culvert Type (Box / Pipe);
2. Size and number of barrels;
3. Upstream and downstream invert levels;
4. Material (concrete/corrugated iron); and
5. Handrail type and extents.

Priority Low Elements of Culvert Data Capture:

The remaining elements associated with culvert data capture as detailed in the Culvert Data Standard by Aurecon, are considered to have type Low Priority and could be incorporated into the modelling using desktop techniques and assumptions. These elements include

1. Wing walls:
2. Road elevation;
3. Handrail elevation;
4. Geo-referenced photos; and
5. Metadata.

Bridges

Each structure has been assigned an overall priority as discussed in Section 3.1.

In addition to this, each element of data associated with capture of structures can further be prioritised as follows:

Priority High Elements of Bridge Data Capture

1. Number / Length of spans;
2. Deck Thickness or soffit level;

3. Pier Configuration (width, shape, orientation etc);
4. Cross section of channel beneath the bridge; and
5. Handrail type and extents.

Priority Low Elements of Bridge Data Capture:

The remaining elements associated with bridge data capture as detailed in the Bridge Data Standard by Aurecon, are considered to have type B Priority and could be incorporated into the modelling using desktop techniques and assumptions. These elements include

1. Road elevation;
2. Handrail elevation;
3. Deck levels points;
4. Geo-referenced photos; and
5. Metadata.

Most bridge details are able to be sourced from the supplied bridge drawings however levels on the drawings will need to be converted to AHD and it is noted that not all bridge drawings are complete.

Farm Dams

Priority Low

It is proposed that the minor farm dams situated in the upper catchments upstream of the proposed hydraulic modelling extent will not be incorporated into the hydrologic or hydraulic modelling. While these small dams may have some impact on catchment hydrology (dependant on the level at the start of a rainfall event), the amount of work required to incorporate these dams into the modelling is not considered justified given that the impact of these dams is likely to be negligible if the dams are full at the start of a rainfall event.

While the farm dams in the upper catchments can justifiably be excluded from the modelling, there are several dams situated farther down in the catchments that are within the proposed hydraulic modelling area and are considered significant enough to warrant incorporation into the modelling. It is anticipated that the influence of the dam embankments on local hydraulic behaviour will be more significant that the storage effect of the impounded water.

It is proposed that these dams should be incorporated into the hydraulic model as follows:

1. Incorporate significant dams into the hydraulic modelling by creating a dam crest breakline. Ideally this should be based on Ground survey however a reasonable approximation should be possible in a lot of cases using aerial LiDAR survey; and

2. Defining initial water levels for the 2d grid within in each dam. It is recommended that a reasonable and conservative approach for this is to assume that the dams are full at the start of each simulation.

Terrain

Priority Low: Utilise Historic LiDAR for Dam Bathymetry

WorleyParsons proposed to utilise historic LiDAR data to supplement the North Pine and Sidling Creek dam bathymetries.

Priority Low: Stream Widths

It is noted that a stream width functionality has been included in the DEM processing utility developed for this project. A stream width field can be applied to the breakline strings that will be getting developed for the project. This is also considered to be a type of 'data capture' task in that it will improve the quality of the DEMs that will be generated for the project.

Miscellaneous

Priority High

It is proposed that relevant authorities should be contacted to confirm the existence of any instream weirs within the study area. If any are reported, then location and geometric details should be attained.

4. RECOMMENDATIONS

WorleyParsons recommends that MBRC should undertake or commission the undertaking of all data capture tasks detailed in this report. If budget and timing constraints limit the potential for this then, as a minimum, all data associated with priority “High” structures should be collected.

5. REFERENCES

Aurecon, July 2010, "Data Standard - Culverts, Regional Floodplain Database - Stage 2, Moreton Bay Regional Council"

Aurecon, July 2010, “Data Standard - Bridges, Regional Floodplain Database - Stage 2, Moreton Bay Regional Council”

Aurecon, July 2010, “Data Standard - Detention Basins, Regional Floodplain Database - Stage 2, Moreton Bay Regional Council”

Aurecon, July 2010, “Data Standard – Trunk Underground Drainage, Regional Floodplain Database - Stage 2, Moreton Bay Regional Council”

JWP (For Pine Rivers Shire Council), December 2004, “Terrors Creek Dayboro, Flood Study, Extreme Event Analysis”

JWP (For Pine Rivers Shire Council), May 2005, “North Pine River Hydrology Final Report”

JWP (For Pine Rivers Shire Council), December 2004, “Terrors Creek Dayboro Flood Study Final Report”

SEQWater, July 2009, “Report for Lake Kurwongbah, (Sideling Creek Dam), Flood Hydrology”

SunWater, June 2007, “North Pine Dam Design Flood Hydrology (Draft)”

WorleyParsons, September 2010 "Regional Floodplain Database - Floodplain Terrain"

Appendix 1 - Data Review Figures

LEGEND

- Minor Basin (MBRC)
- Minor Catchments (MBRC)
- Stream Reaches (MBRC)
- Recommended Stream Reaches
- Existing Structure Junctions (MBRC)
- Identified Hydraulic Structures
- Identified Basins/Dams
- Additional Buildings Identified in Floodplain
- Miscellanious Comments

All data supplied by MBRC.
Additional_Comments, Additional_Hydraulic_Structures, Additional_Bulidings, Additional_DamsBasins and MAR_Reach_Mod supplied by WorleyParsons on the 14/10/10

NOT TO SCALE

Rev	Date	Revision Description	RS ORIG	JM CHK	RS ENG	KH APPD
A	14/10/2010	Issued for use				

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REGIONAL FLOODPLAIN DATABASE PROJECT

FIGURE 5
UPPER PINE RIVER DATA REVIEW

Project No: 301001-01156	Figure: 301001-01156-EN-DAL-0005	Rev: A

Compiled by SUNSHINE COAST INFRASTRUCTURE GIS SECTION

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LEGEND

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All data supplied by MBRC.
Additional_Comments, Additional_Hydraulic_Structures, Additional_Bulidings, Additional_DamsBasins and MAR_Reach_Mod supplied by WorleyParsons on the 5/10/10

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FIGURE 6
SIDLING CREEK DATA REVIEW

Project No: 301001-01156	Figure: 301001-01156-EN-DAL-0006	Rev: A

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APPENDIX B: HYDROGRAPHY REVIEW REPORT

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MORETON BAY REGIONAL COUNCIL

Hydrography Review Report

Package 1

301001-01156 – EN-REP-0005

16 November 2010

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PROJECT 301001-01156 - HYDROGRAPHY REVIEW REPORT

REV	DESCRIPTION	ORIG	REVIEW	WORLEY-PARSONS APPROVAL	DATE	CLIENT APPROVAL	DATE
A	Issued for Internal Review	L.Cheung	R.Stewart		16-Nov-10	N/A	
0	Issue for Use	L.Cheung	R.Stewart	K.Hegerty	16-Nov-10		

CONTENTS

1. INTRODUCTION

WorleyParsons Services Pty Ltd has been engaged by Moreton Bay Regional Council (MBRC) to carry out detailed surface water modelling over two of the regional catchments in their Local Government Area (LGA). The two catchments are Upper Pine River (UPR) and Sideling Creek (SID). These make up 'Package 1' of MBRC's Regional Floodplain Database Project (RFD Project) and are referred to as 'minor basins' in the GIS data provided by MBRC.

At the commencement of this project MBRC handed over an extensive data set including established 'broadscale' models (including associated results and reporting) as well as their established hydrography layer. The hydrography data provided by MBRC includes their previously established stream reaches, stream junctions, major basins, minor basins, major catchments and minor catchments.

WorleyParsons has reviewed the supplied hydrography data against other data provided for the project including aerial imagery and a 2.5m grid aerial LiDAR digital elevation model. Based on this review, we have identified issues and where necessary we have made recommendations to improve the suitability of the hydrography for use in the current detailed modelling project.

2. HYDROGRAPHY REVIEW

2.1 Issues Identified During Stage 1

No issues have been identified during Stage 1 of the RFD Project for either of the Package 1 catchments.

It is worth nothing however that some of the general issues raised for other minor basins (for example Mary River and Stanley River) are also considered relevant to the Package 1 minor basins. In particular, the issue of sub-catchment resolution in the upper catchments which could lead to reduced accuracy in flood modelling predictions.

2.2 Stream Connectivity

No issues with stream connectivity were found during the hydrography review for either of the Package 1 minor basins.

2.3 Inclusion of Floodplain Structures

The majority of major floodplain structures have been picked up in the stream junction GIS layer provided by MBRC. Additional structures have been identified by WorleyParsons and it is recommended that these be incorporated into the MBRC hydrography stream junction layer.

2.4 Existing Resolution/Detail

The current resolution of the MBRC hydrography is considered suitable for use in the RFD project. This is on the basis that stream routing will generally be carried out hydraulically by TUFLOW as opposed to relying on WBNM hydrologic model's stream routing functionality which is calculated as a function of sub-catchment area.

The reason for this distinction is that flow attenuation occurring from channel routing may be incorrect in some instances when calculated using a function of sub-catchment area. This is due to a number of factors including sub-catchment shape, slope, and also by the hydrography including minor stream reaches (tributaries) which are located within a regional floodplain and which can artificially reduce the representative catchment size of the main channel.

It has also been noted that the supplied hydrography layer includes a number of very small sub-catchments. The locations of these small-catchments can be found in the GIS layer provided in this report. It is recommended that consideration be given to consolidation of some of these sub-catchments

3. PROPOSED CHANGES

WorleyParsons' recommended changes to the hydrography are detailed in the GIS data provided with this report. Figures 1 and 2 in Appendix 1 give an overview of this data for each minor basin however due to the large extent of the study areas it is recommended that this data be reviewed using a GIS software package rather than relying on these figures.

The following GIS layers have been provided to describe our recommended changes to the hydrography layer.

1. 'Recommended Stream Reaches': A complete updated set of stream reaches for each minor basin based on MBRC supplied data and incorporating WorleyParsons' suggested changes.
2. 'Recommended Stream Junctions': GIS layer including additional stream junctions which should be included. These stream junctions have been incorporated along the stream reaches layer at locations where additional sub-catchments should be delineated.
3. 'Identified Hydraulic Structure': This is a copy of the identified hydraulic structures that were identified in WorleyParsons previous Package 1 Infrastructure Data Assessment Report (14/10/2010).
4. 'Miscellaneous Comments': Contains comments relating to the hydrography review. Comments are generally associated with highlighting issues with catchment delineation.

It is proposed that MBRC utilise WorleyParsons' GIS data layers to update the Package 1 hydrography. Additional catchments should be delineated along the recommended stream reaches layer at points contained within the recommended stream junctions layer and also the identified hydraulic structure layer.

The location of the additional stream junctions have been chosen based on several factors including:

1. To provide additional catchment break down in the upper catchments to reduce potential inaccuracies identified in the previous stage 1 broadscale modelling.
2. To provide increased sub-catchment resolution where appropriate.
3. To improve sub-catchment shape and length.
4. Stream junctions have also been put at new stream confluences in the recommended stream reaches layer.

4. RECOMMENDATIONS

It is recommended that MBRC update the Package 1 hydrography based on the proposed changes discussed in this report and detailed in the supplied GIS data.

5. REFERENCES

BMT WBM, July 2010, *"Hydraulic Modelling (Broadscale) Regional Floodplain Database Stage 1 Sub-Project 1D"*

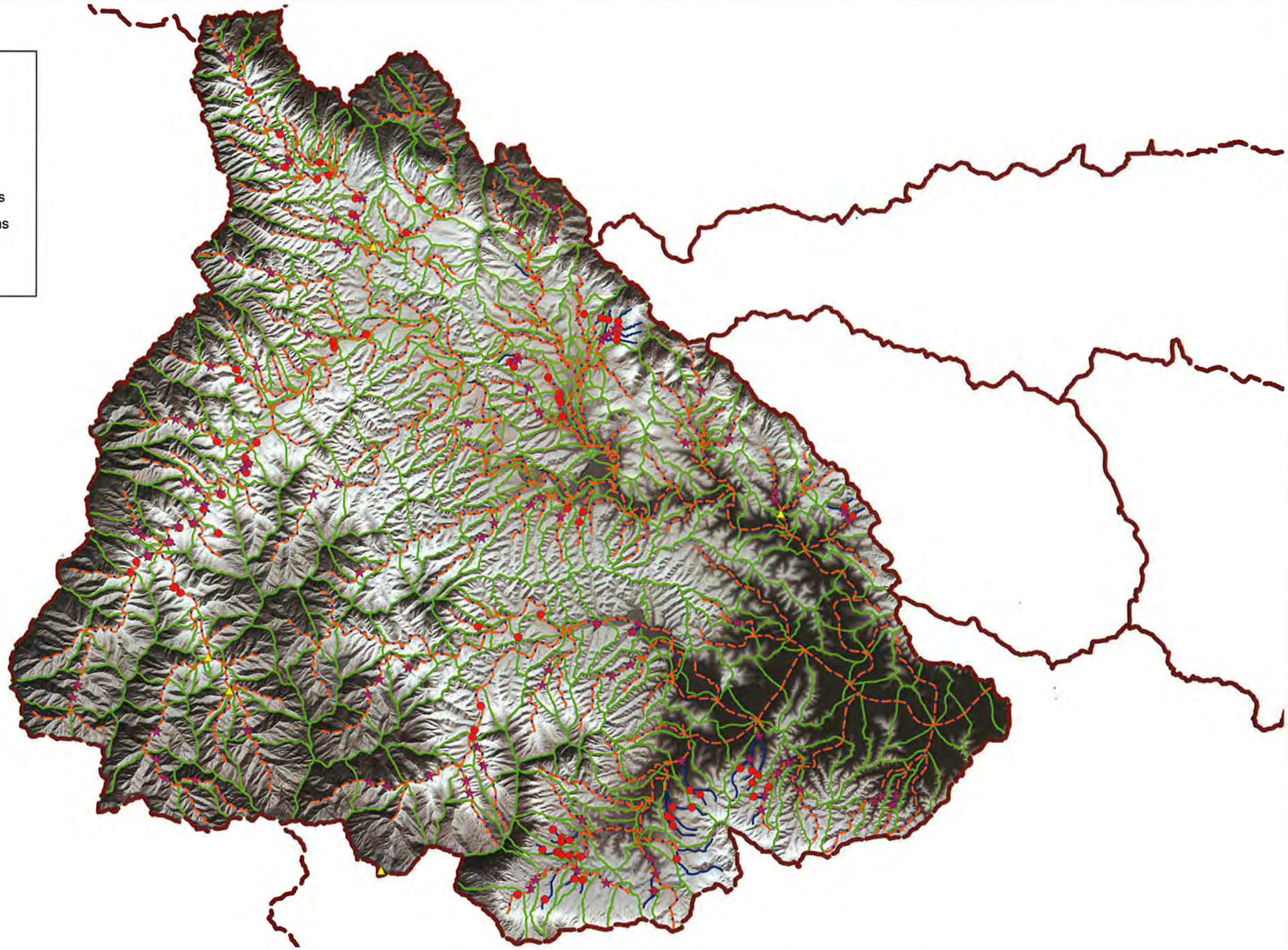
WorleyParsons, September 2010 *"Regional Floodplain Database - Floodplain Terrain"*

WorleyParsons, September 2010 *"Regional Floodplain Database, Design Rainfall - Burpengary Pilot Project"*

Appendix 1 - Hydrography Review Figures

LEGEND

- Minor Basin (MBRC)
- Minor Catchments (MBRC)
- Stream Reaches (MBRC)
- Recommended Stream Reaches
- Recommended Stream Junctions
- Identified Hydraulic Structures
- Miscellaneous Comments



Existing hydrographic data supplied by MBRC. Miscellaneous_Comments, Identified Hydraulic Structures, Recommended Stream Reaches, Recommended Stream Junctions supplied by WorleyParsons on the 11/11/10

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REGIONAL FLOODPLAIN DATABASE PROJECT

FIGURE 1
UPPER PINE RIVER HYDROGRAPHY REVIEW

Project No: 301001-01156	Figure: 301001-01156-EN-DAL-0012	Rev: A

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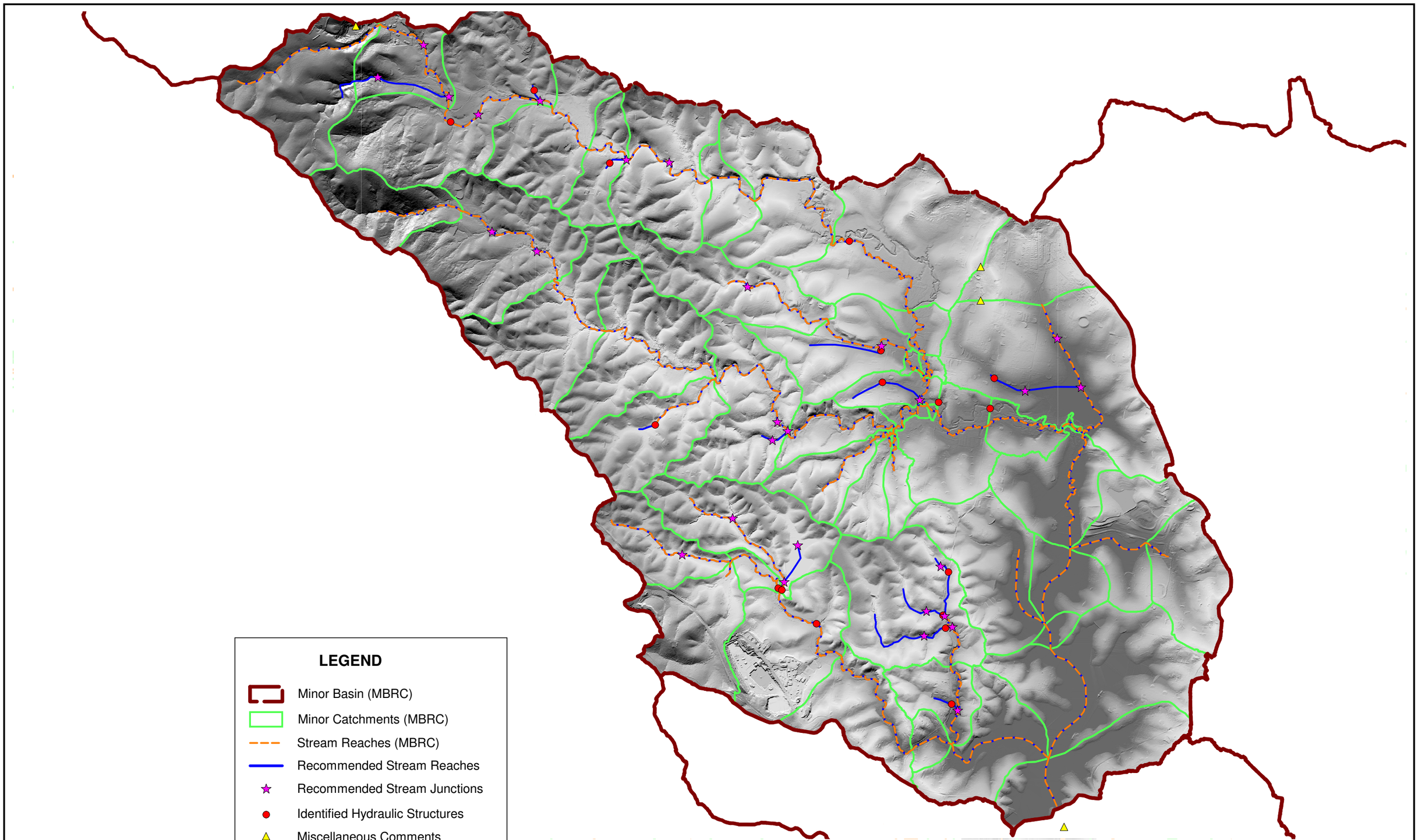

LEGEND

- Minor Basin (MBRC)
- Minor Catchments (MBRC)
- Stream Reaches (MBRC)
- Recommended Stream Reaches
- Recommended Stream Junctions
- Identified Hydraulic Structures
- Miscellaneous Comments

Existing hydrographic data supplied by MBRC.
Miscellaneous_Comments, Identified Hydraulic Structures, Recommended Stream Reaches, Recommended Stream Junctions supplied by WorleyParsons on the 11/11/10

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REGIONAL FLOODPLAIN DATABASE PROJECT

FIGURE 2
SIDLING CREEK HYDROGRAPHY REVIEW

Project No: 301001-01156	Figure: 301001-01156-EN-DAL-0013	Rev: A

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APPENDIX C: CALIBRATION AND VALIDATION FEASIBILITY REPORT

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Calibration and Validation Feasibility Report

Package 1

301001-01156 – EN-REP-0003

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PROJECT 301001-01156 - CALIBRATION AND VALIDATION FEASIBILITY REPORT

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A	Issued for Internal Review	R.Stewart	R.Stewart		8-Nov-10	N/A	
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CONTENTS

1. INTRODUCTION

WorleyParsons Services Pty Ltd has been engaged by Moreton Bay Regional Council (MBRC) to carry out detailed surface water modelling over two (2) of the regional catchments in their Local Government Area (LGA). The two catchments are Upper Pine River (UPR) and Sideling Creek (SID). These make up 'Package 1' of MBRC's Regional Floodplain Database Project (RFD Project) and are referred to as 'minor basins' in the GIS data provided by MBRC.

At the commencement of this project MBRC handed over an extensive data set including established 'broad scale' models (including associated results and reporting) as well as several sources of historic flooding information. The purpose of this report is to assess the feasibility of carrying out historic event calibration and validation for the current detailed modelling project. This assessment is based on a review of the data set provided by MBRC.

2. AVAILABLE DATA

Details of the data available for calibration and validation modelling are provided in this section. This includes data provided by MBRC as well as information obtained from websites of the Bureau of Meteorology (BoM).

2.1 Stream Gauge Data

A total of five (5) river gauge stations providing stream data have been identified within the package 1 Minor Basins. These stream gauges now incorporate telemetry and form part of the BoM's flood warning system. Details of the river gauge stations are summarised in Table 1 below and details of the BoM's flood warning system in the vicinity of Package 1 Sub-basins are provided in Appendix 1.

Table 1 Package 1 Sub-basins River Gauge Stations

Gauge No	Station Name	Minor Basin
142800	Baxters Creek Alert	Upper Pine River
142106	Dayboro TM	Upper Pine River
142107	Kobble Creek TM	Upper Pine River
142801	North Pine Dam Alert	Upper Pine River
142803	Lake Kurwongbah Alert	Sideling Creek

Hourly flood level data has been provided by MBRC for the Kobble Creek TM and Dayboro TM gauges for the period ranging from August 1998 up to April 2009 and Lake Kurwongbah Alert gauge for the period ranging from May 1995 to March 2009. However, stream gauge data for Baxters Creek Alert and North Pine Dam Alert gauges has not been provided. It is expected that some form of continuous flood record should also be available for these two gauges.

2.2 Rainfall Data

There are several historic rainfall gauging stations with both continuous ('pluvio' or 'alert' data) and daily recording situated in and around the package 1 Minor Basins. The spatial coverage of these gauges should allow a sufficient representation of historic rainfall patterns associated with the large weather systems which have historically generated regional flooding in the large package 1 Minor Basins. We note that MBRC has supplied a rainfall database containing data for most of the rainfall gauging stations situated in and around Package 1 Minor Basins for the period between 1996 to June 2009.

2.3 Historic Flood Marks

A GIS layer called “OLD CAB Dist Historic Flood Levels’ has been provided by MBRC. However, this data layer does not contain any information relevant to the Package 1 Minor Basins.

No other historical flood mark data has been provided by MBRC and consequently no flood mark data is currently available for the package 1 minor basins.

2.4 Other Data

A GIS layer called “Maximum Height Indicators’ has been provided by MBRC. However, this data layer does not contain any information relevant to the Package 1 Minor Basins.

Another GIS layer called “WQ Event Monitoring Program’ has also been provided by MBRC. This GIS layout provides some historical flood information across MBRC LGA. However, this data layer also does not contain any information relevant to the package 1 Minor Basins.

It is recommended that long term historic flood level data in North Pine Dam and Kurwongbah Dam be sourced.

Several reports by other consultants have also been provided that contain some calibration data.

3. FLOOD EVENTS

3.1 Possible Events for Calibration/Validation

The following historic floods are considered the most appropriate for calibration and validation of the package 1 Minor Basins.

- December 1991: 345 mm rainfall at the Dayboro Post Office over a 50 hour period (peak 6 hour intensity of 31 mm/hr); It is noted that stream gauge data has not been supplied for this historic event.
- May 2009: This flood event started on the 19 May 2009 and finished on the 21 May 2009.It is the most recent flood significantly impacting the Pine River Catchment region (BoM, September 2009). A 420mm total rainfall was recorded in the event at the Baxters Creek Alert gauge station (peak 6 hour intensity of 18mm/hr). The rainfall data provided by MBRC has included this event but the stream gauge data is missing from this event. Nevertheless, it is expected that stream gauge data for this event could be easily sourced from the operating agencies.

It is noted that currently stream gauge data has not been provided for the December 1991 event. Due to the large size of this historic flood it is a desirable calibration event so it is hoped that sufficient flood mark data and stream gauge data can be obtained to enable calibration of this event. If this is not the case an alternative option is to calibrate to the March 2004 for which stream gauge data has been supplied by MBRC.

3.2 Feasibility of Calibration/Validation

There is sufficient rainfall data to carry calibration and validation for package 1 Minor Basins for the events described in Section 3.1 of this report.

The only historic flood level data currently available is associated with the various stream gauges within the region. It is recommended that this data be supplement with historic flood mark data for the two calibration events described in Section 3.1. This will improve the quality of the calibration that be achieved.

4. RECOMMENDATIONS

It is recommended that calibration and validation of the package 1 models be carried out for the events detailed in Section 3.1.

It is recommended that MBRC collect peak flood mark data for the package 1 catchments for the events detailed in Section 3.1.

It is recommended that continuous flood level data be sourced from the stream gauge stations across the UPR and SID Minor Basins (as described in Table 1 of this report) for the May 2009 and the December 1991 rainfall events. If sufficient data is not available for the 1991 event, calibration could be carried out for the more recent yet smaller March 2004 event.

It is recommended that peak flood level data be collected for each of the calibration events detailed in Section 3.1.

It is also recommended that data associated with long term historic flood levels in the North Pine Dam and Kurwongbah Dam be sourced.

5. REFERENCES

i. BoM, November 2009, *"Caboolture, Pine & Surrounding Rivers Flood Warning Network"* http://www.bom.gov.au/hydro/flood/qld/brochures/caboolture/map.shtml

ii. BoM, September 2009, *"Flood Warning System for the Pine & Caboolture Rivers"* http://www.bom.gov.au/hydro/flood/qld/brochures/caboolture/caboolture.pdf

iii. GHD (for MBRC), June 2010, *"Regional Floodplain Database, Sub-project 2K Historic Flood Information"*

iv. GHD (for SEQ Water), July 2009, *"Report for Lake Kurwongbah (Sideling Creek Dam) Flood Hydrology"*

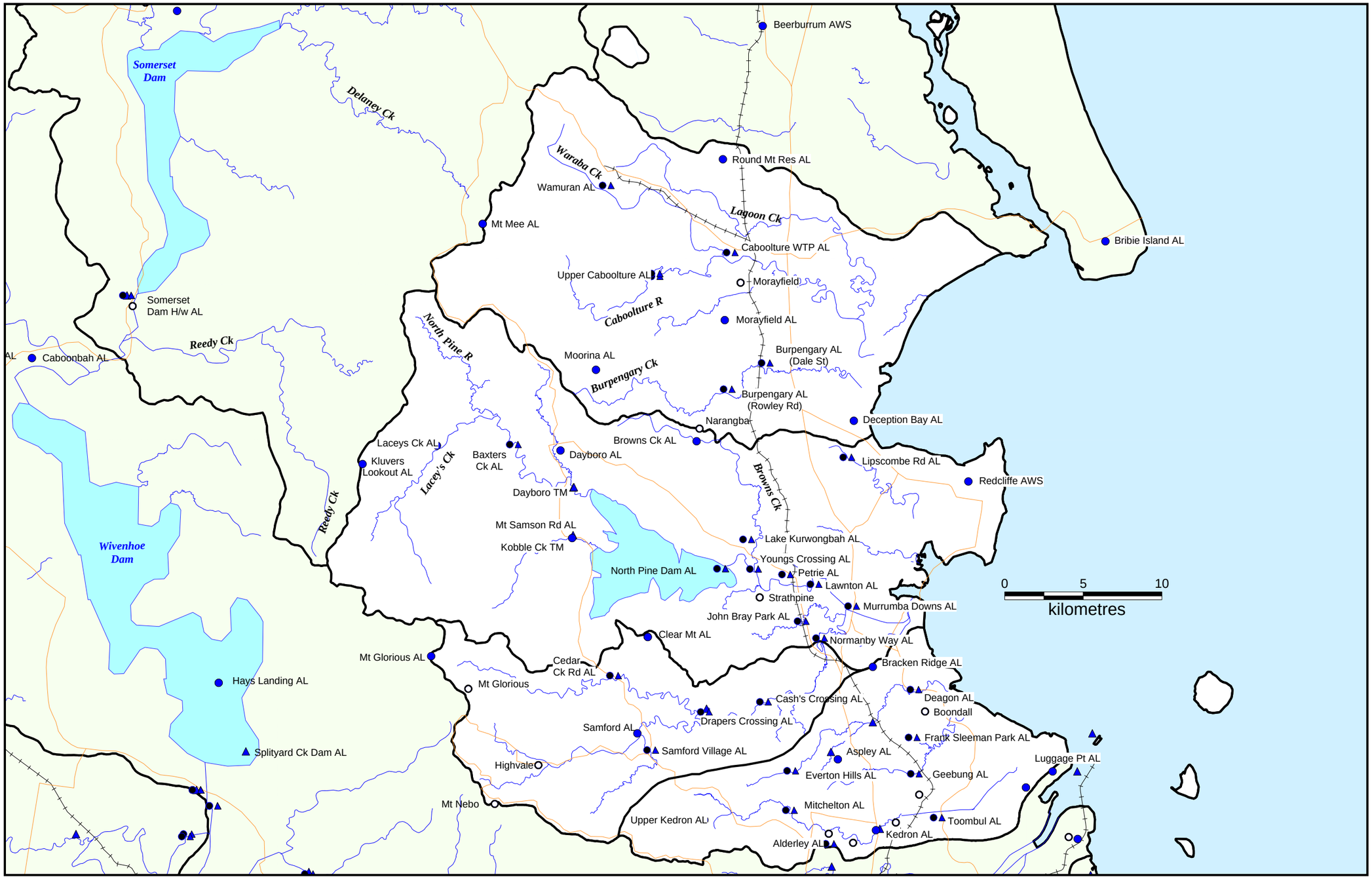
v. John Wilson and Partners (for Pine Rivers Shire Council), May 2005, *"North Pine River Hydrology Final Report"*

vi. SunWater (for SEQ Water), June 2007, *"North Pine Dam, Design Flood Hydrology - DRAFT"*

Appendix 1 - BoM Caboolture, Pine & Surrounding Rivers Flood Warning Network

Australian Government
Bureau of Meteorology

MAP 142.1



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

CABOOLTURE, PINE & SURROUNDING RIVERS

FLOOD WARNING NETWORK

- Major Roads
- Railway

Revised: Nov 2009

r:/pub/maps/map03/map142_1.wor