

Appendix B

**PROJECT TERMS OF
REFERENCE ISSUED BY
DNRM**

Attachment 1

Performance Review of Flood Warning Gauge Network in Queensland

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Information Security

This document has been classified using the Queensland Government Information Security Classification Framework (QGISCF) as PUBLIC and will be managed according the requirements of the QGISCF.

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1. Context

The Queensland Government is committed to improving the whole of cycle flood warning system in Queensland. This includes components associated with the prevention of, preparedness for, response to and recovery phases of major flood events.

A program of works has been established for the Department of Natural Resources and Mines to facilitate the following benefits:

- The Bureau of Meteorology (BoM) will be able to make more timely, reliable and high quality flood warnings and forecasts for Queensland communities based on information from a comprehensive monitoring network equipped with reliable and up-to-date equipment.
- Flood Mapping will reflect a Whole of Government approach to dealing with flood risk.
- Flood related information will be publicly available (including for insurance affordability) which is consistent with Recommendations 2.16 and 2.17 of the Queensland Floods Commission of Inquiry.

A flow on from these program benefits will lead to a more flood-resilient Queensland economy and communities.

A major project, “Flood Warning Network Performance Review” deals with the first item above, that is, the monitoring of hydro-meteorological information by various local, state, private and Commonwealth bodies, and collection and use of this data by BoM for flood warning purposes.

The “Flood Warning Network Performance Review” is to be carried out by the Department of Natural Resources and Mines (DNRM) to support the BoM in its objective to provide a timely, reliable and quality flood warning service. This review will ultimately be used to provide a basis for a flood warning management plan for Queensland.

2. Purpose and Objectives of Study

The purpose of the study is to evaluate the adequacy of the hydrometric gauge network in Queensland used by the Bureau of Meteorology for flood warning purposes, including its spatial configuration, standard of equipment, and operational arrangements, using a risk-based methodology, with a roadmap for implementing improvements to the spatial coverage, equipment standards, and asset management.

The study has multiple objectives:

- Spatial network – to assess the current status, identify gaps in the spatial distribution of gauges in the network, and develop a staged program of implementation (Flood Warning Gauge Network Management Plan);

- Standards of instrumentation, monitoring and data collection – to develop a complete asset inventory of the instrumentation, carry out conditional assessment report and prepare agreed technical standards and guidelines for the instrumentation;
- Asset Management – to provide detail of the current asset management arrangement, identify capacity of asset owners to provide on-going operations and maintenance, and evaluate options for changes to the current arrangement; and
- Other related issues – to compile information on the flow rating curves, adequacy of survey datum for river height gauge, and the accuracy of its geo-location and gauge metadata.

3. Client and Project Oversight

The Client for this work is the Department of Natural Resources and Mines (DNRM).

The DNRM Project Manager will be advised upon successful contract.

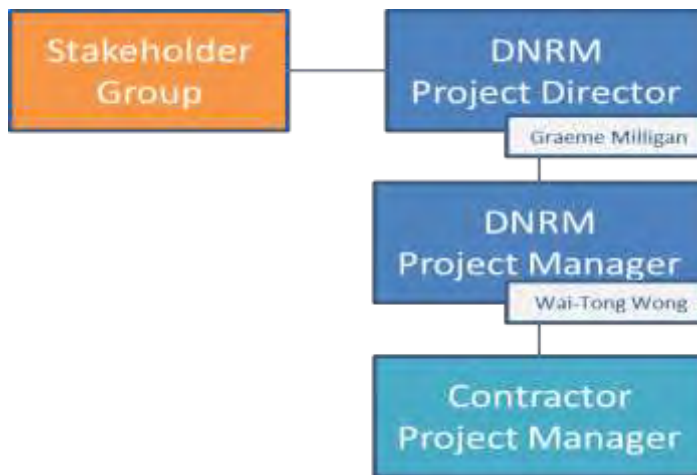
Project oversight will be provided by a Stakeholder Group chaired by the Queensland Reconstruction Authority. Although the composition of the Group has not been finalised, it is likely to have, as a minimum, representatives from:

- Queensland Reconstruction Authority (QRA)(Chair)
- Department of Natural Resources and Mines (DNRM)
- Bureau of Meteorology (BoM)
- Department of Energy and Water Supply (DEWS)
- Department of Infrastructure, Local Government and Planning (DILGP)
- Department of Premier and Cabinet (DPC)
- Department of Science, Information Technology and Innovation (DSITI)
- Inspector General of Emergency Management (IGEM – Observer)
- Local Government Association of Queensland (LGAQ)
- Public Safety Business Agency (PSBA)
- Queensland Fire and Emergency Service (QFES)
- Queensland Police Services (QPS)

4. Project Management and Progress Reporting

The contractor is to provide a Project Manager to liaise with the DNRM's Project Manager on a day-to-day basis.

The project management arrangement is presented below.



A face-to-face meeting and a written brief Progress Report (to an agreed template) to the DNRM Project Manager will be required fortnightly during the course of the study, unless advised otherwise.

Teleconference meetings may also be required to deal with any urgent matters.

5. Available Background Information

Some background information has been collected and will be provided.

Listed below are some brief descriptions of recent work or documents which relate to this project. The information described below is not exhaustive, and the contractor would be expected to undertake a thorough search of all relevant documentation.

QFWCC Audit of FWG Network (2012)

In the aftermath of severe flooding, an Audit of Queensland's Flood Warning Service was undertaken to provide an overview of the current (2011-12) flood warning network provided by the Bureau of Meteorology in Queensland; to identify gaps in the flood warning network (i.e. the river and rainfall monitoring stations that underpin the flood warning network); and to propose how these might be addressed.

The governance of the flood warning network is complex with a wide range of stakeholders with varying priorities. The Audit found that the flood warning network would benefit from a coordinated approach to assessment of network risks, establishment of priorities and evaluation of competing demands to optimise the benefits from the available financial resources. To optimise operation of the network, the Audit recommended as a priority investigation of alternative models for the ongoing management of the flood warning network.

Funding for additional FWG gauges

At the time of the Audit, (late 2011 and early 2012) funding was made available to various local councils in Queensland from *The Natural Disaster Resilience Program (NDRP)*, administered by the Department of Community Safety. In addition to NDRP the Department

of Local Government also provided funding for monitoring stations through its *Cyclone and Flood Warning Subsidy* (CFWS).

Review of Queensland flood warning and flood risk management arrangements.

IN 2013, DNRM engaged PricewaterhouseCoopers (PwC) to examine current gaps in Queensland's flood warning system and flood risk management arrangements that the Department could address through its recently acquired functions. In addition, DNRM requested PwC to provide an initial assessment of the broader flood risk management arrangements in Queensland, by comparing current arrangements to best practice principles outlined in the 'Managing the Floodplain' Emergency Handbook, produced by the Commonwealth Government (AEMI 2013).

In relation to the FWG network, the draft report (DNRM 2014) recommended:

- An update of the audit of Queensland's hydrometric gauge network conducted in 2012 to inform the prioritisation of future investment, applying an appropriate risk-based methodology. The audit should focus on the adequacy of the current spatial configuration of the network, as well as current standard of instrumentation. In addition, the capacity of local governments to maintain gauges on an ongoing basis should be assessed.
- examine options for the Queensland Government to facilitate a major program of works for provision of hydrometric services on behalf of asset owners
- develop instrumentation guidelines for hydrometric gauges

Other Information

A useful description of the National Arrangements for Flood Forecasting and Warning Services in Australia is given in a report prepared by BoM (BoM 2015). This report describes the arrangements nationally, including the roles of the local community, Local Government, Catchment or Regional Authorities, the State and the Commonwealth both before a flood event and during a flood event. It contains more specific information for each state as there are differences between states in responsibilities for flood forecasting and flood warning services.

An independent review of the Bureau of Meteorology's capacity to respond to future extreme weather and natural disaster events and to provide seasonal forecasting services was undertaken by C. Munro in 2011 (Munro 2011). Among other things, this review recommended:

- national standards for operation of flood monitoring networks and vest responsibility in fewer agencies.
- clarification of roles and responsibilities for issuing flash flood warnings.

The Australian Government's response to the above review (Comm 2013) can be found at <http://www.bom.gov.au/governmentresponse/doc/munro-review.pdf>

A summary of the information on the flood warning network used by BoM for its warning and forecasting services is available in a report on the BoM website:

<http://www.bom.gov.au/qld/flood/networks/description.shtml>

This above report contains links to network information held by the Bureau including listings of rainfall stations and river height stations, survey details for gauges, details of road crossings at or near river height stations, station ownership and flood warning network maps.

Information on the Queensland streamflow monitoring network operated by DNRM can be found on the Queensland Government Water Monitoring Portal:

<https://www.dnrm.qld.gov.au/water/water-monitoring-and-data/portal>

A comprehensive set of flood-mapping information for Queensland is maintained by DNRM on its Interactive Floodcheck map site: <https://www.dnrm.qld.gov.au/mapping-data/maps/flood-mapping-program/floodcheck-map>

6. Task Descriptions

To assist with the proposal, following is a list of tasks (not necessarily complete), and for each, a summary of the work envisaged.

6.1 Review of Existing Reports and Data

The review of previous studies and reports will include the Queensland Flood Information Program carried out in 2014 and the FWG network review undertaken in 2012 (FWCC 2012), and the information collected and analysed in those reviews. The information which includes the report, network information, mapping showing locations recommended for upgrades, and individual catchment reports will be made available to the Contractor.

Information on the current networks should be obtained from publically available sources.

A thorough review of background information on the current flood warning arrangements - national, state and local - should be undertaken inclusive of all documents highlighted in section 5 above.

6.2 Consultation Plan

Stakeholders in this study should be identified. These would include entities which have monitoring networks as part of their operations such as BoM, state government departments, Seqwater, Sunwater, local governments, corporations (e.g. Ergon, Energex and Powerlink), companies which owned referable dams, and manufacturers of instruments.

A plan for contacting, consulting with, and advising on progress and outcomes should be prepared.

The Consultation Plan is to be developed in consultation with a parallel project by DNRM, "Performance Review of Flood Mapping in Queensland" to ensure coordination, efficiency and for logistic purposes.

This Plan should be presented to the Projects Key Stakeholder Group (Stakeholder Group) for approval, prior to actual consultations. This Plan may need to be adjusted during the course of the consultation as approved by the Client.

6.3 Risk Based Methodology

- Develop a risk-based methodology, to identify and prioritise the gaps in the flood warning network that supports the BoM flood warning and forecasting system. This should take into consideration flood risk, potential flood damages to communities and critical infrastructure, the adequacy of the current flood warning network, and flood warning times, with the aim of providing a high standard of flood warning and flood forecasting capabilities for Queensland communities.
- Consultation should also be done with the Queensland Fire and Emergency Services which is currently developing a similar methodology for disaster management purposes.
- Some initial work has been done previously which may be of use. This spreadsheet will be provided.

6.4 Questionnaire Survey

- Development of a succinct set of questionnaires in accordance with the Inspector-General Emergency Management (IGEM) Assurance Activity Handbook to meet the objectives of the study. The questionnaire will be used to assist in the survey and consultation process.
- The survey may be conducted by telephone and/ or through innovative methods (e.g. electronically).
- It is expected that existing data and information be compiled by the contractor and will inform the survey design, prior to carrying out the survey with each stakeholder.

6.5 Consultation With Stakeholders

- A sample of the stakeholders across the State is to be consulted on a face-to-face basis.
- Field inspections of some gauging networks will also be required.
- The face-to-face meetings and field inspections are to be carried out in consultation with DNRM who will also be in attendance.

6.6 Spatial Network Analysis

- Gather information on the flood warning network installations from Authorities and companies which own or operate hydrometric monitoring installations currently used partly or wholly for FW purposes. This information will feed into the asset inventory should include:
 - Geospatial location data
 - Class and Type of device
 - Commission date
 - Design life
 - Output data format
 - which organisations capture the data and how
 - which organisation(s) owns, operates and maintains the gauge
 - primary purpose of installation, including if relevant secondary and tertiary drivers
 - Comments and Identified issues with gauges.

This would be best done on a catchment basis. Communities or infrastructure benefiting from the particular installations should be noted.

- Identify installations, or improvements that have occurred as a result of the grants provided in 2011/12 to local governments under the NDRP, and CFWS programs, and describe how these have improved the Bureau's flood warning and flood forecasting capabilities.
- Apply the risk based methodology (after approval by the Stakeholder Group) to the network to identify gaps in the network. This may require extensive consultation with local governments, and relevant government departments. A staged program of network improvement should be prepared with estimates of capital costs for each stage.
- Obtain information on existing hydrometric installations across the State, currently used for purposes other than for BoM flood warning, which could also potentially support the BoM flood warning system. This may include gauges owned by public or private sector organisations as well as by local authorities. Organisations may include mining companies (e.g. Santos), utilities (e.g. Ergon), and authorities (e.g. TMR, and QR).
- Determine the suitability of the above existing installations for integration into flood warning networks, and the costs of upgrading these installations (if necessary) to a standard suitable for flood warning purposes.
- Based on the above investigation, prepare recommendations for integration of existing non-flood warning hydrometric stations into flood warning networks.

6.7 Standards of instrumentation, monitoring and data collection

- Create a complete Asset Inventory of Instrumentation and related systems used in the Flood Warning Network, including a full break down by class, type, Geospatial location, Data output form, O&M agency, Installation date, Design Life etc. This element of work should occur concurrently with specific spatial network analysis and prior to the commencement of specific engineering field audit. The data is to be stored on a suitable software platform with applicable revision/data controls.
- Engineering conditional assessment report of the Identified Instrumentation / monitoring equipment used in the flood warning network, and evaluation of their performance and suitability for ongoing flood warning purposes by BoM. This assessment must contain key measurable quantitative, qualitative and repeatable metrics to form a base line analysis for the network devices and the system. From this an Engineering rectification plan may be created identifying sites in need of refurbishment, replacement or upgrading of existing installations due to non-compliance with standards or desired functional specification. This plan should include a prioritised listing and high level cost estimates as part of the consequential risk based assessment.
- Identification of any issues with identified Instrumentation / Monitoring equipment performance (requiring rehabilitation or replacement) or its compatibility with new program intent, emerging technologies or ALERT2 equipment proposed for future FWG installations. Solutions will need to be proposed for the integration of legacy systems and that of the

emerging technologies, this will need to be recognised within Specification, Guidelines and Standards both now and in transition.

- Capture the known technical standards and documentation for the existing Flood Warning Gauge Network & Hydrometric Networks into a central depository and compile a manageable register of said documentation. Perform Gap Analysis to assist in the development of a set of technical standards and guidelines for flood warning network Installations, Operations & Maintenance and Quality Assurance. This would include requirements such as placement guidance, hardware resilience / durability (fit for purpose requirements), data collection / transmission system requirements, FAT/IAT/CT and O&M minimum recommendations.
- Identify any opportunities to improve reliability, and robustness, or to reduce costs to the Flood Warning Gauges Networks through optimisation and rationalisation of infrastructure and associated third party systems and services providers (Telecommunications provider's , data recovery agents, Maintenance contracts, where these are employed). For example opportunities to reduce costs may exist where multiple data transmission services are employed in multi-use hydrometric installations.
- Identification of performance indicators, periodic inspection regimes and document controls will be provided as part of the O & M and Quality Assurance guideline development, this may be used to form the basis of future service provision contract across the Flood Warning Gauge Network, and tools for Governance and Assurances reviews regarding functional performance and integrity of the network.

6.8 Asset Management

- Compile and define detailed description of the current accountabilities and agreements for the Flood Warning Gauge network, including identification of the authorities responsible for operation and maintenance, and the existing cost sharing arrangements. Proposed recommendations (as necessary) to the responsibility and accountability matrix for parties to the Flood Warning Gauge Network over its lifecycle.
- Review of issues with respect to the current asset management arrangements across the Flood Warning Gauge Network. This may include assessing the capacity of the asset owners to provide effective ongoing operation and maintenance support of their gauges, and ultimately to provide funding for their replacement/renewal/ or alternate solutions to do so. Make recommendations to ensure the ongoing optimisation of the network whilst ensure the functional intent and integrity of the system is maintained.
- Evaluation and provision of options for changes to the current arrangements for operation and maintenance to improve the efficiency, quality, and effectiveness of the flood warning network. This may include consolidation of the responsibilities for operation and maintenance. Evaluate and provided documented option with brief CBA and Risk based assessment of each. Acknowledge Flood Warning Network Asset Management's models of other state jurisdiction to ensure learnings are captured.

- Preparation of an assessment and implementation guidelines to be utilised by entities/agencies/authorities when seeking capital funding for installation of new gauges or network upgrade. This will help ensure consistency in our delivery model for need and response.

6.9 Other Related Issues

- Flow rating curves are used to convert a river height at a location to flood flow (discharge). These rating curves are required in the Bureau's flood forecasting activities. The reliability of a rating curve (and consequently the forecast flood level) depends on many factors including the number of actual flow measurements at a location. Rating curves can be developed through a series of flood discharge measurements, by hydraulic modelling or by gauge height correlations. A listing of the river locations at which rating curves are available, together with their method of derivation, currency and reliability will be prepared.
- The gauge zero of river height monitoring stations must be known relative to the survey datum so gauge heights can be compared with nearby land levels or floor levels. The contractor is to prepare a listing of river height stations indicating which stations have not been tied into AHD.
- A confirmation and consultation of survey tolerances criteria with regard to the geo-location. Datum information plotted against the current asset base is required. A survey of random sites may also be required to re-enforce confidence in the geo-location data (plotting) we currently hold for network stations, this will apply relevance to station data.
- Evaluate the effectiveness and potential for utilisation of non-quantitative monitoring equipment (e.g. cameras, web-based technology) within the BoM flood warning network.

7. Project Deliverables

The project deliverables will be contained in a final report containing at least the following information but not limited to:

- a) The consultation plan and project plan for the study (in Microsoft Office Gantt Chart).
- b) Questionnaire survey (incorporating IGEM methodology).
- c) Creation of a detailed risk based methodology and analysis tool to be used to determine network improvements and weighting assessment. The performance of Risk / Opportunity assessments and their resultant registers.
- d) Create a complete Asset Inventory of Instrumentation and related systems used in the Flood Warning Network in parallel with Spatial Network Analysis, including a full break down by class, type, Geospatial location, Data output form, O&M agency, Installation date, Design Life etc. This element of work should occur concurrently with specific spatial network Analysis and prior to the commencement of specific engineering field review. The data is to be stored on a suitable software platform with applicable revision/data controls.

- e) Description of current network, on a catchment by catchment basis, with mapping showing the Class & Type of installations present with acknowledgement of the Asset Inventory of Instrumentation .
- f) Produce Engineering conditional assessment report of the identified instrumentation / monitoring equipment used in the flood warning network, and evaluation of their performance and suitability for ongoing flood warning purposes by BoM. This assessment must contain key measurable quantitative, qualitative and repeatable metrics to form a base line analysis for the network devices and the system.
- g) Recommendations/opportunities for augmenting the Flood Warning Gauge (FWG) network using existing non-flood-warning hydrometric installations. This should include the views of the owners of the non-flood warning equipment on their potential use in the BoM network.
- h) Recommendations for the upgrade of existing equipment, which currently does not meet desired standards for BoM use.
- i) Solutions to respond to issues with current identified Instrumentation / monitoring equipment performance (requiring rehabilitation or replacement) of ALERT devices or its compatibility with new program intent, emerging technologies or ALERT2 equipment proposed for future FWG installations. Solutions (including costs) will need to be proposed for the integration of legacy systems and that of the emerging technologies; this will need to be recognised within Specification, Guidelines and Standards both now and in transition.
- j) A final program of staged improvements (including costs) to the current FWG network used by BoM, with mapping identifying the locations of the proposed upgrades as well as the current network, and recent (post 2011) upgrades.
- k) Compilation of the known technical standards and documentation for the existing Flood Warning Gauge & Hydrometric Networks into a central depository and compile a manageable register of said documentation. Perform Gap Analysis to assist in the development of a set of technical standards and guidelines for flood warning network Installations, Operations & Maintenance and Quality Assurance.
- l) Compile and define detailed description of the current accountabilities and agreements for the FWG network, including identification of the authorities responsible for operation and maintenance, and the existing cost sharing arrangements. Proposed recommendations (as necessary) to the responsibility and accountability matrix for parties to the Flood Warning Gauge Network over its lifecycle.
- m) Review of issues with respect to the current asset management arrangements across the Flood Warning Gauge Network. This may include assessing the capacity of the asset owners to provide effective ongoing operation and maintenance support of their gauges, and ultimately to provide funding for their replacement/renewal/ or alternate solutions to do so. Make recommendations to ensure the ongoing optimisation of the network whilst ensure the functional intent and integrity of the system is maintained.
- n) Evaluation and provision of options (including costs) for changes to the current arrangements for operation and maintenance to improve the efficiency, quality, and effectiveness of the flood warning network. This may include consolidation of the responsibilities for operation and maintenance. Evaluate and provided documented options with brief cost benefit analysis and Risk based assessment of each. Acknowledge

Flood Warning Network Asset Management's models of other state jurisdiction to ensure learnings are captured.

- o) Recommendations for changes to the current arrangements (including funding and responsibilities) for asset management with justification for the proposed changes.
- p) Process (including performance indicators) for evaluating ongoing network effectiveness.
- q) Preparation of an assessment and implementation guidelines to be utilised by entities/agencies/authorities when seeking capital funding for installation of new gauges or network upgrade.
- r) Evaluations of the rating curve reliabilities and gauge datum completeness for river height stations.
- s) Consult and investigate the standards defined and implemented for the current FWG stations. Define survey tolerances criteria with regard to the geo-location Datum information plotted against the current asset base is required. A survey of random sampling of sites across varied asset owner sites may also be required to re-enforce confidence in the geo-location data (plotting) we currently hold for network stations, this will apply relevance to station data.
- t) Any other significant issues identified during the course of the study.

8. Reporting and Data Handover

8.1 Milestone Report

A Milestone report will be prepared to provide findings from Stage 2 of the project. The reports will contain findings from the survey and consultation with the stakeholders, and discussions of the issues. This report will be distributed (as pdf) to the Stakeholder Group members prior to the presentation/workshop.

8.2 Main Project Report

A final draft project report will be prepared prior to Hold Point 3 workshop. This report will also include the information contained in the milestone report. This report will be reviewed by the Stakeholder Group and feedback provided to the contractor.

8.3 Presentations/Workshops

It is anticipated that three workshops will be held to discuss the outcomes of Stages 1, 2 and 4 of the study as listed in the Key Outputs table in Section 9. These workshops will most likely be of ½ day duration, and will include DNRM personnel and Stakeholder Group members.

8.4 Data Handover

All data/information collected and assessed (including risk assessment framework, spreadsheets, database, ArcMap layers, maps) are owned by the Client. Mapping done is also required to be provided as kml files.

Such data/information will be adequately categorised and handed over to the Client at the completion of the project.

9. Key Outputs and Timeframe

The following table shows indicative timing for key outputs (and corresponding % payment of fees at the completion of each Stage) from the project:

Stage	Key Output (refer also to sections 6 and 7)	Timeframe (weeks from commissioning)	% Payment
1	<ul style="list-style-type: none"> Prepare detailed Project Plan (Gantt Chart) Prepare Consultation Plan Prepare draft Questionnaires (incorporating IGEM methodology) Presentation of proposed risk-based methodology for evaluation of network adequacy and identification of gaps <p>Hold Point 1 Workshop: for PwC review and Stakeholder Group endorsement (Scheduled 29/5/2015)</p>	3 (duration: 3 weeks)	20
2	<ul style="list-style-type: none"> Carry out survey and consultation with stakeholders Carryout face-to-face meeting and field inspection of equipment with selected stakeholders Presentation of information on existing FW network, including base mapping. Upgrades since 2011 which contribute to the BoM FWG network should be identified. Overview of types of equipment in use, condition assessment report and identification of equipment not meeting required standards. Overview of existing available technical standards governing installation, and maintenance of FW hydrometric gauges; and identification of issues or gaps in these standards. Overview of current arrangements (including funding) for asset management and identification of issues. Presentation of options for changes to the current arrangements (including funding) for asset management, including advantages and disadvantages of the options. Draft program of staged improvements (with costs) to the current FWG network used by BoM, with mapping. Description of opportunities, issues and costs for augmenting the FWG network by use of existing hydrometric stations not currently used for flood warning purposes. Any other options for a more efficient and effective network should also be addressed. Proposed guidelines for future funding proposals. Issues identified for rating curves, gauging station datum and geo-location of gauging station. Other issues identified. <p>Hold Point 2 Workshop: Presentation of findings and discussion with Stakeholder Group (Scheduled 7 August 2015)</p>	13 (duration: 10 weeks)	40
3	Prepare draft Report	17 (duration: 4 weeks)	25
4	<p>Feedback to from DNRM / Stakeholder Group/stakeholders for finalisation of draft report. Communication with key stakeholders of outcomes.</p> <p>Hold Point 3 Workshop: for Stakeholder Group endorsement (Scheduled 4 September 2015)</p>	19 (duration: 2 weeks)	

Stage	Key Output (refer also to sections 6 and 7)	Timeframe (weeks from commissioning)	% Payment
5	Final Report (after amendments and subsequent report approval by client) and data handover. (Scheduled Completion: 25/9/2015)	20 (1 week)	15

The Offeror may provide an alternative study program, including alternative set of milestones, timeframes and % payment of fees for consideration by the Client. The Client reserves the right to revise the study program, milestones and payment schedule in consultation with the successful Offeror.

10. Review Process and Hold Points

The study will be reviewed by the Stakeholder Group, under the chair of Queensland Reconstruction Authority. Hold points will occur at the end of Stages 1, 2 and 4 of the table in the previous section.

11. Proposal Response

The Offeror's proposal shall include:

- Response to Section 6;
- Methodology for undertaking the project;
- Assumptions, limitations, exclusions and risks;
- Project program and time input of proposed staff;
- Breakdown costs of the project should be adequately tabled with proposed staff and time;
- Details of similar projects; and
- Brief resume for the proposed project staff.

Generally speaking, the Offeror should show appreciation of the scope of the study, including a description of what key challenges may be encountered and their responses.

12. Meetings and Travel Costs

It is anticipated that a number of face-to-face meetings will be held with various identified stakeholders. The majority of these meetings and site inspections of instrumentation will be held in locations outside Brisbane. They will include DNRM personnel and where applicable Stakeholder Group members and or their representatives.

DNRM will be responsible for organising the group travel and accommodation arrangements. These arrangements will be in line with the Queensland Government Staff Travel arrangements - *Domestic Travelling and Relieving Expenses- Directive No 9/11 September 2011*.

The contractor will be responsible for their own incidentals including all meals, and travel to and from airports.

13. Evaluation of Proposal

The proposal will be assessed in accordance with the following evaluation criteria:

13.1 Methodology

- Clearly thought out process and the methodology for carrying out the project, with some details;
- Demonstration of a clear understanding of the brief (not necessarily repeating text);
- Demonstration of innovation and efficiency gains where opportunities exist; and
- There are no conditions attached to the submission which are inconsistent with the brief.

13.2 Experience of nominated staff

- Demonstrated experience of the nominated project manager to manage and deliver projects similar in scale and complexity;
- Demonstrated wide experience in consulting with local governments;
- Demonstrated experience of team members to include hydrometric network analysis, Geographic Information System (preferably ArcMap), catchment hydrology, flood modelling, cost benefit analysis of wide area instrumentation for operations and maintenance and asset management;
- Significant and extensive experience in developing and implementing effective flood warning system in Queensland or Australia;
- Significant experience in review, monitoring, interpretation, communication and instrumentation for flood warning gauging network;
- Significant experience in preparing clear and high quality report suitable for target audience;
- Demonstrated general knowledge of National and State arrangements for flood warning in Australia;
- Demonstration of experience of successfully working collaboratively to solve complex problems; and
- Registered Professional Engineer of Queensland (for areas covering Information, Telecommunication and Electronics or Electrical, and Civil).

13.3 Lump Sum Cost

- Value for money (lump sum); and
- The cost should be made in accordance with the terms and conditions as per SOA DSITIA SD01.

13.4 Capacity to deliver requirements of specifications

- Availability, time input and commitment of key team members during the project duration;
- Flexibility to adjust to potential changes to meet outcomes of study; and
- The Offeror's proposed program is efficient, realistic and reflects the scope of works.

13.5 Capacity to meet the required timeframes

- Demonstrated project management (and organisational) capacity to meet the required timeframes including due consideration of all project related risk factors.

14. Referees

Offerors are required to nominate a minimum of two current or recent clients of the Offeror who would be able to act as referees. Offerors should ensure that the referees used are customers where the requirements were of a comparable scope and complexity to this RFQ.

Offerors are required to provide details including contact names, telephone number and positions held as required in the Schedule of Particulars. The Client reserves the right to contact these clients during the evaluation process to obtain independent testimony on the Offeror's previous performance.

15. Key Performance Indicators

The contractor's performance will be based on:

Key Performance Area (KPA)	Key Performance Indicator (KPI)
Financial performance and objectives	<ul style="list-style-type: none">• Delivery of outcomes within budget• 100% of invoices submitted correctly upon first lodgement
Quality performance and objectives	<ul style="list-style-type: none">• High quality product acceptable to client and stakeholders• Proper QA of outputs done by contractor• Minimal concerns received from stakeholders
Delivery / Timing performance and objectives	<ul style="list-style-type: none">• Delivery of outcomes to agreed timelines• Timely response to issues raised by client and stakeholders
WHS	<ul style="list-style-type: none">• Appropriate WHS in place by contractor
Administrative performance and objectives	<ul style="list-style-type: none">• Compliance to project management requirements as per contract/terms of reference such as progress reports and meetings

	<ul style="list-style-type: none"> • Commitment by key consultants identified in the contract
Relationship management performance and objectives	<ul style="list-style-type: none"> • Timely response to client's requests • Willingness to assist client within reasonable bounds

16. References

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- Commonwealth (2013) *Australian Government Response to the Review of the Bureau of Meteorology's capacity to respond to future extreme weather and natural disaster events and to provide seasonal forecasting services*. Commonwealth of Australia
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