11.4. ESTABLISHMENT OF A FLOODPLAIN RISK MANAGEMENT COMMITTEE - TUMBARUMBA FLOODPLAIN - ATTACHMENTS

Attachment:

1. Floodplain Management Program - 2022-23 (DOC22/958570) - Funding Agreement
2. Tumbarumba Flood Study-Technical Project Brief-Draft

Attachment 1 - Floodplain Management Program 2022-23 DOC22 958570 Funding Agreement

NSW GOVERNMENT

Department of Planning and Environment

DOC22/958570

Mr Matthew Hyde
General Manager
Snowy Valleys Council
76 Capper Street
TUMUT NSW 2720

Email: info@svc.nsw.gov.au

Attention: Nicholas Wilton

Dear Mr Hyde

I refer to Council's application for funding under the 2022-23 Floodplain Management Program for the following project:

Tumbarumba flood study
Maximum funding amount: $80,000
Grant reference no. 2022/FMP/0140

I am pleased to advise that Council's application to the program has been successful. The offer is subject to Council undertaking to meet the balance of funds for the project, as outlined in the application, and agreeing to the terms set out in the attached *Funding Agreement for Financial Assistance* (the Agreement).

Council may accept this offer by signing the enclosed Agreement and returning it via email by **20 January 2023**. Please note that if the Agreement is not returned by this date the offer of funding may lapse. Please pay attention to any project specific conditions under clause 19.

I would like to draw Council's attention to condition 3.1 of the Agreement, which outlines the requirement to submit a Work Plan after Council has tendered for the work. The Work Plan should be prepared in consultation with Council's Department of Planning and Environment contact, Steve Manwaring, and be submitted electronically using variation process in the Grants Management System no later than **28 April 2023**.

If Council has any questions in relation to this grant offer, please contact me on 02 9895 6494 or at coastalestuary.floodgrants@environment.nsw.gov.au.

Yours sincerely

[redacted] 28/11/2022
Alexandra Gardiner
Acting Manager Contestable Grants - Coast, Estuary and Flood
Grants Branch, Environment and Heritage Group

Contact officer: Steve Manwaring
(02) 6229 7170

4 Parramatta Square | 12 Darcy Street Parramatta NSW 2150 | Locked Bag 5022 Parramatta NSW 2124 | dpie.nsw.gov.au

DEPARTMENT OF PLANNING AND ENVIRONMENT

Funding Agreement for Financial Assistance

under the *2022-23 NSW Floodplain Management Program*

Grant Details

Program **Floodplain Management Program**

Grant number: **2022/FMP/0140**

Recipient: **Snowy Valleys Council**

Project: **Tumbarumba flood study**

Maximum funding amount: **$80,000**

Funding ratio: **4:1**

Funding term completion date: **17 January 2025**

Acceptance of conditions:

On behalf of **Snowy Valleys Council**, I accept the following conditions of this Funding Agreement. This Funding Agreement commences on the signing of this document by both parties.

[redacted] (signature)

Nicholas Wilton (name)

Manager Growth + Activation. (position)

Date: 1 December 2022.

Note: This agreement must be signed by the General Manager or officer delegated with authority to bind the Recipient

Approval of Agreement between Department of Planning and Environment and Snowy Valleys Council

Signed for and on behalf of the Department of Planning and Environment representing the Crown in right of New South Wales by

Alexandra Gardiner – Acting Manager, Contestable Grants - Coast, Estuary and Flood

[redacted]

Date: 28/11/2022

Please return the signed Agreement **by Friday, 20 January 2023** to:
coastalestuary.floodgrants@environment.nsw.gov.au

If the signed Agreement is **not** returned by this date, the offer of funding will automatically lapse.

Document Set ID: 3210205
Version: 1, Version Date: 29/11/2022

Conditions

1 Definitions and Interpretation

Defined terms and aids to interpretation of this Agreement are set out in the Dictionary at the end of this Agreement.

2 DPE's obligations

2.1 DPE will pay the Recipient, in accordance with the terms of this Agreement, an amount up to the Maximum Funding Amount towards the Recipient's performance of the Project.

2.2 DPE will not pay the Recipient for anything that is part of the Recipient's Core Activities.

2.3 DPE may arrange the provision of additional services to the Recipient, including:

- support with the administration of financial assistance
- participation in meetings of the Recipient's Floodplain Risk Management Committee
- meeting with the Recipient's staff frequently, particularly at critical stages in the Project
- assistance with the preparation of briefs and review of proposals for studies
- technical review of plans, studies and designs for compliance with Government objectives and Project aims and requirements
- assistance with the preparation and review of specifications for works
- assistance with the review of tenders for works, and
- assistance with the management of consultants and contractors.

2.4 DPE will approve the Work Plan referred to in clause 3.1.

3 Recipient's obligations

3.1 By **28 April 2023**, and following compliance with clauses 3.12, 17.3 or 18.4 and 17.4 or 18.5 the Recipient will submit a Work Plan using the variation process in DPE's Grants Management System (https://gms.environment.nsw.gov.au/), based on the recommended tender. Before awarding the contract for this project, the Recipient must receive written advice from DPE Grants Branch indicating the Work Plan has been approved.

3.2 The Recipient will carry out the Project as outlined in its Application and in accordance with the Work Plan.

3.3 The Recipient will advise DPE immediately if it has sought, is offered, or intends to accept funding from any other source(s) for this Project at any time during the Funding Term.

3.4 The Recipient contribution must not include funds received from any other NSW or Commonwealth program for the agreed contribution.

3.5 The Recipient must ensure that all funds provided by DPE under this Agreement are applied only to the actual cost of the Project.

3.6 The Recipient will ensure that all activities undertaken under the Project are consistent with the objectives of the Floodplain Management Program, the *NSW Flood Prone Land Policy*, the *NSW Floodplain Development Manual* (2005) and the NSW State Emergency Service requirements from the *Floodplain Risk Management Process Guidelines*. If necessary, the Recipient may seek clarification of this obligation from DPE.

3.7 The Recipient will undertake or oversee all technical, environmental, heritage and risk assessments, and obtain the necessary consents in relation to the Project in accordance with NSW legislative requirements and accepted best practice guidelines.

3.8 The Recipient will, in conjunction with DPE, monitor and evaluate the Project against the agreed project outcomes as described in the Application or any subsequent written agreement between the parties.

3.9 The Recipient will keep DPE informed of the progress of the Project in relation to the Work Plan and will highlight any significant technical issues.

3.10 The Recipient will report on or explain any aspect of the Project requested by DPE, and give due consideration to all comments issued by DPE in relation to the Project.

3.11 The Recipient's Representative will be responsible for managing the Recipient's obligations under this Agreement. The recipient must notify DPE immediately of any change to the Recipient's Representative at any time during the funding term.

3.12 The Recipient will provide DPE with a copy of the proposed technical specification and related contract conditions for comment before tendering. The Recipient is to advise DPE in writing how DPE's comments are incorporated into final documentation before tendering.

3.13 At the completion of the Project, the Recipient will provide to DPE copies of all project deliverables, including but not limited to final reports, model data files, damage calculation files and reports final works designs and specifications, manuals, and work as executed documentation. Project deliverables are to be uploaded electronically through the NSW flood data portal, unless otherwise advised. A hard copy of project deliverables is to be provided to DPE.

4 Record keeping

4.1 The Recipient must:

(a) Maintain financial receipts and expenditure details and other correspondence and materials related to the Project until the grant is formally acquitted

(b) Permit DPE to inspect (and if necessary be supplied with copies of) all the Recipient's accounts and any other documents, including any application documents, relating to the Project, and

(c) Comply with all reasonable requests by DPE for other information and particulars concerning the Project within 14 days of such request.

(d) Retain the records referred to in this clause 4 (**Record keeping**) throughout the Funding Term and for seven (7) years after the date that is the earlier of the date of expiry of the Funding Term or termination of this Agreement.

5 Reports

5.1 The Recipient must prepare and submit to DPE:

(a) a Milestone Report and Expenditure information for each Milestone achieved, and

(b) a Final Report (including financial acquittal) for the Project within two months of the project completion date.

5.2 The reports must be prepared using the **relevant templates provided by DPE in the Online Grants Management System.**

6 Claiming a payment

6.1 DPE will make Milestone Payments to the Recipient under this Agreement up to a total amount not exceeding the Maximum Funding Amount.

6.2 DPE will make a Milestone Payment to the Recipient in response to the successful delivery of a Milestone and the submission of a satisfactory Milestone Report and Expenditure information in accordance with clause 5.1.

6.3 The Milestone Payment for a Milestone will be the proportion, set as the Funding Ratio, of the Recipient's **Actual Expenditure** in delivering the Milestone, as detailed in the relevant Milestone Report, subject to clause 6.4.

6.4 If a Milestone Payment determined under clause 6.3 would mean that the total amount DPE pays under this Agreement would exceed the Maximum Funding Amount, that Milestone Payment will be reduced by the amount by which the Maximum Funding Amount would be exceeded.

6.5 If the total amount of all the Milestone Payments DPE makes for the Project is less than the Maximum Funding Amount, DPE will not be liable to make additional payments to the Recipient.

6.6 Payments will not be made until the Recipient provides DPE with a valid Australian Business Number.

7 Goods and Services Tax (GST)

7.1 In this clause, the expressions 'Australian law', 'consideration', 'GST' and 'input tax credit', have the meanings given to those expressions in the *A New Tax System (Goods and Services Tax) Act 1999.*

7.2 Funding made under this Agreement is a payment specifically covered by an appropriation under Australian law, which is not the provision of consideration for GST purposes.

7.3 DPE's financial assistance to the Recipient under this Agreement will be based upon a Project's actual costs, less any input tax credits the Recipient is entitled to.

8 Variation

8.1 The Recipient must obtain prior approval using the variation process **in the Online Grants Management System** for any variation to the:

(a) Agreement (including the Funding Term)

(b) Work Plan

(c) budget (including any changes to funding sources), or

(d) scope of a Project (to that outlined in the Application).

9 Breach of conditions

9.1 If the Recipient breaches any of the Recipient's obligations under this Agreement, or is otherwise not undertaking or is unable to carry out the Project in accordance with the Work Plan, DPE may make a written request to the Recipient to rectify the breach or resume carrying out the Project in accordance with the Work Plan.

9.2 DPE may suspend or withhold any payments under this Agreement or part thereof until the Recipient has taken action to comply with a request under clause 9.1.

9.3 If the Recipient cannot rectify a breach or complete the Project to the satisfaction of DPE after receiving a request under clause 9.1, DPE may terminate this Agreement.

9.4 If DPE terminates the Agreement:

(a) DPE will only be liable to pay the Recipient in respect of Milestones that the Recipient has satisfactorily delivered at the date of termination and for which the Recipient has submitted a Milestone Report and Expenditure information, and

(b) The Recipient must repay to DPE any monies DPE paid to the Recipient under this Agreement that is in excess of DPE's liability at the date of termination.

9.5 If the Recipient fails to repay any excess payments, DPE may recover them in any appropriate court as a debt due to the Crown.

10 Publicity

10.1 The Recipient must acknowledge the NSW Government's contribution in any public statements or written material in relation to the Project.

10.2 The Recipient must also use the current NSW Government logo in any publicity provisions related to the Project (including brochures, signage, advertising, invitations etc., but excluding those documents referred to in clause 17.15), and ensure compliance with any accompanying logo style guides.

10.3 The Recipient must extend an invitation to a government representative to any launch or public event associated with the Project, and where they are able to attend, acknowledge them as an official guest. Where practicable, the Recipient should also afford the government representative the courtesy of publicly addressing the event.

10.4 DPE may publicise the awarding of the funding at any time after it is awarded, including:

(a) the Recipient's name

(b) the amount of financial assistance

(c) the title and description of the Project, and

(d) the outcomes of the Project.

11 Intellectual property

11.1 In this clause, Intellectual Property includes all statutory, legal, equitable and other proprietary rights and interests, including without limit, in copyright, patents, registered and unregistered trademarks, registered designs, circuit layouts, trade secrets, semiconductor or circuit layout rights, trade, business or company names, or other proprietary rights, or any rights to registration of such rights existing in Australia, whether created before or after this agreement.

11.2 The Recipient warrants that:

(a) in carrying out the Project, it will not infringe any Intellectual Property rights, and

(b) any report by the Recipient will not contain anything that, to its knowledge, is libellous or defamatory.

11.3 The Recipient indemnifies DPE and their employees and agents against any action, costs, expenses, losses or damages suffered or incurred by all, or any more of them, arising out of, or in any way in connection with:

(a) any breach by the Recipient or its employees or its agents of the Recipient's obligations under clause 11.2, and

(b) any infringements by DPE of third-party Intellectual Property rights in it use of the Project Materials.

11.4 Subject to clause 11.5:

(a) The Recipient grants to the State, at no cost, a perpetual, irrevocable, worldwide, royalty-free non-exclusive licence, including the right to sub-licence, to use, reproduce, modify, adapt, publish and communicate to the public, the Project Materials (to avoid doubt, including for the purpose of making the Project Materials freely available to the public or any section of it, whether in hard copy or on-line and including use and modification of any models and copying photographs), and

(b) To ensure compliance by the Recipient with clause 11.4(a), if the Recipient engages a third party to create the Project Materials the Recipient must ensure that the terms of its engagement provide that the third party:

i. assigns Intellectual Property in such materials to the Recipient immediately on creation of materials; and

ii. warrants that it has the legal authority to comply with the obligation referred to in clause 11.4(b)i.

11.5 To the extent that the Recipient cannot take ownership of Intellectual Property in any Incorporated Existing Materials:

(a) the Recipient must ensure that relevant third parties grant to the State, at no cost, a perpetual, irrevocable, worldwide, royalty-free, non-exclusive licence, including the right to sub-licence, to use, reproduce, modify, adapt, publish and communicate to the public, the Incorporated Existing Materials for any Non-Commercial Purpose (to avoid doubt, including for the purpose of making the

Incorporated Existing Materials freely available to the public or to any section of it, whether in hard copy or on-line and including use and modification of any models and copying of photographs); and

(b) if any of the Incorporated Existing Materials are included in the materials referred to in clause 17.14(a), the Recipient must ensure that relevant third parties make those Incorporated Existing Materials available to the public under a Creative Commons Attribution 4.0 licence.

11.6 To the extent that the State owns Intellectual Property in the Project Materials, the State grants to the Recipient, at no cost, a perpetual, irrevocable, worldwide, royalty-free non-exclusive licence, including the right to sub-licence, to use, reproduce, modify, adapt, publish and communicate to the public, the Project Materials.

12 Indemnity and release

12.1 The Project shall be performed at the Recipient's risk. The Recipient accepts full responsibility for the performance of the Project and for the consequences of implementing any of the Project's findings and recommendations.

12.2 The Recipient indemnifies and keeps indemnified the Secretary of the Department of Planning and Environment and her employees and agents, the Minister and the Crown in right of NSW from and against all actions, claims, demands and other proceedings that may be made or recovered against the Secretary of the Department of Planning and Environment and her employees and agents, the Minister and the Crown in right of NSW, in respect of any damage to property, personal injury or death where the damage, injury or death was caused by any wilful, unlawful or negligent act or omission of the Recipient or its employees or agents in relation to the carrying out of the Project. DPE will inform the Recipient as soon as it becomes aware of any such action, claim, demand or proceeding.

12.3 The Recipient will release the Secretary of the Department of Planning and Environment and her employees and agents, the Minister and the Crown in right of NSW from and against all actions, claims, demands and other proceedings that the Recipient may make or recover against the Secretary of the Department of Planning and Environment and her employees and agents, the Minister and the Crown in right of NSW, in respect of any damage to property, personal injury or death suffered by the Recipient, its employees or agents in relation to the carrying out of the Project.

12.4 The indemnity and release provided by the Recipient in clauses 12.2 and 12.3 is reduced proportionately to the extent that the relevant damage to property, personal injury or death is caused or contributed to by any wilful, unlawful or negligent act or omission by DPE or its employees or agents.

13 Insurance

13.1 The Recipient shall be responsible for effecting and maintaining all insurances required under workers' compensation legislation and for taking all other actions requisite as employer of person engaged to carry out all or any part of the Project. The Recipient shall also be responsible for ensuring volunteers carrying out any part of the Project are covered by volunteer personal accident insurance.

13.2 The Recipient must effect and maintain public liability insurance in relation to all premises and sites on which the Project is carried out for all works and activities undertaken for this Project. The insurance shall be for an amount of at least $20,000,000. The policies or a certificate of currency shall be made available to DPE for inspection on request.

14 Confidentiality

14.1 DPE will not disclose any information that is contained in the reports, documents and materials that you have indicated is confidential and that the DPE has agreed not to disclose.

14.2 DPE undertakes not to disclose any personal information (in accordance with the definition of personal information contained in the Privacy and Personal Information Protection Act

1998), that is contained in the reports, documents and materials that you have submitted without your written consent, with the exception of the purpose outlined in 14.4.

14.3 DPE will not use any personal information for purposes other than the original purposes for which that personal information was supplied without your written consent, with the exception of the purpose outlined in 14.4.

14.4 DPE may disclose information contained in reports, documents and materials you have submitted to a third party for the sole purpose of evaluation of its grants programs. DPE will ensure that any third party agrees to keep all information acquired, material prepared or collected and any findings of the Project confidential.

14.5 Clauses 14.1 and 14.2 are subject to any legal obligation on DPE to disclose information.

15 Survival of obligation

15.1 The Recipient's obligations under clauses 4, 5, 10, 11, 12 and DPE's obligations under clause 14 survive the termination or expiry of this Agreement.

16 Miscellaneous

16.1 Any written notice or demand provided for in the Agreement may be served on the Recipient by ordinary prepaid post or email.

16.2 Neither the Recipient nor any person engaged by the Recipient shall be in the service or employment of DPE by virtue of this Agreement.

16.3 Any court proceedings arising out of or relating to this Agreement must not be heard or started in any court other than a court in NSW. The Agreement will be governed by and construed in accordance with the law for the time being in force in NSW.

16.4 The invalidity or unenforceability of any one or more of the conditions of the Agreement shall not invalidate or render unenforceable the remaining conditions of the Agreement. Any invalid or unenforceable condition shall be severable and all other conditions shall remain in full force and effect.

16.5 All project activities need to be consistent with relevant current Government policy.

Specific conditions

17 Studies and Survey, investigations and design, monitoring and documentation projects

17.1 The following conditions apply to studies and survey, investigations and design, monitoring and documentation projects only.

17.2 The Recipient will arrange for all work in the project to be undertaken by an external consultant selected through competitive tendering, unless DPE approves otherwise under clauses 17.16 and 17.17.

17.3 The Recipient will submit the project brief to be used in the call for tenders to DPE and will consider all DPE comments on the brief prior to releasing the call for tenders.

17.4 The Recipient will seek comments from DPE on all proposals received in response to the call for tenders and consider DPE's comments before awarding the contract for the work.

17.5 If the project captures or generates geospatial data, all data will be supplied by the Recipient at, or before, the completion of the project to DPE. Data must be compatible with the ESRI software, unless prior written approval is given by DPE.

17.6 The recipient shall provide digital metadata files for all geospatial data produced under this agreement. The digital metadata files shall be provided to DPE along with each final product deliverable. The metadata file shall meet ISO 19139 standards and NSW metadata portal requirements.

17.7 If the Project involves the collection of any geospatial data (including LiDAR, digital elevation or monitoring data) the Recipient must do all things necessary to ensure that the Whole-of-Government is granted a permanent, irrevocable royalty-free, non-exclusive licence to make such Project Materials publicly available and to otherwise communicate, reproduce, adapt or publicise them on a non-profit basis.

17.8 If the Project involves the collection of any LiDAR or digital elevation data, the Recipient will ensure that the data is collected and classified in accordance with the "ICSM LiDAR Acquisition Specifications and Tender Template" and/or the most recent version of the Land and Property Information "Standard LiDAR Product Specifications".

17.9 If the project involves collecting raw data, such as LiDAR data, the Recipient will ensure that all collected data is supplied in addition to derived data for the project. For LiDAR, this would include supplying the full LAS files.

17.10 Geospatial data includes those generated in a: Geographic Information System (GIS); Land Information System (LIS); Remote Sensing or Image Processing system; Computer-Aided Design and Drafting (CADD) system; Automated Mapping/Facilities Management (AM/FM) system; and other computer system that employs or references data using either absolute, relative, or assumed coordinates.

17.11 The Recipient will supply progress reports, draft reports and working papers on investigations and associated model data files to DPE for technical review. The Recipient will submit all comments provided by DPE following such review to the selected consultant for consideration.

17.12 The Recipient will seek comments from DPE and consider all DPE comments prior to finalisation of any draft reports or working papers or designs and asset management plans and operations and maintenance manuals.

17.13 The Recipient will place a copy of all current public consultation drafts and final floodplain management plans and studies on its internet website within one month of completion of these documents.

17.14 The parties agree that:

(a) The Recipient will make the Project report and associated figures (excluding any sections highlighted as confidential by the Recipient), spatial flood extent layers for key events and other data and tools the Recipient agrees (via correspondence with DPE) available to the public under a Creative Commons Attribution 4.0 licence

(b) All other inputs, outputs, tools and material associated with the project not specifically identified in clause 17.14(a) need not be made available to the public under a Creative Commons licence or otherwise, other than as is required by law.

17.15 The Recipient will ensure that draft and final floodplain management plans and studies **do not** include the NSW Government or DPE name or logo on the cover or title page.

The Recipient will ensure that these documents include the following acknowledgement:

"[the Recipient's name] has prepared this document with financial assistance from the NSW Government through its Floodplain Management Program. This document does not necessarily represent the opinions of the NSW Government or the Department of Planning and Environment."

17.16 If the Recipient proposes to undertake the work in the Project itself:

(a) The Recipient must provide a detailed cost estimate (including those costs directly incurred in undertaking the Project and on-costs to a maximum of 10% of salaries) to DPE and seek approval from DPE

(b) The cost estimate is to be accompanied by detailed justification for the work to be done by the Recipient together with full details of the key staff to be involved demonstrating that they have the expertise, skills, qualifications and experience to undertake the work

(c) The Recipient must show it can and will commit the key staff and other resources required to the project to ensure that work is completed within the time period specified

in the approved Work Plan. The Recipient must not change the nominated key staff without DPE's approval, and

(d) The Recipient will not commence work until DPE gives written approval.

17.17 If DPE gives approval for the Recipient to undertake the work itself:

(a) The Recipient must effect and maintain appropriate professional indemnity insurance in relation to carrying out all works and activities undertaken for the Project. The insurance shall be for an amount of at least $20,000,000. The policies or a certificate of currency shall be made available to DPE for inspection on request

(b) Clauses 17.12 to 17.16 above apply, as appropriate, to the Recipient's undertaking of the work, and

(c) Despite clause 2.2, DPE will pay, under the Agreement, for the Recipient's costs as outlined in the detailed cost estimate provided under clause 17.16 (a). DPE will not pay for other Recipient's Core Activities.

18 Construction and specified maintenance projects

18.1 The following conditions apply to construction and specified maintenance projects only.

18.2 The Recipient will arrange for all construction work to be carried out by an external contractor selected through competitive tendering, unless DPE approves otherwise under clauses 18.8 and 18.9.

18.3 The Recipient will arrange for full-time supervision of construction work to be undertaken by an external contractor selected by competitive tendering, unless DPE approves otherwise under clauses 18.8 and 18.9.

18.4 The Recipient will seek and obtain DPE's comments in writing of the draft plans, designs, estimates and asset management plan or operations and maintenance manual for the works and consider DPE's comments before calling for tenders for the construction work.

18.5 The Recipient will submit a written report on tenders to DPE, seek comments on the recommended tender and consider all DPE comments before awarding the contract for the construction work.

18.6 The Recipient will ensure that the works are constructed strictly in accordance with the agreed plans and specifications. No variations are to be undertaken without DPE's prior written agreement.

18.7 The Recipient is to maintain the works constructed in good order and condition at the Recipient's expense by including the required funding for such maintenance in its asset management plan within its annual Plan of Management. In relation to flood warning systems, maintenance is considered to include the regular servicing of the gauging stations and any other hardware and the operational aspects of the system to ensure that it is fit for its intended purpose.

18.8 If the Recipient proposes to carry out day labour or other work or undertake supervision, the Recipient must provide to DPE sound economic or practical reasons and a detailed cost estimate and obtain written approval from DPE prior to commencing work.

18.9 If DPE gives approval to the Recipient to undertake day labour, or other work or supervision, then:

(a) The Recipient must effect and maintain appropriate professional indemnity insurance in relation to carrying out for all works and activities undertaken for the Project. The insurance shall be for an amount of at least $20,000,000. The policies or a certificate of currency shall be made available to DPE for inspection on request

(b) For full-time supervision of contract works, the Recipient must provide full details of the key staff to be involved demonstrating that they have the expertise, skills, qualifications and experience to undertake the work and that it can and will commit these staff and the other resources required to the project to ensure that work is

completed within the time period specified in the approved Work Plan. The Recipient must not change the nominated key staff without DPE's approval

(c) Clauses 18.4, 18.6 and 18.7 apply as appropriate to the Recipient's undertaking of the work, and

(d) Despite clause 2.2, DPE will pay under the Agreement for the Recipient's costs as outlined in the cost estimate provided under clause 18.8.

19 Project-specific conditions

19.1 Grant funding can only be used for the flood study element of this project.

19.2 Funding reduced to $80,000 to fund the flood study element only (milestones one-three).

Dictionary

"Actual Expenditure" means the actual monetary amount expended on the project and cannot include in-kind contributions.

"Agreement" means this funding agreement and includes the Grant Details, the Conditions, the Work Plan (as agreed to by both parties), any Schedules, attachments or Appendices.

"Applicants Contribution" means the funding portion to be paid by the applicant, this contribution cannot include funds received under any other NSW or Commonwealth programs unless agreed to at the time of application.

"Application" means the recipient's application for funding.

"Confidential Information" means any information that:

(a) is by its nature confidential
(a) is designated, or marked, or stipulated as confidential, or
(b) you know or ought to know is confidential

But does not include information which:

(c) is or becomes public knowledge other than by breach of this Agreement;

"DPE" means the Department of Planning and Environment representing the Crown in right of New South Wales. The Department of Planning and Environment is part of the Department of Premier and Cabinet.

"Expenditure information" means the form that details actual project expenditure to date and is lodged with a Milestone Report to generate a Milestone Payment.

"Final Report" means the report outlining the achievements of the project, including project acquittal.

"Funding Ratio" means the agreed proportion of funding contributed by the Floodplain Management Program relative to the funds provided by Council (from its own revenue, not from other funding sources), to the overall cost of the Project, without exceeding the Maximum Funding Amount., as set out in the Grant Details.

"Funding Term" means the duration of this Agreement as set out in the Grant Details or until the date on which this Agreement is terminated, whichever comes first.

"Incorporated Existing Materials" means any materials existing at the commencement of the Project which are incorporated into the Project Materials.

"Maximum Funding Amount" means the maximum amount of funding that DPE will provide under this Agreement, as set out in the Grant Details.

"Milestone Date" means the date by which each Milestone must be completed as specified in the Work Plan.

"Milestone Payment" means a payment made on the successful delivery of a Milestone.

"Milestone Report" means the report, which provides details of the activities carried out to achieve a Milestone.

"Milestone" is a significant event in the Project that signals the commencement and/or completion of some part of that Project, or a stage at which agreed parts of the Project will be completed as specified in the Work Plan.

"**Online Grants Management System**" means the online portal provided for the management of the grant project.

"Non-Commercial Purpose" means any purpose other than the purpose of generating a profit.

"Project Materials" means anything brought or required to be brought into existence as part of, or for the purpose of, carrying out, or in connection with, the Project, including all reports, documents, computer models, data files and field data.

"Recipient's Core Activities" means core activities undertaken by the Recipient, including 0preparation of study briefs, review of proposals and tenders, researching and copying the Recipient's records, attending meetings, contract administration, accounting costs, and liaising with the public and government agencies.

"Recipient's Representative" means the representative nominated by the Recipient to oversee the Project.

"State" means the Crown in right of the State of New South Wales.

"Work Plan" means the plan that outlines the Project's planned activities, budget, timeline, outputs and Milestones as agreed to by both parties.

The following words have the meaning ascribed to them in the Grant Details: **"Commencement Date", Completion Date", "Grant Number", "Project", "Recipient".**

From: "Simone De Vos" <Simone.DeVos@environment.nsw.gov.au> on behalf of "OEH ROGHD Coastal Estuary Flood Grants Mailbox" <coastalestuary.floodgrants@environment.nsw.gov.au>
Sent: Mon, 28 Nov 2022 17:06:37 +1100
To: "Wilton, Nicholas" <nwilton@svc.nsw.gov.au>;"Info" <Info@svc.nsw.gov.au>
Cc: "Steve Manwaring" <Steve.Manwaring@environment.nsw.gov.au>;"OEH ROGHD Coastal Estuary Flood Grants Mailbox" <coastalestuary.floodgrants@environment.nsw.gov.au>
Subject: Successful application: 2022-23 Floodplain Management Program | 2022/FMP/0140
Attachments: 2022-FMP-0140 Funding Agreement cover letter - Snowy Valleys.pdf, 2022-FMP-0140 Funding Agreement - Snowy Valleys - DPE signed.pdf

Good afternoon Nicholas

RE Tumbarumba flood study
Grant reference number: 2022/FMP/0140

I am pleased to advise that Council's application for funding under the NSW Government Floodplain Management Program was successful, please see the attached letter and funding agreement for further detail.

Regards,
Simone

Simone de Vos
Senior Project Officer – Coast, Estuary and Flood

Environment and Heritage Group
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The Department of Planning and Environment acknowledges that it stands on Aboriginal land. We acknowledge the traditional custodians of the land and we show our respect for elders past, present and emerging through thoughtful and collaborative approaches to our work, seeking to demonstrate our ongoing commitment to providing places in which Aboriginal people are included socially, culturally and economically.

Please consider the environment before printing this e-mail notice

Document Set ID: 3210205
Version: 1, Version Date: 29/11/2022

Attachment 2 - Tumbarumba Flood Study-Technical Project Brief-Draft

Technical project brief for Tumbarumba Flood Study

Commissioned by Snowy Valleys Council

PREFACE

This generic brief has been designed to be used in partnership with your local DPE flood risk management specialist and in conjunction with the associated guideline (*Guideline for using the national generic brief for flood investigations to develop project-specific specifications, NSW DPE*). This aims to generate a brief that is consistent with the:

- Floodplain Development Manual (FDM) 2005
- supporting guidelines
- national best practice as outlined in Australian Institute of Disaster Resilience Handbook Series, Handbook 7: Managing the Floodplain: A Guide to Best Practice in flood risk management in Australia and its accompanying guidelines and materials.

In some cases, such as for flood hazard, more recent national technical guidelines provide the opportunity to provide more specific advice on hazard to support management without being inconsistent with NSW guidance.

Also, the finalisation of the revised FDM (*Flood Risk Management Manual*) and its associated toolkit is likely within the timeframe of this study which needs to be considered.

CONTENTS

Tables

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1 INTRODUCTION

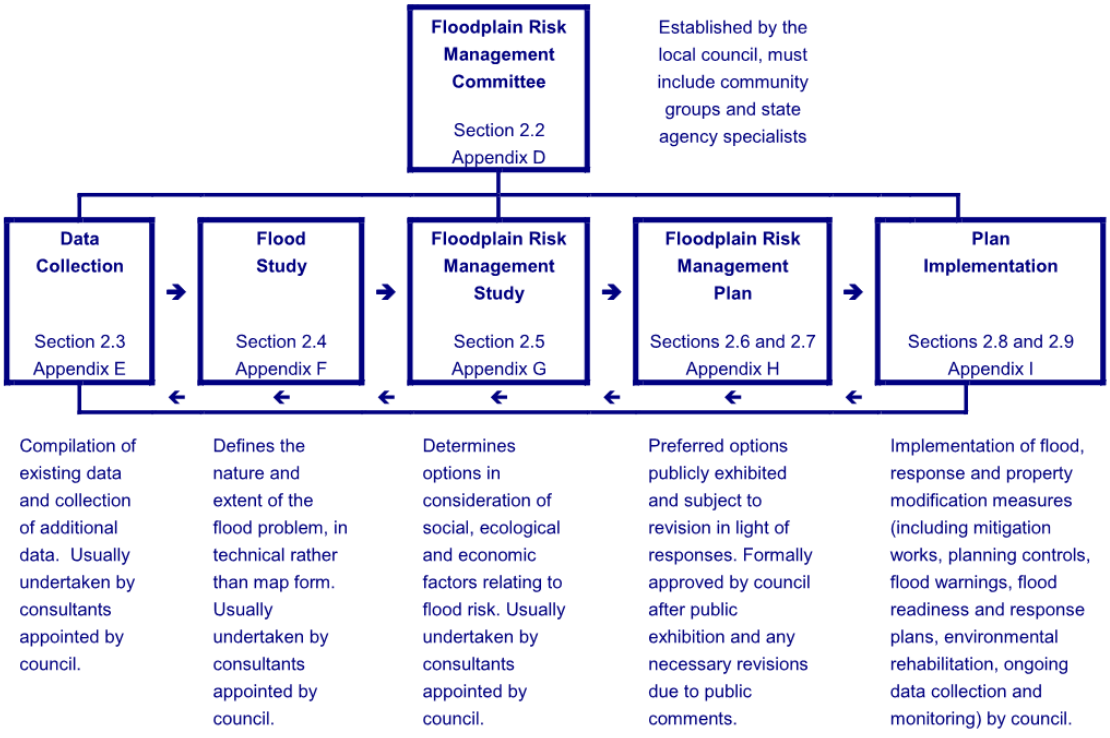
Snowy Valleys Council (the Council) has received financial support from the State Floodplain Management program, managed by the NSW Department of Planning and Environment (DPE), to undertake a flood investigation for the township of Tumbarumba and its environs.

The primary objective of the New South Wales (NSW) Government's Flood Prone Land Policy is to reduce the impact of flooding and flood liability on individual owners and occupiers of flood prone property, and to reduce private and public losses resulting from floods, utilising ecologically positive methods wherever possible.

Through the Department of Planning and Environment and the NSW State Emergency Service (SES), the NSW Government provides specialist technical assistance to local government on all flooding, flood risk management, land-use planning matters and flood emergency management.

The *Floodplain Development Manual* (NSW Government 2005) is provided to assist councils to meet their obligations through the preparation and implementation of floodplain risk management plans, through a staged process. Figure 1, taken from this manual, documents the process for plan preparation, implementation and review.

The *Floodplain Development Manual* is consistent with Australian Institute of Disaster Resilience Handbook 7: *Managing the floodplain: best practice in flood risk management in Australia* (AIDR Handbook 7) (AIDR 2017).



Note: sections refer to the source document
Source: NSW Government (2005)

Figure 1 **The floodplain risk management process in New South Wales**

2 STUDY OBJECTIVES

The objective of this study is to improve understanding of flood behaviour and impacts, and better inform management of flood risk in the study area in consideration of the available information, and relevant standards and guidelines as outlined in Sections 4 and 5, respectively.

The study will be overseen and guided by Snowy Valleys Council (Council) and its Floodplain Risk Management Committee (FRMC), which may include representatives from key stakeholder and end user groups. The study will be guided technically by Council and a technical committee, which may include representatives from the Council and other organisations (such as NSW Government agencies). The Council will be the day-to-day contact for the study.

This project involves conducting a flood study, which is a comprehensive technical investigation of flood behaviour that provides the main technical foundation for the development of a robust floodplain risk management plan. It aims to provide an understanding of the full range of flood behaviour and consequences in the study area. It involves consideration of the local flood history, available collected flood data, and the development of hydrologic and hydraulic models. Where possible, models are calibrated and verified against historic flood events and then extended to estimate the full range of flood behaviour.

The overall project provides an understanding of, and information on, flood behaviour and associated risk to inform:

- relevant government information systems
- government and strategic decision makers on flood risk
- the community
- flood risk management planning for existing and future development
- emergency management planning for existing and future development, and strategic and development scale land-use planning to manage growth in flood risk
- other key stakeholders (including utility providers and the insurance industry) on flood risk

The degree of sophistication of the study should be commensurate with the scope of the study, the outcomes and outputs required from the study and the complexity of the flood situation.

Depending upon the degree of sophistication of the study the outputs of the study outlined in Section 7 may be able to assist this by:

- providing a better understanding of the
  - variation in flood behaviour, flood function, flood hazard and flood risk in the study area
  - impacts and costs for a range of flood events or risks on the existing and future community
  - impacts of changes in development and climate on flood risk
  - emergency response situation and limitations
  - effectiveness of current management measures
- facilitating information sharing on flood risk across government and with the community.

The study outputs can also inform decision making for investing in the floodplain; managing flood risk through prevention, preparedness, response and recovery activities. Each of these areas has different user groups, whose needs vary. The key end-user groups that this study aims to support are identified in Table 1.

Table 1 Project End Users

Potential end user group
High-level strategic decision makers
Community
Flood risk management professionals

Potential end user group
Engineers involved in designing, constructing and maintaining mitigation works
Emergency management planners
Emergency services (i.e. SES, OEM)
Land-use planners (strategic planning and planning controls)
Hydrologists and meteorologists involved in flood prediction and forecasting
Insurers

Meeting the requirements of the identified end user groups, which have been tailored to the context of the flood situation, is a key objective of this study.

3 BACKGROUND AND STUDY AREA

Key drivers for the study

This project encompasses an assessment of riverine and major overland flow flooding at the subject town of Tumbarumba and its environs (see Figure 2).

There is significant development pressure in and around Tumut and Council intend to update the Floodplain Risk Management Study and Plan following the development of a state-of-the-art detailed two-dimensional flood model to define the existing flood risks due to both riverine and major overland flow flooding.

Study area overview

Tumbarumba Creek rises in the Bago Range at an elevation of about 1,290m. It flows 30km in a generally SSW direction to the town of Tumbarumba, where the elevation is about 630m. The catchment area to Tumbarumba has been measured at 139 km^2 at the Albury Street Bridge. Figure 3 shows that the catchment has a relatively elongated shape, which is generally conducive to flatter, longer duration hydrographs compared to a rounder catchment where flow from sub-catchments would arrive at the same time.

The town of Tumbarumba has a population of 1,487 people at the 2006 Census. Most of the town is located on a hillslope on the eastern side of Tumbarumba Creek and is not exposed to flooding from the creek (but may be at risk from overland flows). Several commercial premises and a caravan park are exposed to mainstream flood risks.

Development pressures

There is has been some development pressure in Tumbarumba in recent times both within the township and in the surrounding area. The flood study will involve the development of a detailed two-dimensional flood model to define the existing flood risks due to both riverine and major overland flow flooding for use in the development of appropriate planning strategies.

Study area political context

The study area is located within Snowy Valleys Council, within the Federal Electorate of Eden-Monaro, currently represented by Kristy McBain. Snowy Valleys Council lies within the Wagga Wagga electoral district of the Legislative Assembly of New South Wales and is currently held by Dr Joe McGirr who is an Independent member.

Flood Behaviour
Inundation problems in Tumbarumba may be generally attributed both to local overland flow during heavy local rainfall and to flooding from Tumbarumba Creek and its tributaries. Although generally most of the town is located off the floodplain a series of major floods occurred in 2010 that resulted in the inundation of the local caravan park, showgrounds and various camp grounds causing much inconvenience and damage.

Flood history
There are records of numerous major floods going back to 1889. More recently a series of major floods occurred in 2010 with 5 major peaks occurring between September and December that year. The Town was again impacted by a major flood in March 2012 again flooding the caravan park and other low lying properties.

Extreme flood events
Now previous flood study has been completed for the Study Area so the extent of the PMF (Extreme) flood event is unknown.

This flood study is expected to assess the PMF (Extreme) flood event across the study area with consideration for the probability of coincident flooding events. The exact method of PMF assessment is to be defined in consultation with Council and the FRMC as the project progresses.

Flood emergency management situation.
Preparedness, response and recovery measures for flooding in Tumbarumba are detailed in the Tumbarumba Local Flood Plan (SES, Feb 2013). Currently no flood intelligence card exists for Tumbarumba to the knowledge of Council.

How the study outcomes of the study will be used.
The objective of this study is to develop a state-of-the-art flood model for the Township of Tumbarumba and its environs for the purposes of defining the flood risks due to both riverine and major overland flow flooding.

This project will provide information that will be used to:

- Reduce the impacts of existing flooding and flood liability on communities and to reduce private and public losses resulting from floods.
- Make informed decisions on managing flood risk by preparing floodplain risk management plans (and associated background studies) under the floodplain risk management process.
- Develop a FRM (Floodplain Risk Management) Plan leading to the implementation of floodplain risk management measures to reduce flood risk to both existing and future development, and reduce losses through a range of property, flood and response modification measures as outlined in the Floodplain Development Manual.

Provide essential information to the NSW State Emergency Service to enable the effective preparation and implementation of local flood plans to deal with flood emergency response.

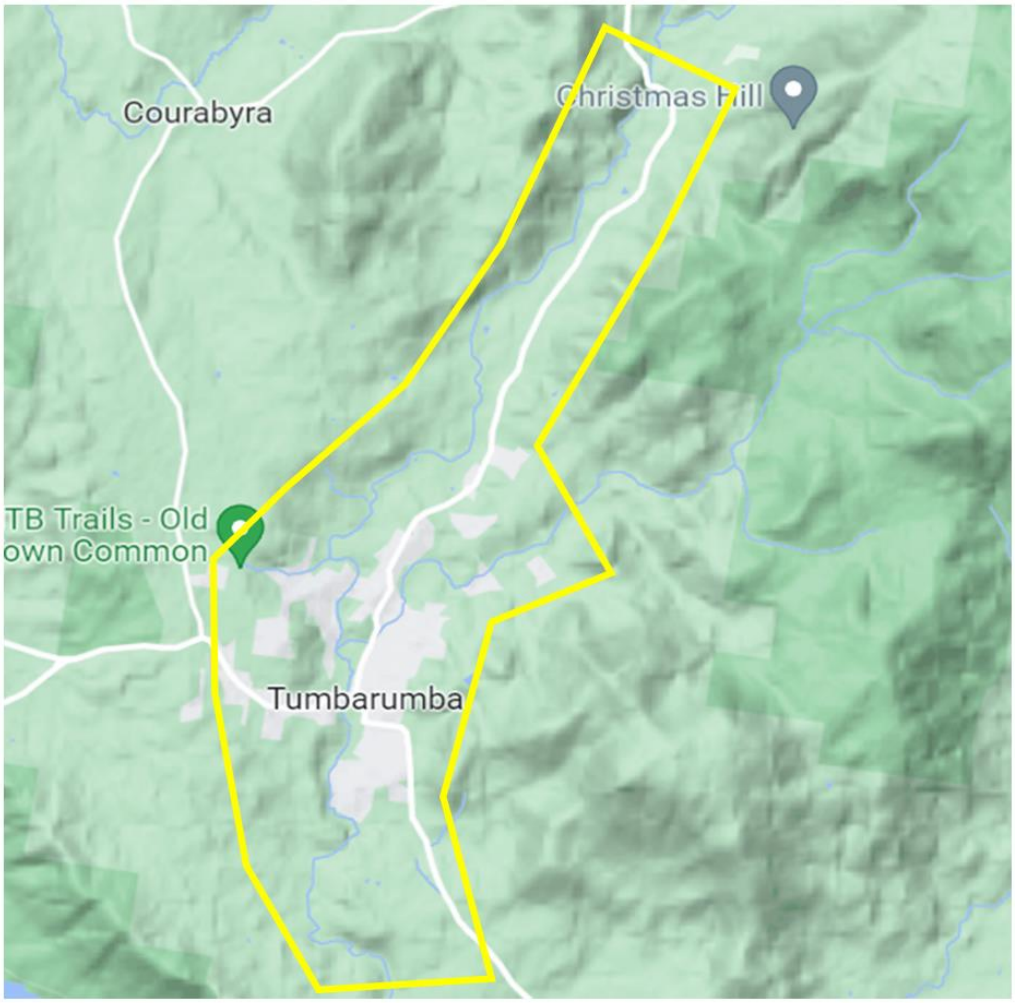


Figure 2 **Study Area**

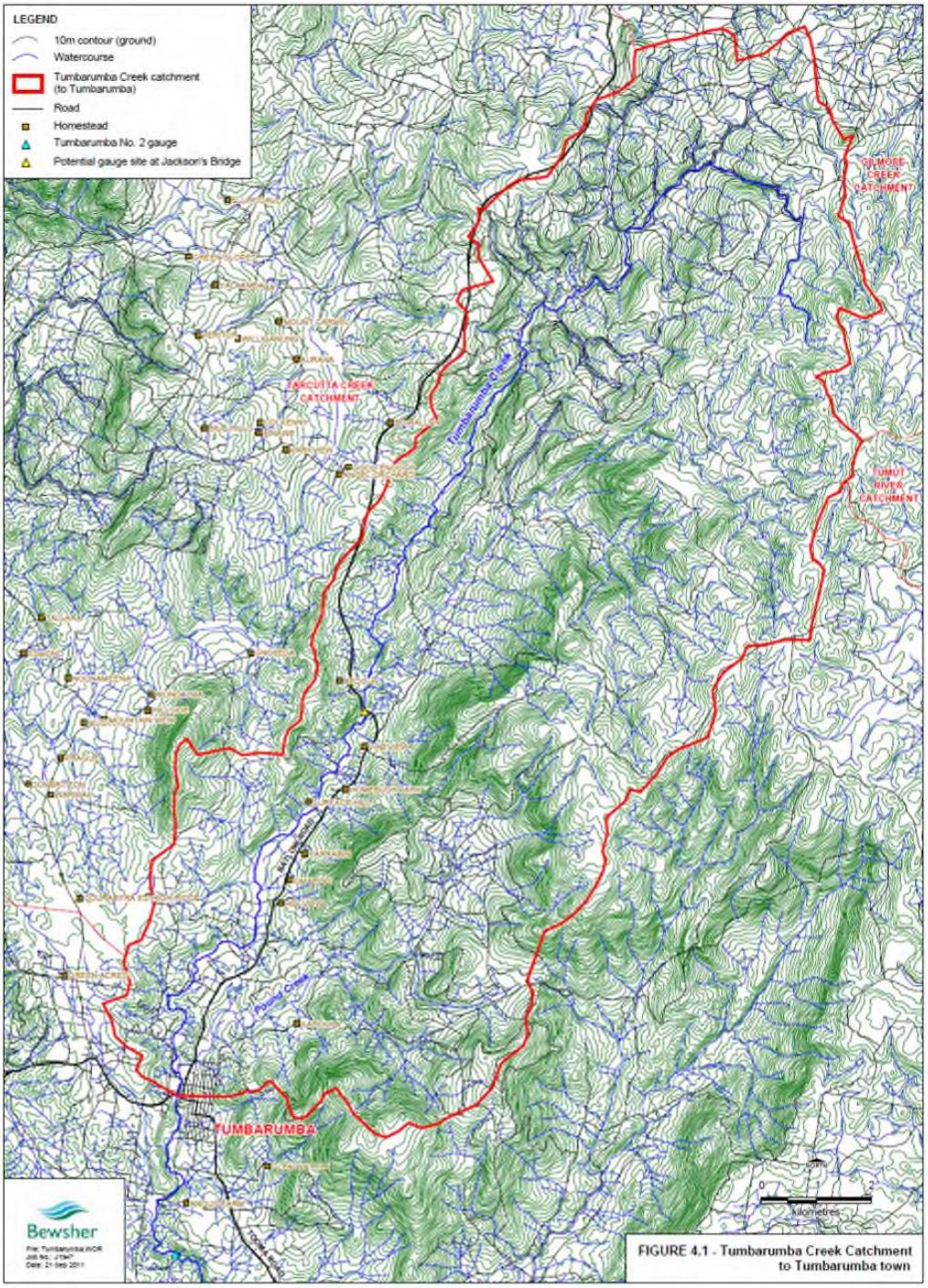


Figure 3 Tumbarumba Creek Catchment

4 AVAILABLE INFORMATION

The study is to draw upon:

- existing flood investigations in the area (Table 2)
- relevant local land-use planning policies, flood emergency management plans and local design standards (Table 3).

The study should use relevant existing data that are available from Council for use by the consultant during the study (Table 4) and other organisations that may have other relevant information – for example, road or rail authorities, and the Bureau of Meteorology (Table 5). The data listed in Table 4 will be provided or arrangements for access made at the start of the study.

Table 2 Summary of previous studies

Study name	Description (one paragraph summary)	Author	Year	Accessible for tendering and project
Flood Intelligence Collection and Review for Towns and Villages in the Murray and Murrumbidgee Regions following the October 2010 Flood	Following severe flooding in October 2010 in the South West Slopes and Riverina districts, the NSW State Emergency Service (NSW SES) commissioned a large flood intelligence collection and review exercise. Fourteen towns and villages across five local government areas were selected for the Investigation including Tumbarumba.	Bewsher Consulting	2012	Available post engagement from Snowy Valleys Council
Flood Intelligence Collection and Review for 24 Towns and Villages in the Murray and Murrumbidgee Regions following the March 2012 Flood	Severe flooding was experienced in March 2012 across similar areas as was experienced in October 2010. In order to capture the additional flood data, the NSW SES commissioned a project to conduct further investigations for 24 towns and villages including Tumbarumba.	Dr Stephen Yeo	2013	Available post engagement from Snowy Valleys Council
Adelong Flood Study	The study objective was to define flood behaviour in the adjacent Adelong Creek catchment at Adelong following the major floods in 2010 and 2012.	Lyall & Associates Consulting Water Engineers	2014	Available post engagement from Snowy Valleys Council
Adelong Floodplain Risk Management Study and Plan	The overall objectives of the Floodplain Risk Management Study were to assess the impacts of flooding, review existing Council policies as they relate to development of land in flood liable areas, consider measures for the management of flood affected land and to develop a Floodplain Risk Management Plan.	Lyall & Associates Consulting Water Engineers	2018	Available post engagement from Snowy Valleys Council

Table 3 Summary of local policies and emergency management plans

Document	Description (one paragraph summary)	Author	Year	Accessible for tendering and project
Land-use planning policies				
Tumbarumba Local Environmental Plan	The Local Environmental Plan (LEP) provides the rules and guidelines for the control of land (both private and public) through zoning. It aims to reduce possible conflict between adjoining land uses and ensures there is adequate land to meet diverse needs.	Snowy Valleys Council	2010	https://www.snowyvalleys.nsw.gov.au/Building-Planning/Planning/Local-Environmental-Plans
Snowy Valleys Development Control Plan 2019	The overall objectives of the Snowy Valleys Development Control Plan 2019 are to: □ achieve the aims and standards in Council's Local Environmental Plan by providing more detailed controls for development; □ outline Council policies, standards and identify the preferred future direction for development design within the Snowy Valleys Council area; and □ assist with the preparation of development proposals by providing proponents a guide to the community's expectation for development	Snowy Valleys Council	2019	https://www.snowyvalleys.nsw.gov.au/Building-Planning/Planning/Development-Control-Plans
Emergency Management Plans				
Tumbarumba Local Flood Plan (LFP)	The purpose of the LFP is to detail arrangements agreed for the planning, preparedness/prevention, response and recovery from flood incidents.	NSW SES	2013	https://www.ses.nsw.gov.au/media/1663/plan-tumbarumba-shire-lfp-feb-2013-endorsed.pdf
Flood Intelligence Cards	NSW SES maintain flood intelligence cards for key gauges across NSW detailing flood impacts at locations. There is currently no FIC for Tumbarumba to Councils knowledge.	NSW SES		.

Table 4 Available and compiled existing data

Document	Description (one paragraph summary)	Author	Year	Accessible for tendering and project
Data Collection Report	See NSW SES data collection reports post 2010 and 2012 events detailed in Table 2 above.			Available post engagement from Snowy Valleys Council
Historic flood information Including photos, satellite imagery and post event reports	See NSW SES data collection reports post 2010 and 2012 events detailed in Table 2 above.			Available post engagement from Snowy Valleys Council
Hydrologic data Stream water level gauges (station number and record length (years))				
Tumbarumba No. 1 gauge	Record length – 1946 to 1983	Owner Water NSW		Accessible by from Pineena software

Document	Description (one paragraph summary)	Author	Year	Accessible for tendering and project
Tumbarumba No. 2 gauge (401007)	Record length - since 2000 to present	Owner Water NSW		Accessible by internet and on Pineena software http://www.bom.gov.au/waterdata/
Survey data (ALS/topographic DEMs), existing floor levels, datum cross references, hydraulic structure details, aerial photos				
LiDAR	1 m grid DEM derived from LiDAR acquired in November 2014 for the Study Area.	NSW Spatial Services – Department of Customer Service	2014	Access via data download from: https://elevation.fsdf.org.au/
LiDAR	2 m grid DEM derived from LiDAR acquired in 2018 for the wider catchment.	NSW Spatial Services – Department of Customer Service	2018	Access via data download from: https://elevation.fsdf.org.au/
GIS Layers	None			
Hydrologic models	None			
Hydraulic models	None			

Table 5 Organisations with relevant existing data

Agency/Office	Relevant contacts – name, email, phone	Comments
Council Engineers	Andrew Vaz- Co-ordinator Survey & Design avaz@svc.nsw.gov.au	
Council Planners – Strategic and statutory planners	Nicholas Wilton - Manager Growth & Activation nwilton@svc.nsw.gov.au Mark Kirton – Co-ordinator Growth and Development mkirton@svc.nsw.gov.au Brad Allen- Development Assessment Planner ballen@svc.nsw.gov.au	Information regarding areas subject to development pressure and potential new release areas and the location of existing and/or proposed critical infrastructure which could impact on the pattern of flooding and/or may be critical for the viability of the community
Floodplain Risk Management Committee, the community and community groups (Historical Societies, Progress Associations)	Committee not yet formed	Information on past flood behaviour, flood photographs, specific problem areas, community concerns
Department of Planning and Environment (DPE)	Steve Manwaring SNRO Floodplain Management Steve.Manwaring@environment.nsw.gov.au	Best practice guidelines, policy, technical and project management advice.
WaterNSW	TBC	River gauging and tidal data, other relevant data from their

Agency/Office	Relevant contacts – name, email, phone	Comments
		records. Blowering Dam operations.
NSW State Emergency Service (SES)	Craig Ronan Coordinator Planning – Hazards Community Planning and Preparedness craig.ronan@one.ses.nsw.gov.au	Information on past flood behaviour, response planning and operation information requirements including potential impacts on emergency service and evacuation facilities as well as access/evacuation issues (closure of roads & access routes)
Bureau of Meteorology		Rainfall data and information on key historic storms
Roads and Maritime Services and State Rail Authority		Road, rail embankment and bridge details including flood damage
Land and Property Information		Existing topographic information (including LiDAR survey) and aerial photographs.
The Foundation Spatial Data Framework (ELVIS)		Topographic information http://elevation.fsdf.org.au/
Geographical Names Board		Gazetted geographical names of local features.
Geographical Names Board		Gazetted geographical names of local features.
Resilience NSW		

5 CURRENT GUIDELINES AND REFERENCES

The consultant should use current guidelines, manuals and technical reference documents during the study. Sources are outlined in Table 6.

Table 6 Guidelines and reference documents

Reference	Source/Link	Topic	Comment
National			
Australian Institute of Disaster Resilience Handbook Series, *Managing the floodplain: A guide to best practice in flood risk management in Australia* – AIDR Handbook 7	https://knowledge.aidr.org.au/resources/handbook-7-managing-the-floodplain/	Best practice	Adhere
AIDR Handbook Series, *AIDR Handbook 7, supporting document* Guideline 7-3 Technical flood risk management guideline – Flood Hazard	https://knowledge.aidr.org.au/resources/guideline-7-3-flood-hazard/	Flood hazard	Adhere
Australian Emergency Management Handbook Series, *AIDR Handbook 7, supporting document* Guideline 7-2 – Flood Emergency Response Classification of Communities	https://knowledge.aidr.org.au/resources/guideline-7-2-flood-emergency-response-classification-of-the-floodplain/	Emergency response	Consider
AIDR Handbook Series, *AIDR Handbook 7, supporting document* Guideline 7-5 – Flood risk information to support land-use planning	https://knowledge.aidr.org.au/resources/guideline-7-5-flood-information-to-support-land-use-planning/	Land use	Adhere
AIDR Handbook Series, *AIDR Handbook 7, supporting document* Guideline 7-6 – Assessing options and service levels for treating existing risk	https://knowledge.aidr.org.au/resources/guideline-7-6-assessing-options-and-service-levels-for-treating-existing-risk/	Mitigation options and service levels	Consider
AIDR Handbook Series, *AIDR Handbook 6*, National Strategy for Disaster Resilience – community engagement framework	https://knowledge.aidr.org.au/resources/handbook-6-community-engagement-framework/	Community engagement	Consider
Australian National Committee on Large Dams (ANCOLD) Guidelines	http://www.ancold.org.au/?page_id=334	Dams	Consider
Australian Rainfall & Runoff (ARR; this includes the current version of ARR and specific project reports, such as Project 5 – Regional flood frequency estimation, Project 15 – Two Dimensional modelling in urban and rural floodplains, Project 18 – Interaction of coastal processes and severe weather events and Project 11 – Blockage of hydraulic structures)	http://arr.ga.gov.au/arr-guideline also http://arr.ga.gov.au/downloads-and-software/revision-project-reports	Best practice	Consider
New South Wales			
Section 733 of the Local Government Act, 1993		Flood prone land policy	Consider
NSW Government's *Floodplain Development Manual – the management of flood liable land*, April 2005, incorporating the NSW Flood Prone Land Policy.	http://www.environment.nsw.gov.au/research-and-publications/publications-search/floodplain-development-manual	Flood prone land policy and industry practice	Adhere
Floodplain Risk Management Guidelines:	http://www.environment.nsw.gov.au/topics/water/floodplains/floodplain-guidelines		
Incorporating Australian Rainfall and Runoff 2016 into studies		Best Practice	Consider
Floodway Definition		Floodway	Consider
Temporary or relocatable flood barriers		Temporary barriers	Consider
Rainwater Tanks – limitations as flood risk management devices		Rainwater tanks	Consider

Reference	Source/Link	Topic	Comment
Drainage behind and through levees		Internal drainage	Consider
SES requirements from floodplain risk management process		SES requirements	Consider
Residential flood damage and supporting calculation spreadsheet		Flood damages	Consider
Practical consideration of climate change		Climate change	Consider
Coincidence of Coastal Inundation and Catchment Flooding		Coincidence	Adhere, where applicable
NSW Department of Planning, Industry and Environment Data Handover requirements	https://flooddata.ses.nsw.gov.au/dataset/flood-project-handover-template https://www.ses.nsw.gov.au/media/2503/fdp-uploading-project-guide_v1.pdf	Data handover	Adhere
NSW Government Elevation data product specifications and description: Source: Airborne Light Detecting and Ranging (LiDAR) Version 2 May 2015	Copy available from OEH on request	LiDAR	Adhere

6 SCOPE OF WORK

The proposal is to outline a methodology that will achieve the objectives of the study, listed in Section 2 for the identified key end users (Table 1). The proposed methodology is to be developed to meet the scope of work and to produce the required deliverables (Section 7) and comply with the guidelines and best practices (Section 5) in consideration of the available information (Section 4).
The tenderer's proposal is to have a section on limitations to specifically indicate the ability to comply with the full requirements of the brief or to specifically identify any limitations of their proposed approach in meeting the full requirements of this brief, including the defined deliverables for all end users.

The scope of hydraulic modelling work includes the following components:

- Tumbarumba Creek extending from the Jackson's Bridge crossing on Batlow Road to Tumbarumba Creek No. 2 Gauge (401007) downstream of Tumbarumba Township.
- Local inflows from Pound Creek from the upper extent that lies within the Study Area (see Figure 2) to the confluence with Tumbarumba Creek within Town.
- Major overland flows within the Tumbarumba Township.

It is envisaged that the flows used for the Tumbarumba Creek modelling work will be based on assessment of the available gauged flow data. However, the limited period of record may result in the need to use alternative AR&R methods.

Local inflows should also be considered including Pound Creek and overland flows throughout the Tumbarumba township. The major overland flow path assessment is not intended to comprise a detailed assessment of stormwater infrastructure. Major overland flow paths are described as significant natural conveyors of concentrated runoff from the town itself and any catchment areas adjoining the township areas which are discharging to the major overland flow paths. Culverts or stormwater pipes less than 525 mm in diameter (or equivalent) are to be excluded from the major overland flow path assessment. The catchment boundaries associated with the major overland flow assessment will need to be defined using the available terrain data, notably the available LiDAR data.

It is envisaged that the hydraulic model for the rural floodplain reaches will be coarser in terms of terrain representation in comparison to the reaches through the urban areas of Tumbarumba.

6.1 Data collection and review

In the data collection stage, all data necessary for the completion of the study should be collated. It is typically begun at the outset of the study, when the majority of data are collected (or commissioned to be collected). The remaining data will be collected during the study, either as it is required or as it becomes available – for example, for a recent flood event.
Section 4 outlines the data collected prior to this study and its availability for review during the tender process. If not available during the tender process, this data will be supplied at the start of the study.
All available and collected data should be reviewed and considered in the development of the study. Reporting on data collection should consider the findings and any recommendations of this review.

Where the need for and availability of data additional to that listed in Section 4 could have reasonably been anticipated before the close of tenders, the consultant shall obtain the data as part of the project. The cost of obtaining these data is to be included in the proposal fee. If additional data become necessary during the study, and it can be shown the need or availability could not have been reasonably anticipated during the tender process, the consultant is to submit a brief to Council that outlines what data are required, and the cost and timing of acquiring them.
Following Council's approval, the consultant will undertake the additional data collection.

6.1.1 Topographic survey

It is expected that the 2013 NSW government acquired LiDAR data will be the principal terrain data source in defining the terrain surface of the areas subject to hydraulic modelling. The 2014 acquired LiDAR, including 1 m grid derived DEM, is available for download from the internet (http://elevation.fsdf.org.au/).

Validation of the existing LiDAR to ground survey points is required to be completed to ensure its accuracy prior to its use. If existing LiDAR data is deemed inadequate and additional LIDAR needs to be obtained, then it is to be captured in accordance with the relevant guideline listed in Table 6.

Additional survey of structures such as bridges and large culverts is required if they are likely to control or significantly influence flood behaviour, and up-to-date, detailed information for these structures does not exist.

Any survey deliverables should meet the requirements and be consistent with the format specified in Table 14.

Following engagement and the completion of the data review activities, the consultant shall submit to Council a Brief outlining details of the additional survey required (e.g. additional structures, additional LiDAR etc).

Following receipt of written approval from Council, the consultant shall arrange for the survey to be undertaken. This may include obtaining quotes from survey firms to undertake the survey in accordance with the Brief prepared by the consultant.

The consultant shall be responsible for the engagement and supervision of the approved subconsultant to complete the survey work. The consultant is also responsible for ensuring any data acquired is fit for purpose.

In relation to tendering price information, the scope of the additional survey work will not be known until the data review phase is completed. Tenderers are therefore instructed to nominate a provisional survey allowance in their pricing submission.

6.1.2 Survey for flood damages assessment

To assess the cost of flooding on the community, a realistic estimate of the associated survey requirements and costs must also be provided. The consultant should consider the proposed end use of this information and outline the proposed methodology and any limitations on the accuracy of this methodology relative to these uses. These limitations also need to be incorporated into the final report.
A floor level survey done as part of this study will be used to assess the relative cost of different events and flood situations. The data are not required by any other identified end users. Typical data to be collected include both survey information (lowest habitable floor level, ground level at dwelling, ground level at kerb near entry) and other property-specific information (type of house construction, number of floors, relative size, etc.).
Consultant's should base their tender proposals on the following approach:

• For properties within the identified 1% AEP flood extent. The floor level of the main building is to be based on a drive by assessment approach (i.e. estimate the height of the floor level above the adjoining ground surface by field visual assessment). The building floor level elevation is to be assigned based on the estimated height above the ground surface added to the LiDAR ground surface elevation. Tenderers to allow for a total of 50 buildings subject to the drive by assessment approach.
• All other properties. The floor level of buildings is assumed to be based on the adjoining LiDAR ground surface elevation plus a nominal amount (e.g. 200mm).
Deliverables should meet the requirements (including relevant coordinate system) and be consistent with the format specified in Table 14.

6.2 Site visit

During the initial stages of the project, the project team should undertake a comprehensive familiarisation field inspection of the study area. This should be conducted to enable an understanding of key features within the catchment and floodplain that may influence flood behaviour. Ideally, this would be undertaken with representative(s) from the Council and would be used to inform development of the survey brief (if required).

6.3 Consultation

Community consultation has an important role in all flood-related studies. The outcome goals for community consultation can be to:

- inform the community about the study
- identify community concerns
- gather information from the community by participation
- develop and maintain community confidence and collaboration with the study results
- inform the community about flood risks in the area
- seek input from the community on management options.

These principles are in line with those detailed in the relevant community engagement guideline listed in Table 6.
The consultant is to propose a consultation program considering the relevant guidance outlined in Table 6 that is suitable for the study, achieves each consultation point identified in Table 7 and, at a minimum, uses the tools identified in the same table. The consultant's proposal is to form the basis of a program community consultation with further discussion at the inception meeting for the project.

Table 7 Consultation points and tools

Consultation Point	Consultation tools	Comment/aim
Milestone 1 - Data Collection, and Review	FRMC inception meeting (meeting 1)	Update Committee and gather input into data collection and review activities
	Public information meeting	Inform on the project and gather flood information from the community
	FRMC meeting 2	Update Committee and gather technical feedback and input
Milestone 2 – Model Development and Calibration / Validation	FRMC meeting 3	Update Committee and gather technical feedback and input
Milestone 3 – Design Flood Modelling & Damages Assessment	Public information meeting	Inform on the project and gather feedback from the community on the preliminary modelling results
	FRMC meeting 4	Update Committee and gather technical feedback and input

Consultation Point	Consultation tools	Comment/aim
Milestone 4 – Draft Flood Study report & Public Exhibition	FRMC meeting 5	Update Committee and gather technical feedback and input
	Public Exhibition process - information meeting supporting the process	Seek feedback / public submissions on draft Flood Study report
Milestone 5 – Final Flood Study report	FRMC meeting 6	Report to Committee on response to public submissions
Milestone 6 – Completion of Contract		

As part of consultation:

- A community questionnaire is to be sent to flood affected landowners and residents in the study area, informing them about the study objectives and requesting any information they may have on historical floods. The survey is to be sent in the post and provided as an online questionnaire.
- A community newsletter is to be sent to flood affected landowners and residents in the study area, informing them about the study objectives or outcomes. The newsletter is to be sent in the post, available for download and available from Council's information centre.
- Three public community information sessions are to be held at key stages in the study, aimed at informing residents about the study progress and gathering information on historical flood events (this excludes the meeting held during the public exhibition period).
- As part of the consultation program, the draft Flood Study report should be placed on public exhibition and be available for viewing for a period of four weeks.
- The consultant is to hold a public information session during the public exhibition period.

Consultation with key stakeholders is an important aspect of the consultation process. Key stakeholder groups are identified in Table 8. This list is not exhaustive and other stakeholder may be identified throughout the study. The consultant is to demonstrate how they will engage with the identified and potential future stakeholders

Table 8 Key stakeholders for consultation

Stakeholder group	Comment
Planning staff at Snowy Valleys Council	Provide flood intelligence and historical information.
Engineering staff at Snowy Valleys Council	Provide flood intelligence and historical information and confirm flood effects.
Tumbarumba Caravan Park owners/managers	Provide flood intelligence and historical information.
WaterNSW	Provide information on stream gauges.
New South Wales State Emergency Service	Provide flood intelligence and historical information.

6.4 Hydrologic analysis

The purpose of the hydrologic analysis is to calculate all flows entering the hydraulic model, either as upstream or point inflows, rainfall or other hydrological model boundaries. The consultant is to provide details of their recommended methods of analyses. They must indicate how the methodology is fit for purpose for both the study area and the project scope and how it aligns with industry best practice as outlined in ARR. Possible methods of analyses may include flood frequency analysis and rainfall-runoff routing models. Features of the catchment that have a distinct influence on the catchment's hydrology are listed in

Table 9.

Table 9 Catchment features affecting hydrology

Catchment feature
• **Tumbarumba Creek catchment conditions have a large impact on runoff.**

Catchment feature
• Pound Creek is a major tributary of Tumbarumba Creek that converge within the township.

6.4.1 Model Selection

River Design Flow Estimates

It is unsure whether design flood estimates for Tumbarumba Creek are to be adopted based on the results of flood frequency analysis (FFA) at the existing downstream stream gauge or from rainfall-runoff modelling. Any rainfall-runoff model parameters should be adjusted to fit the adopted design flood estimates.

Historical records of gauged flows are available at the stream gauges detailed in Table 4 of this Brief. The FFA will draw on the extensive hydrologic records. The FFA should be undertaken in accordance with the procedures outlined in ARR.

Details of the rating curves used in the FFA should be documented. Particular attention needs to be paid to the upper end of the rating curves and discussions with relevant hydrographer staff to confirm the accuracy in major flood events.

The development of the Tumbarumba Creek design event hydrographs should take into account the shape of the historical event hydrographs for major creek flood events.

Pound Creek and Major Overland Flow

In relation to Pound Creek and the local major overland flows, an appropriate computer based rainfall-runoff routing model should be used. The chosen modelling software and approach should be detailed.

The hydrologic analyses are to use the ensemble hydrologic modelling approach outlined in ARR. This approach relies on selecting an ensemble of 10 and in some cases 20 temporal patters for each event duration. The design flow at key locations should be calculated by averaging the flow from the ensemble for each duration. These key locations should include inflow locations to the hydraulic model and those locations further downstream within the hydraulic model where for example tributaries combine.

Extreme Event Modelling

An agreed approach to extreme event modelling should then be sought with Council and the the FRMC.

6.5 Hydraulic model

The purpose of the hydraulic model is to simulate the behaviour of flood waters in the study area, including their depth, level and velocity as they vary across the study area. The model is to be able to represent all hydraulic processes and topographic features that significantly affect flood behaviour, including waterways, overland flow paths and trunk drainage systems structures. The study area for modelling including specific waterways to be modelled (refer to Figure 2).

The proposal is to nominate a software model and configuration that is suitable to achieve the required outcomes of this study, including the assessment of flood risk management measures as part of this or subsequent studies in a cost effective manner. The proposal should detail how it will achieve these outcomes and identify any limitations or shortcomings of the proposed approach. Features of the Tumbarumba Creek floodplain within the reach to be modelled that have a distinct influence on the hydraulic behaviour of the flooding are listed in **Error! Not a valid bookmark self-reference.**.

Table 10 Catchment features affecting hydraulic behaviour

Catchment feature
Jacksons Bridge on the Batlow Road over Tumbarumba Creek
Various low level road bridges and causeways within the Study Area.

Catchment feature
Numerous footbridges across Tumbarumba Creek through Tumbarumba
Albury Street Bridge
Murrays Crossing Road Bridge
Tumbarumba Quarry

The selection of hydraulic modelling technique is primarily governed by the complexity of the flood situation and flood risk present.

6.5.1 Model Selection

Given the scope of the study and outputs required, the size of the study area, and the nature of the waterways and their flood behaviour, a 1D/2D hydraulic model is suitable for this study. This model type will represent the floodplain and flow paths in sufficient detail to accurately simulate flow behaviour in the hydraulic model. Furthermore, a 2D hydraulic model will produce spatial and temporal outputs to a level of detail that is appropriate given the range of end users and their varying needs.

The proposed grid cell resolution should be sufficient to appropriately represent the features within the catchment. Guidance on this is provided in ARR and associated project report Project 15: Two dimensional simulations in rural and urban floodplains.

The hydraulic model grid cell size selection within the Tumbarumba township area should be suitable to define the overland flow in a relatively built-up environment. This may be limited by the accuracy of the topographic data, the stormwater drainage network and other hydraulic structures (and blockage of these), land use, and buildings. The consultant should consider these items when setting out their proposed methodology. Furthermore, a 2D hydraulic model will produce spatial and temporal outputs to a level of detail that is appropriate given the range of end users and their varying needs.

Consideration should be given to using a finer grid size in each of the urban areas to more accurately define the major overland flow paths, the effects of riverine flooding and the interaction between the two sources of flooding.

Information is needed on the variability of key indicators other than the peak flow or depth, such as rate of rise. For this case, the design flood levels should be determined from the ensemble. A representative design flood that is close to the mean should also be determined. The method for selecting the representative design flood will need to be documented.

If a tenderer supports using a different model type, reasoning should be given as to how this model is suitable, including how it will meet the objectives of the study and produce the deliverables as outlined in Section 7 for the full range of end users' needs, as well as any shortcomings the model type will have. The project schedule should be amended to clearly identify a specific item to include all the associated costs. This cost should be considered as part of the lump sum proposal.

6.6 Model calibration and validation

The models are to be calibrated and validated to a standard consistent with both the Council's expectations and with the guidelines on model calibration that form parts of the material listed in Table 6**, before any work on simulation of design flood levels is undertaken**.

The consultant shall review the available data and information and provide guidance on the possibility of undertaking a reasonable calibration and validation process.
Suitable hydrologic and hydraulic models to simulate flood behaviour in the study area are to be developed by calibration and subsequent validation of flood behaviour against available data from historical flood events. Historic events to be used have been listed in Table 11 or should be identified by the successful consultant in consultation with Council.
To appropriately reproduce calibration events, consideration should be given to how conditions on the floodplain have changed and what historical topographic features or structures are not represented in the current survey data. Following calibration, the model is to be validated against the historical events detailed in Scenario ID 1 in Table 11.
During the calibration and validation process, features of the catchment that have a distinct influence on flood behaviour should be considered. The calibration/validation process should guide the final model configuration and selection of hydraulic model grid cell resolution if undertaking 2D modelling. The significant features present in this catchment are listed in Section 6, 'Hydrologic analysis and hydraulic model'.
A report and supporting model data files are to be provided to outline calibration and validation for consideration and review by Council. The consultant shall not undertake any aspect of the design flood modelling until the Council has reviewed and provided written approval of the model calibration and validation. This report and the supporting model data files provided should meet the requirements of the relevant guideline as outlined in Table 6.

The calibrated model is to achieve a satisfactory fit to the historical data. The calibrated model is to be able to reliably reproduce flood behaviour in the Tumbarumba township and its environs in particular.

The consultant is to validate model results and assumptions made to ensure potential flow paths and obstructions are accurately represented within the model and model produced behaviour. This ground truthing exercise is to include field inspections of key locations.

6.7 Rating Curve Review

Where a hydraulic model has been established, the existing rating curves should be validated against the results of the hydraulic model, particularly in the high-flow zone above the highest ratings. In conducting the review, liaison should be undertaken with the gauge owner and the results of the review provided for their consideration.

6.8 Model parameter sensitivity

Sensitivity analyses shall be carried out to assess how much influence model parameter values have on the results of the calibration and validation. The main parameters are those simulating rainfall (spatial and temporal variation), rainfall losses, catchment storage and lag, friction, energy losses, and blockage at culverts, bridges and other structures. The sensitivity of the model results to downstream boundary conditions shall also be tested.
Sensitivity analyses shall also be carried out to assess the relative uncertainty associated with the design results. The consultant is to clearly state the proposed approach and methodology, along with nature and extent of sensitivity testing that will be undertaken.
For comparison purposes the 1% and 5% AEP events should also be developed using the procedures and design inputs including IFD outlined in Australian Rainfall and Runoff 1987. The cause of any significant differences from the estimates derived from this study using the methods outlined in Australian Rainfall and Runoff 2019 should be determined.

6.9 Modelling events

The study should consider flood behaviour for a range of events. The models are to be run for all the relevant scenarios and the results discussed in reporting and used to developed relevant deliverables.
Table 11 outlines the events that should be considered for this study. The events and scenarios included will depend upon the end use of this information.
For the design event runs outlined in The models are to be run for all the relevant scenarios and the results discussed in reporting and used to developed relevant deliverables.
Table 11 the calibrated model is to be modified as necessary to accurately represent the relevant conditions for the scenario, with model and modelling parameter changes clearly documented.
The blockage of structures can be an important factor in this catchment. Different combinations for degrees of blocked and unblocked scenarios can result in peak flood conditions in different areas. Design events may need to be derived using an envelope of different blocked and unblocked scenarios at different points in the catchment.
The study area includes the junction of major waterways. The coincidence of flooding in the vicinity needs to consider relevant guidance in Australian Rainfall and Runoff.
The models are to be run for all the relevant scenarios and the results discussed in reporting and used to developed relevant deliverables.

Table 11 Flood events or floodplain conditions to be assessed

Scenario ID	Event	Description/Information
1(A)	Historical calibration/validation flood events – historic conditions	October 2010/December 2010, March 2012 & a more recent event possibly November 2021 (to be confirmed with Council post engagement)
2(B)	Design flood events - existing conditions	20%, 10%, 5%, 2%, 1%, 0.5%, 0.2% AEP and PMF (or Extreme Flood event)
4(D)	Design flood event to test sensitivity to climate change	Compare 0.5% and 0.2% AEP and PMF (or Extreme Flood Event)
7(C)	Design events for model parameter sensitivity analysis	5%, 1% AEP & PMF (or Extreme Flood event)
8	Design events for assessment of flood hazard	5%, 1% AEP & PMF (or Extreme Flood event)
9	Design events for assessment of flood function	5%, 1% AEP & PMF (or Extreme Flood event)
11	Design events for assessment of flood warning and emergency management	5%, 1% AEP & PMF (or Extreme Flood event)
12	Design events for developing information to support land use planning activities	5%, 1% AEP & PMF (or Extreme Flood event)

The use of an extreme event instead of the probable maximum flood (PMF) is to be approved by Council, unless stated in The models are to be run for all the relevant scenarios and the results discussed in reporting and used to developed relevant deliverables.
Table 11.

6.10 Consequences of Flooding to the Community

This information is to be used to develop an understanding of the consequences of flooding to the community. This needs to be developed and included in the report as outlined below.

6.10.1 Flood emergency response classification of communities

The floodplain shall be categorised based upon the general classification of the flood emergency response classification guideline outlined in Table 6. This classification provides an indication of the relative difficulty of the flood emergency management situation at a

community or precinct scale. It may also assist in identifying the type and scale of information needed by the emergency managers to assist with emergency response planning.

6.10.2 Flood damages assessment

After the full extent of the floodplain has been determined, the study will incorporate an estimate of flood damages to assist in determining the impacts upon the community across the range of flood events. The flood damages are to be estimated in accordance with the relevant guidelines listed in Table 6.

The flood damages assessment shall produce, for each flood event, information on the number of properties affected and their category (residential, commercial, etc.), the tangible damages, and the average annual damage. For the purposes of tendering, it shall be assumed that the damages for the number of developed properties of all types, as detailed in Table 14, are to be assessed.

Depending on the method of floor level collection for flood damage assessment, it is essential that the accuracy and any limitations of the data should be outlined as part of the documentation associated with the flood damages assessment.

6.10.3 Assessment of the impacts of climate change on flood behaviour

Sensitivity analysis of climate change should be undertaken in accordance with events outlined in Table 11 and guidance in Table 6. The assessment should be undertaken in accordance with the recommendations in ARR. The report should outline how sensitive flood behaviour and consequences to the community are in relation to climate change.

6.11 Post processing of results

The information from the hydraulic modelling needs to be further processed to develop important information to inform a range of management and related activities as described below. Specific formats and outputs to be delivered as part of the study are discussed in Tables 12 and 13.

6.11.1 Flood hazard

Flood hazard is to be determined based on hydraulic considerations such as depth and velocity. The assessment is to be undertaken in accordance with guidelines relevant to hazard listed in Table 6 of the brief. The events to be considered are detailed in Scenario ID 8 of Table 11.

6.11.2 Flood function (hydraulic categorisation)

To provide an indication of the existing flood function, flood conveyance and storage areas should be determined based on a detailed assessment of their extents by modelling encroachments into the floodplain due to potential development or an agreed alternative methodology. The different floodplain areas should be confirmed via an alternative method. The events to be considered are included in Scenario ID 9 of Table 11.

6.11.3 Flood emergency response classification of communities

The floodplain shall be categorised based upon the flood emergency response classification guideline outlined in Table 6. This classification provides an indication of the relative difficulty of the flood emergency management situation at a community or precinct scale. It may also assist in identifying the type and scale of information needed by the emergency managers to assist with emergency response planning.

6.12 Information to support decisions on activities in the floodplain and managing flood risk

This section outlines specific activities to support decisions on developing in the floodplain and on managing flood risk.

6.12.1 Flood Planning Area

The study is to map a preliminary flood planning area (FPA) based on the defined flood event and an appropriate freeboard. It is required that the Preliminary FPA and Flood Planning Levels for the Study Area, incorporate both riverine and major overland flow components using best current practice procedures. This is required to allow Council to make informed decisions with regard to new and proposed development within the Study Area prior to the next phase of developing a Floodplain Risk Management Study and Plan for the Study Area. The precise method for completing this task is to be confirmed with Council before finalising the development of the Preliminary FPA.

6.12.2 Information to Support Emergency Management Activities

Information for emergency services should be provided in accordance with the relevant guideline noted in Table 6. A key consideration of this is timing of the flood event reaching critical levels such as cutting evacuation routes. This may result from shorter duration events rather than those generating peak design levels. Therefore, a range of shorter duration events should be modelled as outlined in Table 11 to determine the critical timing for emergency response. This information would generally be required where time to reach a critical level is an important factor in emergency response planning.

Where required, this should include information on the consequences of flooding for key transport and evacuation routes. Key infrastructure for community response and recovery from flooding should be identified. This should include information on what level/gauge height key transport links may become impassable, what level/gauge height key public infrastructure (e.g. hospitals, water supply, sewerage works, main electrical switchyards) are inundated, timing of structures overtopping (including levees and bridges) and gauge-related timing information. This information can be supplemented with historical or anecdotal evidence, including related timing information.

6.12.3 Advice on land-use planning considering flooding

A key objective of the study is to provide better flood information to support land use planning activities in the study area. This includes:

- improved information on how flood related constraints may vary across the floodplain. Advice relating to understanding and considering these constraints is provided in the guideline for developing flood information to support land use planning referred to in Table 6.
- advice on general planning controls within different flood planning constraint categories considering the varying constraints and Council's general requirements and relevant standards.

This information should be made available to inform land use planning activities until more detailed assessment is undertaken in a future floodplain management study.

6.12.4 Advice on land-use planning considering overland flooding

In local overland flooding areas where traditional flood planning area may not be fit for purpose, the consultant is to make recommendations for planning instruments on alternate development controls in consideration of state government directions to reduce the impacts of development on flooding and flood impacts on new development. This may include development controls to ensure maintenance of flow paths and to reduce damage to property in the vicinity of flow paths. The areas are to be identified separately to mainstream flooding and mapping provided where different controls are recommended.

6.13 Peer review

The consultant is to undertake a comprehensive internal peer review of the study including hydrologic and hydraulic modelling, reporting and outcomes. The peer review is to be documented and considered in finalising the outcomes of the report.

6.14 Reporting

The draft and final report is to cover the issues identified in the scope of work in sufficient detail to be fit for the intended purpose. As a minimum it is to contain the following information:

Executive Summary

1 Outlining the purpose of the study as well as its methodology, results and conclusions

Introduction

- Outlining the purpose of the study, the intended end users and the client

Background

(i) Study Area - description of the study area, its catchment(s) and the history of flooding in the area
(ii) Previous Studies - a summary of the previous studies completed in the area and their relevance to the current study
(iii) Discussion of relevant policies, legislation and guidance
(iv) Flood Behaviour - Written description of design and historical flood behaviour for a range of events for locations across the study area

Available Data

Provided and collected - description of all data collected (data and survey) and used for the study and their limitations and final ownership. This includes:

- Historic Data – including summary of historic events and available data
- Guidelines used
- Data collection
- Information from Site Visit
- Topographic and Aerial Survey and imagery
- Survey for Flood damage assessment

Community Consultation

- Methodology
- Materials developed
- Discussion on inclusive consultation undertaken and results for different stages

Hydrological analysis

Description of the hydrologic analyses, including any review of existing models and studies, and calibration and validation, and assumed catchment conditions.

- Hydrologic controls in catchment and changes overtime
- Model Selection
- Model Setup
- Model parameter selection
- Model results – reporting and presentation of results for all design runs identified in Table 11 including design flood hydrographs at gauges and key locations.

Hydraulic Analysis

Description of the hydraulic analyses, including any review of existing models and studies.

- Identification of hydraulic controls in the floodplain and any key changes overtime
- Model Selection
- Model Setup

Model Calibration and Validation

Description of model calibration and validation. Presentation of results showing model fit to calibration and validation flood events, if applicable

- Model parameter selection and assumed catchment conditions
- Model results - reporting and presentation of results for all design runs identified in Table 11 including design flood hydrographs at gauges and key locations.

Model sensitivity

Description of the results of sensitivity analysis and model checks.

Overall Model results

- written description of likely model accuracy and limitations such as domain extent compared with suitable study area for result use

Consequences of Flooding on the Community

- Identification of existing flood problem areas
- Flood Impacts - A preliminary assessment of flood impacts and risk in the study area.
- Written description (aided by figures if needed) to describe flood levels at which roads are cut and other relevant information
- Flood damages. Assessment and reporting on flood damages
- Impacts of climate change

Post Processing of Results

Reporting on and providing the following post processed model outputs.

- Flood Extents
- Flood function
- Flood hazard
- Flood Emergency Response Classification

Information to inform decisions on activities in the floodplain and managing flood risk

- Emergency Response
- Land use planning
- Cumulative Impacts
- Impacts of works on the floodplain.

Option Assessment

- Identification and preliminary assessment of options.

Peer Review

Conclusions

Figures

Acknowledgements

References

Appendices

Data Handover

- The report is to summarise the intellectual property of all study material (including outputs, models and input data), in consideration of the requirements of the brief.
- It is also to document the information handed over as part of the study, including all relevant model files and versions used in the study as outlined in Section 7.

Printing of the final report(s) shall not proceed without the written direction of the Council. The cost of all work associated with preparing the approved final report shall be included in the consultant's fee estimate.

6.15 Meetings

Meetings are to be held regularly throughout the duration of the study. The meetings shall be generally attended by representatives from the floodplain risk management committee (FRMC) comprising elected members of Council, community members, Council staff (typically land-use planning, engineering, disaster management, community engagement, etc.) and Agency Representatives (typically DPE, NSW SES, WaterNSW etc.). Meetings

will generally take place at the project inception and when progress milestones are reached. The meeting location, number of meetings (six FRMC meetings in total including the inception meeting and five subsequent meetings), their purpose and expectations of the consultant are shown in Table 12.
Consultants should advise in their proposals as to their intended approaches for the FRMC meetings (e.g. attending in person at Tumbarumba or participating remotely via MS Teams/or Zoom).

Table 12 Meeting requirements

Meeting Type/Purpose	Location	Number of Visits Required	Expectation of Consultant
Inception meeting with FRMC	Tumbarumba Council offices.	1	Finalising conditions of commission, handover of data etc.
Progress meeting and reports to the FRMC	Tumbarumba Council offices.	5	Reporting and presenting to FRMC, receiving and discussing feedback, clarifying technical matters.
Community meetings	Tumbarumba	2 community meetings pre public exhibition	To gather flood information and get feedback on modelling results
During Public Exhibition community information session	Tumbarumba	1	To present on the draft Flood Study report

6.16 Timing and hold points

The end of each stage represents a milestone. The study will also include significant hold points where a council review period should be allowed for. The consultant is not to commence works on any new stage beyond a hold point without written approval of acceptance of the previous stage from the Council's representative. Acceptance of the final report and handover of all relevant materials will mark the completion of the study. Key project stages for reporting and managing progress payments are shown in Table 13.

Table 13 Project stages

Phase/stage	Milestone	Comments/dates
Stage 1	Data Collection, Review and Community Consultation progress report	Hold point – 2 weeks
Stage 2	Model Development & Calibration/Validation progress report	Hold point – 2 weeks
Stage 3	Design flood modelling and damages assessment progress report	Hold point – 2 weeks
Stage 4	Draft Flood Study report & Public Exhibition	Hold point – 4 weeks
Stage 5	Final Flood Study report & Council adoption	Hold point 4 weeks
Stage 6	Completion of contract	

7 DELIVERABLES

Deliverables are to be produced in the formats specified in this section and provided to the Council in accordance with the milestones of the study as outlined in Table 13. They include progress, draft and final reports, survey data, model set-up files, model files, model results, and mapping products. Outputs will be used by a number of end users for a variety of purposes and therefore all deliverables should adhere to the formats specified in the following section, in accordance with any relevant guideline detailed in Section 5 and provided in GIS format, where possible.

Output deliverables are to be provided for the events listed in Table 11. Table 14 lists the required deliverables and indicates whether a hard copy figure is required as part of the final report. All mapping should be clear and legible. All deliverables are to be provided electronically (where applicable) to assist in provision of information to all study end users. Some deliverables are also required in hardcopy.

Table 14 provides a listing of the majority of deliverables required from this study, it aims to provide an indication of the scope and scale of deliverable requirements for this study.

At the completion of the project, all final deliverables are to be uploaded electronically through the NSW Flood Data Portal and provided to Council on a portable hard drive unless otherwise advised.

Table 14 Output deliverables

Deliverable	Specifics	Data Set ID*	IP*	Notes, Formats and Preferences
Document Transmittal Checklist	Completed and signed	1	2	
Data Schedule	A completed electronic list of all data handover and its formats	1	2	see https://flooddata.ses.nsw.gov.au/template/flood-project-handover-template
NSW Flood Database completed template		3	2	
Data	Study area	4	1	Spatial layer of the study area GDA94
	Survey data	10	2	Raw and Processed. Spatial Layer of locations GDA94 mAHD
	LiDAR	11	2	GDA94 mAHD
	Aerial Imagery	12	2	Catalogue of imagery
	Digital Elevation Model	10	2	GDA94 mAHD
	Flood data	5	2	Collected historical information, gauge/rain mAHD and BOM gauge
	Survey for flood damages assessment	9	1	Assume the floor levels of the main building on 50 properties are to be estimated by way of LIDAR and “drive by” methods. Provided as part of a cadastral GIS layer or as a .csv excel file in tabular form. Floor, ground and levels are to be tabulated with the properties' property number or address, coordinates.
	Hydrologic controls	10,4	2	Survey or description
	Hydraulic controls	10,4	2	Survey or description
Hydrologic Modelling	Advice of Model version used	6	n/a	RORB, XPRAFTS or WBNM etc
	Model set-up files	6	2	Description and components
	Model input files	6	2	All runs or scenarios
	Model output files	7	1	
Hydraulic Modelling	Advice of Model version used	6	n/a	TUFLOW or MIKE etc
	Model DEM	6	2	Consistent with model results
	Model set-up files	6	2	Description and components
	Model input files	6	2	All runs or scenarios
	Model output files	7	1	native format, ASCII, viewer (eg QGIS/waterRIDE)
Flood Damages model and assessment	Advice of Model version used	6	n/a	MS Excel
	Model set-up files	6	2	
	Model input files	6	2	All runs or scenarios
	Model output files	7	1	
Benefit Cost Assessment for options	Cost Estimates	15	2	
	AAD Calculations	15	2	
	NPV Calculations	15	2	

Deliverable	Specifics	Data Set ID*	IP*	Notes, Formats and Preferences
	BC Analysis	15	2	
Management Options Assessment	Multi Criteria Assessment	15	2	
	Environmental Assessment	15	2	
	Concept Design Drawings/Specification for recommended works	16, 4	2	
Reports	Monthly Progress Reports	2	2	1 electronic copy (MS Word/PDF)
	Survey Brief, where required	2	2	1 electronic copy (MS Word/PDF)
	Calibration and Validation Report	2	1	1 electronic copy (MS Word/PDF)
	Progress Reports	2	2	1 electronic copy (MS Word/PDF)
	Internal peer review report	2	2	1 electronic copy (MS Word/PDF)
	Draft report	2	2	2 hard copies of each report, 1 electronic (MS Word/PDF)
	Final report	2	1	5 hardcopies of each report, 2 electronic (MS Word & PDF)
	Figures	2	1	Figures of flood layers to be A3 unless otherwise stated. Flood layers to be overlaid on cadastral map or aerial photography, including a legend. Other figures.
Processed model results study area wide	Post processing software	6	2	Any software developed or acquired to interface or transfer data between models or to pre/post process
	Calibration and validation model results	4	1	ArcGIS (Shapefile) or MapInfo (MID/MIF, etc.) (grid) and figures To be provided at the calibration milestone and final data handover
	Maximum water level, water depth, velocity	4	1	ArcGIS (Shapefile) or MapInfo (MID/MIF, etc.) (grid) and figures Calibration/Design
	Flood extents	4	1	GIS layers (polygons/grid) and as figures (A3).
	Impacts on flooding of future conditions	17	1	GIS layers and figures
	Flood planning area/levels	14	1	GIS layers and figures
	Flood Function maps	4	1	GIS layers and figures
	Assessment of change in flood behaviour or levels as a result of mitigation works	7	2	GIS layers and figures
	Flood emergency response classification maps	13, 4	1	GIS layers and figures
	Flood hazard maps	4	1	GIS layers and figures
	Flood Impacts – Flood Damages	7	2	GIS layers and figures
	Mapping to support land use planning activities	14	1	GIS layers and figures
	Flood profiles/flood depths	7	1	Graphs (figures) and tables
Model results specific locations	Levels/AEP at which critical access roads/critical	13	1	Tables and figures

Deliverable	Specifics	Data Set ID*	IP*	Notes, Formats and Preferences
	infrastructure are affected			
	Levels/AEP at which properties are affected	4	1	Tables and figures
	Timing of structures overtopped, including levees and bridges	13	1	Tables and figures
	Gauge information (related timing)	13	1	Tables and figures
	Gauge height/elevations at which structures are overtopped	13	1	Tables and figures
	Link between gauge height and areas inundated	13	1	Tables and figures
	Inundation timing of properties/access roads	13	1	Tables and figures
Visualisation/ Animations	Video animation of flood progression in whole study area	8	2	viewer (eg QGIS/waterRIDE)

* Note: IP - Case 1: IP Clauses 1.1-1.7 and Schedule A apply
IP - Case 2: IP Clauses 1.1-1.6 apply
Data Set ID: refers to Dataset categories used in NSW Flood Data Portal. The Dataset categories are provided in Table 15.

Table 15 Dataset ID References

Dataset ID	Description
1	Checklist and summary of inclusions in Datasets
2	Report and all Figures
3	Completed NSW Flood Database Template
4	Spatial Layers
5	Collected Data
6	Hydrological, Hydraulic and flood damage model input files
7	Hydrological, Hydraulic and flood damage model output
8	Hydraulic modelling post processed files for AVIs
9	Base survey information for flood damage assessments
10	Survey information
11	LiDAR
12	Aerial Imagery
13	Emergency Response Planning
14	Land use planning
15	Management options and recommended management packages
16	Plans for works
17	All Other Required Data

7.1 Handover Material – Development, Delivery and Intellectual Property

The Consultancy Agreement should contain clauses including the following information or an equivalent which does not place any additional restriction on use by the State or use of specific information under creative commons. Table 14 column 4 identifies Intellectual Property Cases 1 and 2 which are defined as follows.
Case 1 -all clauses apply –which involves making information available under creative commons as outlined in Clause 1.7 and Schedule A below.

Case 2 – clauses 1.1 to 1.6 apply

2 *Intellectual property*

1.1 In this clause, Intellectual Property includes all statutory, legal, equitable and other proprietary rights and interests, including without limit, in copyright, patents, registered and unregistered trademarks, registered designs, circuit layouts, trade secrets, semiconductor or circuit layout rights, trade, business or company names, or other proprietary rights, or any rights to registration of such rights existing in Australia, whether created before or after this agreement.

1.2 The consultant indemnifies Council, the Department of Planning, Industry and Environment (NSW Government) and their employees and agents against any action, costs, expenses, losses or damages suffered or incurred by all, or any more of them, arising out of, or in any way in connection with:

- *any breach by the consultant or its employees or its agents of the consultant's obligations under clause 1.2, and*
- *any infringement by council or NSW Government of third party Intellectual Property rights in its use of the Project Materials.*

1.3 The consultant warrants that:

(a) in carrying out the Project, it will not infringe any Intellectual Property rights, and

(b) any report by the Recipient will not contain anything that, to its knowledge, is libellous or defamatory.

1.4 Subject to clause 1.5:

- *The consultant grants to the council and the State, at no cost, a perpetual, irrevocable, worldwide, royalty-free non-exclusive licence, including the right to sub-license, to use, reproduce, modify, adapt, publish and communicate to the public, the Project Materials (to avoid doubt, including for the purpose of making the Project Materials freely available to the public or any section of it, whether in hard copy or on-line and including use and modification of any models and copying photographs), and*
- *To ensure compliance by the consultant with clause 1.4(a), if the consultant engages a third party to create the Project Materials the consultant must ensure that the terms of its engagement provide that the third party:*
  - *assigns Intellectual Property in such materials to the council immediately on creation of the materials; and*

warrants that it has the legal authority to comply with the obligation referred to in clause 0□o.

1.5 To the extent that the consultant cannot take ownership of Intellectual Property in any Incorporated Existing Materials:

- *the consultant must ensure that relevant third parties grant to the council and State, at no cost, a perpetual, irrevocable, worldwide, royalty-free, non-exclusive licence, including the right to sub-licence, to use, reproduce, modify, adapt, publish and communicate to the public, the Incorporated Existing Materials for any Non-Commercial Purpose (to avoid doubt, including for the purpose of making the Incorporated Existing Materials freely available to the public or to any section of it, whether in hard copy or on-line and including use and modification of any models and copying of photographs); and*
- *if any of the Incorporated Existing Materials are included in the materials referred to in clause 1.7, the Recipient must ensure that*

relevant third parties make those Incorporated Existing Materials available to the public under a Creative Commons Attribution 4.0 licence.

1.6 This clause 1 survives termination or expiry of this agreement.

1.7 To make the required information available under a Creative Commons Attribution 4.0 licence the Consultant must insert a copyright notice into the deliverables indicated below in accordance with the form and instructions in Schedule A. The Consultant must particularise New Contract Material and Existing Contract Material, as specified in the instructions in Schedule A. The deliverables this refers to are as follows:

(v) project report(s) and associated figures (excluding any sections highlighted as confidential by the council);

(vi) spatial flood extent layers for key events; and

(vii) any other data and tools noted as IP Case 1 in Column 4 of Table 14 or otherwise advised by council to the consultant

SCHEDULE A

This copyright notice is to be incorporated into the Deliverable Services. It can be downloaded MS Word format from: https://goo.gl/dsuQD5. It should replace any other copyright notice in the document(s), which are generally located inside the front cover.

Instructions

1. *Ensure that the hyperlink under the Creative Commons Logo is maintained. https://creativecommons.org/licenses/by/4.0/*
2. *Replace [Title of document] [Year] with the appropriate content*
3. *Replace [Purchaser] [Year] with the appropriate content*
4. *Obtain the particulars required by the Purchaser for inclusion under the heading:* ***Further Information***
5. *In the Disclaimer section, replace* ***[Consultant]*** *and* ***[Council]*** *with the appropriate content. Please note that the Purchaser appears twice.*
6. *You are required to particularise the Existing Contract Material (this includes third party material and material provided by the Purchaser)that is* ***incorporated*** *into the Deliverable Services, in a Table of References.(See above and Clause 23) Each reference shall particularise the title of the material being reproduced, Author or Copyright Holder, Year of Publication, Page number (if appropriate), Copyright Licence(if any – E.g. CC Attribution Licence), or 'All Rights Reserved'*

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Please give attribution to: *© [Purchaser] [Year]*

We also request that you observe and retain any notices that may accompany this material as part of the attribution.

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Attachment A – Cost Schedule

Consultants can expand this table to include additional Team Members.

	Team Member 1 **Name** **Role**	**Team Member 2** **Name** **Role**	**Team Member 3** **Name** **Role**	**Disbursement**	**Total**	
$/Hour	$ (excl. GST)	$ (excl. GST)	$ (excl. GST)			
	Hours	Hours	Hours	**$ (excl. GST)**	**Hours**	**$ (excl. GST)**
Familiarisation with Project (Sections 1-5)						
				Sub-total		
Data Collection and Review (Sections 6.1 and 6.2)						
Site inspection(s)						
Data Collection and Review						
Preparing and managing Survey Brief						
Additional survey - provisional fee allowance						
DEM Development						
Floor Level Survey – Drive by assessment for 50 buildings						
				Sub-total		
Community Consultation (Section 6.3)						
Community Questionnaire						
Community Newsletter						

Community information sessions – total of 2						
Public exhibition period						
Public presentation during public exhibition						
				Sub-total		
Hydrologic Analysis (Section 6.4)						
Flood Frequency Analysis – Tumbarumba Creek						
Establish Hydrologic Model(s) – Tumbarumba Creek (if necessary) and Pound Creek and major overland flow at Tumbarumba.						
Develop design hydrographs						
				Sub-total		
Hydraulic Analysis (Section 6.5)						
Establish Hydraulic Model(s)						
				Sub-total		
Model Calibration and Validation (Section 6.6 and 6.7)						
Calibrate/Validate Hydrologic/Hydraulic Model(s), reporting and data provision						
Sensitivity Assessment						
				Sub-total		
Modelling Existing Scenarios (Section 6.7)						
Model Design Events						
				Sub-total		

Impacts of Flooding on the Community						
Impacts on the Community and Emergency Response						
Flood Damages Assessment						
Climate Change Assessment						
				Sub-total		
Post Processing of Model Outputs						
Flood Hazard						
Flood Function						
Flood Emergency Response Classifications						
				Sub-total		
Information to Support Decisions						
Interim FPA						
Information to support emergency management						
Advice on Land use Planning - Riverine						
Advice on Land use Planning – overland flooding						
				Sub-total		
Peer Review						
Reporting						
Draft						
Final						
				Sub-total		
FRMC Meetings (6 No.)						
Data Handover						

SUB TOTAL (excl. GST)						
10% GST						
TOTAL (incl. GST)						
Additional Costs (not included in Total Cost)						
Additional FRMC meetings at Council (excl. GST)						
Additional FRMC meetings held remotely (excl. GST)						
Additional community information meetings (excl. GST)						
Cost of assessing damages using drive by method for additional properties (over and above first 50) (excl. GST)						
Re-familiarising with suspended project (excl. GST)						
Other						