Australian Government
Bureau of Meteorology

Service Level Specification for Flood Forecasting and Warning Services for Western Australia – Version 3.3

This document outlines the Service Level Specification for Flood Forecasting and Warning Services provided by the Commonwealth of Australia through the Bureau of Meteorology for the State of Western Australia in consultation with the Western Australian Flood Warning Consultative Committee

Service Level Specification for Flood Forecasting and Warning Services for Western Australia

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Cover image: Flooding on Roebuck Plains, Great Northern Highway, Western Australia.
Photo courtesy of: Emma Winter

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1 Introduction

1.1 The purpose of this Service Level Specification is to document and describe the flood forecasting and warning services provided by the Bureau of Meteorology (the Bureau) in Western Australia.

1.2 The Bureau's flood forecasting and warning services are provided within the context of the Total Flood Warning System as defined in the Australian Emergency Manuals Series, Manual 21 Flood Warning (Australian Government, 2009 and illustrated in Figure 1).

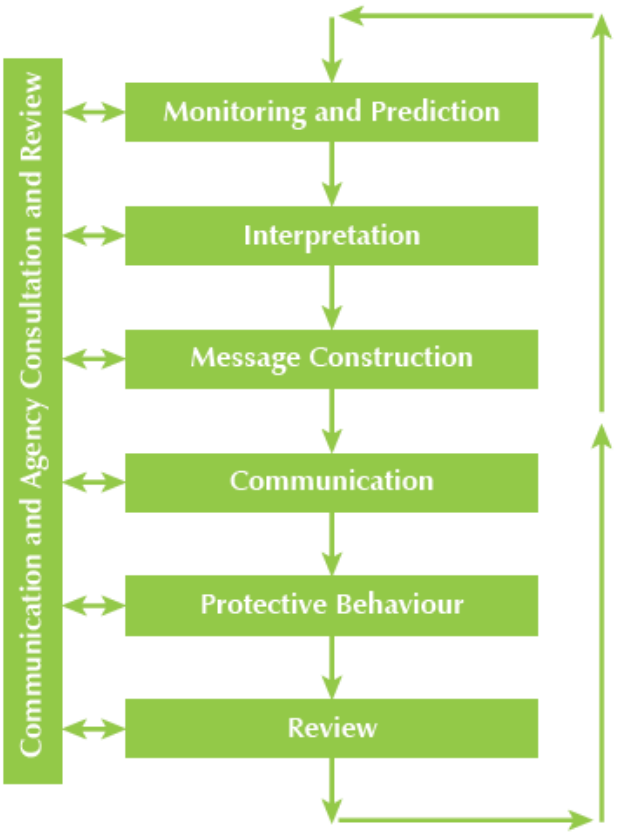

Figure 1: The components of the Total Flood Warning System (Australian Emergency Manual Series, Manual 21 Flood Warning, Australian Government 2009)

1.3 The Total Flood Warning System recognises that a fully effective flood warning service is multi-faceted in nature and its development and operation involves input from a number of agencies each with specialised roles to play. It is vital that the agencies involved work in close cooperation through all stages of developing and operating the system. The services described here are the Bureau's contribution to the Total Flood Warning System.

1.4 The Bureau's main role in the Total Flood Warning System is focussed on monitoring and prediction, and to a lesser extent interpretation, message construction, and communication components (see Appendix A for descriptions). The Bureau also contributes to review activities and takes a role in the planning and coordination activities associated with ensuring that the activities of all agencies and appropriate linkages are well coordinated. The roles and responsibilities of all key stakeholders involved in the provision of a flood warning service in Western Australia are described in the National Arrangements for Flood

Forecasting and Warning (Bureau of Meteorology, 2015)[1] as well as Appendix B of the Government of Western Australia – State Emergency Management Plan for Flood (Westplan - Flood).

1.5 This Service Level Specification is concerned with describing the Bureau's role in the Total Flood Warning System and its interaction with other stakeholders as described in the National Arrangements. This is to ensure that the service the Bureau is providing in support of each of the relevant components of the Total Flood Warning System is understood by the Bureau and other stakeholders.

1.6 A description of the activities that make up the Bureau's flood forecasting and warning services for Western Australia is given in Section 3. This set of activities, associated products and target levels of service constitute the current standard services provided freely by the Bureau. The Bureau also provides supplementary services on a commercial or cost recovery basis but they are not covered in this document.

[1] The National Arrangements for Flood Forecasting and Warning (2015) is available on the Bureau's website: http://www.bom.gov.au/water/floods/index.shtml

2 Flood Warning Consultative Committee

2.1 The Western Australian Flood Warning Consultative Committee provides the Bureau's key stakeholder's with a consultation mechanism for its flood forecasting and warning services. As such, the committee is responsible for reviewing this Service Level Specification on an annual basis or as required. The role of the committee is also covered in Section 1.7.1.1 of Westplan-Flood.

2.2 The overall role of the Western Australian Flood Warning Consultative Committee is to coordinate the development and operation of flood forecasting and warning services in Western Australia, acting as an advisory body to the Bureau and participating State and local government agencies. Membership and terms of reference for this committee in Western Australia are detailed in Schedule 1.

2.3 The Bureau chairs and provides the secretariat support to the Western Australian Flood Warning Consultative Committee, which meets six monthly depending on activity and need.

3 Bureau flood forecasting and warning services

3.1 The scope of services covered by this Service Level Specification is confined to those dealing with riverine flooding caused by rainfall where typical rain-to-flood times are six hours or more. Flash flooding (rain-to-flood times less than six hours) and flooding caused purely by elevated sea levels are not covered, nor are the weather forecasting and other services the Bureau provides that contribute to the flood forecasting and warning service, including Severe Weather and Severe Thunderstorm Warnings, Tropical Cyclone Warnings, provision of radar data and rainfall forecasts.

3.1.1 However, a number of locations have been included in Schedule 2 where the forecast lead times are less than six hours due to them being located in the upper reaches of the catchments.

3.1.2 The schedules listing stations being used for flood forecasting and warning include a number of locations which have been installed primarily for monitoring flash flooding by the councils because of their use in enhancing situational awareness and modelling.

3.2 The nature of the services covered by this Service Level Specification include undertaking the routine catchment monitoring and river height prediction activities necessary for the operation of Total Flood Warning System, as well as issuing and publishing specific warning and data products. These activities are listed below with further detail and associated performance measures provided in subsequent sections.

- Collect and publish rainfall and river level data
- Routine monitoring of flood potential
- Flood modelling and prediction
- Automated information and alerting
- Issue flood watches
- Issue flood warnings
- Communication of flood warnings and flood watches
- Data networks, communications and storage
- Operations
- Maintain systems to collect data and flood information
- Planning and liaison
- Support for emergency management training and training exercises

3.3 Collect and publish rainfall and river level data

3.3.1 The collection and publishing of rainfall and river level data is an important component of the overall service. Apart from use by the Bureau for data analysis and its hydrological modelling for flood predictions, the data is also used by the emergency service agencies, numerous operational agencies, businesses and the public to monitor rainfall and river conditions. To assist in describing the service, the locations where river height; dam, weir or lake level; and tidal observations are made are categorised into three types; namely forecast location (Schedule 2), information location (Schedule 3) and data location (Schedule 4).

- **Forecast location** is a location for which the Bureau provides a forecast of future water level either as the class of flood that is predicted (minor, moderate or major) or as a level and class – refer to Appendix A for definitions. At these locations observed data, flood classifications and additional qualifying information will also be available (Schedule 2).

- **Information location** is a location at which flood classifications are defined and observations of water level data are provided. At these locations forecasts of future water level are not produced. Other key thresholds may be defined and reported against (Schedule 3).

- **Data location** is a location for which just the observed water level data is provided. Flood classifications are not available for these locations and forecasts of future water level are not produced (Schedule 4).

3.3.2 An indicative level of priority has been assigned to each observing site and key communication infrastructure such as radio repeaters (Schedules 2-4 and 7-9) based on a three tiered scheme (Table 1**Error! Not a valid bookmark self-reference.**). The priority level is based on the expected impact to the Bureau's services. The impacts identified are the expected outcome of a service outage at that site during a flood emergency. Impact is described in terms of forecast performance and the Bureau's ability to provide a flood warning service. Note that the scope of this priority scheme is limited to consideration of the requirements of forecasting and prediction only and should not be confused with any other priority assigned to that site by third party owners or other users.

Priority Level	Impact on performance	Impact on service delivery	Description
High	Very difficult to meet target	Direct and significant high level impact for the site and/or downstream locations	Degradation of service highly likely.
Medium	Difficult to meet target	Some impact for the site and/or downstream locations.	Possible degradation of service.
Low	Not likely to affect meeting targets	Little impact on the site and/or downstream location	No change in service. Lower possibility of degradation of service.

Note*:* Multiple outages within a given network will lead to higher impact levels and greater service degradation. Table 1 indicates the effect of a single site failure within an otherwise functional network.

3.4 Routine monitoring of flood potential

3.4.1 The Bureau will maintain an awareness of catchment conditions and monitor the potential for riverine flooding. This monitoring activity will be supported by the Bureau's weather services as required and is an activity undertaken to plan future flood operations.

3.5 Flood modelling and prediction

3.5.1 The Bureau will develop and maintain prediction systems for the forecast locations listed in Schedule 2.

3.5.2 The Bureau prediction systems can include real-time hydrologic models, simple peak to peak correlations and other hydrologic techniques as appropriate.

3.5.3 The Bureau prediction systems will be maintained and updated following significant events or when new data becomes available.

3.5.4 The target level of performance for the prediction at each forecasting location is given in Schedule 2.

3.6 Automated information and alerting

3.6.1 Automated information and alerting is not applicable in Western Australia.

3.7 Issue flood watches

3.7.1 The Bureau will issue flood watches when the combination of forecast rainfall and catchment conditions indicates flooding is possible. The catchments and basins covered by flood watches include all those listed in Schedule 10. Note that flood watches may cover catchments that do not have established flood warning services.

3.7.2 The primary purpose of a flood watch is to provide early advice to communities and the relevant emergency service organisations of the potential flood threat from a developing weather situation. Typically, a flood watch is issued 1 to 4 days before an anticipated flood event depending on the confidence in rainfall forecasts.

3.7.3 Flood watches will be communicated by the Bureau using the dissemination methods detailed in Section 3.9.

3.8 Issue flood warnings

3.8.1 In general flood warnings are issued based on the following criteria:

- The river level of at least one forecast location (listed in Schedule 2) is expected to reach and or exceed or has exceeded the minor flood level;
- The flood class levels or trigger heights defined at forecast locations are expected to be exceeded (refer to Schedule 2);
- The flood class levels defined at information locations are exceeded (refer to Schedule 3).

The specific initiating criteria, if any, for each flood warning product is listed in Schedule 10

3.8.2 Flood warnings may include either **qualitative** or **quantitative** predictions at forecast locations or a statement about future flooding in more **generalised** terms as outlined in Table 2. The type of prediction included is commensurate with user requirements, the availability of real time rainfall and river level data, and the capability of available flood prediction systems. A flood warning may contain **generalised, quantitative** and **qualitative** predictions and typically start with more **generalised** information and become more specific as data becomes available as the event develops and progresses.

3.8.3 **Quantitative** predictions include expected flood class (minor, moderate or major) with more specific information on the height and time of water levels at the forecast locations identified in Schedule 2. A **quantitative** prediction can be a specific level, or a range of levels, and has detailed timing down to blocks of a minimum of 3-6 hours. **Quantitative** predictions are based on all available information at the time of warning issue. The target lead time of the river height prediction for each forecast location where **quantitative** predictions are provided is given in Schedule 2. For an example of a **quantitative** prediction refer to Table 2.

3.8.3.1 For the Bureau to be able to provide a **quantitative** prediction at a location, it is essential to have a suitable network of rainfall and river level sites upstream with data coming in real time, sufficient historical data to calibrate the flood forecasting model, a reliable rating table and documented flood impacts and flood classifications.

3.8.4 **Qualitative** predictions include expected flood class (minor, moderate or major) and timing of flooding at the forecast locations identified in Schedule 2. The timing is indicated in blocks of six, 12 or 24 hours, using the terms such as early morning, afternoon or overnight. Such predictions are based on all available information at that time and may include advice on the peak classification that is expected or has occurred at that location. The target lead time for each forecast location where only **qualitative** predictions are provided are given in Schedule 2. For an example of a **qualitative** prediction refer to Table 2

3.8.4.1 For the Bureau to be able to provide a **qualitative** prediction at a location, it is essential to have at least some rainfall and river level sites upstream of the location with data coming in real time, at least some historical flood data to calibrate the flood forecasting model, a reasonable rating table and documented flood impacts and flood classifications.

3.8.5 The Bureau may also issue flood warnings with more **generalised** predictions and information when there are not enough data to make specific predictions or in the developing stages of a flood. These warnings contain generalised statements advising that flooding is expected and may include forecast trend (rising or falling) (for examples refer to Table 2).

3.8.6 The typical target accuracy of a **quantitative** water level prediction is that 70% are within 0.3 or 0.6 metres of the observed water level. Specific accuracy targets by location are defined in Schedule 2. Achievement of these targets is not possible in all floods or at all locations. In general predictions of a flood peak are more accurate than “reach” or “exceed” predictions that are issued during the developing stages of a flood. This is due to uncertainty of future rainfall rates and/or upstream floodplain behaviour that are used when making those predictions.

3.8.7 A list of the flood warnings issued in Western Australia, along with the basin/river to which they apply is included in Schedule 10. Details about forecast locations in each basin/river are included in Schedule 2.

3.8.8 Flood warning summaries – A summary of flood watches and warnings that are current is provided to help media and other users readily access information.

Table 2. Prediction type description

Prediction Type	Height prediction	Time of prediction	Example
Quantitative	Numerical prediction - Any Height - Peak Height Can refer to flood class	More specific, typically in blocks of 3 to 6 hours	The Gascoyne River at Nine Mile Bridge is likely to exceed 6.5 metres with moderate flooding by 3pm Saturday before peaking late Saturday night. The Gascoyne River at Nine Mile Bridge is expected to peak near 7.7 metres (major flooding) about 6pm Sunday.
Qualitative	Refers to flood class (minor, moderate or major)	Range of times (6, 12 or 24 hour blocks)	Minor to moderate flooding is expected to continue in the Murray River at Pinjarra during Saturday

			afternoon and the river level is expected to peak early Sunday morning.
Generalised	No height prediction - forecast trend (rising or falling)	Range of times (24 hour blocks)	Widespread local flooding is expected to continue during Saturday in the Ludlow and Capel River catchments with further rises likely as the second peak moves through the area.

3.9 Communication of flood warnings and flood watches

3.9.1 Flood watches and warnings will be issued directly to a list of stakeholders with emergency management responsibilities. The list is maintained by the Bureau but is not detailed in this document. The direct dissemination methods supported include email, fax and internet protocols such as File Transfer Protocol (FTP).

3.9.2 The format of messaging in flood related products will conform to a nationally consistent standard determined by the Bureau, in consultation with the Flood Warning Consultative Committee.

3.9.3 Flood watches and warnings are also communicated via:

3.9.3.1 **Radio:** Radio stations, particularly the ABC, broadcast flood warning information as part of their news bulletins, or whenever practicable. This form of broadcast may be covered in separate agreements between the Bureau and broadcasters.

3.9.3.2 **Weather warning service:** Flood warning information is recorded on a contracted telephone information service. Calls to this service incur a fee-for-service charge.

3.9.3.3 **Internet:** Flood watches and warnings are published on the Bureau's public web site and available by File Transfer Protocol (FTP) and Rich Site Summary (RSS) along with related rainfall and river level information (see 3.12).

3.9.3.4 **Social Media:** The Bureau endeavours to issue Tweets related to flood watches, flood warnings and relevant information, subject to operational constraints and in connection with other weather information. The Bureau website remains the main platform for the publishing of flood information.

3.9.4 Emergency management partners[2] and media can also access flood level and warning information directly from the Bureau Flood Warning Centre and Bureau National Operations Centre, subject to operational constraints. The Bureau does not publish to the public the contact details for the Flood Warning Centres and Bureau National Operations Centre.

3.10 Data networks, communications and storage

3.10.1 The services to be provided by the Bureau under this Service Level Specification depend on provision of data from networks of stations owned and operated by the Bureau and partner agencies. Permanent or temporary loss of real time data may

[2] Emergency management partners include those organisations that have an emergency management responsibility for the wider community (e.g. State Emergency Services)

necessitate a downgrading of the flood warning service from **quantitative** predictions to **qualitative** or then **generalised**.

3.10.2 The Bureau contribution to this network of stations includes:

- The operation and maintenance of equipment at the sites which are fully owned and maintained by the Bureau as listed in Schedule 7.
- Assisting with maintenance of equipment for other agencies at the sites listed in Schedule 8.
- Operating and maintaining Bureau-owned equipment at sites where this equipment is co-located at a site owned by another agency Schedule 9.

3.10.3 Where the site is owned or operated by other parties, installation, maintenance and repairs of Bureau equipment will depend on adequate access being provided to the Bureau and any of its contractors. The Bureau will confirm access arrangements with relevant land owners before entering the premises. The Bureau also requires that the site operators provide timely advice regarding any possible faults or other issues affecting the performance of the data network.

3.10.4 The flood forecasting and warning service for Western Australia also depends on the provision of data from partner agency data networks. The provision of these data for each of the agencies concerned is detailed in a Data Sharing Agreement between the Bureau and each partner (Schedule 6).

3.10.5 The Bureau will maintain the essential set of metadata describing the network of stations and related infrastructure regarding the Bureau's component of the data network, along with metadata required to inform the data ingest process for partner agency related networks and sites.

3.10.6 The Data Sharing Agreements are intended to reflect operational arrangements and are not legally binding and allow multiple agreements between individual and/or multiple agencies.

3.10.7 The parties agree to the provision of data as set out in the Data Sharing Agreements during periods of routine site operation and increased frequency during flood periods.

3.10.8 Data transfer protocols and conditions regarding fitness for purpose as provided by each stakeholder will be adhered to as set out in the Data Service Agreements for data provision.

3.10.9 The sharing of data as set out in the Data Sharing Agreements can be amended by following the process described in the agreement.

3.10.10 The Bureau has developed special purpose software (Enviromon) for collecting, alarming, storing, on-forwarding and display of data from Event-Reporting Radio Telemetry Systems (ERRTS) (field equipment) based on Automated Local Evaluation in Real Time (ALERT) data protocol.

3.10.11 The Bureau provides a range of supplementary services associated with Enviromon, including: installation of Enviromon software; the commissioning of an Enviromon base station or maintenance and support; and onsite Enviromon training. However, software licensing and limited support for Enviromon base stations listed in Schedule 5 is currently a standard service (free of charge).

3.11 Operations

3.11.1 The Bureau will use reasonable endeavours to provide a 24 hours a day, seven days a week operational systems capability necessary to support flood warning operations. This will include on-line computer and data ingestion systems, along with appropriate communications infrastructure.

3.11.2 The Bureau operates a regional Flood Warning Centre in each capital city and a Bureau National Operations Centre in Melbourne on an as-required basis.

3.11.3 Through the regional Flood Warning Centre and Bureau National Operations Centre, the Bureau will provide operational coverage for up to 24 hours per day during flood events, subject to event requirements and operational constraints. The Bureau will advise its key emergency management clients of any impact in services if it is unable to provide sufficient staff coverage to meet the service levels set out in the Service Level Specification (see also 4.2).

3.11.4 Staff in the Bureau National Operations Centre will support regional operations either remotely or by providing additional capacity to a regional Flood Warning Centre where reasonably possible during significant and long duration events. When necessary, staff from regional offices in areas not impacted by current flooding will endeavour to assist.

3.11.5 The Bureau will maintain an internal catchment directive for each catchment where a warning service is provided. The catchment directive documents and describes the forecast process for the particular catchment and includes flood intelligence information, flood history, contact details for partners with local knowledge and warning issue criteria.

3.11.6 The operation of the Flood Warning Centres will endeavour to be compliant with the fatigue management guidelines developed under the Bureau's Work Health and Safety procedures. Particular attention to fatigue management will be provided during the management of extreme events. The requirement to comply with these guidelines applies to all personnel present at these centres.

3.11.7 The Bureau will assist in meeting the needs of the Australian Government Crisis Coordination Centre. The Bureau will use reasonable endeavours to support and participate in relevant critical event briefings as resources permit.

3.12 Maintain systems to collect data and flood information

3.12.1 The Bureau will maintain the systems to ingest all data being gathered through the special purpose flood warning data network.

3.12.2 The river height and rainfall data received by the Bureau will be published as soon as practicable (the data are supplied at different frequencies and by various methods) upon receipt into Bureau operational systems. This data will be published in the form of data tables, maps and plots and will also be included in warnings and alerting messages and used in modelling systems.

3.12.3 Data collected in Bureau systems will be available for use by the Bureau as it requires and for distribution to the public on suitable open source licence terms[3].

3.12.4 The Bureau will continue to collect and update the flood background information on floods contained on its website. These include survey information, flood history and flood event reports, catchment maps and brochures.

3.13 Planning and liaison

3.13.1 The Bureau undertakes a range of routine planning, maintenance and liaison activities that support the Total Flood Warning System. This includes contributing to related flood risk management activities within the State or Territory impacting on, or related to flood warning along with the ongoing coordination and liaison activities essential to the smooth operation of the Total Flood Warning System.

3.14 Support for emergency management training and exercises

3.14.1 The Bureau will, within operational constraints, endeavour to support and participate in relevant disaster management activities outside of flood operational periods, including training exercises and flood response planning.

[3] Please refer to the Creative Commons License:
http://www.bom.gov.au/water/regulations/dataLicensing/ccLicense.shtml

4 Level of service and performance reporting

4.1 Achievable levels of service provided by the Bureau are dependent on many factors including adequate access to Bureau equipment where located on sites owned by other agencies, data availability in near real time from Bureau and partner agencies, modelling and prediction capability, geomorphology of the catchment and meteorological considerations such as rainfall patterns.

4.2 If during a flood event the achievable service level is expected to be reduced, for any reason below the target level as stated in this Service Level Specification, the Bureau will inform the key emergency management clients in Western Australia of the reduced service level via email and phone.

4.3 The Bureau's performance of service will be reviewed and reported on within the context of the Total Flood Warning System annually using a standard report performance structure based on the performance indicators and the service levels defined in Schedule 2.

4.4 The annual performance of service report will be tabled at the last Flood Warning Consultative Committee meeting of the calendar year. This report will be published on the Bureau website.

4.5 Event based performance reports with more detailed technical information may also be produced for significant and high profile events.

5 Limitations of service

5.1 Performance of services provided under this document are subject to:

(a) The availability of funds and human resources of the Bureau and its partner agencies and changes to organisational policies that may affect the terms and conditions of the Service Level Specification.

(b) Circumstances beyond the control of the Bureau including where the performance is the responsibility of another entity.

(c) The existence of a reliable and ongoing supply of quality real time rainfall, water level and flow data.

(d) The reliable and ongoing availability of the computing and communication infrastructure required for the performance of the services.

(e) Adequate communication between the Bureau and all relevant partners under this Service Level Specification and related Data Sharing Agreements and any other agreement relevant to it including on any faults or issues.

5.2 In Western Australia there is one key document that describes the State's arrangements for flood warning and flood risk management. This Service Level Specification does not replace or reduce the value of this document. The document is:

(a) State Emergency Management Plan for Flood (Westplan-Flood), August 2015, Department of Fire and Emergency Services.

6 Service Level Specification consultation, review and updating

6.1 The initial and annual process for acceptance of this Service Level Specification will be:

6.1.1 The Flood Warning Consultative Committee members will be provided with the draft or amended Service Level Specification in advance of a special or scheduled committee meeting.

6.1.2 The members of the Flood Warning Consultative Committee will distribute the draft or amended Service Level Specification within their organisations and provide feedback from their organisation at the committee meeting.

6.1.3 After consultation and discussion at the Flood Warning Consultative Committee meeting, the Bureau will update the Service Level Specification.

6.1.4 The Chair of the Flood Warning Consultative Committee (Bureau's Regional Director) will accept and sign the document on behalf of the committee.

6.1.5 The Assistant Director Water Forecasting Services will sign the Service Level Specification on behalf of the Director of Meteorology.

6.1.6 The Bureau will then distribute the Service Level Specification to all members of the Flood Warning Consultative Committee and publish a copy on the Bureau website.

6.2 The schedules of this Service Level Specification will be reviewed annually and either updated following review, or when a significant change is made that impacts on the level of services described in this document. Updates to this document will be recorded in Schedule 11.

6.3 Any changes to the categorisation of a location into data, information or forecast location or to the level of services described in this document will be through a consultative process using agreed arrangements in Western Australia coordinated by the Flood Warning Consultative Committee.

7 Signature of parties

7.1 This Service Level Specification has been prepared by the Bureau of Meteorology in consultation with the Western Australia Flood Warning Consultative Committee.

…….. ……

Mike Bergin Date
Chair of Western Australia Flood Warning Consultative Committee, and
State Manager – Western Australia
Bureau of Meteorology

…….. ……

Jeff Perkins Date
Acting General Manager Public Safety
Bureau of Meteorology

Schedule 1: Flood Warning Consultative Committee

The Western Australia Flood Warning Consultative Committee was formed in 1989. The Committee's role is to coordinate the development and operations of the State's flood forecasting and warning services. It is an advisory body and reports to the Bureau of Meteorology and participating state and local government agencies twice each year. The membership includes:

- Bureau of Meteorology (Chair/Secretariat)
- representative(s) of Department of Fire and Emergency Services (Hazard Management Agency for flood);
- representative(s) of Department of Water;
- representative(s) of Water Corporation;
- representative(s) of Main Roads Western Australia;
- representative(s) of Department of Agriculture and Food;
- representative(s) of WA Housing Authority
- representative(s) of Landgate (Satellite Remote Sensing Service)
- representative(s) of Department of Planning
- representative(s) of Western Australian Local Government Association; and
- other agencies as seconded by the Chair

Representative(s) from other government agencies may include (e.g. Department of Planning and Infrastructure – Marine Information, Department of Park and Wildlife, etc.), academic institutions, industry or specific communities may be invited to work with the Committee to work on particular issues, problems and solutions.

The nationally consistent Terms of Reference for Flood Warning Consultative Committees are:

1. Identify requirements and review requests for new and upgraded forecasting and warning services
2. Establish the priorities for the requirements that have been identified using risk based analyses of the Total Flood Warning System.
3. Review and provide feedback on the Service Level Specification for the Bureau's Flood Forecasting and Warning services on an annual basis
4. Coordinate the implementation of flood warning systems in accordance with appropriate standards.
5. Promote effective means of communication of flood warning information to the affected communities
6. Monitor and review the performance of flood forecasting and warning services.
7. Build awareness and promote the Total Flood Warning System concept.

Schedule 2: Forecast locations and levels of service

Column definitions:

Bureau number: Refers to the unique number assigned to a particular station by the Bureau

Forecast location: Is the specific location that will be referred to in flood warnings (refer 3.3.1)

Station owner: Refers to the owning and operating agency of the station. The Bureau may co-own stations. (refer Schedules 7 and 8)

Gauge type: Either manual (read by human) or automatic (ERTS, IP (Next G and satellite and dial-up telemetry)

Flood classification: For definitions please refer to Appendix A.2.

Prediction type: The type of warning service that particular location can expect. (refer 3.8)

Target warning lead time: The minimum lead time that will be provided before the height or the flood class level given is exceeded (refer 3.8)

Target peak accuracy: The error within which peak river level height is predicted (refer 3.8.7)

Priority: The impact a temporary or permanent loss of site will have on service delivery and in meeting performance targets (refer 3.3.2)

Bureau number	Forecast location	Station owner	Gauge type	Flood classification (m)			Prediction type	Target warning lead time		70% of peak forecasts within	Priority
				Minor	Moderate	Major		Time (hours)	Trigger height (m)		
802 – Fitzroy River (WA)											
503014	Fitzroy Crossing	Department of Water	Automatic	9.5	11.0	12.5	Qualitative	15	Minor	n/a	High
503007	Noonkanbah	Department of Water	Automatic	9.5	12.0	13.0	Qualitative	15	Minor	n/a	High
503013	Willare Crossing	Department of Water	Automatic	8.0	8.8	9.2	Qualitative	48	Minor	n/a	High
710 – De Grey River											
504000	Coolenar Pool (Great Northern Highway)	Department of Water	Automatic	5.5	6.0	8.0	Qualitative	48	Minor	n/a	High
706 – Ashburton River											
505000	Nanutarra	Department of Water	Automatic	6.0	7.5	8.0	Qualitative	24	Minor	n/a	High

Bureau number	Forecast location	Station owner	Gauge type	Flood classification (m)			Prediction type	Target warning lead time		70% of peak forecasts within	Priority
				Minor	Moderate	Major		Time (hours)	Trigger height (m)		
704 – Gascoyne River											
506012	Jimba	Department of Water	Automatic	4.0	7.0	8.0	Qualitative	12	Minor	n/a	High
506011	Fishy Pool	Department of Water	Automatic	4.5	9.0	11.0	Quantitative	12	Minor	+/- 0.5m	High
506000	Nine Mile Bridge	Department of Water	Automatic	5.5	6.5	7.6	Quantitative	24	Minor	+/- 0.5m	High
701 – Greenough River											
508036	Eradu	Department of Water	Automatic	3.5	4.2	5.0	Qualitative	24	Minor	n/a	High
508020	Karlanew	Department of Water	Automatic	2.5	3.5	4.5	Qualitative	24	Minor	n/a	High
508032	Mountain Bridge	Department of Water	Automatic	4.5	6.5	7.0	Qualitative	6	Minor	n/a	High
617 – Moore-Hill Rivers											
508000	Moora Caravan Park	Department of Water	Automatic	3.0	3.5	4.0	Qualitative	6	Minor	n/a	High
616 – Swan Coast											
509438	Walyunga	Department of Water	Automatic	3.5	7.0	7.5	Quantitative	24	Minor	+/- 0.5m	High
509440	Barrack Street Jetty	Department of Transport	Automatic	1.6	2.0	2.5	Qualitative	24	Minor	n/a	High
615 – Avon River											
510507	Beverley	Department of Water	Automatic	1.5	2.0	2.5	Qualitative	12	Minor	n/a	High
510059	York	Department of Water	Automatic	2.5	3.0	4.0	Qualitative	12	Minor	n/a	High
510061	Northam	Department of Water	Automatic	1.5	1.8	2.0	Quantitative	12	Minor	+/- 0.5m	High
510060	Toodyay	Department of Water	Automatic	4.0	5.0	6.0	Quantitative	12	Minor	+/- 0.5m	High
714 – Murray River											
509542	Pinjarra	Department of Water	Automatic	6.5	7.0	8.0	Qualitative	12	Minor	n/a	High
611 – Preston River											
509525	Donnybrook	Department of Water	Automatic	3.5	4.5	5.0	Qualitative	6	Minor	n/a	High
509524	Boyanup Bridge	Department of Water	Automatic	3.0	3.5	4.0	Qualitative	12	Minor	n/a	High
609 – Blackwood River											
509517	Bridgetown	Department of Water	Automatic	3.5	4.2	6.0	Qualitative	12	Minor	n/a	High
509518	Nannup	Department of Water	Automatic	5.5	7.0	8.0	Qualitative	12	Minor	n/a	High

Notes:

- All levels are in metres to local gauge datums unless indicated otherwise.
- AHD - Australian Height Datum. See Geoscience Australia for further information.
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Schedule 3: Information locations with flood class levels defined

Bureau number	Station name	Station owner	Gauge type	Flood classification (m)			Priority
				Minor	Moderate	Major	
809 – Ord River							
501000	King River at Cockburn North	Department of Water and Environmental Regulation	Automatic	2	2.5	3	Medium
502000	Ord River at Tarrara Bar	Department of Water and Environmental Regulation	Automatic	6	10	12	Medium
502010	Wilson River at Odonnell Range	Department of Water and Environmental Regulation	Automatic	5	6.5	8.2	Medium
502015	Ord River at Bedford Downs	Department of Water and Environmental Regulation	Automatic	6.5	7.5	8	Medium
502028	Ord River at Old Ord Homestead	Department of Water and Environmental Regulation	Automatic	6.5	10	15	Medium
502029	Dunham River at Flying Fox Hole	Department of Water and Environmental Regulation	Automatic	6.5	10	12	Medium
502031	Dunham River at Dunham Gorge	Department of Water and Environmental Regulation	Automatic	8	10	12	Medium
514825	Negri River at Mistake Ck Homestead	Department of Water and Environmental Regulation	Automatic	6.8	10	15	Medium
501029	Moochalabra Cr at Moochalabra Dam	Department of Water and Environmental Regulation	Automatic	6.8	2.5	3	Medium
802 – Fitzroy River							
502001	Leopold River at Mount Winifred	Department of Water and Environmental Regulation	Automatic	7.5	9	10	Medium
502005	Margaret River at Mount Krauss	Department of Water and Environmental Regulation	Automatic	6.5	8	11	High
502006	Margaret River at Me No Savvy	Department of Water and Environmental Regulation	Automatic	7	9	12	Medium
502024	Hann River at Phillips Range	Department of Water and Environmental Regulation	Automatic	6.5	9	12	Medium
502027	Fitzroy River at Dimond Gorge	Department of Water and Environmental Regulation	Automatic	6.5	9	12	High
502059	Margaret River at Margaret Gorge	Department of Water and Environmental Regulation	Automatic	6.5	8	9.5	Medium
503000	Christmas Creek at Homestead	Department of Water and Environmental Regulation	Automatic	4	6	7.5	Medium
503012	Fitzroy River at Looma	Department of Water and Environmental Regulation	Automatic	7.5	9	10	Medium
503017	Fitzroy River at Fitzroy Barrage	Department of Water and Environmental Regulation	Automatic	7	9	10	Medium
710 – De Grey River							
504016	Nullagine River at Nullagine	Department of Water and Environmental Regulation	Automatic	0.8	3	4	Medium
504035	Shaw River at North Pole Mine	Department of Water and Environmental Regulation	Automatic	1	3	5	Medium
504036	Nullagine River at Tumbinna Pool	Department of Water and Environmental Regulation	Automatic	1.5	3.5	4	Medium

Bureau number	Station name	Station owner	Gauge type	Flood classification (m)			Priority
				Minor	Moderate	Major	
710 – De Grey River (continued)							
504037	Coongan River at Marble Bar	Department of Water and Environmental Regulation	Automatic	1	2.5	3.5	Medium
504039	Oakover River at Ripon Hills Rd	Department of Water and Environmental Regulation	Automatic	1.5	5	8	Medium
504040	Shaw River at Marble Bar Rd	Department of Water and Environmental Regulation	Automatic	1.5	2.5	3	Medium
504041	Coongan River at Marble Bar Rd	Department of Water and Environmental Regulation	Automatic	2	2.8	3.8	Medium
709 – Port Hedland Coast							
504017	Yule River at Jelliabidina Well	Department of Water and Environmental Regulation	Automatic	2.5	5	6	Medium
505042	Maitland River at Miaree Pool	Department of Water and Environmental Regulation	Automatic	2	5	7	Low
708 – Fortescue River							
507011	Fortescue River at Newman Rd Br	Department of Water and Environmental Regulation	Automatic	4	6	7.5	Medium
505039	Fortescue River at Gregory Gorge	Department of Water and Environmental Regulation	Automatic	4.5	6	7	Medium
505039	Fortescue River at Bilanoo Pool	Department of Water and Environmental Regulation	Automatic	4	7	8	Medium
707 – Onslow Coast							
505055	Cane River at Toolungu	Department of Water and Environmental Regulation	Automatic	3	5	6	Medium
706 – Ashburton River							
507002	Ashburton River at Capricorn Range	Department of Water and Environmental Regulation	Automatic	5.2	8	10	High
705 – Lyndon-Minilya River							
506004	Minilya River at Minilya Bridge	Department of Water and Environmental Regulation	Automatic	3	4	4.5	Medium
704 – Gascoyne River							
506013	Lyons River at Lyons River Xing	Department of Water and Environmental Regulation	Automatic	1.5	5	6	High
506016	Gascoyne River at Pells Island	Department of Water and Environmental Regulation	Automatic	2.5	3.8	4.5	Medium
507000	Gascoyne River at Yinnetharra Xing	Department of Water and Environmental Regulation	Automatic	3	4.5	5.5	Medium
702 – Murchison River							
508021	Murchison River at Emu Springs	Department of Water and Environmental Regulation	Automatic	5	6	7	Medium
701 – Greenough River							
508017	Greenough River at Pindarring Rocks	Department of Water and Environmental Regulation	Automatic	2	2.5	3	Medium

Bureau number	Station name	Station owner	Gauge type	Flood classification (m)			Priority
				Minor	Moderate	Major	
701 – Greenough River (continued)							
508037	Greenough River at Mitthutharra	Department of Water and Environmental Regulation	Automatic	2.5	6.5	7.5	High
508038	Irwin River at Yatharagga	Department of Water and Environmental Regulation	Automatic	4	6	7	Medium
508039	Lockier River at Mingenew	Department of Water and Environmental Regulation	Automatic	2.5	4	4.5	Medium
508303	Irwin River at Strawberry Bridge	Department of Water and Environmental Regulation	Automatic	4	6	7	High
617 – Moore-Hill River							
508000	Moore River Nth at Moora Caravan Park	Department of Water and Environmental Regulation	Automatic	3	3.5	4	High
508030	Moore River Nth at Long Pool Br	Department of Water and Environmental Regulation	Automatic	1.2	2	3	Medium
508035	Moore River Nth at Nardy Road	Department of Water and Environmental Regulation	Automatic	1	1.2	1.6	Medium
509168	Hill River at Hill River Springs	Department of Water and Environmental Regulation	Automatic	1.5	2	2.5	Medium
509381	Moore River at Quinns Ford	Department of Water and Environmental Regulation	Automatic	3.5	4.5	5	Medium
509418	Hill River at Ardross	Department of Water and Environmental Regulation	Automatic	2.5	2.8	3.5	Medium
509419	Gingin Brook at Bookine Bookine	Department of Water and Environmental Regulation	Automatic	1.4	1.8	2	Medium
509421	Moore River at Waterville Road	Department of Water and Environmental Regulation	Automatic	2	2.7	3	Medium
509427	Gingin Brook at Gingin	Department of Water and Environmental Regulation	Automatic	1	1.5	2	Medium
615 – Avon River							
510514	Avon River at Boyagarra Rd	Department of Water and Environmental Regulation	Automatic	2.2	2.5	3	Medium
510000	Mortlock River North at Frenches	Department of Water and Environmental Regulation	Automatic	1.9	2.2	2.5	High
510035	Mortlock River at ODriscolls Farm	Department of Water and Environmental Regulation	Automatic	1.8	2.2	2.5	High
510058	Salt River at Qualandary Crossing	Department of Water and Environmental Regulation	Automatic	2.2	2.5	3	High
510508	Dale River at Waterhatch Br	Department of Water and Environmental Regulation	Automatic	2	2.5	3	High
510524	Avon River at Bells Farm	Department of Water and Environmental Regulation	Automatic	1.5	2.5	3	Medium
616 – Swan Coast							
509063	Southern River at Anaconda Drive	Department of Water and Environmental Regulation	Automatic	3	3.5	4	Medium
509376	Wooroloo Brook at Karls Ranch	Department of Water and Environmental Regulation	Automatic	2.2	2.6	3.2	High
509378	Swan River at Meadow Street Br	Department of Water and Environmental Regulation	Automatic	2	3.5	4	High
509379	Canning River at Seaforth	Department of Water and Environmental Regulation	Automatic	3	4	5	High

Bureau number	Station name	Station owner	Gauge type	Flood classification (m)			Priority
				Minor	Moderate	Major	
616 – Swan Coast (continued)							
509447	Brockman River at Tanamerah	Department of Water and Environmental Regulation	Automatic	2.5	3.5	4.5	Medium
509456	Jane Brook at National Park	Department of Water and Environmental Regulation	Automatic	1	1.5	2	Medium
509457	Ellen Brook at Railway Parade	Department of Water and Environmental Regulation	Automatic	1.8	2	2.5	Medium
509458	Helena River at Poison Lease	Department of Water and Environmental Regulation	Automatic	2	2.5	3	Medium
509459	Helena Brook at Trew Road	Department of Water and Environmental Regulation	Automatic	1	1.2	1.4	Medium
509471	Darkin River at Pine Plantation	Department of Water and Environmental Regulation	Automatic	1	1.5	2	Medium
509484	Canning River at Kent St Weir	Department of Water and Environmental Regulation	Automatic				
510523	Brockman River at Yalliawirra	Department of Water and Environmental Regulation	Automatic	3.5	7	7.5	High
614 – Murray River							
509129	Marrinup Brook at Brookdale Siding	Department of Water and Environmental Regulation	Automatic	1.6	1.8	2.2	Medium
509295	Serpentine Drain at Dog Hill	Department of Water and Environmental Regulation	Automatic	2	2.5	3	Medium
509428	Peel Main Drain at Karnup Road	Department of Water and Environmental Regulation	Automatic	1.4	1.8	2.2	Medium
509541	Murray River at Baden Powell Spout	Department of Water and Environmental Regulation	Automatic	4.5	6	7	High
509544	Williams River at Saddleback Rd Br	Department of Water and Environmental Regulation	Automatic	3	5.5	6.5	High
509545	Hotham River at Marradong Road Br	Department of Water and Environmental Regulation	Automatic	3.5	4.5	5	High
510521	Crossman River at Rivendale	Department of Water and Environmental Regulation	Automatic	2	3	4	Medium
613 – Harvey River							
509119	Harvey River at Dingo Road	Department of Water and Environmental Regulation	Automatic	3	3.6	4	Medium
509557	Meredith Drain at Johnston Rd	Department of Water and Environmental Regulation	Automatic	n/a	n/a	n/a	n/a
612 – Collie River							
509529	Collie River East at Coolangatta	Department of Water and Environmental Regulation	Automatic	3.5	5	6	Medium
509534	Collie River at Buckingham Mill	Department of Water and Environmental Regulation	Automatic	3.5	4	4.5	Medium
509539	Collie River East at James Crossing	Department of Water and Environmental Regulation	Automatic	2	2.5	3	Medium
509530	Collie River at Mungalup Tower	Department of Water and Environmental Regulation	Automatic	2.8	4.5	5.5	Medium
509532	Collie River South at Collie	Department of Water and Environmental Regulation	Automatic	1.8	2.2	2.4	Medium
509533	Collie River at Collie	Department of Water and Environmental Regulation	Automatic	3.5	4	4.8	Medium

Bureau number	Station name	Station owner	Gauge type	Flood classification (m)			Priority
				Minor	Moderate	Major	
612 – Collie River (continued)							
509536	Collie River at Rose Road	Department of Water and Environmental Regulation	Automatic	3	4.5	5	Medium
611 – Preston River							
509551	Ferguson River at South Western Hwy	Department of Water and Environmental Regulation	Automatic	2.3	3.2	4	Medium
610 – Busselton Coast							
9984	Sabina Main Drain at Vasse Hwy CB3	Bureau of Meteorology	Automatic	2.8	3.3	3.6	High
109508	Vasse River at Doyle Rd CB1	Bureau of Meteorology	Automatic	2.8	3.3	3.6	High
109509	Walsall Bk at Chapman Hill Rd CB2	Bureau of Meteorology	Automatic	3	3.6	3.7	High
509521	Vasse Diversion at D/S Hill Rd	Department of Water and Environmental Regulation	Automatic	2.5	3.5	4.2	High
509523	Vasse Diversion at Wonnerup East Rd	Department of Water and Environmental Regulation	Automatic	1.5	1.8	2.4	Medium
609 – Blackwood River							
509461	Blackwood River at Winnejup	Department of Water and Environmental Regulation	Automatic	3.5	4.2	6	High
509519	Blackwood River at Boyup Flax Mill	Department of Water and Environmental Regulation	Automatic	3.2	5	6.5	High
510500	North Arthur River at Lake Toolibin	Department of Water and Environmental Regulation	Automatic	1	1.4	2	Medium
510502	Beaufort River at Manywaters	Department of Water and Environmental Regulation	Automatic	2	2.5	2.8	Medium

Notes:

- All levels are in metres
- All flow rates in cumecs (m^3/sec) unless indicated otherwise
- n/a indicates flood class levels are not yet determined
- All levels indicate flooding in the local reaches of the stream
- AHD – Australian Height Datum. Geoscience Australia for further information.

Schedule 4: River data locations

Bureau number	Station name	Owner	Gauge type	Priority
802 – Fitzroy River				
503011	ELLENDALE	Department of Water and Environmental Regulation	Automatic	Medium
803 – Lennard River				
503008	MOUNT JOSEPH	Department of Water and Environmental Regulation	Automatic	Medium
804 – Isdell River				
503009	DALES YARD	Department of Water and Environmental Regulation	Automatic	Medium
709 – Port Hedland Coast				
504032	PINCUNAH	Department of Water and Environmental Regulation	Automatic	Medium
708 – Fortescue River				
505011	FLAT ROCKS	Department of Water and Environmental Regulation	Automatic	Medium
505040	TARINA	Department of Water and Environmental Regulation	Automatic	Medium
505041	WATERLOO BORE	Department of Water and Environmental Regulation	Automatic	Medium
505054	DEEP REACH	Department of Water and Environmental Regulation	Automatic	Medium
707 – Robe River				
505059	YARRALOOLA	Department of Water and Environmental Regulation	Automatic	Medium
701 – Greenough River				
508026	UTAKARRA	Department of Water and Environmental Regulation	Automatic	Medium
508040	YERINA	Department of Water and Environmental Regulation	Automatic	Medium
615 – Avon River				
510030	GAIRDNERS CROSSING	Department of Water and Environmental Regulation	Automatic	Medium
510252	KWOLYN HILL	Department of Water and Environmental Regulation	Automatic	Medium
616 – Swan Coast				
509476	SLADE STREET	Department of Water and Environmental Regulation	Automatic	Medium
509484	KENT STREET WEIR	Department of Water and Environmental Regulation	Automatic	Medium
614 – Murray River				
509221	ONEIL ROAD	Department of Water and Environmental Regulation	Automatic	Medium
509442	LOWLANDS	Department of Water and Environmental Regulation	Automatic	Medium
509483	YANGEDI SWAMP	Department of Water and Environmental Regulation	Automatic	Medium
509586	KIELMAN	Department of Water and Environmental Regulation	Automatic	Medium
613 – Harvey River				
509368	URQUAHARTS	Department of Water and Environmental Regulation	Automatic	Medium
509589	OLD BUNBURY ROAD	Department of Water and Environmental Regulation	Automatic	Medium
614 – Collie River				
509309	PALMER	Department of Water and Environmental Regulation	Automatic	Medium
509370	SANDLEWOOD	Department of Water and Environmental Regulation	Automatic	Medium
509531	CROSS FARM	Department of Water and Environmental Regulation	Automatic	Medium
509535	JUEGENUP	Department of Water and Environmental Regulation	Automatic	Medium
509594	WORSLEY	Department of Water and Environmental Regulation	Automatic	Medium
Bureau number	**Station name**	**Owner**	**Gauge type**	**Priority**

611 – Preston River				
509450	DOWDELLS ROAD BRIDGE	Department of Water and Environmental Regulation	Automatic	Medium
509526	LOWDEN ROAD BRIDGE	Department of Water and Environmental Regulation	Automatic	Medium
509528	WOODPERRY HOMESTEAD	Department of Water and Environmental Regulation	Automatic	Medium
610 – Busselton Coast				
509065	WILLMOTS FARM	Department of Water and Environmental Regulation	Automatic	Medium
509190	WOODLANDS	Department of Water and Environmental Regulation	Automatic	Medium
509355	WHICHER RANGE	Department of Water and Environmental Regulation	Automatic	Medium
509462	YATES BRIDGE	Department of Water and Environmental Regulation	Automatic	Medium
509522	LENNOX VINEYARD	Department of Water and Environmental Regulation	Automatic	Medium
509591	CAPEL RAILWAY BRIDGE	Department of Water and Environmental Regulation	Automatic	Medium
609 – Blackwood River				
509199	BRENNANS FORD	Department of Water and Environmental Regulation	Automatic	Medium
509468	GINGILUP	Department of Water and Environmental Regulation	Automatic	Medium
509470	FOREST GROVE	Department of Water and Environmental Regulation	Automatic	Medium
509473	DARRAUP	Department of Water and Environmental Regulation	Automatic	Medium
509475	ROSA CAMPSITE	Department of Water and Environmental Regulation	Automatic	Medium
509549	HUT POOL	Department of Water and Environmental Regulation	Automatic	Medium
510501	MOUNT BROWN	Department of Water and Environmental Regulation	Automatic	Medium
608 – Donnelly River				
509467	STRICKLAND	Department of Water and Environmental Regulation	Automatic	Medium
607 – Warren River				
509463	BARKER RD CROSSING	Department of Water and Environmental Regulation	Automatic	Medium
509464	CASCADES	Department of Water and Environmental Regulation	Automatic	Medium
509465	WHEATLEY FARM	Department of Water and Environmental Regulation	Automatic	Medium
509482	QUINTARRUP	Department of Water and Environmental Regulation	Automatic	Medium
509566	TONE RIVER AT BULLIUP	Department of Water and Environmental Regulation	Automatic	Low
509572	RAINBOW TRAIL	Department of Water and Environmental Regulation	Automatic	Medium
606 – Shannon River				
509196	BALDANIA CREEK CONFLUENCE	Department of Water and Environmental Regulation	Automatic	Medium
509266	ORDINANCE ROAD CROSSING	Department of Water and Environmental Regulation	Automatic	Medium
509300	TEDS POOL	Department of Water and Environmental Regulation	Automatic	Medium
509412	WATTLE BLOCK	Department of Water and Environmental Regulation	Automatic	Medium
509578	DOG POOL	Department of Water and Environmental Regulation	Automatic	Medium
605 – Frankland River				
509548	MOUNT FRANKLAND	Department of Water and Environmental Regulation	Automatic	Medium

Bureau number	Station name	Owner	Gauge type	Priority
604 – Kent River				
509278	STYX JUNCTION	Department of Water and Environmental Regulation	Automatic	Medium
509385	ROCKY GLEN	Department of Water and Environmental Regulation	Automatic	Medium
603 – Denmark River				
509017	MOUNT LINDESAY	Department of Water and Environmental Regulation	Automatic	Medium
509022	WOONANUP	Department of Water and Environmental Regulation	Automatic	Medium
509439	SLEEMAN ROAD BRIDGE	Department of Water and Environmental Regulation	Automatic	Medium
509451	TORBAY TOWNSHIP	Department of Water and Environmental Regulation	Automatic	Medium
509466	KOMPUP	Department of Water and Environmental Regulation	Automatic	Medium
509514	DENMARK COLLEGE	Department of Water and Environmental Regulation	Automatic	Medium
509559	WILSON INLET AT OLD RAINLWAY BRIDGE	Department of Water and Environmental Regulation	Automatic	Medium
509587	OCEAN BEACH ROAD	Department of Water and Environmental Regulation	Automatic	Medium
509590	EDEN ROAD	Department of Water and Environmental Regulation	Automatic	Medium
602 – Albany Coast				
509011	BLACK CAT FLATS	Department of Water and Environmental Regulation	Automatic	Medium
509320	STEVENS FARM	Department of Water and Environmental Regulation	Automatic	Medium
509585	BILLA BOYA RESERVE	Department of Water and Environmental Regulation	Automatic	Medium
510026	BULL CROSSING	Department of Water and Environmental Regulation	Automatic	Medium
601 – Esperance Coast				
509004	NEDS CORNER	Department of Water and Environmental Regulation	Automatic	Medium
509195	FAIRFIELD	Department of Water and Environmental Regulation	Automatic	Medium
509513	FISHERIES ROAD	Department of Water and Environmental Regulation	Automatic	Medium
509546	MYRUP ROAD	Department of Water and Environmental Regulation	Automatic	Medium
512018	CASCADES	Department of Water and Environmental Regulation	Automatic	Medium

Schedule 5: Enviromon base stations installed in Western Australia

Owner	City/town	License number	Number of users	Date of registration	License version
Bureau	Perth	61090005	10	8/05/2007	3

Schedule 6: List of Data Sharing Agreements for data provision

A Data Sharing Agreement for data provision has been set up or is in development for the following agencies.

Agency	Status (Completed or In Progress)	Date of Completion	Number of sites
Department of Water and Environmental Regulation	Completed	2016	189
Department of Primary Industries and Regional Development	In Progress	TBA	99
Department of Biodiversity, Conservation and Attractions	In progress	TBA	13
BHP-Billion	In progress	TBA	6
Rio Tinto	In progress	TBA	4

Schedule 7: List of sites owned and maintained by the Bureau

Bureau number	Station name	Gauge type	Data type	Priority
809 – Ord River				
1006	WYNDHAM AERO *	Automatic	Rainfall	Medium
2012	HALLS CREEK AIRPORT *	Automatic	Rainfall	Medium
2056	KUNUNURRA AERO *	Automatic	Rainfall	Medium
2064	ARGYLE AERODROME *	Automatic	Rainfall	Medium
2072	BEDFORD DOWNS AIRSTRIP	Automatic	Rainfall	Medium
806 – King Edward River				
1019	KALUMBURU	Automatic	Rainfall	Medium
802 – Fitzroy River				
2009	GIBB RIVER	Automatic	Rainfall	Medium
2021	MOUNT AMHURST	Automatic	Rainfall	Medium
2022	MOUNT WINIFRED	Automatic	Rainfall	Medium
2030	YULMBU	Automatic	Rainfall	Medium
2036	OLD MORNINGTON HOMESTEAD	Automatic	Rainfall	Medium
2043	MOUNT KRAUSS	Automatic	Rainfall	Medium
2053	LANSDOWNE	Automatic	Rainfall	Medium
2073	MARGARET RIVER AIRSTRIP	Automatic	Rainfall	Medium
2074	MOOLA BULLA AIRSTRIP	Automatic	Rainfall	Medium
2077	SIDDINS CREEK	Automatic	Rainfall	Medium
2078	LARRAWA AIRSTRIP	Automatic	Rainfall	Medium
3032	DERBY AERO *	Automatic	Rainfall	Low
3043	CHRISTMAS CREEK HOMESTED	Automatic	Rainfall	Medium
3051	MOUNT BARNETT	Automatic	Rainfall	Medium
3080	CURTIN AERO *	Automatic	Rainfall	Low
3093	FITZROY CROSSING AERO *	Automatic	Rainfall	Medium
3098	MOUNT HOUSE AIRSTRIP	Automatic	Rainfall	Medium
3099	LEOPOLD DOWNS TBRG	Automatic	Rainfall	High
3101	DAMPIER DOWNS AIRSTRIP	Automatic	Rainfall	High
808 – Pentecost River				
2068	MARION DOWNS	Automatic	Rainfall	Medium
801 – Cape Leveque Coast				
3003	BROOME AIRPORT *	Automatic	Rainfall	Medium
3096	WEST ROEBUCK *	Automatic	Rainfall	Medium
803 – Lennard River				
3094	WINDJANA GORGE	Automatic	Rainfall	Medium
125 – Sandy Desert				
4019	MANDORA *	Automatic	Rainfall	Medium
13030	TELFER AERO *	Automatic	Rainfall	Medium
709 – Port Hedland Coast				
4032	PORT HEDLAND AIRPORT *	Automatic	Rainfall	Medium
4083	KARRATHA AERO *	Automatic	Rainfall	Medium

4090	ROEBOURNE AERO *	Automatic	Rainfall	Medium
Bureau number	**Station name**	**Gauge type**	**Data type**	**Priority**
710 – De Grey River				
4106	MARBLE BAR *	Automatic	Rainfall	Medium
705 – Lyndon-Minilya Rivers				
5007	LEARMONTH AIRPORT *	Automatic	Rainfall	Medium
6072	EMU CREEK STATION *	Automatic	Rainfall	Medium
6108	CAPE CUVIER WHARF *	Automatic	Rainfall	Medium
707 – Onslow Coast				
5008	MARDIE *	Automatic	Rainfall	Medium
706 – Ashburton River				
5017	ONSLOW AIRPORT *	Automatic	Rainfall	Medium
7185	PARABURDOO AERO *	Automatic	Rainfall	Medium
704 – Gascoyne River				
6011	CARNARVON AIRPORT *	Automatic	Rainfall	Medium
6104	MINNIE CREEK AIRSTRIP	Automatic	Rainfall	Medium
6111	WINDERIE AIRSTRIP *	Automatic	Rainfall	Medium
6112	LYONS RIVER AIRSTRIP *	Automatic	Rainfall	Medium
7008	BRYAH	Automatic	Rainfall	Medium
7008	THREE RIVERS	Automatic	Rainfall	Medium
7132	MOUNT CLERE	Automatic	Rainfall	Medium
7165	MINGAH SPRINGS	Automatic	Rainfall	Medium
7207	LANDOR AIRSTRIP *	Automatic	Rainfall	Medium
7208	MOUNT AUGUSTUS AIRSTRIP *	Automatic	Rainfall	Medium
7209	COBRA AIRSTRIP *	Automatic	Rainfall	Medium
7210	BURRINGURRAH AIRSTRIP *	Automatic	Rainfall	Medium
7211	DALGETY DOWNS AIRSTRIP *	Automatic	Rainfall	Medium
7212	GINGINJIBBY	Automatic	Rainfall	Medium
703 – Wooramel River				
6105	SHARK BAY AIRPORT *	Automatic	Rainfall	Low
702 – Murchison River				
7045	MEEKATHARRA AIRPORT *	Automatic	Rainfall	Medium
708 – Fortescue River				
5098	KARIJINI NORTH *	Automatic	Rainfall	Medium
7176	NEWMAN AERO *	Automatic	Rainfall	Medium
618 – Yarra Yarra Lakes				
7600	MOUNT MAGNET AERO *	Automatic	Rainfall	Medium
8296	MORAWA AIRPORT *	Automatic	Rainfall	Medium
701 – Greenough River				
8237	TENINDEWA	Automatic	Rainfall	High
8298	TIBRADDEN	Automatic	Rainfall	High
8299	ARRADALE	Automatic	Rainfall	High
8300	TABLETOP	Automatic	Rainfall	High
8304	MOASCAR	Automatic	Rainfall	High
8307	COOLANGATTA ALERT	Automatic	Rainfall	Medium

Bureau number	Station name	Gauge type	Data type	Priority
701 – Greenough River (continued)				
8308	TARDUN HILL	Automatic	Rainfall	Medium
8309	BELLENDAINE	Automatic	Rainfall	Medium
8310	SOUTH HOLMWOOD ALERT	Automatic	Rainfall	High
8315	GERALDTON AIRPORT *	Automatic	Rainfall	High
615 – Avon River				
8297	DALWALLINU AWS	Automatic	Rainfall	Medium
8302	WONGAN HILLS NORTH	Automatic	Rainfall	Medium
10000	AMERY ACRES	Automatic	Rainfall	Medium
10031	YORKRAKINE TBRG	Automatic	Rainfall	Medium
10064	BOLGART BIN	Automatic	Rainfall	Medium
10089	LONG FOREST	Automatic	Rainfall	High
10111	NORTHAM	Automatic	Rainfall	Medium
10129	MOUNT NODDY	Automatic	Rainfall	High
10132	MOUNT HARDEY	Automatic	Rainfall	High
10230	WAEEL	Automatic	Rainfall	Medium
10245	BERRING	Automatic	Rainfall	Medium
10286	CUNDERDIN AIRFIELD *	Automatic	Rainfall	Medium
10307	QUADNEY	Automatic	Rainfall	Medium
10308	TOODYAY EAST	Automatic	Rainfall	Medium
10311	YORK	Automatic	Rainfall	Medium
10511	WICKEPIN SOUTH	Automatic	Rainfall	Medium
10515	BEVERLEY	Automatic	Rainfall	Medium
10524	BROOKTON	Automatic	Rainfall	Medium
10527	BULYEE	Automatic	Rainfall	Medium
10536	CORRIGIN	Automatic	Rainfall	Medium
10556	COONDEE	Automatic	Rainfall	Medium
10614	NARROGIN	Automatic	Rainfall	Medium
10626	PINGELLY	Automatic	Rainfall	Medium
10628	QUAIRADING	Automatic	Rainfall	Medium
10692	NEWDEGATE RESEARCH STATION *	Automatic	Rainfall	Medium
10908	YANGEDINE	Automatic	Rainfall	High
10911	LAKE GRACE *	Automatic	Rainfall	Medium
10912	YEALERING EAST	Automatic	Rainfall	Medium
10920	MOUNT WESTDALE	Automatic	Rainfall	High
10923	WILLIAMS NORTH	Automatic	Rainfall	High
12320	SOUTHERN CROSS AIRFIELD *	Automatic	Rainfall	Medium
617 – Moore-Hill River				
8151	WALEBING	Automatic	Rainfall	Medium
8202	BINDI BINDI NORTH	Automatic	Rainfall	Medium
8301	BARBERTON EAST	Automatic	Rainfall	High
8302	WONGAN HILLS NORTH	Automatic	Rainfall	Medium
8316	YALLALIE BASIN	Automatic	Rainfall	Medium

8317	ANRO TBRG	Automatic	Rainfall	Medium
Bureau number	**Station name**	**Gauge type**	**Data type**	**Priority**
617 – Moore-Hill River (continued)				
8318	MINDALLA TBRG	Automatic	Rainfall	Medium
9037	BADGINGARRA RESEARCH STN *	Automatic	Rainfall	Medium
9178	GINGIN AERO *	Automatic	Rainfall	Medium
9274	MINSTON PARK	Automatic	Rainfall	Medium
9279	CANTERBURY	Automatic	Rainfall	High
9280	LANCELIN (DEFENCE)	Automatic	Rainfall	Medium
616 – Swan Coast				
9021	PERTH AIRPORT *	Automatic	Rainfall	Medium
9053	PEARCE RAAF *	Automatic	Rainfall	High
9066	GIDGEGANNUP	Automatic	Rainfall	Medium
9172	JANDAKOT AERO *	Automatic	Rainfall	Medium
9204	GOOSEBERRY HILL *	Automatic	Rainfall	Medium
9215	SWANBOURNE	Automatic	Rainfall	Medium
9225	PERTH METRO *	Automatic	Rainfall	Medium
9240	BICKLEY *	Automatic	Rainfall	High
9263	WHITEMAN PARK	Automatic	Rainfall	Medium
9268	JULIMAR FOREST	Automatic	Rainfall	High
9270	MOOLIABEENEE TBRG	Automatic	Rainfall	Medium
9271	BUNGENDORE	Automatic	Rainfall	Medium
9274	MINSTON PARK	Automatic	Rainfall	High
9275	MUCHEAU	Automatic	Rainfall	Medium
9277	LAKE CHITTERING	Automatic	Rainfall	Medium
9281	MILLENDON (SWAN VALLEY)*	Automatic	Rainfall	Medium
10310	WERRIBEE	Automatic	Rainfall	Medium
614 – Murray River (WA)				
9023	JARRAHDALE	Automatic	Rainfall	Medium
9039	SERPENTINE	Automatic	Rainfall	Medium
9260	MOUNT SOLUS	Automatic	Rainfall	High
9538	DWELLINGUP *	Automatic	Rainfall	Medium
9769	CULFORD	Automatic	Rainfall	Medium
9977	MANDURAH	Automatic	Rainfall	Medium
10917	WANDERING *	Automatic	Rainfall	Medium
10919	WILGARRA	Automatic	Rainfall	High
109516	BODDINGTON NORTH	Automatic	Rainfall	Medium
609 – Blackwood River				
9518	CAPE LEEUWIN *	Automatic	Rainfall	Medium
9617	BRIDGETOWN *	Automatic	Rainfall	High
10916	KATANNING *	Automatic	Rainfall	High
610 – Busselton Coast				
9278	YOONGARILLUP TNRG	Automatic	Rainfall	Medium
9519	CAPE NATURALISTE *	Automatic	Rainfall	Medium
9603	BUSSELTON AERO *	Automatic	Rainfall	Medium

Bureau number	Station name	Gauge type	Data type	Priority
610 – Busselton Coast (continued)				
9746	WITCHCLIFFE *	Automatic	Rainfall	Medium
9776	ASTON DOWNS ALERT	Automatic	Rainfall	Medium
9877	LUDLOW	Automatic	Rainfall	Medium
9971	ACTON PARK	Automatic	Rainfall	Medium
9978	JINDONG	Automatic	Rainfall	Medium
9984	VASSE HWY CB3	Automatic	River	High
9987	PAYNEDALE ALERT	Automatic	Rainfall	Medium
9988	HAPPY VALLEY	Automatic	Rainfall	Medium
9992	CAPEL NORTH	Automatic	Rainfall	Medium
9997	RAVENSCLIFFE ALERT	Automatic	Rainfall	Medium
109508	DOYLE ROAD CB1	Automatic	River	High
109509	CHAPMAN HILL ROAD CB2	Automatic	River	High
611 – Preston River				
9527	DARDANUP EAST	Automatic	Rainfall	Medium
9965	BUNBURY *	Automatic	Rainfall	Medium
9989	THOMSON BROOK	Automatic	Rainfall	Medium
9990	BOYANUP NORTH	Automatic	Rainfall	Medium
9991	DONNYBROOK EAST	Automatic	Rainfall	Medium
109507	FERGUSON VALLEY ALERT	Automatic	Rainfall	Medium
601 – Esperance Coast				
9542	ESPERANCE AERO *	Automatic	Rainfall	Medium
9789	ESPERANCE *	Automatic	Rainfall	Medium
9961	HOPETOUN NORTH *	Automatic	Rainfall	Medium
12044	MUNGLINUP WEST *	Automatic	Rainfall	Medium
607 – Warren River				
9573	MANJIMUP *	Automatic	Rainfall	Medium
602 – Albany Coast				
9741	ALBANY AIRPORT *	Automatic	Rainfall	Medium
10905	JACUP *	Automatic	Rainfall	Medium
604 – Kent River				
9964	ROCKY GULLY *	Automatic	Rainfall	Medium
606 – Shannon River				
9968	SHANNON *	Automatic	Rainfall	Medium
9998	NORTH WALPOLE *	Automatic	Rainfall	Medium
612 – Collie River				
9982	HENTY BROOK	Automatic	Rainfall	High
9994	COLLIE EAST *	Automatic	Rainfall	High
122 – Nullarbor				
11003	EUCLA *	Automatic	Rainfall	Medium
11052	FORREST *	Automatic	Rainfall	Medium
124 – Salt Lake				
12009	NORSEMAN AERO *	Automatic	Rainfall	Medium

12038	KALGOORLIE-BOULDER AIRPORT *	Automatic	Rainfall	Medium
Bureau number	**Station name**	**Gauge type**	**Data type**	**Priority**
124 – Salt Lake (continued)				
12071	SALMON GUMS RES.STN. *	Automatic	Rainfall	Medium
12241	LEONORA AERO *	Automatic	Rainfall	Medium
12305	LAVERTON AERO *	Automatic	Rainfall	Medium
12314	LEINSTER AERO *	Automatic	Rainfall	Medium
13044	WILUNA AERO *	Automatic	Rainfall	Medium
123 – Warburton River				
13011	WARBURTON AIRFIELD *	Automatic	Rainfall	Medium
613 – Harvey River				
109501	MOUNT WILLIAM	Automatic	Rainfall	High

Notes:

- Does not include daily rainfall and other Bureau synoptic stations.

* Refers to an Automatic Weather Station which is owned and operated by the Bureau of Meteorology but its primary purpose is not flood warning.

Schedule 7a: List of rainfall sites owned and maintained by external agencies

***Not including DWER Stations**

Station Number	Station Name	Gauge Type	Owner	Priority
601 – Esperance Coast				
509556	ESPERANCE (DPIRD)	Automatic	DPIRD	Medium
509574	COOMALBIDGUP (DPIRD)	Automatic	DPIRD	Medium
509579	CONDINGUP WEST (DPIRD)	Automatic	DPIRD	Medium
509595	BOYATUP (DPIRD)	Automatic	DPIRD	Medium
510517	RAVENSTHORPE (DPIRD)	Automatic	DPIRD	Medium
510553	MOUNT MADDEN EAST (DPIRD)	Automatic	DPIRD	Medium
511002	MT BURAMINYA (DPIRD)	Automatic	DPIRD	Medium
512014	SCADDAN (DPIRD)	Automatic	DPIRD	Medium
512015	SALMON GUMS (DPIRD)	Automatic	DPIRD	Medium
512015	SALMON GUMS (DPIRD)	Automatic	DPIRD	Medium
512016	MT HOWICK (DPIRD)	Automatic	DPIRD	Medium
512017	MT BURDETT (DPIRD)	Automatic	DPIRD	Medium
512021	CASCADE (DPIRD)	Automatic	DPIRD	Medium
512025	GRASS PATCH (DPIRD)	Automatic	DPIRD	Medium
512026	CASCADE NW (DPIRD)	Automatic	DPIRD	Medium
512027	CASCADE NE (DPIRD)	Automatic	DPIRD	Medium
602 – Albany Coast				
509570	WELLSTEAD (DPIRD)	Automatic	DPIRD	Medium
509571	MANY PEAKS (DPIRD)	Automatic	DPIRD	Medium
509581	GAIRDNER (DPIRD)	Automatic	DPIRD	Medium
509582	STIRLINGS SOUTH (DPIRD)	Automatic	DPIRD	Medium
509623	BREMER BAY (DPIRD)	Automatic	DPIRD	Medium
509625	KENDENUP WEST (DPIRD)	Automatic	DPIRD	Medium
510511	JERRAMUNGUP (DPIRD)	Automatic	DPIRD	Medium
510532	MAGENTA DAM (DPIRD)	Automatic	DPIRD	Medium
510540	STIRLINGS NORTH (DPIRD)	Automatic	DPIRD	Medium
510558	WEST RIVER (DPIRD)	Automatic	DPIRD	Medium
510563	GNOWANGERUP GRDC (DPIRD)	Automatic	DPIRD	Medium
603 – Denmark Coast				
509555	MOUNT BARKER (DAFWA)	Automatic	DPIRD	Medium
509627	DENMARK (DPIRD)	Automatic	DPIRD	Medium
605 – Frankland River				
509573	FRANKLAND (DAFWA)	Automatic	DPIRD	Medium
510539	TUNNEY (DAFWA)	Automatic	DPIRD	Medium
606 – Shannon River				
509512	WALPOLE CALM	Automatic	DBCA	Medium
509626	NORTHCLIFFE (DPIRD)	Automatic	DPIRD	Medium
607 – Warren River				
509506	MANJIMUP CALM	Automatic	DBCA	Medium
509509	PEMBERTON CALM	Automatic	DBCA	Medium

509554	MANJIMUP (DPIRD)	Automatic	DPIRD	Medium
Station Number	**Station Name**	**Gauge Type**	**Owner**	**Priority**
607 – Warren River (continued)				
509619	TONEBRIDGE (DPIRD)	Automatic	DPIRD	Medium
509624	QUININUP (DPIRD)	Automatic	DPIRD	Medium
608 – Donnelly River				
509564	BEEDELUP (DPIRD)	Automatic	DPIRD	Medium
509620	YANMAH (DPIRD)	Automatic	DPIRD	Medium
609 – Blackwood River				
509508	NANNUP (CALM)	Automatic	DBCA	High
509580	QUAELUP (DPIRD)	Automatic	DPIRD	High
509583	SCOTT RIVER (DPIRD)	Automatic	DPIRD	High
509612	BALINGUP (DPIRD)	Automatic	DPIRD	Medium
509613	DININNUP (DPIRD)	Automatic	DPIRD	Medium
509615	NANNUP (DPIRD)	Automatic	DPIRD	Medium
509617	MAYANUP SOUTH (DPIRD)	Automatic	DPIRD	Medium
509618	CARLOTTA (DPIRD)	Automatic	DPIRD	Medium
509621	KARRIDALE (DPIRD)	Automatic	DPIRD	Medium
509622	MILYEANNUP (DPIRD)	Automatic	DPIRD	Medium
509629	STYLES TOWER (DPIRD)	Automatic	DPIRD	Medium
509630	FOURACRES (DPIRD)	Automatic	DPIRD	Medium
510510	KATANNING (DPIRD)	Automatic	DPIRD	High
510516	WICKEPIN (DPIRD)	Automatic	DPIRD	Medium
510534	WAGIN AERO (DPIRD)	Automatic	DPIRD	Medium
510535	DUMBLEYUNG AERO (DPIRD)	Automatic	DPIRD	Medium
510536	DARKAN (DDPIRD)	Automatic	DPIRD	High
510552	HIGHBURY EAST (DPIRD)	Automatic	DPIRD	Medium
510555	WOODANILLING W (DPIRD)	Automatic	DPIRD	Medium
510556	KATANNING NG OUT (DPIRD)	Automatic	DPIRD	Medium
510559	DUMBLEYUNG GRDC (DPIRD)	Automatic	DPIRD	Medium
510560	NYABING GRDC (DPIRD)	Automatic	DPIRD	Medium
510561	KATANNING GRDC (DPRID)	Automatic	DPIRD	Medium
610 – Busselton Coast				
509505	KIRUP CALM	Automatic	DBCA	Medium
509553	VASSE (DPIRD)	Automatic	DPIRD	Medium
509584	WILYABRUP (DPIRD)	Automatic	DPIRD	Medium
509610	NEWLANDS (DPIRD)	Automatic	DPIRD	Medium
509614	ROSA BROOK (DPIRD)	Automatic	DPIRD	Medium
509616	MARGARET RIVER (DPIRD)	Automatic	DPIRD	Medium
509628	CAPEL (DPIRD)	Automatic	DPIRD	Medium
611 – Preston River				
509563	DONNYBROOK (DPIRD)	Automatic	DPIRD	Medium
509608	CORDERING (DPIRD)	Automatic	DPIRD	Medium
612 – Collie River				
509503	COLLIE CALM	Automatic	DBCA	High

Station Number	Station Name	Gauge Type	Owner	Priority
612 – Collie River (continued)				
509577	DARDANUP (DPIRD)	Automatic	DPIRD	High
509599	BRUNSWICK JUNCTION (DPIRD)	Automatic	DPIRD	Medium
509607	DARDANUP 2 (DPIRD)	Automatic	DPIRD	Medium
509609	MCALINDEN (DPIRD)	Automatic	DPIRD	Medium
613 – Harvey River				
509598	LOGUE BROOK (DPIRD)	Automatic	DPIRD	Medium
509360	ORION	Automatic	RIO	Medium
509504	HARVEY CALM	Automatic	DBCA	High
509562	MYALUP (DAFWA)	Automatic	DPIRD	High
509575	WAROONA (DAFWA)	Automatic	DPIRD	Medium
509576	HARVEY (DAFWA)	Automatic	DPIRD	High
614 – Murray River				
509396	MEDINA (DAFWA)	Automatic	DPIRD	Medium
509486	JARRAHDALE 2 (DPIRD)	Automatic	DPIRD	Medium
509490	JARRAHDALE (DPIRD)	Automatic	DPIRD	Medium
509500	BODDINGTON CALM	Automatic	DBCA	Medium
509510	SADDLEBACK CALM	Automatic	DBCA	Medium
509596	PINJARRA (DPIRD)	Automatic	DPIRD	Medium
509597	MARRADONG (DPIRD)	Automatic	DPIRD	Medium
510530	POPANYINNING (DAFWA)	Automatic	DPIRD	Medium
510531	NARROGIN AERO (DAFWA)	Automatic	DPIRD	Medium
510551	WILLIAMS (DPIRD)	Automatic	DPIRD	Medium
615 – Avon River				
508041	WONGAN HILLS (DPIRD)	Automatic	DPIRD	Medium
510062	MERREDIN (DPIRD)	Automatic	DPIRD	Medium
510063	NORTHAM (DPIRD)	Automatic	DPIRD	Medium
510064	MECKERING NORTH (DPIRD)	Automatic	DPIRD	Medium
510065	MURESK (DPIRD)	Automatic	DPIRD	Medium
510067	BEACON AERO (DPIRD)	Automatic	DPIRD	Medium
510068	MUKINBUDIN AERO (DPIRD)	Automatic	DPIRD	Medium
510069	TRAYNING WEST (DPIRD)	Automatic	DPIRD	Medium
510070	KELLERBERRIN AERO (DPIRD)	Automatic	DPIRD	High
510072	SHACKLETON (DPIRD)	Automatic	DPIRD	High
510073	KOORDA AERO (DPIRD)	Automatic	DPIRD	Medium
510074	EJANDING (DPIRD)	Automatic	DPIRD	High
510076	BENCUBBIN (DPIRD)	Automatic	DPIRD	Medium
510077	KELLERBERRIN NORTH (DPIRD)	Automatic	DPIRD	Medium
510078	MERREDIN NG OUT (DPIRD)	Automatic	DPIRD	Medium
510080	TAMMIN (DPIRD)	Automatic	DPIRD	Medium
510082	YORK EAST (DPIRD)	Automatic	DPIRD	Medium
510509	NEWDEGATE (DPIRD)	Automatic	DPIRD	Medium
510515	WICKEPIN EAST (DPIRD)	Automatic	DPIRD	Medium

510518	LAKE KING (DPIRD)	Automatic	DPIRD	Medium
Station Number	**Station Name**	**Gauge Type**	**Owner**	**Priority**
615 – Avon River (continued)				
510519	HOLT ROCK (DPIRD)	Automatic	DPIRD	Medium
510520	EAST BEVERLEY (DPIRD)	Automatic	DPIRD	Medium
510525	NAREMBEEN AERO (DPIRD)	Automatic	DPIRD	Medium
510526	BROOKTON (DPIRD)	Automatic	DPIRD	Medium
510527	CORRIGIN AERO (DPIRD)	Automatic	DPIRD	Medium
510528	HYDEN (DPIRD)	Automatic	DPIRD	Medium
510529	DRAGON ROCKS (DPIRD)	Automatic	DPIRD	Medium
510533	KONDININ AERO (DPIRD)	Automatic	DPIRD	Medium
510537	NYABING EAST (DPIRD)	Automatic	DPIRD	Medium
510538	ONGERUP NORTH (DPIRD)	Automatic	DPIRD	Medium
510541	WICKEPIN NORTH (DPIRD)	Automatic	DPIRD	Medium
510542	BELKA EAST (DPIRD)	Automatic	DPIRD	Medium
510543	QUAIRADING AIRPORT (DPIRD)	Automatic	DPIRD	Medium
510544	MT WALKER (DPIRD)	Automatic	DPIRD	Medium
510545	BABAKIN (DPIRD)	Automatic	DPIRD	Medium
510546	KWEDA (DPIRD)	Automatic	DPIRD	Medium
510547	CORRIGIN EAST (DPIRD)	Automatic	DPIRD	Medium
510548	PINGELLY WEST (DPIRD)	Automatic	DPIRD	Medium
510549	PINGARING (DPIRD)	Automatic	DPIRD	Medium
510550	KULIN (DPIRD)	Automatic	DPIRD	Medium
510554	PINGRUP EAST (DPIRD)	Automatic	DPIRD	Medium
510562	ONGERUP GRDC (DPIRD)	Automatic	DPIRD	Medium
512010	BONNIE ROCK (DPIRD)	Automatic	DPIRD	Medium
512013	YILGARN SOUTH (DPIRD)	Automatic	DPIRD	Medium
512020	WESTONIA (DPIRD)	Automatic	DPIRD	Medium
512022	BURRACOPPIN SOUTH (DPIRD)	Automatic	DPIRD	Medium
512024	MOORINE ROCK (DPIRD)	Automatic	DPIRD	Medium
616 – Swan Coastal				
509281	WANNEROO (DPIRD)	Automatic	DPIRD	Medium
509288	WANNEROO CALM	Automatic	DBCA	Medium
509391	SOUTH PERTH (DPIRD)	Automatic	DPIRD	Medium
509446	FLOREAT PARK (DPIRD)	Automatic	DPIRD	Medium
509487	BINDOON (DPIRD)	Automatic	DPIRD	Medium
509488	KINGS PARK (DPIRD)	Automatic	DPIRD	Medium
509489	GLEN EAGLE (DPIRD)	Automatic	DPIRD	Medium
617 – Moore-Hill Rivers				
508044	MOORA (DPIRD)	Automatic	DPIRD	High
508054	LATHAM (DPIRD)	Automatic	DPIRD	Medium
508055	ENEABBA (DPIRD)	Automatic	DPIRD	High
508056	WATHEROO (DPIRD)	Automatic	DPIRD	High
508057	BINDI BINDI (DPIRD)	Automatic	DPIRD	Medium
508062	COOROW WEST (DPIRD)	Automatic	DPIRD	Medium

Station Number	Station Name	Gauge Type	Owner	Priority
617 – Moore-Hill Rivers (continued)				
508063	WARRADARGE EAST (DPIRD)	Automatic	DPIRD	Medium
508070	BUNTINE WEST (DPIRD)	Automatic	DPIRD	Medium
508071	MOORA NW (DPIRD)	Automatic	DPIRD	Medium
509430	GIN GIN WEST (DPIRD)	Automatic	DPIRD	High
509431	LANCELIN EAST (DPIRD)	Automatic	DPIRD	Medium
509445	BADGINGARRA (DPIRD)	Automatic	DPIRD	High
509478	JURIEN BAY (DPIRD)	Automatic	DPIRD	Medium
509479	NEW NORCIA (DPIRD)	Automatic	DPIRD	Medium
618 – Yarra Yarra				
508045	MORAWA (DPIRD)	Automatic	DPIRD	Medium
508053	PERENJORI AERO (DPIRD)	Automatic	DPIRD	Medium
508058	THREE SPRINGS (DPIRD)	Automatic	DPIRD	Medium
508060	CANNA EAST (DPIRD)	Automatic	DPIRD	High
508069	DUDAWA (DPIRD)	Automatic	DPIRD	Medium
510066	KALANNIE (DPIRD)	Automatic	DPIRD	Medium
510075	BURAKIN (DPIRD)	Automatic	DPIRD	Medium
510081	GOODLANDS (DPIRD)	Automatic	DPIRD	Medium
701 – Greenough River				
508046	MULLEWA (DPIRD)	Automatic	DPIRD	Medium
508046	MULLEWA (DPIRD)	Automatic	DPIRD	High
508048	MINGENEW (DPIRD)	Automatic	DPIRD	High
508049	ERADU (DPIRD)	Automatic	DPIRD	High
508050	CHAPMAN VALLEY (DPIRD)	Automatic	DPIRD	Medium
508051	YUNA (DPIRD)	Automatic	DPIRD	Medium
508052	ERANGY SPRINGS (DPIRD)	Automatic	DPIRD	High
508059	GUTHA WEST (DPIRD)	Automatic	DPIRD	High
508061	ALLANOOKA (DPIRD)	Automatic	DPIRD	High
508067	MINGENEW NW (DPIRD)	Automatic	DPIRD	Medium
508068	YUNA NE (DPIRD)	Automatic	DPIRD	Medium
702 – Murchison River				
508047	BINNU (DPIRD)	Automatic	DPIRD	Medium
704 – Gascoyne River				
506014	CARNARVON (DPIRD)	Automatic	DPIRD	Medium
706 – Ashburton River				
505019	AREA C	Automatic	BHP	Medium
505043	BROCKMAN 2	Automatic	RIO	Medium
505044	BROCKMAN 4	Automatic	RIO	Medium
505046	MARANDOO	Automatic	RIO	Medium
505047	TOM PRICE	Automatic	RIO	Medium
507018	CHANNAR	Automatic	RIO	High
507019	PARABURDOO	Automatic	RIO	High
507020	WEST ANGELAS	Automatic	RIO	Medium

Station Number	Station Name	Gauge Type	Owner	Priority
708 – Fortescue River				
504043	YANDI	Automatic	BHP	Medium
505045	HOPE DOWNS 1	Automatic	RIO	Medium
505048	YANDICOOGINA	Automatic	RIO	Medium
507013	WHEELARRA	Automatic	BHP	Medium
507014	WHALEBACK	Automatic	BHP	Medium
507015	OPHTHALMIA	Automatic	BHP	Medium
710 – De Grey River				
504042	YARRIE	Automatic	BHP	Medium
809 – Ord River				
502007	KUNUNURRA (DPIRD)	Automatic	DPIRD	Medium

Notes:

- DPIRD Department of Primary Industries and Regional Development
- DBCA Department of Biodiversity, Conservation and Attractions
- BHP BHP Billiton Limited
- RIO Rio Tinto

Schedule 8: List of sites where the Bureau assists other agencies with maintenance

Bureau number	Station name	Owner	Gauge type	Data type	Priority
NIL	NIL	NIL	NIL	NIL	NIL

Notes:

- The Bureau does not currently assist any other agencies with maintenance in Western Australia

Schedule 9: List of sites owned by another agency where the Bureau co-locates equipment

Bureau number	Station name	Owner	Gauge type	Data type	Priority
610 – Busselton Coast					
509521	D/S HILL ROAD	Department of Water	Automatic	River	High
616 – Swan Coast					
509440	BARRACK STREET JETTY	Department of Transport (Marine Information)	Automatic	River	High
509438	WALYUNGA POOL	Department of Water	Automatic	River	High
615 – Avon River					
510060	STIRLING TCE TOODYAY	Department of Water	Automatic	River	High
510061	NORTHAM WEIR	Department of Water	Automatic	River	High

Notes:

- Does not include daily rainfall, automatic weather stations and other Bureau synoptic stations.

Schedule 10: List of flood warning related products issued by the Bureau in Western Australia (warnings, watches, bulletins)

Flood warnings

Product ID	Product name	Initiating criteria	Updated	Finalising
IDW39700	Eucla District	To be issued in potential or actual developing weather situations which could lead to flooding.	Minimum once a day, usually twice daily, more frequently depending on severity of event or if significant changes in the situation indicate the need to do so.	When no further significant rainfall expected and threat of further stream rises has passed.
IDW39720	Southern Coastal District	To be issued in potential or actual developing weather situations which could lead to flooding.	Minimum once a day, usually twice daily, more frequently depending on severity of event or if significant changes in the situation indicate the need to do so.	When no further significant rainfall expected and threat of further stream rises has passed.
IDW39725	South East Coastal District	To be issued in potential or actual developing weather systems which could lead to flood situations.	Minimum once a day, usually twice daily, more frequently depending on severity of event or if significant changes in the situation indicate the need to do so.	When no further significant rainfall expected and threat of further stream rises has passed.
IDW39730	Blackwood River Catchment	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded.	Minimum once a day, usually twice daily, more frequently depending on severity of event or if significant changes in the situation indicate the need to do so.	When all river levels are falling, approaching minor flood level and the threat of renewed rises has passed.
IDW39740	South West District	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded.	Minimum once a day, usually twice a day. More frequently if required due to the severity of the event and/or a fast rate of rise.	When all river levels are falling, approaching minor flood level and the threat of renewed rises has passed.
IDW39760	Preston River Catchment	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded.	Minimum once a day, usually twice a day. More frequently if required due to Three (3) or six (6) hourly intervals, depending on the severity of the event and/or a fast rate of rise.	When all river levels are falling, approaching minor flood level and the threat of renewed rises has passed.
IDW39765	Collie River Catchment	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded.	Minimum once a day, usually twice a day. More frequently if required due to the severity of the event and/or a fast rate of rise.	When all river levels are falling, approaching minor flood level and the threat of renewed rises has passed.
IDW3977	Harvey River Catchment	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded.	Minimum once a day, usually twice a day. More frequently if required due to the severity of the event and/or a fast rate of rise.	When all river levels are falling, approaching minor flood level and the threat of renewed rises has passed.

Product ID	Product name	Initiating criteria	Updated	Finalising
IDW39775	Murray River Catchment	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded.	Minimum once daily, usually twice a day. More frequently if required due to the severity of the event and/or a fast rate of rise.	When all river levels are falling, approaching minor flood level and the threat of renewed rises has passed.
IDW39780	Canning River Catchment	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded.	Minimum once daily, usually twice a day. More frequently if required due to the severity of the event and/or a fast rate of rise.	When all river levels are falling, approaching minor flood level and the threat of renewed rises has passed.
IDW39785	Swan River Catchment	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded.	Minimum once daily, usually twice a day. More frequently if required due to the severity of the event and/or a fast rate of rise.	When all river levels are falling, approaching minor flood level and the threat of renewed rises has passed.
IDW39790	Avon River Catchment	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded.	Minimum once a daily, usually twice a day. More frequently if required due to the severity of the event and/or a fast rate of rise.	When all river levels are falling, approaching minor flood level and the threat of renewed rises has passed.
IDW39798	Moore River Catchment	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded.	Minimum once a day, usually twice a day. More frequently if required due to the severity of the event and/or a fast rate of rise.	When all river levels are falling, approaching minor flood level and the threat of renewed rises has passed.
IDW39799	Yarra Yarra Lakes District	To be issued in potential or actual developing weather situations which could lead to flooding.	Minimum once a day, usually twice daily, more frequently depending on severity of event or if significant changes in the situation indicate the need to do so.	When no further significant rainfall expected and threat of further stream rises has passed.
IDW39800	Irwin River Catchment	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded.	Minimum once a day, usually twice a day. More frequently if required due to the severity of the event and/or a fast rate of rise.	When all river levels are falling, approaching minor flood level and the threat of renewed rises has passed.
IDW39802	Greenough River Catchment	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded.	Minimum once a day, usually twice a day. More frequently if required due to the severity of the event and/or a fast rate of rise.	When all river levels are falling, approaching minor flood level and the threat of renewed rises has passed.
IDW39805	Chapman River Catchment	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded.	Minimum once a day, usually twice a day. More frequently if required due to the severity of the event and/or a fast rate of rise.	When all river levels are falling, approaching minor flood level and the threat of renewed rises has passed.

Product ID	Product name	Initiating criteria	Updated	Finalising
IDW39808	Wooramel River Catchment	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded.	Minimum once daily, usually twice a day. More frequently if required due to the severity of the event and/or a fast rate of rise.	When all river levels are falling, approaching minor flood level and the threat of renewed rises has passed.
IDW39810	Murchison River Catchment	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded.	Minimum once daily, usually twice a day. More frequently if required due to the severity of the event and/or a fast rate of rise.	When all river levels are falling, approaching minor flood level and the threat of renewed rises has passed.
IDW39820	Gascoyne River Catchment	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded	Minimum once daily, usually twice a day. More frequently if required due to the severity of the event and/or a fast rate of rise.	When all river levels are falling, approaching minor flood level and the threat of renewed rises has passed.
IDW39822	Lyndon-Minilya Catchment	To be issued in potential or actual developing weather situations which could lead to flooding.	Minimum once a day, usually twice daily, more frequently depending on severity of event or if significant changes in the situation indicate the need to do so.	When no further significant rainfall expected and threat of further stream rises has passed.
IDW39825	Onslow Coastal Catchment	To be issued in potential or actual developing weather situations which could lead to flooding.	Minimum once a day, usually twice daily, more frequently depending on severity of event or if significant changes in the situation indicate the need to do so.	When no further significant rainfall expected and threat of further stream rises has passed.
IDW39830	Pilbara Coastal Rivers	To be issued in potential or actual developing weather situations which could lead to flooding.	Minimum once a day, usually twice daily, more frequently depending on severity of event or if significant changes in the situation indicate the need to do so.	When no further significant rainfall expected and threat of further stream rises has passed.
IDW39835	Ashburton River Catchment	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded.	Minimum once daily, usually twice a day. More frequently if required due to the severity of the event and/or a fast rate of rise.	When all river levels are falling, approaching minor flood level and the threat of renewed rises has passed.
IDW39840	Fortescue River Catchment	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded.	Minimum once daily, usually twice a day. More frequently if required due to the severity of the event and/or a fast rate of rise.	When all river levels are falling, approaching minor flood level and the threat of renewed rises has passed.
IDW39845	De Grey River Catchment	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded.	Minimum once daily, usually twice a day. More frequently if required due to the severity of the event and/or a fast rate of rise.	When all river levels are falling, approaching minor flood level and the threat of renewed rises has passed.
IDW39850	Sturt Creek District	To be issued in potential or actual developing weather situations which could lead to flooding.	Minimum once a day, usually twice daily, more frequently depending on severity of event or if significant changes in the situation indicate the need to do so.	When no further significant rainfall expected and threat of further stream rises has passed.

Product ID	Product name	Initiating criteria	Updated	Finalising
IDW39855	Salt Lakes District	To be issued in potential or actual developing weather situations which could lead to flooding.	Minimum once a day, usually twice daily, more frequently depending on severity of event or if significant changes in the situation indicate the need to do so.	When no further significant rainfall expected and threat of further stream rises has passed.
IDW39860	Sandy Desert District	To be issued in potential or actual developing weather situations which could lead to flooding.	Minimum once a day, usually twice daily, more frequently depending on severity of event or if significant changes in the situation indicate the need to do so.	When no further significant rainfall expected and threat of further stream rises has passed.
IDW39865	Warburton District	To be issued in potential or actual developing weather situations which could lead to flooding.	Minimum once a day, usually twice daily, more frequently depending on severity of event or if significant changes in the situation indicate the need to do so.	When no further significant rainfall expected and threat of further stream rises has passed.
IDW39875	North Kimberley District	To be issued in potential or actual developing weather situations which could lead to flooding.	Minimum once a day, usually twice daily, more frequently depending on severity of event or if significant changes in the situation indicate the need to do so.	When no further significant rainfall expected and threat of further stream rises has passed.
IDW39880	West Kimberley District	To be issued in potential or actual developing weather situations which could lead to flooding.	Minimum once a day, usually twice daily, more frequently depending on severity of event or if significant changes in the situation indicate the need to do so.	When no further significant rainfall expected and threat of further stream rises has passed.
IDW39885	Fitzroy River Catchment	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded	Minimum once daily, usually twice a day. More frequently if required due to the severity of the event and/or a fast rate of rise.	When all river levels are falling, approaching minor flood level and the threat of renewed rises has passed.
IDW39890	Ord River Catchment	To be issued in potential or actual developing flood situations when minor flood levels are expected to be exceeded	Minimum once daily, usually twice a day. More frequently if required due to the severity of the event and/or a fast rate of rise.	When all river levels are falling, approaching minor flood level and the threat of renewed rises has passed.
IDW39600	Western Australia Flood Summary	Is issued once the first flood warning or watch product is issued.	When new warning and watch products are added and/or removed.	Once all warning and watch products are removed.

Flood watches

Product ID	Product name	Initiating criteria	Updated	Finalising
IDW39605	Flood Watch 1 (WA)	When, as a result of a routine assessment, it is anticipated that flood producing rainfall may occur within 24 to 72 hours for a particular forecast district or region.	A flood watch will be issued daily or more frequently if the changing weather situation indicates the need to do so.	The flood watch advice is to remain in effect until either the potential flood threat passes and activity reverts to routine catchment monitoring, or the flood situation has developed to a point where flood warnings are warranted.
IDW39606	Flood Watch 2 (WA)	When, as a result of a routine assessment, it is anticipated that flood producing rainfall may occur within 24 to 72 hours for a particular forecast district or region.	A flood watch will be issued daily or more frequently if the changing weather situation indicates the need to do so.	The flood watch advice is to remain in effect until either the potential flood threat passes and activity reverts to routine catchment monitoring, or the flood situation has developed to a point where flood warnings are warranted.

River height bulletins

Product ID	Product name	Initiating criteria	Updated	Finalising
IDW60400	Latest River Heights for the Pentecost, Ord, Fitzroy, Lenard and Isdell Rivers	None	Hourly	Never
IDW60401	Latest River Heights for the De Grey, Pilbara coastal, Fortescue and Ashburton Rivers	None	Hourly	Never
IDW60402	Latest River Heights for the Lyndon-Minilya, Gascoyne, Wooramel and Murchison Rivers	None	Hourly	Never
IDW60403	Latest River Heights for the Hutt, Chapman, Greenough, Irwin and Hill-Moore Rivers	None	Hourly	Never
IDW60404	Latest River Heights for the Avon, Dale, Mortlock, Brockman, Swan and Canning Rivers	None	Hourly	Never
IDW60405	Latest River Heights for the Serpentine, Murray, Harvey, Collie, Preston, Capel and Ludlow Rivers	None	Hourly	Never
IDW60406	Latest River Heights for the Vasse, Margaret, Blackwood, Donnelly, Warren, Shannon, Frankland, Kent and Denmark Rivers	None	Hourly	Never
IDW60407	Latest River Heights for the Albany and Esperance Coast Rivers	None	Hourly	Never

Rainfall bulletins – 1 Hourly

Product ID	Product name	Initiating criteria	Updated	Finalising
IDW60200	Kimberley	None	Hourly	Never
IDW60202	Pilbara	None	Hourly	Never
IDW60203	Gascoyne – Murchison	None	Hourly	Never
IDW60204	Mid West	None	Hourly	Never

Product ID	Product name	Initiating criteria	Updated	Finalising
IDW60207	Avon – Swan	None	Hourly	Never
IDW60205	Mandurah – Ludlow	None	Hourly	Never
IDW60206	Busselton – Albany	None	Hourly	Never
IDW60201	Albany to Esperance	None	Hourly	Never
IDW60208	Goldfields	None	Hourly	Never
IDW60227	Wheatbelt	None	Hourly	Never

Rainfall bulletins – 3 Hourly

Product ID	Product name	Initiating criteria	Updated	Finalising
IDW60209	Kimberley	None	Every three hours	Never
IDW60211	Pilbara	None	Every three hours	Never
IDW60212	Gascoyne – Murchison	None	Every three hours	Never
IDW60213	Mid West	None	Every three hours	Never
IDW60216	Avon – Swan	None	Every three hours	Never
IDW60214	Mandurah – Ludlow	None	Every three hours	Never
IDW60215	Busselton – Albany	None	Every three hours	Never
IDW60210	Albany to Esperance	None	Every three hours	Never
IDW60217	Goldfields	None	Every three hours	Never
IDW60228	Wheatbelt	None	Every three hours	Never

Rainfall bulletins – 24 Hourly

Product ID	Product name	Initiating criteria	Updated	Finalising
IDW60218	Kimberley	After 9am	Hourly	Never
IDW60220	Pilbara	After 9am	Hourly	Never
IDW60221	Gascoyne – Murchison	After 9am	Hourly	Never
IDW60222	Mid West	After 9am	Hourly	Never
IDW60225	Avon – Swan	After 9am	Hourly	Never
IDW60223	Mandurah – Ludlow	After 9am	Hourly	Never
IDW60224	Busselton – Albany	After 9am	Hourly	Never
IDW60219	Albany to Esperance	After 9am	Hourly	Never
IDW60226	Goldfields	After 9am	Hourly	Never
IDW60229	Wheatbelt	After 9am	Hourly	Never

Rainfall bulletins – Longer Term

Product ID	Product name	Initiating criteria	Updated	Finalising
IDW60042	Northern and Eastern Forecast Districts – Daily Rainfall Bulletin	After 9am	Daily	Never
IDW60044	South West Land Division Forecast Districts – Daily Rainfall Bulletin	After 9am	Daily	Never
IDW60043	Northern and Eastern Forecast Districts – Weekly Rainfall Bulletin	After 9am	Daily	Never
IDW60045	South West Land Division Forecast Districts - Weekly Rainfall Bulletin	After 9am	Daily	Never

Schedule 11: List of changes to this Service Level Specification

Version	Date	Name	Update
1.0	25th October 2013	Nicole Pana	Version 1.0 signed
2.0	April 2015	Nicole Pana	Additional sentence to clause 1.6 highlighting supplementary services
			Addition of priorities to stations in schedules 2-4 and 7-9. This is defined in clause 3.3.2 and Table 1 which are also new additions.
			Quantitative and Qualitative clauses better described (3.8.3 and 3.8.4)
3.1	May 2018	Steve Duggan	Updated version and flood class level changes.
		Robert Lawry	Updated products issued and product identification numbers
3.1	July 2019	Robert Lawry	Updated schedule
3.11	Aug 2020	Michael Salinas	Updated schedule and changed signature parties

Appendix A: Glossary of terms

A.1. General

Bureau Flood Warning Centre: an operational area set aside in each capital city to fulfil the Bureau's role in the Total Flood Warning System specifically flood forecasting and warning.

Bureau National Operations Centre: The principal role of the National Operations Centre is to augment regional flood forecasting teams during major floods and to provide operational system support. The National Operations Centre is also responsible for leading new initiatives to enhance the quality of operations and services.

Catchment Directive: A catchment directive provides guidance specific to a catchment to help develop forecasting and warning products.

Flood warning: A written product to provide advice on impending flooding so people can take action to minimise its negative impact. This will involve some people taking action on their own behalf and others doing so as part of agency responsibilities.

Flood watch: A written product that alerts when the combination of forecast rainfall and catchment conditions indicates the flooding is likely.

Australian Government Crisis Coordination Centre: The Australian Government Crisis Coordination Centre has been designed to connect relevant Australian Government, State and Territory agencies to centralise Australian Government actions during complex national crises, to develop a single, timely and consistent picture or understanding of a crisis, its implications and the national capacity to respond.

National Flood Warning Arrangements: The National Arrangements outline the general roles and responsibilities of each level of Government in providing and supporting an effective flood warning service and includes separate chapters describing the specific arrangements and agency roles that apply in each jurisdiction.

Protective behaviour: generating appropriate and timely actions and behaviours from the agencies involved and from the threatened community.

Severe Thunderstorm: A thunderstorm is characterised by sudden electrical discharges, each manifested by a flash of light (lightning) and a sharp rumbling sound. Thunderstorms are associated with convective clouds (cumulonimbus) and are usually accompanied by precipitation. Thunderstorms are often short-lived and impact on only a small area. Severe thunderstorms may last for an hour or more and can have a more widespread impact.

A severe thunderstorm will also have one or more of the following phenomena:

- Tornado
- Wind gust of 90 km/h (49 knots) or more
- Hailstones with diameter of 2 cm or larger
- Very heavy rain sufficient to cause flash flooding

Weather warnings: Weather warnings are messages sent out by the Bureau to warn the community of potentially hazardous or dangerous weather conditions. Such warnings include but are not limited to: road weather alerts, severe thunderstorm warnings, severe weather warnings for heavy rain, strong or gale force winds, marine wind warnings, warnings for sheep graziers and frost warnings. More information on weather terms is given in the Bureau's glossary.

A.2. The components of the Total Flood Warning System

Based on the Manual 21 Australian Emergency Manual Series, Australian Government 2009 (see the Manual for more details).

Communication: disseminating warning information in a timely fashion to people and organisations likely to be affected by the flood (see Chapter 6).

Interpretation: identifying in advance the impacts of the predicted flood levels on communities at risk (see Chapter 4).

Message construction: devising the content of the message which will warn people of impending flooding (see Chapter 5).

Monitoring and prediction: detecting environmental conditions that lead to flooding, and predicting river levels during the flood (see Chapter 3),

Review: examining the various aspects of the system with a view to improving its performance (see Chapter 7).

A.3 Flood classifications

The classification of minor, moderate and major flood levels at key river height stations is based upon the effect of flooding for some distance upstream and downstream of that station. These levels are determined using the following descriptive categories of flooding, historical data or relevant local information.

The process for establishing flood class levels involves determining local flood effects, review and endorsement by relevant stakeholders and passing recommendations to the Bureau for inclusion in forecast and warning procedures. The process for establishment of flood class levels specific to each State and Territory is documented in the National Arrangements.

- Minor flooding - Causes inconvenience. Low-lying areas next to watercourses are inundated. Minor roads may be closed and low-level bridges submerged. In urban areas inundation may affect some backyards and buildings below the floor level as well as bicycle and pedestrian paths. In rural areas removal of stock and equipment may be required.

- Moderate flooding - In addition to the above, the area of inundation is more substantial. Main traffic routes may be affected. Some buildings may be affected above the floor level. Evacuation of flood affected areas may be required. In rural areas removal of stock is required.

- Major flooding - In addition to the above, extensive rural areas and/or urban areas are inundated. Many buildings may be affected above the floor level. Properties and towns are likely to be isolated and major rail and traffic routes closed. Evacuation of flood affected areas may be required. Utility services may be impacted.

Appendix B: References

1. Emergency Management Australia 2009, *Flood Warning Manual,* Series 21.

2. Bureau of Meteorology 2013, *National Flood Warning Arrangements*

3. Bureau of Meteorology 2013, *National Flood Directive* (unpublished - internal use)

4. Bureau of Meteorology 2013, *Catchment Flood Directives* (unpublished - internal use)