

QUEENSLAND FLOOD COMMISSION OF INQUIRY

- State Representation

REQUIREMENT No. 1684613

VOLUME 2 of 2

Statement of Gary Mahon

Signed: 7 September 2011

QFCI
Date: 19 09 11

Exhibit Number: 534

QUEENSLAND FLOODS COMMISSION OF INQUIRY

STATEMENT OF GARY LEONARD MAHON

- I, GARY LEONARD MAHON, c/- 125 Park Road, Kedron, in the State of Queensland, Assistant Director-General, Strategic Policy Division, Department of Community Safety state:
- 1. I provide this statement in response to the Queensland Floods Commission of Inquiry Requirement number 1684613 addressed to me and dated 26 August 2011.

Role and position within the Department of Community Safety

- 2. I hold the position of Assistant Director-General, Strategic Policy Division and I have been employed by the Department of Community Safety (previously the Department of Emergency Services (DES)) since 24 July 2006. For ease of reference, I will refer to the Department throughout this statement as 'DCS', appreciating that it may at relevant times have been DES. I will also refer to other departments by reference to their current names, for example, DERM and DLGP.
- 3. I have been employed in state public service positions for over 30 years and my experience includes operational, policy and strategic planning in three large and diverse departments.
- 4. I have held positions at the Senior Executive level for the last 12 years.
- I also hold an Executive Masters of Public Administration from the Australian and New Zealand School of Government.

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- As the Assistant Director-General, Strategic Policy Division, I have a number of key accountabilities, including:
 - (a) The agency's strategic policy, monitoring performance, planning (incorporating SPP 1/03), and legislative programme.
 - (b) The delivery of legal services to the department and processing right to information applications; and
 - (c) The delivery of the agency's executive service functions which includes, Cabinet and parliamentary services, Ministerial and Executive Correspondence, and Media and communications.

Role of DCS in drafting and administering the State Planning Policy 1/03 (SPP 1/03)

Drafting SPP 1/03

- 7. Having only joined DCS on 24 July 2006, I have had to rely on available records in responding to the Commission's questions, particularly regarding the drafting of SPP 1/03.
- 8. Our records indicate that, since the introduction of the Integrated Planning Act (1997), there were requests from DLGP for DCS to comment on local government planning schemes, development control plans and other related policies. However there was no statutory obligation for development applications to be reviewed by local government in relation to hazard mitigation including flood.

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- 9. A briefing note dated 18 October 1999 describes the emerging case for a State Planning Policy on land use planning for disaster mitigation and provided approval for a letter outlining same from DCS to DLGP. The briefing note dated 18 October 1999 (enclosing the letter) is attached and marked GLM-1.
- 10. In a letter dated 16 December 1999, the Director-General of DLGP responded to DCS and supported the proposed SPP. This letter, dated 16 December 1999 is attached and marked GLM-2.
- 11. SPP 1/03 was drafted between 2001 and 2003.
- 12. The objective of SPP 1/03 was to assist in slowing the rate of increase in the costs to the community, the Government and the insurance industry of recovering from a natural disaster.
- 13. DCS chaired an inter-agency Government Advisory Committee (GAC) established in June 2001 to provide strategic advice on the development of SPP 1/03. In August 2001, DCS issued a Consultation Report for community consultation about the intent to prepare an SPP. The Report (including analysis) is attached and marked GLM-3. A Ministerial Brief (dated 21 December 2001) was prepared to advise the Minister of the outcomes of public consultation and that brief is attached and marked GLM-4.
- 14. Approval was given to engage town planning consultants to draft the SPP and Guidelines in March 2002. An Executive Brief (dated 14 March 2002) seeking approval to engage consultants is attached and marked GLM-5.

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Witness (JP/Lawyer/Commissioner for Declarations:

- 15. Between 10 October 2002 and 13 December 2002, DCS sought community feedback on a Draft SPP and Guideline. DCS held workshops in 12 regional centres, which over 650 people attended and 68 written submissions were received. A draft of the SPP and the Guideline dated 29 August 2002 are attached and marked GLM-6.
- 16. In 2003, DCS provided an analysis of the issues raised during public consultation to the GAC. A consultation stage report summarizing the outcomes of the consultation stage of the draft SPP is attached and marked GLM-7.
- 17. The GAC was established in June 2001 to provide strategic advice for the development of the SPP. The GAC had representatives from DES, DLGP, DNRM, DSD, DPW, DPC, QT, DMR, DPI and EPA. Minutes of the first recorded GAC meeting held on 29 July 2001 are attached and marked GLM-8.
- 18. The GAC considered the analysis and recommended responses to submissions as prepared by DCS. For example, regarding submission number 59 on page 20 the Gold Coast City Council raised "the SPP does not require a local government to adopt a flood event within a specified timeframe, until such time the SPP does not come into effect". In this example, the analysis was that "Local Governments will be required to identify Natural Hazard Management Areas and include suitable measures when making and amending planning schemes". This effectively introduces an 8 year timeframe for implementation of the SPP."
- 19. A table detailing the analysis of the issues raised in submissions on the draft SPP, dated 7 March 2003, is attached and marked GLM-9.
- 20. The Minister for Local Government and Planning subsequently adopted the SPP 1/03 on 19 May 2003. The SPP was subsequently gazetted on 20 June 2003 and took effect on 1 September 2003. The Gazette notice dated 20 June 2003 is attached and marked **GLM-10**.

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21. SPP 1/03 covers three hazards, being flood, bushfire and landslide. The analysis below is in relation to the flood aspects only.

Administering SPP 1/03

- 22. DCS' roles and responsibilities regarding SPP 1/03 are set out in Section 8 of the SPP 1/03 Guideline.
- 23. Section 8.5 of the Guideline states that DCS reviews draft planning schemes to determine whether the SPP has been appropriately reflected, thereby achieving the State's interest in respect of natural hazard management, and conveys advice to DLGP.
- 24. DCS provides advice to DLGP on whether or not the local planning scheme appropriately reflects SPP 1/03 requirements through the State interest review process. DCS responds to specific requests of DLGP at stages known as the first and second state interest review.
- 25. The main steps of the process coordinated by the Strategic Policy Division of DCS are:
 - (a) DCS receives a written request from DLGP to review the planning scheme/amendments as part of the first State interest review to assist the Minister for Local Government (the Minister) to determine if the proposed planning scheme/amendments adversely affect State interests. DLGP provides the proposed planning scheme content submitted by Local Government to DCS electronically with a template for DCS to record comments or issues with respect to DCS State interests.
 - (b) DCS requests DLGP obtain from Council all natural hazard background studies that informed the development of the flood mitigation components of the planning scheme. These studies are then forwarded to DERM for their review and advice.

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- (c) DCS officers, assisted as necessary by town planning consultants, review the planning scheme against SPP 1/03, specifically the extent to which Outcomes 1 to 6 of the SPP are addressed.
- (d) Written DCS advice (including DERM comments with regard to technical flood matters) on the extent to which the planning scheme adequately reflects SPP 1/03 is sent to DLGP in the required template provided by DLGP.
- (e) As outlined in DLGP's Statutory Guideline 02/09, if it is determined by the Minister for DLGP that a second State interest review is required, DLGP forwards the Local Government response and planning scheme revisions to each agency as deemed necessary by DLGP (which may include DCS) with a formal request to conduct a second State interest review.
- (f) DCS reviews (using town planning consultants as necessary and consulting DERM again on flood technical matters) and advises DLGP if the matters raised by DCS on the first state interest review have been satisfactorily resolved.
- 26. A table illustrating the above process is attached and marked GLM-11.
- 27. Section 8.6 of the Guideline states that DCS provides advice on interpreting and implementing the SPP and should be consulted by local governments about integrating the SPP into planning schemes.
- 28. In 2003, DCS coordinated training and information sessions on SPP 1/03 in 10 regional centres to over 350 people. A map (with commentary) showing the extent of the training and information sessions is attached and marked **GLM-12**.
- 29. A training package is available on the DCS website and is marked at attached GLM-13.

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- 30. When requested, DCS provides informal advice to Councils on interpreting and implementing SPP 1/03. For example, councils may contact DCS if they are contemplating a new planning scheme and are seeking advice on how that planning scheme should incorporate SPP 1/03.
- 31. Section 8.7 of the Guideline states that DCS, in consultation with DERM on flood and landslide hazards, provides advice about the appropriate level of hazard assessment to determine natural hazard management areas when preparing planning schemes.
- 32. During the first state interest review, DCS requests DLGP obtain from Council all natural hazard background studies that informed the development of the flood mitigation components of the planning scheme. These studies are then forwarded to DERM for their review and advice.
- 33. DCS consults DERM for technical aspects of natural hazard management areas (flood) such as hydraulic studies.
- 34. Section 8.8 of the Guideline states that DCS provides advice on the appropriate agencies and officers to contact in relation to specific natural hazard management issues. For example, if a Council wishes to conduct a flood study, DCS would refer that council to DERM for advice on how to undertake a flood study.
- 35. At a June 2001 stakeholder workshop, support for the development of a State Planning Policy was expressed by the Commonwealth, State and Local Government; academics with expertise in land use planning, climatology and disaster management; and peak bodies such as the Local Government Association Queensland, Urban Development Institute of Australia, Planning Institute of Australia.

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36. In May 2003, a joint letter from the Minister for Local Government and Planning and the Minister for Emergency Services was sent to all 68 submitters to the SPP public consultation, attaching a summary of issues raised and the proposed response. For example, the main issue raised in the submissions was the lack of a "default" mechanism for flood in the SPP. The response recognised the constraint on adopting the flood component of SPP due to a lack of existing flood data. The response stated "that unlike the situation for bushfire and landslide, it has not been possible to identify a workable default natural hazard management area for flood because there is a lack of reliable State-wide data on flooding. Also, the flood studies that are required to generate reliable flood data can be resource intensive for local governments. In the absence of reliable flood data, it is not feasible to mandate a specific level of flood immunity that would be equally applicable to all parts of the State." The letter (undated copy) is attached and marked GLM-14.

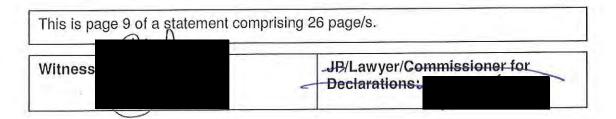
DCS interaction with DLGP and DERM in drafting and administering SPP 1/03 – Specific examples with respect to the Brisbane City Plan, Bundaberg City Plan, Ipswich Planning Scheme and Emerald Shire Council Planning Scheme

- 37. DCS's role in drafting and administering SPP 1/03 and interaction with DLGP and DERM is set out in paragraphs 7 to 36 above.
- 38. DCS is not a referral agency so it does not ordinarily assess any development applications submitted to local governments. However, records show that between 1 September 2003 and 31 March 2007, DCS reviewed some development applications. This was because Guide 6 of the Guides to the use of the Integrated Development Assessment System (IDAS) development application forms provided that where a development application triggered a referral to three or more concurrence agencies all State Agencies (including DCS) were required to review the application. A copy of the Guide is attached and marked GLM-15.

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Brisbane City Plan

- 39. A search of our records reveals that on 22 June 2004, DLGP invited agencies, including DCS, to review proposed amendments to the Brisbane City Plan. An email from DLGP to DCS dated 22 June 2004 is attached and marked GLM-16.
- 40. On 26 July 2004, DCS informed DLGP that it did not agree BCC's proposed amendment which amounted to a statement that SPP 1/03 was reflected in the City Plan. An email dated 26 July 2004 from DCS to DLGP is attached and marked GLM-17.
- 41. Although DCS acknowledged the Brisbane City Plan included codes to ensure development was compatible with the hazard, the lack of information on the hazard and mapping precluded agreement to the position that SPP 1/03 is reflected in the scheme.
- 42. On 16 August 2004, DLGP informed DCS that Brisbane City Council had no objection to deleting reference to SPP 1/03 in the proposed amendments to the City Plan. I refer to the email at GLM-15 in this regard.
- 43. On 31 May 2005, DCS was invited to provide further comment, if required, on the proposed Brisbane City Plan amendments. As DCS understood, reference to SPP 1/03 had been withdrawn from the proposed amendments. A search of records reveals a response from DCS. A copy of the email from DLGP on 31 May 3005 is attached and marked GLM-18.
- 44. Since 2005 DCS has commented on various components of the Brisbane City Plan such as neighborhood plans and renewal strategies. In doing so, DCS has reminded BCC through DLGP that the City Plan is not compliant with SPP 1/03. An example is the *Taringa-St Lucia draft renewal strategy* dated 6 June 2011 and this document is attached and marked **GLM-19**.



Bundaberg City Plan

- 45. On 16 September 2003, DCS advised DLGP that the Bundaberg City Plan did not appropriately reflect SPP 1/03. Reasons included: lack of justification for a flood immunity level of Q50; and no provision for different flood immunity of essential services infrastructure. A letter dated 16 September 2003 from DCS to DLGP is attached and marked GLM-20.
- 46. On 7 November 2003, via DLGP, Bundaberg City Council argued in favour of Q50 because of: an extensive flood warning system; historical acceptance in the community; and long warning time. Council also stated that, since there was no mapping for Annual Exceedance Probability of 0.2% and 0.5%, it was not practicable to require specific critical infrastructure to be above these levels. An email from Bundaberg City Council to DLGP dated 7 November 2003 is attached and marked GLM-21. See pages 5, 6 and 7 of this attachment for the information related to DCS.
- 47. On 12 November 2003, DCS informed DLGP that it was consulting DERM over the acceptability of a 2% AEP and that lack of flood mapping was not an acceptable reason not to identify 0.2% and 0.5% AEPs as criteria for critical infrastructure in the scheme. An email from DCS to DLGP dated 12 November 2003 is attached and marked GLM-22.
- 48. On 21 November 2003, DCS informed DLGP that it had reviewed the revised flood management code and associated comments. DCS advised that it understood that the amendments to the flood management code within the Bundaberg City Council Plan had been appropriately reflected. However, amongst other comments, DCS advised that Council should amend the purpose of the code. An email from DCS to DLGP dated 21 November 2003 is attached and marked GLM-23.

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Ipswich Planning Scheme

- 49. On 6 February 2003, DLGP forwarded the proposed draft Ipswich City planning scheme to agencies for the first state interest review. A letter from DLGP to DCS dated 6 February 2003 is attached and marked GLM-24.
- 50. On 5 March 2003, DCS informed DLGP that, when the SPP is adopted, the Ipswich IPA planning scheme may need to be amended to achieve Outcomes 4-6 of the draft SPP 1/03. A letter from DCS to DLGP dated 5 March 2003 is attached and marked GLM-25.
- 51. On 4 December 2003, DLGP informed agencies, including DCS, that Council would submit the planning scheme for reconsideration of state interests and that, since changes relate to three main areas (the conservation zone, Marburg, and Springfield) a full state interest review was not required. An email from DLGP to all relevant state agencies dated 4 December 2003 is attached and marked GLM-26.
- 52. On 26 August 2005, DCS informed DLGP that DCS raised no issues to the draft Ipswich City Planning Scheme amendments including the Walloon Thagoona Master Plan. A copy of this letter 26 August 2005 is attached and marked GLM-27.
- 53. On 2 March 2006, DLGP wrote to DCS inviting consideration of a proposed amendment to the Ipswich City Planning Scheme, specifically the Walloon Thagoona Master Plan Amendment Package 1 of 2006. A copy of this letter, dated 2 March 2006 is attached and marked GLM-28.
- 54. Records show that on 11 April 2006, DCS replied to DLGP advising that DCS has no comment in relation to the Walloon Thagoona Master Plan. A copy of this email is attached and marked GLM-29.

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- 55. On 24 May 2007, DLGP wrote to DCS inviting comment on the second amendment package for the Ipswich planning scheme. A copy of the letter dated 24 May 2007 is attached and marked GLM-30.
- 56. A memorandum dated 5 April 2007 from the Planning Manager (Ipswich City Council) to the City Planner (Ipswich City Council) gives an overview of amendments contained in the package. The memorandum makes no reference to flood provisions, however line 43 of the accompanying table referred to amendments to the flood overlay map at OV5 of the Ipswich City Plan. A copy of the memorandum dated 5 April 2007 and accompanying table is attached and marked GLM-31.
- 57. On 20 June 2007, DCS replied to DLGP by email, stating that the amendments to the Ipswich City Planning Scheme do not raise any issues for DCS. A copy of this email is attached and marked GLM-32.

Emerald Shire Council Planning Scheme

- 58. On 1 October 2004, DCS informed DLGP that the draft Emerald Planning Scheme had not addressed the natural hazard associated with flooding and also provided further advice that might assist Council in adopting an appropriate Defined Flood Event. A copy of this letter is attached and marked GLM-33.
- 59. On 29 September 2006, DCS advised DLGP that, following the second state interest review, the draft Emerald Planning Scheme does not completely reflect SPP 1/03. In respect of the flooding aspect of the plan there was no flood hazard map and no natural hazard overlay regarding flood. Records reveal no further requests were made to DCS by DLGP. A copy of this letter is attached and marked GLM-34.

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Role of DCS (in conjunction with DERM and DLGP) in monitoring whether each local government has an adequate flood map, carried out adequate flood studies, identified an appropriate defined flood event in its planning scheme and taken steps to appropriately reflect the SPP 1/03 with respect to flood in its planning scheme

- 60. DCS does not have a role in monitoring whether each local government has an adequate flood map. DCS' responsibility is to review planning schemes at the request of DLGP and convey advice to DLGP. DCS checks whether a flood map is provided, however the adequacy of the flood map is the responsibility of DERM.
- 61. DCS does not have a role in monitoring whether each local government has carried out adequate flood studies. DCS' responsibility is to review planning schemes at the request of DLGP and convey advice to DLGP. The adequacy of flood studies is the responsibility of DERM,
- 62. DCS does not have a role in monitoring whether each local government has identified an appropriate defined flood event in its planning scheme. DCS' responsibility is to review planning schemes at the request of DLGP and convey advice to DLGP. Part of the state interest review for individual planning schemes passed to DCS by DLGP is to confirm (in consultation with DERM) that a DFE has been appropriately applied..
- 63. DCS does not have a role in monitoring whether each local government has taken steps to appropriately reflect the SPP 1/03 with respect to flood in its planning scheme. DCS' responsibility is to review planning schemes at the request of DLGP and provide advice to DLGP.

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- 64. The review of SPP 1/03 (coordinated by DCS) will assess the uptake of flood studies by local governments.
- 65. When the SPP took effect in September 2003, an eight year timeframe was envisaged for the introduction of the flood component because of a lack of flood data.
- 66. However, post local government amalgamations in 2007 and the introduction of the *Sustainable Planning Act (SPA) 2009* in 2009, DCS is finding that Councils are only now beginning to offer new draft planning schemes to DLGP for review.

In the event the SPP 1/03 is not appropriately reflected with respect to flood in its planning scheme, any processes followed or actions taken by DCS to ensure compliance with the SPP 1/03 in the future

- 67. DCS does not have a role in ensuring compliance with SPP 1/03 in the event that it is not adequately reflected in a planning scheme with respect to flood (or bushfire or landslide).
- 68. DCS has administered three funding programs available to local governments for disaster resilience, mitigation and risk management. Within the scope of these programs, local governments may apply for support to fund flood-studies to assist with adequately reflecting SPP 1/03 in their planning scheme. These programs are: the Natural Disaster Risk Management Studies Program (NDRMSP), the Natural Disaster Mitigation Program (NDMP), and the Natural Disaster Resilience Program (NDRP). These schemes are discussed in more detail below.

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SPP 1/03's designation of the 1% Annual Exceedance Probability (AEP) flood as generally the appropriate flood event for determining a natural hazard management area

- 69. Oversight of the SPP drafting process was provided by the GAC.
- 70. The initial draft SPP dated 28 March 2002, identified 5 options for specific natural hazard prone areas for flood. A copy is attached and marked GLM-35.
- 71. Three options had 1% AEP as the effective default following comprehensive flood studies.
- 72. One option had medium, high and extreme zones as defined in appendix K of Flood plain management in Australia; best practice principles in guidelines.
- 73. One option had the local government assessment manager determining the DFE following comprehensive flood studies.
- 74. At the subsequent GAC workshop on 11 April 2002, the DERM representative is recorded as outlining only one option as recorded in the meeting minutes. The minutes of the GAC workshop on 11 April 2002 are attached and marked GLM-36.
- 75. On 24 May 2002 a GAC meeting discussed a focus workshop that occurred on 10 May 2002 with the Urban Development Institute of Australia (UDIA), the Royal Australian Planning Institute (RAPI) and the Local Government Association of Queensland (LGAQ). Discussion included:
 - (a) what was a reasonable definition of a natural hazard prone area for flood;
 - (b) whether the SPP could apply to flooding on 'Day 1' given the availability of information in some local governments; and

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- (c) the longer term benefits of requiring local governments to undertake flood studies, in particular whether the benefits justify the costs and resources required.
- 76. Minutes of the GAC meeting on 24 May 2002 are attached and marked GLM-37.
- 77. SPP 1/03 is not based upon a single flood height of 1% AEP. The SPP recommends (Guideline Appendix 2) that natural hazard management areas (flood) ideally should be determined from a comprehensive floodplain management study as outlined in the SCARM report. Important aspects of the SCARM report's risk-based approach are included in the SPP (eg Guideline Section 2.27 to 2.31)
- 78. DCS expected that with the variability of risk across the State it would follow that some variability in DFE would be proposed by local governments. This reflects the importance of local conditions expressed in the SCARM Report (for example section K4 on page 75). It is also one of the conclusions of public consultation on a 2001 Discussion Paper that "it would be inappropriate to set a consistent flood level across the State as the impacts of flooding are influenced by local conditions". The SCARM report is attached and marked GLM-38.
- 79. The SPP (Guideline Appendix 9) requires different levels of flood immunity to be applied to community infrastructure, for example: water treatment plants and electricity substations to 0.5% AEP (Q200), while hospitals and major electricity switch yards are at 0.2% AEP (Q500). This reflects the zoned approach in Table 3.1 of the SCARM report.
- 80. In accordance with the SPP, the onus rests with local government to conduct the floodplain management study, set a defined flood event based upon assessed risk, and implement the associated development constraints through its planning scheme.

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History of the use of the Q100 line in Queensland up to the SPP 1/03

- 81. Prior to the SPP being introduced in 2003, some councils were applying flood mitigation measures to their development decisions.
- 82. I am not aware that DCS maintained a history of this use.
- 83. I am not aware of a formal review of the "flood height standard approach" of 1% AEP since the inception of the SPP. This is a matter for the Review of SPP 1/03.
- 84. In response to advice requested by the Local Government Association of Queensland (LGAQ) in 2009, the Minister for Climate Change and Sustainability and the Minister for Planning and Infrastructure jointly established the State Government/LGAQ Inland Flood Study (IFS)

 Increasing Queensland's resilience to inland flooding in a changing climate. The purpose of the IFS was to deliver:
 - (a) An improved methodology for assessing inland flooding risk that considers how to take account of climate change.
 - (b) Specific policy options for improved flood risk management in the case study area, namely the Gayndah township in the North Burnett Regional Council (NBRC).
 - (c) General policy options for consideration as part of the review of State Planning Policy 1/03: Mitigating the Adverse Impacts of Flood, Bushfire and Landslide (SPP 1/03).
- 85. The final report delivering these outcomes was released on the Office of Climate Change website in November 2010. This report is attached and marked **GLM-39**.

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- 86. The study included a draft flood constraint code for assessing development applications in Gayndah based upon four flood hazard areas linked to 1% (i.e. Q100), 0.5% (i.e. Q200), and 0.2% (i.e. Q500) AEP flood levels.
- 87. Although DCS was not a formal partner in the project, DCS was represented on the Project Board and the Policy Planning Advisory Group that informed the development of the project deliverables.
- 88. The IFS was precursor work for the Review of SPP 1/03. The recommendations from the IFS, including the zoned approach, were transported into the SPP Review. This is discussed further below in the section dealing with the SPP Review.

Meaning and operation of section 6.6 of SPP 1/03

- 89. DCS has no role in assessing development applications.
- 90. The policy intent of paragraph 6.6 is that Council's must set a DFE and that a Council's planning scheme cannot be compliant with SPP 1/03 until a DFE is set.
- 91. It was never the intent that paragraph 6.6 permits a Council to avoid setting a DFE and therefore avoid compliance with SPP 1/03.
- 92. Paragraph 6.6 was inserted in SPP 1/03 to acknowledge the lack of flood data across the State, noting that it would be resource intensive and costly for local governments to conduct flood studies. It was also seen as inappropriate to apply a single "one-size-fits-all" default since there should be flexibility for Councils to respond to particular local conditions.

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- 93. Given the planning scheme review timetable, it was reasonable to expect that all local governments would have set a DFE within an 8 eight-year period.
- 94. DCS has on occasion provided advice to Councils through DLGP that their planning schemes do not adequately reflect the flood provisions of SPP 1/03 and are reminded that they should make decisions on development in flood prone areas with regard to the code in the tables to Appendix 5 of the SPP 1/03 Guideline. An example of this advice can be found at GLM-19.
- 95. Alternative flood study approaches would be referred by DCS to DERM as required by the Guideline to SPP 1/03 (section 8). DCS has no technical expertise in hydraulics.

Status of the review of the SPP 1/03

- 96. The IDC first met on 9 December 2010 with Ms Yolande Yorke, Executive Director of Policy and Legislative Reform in DCS as the Chair. Other members were: Bruce Stewart, Director, Environment and Resources in Department of Premier and Cabinet; Michael Papageorgiou Executive Director of Planning Policy in DLGP; and John Lane, Director, Integrated Planning, Strategy and Policy in DERM.
- 97. Minutes of the first meeting, the project plan and a set of Frequently Asked Questions are attached and marked GLM-40.
- 98. The Review of SPP 1/03 commenced in November 2010. There is a statutory requirement to complete the review by September 2013.

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99. Key issues to be considered in the review include:

- (a) A audit of planning schemes to determine whether and how SPP1/03 has been adequately reflected;
- (b) Introduction of climate change a significant additional risk, the scale of which is changing over time;
- (c) Flood studies conducted: by whom, across whole catchments/basins or by Local Government area, using which technical methodology, whether awaiting the 25-year revision of Australian Rainfall and Run-Off tables in 2014, implications of the June 2011 Commonwealth report: A National Approach to Flood Modelling; Attached and marked GLM-41.
- (d) A flood-level or zoned approach to development constraints, noting recent evidence from the UK that multi-zoned approaches in practice tend to default to the high risk zone;
- (e) Whether referral of development applications was appropriate and, if so, what the triggers should be;
- (f) Implications for communities of introducing potentially demanding new development constraints (eg as a result of climate change) alongside existing housing stock;
 - (g) Introduction of adaptation strategies including questions of defend or retreat.

100. DCS had already

(a) Been closely involved in the Inland Flood Study that established the climate change impact on extreme event rainfall – and hence flood (refer attachment "GLM-39"; and

(b) Commissioned the work by Risk Frontiers (the commercial arm of Macquarie University) to establish a state wide natural hazard risk assessment.

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- 101. In November 2010, key stakeholders, including LGAQ and all local governments, were invited to submit issues they wanted to be considered in the Review. A summary of issues and interests arising from submissions is attached and marked GLM-42.
- 102. Public consultation has not yet occurred. In accordance with the Strategic Planning Instruments (SPI) Program Guideline, public consultation is to occur when a draft revised SPP has been produced.
- 103. The IDC will meet during September to address new issues arising from the January 2011 flood events and interim work undertaken by the Queensland Reconstruction Authority (see paragraph 105 below).
- 104. The floods of December 2010 and January 2011 impacted on key aspects of the review including the flood technical studies. It was also appropriate to realign the timetable of the review to benefit from the recommendations of the Queensland Floods Commission of Inquiry.
- 105. I understand urgent work to address floodplain management issues arising from the Queensland floods is being undertaken by the Queensland Reconstruction Authority (QRA). A temporary SPP and Guideline are being considered. When that work is complete, coupled with any of the recommendations on land use planning arising from this Commission, the IDC for the SPP Review will need to finalise the review of the flood component of the SPP.
- 106. The method proposed to be used for identifying the flood risk and the considerations involved in making this decision is a matter for the review in light of the work of the QRA.

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Witness		JP/Lawyer/Commissioner for Declarations:

Summary of the Natural Disaster Resilience Program (NDRP)

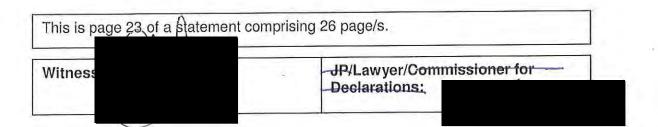
- 107. DCS has administered three funding programs available to local governments for disaster resilience, mitigation and risk management. These programs are the Natural Disaster Risk-management Studies Program (NDRMSP), the Natural Disaster Mitigation Program (NDMP) and the Natural Disaster Resilience Program (NDRP).
- 108. The types of projects covered by these schemes include:
 - (a) Reducing community vulnerability to natural hazards;
 - (b) Building Community Resilience;
 - (c) Increasing self-reliance; and
 - (d) Building partnership between sectors, supporting volunteering, encouraging a regional area approach to mitigation and countering the impacts of climate change.
- 109. The guidelines to the NDRP are attached and marked GLM-43.
- 110. Natural Disaster Risk Management Studies Program (NDRMSP): In 1999, the Commonwealth Department of Finance and Administration (DOFA) initiated the Natural Disaster Risk Management Studies Program (NDRMSP). The program ceased on 30 June 2005. The Department of Community Safety (DCS), Emergency Management Queensland (EMQ) was the lead agency contact in Queensland for administering the NDRMSP.

Witness	.):	JP/Lawyer/Commissioner for Declarations:

111. Funding based on 1/3 contributions by Applicant, State and Australian Governments:

Funding Round	Aust Govt	State Govt	Total
Round 1 1999/00	\$988,236	\$988,236	\$197,6472
Round 2 2000/01	\$294,533	\$294,533	\$589,066
Round 3 2001/02	\$1,232,211	\$1,233,213	\$2,465,424
Round 4 2002/03	\$1,050,000	\$966,466	\$2,016,466
Round 5 2003/04	\$560,700	\$842,670	\$1,403,370
Round 6 2004/05	\$1,257,330	\$1,257,330	\$2,514,660

- 112. A total of 255 applications were received for NDRMSP with 236 (93%) focused on flood studies. Of the 255 applications received, 238 were deemed successful with 225 (95%) of these projects for Local Government flood study focused projects. A table listing applications under this program is attached and marked GLM-44.
- 113. Natural Disaster Mitigation Program (NDMP:) The NDMP was a national program aimed at identifying and addressing natural disaster risk priorities across Queensland and was first launched on 1 April 2004. From 1 July 2004, the NDRMSP was incorporated into the new NDMP. The Department of Community Safety (DCS), Emergency Management Queensland (EMQ) was the lead agency contact in Queensland for administering the NDMP. The NDMP ceased on 30 June 2009 and was replaced by the Natural Disaster Resilience Program (NDRP).
 - 114. Since the launch of the NDMP on 1 April 2004, NDMP provided funding to 128 Queensland projects at a total project cost of \$38,133,030.



115. Funding based on 1/3 contributions by Applicant, State and Australian Governments.

Funding Round	Aust Govt	State Govt	Total
Round 1 2003/04	\$1,292,666	\$713,667	\$2,006,333
Round 2 2004/05	\$3,515,441	\$1,377,609	\$4,893,050
Round 3 2005/06	\$2,140,195	\$1,156,029	\$3,296,224
Round 4 2006/07	\$2,349,734	\$2,264,403	\$4,614,137
Round 5 2007/08	\$5,624,006	\$5,624,007	\$11,248,013
Round 6 2008/09	\$5,347,979	\$5,347,978	\$10,695,957

- 116. A total of 444 applications were received for NDMP with 108 (24%) focused on flood studies. Of the 444 applications received, 207 were deemed successful with 69 (33%) of these projects for Local Government flood study focused projects. The recorded figure of 207 successful projects includes re-applications (projects where funding had been approved in first year and a reapplication to continue the project was submitted in subsequent years with the funding allocation recorded against each funding round.) A table listing applications under this program is attached and marked GLM-45.
- 117. Natural Disaster Resilience Program (NDRP): The NDRP is a four year mitigation and resilience program and is a joint Australian and State Government grant program, with the Department of Community Safety the lead agency for Queensland.
- 118. Funding is based on 1/3 contributions by Applicant, State and Australian Governments.

 Exceptions to these conditions apply and are considered on a case-by-case basis.
- 119. \$44M allocated over 4 years comprising \$10M each round for the competitive funds and \$1M each round for the strategic funds. The funding approved listed in the table below refers to competitive funds only:

Funding Round	Aust Govt	State Govt	Total
Round 1 2008/09	\$3,556,815.89	\$3,556,814.87	\$7,113,630.76
Round 2 2009/10	\$6,297,040	\$6,297,039	\$12,594,079

This is page 24 of a statement comprising 26 page/s.

Witnes:

JP/Lawyer/Commissioner for Declarations:

- 120. A total of 184 applications were received for NDRP with 37 (20%) focused on flood studies. Of the 184 applications received, 108 were deemed successful with 28 (26%) of these projects for Local Government flood study focused projects. A table listing applications under this program is attached and marked GLM-46.
- 121. The NDMP and the NDRMSP were announced via a joint press release by the State and Australian Governments. In addition, the then Emergency Services Minister wrote to each Local Government inviting applications upon the opening of each funding round. The programs were also advertised on the Australian Government's website.
- 122. The Minister for Police, Corrective Services and Emergency Services wrote to each Local Government inviting applications under the NDRP upon each round opening. The program was advertised on the Department of Community Safety's website (www.communitysafety.qld.gov.au) and featured in presentations at the LGAQ conferences. At the onset of the program in 2009, LGAQ and DCS undertook road shows across Queensland to brief Local Governments about the new program. LGAQ have a position funded by NDRP for the express purpose of promoting NDRP and assisting Council's in applying for NDRP grants. Round three of the program has just closed.

This is page 25 of a statement comprising 26 page/s.

Witnes:

- JP/Lawyer/Commissioner for Declarations;

Involvement of the DCS in commenting on or drafting the Queensland Planning Provisions

123. DCS is contributing to the development of Queensland Planning Provisions as a member of the QPP working group.

I make this statement of my own free will believing its contents to be true and correct.

Signed at Brisbarie this 8th day of September 2011

This is page 26 of a/statement comprising 26 page/s.

Witness (
This is page 26 of a statement comprising 26 page/s.

Declarations:

STATEMENT OF GARY MAHON – INDEX OF ATTACHMENTS

VOLUME 2

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GLM-7	Consultation Stage Report dated March 2003	16
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GLM-10	Gazette notice dated 20 June 2003	20
GLM-11	Table illustrating SPP process	26
GLM-12	Map showing training locations and information sessions	28
GLM-13	Training Packed from www.dcs.qld.gov.au	29
GLM-14	Letter to submitters	36
GLM-15	Guide to IDAS	38
GLM-16	Email dated 22 June 2004	39
GLM-17	Emails dated 26 July 2004/16 August 2004	40
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GLM-20	Letter dated 16 September 2003	45
GLM-21	Email dated 7 November 2003	46
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GLM-23	Email dated 21 November 2003	48
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GLM-29	Email dated 11 April 2006	54
GLM-30	Letter dated 24 May 2007	55
GLM-31	Memorandum dated 5 April 2007 with Table accompanying memorandum	56
GLM-32	Email dated 20 June 2007	57
GLM-33	Letter dated 1 October 2004	58
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GLM-40	Minutes of IDC meeting dated 9 December 2010	97	
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STATEMENT OF GARY MAHON - INDEX OF ATTACHMENTS

Attachment Number	Description	Paragraph Reference
GLM-1	Memorandum (including briefing note and accompanying letter) dated 18 October 1999	9
GLM-2	Letter from DLGP dated 16 December 1999	10
GM-3	Preparation Stage Consultation Report (incorporating discussion paper) dated December 2001	13
GLM-4	Ministerial Brief dated 21 December 2001	13
GLM-5	GLM-5 Executive Briefing Note dated 14 March 2002	
GLM-6	Draft of SPP and Guideline as at 29 August 2002	15

Natural Disaster Resilience Program All Projects

No.	ID lumber	Funding Year	Study Title	Project Type	Categories	Organisation	Status	Applicant Proposed/Approved Funds	State Government Proposed/Approved Funds	Australian Government Proposed/Approved Funds	Other Proposed/Approved Funds	TOTAL Proposed/Approved Funds
-1	1814	200910	Community Disaster Preparedness and Education	Technical/Supporting Project	Storm Tide:Flood:Bushfire:Cyclone	Fraser Coast Regional Council	Approved	\$28,000 00	\$28,000.00	\$28,000.00	\$0.00	84,000.00
2	1816	200910	Tigalee Creek Retarding Basin Construction	Works/Construction	Other	Gladstone Regional Council	Approved	\$554,914.66	\$554,914.67	\$554,914.67	\$0.00	1.664,744.00
3	1817	200910	Gold Coast City Evacuation Plan Stage 2	Technical/Supporting Project	Sigrm Tide Flood Other Bushire Cyclone	Gold Coast City Council	Approved	\$54,796.00	\$54,700.00	\$54,700.00	\$0.00	164,196.00
4	1819	200910	Establishing Disaster Management Community Watch Groups	Technical/Supporting Project	Storm Tide Bushfire Cyclone	Gold Coast City Council	Approved	\$60,596.00	\$60,000 00	\$60,000.00	\$0.00	180,596.00
5	1820	200910	Disaster Management Education and Training Program	Technical/Supporting Project	Storm Tide:Flood:Bushfire:Cyclone	Gold Coast City Council	Approved	\$60,892.00	\$59,500 00	\$59,500.00	\$0.00	179,892.00
6	1821	200910	Helensvate Emergency Shelter and Recovery Centre Exercise	Technical/Supporting Project	Flood	Gold Coast City Council	Approved	\$60,000 00	\$56,500.00	\$56,500.00	\$0.00	173,000.00
7	1822	200910	Cairns Region Evacuation Strategy Finalisation	Technical/Supporting Project	Storm Tide:Flood:Cyclone	Caims Regional Council	Approved	\$38,333.00	\$38,333.50	\$38.333.50	\$0.00	115,000.00
8	1823	200910	Cassowary Coast Disaster Management Community Resilience and Education Program	Technical/Supporting Project	Storm Tide Flood Bushfire Cyclone	Cassowary Coast Regional Council	Approved	\$181,123.00	\$254,204 50	\$254,204.50	\$0.00	689,532.00
9	1824	200910	Local Area Natural Hazard Risk Assessment	Technical/Supporting Project	Flood Bushfire	Toowoomba Regional Council	Approved	\$15,000.00	\$15,000 00	\$15,000.00	\$0.00	45,000.00
- 10	1825	200910	Cairns CBD South Flood Miligation Program	Technical/Supponing Project	Flood	Caims Regional Council	Approved	\$30,000.00	\$30,000 00	\$30,000.00	\$0.00	90,000 00
11	1826	200910	Severe Siorm Miligation for Gatton	Technical/Supporting Project	Other	Lockyer Valley Regional Council	Approved	\$39,986.00	\$39,986.50	\$39,986 50	\$0.00	119,969 00
12	1828	1000	Coastal Imagery Capricom-Wide Bay	Technical/Supporting Project	Storm Tide:Flood:Other Bushfire Cyclone	Department of Environment & Resource Management	Approved	\$265,000.00	\$265,000 00	\$265,000 00	\$0.00	795,000.00
13	1829	200910	South West Region River Catchment Flood Management Planning	Technical/Supporting Project	Flood	Murweh Shire Council	Approved	\$0.00	\$550,000 00	\$550,000 00	\$0.00	1,100,000.00
14	1830	200910	Emergency Power Generators for Key Facilities	Works/Construction	Other	Central Highlands Regional Council	Approved	\$208,600.00	\$208,597.50	\$208,597 50	90 00	625,795.00
15	1831	200910	Building Disaster Resilience in the Croydon Shire through Improved Preparedness	Technical/Supporting Project	Flood Other Bushfire Cyclone	Croydon Shire Council	Approved	\$0.00	\$12,000.00	\$12,000.00	\$0.00	24,000 00
16	1832	200910	Mt Gionous EWS	Works/Construction	Other	Moreton Bay Regional Council	Approved	\$46,833.34	\$46,833.33	\$46,833.33	\$0.00	140,500.00
17	1833	200910	Regional Floodplain Daiabase (Stage 2)	Technical/Supporting Project	Flood	Moreton Bay Regional Council	Approved	\$360,000.00	\$360,000.00	\$360,000.00	\$0.00	1,080,000.0
18	1894	200910	Coestal Erosion Investigation and Mingation Plan	Technical/Supporting Project	Other Cyclone	Whitsunday Regional Council	Approved	89,728.63	\$9,736.66	\$9,736.65	\$0.00	29,200.00
19	1835	200910	Flood Miligation Study Dawson River	Technical/Supponing Project	Flood	Banana Shire Council	Approved	\$80,666.50	\$80,666.50	\$80,666.50	\$0.00	241,999.50
20	1836	200910	Automatic Flood Recording Stations - Alpha/Jencho Areas	Works/Construction	Other	Barcaldine Regional Council	Approved	90,00	\$60,000 00	\$60,000.00	\$0.00	120,000.0
21	1840	200910	Sunshine Coast Region Natural Hazard Risk Assessment Study	Technical/Supporting Project	Other	Sunshine Coast Regional Council	Approved	\$41,250.00	\$41,250.00	\$41,250.00	\$0.00	123,750.00
22	1843	200910	Provision of Flood Protection to SES Building Giru	Works/Construction	Floodway	Burdekin Shire Council	Approved	\$8,327.00	\$8,326.50	\$8.326 50	\$0.00	24,980.00
23	1844	200910	Installation of 'Guardian' Task Tracking System in Burdelon & Hinchinbrook Shires	Technical/Supporting Project	Storm Tide Flood Bushfire Severe Storm Cyclone	Burdekin Shire Council	Approved	\$25,300.00	\$25,300.00	\$25,300 00	\$0.00	75,900.00
24	1845	200910	Natural Hazard Risk Assessment	Technical/Supporting Project	Storm	Rockhampion Regional Council	Approved	\$40,000.00	\$40,000 00	\$40,000.00	\$0.00	120,000.00
25	1850	200910	Lilliesmere NBWB Dam Outlet	Works/Construction	Other	Burdekin Shire Council	Approved	\$106,667.00	\$106,666.50	\$106,666.50	\$0.00	320,000.0
26	1853	20091	Ayr Flood Study · 2D	Technical/Supporting Project	Flood Severe Storm-Cyclone	Burdekin Shire Council	Approved	\$60,000.00	\$60,000.00	\$60,000 00	\$0.00	180,000.0
27	1857	20091	Barcaldine Regional Council Natural Hazard Risk Assessment	Technical/Supporting Project	Other	Barcaldine Regional Council	Approved	\$33,600.00	\$33,600 00	\$33,600.00	\$0.00	100,800.0
28	1858	20091	Emergency power supply for Carpeniana Local Disaster Coordination Centre	Technical/Supporting Project	Storm Tide Flood Bushfire Severe Storm Cyclone	Carpentana Shire Council	Approved	\$25,666.66	\$26,666.67	\$26,666.67	\$0.00	80,000.0

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No.	ID Number	Funding Year	Study Title	Project Type	Categories	Organisation	Status	Applicant Proposed/Approved Funds	State Government Proposed/Approved Funds	Australian Government Proposed/Approved Funds	Other Proposed/Approved Funds	TOTAL Proposed/Approved Funds
29	1866	200910	Flood Resilience of the Lower James Street area. Goodna - Planning Study	Technical/Supponing Project	Flood	Ipswich City Council	Approved	\$20,000 00	\$20,000 00	\$20,000.00	\$0.00	60,000.0
30	1867	200910	Increasing the Flood Resilience of Rosewood Township	Technical/Supporting Project	Flood	Ipswich City Council	Approved	\$70,000.00	\$70,000.00	\$70,000 00	\$0.00	210,000.0
31	1870	200910	Capella Road Crossing	Works/Construction	Other	Central Highlands Regional Council	Approved	\$191,282.27	\$191,282.26	\$191,282.27	\$0.00	573,846.80
32	1871	200910	Community DEM. Acquisition of high resolution Digital Elevation Model data to support accurate mapping over coastal and flood risk communities in the Gulf of Carpentaria	Technical/Supporting Project	Storm Tide:Flood:Cyclone	Carpeniana Shire Council	Approved	\$0.00	\$96,050 00	\$96,050.00	\$0.00	192,100.0
33	2054	200910	Natural Disaster Risk Assessment for the Longreach Regional Council Area	Technical/Supporting Project	Storm Tide Flood Earthquake Other I ushfire Severe	3 Longreach Regional Council	Approved	\$10,405.27	\$10,405.27	\$10,405.26	\$0.00	31,215.8
34	1861	200910	CANCELLED - Indigenous Skilling (Fire Management)	Technical/Supporting Project	Bushfire	Department of Environment & Resource Management	Cancelled	\$5,100.00	\$5,100.00	\$5,100.00	\$0.00	15,300.00
35	1849	200910	Establishment of Community Education and Volunteer Training Facility	Technical/Supporting Project	Storm Tide Flood Severe Storm Cyclone	Burdekin Shire Council	Finalised	\$4,333.00	\$4,333.00	\$4,334.00	80.00	13,000.0
36	1854	200910	Barratta Creek and Planiation Creek Alen Stations	Technical/Supporting Project	Flood Severe Storm Cyclone	Burdekin Shire Council	Finalised	\$10,834.00	\$10,833.00	\$10,833.00	\$0.00	32,500.00
37	1855	200910	Burdekin River Alert Upgrade - Launders and Expedition Creeks	Technical/Supporting Project	Flood Severe Storm: Cyclone	Burdekin Shire Council	Finalised	\$6,200.00	\$6,200.00	\$6,200.00	\$0.00	18,600.00
38	1856	200910	Dal Sanio's Aleri - Brandon	Technical/Supporting Project	Flood Severe Storm Cyclone	Burdekin Shire Council	Finalised	\$8,834.00	\$8,833.00	\$8.833.00	\$0.00	26,500.00
38						1	SUBTOTA	£ \$2,763,266.33	\$3,548,819.38	\$3,548,820.39	\$0.00	\$9,860,906.16
1	1827	200910	Purchase and Removal of Houses in High Flood Risk Areas - Woogaroo Creek Stage 2	Works/Construction	Other	Ipswich Rivers Improvement Trust	Ineligible	\$575,000.00	\$550,000.00		\$0.00	1,675,000.00
2	1837	200910	Nonh Burnett Regional Council Natural Disaster Resilience	Technical/Supporting Project	Bushire	Nonh Burnett Regional Council	Ineligible	\$1,000,000.00	\$1,000,000.00	\$1,000,000.00	\$0.00	3,000,000 00
3	1838	200910	McEwen's Beach Sand Replenishment	Works/Construction	Other	Mackay Regional Council	Ineligible	\$196,772.00	\$196,772.00		\$0.00	590,316.00
4	1847	200910	Jerona - Evacuation Helipad	Works/Construction	Other	Burdekin Shire Council	Ineligible	\$13,534.00	\$13,533.00		50.00	
5	1848	200910	Groper Creek - Evacuation Helipad	Works/Construction	Other	Burdekin Shire Council	Ineligible	\$13,534.00	\$13,533.00		\$0.00	40,600.00
6	1860	200910	Developing Local Government Capacity to Respond to Bushfire	Technical/Supporting Project	Bushfire	Department of Environment & Resource Management	Inaligible	\$23,000.00	\$21,000.00			40,600.00
7	1815	200910	Fitzroy River Floodplain Management Study	Technical/Supporting Project	Flood	Rockhampion Regional Council	Unsuccessful	\$70,000.00	\$60,000.00		\$0.00	65,000.00
8	1818	200910	Installation of an Early Warning Stren System within the Gold	Works/Construction	Other	Gold Coasi City Council	Unsuccessful	\$999,984.00	\$999,000.00		\$0.00	190,000.00
9	1839		Koala Court Flood Miligation Works Stage 2	Works/Construction	Other	Sunshine Coast Regional Council	Unsuccessiul	\$179,667.00	\$179,666.50		\$0.00	2,997,984.00
10	1841	200910	Maroochy River Foreshore Flood Miligation Stage 1	Technical/Supporting Project	Siorm Tide:Flood	Sunshine Coast Regional Council	Unsuccessful	\$116,000.00	\$116,000.00		\$0.00	539,000.0
11	1842	200910	Emergency Generator - St Andrew's Meals On Wheels	Works/Construction	Other	Burdekin Shire Council	Unsuccessful	\$7,333.00	\$7,333.50		\$0.00	348,000 0
12	1846	200910	Burdekin Meerkat Alen	Technical/Supporting Project	Storm Tide:Flood:Bushfire:Severe	Burdekin Shire Council	Unsuccessful	\$59,334.00	\$59,333.00		\$0.00	22,000.00
13	1851	200910	N5 - Airdmillan Road Cossing Upgrade	Works/Construction	Storm:Cyclone Road upgrade	Burdakin Shire Council	Unsuccessful	\$36,000.00	\$36,000.00		\$0.00	178,000 00
14	1852	200910	L4 - Lilliesmere Road Crossing	Works/Construction	Road upgrade	Burdekin Shire Council	Unsuccessful	\$40,334.00	\$40,333.00		\$0.00	
15	1859	200910	Community protection through enhanced fire miligation works at high risk interface zones ((Zones)	Works/Construction	Other	Department of Environment & Resource Management	Unsuccessful	\$183,000.00	\$173,500.00		\$0.00	121,000.00
16	1862		Dangerous Tree Project	Technical/Supporting Project	Bushfire:Severe Storm:Cyclone	Department of Environment & Resource Management	Unsuccessful	\$18,200.00	\$18,200.00		\$0.00	100000
17	1863	200910	Feasibility Study for Flood Surveillance Cameras	Technical/Supporting Project	Flood	Ipswich City Council	Unsuccessful	\$20,000.00	\$20,000.00		\$0.00	54,600.00
18	1864	200910	Increasing the Flood Resilience of Greater Thagoona	Technical/Supporting Project	Flood	Ipswich City Council	Unsuccessful	\$116,000.00	\$117,000.00			60,000 0
19	1865	200910	Floodway Upgrade at Greys Plains Road Mount Mon	Works/Construction	Floodway	Ipswich City Council	Unsuccessful	\$140,000.00			\$0.00	
-					L			3140,000.00	\$140,000,00	\$140,000.00	\$0.00	420,000 0

No.	ID Number	Funding Year	Study Title	Project Type	Categories	Organisation	Status	Applicant Proposed/Approved Funds	State Government Proposed/Approved Funds	Australian Government Proposed/Approved Funds	Other Proposed/Approved Funds	TOTAL Proposed/Approved Funds
20	1868	200910	Update of Ipswich Natural Disaster Risk Management Study and Ipswich Disaster Management Plan Phase 1	Technical/Supporting Project	Flood:Bushfire:Severe Storm:Cyclone	Ipswich City Council	Unsuccessful	\$29,000.00	\$29,000.00		\$0.00	
21	1869	200910	Don River Floodplain Management Study	Technical/Supporting Project	Flood Cyclone	Don River Improvement Trust	Unsuccessful	\$50,000.00	\$50,000.00	\$50,000.00	\$0.00	150,000 0
21							SUBTOTAL	\$3,886,692.00	\$3,840,204.00	\$3,840,204.00	\$0.00	\$11,567,100.0
59							TOTALS	\$8,649,958.33	\$7,389,023 38	\$7,389,024.39	\$0.00	
,	2114	201011	Deliver Accredited Disaster Management Training	Technical/Supporting Project	Storm Tide Flood Bushfire Severe Storm Cyclone	Local Government Association of Queensland	Approved	\$12,000.00	\$11,075.00		\$0.00	34,150.0
2	2122	201011	Emergency Generator - St Andrew's Meals on Wheels 2010-11	Technical/Supporting Project	Storm Tide Flood Bushfire Severe Storm Cyclone	Burdekin Shire Council	Approved	\$1,333.00	\$7,333.50	\$7,333.50	\$6,000.00	
3	2123	201011	Forest Hill Flood Hazard Study	Technical/Supporting Project	Flood	Lockyer Valley Regional Council	Approved	\$27,815.30	\$27,815.85	\$27,815.85	\$0.00	83,447.0
4	2125	201011	Wyandra Community Resource / Local Emergency Coordination Centre (LECC)	Works/Construction	Sheller	Paroo Shire Council	Approved	\$0.00	\$32,500 00	\$32,500.00	\$0.00	65,000.0
5	2126	201011	Flood Mitigation Study Dawson River 2010-11	Technical/Supporting Project	Flood	Banana Shire Council	Approved	\$69,334.00	\$69.333 00	\$69,333.00	\$0.00	
6	2127	201011	Woogaroo Creek Cauchmeni Flood Study and Flood Risk Management Study	Technical/Supporting Project	Flood Severe Storm	Ipswich Rivers Improvement Trust	Approved	\$100,000.00	\$100,000.00		\$0.00	
7	2128	201011	Natural Disaster Risk Assessment Western Downs Regional Council Region	Technical/Supporting Project	Flood-Other Bushfire Severe	Western Downs Regional Council	Approved	\$0.00	\$20,000 00			
В	2129	201011	Community Education and Resources Centres for Russell and Stradbroke Islands	Technical/Supporting Project	Storm Tide:Flood Bushfire:Severe	Redland City Council	Approved	\$121,885.00	\$121,885.00		\$0.00	
9	2130		Bouldercombe Fire Trail Construction	Works/Construction	Storm Cyclone Fire Traits	Rockhampton Regional Council	Approved	\$8,166.34	1		\$0.00	365.655.0
10	2131	201011	Natural Disasier Risk Assessment - Goondiwindi Region	Technical/Supporting Project	Flood:Other:Severe Storm	Goondiwindi Regional Council	Approved		\$6,166.83		\$0.00	18,500 0
11	2132			Works/Construction				\$0.00	\$19,223.50	\$19.223.50	\$0.00	38,447 0
-			Installation of Genset and Wiring for Auxiliary power to Clermont LEOC Installation of Genset and Wiring for Auxiliary power to the		Other	Isaac Regional Council	Approved	\$14,600.00	\$14,599.50	\$14,599.50	\$0.00	43,799.0
12	2133		LDCC	Works/Construction	Other	Isaac Regional Council	Approved	\$21,185.00	\$21,185.00	\$21,185.00	\$0.00	63,555.0
13	2134	201011	Installation of 'Guardian' task tracking system in Isaac Regional Council	Technical/Supporting Project	Tide Flood Bushfire Severe Storm Cyclone	Isaac Regional Council	Approved	\$11,367.00	\$11,366.50	\$11,366.50	\$0.00	34,100.0
14	2135	201011	Isaac Regional Council Natural Hazard Risk Assessment Study	Technical/Supporting Project	Tide Flood:Bushfire:Severe Storm:Cyclone	Isaac Regional Council	Approved	\$31,666.00	\$31,667.00	\$31,667.00	\$0.00	95,000 0
15	2139	201011	Equipment to fit-out training and operations management facility for ES volunteers and community groups	Technical/Supporting Project	Flood:Bushfire:Severe Storm:Cyclone	Somerset Regional Council	Approved	\$0.00	\$10,000 00	\$10,000.00	\$0.00	20,000.0
16	F141	201011	MBRC DM training and exercise program	Technical/Supporting Project	Storm Tide:Flood:Bushlire:Severe Storm Cyclone	Moreton Bay Regional Council	Approved	\$12,566.66	\$12,566.67	\$12,566.67	\$0.00	37,700 0
17	2142	201011	Balonne Shire Levee Bank Improvement Project	Works/Construction	Other	Balonne Shire Council	Approved	\$93,500.00	\$93,250.00	\$93,250.00	\$0.00	280,000.0
18	2148	201011	Noosa North Shore Priority Fire Trails	Works/Construction	Fire Trails	Sunshine Coasi Regional Council	Approved	\$20,000 00	\$20,000.00	\$20,000.00	\$0.00	
19	2149	201011	Installation of emergency power generator for key emergency control facility	Technical/Supporting Project	Flood Bushlire Severe Storm	Toowoomba Regional Council	Approved	\$50,000.00	\$50,000.00	\$50,000.00	\$0.00	334723
20	2150	201011	Community Resilience VolunteerAlert Program Pannership	Technical/Supporting Project	Storm Tide Severe Storm Cyclone	Volumeering North Queensland Inc	Approved	\$0.00	\$15,000.00		\$0.00	
21	2152	201011	Flood mitigation and community awareness - Germields community	Technical/Supporting Project	Flood Severe Storm	Central Highlands Regional Council	Approved	\$5,470.00	\$6,535.50		\$4,800.00	
22	2154	201011	ALERT Flood Warning System for Cornet River	Technical/Supporting Project	Flood Severe Storm	Central Highlands Regional Council	Approved	\$23,000.00	\$54,000.00	10000	\$23,500 00	154,500.0
23	2155	201011	Development and Installation of 'Pathway / Dekho' Task Tracking system in TRC	Technical/Supporting Project	Flood:Bushfire:Severe Storm	Toowoomba Regional Council	Approved	\$29,700.00	\$29,700 00		\$0.00	
24	2156	201011	Pioneer River Flood Mitigation Scheme - Nonh Mackay Stage 1 8/2	Works/Construction	Floodway	Mackay Regional Council	Approved	\$232,631 00	\$232,631.00		\$0.00	89,100.0 697,893.0
25	2157	201011	MBRC Natural Disaster Risk Assessment Study	Technical/Supporting Project	Storm Tide Flood Bushfire Severe	Moreton Bay Regional Council	Approved	\$40,000.00	\$40,000 00			
26	2164	201011	Update of the Balonne Shire Council Disaster Risk Management Study	Technical/Supporting Project	Storm Cyclone Storm Tide:Flood Bushlire Severe	Balonne Shire Council	Approved	\$13,400.00	\$13,300.00		\$0.00	
1	1		The state of the s		Storm Cyclone		- Parado	\$13,400 00	\$13,300.00	\$13,300.00	\$0.00	40,000.0

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No.	ID lumber	Punding Year	Study Title	Project Type	Categories	Organisation	Status	Applicant Proposed/Approved Funds	State Government Proposed/Approved Funds	Australian Government Proposed/Approved Funds	Other Proposed/Approved Funds	TOTAL Proposed/Approved Funds
27	2165	201011	Flood Mitigation Work: Jencho Levee	Works/Construction	Floodway	Barcaldine Regional Council	Approved	\$428,410.00	\$428,410.00	\$428,410.00	\$0.00	1,285,230.0
28	2166	201011	Brisbane River hydraulic model and review to probable maximum flood	Technical/Supporting Project	Storm Tide:Flood:Severe Storm:Cyclone	Ipswich City Council	Approved	\$75,000.00	\$187,500.00	\$187,500.00	\$0.00	450,000.00
29	2168	201011	Coincident Flooding in Queenstand	Technical/Supporting Project	Storm Tide:Flood Bushfire:Severe Storm:Cyclone	Department of Environment & Resource Management	Approved	\$150,000.00	\$150,000.00	\$150,000.00	\$0.00	450,000.0
30	2169	201011	Cape York Communities Prepared and Ready Pannerships	Technical/Supporting Project	Storm Tide Flood Bushfire Severe Storm Cyclone	Regional Organisation of Councils of Cape York & Torres Shire	Approved	\$0.00	\$135,000.00	\$135,000.00	\$0.00	270,000.0
31	2170	201011	Regional Floodplain Daiabase - Stage 3	Technical/Supporting Project	Flood	Moreton Bay Regional Council	Approved	\$150,000 00	\$150,000.00	\$150,000.00	\$0.00	450,000.0
32	2174	201011	inland Flood Towns Imagery	Technical/Supporting Project	Flood-Bushfire Severe Storm Cyclone	Department of Environment & Resource Management	Approved	\$170,000.00	\$170,000.00	\$170,000.00	\$0.00	510,000.0
33	2176	201011	Ponable Back Up Power Supplies	Technical/Supporting Project	Flood Bushfire Severe Storm Cyclone	Finders Shire Council	Approved	\$38,500.00	\$38,250 00	\$38,250.00	\$0.00	115,000.0
34	2177	201011	Project 1 - Business Roundtable EXTEND	Technical/Supporting Project	Storm Tide:Flood.Other:Bushtire:Sev ere Storm:Cyclone	Volunteering Queenstand Inc	Approved	\$100,000.00	\$843,665.00	\$643,665.00	\$9,999,999 99	11,387,329.9
35	2178	201011	Back Up Power Supply for the Emergency Evacuation Centre	Technical/Supporting Project	Flood Bushlire Severe Storm:Cyclone	Flinders Shire Council	Approved	\$18,400.00	\$18,300.00	\$18,300.00	\$0.00	55,000.0
36	2179	201011	Installation of a Flood Warning System	Technical/Supporting Project	Flood Cyclone	Flinders Shire Council	Approved	\$0.00	\$35,000 00	\$35,000 00	\$0.00	70,000.0
37	2181	201011	Flood Mapping of Hughenden Urban Area	Technical/Supporting Project	Flood Severe Storm Cyclone	Flinders Shire Council	Approved	\$20,000 00	\$72,500 00	\$72.500 00	\$0.00	165,000 0
38	2185	201011	MBRC Bushlire Hazard Management Strategy	Technical/Supporting Project	Bushfire	Moreton Bay Regional Council	Approved	\$80,000 00	\$40,000.00	\$40,000.00	\$0.00	160,000 0
39	2186	201011	SEQ Region FloodWise Early Warning Flood Alens	Technical/Supporting Project	Storm Tide:Flood:Cyclone	Ipswich City Council	Approved	\$30,000.00	\$30,000.00	\$30,000 00	\$0.00	90,000 0
40	2187	20101	Guardian Disaster Management Software	Technical/Supporting Project	Flood	Murweh Shire Council	Approved	\$0.00	\$17,500.00	\$17,500.00	\$0.00	35,000.0
41	2188	20101	Tablelands Resilient Stormwater Infrastructure Study	Technical/Supporting Project	Flood Severe Storm Cyclone	Tablelands Regional Council	Approved	\$100,000.00	\$100,000 00	\$100,000 00	\$0.00	300,000 0
42	2189	20101	Environon System Improvement Project	Technical/Supporting Project	Storm Tide Flood Severe Storm Cyclone	Townsville City Council	Approved	\$41,488.00	\$41,487.00	\$41,487.00	\$0.00	124,462.0
43	2190	20101	Feasibility and Pilot Study for Flood Surveillance Cameras	Technical/Supporting Project	Flood:Severe Storm	Ipswich City Council	Approved	\$31,000 00	\$31,000.00	\$31,000 00	\$0.00	93,000.0
44	2191	20101	Tropical Cyclone Storm Surge and Wave Impacts Study - Mackay Regional Coastline	Technical/Supporting Project	Storm Tide Flood Cyclone	Mackay Regional Council	Approved	\$22,000.00	\$22,000 00	\$22,000 00	\$0.00	66,000 0
45	2194	20101	Bradleys Gully Water Diversion Channel	Works/Construction	Other	Murweh Shire Council	Approved	\$0.00	\$603,465.50	\$603,465.50	\$0.00	1,206,931.0
46	2199	20101	Mobile Emergency Power Supply for Critical Assets and Shelter to secure	Works/Construction	Shelter	Richmond Shire Council	Approved	\$30,827.00	\$30,826.50	\$30,826.50	\$0.00	92,480.0
47	2196	20101	Mackay Regional Council - Backup Generalor System for Administration Building	Technical/Supporting Project	Storm Tide Flood Bushlire:Severe Storm Cyclone	Mackay Regional Council	Approved	\$39,600.00	\$39,600,00	\$39,600.00	\$0.00	118,800.0
48	2197	20101	Spatial Data Exchange Capability on the DCS Volunteer Portal Website	Technical/Supporting Project	Storm Tide:Flood Bushlire:Severe Storm Cyclone	Department of Community Safety	Approved	\$30,000 00	\$0.00	\$30,000.00	\$0.00	60,000.0
49	2198	20101	Charleville Flood Gase Strategy	Works/Construction	Other	Murweh Shire Council	Approved	\$39,600.00	\$39,600.00	\$39,600.00	\$0.00	118,800.0
50	2199	20101	Ploodway Upgrade at Greys Plains Road Mount Mort (Phase 2)	Works/Construction	Floodway	Ipswich City Council	Approved	\$140,000 00	\$140,000.00	\$140,000.00	\$0.00	420,000.0
51	2200	20101	Update of lpswich NDRM Study and DM Plan	Technical/Supponing Project	Flood Bushlire Severe Storm Cyclone	Ipswich City Council	Approved	\$29,000 00	\$29,000.00	\$29,000.00	\$0.00	87,000.0
52	2201	20101	Building Disaster Resilience in Welpa through improved preparedness	Technical/Supporting Project	Storm Tide Flood Other Bushfire Severe Storm Cyclone	Weips Town Authority	Approved	\$10.000.00	\$10,000.00	\$10,000.00	\$0.00	30,000.0
53	2204	20101	1 2010-2011 Storm Tide and Flood Project	Technical/Supporting Project	Storm Tide Flood	Townsville City Council	Approved	\$220,000 00	\$42,500 00	\$42,500.00	\$0.00	305,000.0
54	2206	20101	1 Community Resilience Profile	Technical/Supporting Project	Storm Tide:Flood:Bushlire:Severe Storm Cyclone	Queensland Council of Social Service Inc.	Approved	\$9,000 00	\$165,000.00	\$165,000.00	90 00	339,000.0
55	2210	20101	1 Harden up - Go green	Technical/Supporting Project	Storm Tide Severe Storm Cyclone	Green Cross Australia	Approved	\$0.00	\$389,900.00	\$389,900.00	\$254,300.00	1,034,100.0
58	2211	20101	Flood Misgation Emerald Township - Railway Line Improvements	Works/Construction	Floodway	Central Highlands Regional Council	Approved	\$8.000.00	\$83,845.00	\$83,845.00	\$244,800 00	420,490.0

No.	ID Number	Funding Year	Study Title	Project Type	Categories	Organisation	Status	Applicant Proposed/Approved Funds	State Government Proposed/Approved Funds	Australian Government Proposed/Approved Funds	Other Proposed/Approved Funds	TOTAL Proposed/Approved Funds
57	2212	201011	Rural Addressing and Signage for Disaster and Emergency Purposes	Technical/Supporting Project	Flood Severe Storm: Cyclone	Central Highlands Regional Council	Approved	\$40,380.00	\$19,750.00	\$19,750.00	\$0.00	79,880.00
58	2213	201011	Paim Creek Pedestrian Link Bridge (Design & Feasibility Study)	Technical/Supporting Project	Flood	Hinchinbrook Shire Council	Approved	\$10,000.00	\$10,000.00	\$10,000.00	\$0.00	30,000.00
59	2214	201011	Increasing the Flood Resilience of Greater Thagoona	Technical/Supporting Project	Flood:Severe Storm	Ipswich City Council	Approved	\$116,667.00	\$116,666.50	\$116,666.50	\$0.00	350,000.00
60	2215	201011	System Gaps	Technical/Supporting Project	Flood Severe Storm	Ipswich City Council	Approved	\$136,752.00	\$136,752 00	\$136,752.00	\$0.00	410,256.00
61	2218	201011	Improving disaster readiness response and recovery by strengthening support networks and engagement by people with disability their families and their neighbours	Technical/Supporting Project	Flood-Cyclone	National Disability Services (Queensland)	Approved	\$0.00	\$162,500.00		\$0.00	325,000.00
52	2219	201011	Improving the self-reliance of Cooktown in disasters	Technical/Supporting Project	Storm Tide Flood: Severe Storm: Cyclone	Cook Shire Council	Approved	\$0.00	\$25,000.00	2,000	\$0.00	
63	2221	201011	OIT Guardian Disaster Management Program	Technical/Supponing Project	Storm Tide Flood Bushfire Severe	Bundaberg Regional Council	Approved	\$0.00	\$130,500.00			50,000.00
64	2223	201011	Town Emergency Warning System	Technical/Supporting Project	Storm Cyclone Flood Bushfire:Severe Storm	Diarmantina Shire Council	Approved		120000		\$0.00	261,000.00
65	2234	201011	Project 2 - Aboriginal Community Resilience Building Project	Technical/Supporting Project	Storm Tide Flood Other Bushfire Sev		76.55	\$3,033.00	\$3,033 50		\$0.00	9,100.00
66	2235		Project 3 - Youth Communication and Resilience Project		ere Storm:Cyclone Storm		Approved	\$5,000.00	\$173,126 00	\$173,126.00	\$390,000 00	741,252 00
67	2236			Technical/Supporting Project	ere Storm Cyclone Storm	Volunteering Queensland Inc	Approved	\$50,000.00	\$97,037.00	\$97,037.00	\$50,000 00	294,074.00
			Project 4 - Emergency Volunieering Ponal Project 5 - Emergency Volunieering Community Workshop	Technical/Supporting Project	Tide:Flood Other Bushlire Severe Storm Cyclone	Volunteering Queensland Inc	Approved	\$50,000 00	\$103,998 50	\$103,998.50	\$0.00	257,997 00
68	2237	201011	Project	Technical/Supporting Project	Tide Flood Other Bushfire Sev ere Storm Cyclone	Volunteering Queensland Inc	Approved	\$45,000.00	\$107,511.50	\$107,511.50	\$2,000 00	262,023 00
69	2238	201011	Project 6 - Natural Disaster Leadership Project	Technical/Supporting Project	Tide Flood Other Bushfire Sev ere Storm Cyclone	Volunteering Queensland Inc	Approved	\$50,000.00	\$106,430 50	\$106,430.50	\$10,000 00	272,861 00
70	2342	201011	Roma Flood Study and Flood Mitigation Project	Technical/Supporting Project	Flood	Maranoa Regional Council	Approved	\$88,333.00	\$88,334 00	\$88,333.00	\$0.00	265,000 00
70							SUBTOTA	NL \$3,543,609.30	\$6,236,122.35	\$6,266,121.35	\$10,985,399.99	\$27,031,252.99
1	2144	201011	Purchase of Equipment for Fraser Coast SES Units	Technical/Supporting Project	Storm Tide:Flood:Bushlire:Severe Storm:Cyclone	Fraser Coast Regional Council	Ineligible	\$9,000.00	\$8,314.50	\$8,314.50	\$0.00	25,629.00
2	2145	201011	Fit out of new multi purpose Community Facility in Burrum Heads	Technical/Supporting Project	Storm Tide:Flood Bushfire:Severe Storm:Cyclone	Fraser Coast Regional Council	Ineligible	\$35,400.00	\$30,000.00	\$30,000.00	50.00	95,400.00
3	2147	201011	Fraser Coast SES Signage Project	Technical/Supporting Project	Storm Tide:Flood:Bushfire:Severe Storm:Cyclone	Fraser Coast Regional Council	Ineligible	\$3,300.00	\$2,215.00	\$2,215.00	\$0.00	7,730.00
4	2162	201011	Wondecla Training & Incident Control Centre	Technical/Supporting Project	Bushlire Cyclone	Wondecta Rural Fire Brigade	Ineligible	\$0.00	\$20,888.00	\$20,888.00	50.00	41,776.00
9	2172	201011	Cookiown SES Volumeers - Prepared and Ready to Respond	Technical/Supporting Project	Storm Tide:Flood:Bushfire:Severe	Cooktown State Emergency Service	Ineligible	\$0.00	\$40,000.00		50 00	80,000,00
6	2173	201011	Bouldercombe Rural Fire Brigade Training Facility	Works/Construction	Other	Bouldercombe Rural Fire Brigade	ineligible	\$0.00	\$40,000.00	\$40,000.00	50.00	
7	2175	201011	Building cross sector pannerships and tools to support and build capacity in volunteer rural fire brigades	Technical/Supporting Project	Other	Reel Caichments Mackay Whitsunday Inc	Ineligible	\$200,000.00	\$147,000.00			80,000 00
8	2180	201011	Mt Gamet SES - New Training and Incident Control Premises	Works/Construction	Other	Mt Gamet SES Unit	Ineligible	\$0.00		\$147,000.00	\$100,000.00	594,000.00
9	2182	201011	Combined Flood Boat Training Centre & SES Proston Station	Works/Construction	Other	Barambah SES Unit			\$69,856.00		\$50,000 00	189,712.00
10	2183	201011	Volunteer Training and Community education Facility. FNQ	Technical/Supporting Project	Storm Tide:Flood:Severe		Ineligible	\$0.00	\$1,300,000.00	- 100000000	\$200,000.00	2,800,000.00
11	2184		Emergency Response Facility		Storm:Cyclone Storm Tide:Flood:Severe	Surr Life Saving Queensland	Ineligible	\$300,000.00	\$45,000.00	\$45,000.00	\$0.00	390,000.00
100	2192			Technical/Supporting Project	Storm Tide Flood Severe	Surf Life Saving Queensland	Ineligible	\$10,000.00	\$16,000.00	\$16,000.00	\$0.00	42,000.00
14		2000	South East Queensland Emergency Operations Support Unit Community meeting training facility and	Technical/Supporting Project	Storm Cyclone Storm	Surl Life Saving Queensland	Ineligible	\$75,000.00	\$37,500,00	\$37,500.00	\$0.00	150,000.00
13	2207	acron.	coordination/communications centre - VMR Midge Pt	Technical/Supporting Project	Tide Flood Bushlire Severe Storm Cyclone Storm	Volunieer Marine Rescue Association Queensland	Ineligible	\$0.00	\$27,500.00	\$27,500,00	\$0.00	55,000.00
14	2208	201011	Community Meeting Training Facility & Coordinatory/Communications Centre - VMR Karumba	Technical/Supporting Project	Tide Flood Bushlire Severe Storm Cyclone	Volumeer Marine Rescue Association Queensland	Ineligible	\$0.00	\$27,500.00	\$27,500.00	\$0.00	55,000.00
15	2220	201011	Training room and communications room for Birdsville Shed	Works/Construction	Other	Diamantina Shire Council	Ineligible	\$11,333.00	\$11,333.50	\$11,333.50	-	

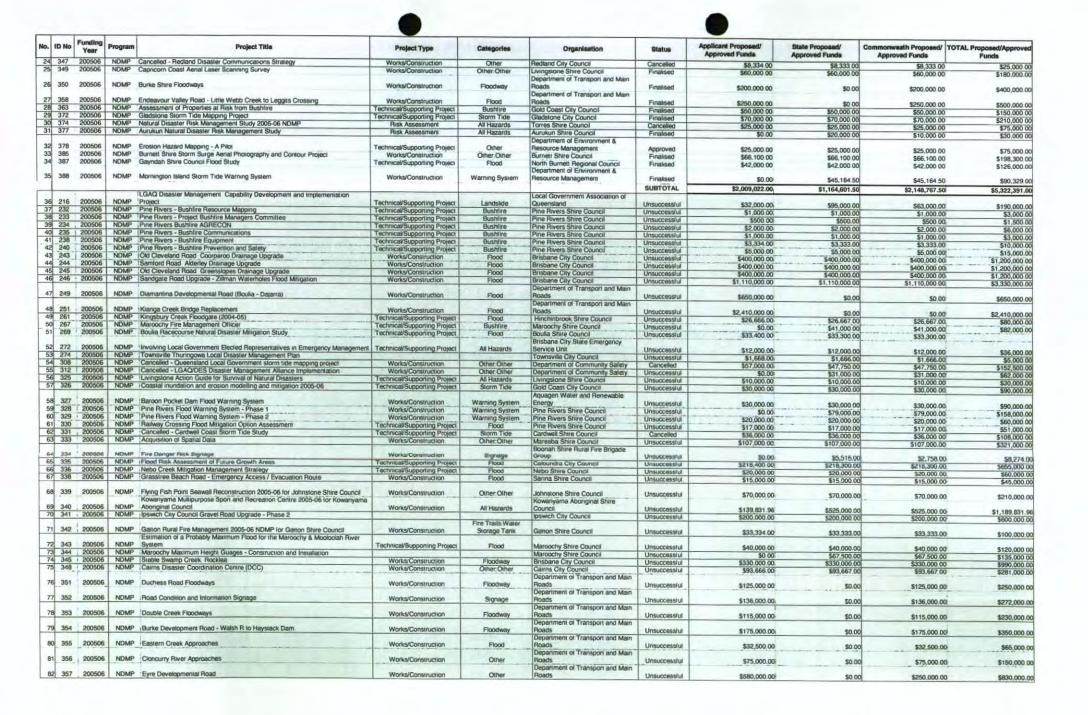
No.	ID Numbe		unding Year	Study Title	Project Type	Categories	Organisation	Status	Applicant Proposed/Approved Funds	State Government Proposed/Approved Funds	Australian Government Proposed/Approved Funds	Other Proposed/Approved Funds	TOTAL Proposed/Approved Funds
16	222	22	201011	Improve volunteer capacity and retention through enhanced	Technical/Supporting Project	Storm Tide:Flood:Bushfire:Severe Storm:Cyclone	Maroochydore Group State Emergency Service Unit	Ineligible	\$0.00	\$5,259 00	\$5,259.00	\$0,00	10,518.0
17	222	26	201011	Construction of mini rail system	Technical/Supporting Project	Flood Severe Storm	Innistal Mins Rail Incorporated	Ineligible	\$30,000.00	\$9,000.00	\$9,000.00	\$0.00	48,000 0
18	22	231	201011	Eyre and King Creek and Floodway Regrading	Works/Construction	Floodway	Diamantina Shire Council	Ineligible	\$0.00	\$3,000,000.00	\$3,000,000.00	\$2,950,000.00	8,950,000.0
19	22	32	201011	Critical Monkira Crossings of Diamantina River	Works/Construction	Other	Diamantina Shire Council	Ineligible	\$0.00	\$350,000.00	\$350,000.00	\$2,806,264.00	3,506,264.0
20	22	233	201011	Brown's Creek Floodway	Works/Construction	Floodway	Diamantina Shire Council	Ineligible	\$0.00	\$51,811.00	\$51,811.00	\$286,103.00	389,725.0
21	21	115	201011	Construction of evacuation and emergency food drop off helipad for Jerona	Works/Construction	Other	Burdekin Shire Council	Unsuccessful	\$8,533.00	\$8,533.50	\$8,533.50	\$10,000.00	35.600.0
22	21	116	201011	Airdmillan Road Crossing	Technical/Supporting Project	Flood:Severe Storm:Cyclone	Burdekin Shire Council	Unsuccessful	\$30,000.00	\$30,000.00	\$30,000 00	\$0.00	90,000 0
23	21	117	201011	Lilliesmere Road Crossing	Technical/Supporting Project	Flood:Severe Storm: Cyclone	Burdekin Shire Council	Unsuccessful	\$40,667.00	\$40,666.50	\$40,668.50	\$0.00	122,000 0
24	21	18	201011	Groper Creek Helipad	Works/Construction	Other	Burdekin Shire Council	Unsuccessful	\$58,334.00	\$58,333.00	\$58,333.00	\$0.00	175,000.0
25	21	119	201011	Beach Road Crossing	Technical/Supporting Project	Flood:Severe Storm: Cyclone	Burdekin Shire Council	Unsuccessful	\$36,667.00	\$36,686.50	\$36,666.50	\$0.00	110,000 0
26	21	120	201011	Nelson's Lagoon Drainage Reach	Works/Construction	Other	Burdekin Shire Council	Unsuccessiul	\$127,667.00	\$127,666.50	\$127,666.50	\$0.00	383,000.0
27	21	121	201011	Town Drainage Reach	Works/Construction	Other	Burdekin Shire Council	Unsuccessful	\$266,567.00	\$266,566.50	\$266,566.50	\$0.00	799,700 0

No.	ID Number	Funding Year	Study Title	Project Type	Categories	Organisation	Status	Applicant Proposed/Approved Funds	State Government Proposed/Approved Funds	Australian Government Proposed/Approved Funds	Other Proposed/Approved Funds	TOTAL Proposed/Approved Funds
28	2124	201011	Purchase and removal of houses in high flood risk areas - Woogaroo Creek 2010-11	Technical/Supporting Project	Flood Severe Storm	Ipswich Rivers Improvement Trust	Unsuccessful	\$550,000.00	\$550,000.00	\$550,000.00	\$0.00	1,650,000.0
29	2136	201011	Extended Whole Diamantina Catchment Studies	Technical/Supporting Project	Flood	Diamantina Shire Council	Unsuccessful	\$0.00	\$85,000.00	\$85,000.00	\$0.00	170,000 0
30	2137	201011	Digital Terrain and Flood Study - Diamantina	Technical/Supporting Project	Flood	Diamantina Shire Council	Unsuccessful	\$0.00	\$119,000.00	\$119,000,00	\$0.00	238,000 0
31	2138	201011	Pohlmans Range Communication Tower	Technical/Supporting Project	Flood:Bushfire:Severe Storm:Cyclone	Somersat Regional Council	Unsuccessful	\$0.00	\$119,000.00	\$119,000.00	\$0.00	236,000.0
32	2140	201011	Cairns C8D South Flood Mitigation Program - Continuation of ID 1825	Technical/Supporting Project	Flood	Caims Regional Council	Unsuccessful	\$300,000.00	\$300,000.00	\$300,000.00	\$0.00	
33	2143	201011	Extend Food Storage - Aurukun Community Store	Technical/Supporting Project	Storm Tide:Flood:Bushfire:Severe	Aurukun Shire Council	Unsuccessful	\$0.00	\$851,515.00	\$851,515.00	\$0.00	1,703,030 0
34	2146	201011	Purchase of a fire fighting water tank and fittings for the Maaroom community	Technical/Supporting Project	Storm:Cyclons Bushfire	Fraser Coast Regional Council	Unsuccessful	\$1,200.00	\$1,200.00	\$1,200.00	\$0.00	
35	2151	201011	Strengthening Volunteer Sector - Community Resilience Program	Technical/Supporting Project	Storm Tide Flood Bushfire Severe	Volunteering North Queensland Inc.	Unsuccessful	\$0.00	\$199,000.00	\$199,000.00		3,600 0
36	2153	1 500	Equipment for Disaster Coordination Centre	Technical/Supporting Project	Storm Cyclone Flood:Bushfire:Severe Storm	Toowoomba Regional Council	Unsuccessful	\$5,000.00	\$7,500.00		\$0.00	-
37	2158	201011	Bradman Avenue Foreshore Flood Miligation	Technical/Supporting Project	Storm Tide-Flood	Sunshine Coast Regional Council	Unsuccessful	\$116,000.00		\$7,500.00	\$0.00	20,000.0
38	2159	201011	Red Cross Vulnerable Communities Resilience Project	Technical/Supporting Project	Storm Tide Flood Bushline Severe	Australian Red Cross			\$116,000.00	\$116,000.00	\$0.00	348,000.0
39	2160	201011	ADRA Emergency Accommodation Volunteer Training Project	Technical/Supporting Project	Storm Cyclone Storm Tide:Flood:Earthquake:Bushlin	Adventist Development and Relief Agency	Unsuccessful	\$0.00	\$1,817,248.50	\$1,817,248.50	\$0.00	3,634,497.0
40	2161		& North QLD VolunieersBuilding Community Resilience		e:Severe Storm	(ADRA) Australia	Unsuccessful	\$0.00	\$15,242.50	\$15,242.50	\$0.00	30,485.0
41			QLD Emergency Accommodation Volunteer Leaders	Technical/Supporting Project	Tide:Flood:Bushlire:Severe Storm Cyclone Storm	FNQ Volunteers Inc	Unsuccessful	\$0.00	\$109,577.50	\$109,577.50	\$0.00	219,155.0
41	2163	201011	Development Project	Technical/Supporting Project	Tide:Flood:Earthquake:Bushlir e:Severe	Adventist Development and Relief Agency (ADRA) Australia	Unsuccessful	\$0.00	\$16,714.00	\$16,714.00	\$0.00	33,428.0
42	2167	201011	Flood Resupply Vehicle Local Response Project - promoting and supporting the	Technical/Supporting Project	Flood	Carpentaria Shire Council	Unsuccessful	\$26,667.00	\$26,666.50	\$26,666.50	\$0.00	80,000 0
43	2171	201011	capacity of local communities through VolunteerAlert and VolunteerConnect	Technical/Supporting Project	Tide:Flood:Other:Bushfire:Severe Storm:Cyclone	Community Information Support Services	Unsuccessful	\$75,314.50	\$334,222.50	\$334,222.50	\$16,747.50	760,507 0
44	2193	201011	Flashing Lights at Flooding Roads Project	Technical/Supporting Project	Storm Tide:Flood:Cyclone	Brisbane City Council	Unsuccessful	\$150,000.00	\$150,000.00	\$150,000.00	\$0.00	450,000 0
45	2202	20101	Mackay Regional Council - Backup Generator for new Depot Building	Technical/Supporting Project	Tide:Flood:Other Bushfire:Severe Storm:Cyclone	Mackay Regional Council	Unsuccessful	\$317,145.00	\$184,904.00	\$184,904.00	\$0.00	686,953.0
46	2205	20101	MBRC Bushland Parks - Bushlire Miligation Project	Technical/Supporting Project	Bushfire	Moreton Bay Regional Council	Unsuccessful	\$141,225.00	\$141,225.00	\$141,225.00	\$0.00	423,675.0
47	2809		Community Resilience Capacity Planning and Coordination	Technical/Supporting Project	Storm Tide:Flood:Bushfire:Severe Storm:Cyclone	Wide Bay Volumeers	Unsuccessful	\$0.00	\$80,000.00	\$60,000.00	\$0.00	120,000 0
48	2216	201011	Sunshine Coasi strengthening volunteer capacity and coordination	Technical/Supporting Project	Storm Tide:Flood:Bushfire:Severe Storm:Cyclone	Volunteering Sunshine Coast	Unsuccessful	\$0.00	\$110,000 00	\$110,000.00	\$0.00	220,000.0
49	2217	201011	Cambroon Bridge Cambroon (Mary River)	Works/Construction	Other	Sunshine Coast Regional Council	Unsuccessful	\$1,300,000.00	\$650,000.00	\$650,000.00	\$0.00	2,600,000.0
50	2224	201011	Raising Community Awareness on Emergency Management Volunteer Recruitment and Retention	Technical/Supporting Project	Storm Tide:Flood:Bushfire:Severe Storm:Cyclone	Volunteering Gold Coast Inc	Unsuccessful	\$0.00	\$451,523.00	\$451,523.00	\$0.00	903,046.0
51	2225	201011	Developing Community Education on Emergency Management Volunteering	Technical/Supporting Project	Storm Tide:Flood:Bushlire:Severe Storm:Cyclone	Volunteering Gold Coast Inc	Unsuccessful	\$0.00	\$240,474.00	\$240,474.00	\$0.00	
52	2226	201011	DDMG Incident Control Centre	Technical/Supporting Project	Storm Tide:Flood:Bushfire:Severe	Queensland Police Service	Unsuccessful	\$12,633.34	\$12,633.33	\$12,633.33	\$0.00	37,900.0
53	2227	201011	Enhancing Community resilience in local high risk areas of coastal Queensland: perspectives from local government and volunieer organisations	Technical/Supporting Project	Storm Cyclone Storm Tide:Flood:Severe Storm:Cyclone	Bond University	Unsuccessful	\$0.00	\$63,662.00	\$63,662.00	\$0.00	127,324.0
54	2229	201011	Georgina Eyre Burke and Hamilton Terrain and Flood Studies	Technical/Supporting Project	Flood	Diamantina Shire Council	Unsuccessiul	\$0.00	\$129,000 00	\$129,000 00	\$0.00	258,000.0
55	2230	201011	Aenal Surveillance During Flood Events	Technical/Supporting Project	Flood	Diamanena Shire Council	Unsuccessful	\$0.00	\$35,000.00	\$35,000.00	\$0.00	
55							SUBTOTAL		\$12,703,917.33	\$12,703,917.33		70,000.0
125							TOTAL	\$7,781,262.14	912,100,317,33	\$12,703,917.33	\$6,419,114.50	\$36,064,602.0

Natural Disaster Mitigation Program All Projects

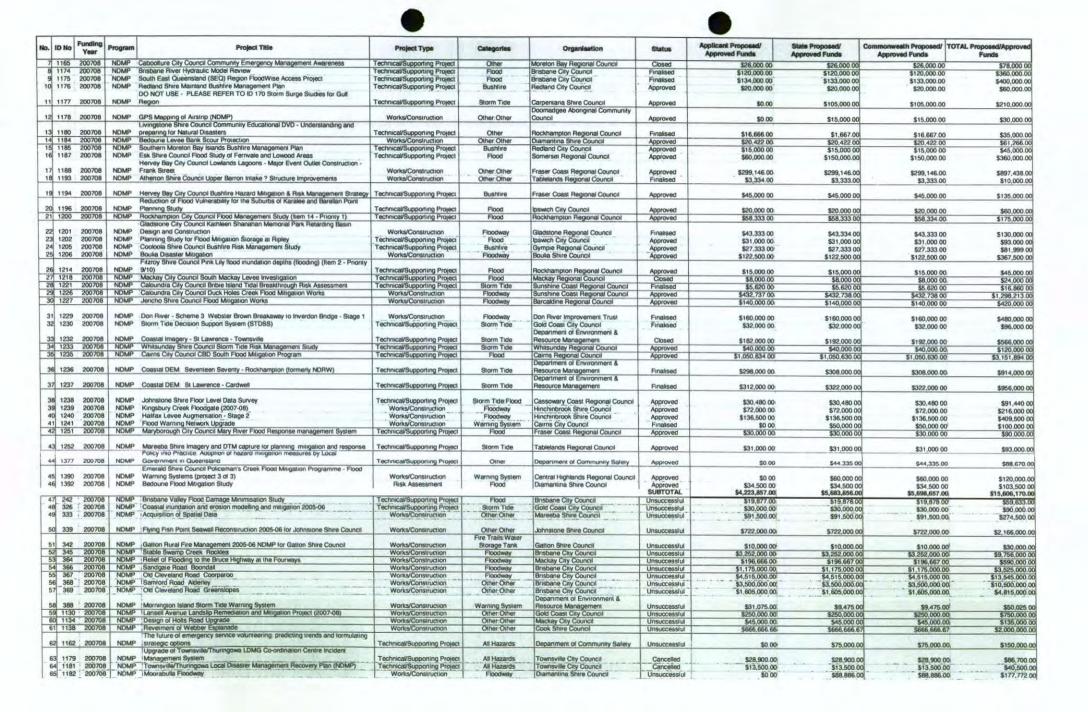
No. ID	No	Funding Year	Program	Project Title	Project Type	Categories	Organisation	Status	Applicant Proposed/ Approved Funds	State Proposed/ Approved Funds	Commonweath Proposed/ Approved Funds	TOTAL Proposed/Approved Funds
		200304	NDMP	Town of Ayr & Lilliesmere Area Flood & Drainage Scheme	Works/Construction	Floodway	Burdekin Shire Council	Approved	\$20,000.00	\$20,000,00	\$20,000.00	#ca aga ag
2 2		200304	NDMP	Decision Support Tool for the provision of Emergency Flood Information	Technical/Supporting Project	Flood	Gold Coast City Council	Finalised	\$26,666.00	\$26,667.00	\$26,667.00	\$60,000.00
		200304	NDMP	Impact of Storm Surge & Riverine Floods	Technical/Supporting Project	Storm Tide Flood	Gold Coast City Council	Finalised	\$15,000.00	\$15,000.00	\$15,000.00	\$80,000.00
4 2	111 .	200304	NDMP	Flood Improvement of Tallebudgera & Currumbin Creeks during floods	Technical/Supporting Project	Flood	Gold Coast City Council	Finalised	\$18,334 00	\$18,333.00		\$45,000.00
5 2	112	200304	NDMP	Enhancement of GIS for Natural Disaster Management	Technical/Supporting Project	Flood	Ipswich City Council	Closed	\$5,000 00			\$55,000.00
6 2	213	200304	NDMP	Preparation of Local Disaster Management Plan	Technical/Supporting Project	Other	Ipswch City Council	Finalised	\$5,000 00	\$5,000.00		\$15,000.00
		200304	NDMP	Ipswich City Council - Gravel Road Upgrade	Technical/Supporting Project	Flood	Ipswich City Council	Finalised		\$5,000 00	\$5,000.00	\$15,000 00
		200304	-	LGAQ Disaster Management Capability Development and Implementation	Technical/Supporting Project	Landslide	Local Government Association of		\$20,000.00	\$20,000 00	327132500	\$60,000.00
	217	200304		Bushfire Building Materials Research	Technical Supporting Project		Queensland	Approved	\$32,000.00	\$95,000.00	\$63,000 00	\$190,000.00
10 2		200304		Cyclone Shelter Program	Technical/Supporting Project Technical/Supporting Project	Bushfire	Department of Public Works	Approved	\$6,667 00	\$0.00	\$3,333 00	\$10,000.00
		200304		Big Coleman River		Cyclone	Department of Public Works Department of Transport and Main	Finalised	\$6,667 00	\$0.00		\$10,000.00
					Works/Construction	Floodway	Roads Department of Transport and Main	Finalised	\$159,000 00	\$0 00	\$159,000 00	\$318,000.00
12 2		200304		Peninsula Development Road (Laura - Coen) at 5 Mile Creek Diamantina Developmental Road (Bedourie - Boulia) at chainage 177km to	Technical/Supporting Project	Flood	Roads Department of Transport and Main	Finalised	\$160,000.00	\$0.00	\$160,000.00	\$320,000.00
13	221	200304	NDMP	185km	Technical/Supporting Project	Flood	Roads Department of Transport and Main	Finalised	\$275,000 00	\$0.00	\$275,000.00	\$550,000.00
14 2	222	200304	NDMP	Eidsvold to Theodore Road (Mt Steel area)	Technical/Supporting Project	Flood	Roads Department of Transport and Main	Finalised	\$149,000.00	\$0.00	\$149,000 00	\$298,000 00
15 2	223	200304	NDMP	Jackson-Wandoan Road (Clark Creek Section)	Technical/Supponing Project	Flood	Roads	Finalised	\$125,000.00	\$0.00	\$125,000 00	\$250,000 00
16	225	200304	NDMP	Blair Gully - Russian Gully flood immunity enhancement	Technical/Supporting Project	Flood	Department of Transport and Main Roads	Finalised	\$245,000.00	\$0.00		\$490,000 00
-	See	-						SUBTOTAL	\$1,268,334.00	\$205,000.00		\$2,766,000.00
17	215	200304	NDMP	Ipswich City Council - Rural Addressing	Works/Construction	Other:Other	Ipswich City Council	Unsuccessful	\$5,000.00	\$5,000.00		
18	224	200304	NDMP	Burnett Highway (Gayndah-Monto)	Works/Construction	Other	Department of Transport and Main Roads	Unsuccessful	\$325,000.00	\$0.00		
			-				177444	SUBTOTAL	\$330,000.00	\$5,000.00		\$650,000.00
								TOTAL			\$330,000.00	\$665,000.00
1 1	212	200405	NDMP	Enhancement of GIS for Natural Disaster Management	Technical/Supporting Project	TOTAL TOTAL	TELEFORE TO THE PERSON OF THE		\$1,598,334.00	\$210,000.00	\$1,622,666.00	\$3,431,000.00
	213	200405	NDMP	Preparation of Local Disaster Management Plan		Flood	Ipswich City Council	Closed	\$15,000.00	\$15,000.00	\$15,000.00	\$45,000.00
	214	200405	NDMP	Ipswich City Council - Gravel Road Upgrade	Technical/Supporting Project	Other	Ipswich City Council	Finalised	The second second second	\$5,000.00	\$5,000.00	\$10,000 00
				LGAQ Disaster Management Capability Development and Implementation	Technical/Supporting Project	Flood	Ipswich City Council Local Government Association of	Finalised	\$180,000.00	\$180,000.00	\$180,000.00	\$540,000 00
	216	200405	NDMP	Project	Technical/Supporting Project	Landslide	Queensland	Approved	\$32,000.00	\$95,000.00	\$63,000.00	\$190,000.00
		200405	NDMP	Bushfire Building Materials Research	Technical/Supporting Project	Bushfire	Department of Public Works	Approved	\$86,667.00	\$0.00		\$130,000.00
6	218	200405		Cyclone Sheller Program	Technical/Supporting Project	Cyclone	Department of Public Works	Finalised	\$60,000 00	\$0.00		\$130,000.00
7	226	200405	NDMP	Toowoomba Escarpment Bushfire Risk Mitigation Project	Technical/Supporting Project	Bushlire	Toowoomba Regional Council	Finalised	\$242,000.00	\$240,000.00		
8	227	200405	NDMP	Alpha Town Flood Mitigation Study Cabooliure City Council South East Queensland Disaster Communications	Technical/Supporting Project	Flood	Jericho Shire Council	Finalised	\$23,334.00	\$23,333.00		
10	228 230	200405 200405		Project. Promoting Safe Sustainable Communities Flood Forecasting System for Ipswich Bowen Shire Council Molongle Creek Drainage Calchment Flood Study 2004-05	Works/Construction Technical/Supporting Project	Other:Other Flood	Moreton Bay Regional Council Ipswich City Council	Cancelled Closed	\$141,000 00 \$20,000 00	\$89,000 00 \$20,000 00		\$279,000 00 \$60,000 00
	231	200405	NDMP	NDMP	Technical/Supporting Project	Flood	Whitsunday Regional Council	Approved	\$30,000.00	\$30,000.00	\$30,000 00.	\$90,000 00
12		200405		Pine Rivers - Bushfire Resource Mapping	Technical/Supporting Project	Bushfire	Pine Rivers Shire Council	Closed	\$5,000.00	\$5,000.00		\$15,000 00
13		200405			Technical/Supporting Project	Bushfire	Pine Rivers Shire Council	Closed	\$2,000 00	52,000 00		
14		200405		Pine Rivers - Bushlire Breaks	Works/Construction	Fire Trails	Pine Rivers Shire Council	Closed	\$33,336,00	\$33.332.00		\$100,000.00
15		200405		Pine Rivers Shire Council - Mt Neoo evacuation area and warning siren	Works/Construction	Warning System	Moreton Bay Regional Council	Closed	\$3,334.00	\$3,333.00		\$10,000.00
	239	200405		Pine Rivers - Bushfire Smart	Technical/Supporting Project	Bushiire	Pine Rivers Shire Council	Finalised	\$5,000.00	\$5,000.00		
	241	200405		Pine Rivers - Bushfire Signage	Technical/Supporting Project	Bushfire	Pine Rivers Shire Council	Finalised	\$666.00	\$667.00		
18		200405	NDMP	Brisbane Valley Flood Damage Minimisation Study	Technical/Supporting Project	Flood	Brisbane City Council	Closed	\$98,500.00	\$98,500 00		
	247 248	200405 200405	NDMP NDMP	Extreme Flood Event Modelling of the Pine River and Hays Inlet Catchment Terrors Creek Flood Mitigation Project	Technical/Supporting Project Technical/Supporting Project	Flood Flood	Pine Rivers Shire Council Pine Rivers Shire Council	Finalised	\$35,000 00 \$13,334 00	\$35,000 00 \$13,333 00	\$35,000.00	\$105,000.00
21	249	200405	NDMP	Diamantina Developmental Road (Boulia - Dajarra)	Works/Construction	Flood	Department of Transport and Main Roads	Finalised	\$100,000 00	\$0.00	09430038233-0	12345-1351
22	250	200405	NDMP	May Creek Approaches	Works/Construction	Flood	Department of Transport and Main Roads	Finalised	\$123,000 00	3,47.0		-
23	251	200405	10000	Kianga Creek Bridge Replacement	Works/Construction	Flood	Department of Transport and Main Roads	Finalised		\$0.00		
	252	200405		Nonh Old Strategy Report into a Natural Disaster Mitigation Program			Department of Transport and Main		\$0.00	\$0.00		
	- 1	-30	100000		Risk Assessmeni	Other	Poads Department of Transport and Main	Approved	\$80,000.00	\$0.00	\$40,000.00	\$120,000.00
	253	200405	300	Burke Developmental Road - Trimbles Crossing to Whip Handle	Works/Construction	Flood	Poads Department of Transport and Main	Finalised	\$250,000 00	\$0.00		
	254	200405		Gilben River Culverts	Works/Construction	Flood	Roads Department of Transport and Main	Finalised	\$150,000 00	\$0.00	\$150,000.00	\$300,000.00
	255	200405		Peninsula Developmental Road (Laura-Coen) 10 Mile Creek	Works/Construction	Flood	Roads Department of Transport and Main	Finalised	\$250,000.00	\$0.00	\$250,000.00	\$500,000.00
28	256	200405	NDMP	Wesiern Road Condition Signage	Works/Construction	Other Other	Roads Department of Transport and Main	Finalised	\$151,000.00	\$0.00	\$151,000 00	\$302,000.00
29	257	200405	NDMP	Peninsula Developmental Road (Laura-Coen) at Carroll Creek	Works/Construction	Flood	Roads Department of Transport and Main	Finalised	\$125,000 00	\$0.00	\$125,000.00	\$250,000.00
30	258	200405	NDMP	Southern Cross Floodway	Works/Construction	Flood	Roads	Finalised	\$95,000 00	\$0.00	\$95,000.00	\$190,000.00
31	259	200405	NDMP	Peninsula Developmental Road (Laura-Coen) Unnamed Creek (Ch149.6 km)	Works/Construction	Flood	Department of Transport and Main Roads	Finalised	\$125,000 00	\$0.00	\$125,000.00	\$250,000.00
32	260	200405	NDMP	Peninsula Developmental Road (Laura - Coen) Red Blanket Creek	Works/Construction	Flood	Department of Transport and Main Roads	Finalised	\$62,500.00	\$0.00	\$62,500.00	\$125,000.00

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No. ID I	Ye Ye	ear	rogram	Project Title	Project Type	Categories	Organisation	Status	Applicant Proposed/ Approved Funds	State Proposed/ Approved Funds	Approved Funds	TOTAL Proposed/Approved Funds
33 26	32 200	0405		Fire Management Plans in Noosa Shire Council coastal bushland reserves Diamantina Developmental Road 93B between Quilpie and Windorah Flood	Technical/Supporting Project	Bushfire	Noosa Shire Council	Finalised	\$21,666.00	\$21,667.00	\$21,667.00	\$65,000.00
34 26	3 200	1405		Mitigation	Works/Construction	Flood	Department of Transport and Main Roads	Finalised	\$250,000.00	\$0.00	\$250,000 00	#### #### ############################
34 26 35 26				Athenon Tablelands Wildlire Mitigation Project	Technical/Supporting Project	Bushire	Atherion Shire Council	Finalised	\$55,457.00	\$55,457.00		
36 26	5 200	0405	NDMP	Maroochy Flood Mitigation Warning System	Works/Construction	Warning System	Maroochy Shire Council	Finalised	\$0.00	\$62,500.00		
	66 200			Maroochy Flood Mitigation Software	Technical/Supporting Project	Flood	Maroochy Shire Council	Finalised	\$8,334.00	\$8,333.00		\$25,000.0
38 26 39 27	88 200			Maroochy Shire Council Flood Mitigation Study Erosion of Burke River Bank	Technical/Supporting Project Risk Assessment	Flood	Sunshine Coast Regional Council	Finalised	\$13,334.00	\$13,333.00		
40 27				Upgrade of Special Needs Evacuation Centre for Townsville and Thuringowa	Risk Treatment	Flood Other	Boulia Shire Council Townsville City Council	Approved Closed	\$40,000.00 \$30,070.00	\$40,000.00 \$30,070.00		\$120,000.00
41 28		0405		Local Government Storm Tide Mapping Project	Technical/Supporting Project	Storm Tide	Department of Community Safety	Approved	\$57,000.00	\$52,750.00		\$90,210.00
				Review of practices and outcomes of the Natural Disaster Risk Management					437,000.00	401,700.00	GDE.750.01	\$102,000 0
42 30				Studies Program	Works/Construction	Other Other	Department of Community Safety	Approved	\$0.00	\$45,000 00	\$45,000 0	\$90,000.00
43 30				Engaging and Supporting Indigneous Communities in Natural Disaster Mitigation Disaster management community portal	Works/Construction Technical/Supporting Project	Other Other	Department of Community Safety Department of Community Safety	Approved Approved	\$0.00 \$0.00	\$100,000.00 \$100,000.00	\$50,000.0	\$150,000.0
AEL 21	15 200	DADE	NDMP	Ipswich City Council - Rural Addressing	Works/Construction	Other Other	Ipswich City Council	SUBTOTAL	\$3,013,532.00	\$1,402,608.00		
75, 21	15 200	0405	IACINI	powert ony council - Italia Addressing	WORSCOISTBEIDT	Other Other	Department of Transport and Main	Unsuccessful	\$20,000.00	\$20,000.00	\$20,000.0	\$60,000.0
46 22		0405	NDMP	Burnett Highway (Gayndah-Monto)	Works/Construction	Other	Roads	Unsuccessful	\$434,000.00	\$0.00	\$216,000.0	\$650,000.00
47 23		0405	NDMP	Pine Rivers - Project Bushfire Managers Committee	Technical/Supporting Project	Bushlire	Pine Rivers Shire Council	Unsuccessful	\$500.00	\$500.00		
48 23				Pine Rivers - Bushfire Communications	Technical/Supporting Project	Bushfire	Pine Rivers Shire Council	Unsuccessful	\$5,000.00	\$5,000.00		\$15,000.0
	36 200			Pine Rivers - Bushfire Breaks	Works/Construction	Fire Traits	Pine Rivers Shire Council	Unsuccessful	\$33,334.00	\$33,333.00		
50 23				Pine Rivers - Bushfire Breaks Pine Rivers - Bushfire Equipment	Works/Construction Technical/Supporting Project	Fire Traits Bushlire	Pine Rivers Shire Council Pine Rivers Shire Council	Unsuccessful Unsuccessful	\$33,334.00	\$33,333.00		
52 24				Pine Rivers - Bushfire Prevention and Salety	Technical/Supporting Project	Bushlire	Pine Rivers Shire Council	Unsuccessiul	\$5,000.00° \$5,000.00	\$5,000.00 \$5,000.00		
	43 200	0405		1Old Cleveland Road Coorparoo Drainage Upgrade	Works/Construction	Flood	Brisbane City Council	Unsuccessful	\$70,000.00	\$70,000.00		
	44 20	0405	NDMP	Samford Road Alderley Drainage Upgrade	Works/Construction	Flood	Brisbane City Council	Unsuccessful	\$70,000.00	\$70,000.00		
	45 20	0405	NDMP	Old Cleveland Road Greenslopes Drainage Upgrade	Works/Construction	Filod	Brisbane City Council	Unsuccessful	\$70,000.00	\$70,000.00		
56 2	46 20	0405	NDMP	Sandgate Road Upgrade - Zillman Waterholes Flood Mitigation	Works/Construction	Flood	Brisbane City Council	Unsuccessful	\$70,000.00	\$70,000.00		
57 2	61 20		NDMP	Kingsbury Creek Floodgate (2004-05)	Technical/Supporting Project	Flood	Hinchinbrook Shire Council	Unsuccessful	\$13,334.00	\$13,333.00		
	67 20			Maroochy Fire Management Officer	Technical/Supporting Project	Bushfire	Maroochy Shire Council	Unsuccessful	\$0.00	\$37,500.00		
59 2	69 20	0405		Boulia Racecourse Natural Disaster Mitigation Study	Technical/Supporting Project	Flood	Boulia Shire Council	Unsuccessful	\$20,000.00	\$20,000.00		\$60,000.00
60 2	71 20	0405	NDMP	Pioneer Promenade - Stage 2	Technical/Supporting Project	Flood	Mackay City Council	Unsuccessful	\$2,150,000.00;	\$275,000.00	\$275,000.0	\$2,700,000.00
	70 00	MADE	sims in	Involved Land Communical Elizabet Descriptions in Figure Management	Technical Consession Protect	*********	Brisbane City State Emergency	*************	24 44 44	41 11 11		
	72 20	00405		Involving Local Government Elected Representatives in Emergency Management Townsville Thuringowa Local Disaster Management Plan	Technical/Supporting Project	All Hazards	Service Unit	Unsuccessful	\$8,000.00	\$8,000.00		
	275 20			Torres Strait Flood and Erosion Mitigation Plan	Technical/Supporting Project	Flood	Townsville City Council	Unsuccessful	\$6,668.00	\$6,666.00		
3 60	75 20	10-105	NOW	Torres Strait Flood and Crosion Mingaron Flan	recrinicar supporting Project	riouu	Island Coordinating Council Department of Transport and Main	Unsuccessful	\$300,000.00	\$0.00	\$200,000.0	\$500,000.00
64 2	276 20	00405	NDMP	Burnett Highway (Gaynday - Monto)			Roads	Unsuccessful	\$434,000.00	\$0.00	\$216,000.0	**************************************
		00405		Nunkulla Road Floodway	Works/Construction	Floodway	Cambooya Shire Council	Unsuccessful	\$14,200.00	\$14,200.00		
66 2	278 20	00405		i Hodgson Creek (Kearney Street) Flood Mitigation	Works/Construction	Floodway	Cambooya Shire Council	Unsuccessful	\$31,134,00	\$31,133.0		
67 2	279 20	00405		Cudmore Road Floodway	Works/Construction	Floodway	Cambooya Shire Council	Unsuccessful	\$23,166.00	\$23,167.0	\$23,167.0	
68 3	302 20	00405	NDMP	Cancelled - Development of Queensland?s Hazard and Risk Assessment Process	Works/Construction	Other: Other	Department of Community Safety	Cancelled	\$0.00	\$0.0		
		20105	NIDA ID	Assisting Queensland?s Local Governments to complete their studies and	W-1-10	Other Other			Market 200 cm	2200000	A STATE OF THE PARTY OF THE PAR	
	307 20	00405		integrate the outcomes Cancelled - Queensland Local Government storm tide mapping project	Works/Construction Works/Construction	Other: Other Other: Other	Department of Community Safety	Unsuccessful	\$200,000.00	\$200,000.0		
70 3	300 20	00405	NUME	Cancelled - Queensland cocar Government storm rule mapping project	Works Construction	Other Other	Department of Community Safety	Cancelled	\$57,000.00	\$47,750.0	\$47,750.0	0 \$152,500.0
71 3	309 20	00405	NDMP	development	Works/Construction	Other:Other	Department of Community Safety	Cancelled	\$0.00	\$40,000.0	500 000 0	
72 3		00405		Cancelled - Queensland?s Natural Disaster Mitigation Strategy	Works/Construction	Other: Other	Department of Community Salety	Cancelled	\$0.00	\$40,000.0		
73 3	312 20	00405	NDMP	Cancelled - LGAQ/DES Disaster Management Alliance Implementation	Works/Construction	Other: Other	Department of Community Safety	Cancelled	\$0.00	\$54,600.0		
							and the same of th	SUBTOTAL	\$4,073,670.00	\$1,193,515.0		
								TOTAL	\$7,087,202.00	\$2,596,123.0	0 \$5,300,956.0	0 \$14,984,281.0
1 2		00506		Town of Ayr & Lifliesmere Area Flood & Drainage Scheme	Works/Construction	Floodway	Burdekin Shire Council	Approved	\$78,667.00	\$78,667.0		0 \$236,000.0
2 2		00506	NDMP	Decision Support Tool for the provision of Emergency Flood Information	Technical/Supporting Project	Flood	Gold Coast City Council	Finalised	\$13,334.00	\$13,333.0		
		00506	NDMP NDMP	Impact of Storm Surge & Riverine Floods Flood Improvement of Tallebudgera & Currumbin Creeks during Iloods	Technical/Supporting Project	Storm Tide Flood Flood	Gold Coast City Council	Finalised	\$11,666.00	\$11,667.0		
		00506	NDMP	Bushfire Building Materials Research	Technical/Supporting Project Technical/Supporting Project	Bushlire	Gold Coast City Council Department of Public Works	Finalised Approved	\$15,000 00 \$13,333 00	\$15,000.0		
		00506	NDMP		Technical/Supporting Project	Bushlire	Toowoomba Regional Council	Finalised	\$110,000.00	\$0.0 \$110,000.0		
		00506	NDMP	Alpha Town Flood Mitigation Study	Technical/Supporting Project	Flood	Jericho Shire Council	Finalised	\$46,666.00	\$46,667.0		
				Caboolture City Council South East Queensland Disaster Communications					7.0,000,00	4.0,00.0	510,007	\$140,000.0
8 2	228 20	00405		Project: Promoting Safe Sustainable Communities	Works/Construction	Other:Other	Moreton Bay Regional Council	Cancelled	\$0.00	\$69,000 0	0 \$69,000 (0 \$138,000 0
9 2				Pine Rivers - Bushfire Sman	Technical/Supporting Project	Bushfire	Pine Rivers Shire Council	Finalised	\$5,000.00	\$5,000 0	0 \$5,000.0	
10 2				Pine Rivers - Bushfire Signage	Technical/Supporting Project	Bushfire	Pine Rivers Shire Council	Finalised	\$666.00	\$667.0		0 \$2,000.0
11 2	242 20	00506	NDMP	Brisbane Valley Flood Damage Minimisation Study	Technical/Supporting Project	Flood	Brisbane City Council	Closed	\$78,623.00	\$78,622.0		
12 2		00506		Extreme Flood Event Modelling of the Pine River and Hays Inlet Catchment	Technical/Supporting Project	Flood	Pine Rivers Shire Council	Finalised	\$33,333.00	\$33,333.0		
13 2	248 20	00506	NDMP	Terrors Creek Flood Mitigation Project	Technical/Supporting Project	Flood	Pine Rivers Shire Council Department of Transport and Main	Finalised	\$20,000 00	\$20,000.0	\$20,000	\$60,000.0
14	257 20	00506	NDMP	Peninsula Developmental Road (Laura-Coen) at Carroll Creek	Works/Construction	Flood	Roads Department of Transport and Main	Finalised	\$125,000 00	\$0.0	\$125,000.0	\$250,000 0
15	260 20	00506	NDMP	Peninsula Developmental Road (Laura - Coen) Red Blanket Creek Diamanting Developmental Road 938 between Quilple and Windorah Flood	Works/Construction	Flood	Roads Department of Transport and Main	Finalised	\$162,500.00	\$0.0	\$162,500.6	0 \$325,000.0
16	263 20	00506	NDMP	Miligation	Works/Construction	Flood	Roads	Finalised	\$250,000.00	\$0.0	\$250,000	\$500,000.0
17 2		00506		Atherton Tablelands Wildfire Miligation Project	Technical/Supporting Project	Bushfire	Athenon Shire Council	Finalised	\$8,359.00	\$8,359 0		
18	270 2	00506	NDMP	Erosion of Burke River Bank	Risk Assessment	Flood	Boulia Shire Council	Approved	\$36,668.00	\$36,666.0	\$36,666.0	
19	323 2	00506	NDMP	'Arno Crossing	Works/Construction	Floodway	Isisford Shire Council	Closed	\$82,773.00	\$82,773.0	\$82,773.0	90 \$248,319.0
20	324 2	00506	NDMP	Weipa Natural Disaster Risk Management Study	Risk Assessment	All Hazards	Weipa Town Authority	Closed	\$10,000 00	\$10,000.0	\$10,000.	90 \$30,000.0
				Control Chica Control Classic and Charge Duran Investment District	T	Donal	C	Forter.	********		4200000	
4.	332 2	00506	NDMP	Cardwell Shire Council Flood and Storm Surge Inundation Study Sarina Shire Council Shelter Building Upgrade	Technical/Supporting Project	Flood	Cassowary Coast Regional Council Mackay Regional Council	Finalised	\$81,000.00	\$103,250 (
21	999 0			carrier come Council cherer politimity updrate	Works/Construction	Shelter	Redland City Council	Finalised	\$15,000.00 \$15,000.00	\$15,000.0 \$15,000.0	00 \$15,000. 00 \$15,000.	00 \$45,000.0 00 \$45,000.0
21 22 23		00506	NDMP	Redland Shire Community Readiness Plan and Communications Strategy	Technical/Supporting Project	Other		Finalised				



o. IDI	No	Year Year	Program	Project Title	Project Type	Categories	Organisation	Status	Applicant Proposed/ Approved Funds	State Proposed/ Approved Funds	Commonwealth Proposed/ Approved Funds	TOTAL Proposed/Approve Funds
83 35	59	200506	NDMP	Peninsula Developmental Road - Fairview Jumpup	Works/Construction	Floodway	Department of Transport and Main Roads	Unsuccessful	\$250,000.00	\$0.00	\$250,000.00	\$500,000.0
36	60	200506	NOMP	Diamond Floodway	Works/Construction	Floodway	Department of Transport and Main Roads	Unsuccessiul	\$150,000.00	\$0.00	\$75,000.00	
5 36	61	200506	NDMP	Hay Point Road	Works/Construction	Floodway	Department of Transport and Main Roads	Unsuccessful	\$225,000.00	\$0.00		- 11 37 37 65 0
6 20	00	200506	MONE	Many Peaks to Dawes Range		Palalina and	Department of Transport and Main			30,00	\$225,000.00	\$450,000.0
			NDMP	Relief of Flooding to the Bruce Highway at the Fourways	Works/Construction Works/Construction	Floodway	Roads Mackay City Council	Unsuccessful	\$200,000.00 \$941,334.00	\$0.00	\$200,000.00	
							Queensland Fire & Rescue Services		3941,334.00	\$941,333.00	\$941,333.00	\$2,824,000.0
		200506	NDMP	Combined Regional Emergency Services Technology Sandgare Road Boondali	Works/Construction Works/Construction	Other: Other Floodway	- DO NOT USE Brisbane City Council	Unsuccessful Unsuccessful	\$0.00	\$0.00		\$0.0
0 36	67	200506	NDMP	Old Cleveland Road Coorparoo	Works/Construction	Floodway	Brisbane City Council	Unsuccessful	\$75,000.00 \$75,000.00	\$75,000.00 \$75,000.00	\$75,000.00 \$75,000.00	
		200506	NDMP	Samford Road Alderley Old Cleveland Road Greenslopes	Works/Construction	Other Other	Brisbane City Council	Unsuccessful	\$75,000.00	\$75,000.00	\$75,000.00	
3 37	70	200506	NDMP	Brisbane River Flood Decision Support System 2005-06	Works/Construction Technical/Supporting Project	Other Other Flood	Brisbane City Council Brisbane City Council	Unsuccessful Unsuccessful	\$75,000.00 \$50,000.00	\$75,000.00		
4 37	71	200506	NDMP	SEQ Integrated Disaster Management Suite	Works/Construction	Other:Other	Brisbane City Council	Unsuccessful	\$18,000.00	\$50,000.00 \$18,000.00	\$50,000.00 \$18,000.00	\$150,000 \$54,000
5 37	73	200506	NDMP	McKinlay Shire Disaster Management Plan Upgrade Feasibility Study into Developing a Wind Sensor Network for Warning and	Technical/Supporting Project	All Hazards	McKinlay Shire Council	Unsuccessful	\$2,500.00	\$2,500.00	\$2,500.00	
6 37	76	200506	NDMP	Mitigation Purposes	The state of the s		Bureau of Meteorology	Ineligible	\$0.00	#24 6F0 00	ED1 050 00	1,111
	- 1						Department of Environment &	mengiole	\$0.00	\$21,650.00	\$21,650.00	\$43,300
7 37	79	200506	NDMP	Old Storm Tide Studies Data Compilation Project	Technical/Supporting Project	Storm Tide	Resource Management	Unsuccessful	\$30,000.00	\$0.00	\$30,000.00	\$60,000
8 38	180	200506	NDMP	Storm Tide Inundation Modelling and Mapping Review	Technical/Supporting Project	Storm Tide	Department of Environment & Resource Management	Unsuccessful	\$50,000.00	***		212020
99 38		200506	NDMP	Natural Disaster Community Awareness & Readiness Measures Project	Works/Construction	Other:Other	Warwick Group Rural Fire Service	Unsuccessful	\$0.00	\$120,000.00		
				Clyde Road Flood Management Plan Chinaman Creek Flood Investigation	Technical/Supporting Project	Flood	Cairns City Council	Unsuccessful	\$10,000.00	\$10,000.00		
2 3	84	200506	NDMP	Nogoa River Floodplain Approved Development Case	Technical/Supporting Project Technical/Supporting Project	Flood Flood	Cairns City Council Nogoa River Flood Plain Board	Unsuccessful	\$66,668.00	\$66,666.00		\$200,000
	100		7			1000	Whitsunday Rivers Improvement	Unsuccessful	\$18,000.00	\$18,000.00	\$18,000.00	\$54,000
3	337	200506	NOMP	O'Connell River at Vickers River Bank Stabilisation Project Jericho Shire Council Flood Mitigation Works	Works/Construction	Floodway	Trust	Unsuccessful	\$52,966.00	\$52,967.00	\$52,967.00	\$158,900
12	123	200000	HUMP	Jenicho anne Council Placo Miligation Works	Works/Construction	Floodway	Barcaldine Regional Council	SUBTOTAL	\$70,000.00	\$70,000.00	\$70,000.00	
								TOTAL	\$10,628,767.96 \$12,637,789.96	\$6,229,648.00 \$7,394,249.50	\$7,933,390.00	
	20.0			LGAQ Disaster Management Capability Development and Implementation	Control of the contro		Local Government Association of	101111	\$18,097,102,30	31,334,243,30	\$10,082,157.50	\$30,014,196
		200607		Project Toowoomba Escarpment Bushfire Risk Mitigation Project	Technical/Supporting Project	Landslide	Queensland	Approved	\$32,000.00	\$110,000.00		\$220,000
3 2	280	200607	NDMP	Local Government Storm Tide Mapping Project	Technical/Supporting Project Technical/Supporting Project	Bushlire Storm Tide	Toowoomba Regional Council Department of Community Safety	Finalised Approved	\$130,000.00	\$130,000.00		
		1000				Didnii ride	Department of Community Safety	Approved	\$57,000.00	\$47,750.00	\$47,750.00	\$152,500.
		200607		Cardwell Shire Council Flood and Storm Surge Inundation Study	Technical/Supporting Project	Flood	Cassowary Coast Regional Council Kowanyama Aboriginal Shire	Finalised	\$30,200.00	\$30,200.00	\$30,200 00	\$90,600
	712	200607	NDMP	Kowanyama Multipurpose Sport and Recreation Centre 2006-07 NDMP	Works/Construction	Other	Council	Approved	\$0.00	\$160,563.00	\$160,563.00	\$321,126
	722	200607	NOMP	CANCELLED - Thargomindah Flood Study Raising of (4) Low-Set Council Owned Residential Houses	Technical/Supporting Project	Flood	Bulloo Shire Council	Cancelled	\$42,667.00	\$42,667 00		\$128,001
	733	200607		Cabooliure Shire Natural Disaster Risk Management Study 2006-07	Risk Assessment	All Hazards	BOIGU ISLAND COUNCIL Caboolture Shire Council	Finalised Finalised	\$40,000 00 \$18,000 00	\$132,000.00		
9 7	740	200607	NDMP	Hinchinbrook All Hazards Disaster Risk Management Study	Technical/Supporting Project	Other	Hinchinbrook Shire Council	Finalised	\$13,333.00	\$18,000 00 \$13,333 00		
0 7	747	200607	NDMP	Bloomfield River Suspension Bridge	Works/Construction	Other	Wujal Wujal Aboriginal Shire		NAME OF STREET	100000		
11 7	759	200607	NDMP	North Stradbroke Island Fire Break Report	Risk Assessment	Bushfire	Council Redland City Council	Approved Finalised	\$682,000.00 \$20,000.00	\$379,300.00		
12 7		200607	NDMP	Pine Rivers Shire Council - Emergency warning system to Mt Nebo Village	Works/Construction	Warning System	Moreton Bay Regional Council	Finalised	\$25,333.00	\$20,000.00 \$25,333.00	\$20,000.00 \$25,334.00	
3 7		200607	NDMP	Flood Assessmeni Data for Burnett Shire Thunngowa City Council All Hazards Risk Management Study	Technical/Supporting Project	Flood	Burnett Shire Council	Closed	\$82,667.00	\$82,667.00		
"	/69	200007		The state of the s	Technical/Supporting Project	Other	Townsville City Council	Approved	\$59,000 00	\$59,000.00	\$59,000.00	\$177,000
	791 795	200607 200607	NDMP	Johnstone Shire Council Storm Tide Study Atherion Shire Council FNO Wildline Mitigation Project	Technical/Supponing Project Technical/Supponing Project	Storm Tide	Cassowary Coast Regional Council	Finalised	\$55,000 00	\$112,500.00		
17 7				Gladsione City Council BUSHFIRE HAZARD RISK MITIGATION & MAINTANCE INVESTIGATION PROJECT		Other	Tablelands Regional Council	Finalised	\$120,000 00	\$120,000 00	\$120,000 00	\$360,000
1 /		200607	NDMP	Jondaryan Shire Council Natural Disaster Risk Management Study 2006-07	Technical/Supporting Project	Bushfire	Gladstone Regional Council	Finalised	\$80,000 00	\$80,000.00	\$80,000 00	\$240,000
1 -		200607	NDMP	Maryborough City Council Mary River Flood Mitigation Study	Technical/Supporting Project	Other	Toowoomba Regional Council	Finalised	\$15,000.00	\$15,000.00		
									\$38,334.00	\$38,334.00	\$38,334.00	\$115,002
		200607	NDMP		Technical/Supporting Project	Flood	Fraser Coast Regional Council	Approved	400,004.00	400,004,00		
9 8	903			Indigenous Community Mapping Project	Technical/Supporting Project Technical/Supporting Project	Storm Tide	Department of Environment & Resource Management	Approved	\$30,000 00	\$325,000 00	\$325,000.00	\$680,000
19 8	903 909	200607		Indigenous Community Mapping Project Cabooliure Shire Council topographic information collection for storm tide and flood inundation mapping			Department of Environment &					
19 8 20 8 21 8	903 809 814	200607 200607 200607	NDMP	Indigenous Community Mapping Project Cabbollure Shire Council topographic information collection for storm tide and lood inundation mapping Livingsione Shire Council Professional assessment and updrade of Emercency	Technical/Supporting Project Technical/Supporting Project	Storm Tide Storm Tide	Department of Environment & Resource Management Moreton Bay Regional Council	Approved Approved	\$30,000 00 \$150,000 00	\$325,000 00 \$150,000 00	\$150,000.00	\$450,000
9 8 20 8 21 8 22 8 23 8	903 909 814 819 833	200607 200607 200607 200607 200607	NDMP NDMP NDMP	Indigenous Community Mapping Project Caboollure Shire Council topographic information collection for storm tide and flood inundation mapping Livingsione Shire Council Professional assessment and upgrade of Emergency Evacuation/Shetter Buildings Cook Shire Storm Tide Mapping Project	Technical/Supporting Project Technical/Supporting Project Works/Construction	Storm Tide	Department of Environment & Resource Management Moreton Bay Regional Council Rockhampton Regional Council	Approved Approved Closed	\$30,000 00 \$150,000 00 \$37,751 00	\$325,000 00 \$150,000 00 \$37,751 00	\$150,000 00	\$450,000
9 8 0 8 21 8 22 8 23 8 24 8	803 809 814 819 833 843	200607 200607 200607 200607 200607 200607	NDMP NDMP NDMP NDMP	Indigenous Community Mapping Project Cabbollure Shire Council topographic information collection for storm tide and flood inundation mapping Livingsione Shire Council Professional assessment and upgrade of Emergency Evacuation/Shetter Buildings Cook Shire Storm Tide Mapping Project Daity Town Council Flood Mitigation Project	Technical/Supporting Project Technical/Supporting Project Works/Construction Technical/Supporting Project Technical/Supporting Project	Storm Tide Storm Tide Shelter Storm Tide Flood	Department of Environment & Resource Management Moreton Bay Regional Council Rockhampton Regional Council Cook Shire Council Western Downs Regional Council	Approved Approved	\$30,000 00 \$150,000 00 \$37,751 00 \$26,670 00	\$325,000 00 \$150,000 00 \$37,751 00 \$26,670 00	\$150,000 00 \$37,751,00 \$26,670.00	\$450,000 \$113,253 \$80,010
9 8 20 8 21 8 22 8 23 8 24 8	803 809 814 819 833 843	200607 200607 200607 200607 200607	NDMP NDMP NDMP NDMP	Indigenous Community Mapping Project Caboollure Shire Council topographic information collection for storm tide and flood inundation mapping Livingsione Shire Council Professional assessment and upgrade of Emergency Evacuation/Shetter Buildings Cook Shire Storm Tide Mapping Project	Technical/Supporting Project Technical/Supporting Project Works/Construction Technical/Supporting Project	Storm Tide Storm Tide Shelter Storm Tide	Department of Environment & Resource Management Moreton Bay Regional Council Rockhampion Regional Council Cook Shire Council Western Downs Regional Council Mornington Shire Council	Approved Approved Closed Finalised	\$30,000 00 \$150,000 00 \$37,751 00	\$325,000 00 \$150,000 00 \$37,751 00	\$150,000 00 \$37,751,00 \$26,670.00 \$57,000 0	\$450,000 \$113,253 \$80,010 \$202,000
19 8 20 8 21 8 22 8 23 8 24 8 25 8	803 809 814 819 833 843 866	200607 200607 200607 200607 200607 200607	NDMP NDMP NDMP NDMP NDMP NDMP	Indigenous Community Mapping Project Caboolture Shire Council topographic information collection for storm tide and flood inundation mapping Livingsione Shire Council Professional assessment and upgrade of Emergency Evacuation/Shelter Suildings Cook Shire Storm Tide Mapping Project Daiby Town Council Flood Mitigation Project Mornington Island Disaster Risk Management Study	Technical/Supporting Project Technical/Supporting Project Works/Construction Technical/Supporting Project Technical/Supporting Project	Storm Tide Storm Tide Shelter Storm Tide Flood	Department of Environment & Resource Management Moreton Bay Regional Council Rockhampton Regional Council Cook Shire Council Western Downs Regional Council Momington Shire Council Department of Environment & Resource Management	Approved Approved Closed Finalised Approved	\$30,000 00 \$150,000 00 \$37,751 00 \$26,670 00 \$88,000 00	\$325,000 00 \$150,000 00 \$37,751 00 \$26,670 00 \$67,000 00	\$150,000 00 \$37,751,00 \$26,670.00 \$67,000 00 \$20,000.00	\$450,000 \$113,253 \$80,010 \$202,000 \$40,000
19 8 20 8 21 8 22 8 23 8 24 8 25 8	803 809 814 819 833 843 866	200607 200607 200607 200607 200607 200607 200607	NDMP NDMP NDMP NDMP NDMP NDMP NDMP NDMP	Indigenous Community Mapping Project Caboolture Shire Council topographic information collection for storm tide and flood inundation mapping Livingsione Shire Council Professional assessment and upgrade of Emergency Evacuation/Shelter Suildings Cook Shire Storm Tide Mapping Project Daity Town Council Flood Mitigation Project Mornington Island Disaster Risk Management Study	Technical/Supporting Project Technical/Supporting Project Works/Construction Technical/Supporting Project Technical/Supporting Project Plosk Assessment	Storm Tide Storm Tide Shelter Storm Tide Flood All Hazards	Department of Environment & Resource Management Moreton Bay Regional Council Rockhampton Regional Council Cook Shire Council Western Downs Regional Council Mornington Shire Council Mornington Shire Council Department of Environment &	Approved Approved Closed Finalised Approved Approved	\$30,000 00 \$150,000 00 \$37,751 00 \$26,670 00 \$68,000 00	\$325,000 00 \$150,000 00 \$37,751 00 \$26,670 00 \$67,000 00	\$150,000 00 \$37,751.00 \$26,670 00 \$67,000 00 \$20,000 00 \$33,334 00	\$450,000 \$113,253 \$80,010 \$202,000 \$40,000
19 8 20 8 21 8 22 8 23 8 24 8 25 8 26 10	803 809 814 819 833 843 866 006	200607 200607 200607 200607 200607 200607 200607 200607	NDMP NDMP NDMP NDMP NDMP NDMP NDMP	Indigenous Community Mapping Project Cabboliure Shire Council topographic information collection for storm tide and flood inundation mapping Livingsione Shire Council Professional assessment and upgrade of Emergency Evacuation/Shetter Buildings Cook Shire Storm Tide Mapping Project Delby Town Council Flood Mitigation Project Mornington Island Disaster Risk Management, Study Storm Tide Modelling and Mapping Guideline Queensland Storm Tide Inundation Studies Data Compitation Project	Technical/Supporting Project Technical/Supporting Project Works/Construction Technical/Supporting Project Technical/Supporting Project Risk Assessment Technical/Supporting Project Technical/Supporting Project	Storm Tide Storm Tide Shelter Shorm Tide Flood All Hazards Storm Tide Storm Tide	Department of Environment & Resource Management Moreton Bay Regional Council Rockhampton Regional Council Cook Shire Council Western Downs Regional Council Western Downs Regional Council Mornington Shire Council Department of Environment & Resource Management Department of Environment & Resource Management	Approved Approved Closed Finalised Approved Approved Approved Finalised SUBTOTAL	\$30,000 00 \$150,000 00 \$37,751 00 \$26,670 00 \$68,000 00 \$0 00 \$0 00 \$0 00 \$0 00 \$1,852,955.00	\$325,000 00 \$150,000 00 \$37,751 00 \$26,670 00 \$20,000 00	\$150,000 00 \$37,751.00 \$26,670 00 \$87,000 00 \$20,000 00 \$33,334 00 \$20,000 00	\$450,000 \$113,253 \$80,010 \$202,000 \$40,000 \$100,000 \$60,000
19 8 20 8 21 8 22 8 23 8 24 8 25 8 26 10 27 10	803 809 814 819 833 843 866 006	200607 200607 200607 200607 200607 200607 200607 200607	NDMP NDMP NDMP NDMP NDMP NDMP NDMP NDMP	Indigenous Community Mapping Project Caboolture Shire Council topographic information collection for storm tide and flood inundation mapping Livingsione Shire Council Professional assessment and upgrade of Emergency Evacuation/Shelter Suildings Cook Shire Storm Tide Mapping Project Daity Town Council Flood Mitigation Project Morrington Island Disaster Risk Management Study Storm Tide Modelling and Mapping Guideline Queenstand Storm Tide Inundation Studies Data Compitation Project	Technical/Supporting Project Technical/Supporting Project Works/Construction Technical/Supporting Project Technical/Supporting Project Plask Assessment Technical/Supporting Project Technical/Supporting Project Technical/Supporting Project	Storm Tide Storm Tide Shelter Storm Tide Flood All Hazards Storm Tide Storm Tide Storm Tide	Department of Environment & Resource Management Moreton Bay Regional Council Rockhampton Regional Council Cook Shire Council Western Downs Regional Council Momington Shire Council Momington Shire Council Department of Environment & Resource Management Department of Environment & Resource Management Burdekin Shire Council	Approved Approved Closed Finalised Approved Approved Approved Finalised SUBTOTAL Unsuccessful	\$30,000 00 \$150,000 00 \$37,751 00 \$26,670 00 \$68,000 00 \$0 00 \$0 00 \$1,852,955,00 \$132,200 00	\$325,000 00 \$150,000 00 \$37,751 00 \$26,670 00 \$20,000 00 \$66,666 00 \$40,000 00 \$2,349,734.00 \$132,200.00	\$150,000 00 \$37,751,00 \$26,670 00 \$47,000 00 \$20,000 00 \$33,334 00 \$20,000 00 \$132,264,404,00	\$450,000 \$113,253 \$80,010 \$80,010 \$202,000 \$40,000 \$100,000 \$60,000 \$64,667,693
19 8 20 8 21 8 22 8 23 8 24 8 26 8 26 10 27 10 28 2 29 2	903 809 814 819 833 843 866 006 007	200607 200607 200607 200607 200607 200607 200607 200607 200607	NDMP NDMP NDMP NDMP NDMP NDMP NDMP NDMP	Indigenous Community Mapping Project Cabboliure Shire Council topographic information collection for storm tide and flood inundation mapping Livingsione Shire Council Professional assessment and upgrade of Emergency Evacuation/Shelter Buildings Cook Shire Storm Tide Mapping Project Delby Town Council Flood Mitigation Project Mornington Island Disaster Risk Management Study Storm Tide Modelling and Mapping Guideline Queensland Storm Tide Inundation Studies Data Compitation Project	Technical/Supporting Project Technical/Supporting Project Works/Construction Technical/Supporting Project Technical/Supporting Project Pisk Assessmen Technical/Supporting Project Technical/Supporting Project Works/Construction Technical/Supporting Project	Storm Tide Storm Tide Shelter Shorm Tide Flood All Hazards Storm Tide Storm Tide Floodway Flood	Department of Environment & Resource Management Moreton Bay Regional Council Rockhampion Regional Council Cook Shire Council Western Downs Regional Council Western Downs Regional Council Department of Environment & Resource Management Department of Environment & Resource Management Environment & Resource Management Burdekin Shire Council Igowich City Council	Approved Approved Closed Finalsed Approved Approved Approved Finalised SUBTOTAL Unsuccessful Unsuccessful	\$30,000 00 \$150,000 00 \$37,751 00 \$26,670 00 \$68,000 00 \$0 00 \$50 00 \$50 00 \$1,852,955.00 \$132,200 00 \$20,000 00	\$325,000 00 \$150,000 00 \$37,751 00 \$26,670 00 \$27,000 00 \$20,000 00 \$40,000 00 \$2,349,734.00 \$132,200,00	\$150,000 00 \$37,751,00 \$26,670,00 \$87,000 00 \$20,000,00 \$33,334 00 \$20,000 00 \$2,264,404,00 \$132,200,00 \$20,000,00	\$450,000 \$113,253 \$80,010 \$202,000 \$40,000 \$40,000 \$500,000 \$6,407,000 \$5,407,000 \$5,407,000
19 8 20 8 21 8 22 8 23 8 24 8 25 8 26 10 27 10 28 2 29 2 30 2 31 2	803 809 814 819 833 843 866 1006 1007 208 212 214 217	200607 200607 200607 200607 200607 200607 200607 200607 200607 200607 200607 200607 200607	NDMP NDMP NDMP NDMP NDMP NDMP NDMP NDMP	Indigenous Community Mapping Project Cabodiure Shire Council topographic information collection for storm tide and flood inundation mapping Livingsione Shire Council Professional assessment and upgrade of Emergency Evacuation/Shelter Buildings Cook Shire Storm Tide Mapping Project Deby Town Council Flood Mitigation Project Mornington Island Disaster Risk Management Study Storm Tide Modelling and Mapping Guideline Queenstand Storm Tide Inundation Studies Data Compitation Project Town of Ayr & Lilliesmere Area Flood & Drainage Scheme Ernhancement of GIS for Natural Disaster Management Igswich City Council - Gravel Road Upgrade Bushire Building Materials Research	Technical/Supponing Project Technical/Supponing Project Works/Construction Technical/Supponing Project Technical/Supponing Project Pisk Assessment Technical/Supponing Project Technical/Supponing Project Works/Construction Technical/Supponing Project	Storm Tide Storm Tide Shelter Storm Tide Flood All Hazards Storm Tide Storm Tide Storm Tide	Department of Environment & Resource Management Moreton Bay Regional Council Rockhampton Regional Council Cook Shire Council Western Downs Regional Council Western Downs Regional Council Mornington Shire Council Department of Environment & Resource Management Department of Environment & Resource Management Burdekin Shire Council Ipswich City Council Ipswich City Council	Approved Approved Closed Finalised Approved Approved Approved Approved Finalised SUBTOTAL Unsuccessful Unsuccessful Unsuccessful Unsuccessful	\$30,000 00 \$150,000 00 \$37,751 00 \$26,670 00 \$68,000 00 \$0 00 \$0 00 \$1,822,955,00 \$132,200 00 \$20,000 00 \$200,000 00	\$325,000 00 \$150,000 00 \$37,751 00 \$26,670 00 \$20,000 00 \$40,000 00 \$2,349,734.00 \$13,2200 00 \$20,000.00	\$150,000 00 \$37.751,00 \$26,670 00 \$87,000 00 \$20,000 00 \$20,000 00 \$2,264,404,00 \$2,264,404,00 \$20,000 00 \$20,000 00 \$20,000 00	\$450,000 \$113,253 \$80,010 \$80,010 \$202,000 \$400,000 \$100,000 \$60,000 \$60,000 \$396,600 \$396,600
19 8 20 8 21 8 22 8 23 8 24 8 25 8 26 10 27 10 28 2 29 2 30 2 31 2 32 2 32 2	803 809 814 819 833 843 866 006 007 208 212 212 214 2213	200607 200607 200607 200607 200607 200607 200607 200607 200607 200607 200607 200607 200607	NDMP NDMP NDMP NDMP NDMP NDMP NDMP NDMP	Indigenous Community Mapping Project Caboollure Shire Council topographic information collection for storm tide and flood inundation mapping Livingsione Shire Council Professional assessment and upgrade of Emergency Evacuation/Shetter Buildings Cook Shire Storm Tide Mapping Project Daity Town Council Food Mitigation Project Morrington Island Disaster Risk Management Study Storm Tide Modelling and Mapping Guideline Queensland Storm Tide Inundation Studies Data Compitation Project Town of Ayr & Lilliesmere Area Flood & Drainage Scheme Enhancement of GIS for Natural Disaster Management Ipswich City Council - Gravel Road Upgrade Bushline Building Materials Research Pine Rivers - Project Bushline Managers Committee	Technical/Supponing Project Technical/Supponing Project Works/Construction Technical/Supponing Project Technical/Supponing Project Pisk Assessment Technical/Supponing Project Technical/Supponing Project Works/Construction Technical/Supponing Project	Storm Tide Storm Tide Shelter Storm Tide Flood All Hazards Storm Tide Storm Tide Floodway Flood Bushtire Bushtire	Department of Environment & Resource Management Moreton Bay Regional Council Rockhampton Regional Council Cook Shire Council Western Downs Regional Council Western Downs Regional Council Department of Environment & Resource Management Department of Environment & Resource Management Burdekin Shire Council Ipswich City Council Ipswich City Council Department of Public Works Plass Wire Council Department of Public Works Pine Rivers Shire Council	Approved Approved Closed Finalsed Approved Approved Approved Finalised SUBTOTAL Unsuccessful Unsuccessful	\$30,000 00 \$150,000 00 \$37,751 00 \$26,670 00 \$68,000 00 \$0 00 \$50 00 \$50 00 \$1,852,955.00 \$132,200 00 \$20,000 00	\$325,000 00 \$150,000 00 \$37,751 00 \$26,670 00 \$27,000 00 \$20,000 00 \$40,000 00 \$2,349,734.00 \$132,200,00	\$150,000 00 \$37,751,00 \$26,670,00 \$87,000 00 \$20,000 00 \$33,334 00 \$22,000 00 \$2,264,404.00 \$132,200,00 \$20,000,00 \$20,000,00 \$20,000,00 \$20,000,00 \$20,000,00 \$36,667,00	\$450,000 \$113,253 \$80,010 \$202,000 \$40,000 \$540,
19 8 20 8 21 8 22 8 23 8 24 8 25 8 26 10 27 10 28 2 29 2 30 2 31 2 31 2 33 2 23 33 2	803 809 814 819 833 843 866 006 007 208 212 212 214 2213	200607 200607 200607 200607 200607 200607 200607 200607 200607 200607 200607 200607 200607	NDMP NDMP NDMP NDMP NDMP NDMP NDMP NDMP	Indigenous Community Mapping Project Cabodiure Shire Council topographic information collection for storm tide and flood inundation mapping Livingsione Shire Council Professional assessment and upgrade of Emergency Evacuation/Shelter Buildings Cook Shire Storm Tide Mapping Project Deby Town Council Flood Mitigation Project Mornington Island Disaster Risk Management Study Storm Tide Modelling and Mapping Guideline Queenstand Storm Tide Inundation Studies Data Compitation Project Town of Ayr & Lilliesmere Area Flood & Drainage Scheme Ernhancement of GIS for Natural Disaster Management Igswich City Council - Gravel Road Upgrade Bushire Building Materials Research	Technical/Supporting Project Technical/Supporting Project Works/Construction Technical/Supporting Project Technical/Supporting Project Pisks Assessment Technical/Supporting Project	Storm Tide Storm Tide Shelter Storm Tide Flood All Hazards Storm Tide Storm Tide Floodway Flood Flood Bushlire	Department of Environment & Resource Management Moreton Bay Regional Council Rockhampion Regional Council Cook Shire Council Western Downs Regional Council Western Downs Regional Council Department of Environment & Resource Management Department of Union Council Department of Public Works	Approved Approved Closed Finalised Approved Approved Approved Finalised SUBTOTAL Unsuccessful Unsuccessful Unsuccessful Unsuccessful Unsuccessful	\$30,000 00 \$150,000 00 \$37,751 00 \$26,670 00 \$68,000 00 \$0 00 \$0 00 \$1,852,955.00 \$132,200 00 \$20,000 00 \$20,000 00 \$133,333 00	\$325,000 00 \$150,000 00 \$37,751 00 \$26,670 00 \$67,000 00 \$20,000 00 \$40,000 00 \$2,349,734.00 \$132,200.00 \$20,000.00	\$150,000 00 \$37,751,00 \$26,670,00 \$57,000 00 \$20,000 00 \$33,334 00 \$20,000 00 \$22,264,404,00 \$132,200,00 \$20,000,00 \$20,000,00 \$20,000,00 \$20,000,00 \$20,000,00 \$20,000,00 \$20,000,00 \$20,000,00 \$20,000,00 \$20,000,00 \$20,000,00 \$20,000,00 \$20,000,00 \$20,000,00 \$20,000,00 \$20,000,00 \$20,000,00	\$450,000 \$113,253 \$80,010 \$202,000 \$40,000 \$50,000 \$50,000 \$54,000 \$50,000 \$54

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o. ID N	Y	ear	Program	Project Title	Project Type	Categories	Organisation	Status	Applicant Proposed/ Approved Funds	State Proposed/ Approved Funds	Commonweath Proposed/ Approved Funds	TOTAL Proposed/Approved
36 240 37 241	200	0607	NDMP	Pine Rivers - Bushlire Prevention and Safety Pine Rivers - Bushlire Signage	Technical/Supporting Project	Bushfire	Pine Rivers Shire Council	Unsuccessful	\$5,000.00	\$5,000.00		\$15,000.0
		0607	NDMP	Brisbane Valley Flood Damage Minimisation Study	Technical/Supporting Project Technical/Supporting Project	Bushiire Flood	Pine Rivers Shire Council Brisbane City Council	Unsuccessful	\$2,000.00	\$2,000.00	\$2,000.00	\$6,000.0
38 242 39 243	200	0607	NDMP	Old Cleveland Road Coorparoo Drainage Upgrade	Works/Construction	Flood	Brisbane City Council	Unsuccessful	\$19,877.00 \$4,300,000.00	\$19,878.00		
40 244		0607	NDMP	Samford Boad, Alderley Drainage Hograde	Works/Construction	Flood	Brisbane City Council	Unsuccessful	\$3,330,000.00	\$4,300,000.00 \$3,330,000.00	\$4,300,000.00	
41 245		0607	NDMP	Old Cleveland Road Greenslopes Drainage Upgrade	Works/Construction	Flood	Brisbane City Council	Unsuccessful	\$1,530,000 00	\$1,530,000.00	\$3,330,000.00 \$1,530,000.00	
42 246		0607	NDMP	Sandgate Road Upgrade - Zillman Waterholes Flood Mitigation	Works/Construction	Flood	Brisbane City Council	Unsuccessful	\$1,120,000.00	\$1,120,000.00	\$1,000,000.00	
43 261	200	0607	NDMP	Kingsbury Creek Floodgate (2004-05)	Technical/Supporting Project	Flood	Hinchinbrook Shire Council	Unsuccessful	\$72,000.00	\$72,000.00		
44 263	200	0607	NDMP	Diamantina Developmental Road 93B between Quilpie and Windorah Flood Mitigation	141-4-10-4-1-1	-	Department of Transport and Main	Cara and the sale				42.0,000.0
		0607	NDMP	Maroochy Fire Management Officer	Works/Construction Technical/Supporting Project	Flood Bushfire	Roads Chica County	Unsuccessful	\$250,000.00	\$0.00		
	-			The second of the second second	recrimeavouppoining Project	Dustrille	Maroochy Shire Council Brisbane City State Emergency	Unsuccessful	\$0.00	\$44,500.00	\$44,500.00	\$89,000.0
46 272			NDMP	Involving Local Government Elected Representatives in Emergency Management	Technical/Supporting Project	All Hazards	Service Unit	Unsuccessful	\$12,000.00	210,000,00		
47 308		0607	NDMP	Cancelled - Queensland Local Government storm tide mapping project	Works/Construction	Other Other	Department of Community Safety	Cancelled	\$114,000.00	\$12,000.00		
48 326	200	0607	NDMP	Coastal inundation and erosion modelling and mitigation 2005-06	Technical/Supporting Project	Storm Tide	Gold Coast City Council	Unsuccessful	\$30,000.00	\$30,000.00		
40 000		0000	NUMBER				Aquagen Water and Renewable		\$00,000.00	300,000.00	\$30,000.00	\$90,000.0
49 327				Baroon Pocket Darn Flood Warning System Acquisition of Spatial Data	Works/Construction	Warning System	Energy	Unsuccessful	\$159,334.00	\$159,333.00	\$159,333.00	\$478,000.0
				Nebo Creek Miligation Management Strategy	Works/Construction	Other:Other	Mareeba Shire Council	Unsuccessful	\$41,500.00	\$41,500.00	\$41,500.00	
31 330	2 1 200	0007	IADIMI	14600 Creek Miligation Management Strategy	Technical/Supporting Project	Flood	Nebo Shire Council	Unsuccessful	\$80,000.00	\$80,000.00	\$80,000.00	
52 339	200	0607	NDMP	Flying Fish Point Seawall Reconstruction 2005-06 for Johnstone Shire Council	Works/Construction	Other:Other	Johnstone Shire Council	the second		40000000		The state of the s
	4.			The state of the s	***OFFS**CONSTRUCTION	Fire Trails: Water	Johnstone Shire Council	Unsuccessful	\$100,000.00	\$100,000.00	\$100,000.00	\$300,000.0
53 342		0607	NDMP	Galton Rural Fire Management 2005-06 NDMP for Gatton Shire Council	Works/Construction	Storage Tank	Gatton Shire Council	Unsuccessful	\$90,000.00	### ### P		A STATE OF THE STA
54 345	5 200	0607	NDMP	Stable Swamp Creek Rocklea	Works/Construction	Floodway	Brisbane City Council	Unsuccessful	\$1,300,000.00	\$90,000.00		
			-				Department of Transport and Main	- Chiadeacasarar	\$1,000,000.00	\$1,300,000.00	\$1,300,000.00	\$3,900,000.0
55 354	4 ; 20	00607	NDMP	Burke Development Road - Walsh R to Haystack Dam	Works/Construction	Floodway	Roads	Unsuccessful	\$200,000.00	\$0.00	\$200,000.00	
56 36	2 00	20007	NON	the Court of the C			Department of Transport and Main			30.01	\$200,000.00	
		00607	NOMP	Many Peaks to Dawes Range Sandgate Road Boondalf	Works/Construction	Floodway	Roads	Unsuccessful	\$225,000.00	\$0.00	\$225,000.00	\$450,000.0
58 36	7 20	0607	NIDMP	Old Cleveland Road Coorparoo	Works/Construction	Floodway	Brisbane City Council	Unsuccessful	\$1,165,000.00	\$1,165,000.00		
59 36	8 20	0607	NDMP	Samford Road Alderley	Works/Construction Works/Construction	Floodway Other:Other	Brisbane City Council	Unsuccessful	\$420,000.00	\$420,000.00		\$1,260,000.0
60 36		00607	NDMP	Old Cleveland Road Greenslopes	Works/Construction	Other Other	Brisbane City Council Brisbane City Council	Unsuccessful	\$420,000.00	\$420,000.00		\$1,260,000.0
-			-	Low area contact research of caracteristics	Works Constitution	Omer; Other	Department of Environment &	Unsuccessful	\$420,000.00	\$420,000.00	\$420,000.00	\$1,260,000.0
61 38	8 20	00607	NDMP	Mornington Island Storm Tide Warning System	Works/Construction	Warning System	Resource Management	Unsuccessful	\$8,850.00	\$525.00	\$525.00	\$9,900.0
62 71	4 20	00607	NDMP	Baroon Pocket Dam Flood Warning System - Round 4 NDMP Air-conditioning of Community Halls for use as Heatwave Cooling/Respite	Works/Construction	Warning System	Aquagen Water and Renewable Energy	Unsuccessful	\$189,340.00	\$189,330.00	\$189,330.00	\$568,000.0
63 73	4 20	00607	NDMP	Centres - NDMP	Marketton							
	8 20			Cairns Road Calchment Flood Mitigation Works	Works/Construction Works/Construction	Other	Caboolture Shire Council Atherton Shire Council	Unsuccessful	\$160,000.00	\$160,000.00		
65 74	9 20	00607	NDMP	Hervey Bay Community Awareness project.	Technical/Supporting Project	Other	Hervey Bay City Council	Unsuccessful	\$93,466.00	\$93,467.00		
66 75	2 20	00607	NDMP	Identification and replacement of electrical equipment in high risk areas.	Works/Construction	Other	Hervey Bay City Council	Unsuccessful	\$22,000.00	\$22,000.00	\$22,000.00	
67 75	3 20	00607	NDMP	Survey and requirements of ground anchor points for temporary residences	Technical/Supporting Project	Other	Hervey Bay City Council	Unsuccessful	\$35,000.00 \$12,000.00	\$35,000.00	\$35,000.00	
100							Protest and any account	Onsuccession	\$12,000.00	\$12,000.00	\$12,000.00	\$36,000.0
68 75			NDMP	Finalisation of construction of purpose built Disaster Coordination Centre (DCC) Townsville/Thuringowa Local Disaster Management Group-Community Education	Works/Construction	All Hazards	Cairns City Council	Unsuccessful	\$127,000.00	\$87,500.00	\$87,500.00	\$302,000,0
69 76	5 20	00607	NDMP	Advertising Campaign Townsville/Thuringowa 'A Disaster could seriously disrupt your life - Community	Technical/Supporting Project	All Hazards	Townsville City Council	Unsuccessful	\$7,334.00	\$7,333.00	\$7,333.00	\$22,000
70 76		00607	NDMP	Awareness Display	Technical/Supporting Project	All Hazards	Townsville City Council	Unsuccessful	\$2,534.00	*****		
71 76		00607	NDMP	South Mission Beach Foreshore Protection Program	Works/Construction	Storm Tide	Cardwell Shire Council	Unsuccessiul	\$33,000.00	\$2,533.00 \$33,000.00	\$2,533.00	
72 76	9 20	00607	NDMP	Brisbane River Flood Decision Support System 2006-07	Technical/Supporting Project	Flood	Brisbane City Council	Unsuccessful	\$60,000.00	\$60,000.00	0 \$33,000.00 \$60,000.00	
73 77	5 20	00607		Pine Water Generator Set	Works/Construction	Other	Pine Rivers Shire Council	Unsuccessful	\$83,330.00	\$83,330,00		
			MUNIO	Albany Avenue South Landslip Remediation and Miligation Project Albany Avenue North Landslip Remediation and Mitigation Project	Technical/Supporting Project	Other	Gold Coast City Council	Unsuccessful	\$65,000.00	\$65,000.00		\$195,000
76 78			NOMP	Lansell Avenue Landslip Remediation and Mitigation Project (2006-07)	Works/Construction	Other	Gold Coast City Council	Unsuccessful	\$150,000.00'	\$150,000.0	5150,000.00	
77 78	2 20	00607	NDMP	Coastal inundation and erosion modelling and mitigation 2006-07	Works/Construction Technical/Supporting Project	Other	Gold Coast City Council	Unsuccessful	\$250,000.00	\$250,000.0		\$750,000.
78 78		00607		Picnic Point Seawall and Rock Armouring	Works/Construction	Other	Gold Coast City Council Redcliffe City Council	Unsuccessful	\$30,000.00	\$30,000.0		
79 78		00607	NDMP	Design of the Holts Road Upgrade (McCreadys Creek Southern Tributary)	Works/Construction	Other	Mackay City Council	Unsuccessful Unsuccessful	\$204,000.00	\$204,000.0		
80 81		00607	NDMP	Flying Fish Point Seawall Reconstruction 2006-07	Works/Construction	Storm Tide	Johnstone Shire Council	Unsuccessful	\$23,000.00 \$125,930.00	\$20,000.0 \$97,180.0		
81 81		00607	NDMP	Sandgate Road Boondall (2006-07)	Works/Construction	Flood	Brisbane City Council	Unsuccessful	\$80,000,00	\$80,000.0		
82 81	6 20	00607	NDMP	Scarborough Cliffs Erosion Protection Works	Works/Construction	Other	Redcliffe City Council	Unsuccessful	\$166,667.00	\$166,667.0		\$240,000.
83 82	9 90	00607	NDMP	Livingstone Shire Council? Emergency Action Guide for Survival of Natural	4	No bear was				01.00(001)0	\$100,007.01	3000,001.
84 83				Disasters	Technical/Supporting Project	All Hazards	Livingstone Shire Council	Unsuccessful	\$10,000.00	\$10,000.0	0 \$10,000.00	530,000.
			NDMP	Gravel Road Upgrade (Extension of Current Project + 2 New Locations) Noosa Drive Stormwater Mitigation	Works/Construction	Other	Ipswich City Council	Unsuccessful	\$200,000.00!	5200,000.0	0 \$200,000.00	\$600,000
86 83	9 20	00607	NDMP	Albany Road pumped flood diversion	Works/Construction Works/Construction	Floodway	Noosa Shire Council	Unsuccessful	\$30,000.00	\$30,000.0	0 \$30,000.00	\$90,000
87 85		00607	NDMP	Killara Street flood diversion	Works/Construction	Flood	Townsville City Council Townsville City Council	Unsuccessful	\$373,000.00	\$373,000.0		51,119,000
88 85 89 86 90 86	5 20		NDMP	Campbell Street pumped flood diversion	Works/Construction	Flood	Townsville City Council	Unsuccessful Unsuccessful	\$44,000.00	\$44,000.0		
89 86	3 20	00607	NDMP	Minimisation of Sewage Overflows	Technical/Supporting Project	Other	Wide Bay Water Corporation	Unsuccessful	\$78,000.00	\$78,000.0		
90 86	4 20	00607	NDMP	Continuation of Water Supply	Technical/Supporting Project	Other	Wide Bay Water Corporation	Unsuccessful	\$15,000.00	\$19,000.0 \$15,000.0		
91 86	/ 20	00607	NDMP	Coastal erosion asset protection	Works/Construction	Other	Island Coordinating Council	Unsuccessful	\$0.00	\$150,000.0	0 \$150,000.0	
							A CONTRACTOR OF THE PARTY OF TH	SUBTOTAL	\$18,478,195.00	\$17,886,276.0		
41 64		00700	AUDI I				and the same of th	TOTAL	\$20,331,150.00	\$20,236,010.0		
	0 20			Local Government Storm Tide Mapping Project	Technical/Supporting Project	Storm Tide	Department of Community Safety Kowanyama Aboriginal Shire	Approved	\$57,000 00	\$47,750.0		
		00709	NDMP	Kowanyama Multipurpose Sport and Recreation Centre 2006-07 NDMP	Works/Construction	Other	Council	Approved	\$0.00	\$529,687 0	0 \$529,687.0	0 \$1,059,374
	2 20	00700						1				
2 71	1 20	00708	NDMP	Johnstone Shire Council Storm Tide Study	Technical/Supporting Project	Storm Tide	Cassowary Coast Regional Council	Finalised	\$15,270.00	\$18,400.0		0 \$52,070
2 71	1 20		NDMP	Atherton Shire Council FNQ Wildfire Mitigation Project	Technical/Supporting Project Technical/Supporting Project	Storm Tide Other	Cassowary Coast Regional Council Tablelands Regional Council	Finalised Finalised	\$15,270.00 \$21,666.00	\$18,400.0 \$21,667.0		
2 71 3 79 4 79	1 20	00708	NDMP NDMP	Johnstone Shire Council Storm Tide Study Atherton Shire Council FNO Wildlire Mitigation Project Augathelia and Charlevilla Levees construction of stage 1 RFMP ongoing project commenced June 03	Technical/Supporting Project Technical/Supporting Project Works/Construction		Cassowary Coast Regional Council Tablelands Regional Council Murweh Shire Council				0 \$21,667.0	0 \$65,000.



No. I		Year 200708	Program	Project Title Motorcar Creek Causeway	Project Type	Categories	Organisation	Status	Applicant Proposed/ Approved Funds	State Proposed/ Approved Funds	Commonweath Proposed/ Approved Funds	TOTAL Proposed/Approved
		200708	8 NDMP	Flood Warning Infrastructure	Works/Construction Works/Construction	Floodway	Diamantina Shire Council	Unsuccessful	\$0.00	\$107,318.0	\$107,318.00	
					Particular Control of the Control of	Warning System	Maroochy Shire Council	Unsuccessful	\$33,334.00	\$33,333.0	\$33,333,00	\$100,000.00
68	1189	200708	8 NDMP	Reduction of Flood Vulnerability in High Risk Areas at Goodna - Woogaroo Creek	Technical/Supporting Project	Flood	Ipswich Rivers Improvement Trust	Unsuccessful	\$550,000.00	\$550,000.00	\$650,000.00	£4 550 500 00
		200708		Campbell Street Basin Pumped Flood Diversion Storm Tide Mapping	Works/Construction	Floodway	Townsville City Council	Unsuccessful	\$420,000.00	\$420,000.00		
	-	200100	1401411	Study of the impacts of climate change - threat of coasial erosion to Thuringowa's	Technical/Supporting Project	Storm Tide	Miriam Vale Shire Council	Unsuccessful	\$25,000.00	\$25,000.0	\$25,000.00	
		200708		inth beaches	Technical/Supporting Project	Other	Thuringowa City Council	Unsuccessiul	#50 000 00			
		200708		Disaster Management Plan	Technical/Supporting Project	All Hazards	Boonah Shire Council	Unsuccessful	\$59,020.00 \$0.00	\$0.00 \$7,500.00	0 \$30,000.00 0 \$7,500.00	
13	1190	200706	8 NOMP	Tambo House Flood Prevention Plan for the upgrade of shelter buildings (cyclones and earthquakes) (Item 13	Works/Construction	Other:Other	Tambo Shire Council	Unsuccessful	\$25,452.00	\$25,452.0		\$15,000 00 \$76,356 00
74	1203	200708	8 NDMP	Priority 2)	Technical/Supporting Project	Easternake Curione	Dealth and Co. Co.					
	-			Investigate options for increasing airport flood immunity (flooding) (flem 9 Priority	reconcersopporting rioject	Earthquake:Cyclone	Rockhampton City Council	Unsuccessful	\$20,000.00	\$20,000.0	\$20,000.00	\$60,000.00
75	1207	200708	8 NDMP	(3)	Technical/Supporting Project	Flood	Rockhampton City Council	Unsuccessful	\$24,000.00	\$24,000 0	\$24,000.00	£72 000 00
		200708	8 NDMP	Fessibility Investigation for a Storm Tide Defence for Cairns Low-lying Suburbs	Technical/Supporting Project	Orners Tute	2				- 19.00	
77	1209	200708	8 NDMP	Development of geology map (earthquakes) (Item 11A Priority 4)	Technical/Supporting Project	Storm Tide Earthquake	Cairns City Council Rockhampion City Council	Unsuccessful	\$103,334.00	\$103,333.0		
70		200708				men in equation	riocalitation only countries	Unsuccessiul	\$15,000.00	\$15,000.0	\$15,000.00	\$45,000.00
/8	1210	200708	8 NDMP		Technical/Supporting Project	Earthquake	Rockhampton City Council	Unsuccessful	\$16,666.00	\$16,666.0	\$16,666.00	\$49,998.00
79	1211	200708	8 NDMP	Develop a map of the natural period of vibration (earthquakes) (Item 11B Prionty 6)	Technical/Supporting Project	Earthquake	0.10	No. of Contract of the Contrac			\$10,000.00	310,350.00
80	1212	200708	8 NDMP	Audit of Bajool Industrial area (earthquakes) (Item 11C Priority 7)	Technical/Supporting Project	Earthquake	Rockhampton City Council Fitzroy Shire Council	Unsuccessful Unsuccessful	\$25,000.00	\$25,000.0		
81	1213	200708	8 NDMP	GIS of ground levels and floor levels of buildings (flooding) (Item 3 Priority 8)	Technical/Supporting Project	Earthouake	Rockhampton City Council	Unsuccessful	\$10,000.00 \$45,000.00	\$10,000.0		
		200708		Flood proofing of commercial premises (flooding) (item 5 Priority 10/10)	Technical/Supporting Project	Flood	Rockhampton City Council	Unsuccessful	\$18,334.00	\$45,000.0 \$18,333.0		
	1228	200708		Policeman's Creek Flood Mitigation Programme	Technical/Supporting Project	Flood	Emerald Shire Council	Unsuccessful	\$330,000.00	\$330,000.0		
		200708		Flood Proof Housing Mirani Township Flood Study	Technical/Supporting Project	Flood	Gold Coast City Council	Unsuccessful	\$70,000.00	\$70,000.0		
				Woody Point Foreshore Stabilisation	Technical/Supporting Project		Mirani Shire Council	Unsuccessful	\$30,000.00	\$30,000.0		
				Gravel Floodway Upgrade at Greys Plains Road Mount Mon	Works/Construction	Other:Other	Redcliffe City Council	Unsuccessful	\$140,000.00;	\$140,000.0		\$420,000.00
88	1244	200708	8 NDMP	Finch Haiton Gorge access protection works	Works/Construction Works/Construction	Floodway	Ipswich City Council	Unsuccessful	\$150,000.00	\$150,000.0		
89	1248	200708	8 NDMP	Landslide Risk Assessment Study	Technical/Supporting Project	Floodway	Mirani Shire Council Calliope Shire Council	Unsuccessful	\$30,000.00	\$30,000.0	530,000.00	
90	1250	200708	B NDMP	Griffiths Street (South) Drainage Scheme	Works/Construction	Other:Other	Toowoomba Regional Council	Unsuccessful	\$20,000.00	\$20,000.0		\$60,000.00
91	1253	20070	8 NDMP	Cairns CBD and Environs Catchment Management Plan	Technical/Supporting Project	Flood	Cairns City Council	Unsuccessful Unsuccessful	\$2,000,000.00	\$2,000,000.0		\$6,000,000.00
						7,000	Cantis City Council	Unsuccessiul	\$110,000.00	\$110,000.0	\$110,000.00	\$330,000.00
92	1254	20070		Palm Island Emergency Water Supply	Works/Construction	Other Other	Palm Island Aboriginal Shire Council	Unsuccessful	50.00	\$2,837.0	\$2,837.00	
94	1367	20070	B NOWP	Organisation and Community Resilience Mitigating the Effects of Cyclones - Learning from Larry	Technical/Supporting Project		Department of Community Safety	Unsuccessful	\$0.00	\$50,000.0		
96	1375	20070	B NOMP	Saibar Island Infrastructure Protection Program	Technical/Supporting Project		Johnstone Shire Council	Unsuccessful	\$10,000.00	\$60,000.0		
			8 NDMP	Warraber Island Seawali Construction and Upgrading Project	Works/Construction Works/Construction	Other	Saibai Island Council	Unsuccessful	\$0.00	\$52,500.0	552,500.00	\$105,000.00
97	1379	20070	8 NDMP	Masio Island Sand Bypassing Campaign	Technical/Supporting Project	Other Other	Island Coordinating Council	Unsuccessful	\$0.00;	\$475,500.0	\$475,500.00	
98	1380	20070	8 NDMP	Boigu Island Seawall Construction and Upgrading Project.	Works/Construction	Other	Island Coordinating Council Island Coordinating Council	Unsuccessful	\$0.00	\$102,250.0		\$204,500.00
99	1381	20070	8 NOMP	Saibai Island Seawall Construction and Upgrading Project	Technical/Supporting Project	Other	Island Coordinating Council	Unsuccessful Unsuccessful	\$0.00	\$780,750.0		
100	1200	20070		Policeman's Creek Flood Mitigation Programme - Vane Tempest Fload Immunity (project 2 of 3)	The second second second		Same Sociality Council	Ulisuccessiul	\$0.00	\$1,693,000.0	\$1,893,000.00	\$3,786,000.00
100	1009	20070	NUMP	(project 2 of 3)	Works/Construction	Flood	Emerald Shire Council	Unsuccessful	\$100,000.00;	\$100,000.0	\$100,000.00	\$300,000 00
								SUBTOTAL	\$20,532,324.66	\$24,137,244,6		\$68,836,814.00
T						1		TOTAL	\$24,756,181.66	\$29,820,900.6	\$29,865,901.67	
	1178		9 NDMP	GPS Mapping of Airstrip (NDMP)	Works/Construction	Other Other	Doomadgee Aboriginal Community	20.00	E. 15			400,000
		20080	9 NDMP	Boulia Disaster Mitigation	Works/Construction	Floodway	Council Boula Shire Council	Approved	\$0.00	\$16,500.0		
3	1235	20080	9 NDMP	Cairns City Council CBD South Flood Mitigation Program	Technical/Supporting Project	Flood	Carns Regional Council	Approved Approved	\$157,500.00 \$1,100.000.00	\$157,500.0		
1	1.038	20060	9 NOMP	Johnstone Shire Floor Level Data Survey				гарлочен	\$1,100,000.00	\$1,100,000 0	\$1,100,000.00	\$3,300,000 00
	1850	20000	14CMI	Debris Impact Testing of Building Materials and Construction Methodologies for	Technical/Supporting Project	Storm Tide:Flood	Cassowary Coast Regional Council	Approved	\$34,520.00	\$34,520.0	\$34,520.00	\$103,560 00
5	1616	200809	9 NDMP	use in Public Cyclone Shelters	Technical/Supponing Project	Cyclone	Description of Base was				\$54,325,00	\$103,300 00
			-		recrimeas adoptining Project	Storm	Department of Public Works	Approved	\$0.00	\$25,000.0	\$25,000.00	\$50,000.00
1 1				CANCELLED - Mt Morgan District (formerly Mt Morgan Shire Council) Natural		Tide Flood Earthquake						
		200809	9 NDMP	Disaster Risk Management Study and Consolidation of Existing Natural Disaster	Light and the second	Bushtire Landslide Cyclo						
6	1017	20080	19 NUMP	Risk Management Studies of former Councils	Technical/Supporting Project	ne	Rockhampton Regional Council	Cancelled	\$26,666.00	\$26,667.0	\$26,667.00	E80 000 00
						Storm				420,007.0	\$20,007.00	\$80,000.00
7	1618	200809	9 NDMP	Development of an Evacuation Strategy for Carris Regional Council	Technical/Supporting Project	Tide Flood Bushfire Cycl		SOMETIME.				
			9 NDMP	Wowan Flood Study	Technical/Supporting Project	Flood	Cairns Regional Council Banana Shire Council	Finalised	\$15,000 00	\$15,000.0		
						FILOU	Benerie Shire Council	Approved	\$15,000 00	\$15,000.0	\$15,000.00	\$45,000 00
				Publication of Children's Story Book relating to cyclones and personal preparation			Townsville City Council	Closed	\$5,759 00	25.252.0		
	1626	200809			Technical/Supporting Project	Other	Pioneer River Improvement Trust	Finalised	\$5,759.00	\$5,757.0 \$40,490.0		
	1627				Technical/Supporting Project		Herbert River Improvement Trust	Approved	\$30,000 00	\$40,490.0	0 \$40,490.00 0 \$30,000.00	
			9 NDMP	Purchase and removal of houses in high flood risk areas - Woogaroo Creek Development of Cross Border Disaster Management Arrangements	Works/Construction	Other	Ipswich Rivers Improvement Trust	Finalised	\$550,000 00	\$550,000 0		
			9 NDMP	Condamine River and Tributaries Flood Study	Technical/Supporting Project Technical/Supporting Project	Other Flood	Gold Coast City Council	Approved	\$20,000 00.	\$16,000.0	\$16,000.00	
15	1633	20080	9 NOMP	River Height Measuring Stations	Technical/Supporting Project	Flood	Southern Downs Regional Council	Approved	\$203,780.00	\$203,780.0	\$203,780.00	\$611,340.00
16	1634	200809	9 NDMP	Foldable Road Closed Signs	Works/Construction	Other	Isaac Regional Council	Approved	\$0.00	\$180,000.0		\$360,000.00
			9 NDMP	CANCELLED - Cyclone Warning and Response	Works/Construction	Other	Isaac Regional Council Aurukun Shire Council	Finalised	\$0.00	\$12,750.0		
18	1639	20080		Logan City Council Bushfire Risk Management Study	Technical/Supporting Project		Logan City Council	Cancelled Approved	\$0.00	\$8,750.0		\$17,500.00
19	1640			Logan City Council Evacuation Risk Management Study Project Officer	Technical/Supporting Project	Other	Logan City Council	Approved	\$20,000 00	\$20,000 0 \$24,444 5	0 \$20,000.00 \$24,446.50	
20	1643 1644			Koala Coun Flood Mitigation Works	Works/Construction	Floodway	Sunshine Coast Regional Council	Approved	\$5,000.00	\$5,000.0		
21	1044	20080	13 INDIMP	Cambroon Bridge Review of Australia's Capital Cities Integrated City Salety and Security	Works/Construction	Other	Sunshine Coast Regional Council	Approved	\$200,000 00	\$200,000.0		
22	1650	200809	9 NDMP	Arrangements	Technical/Supporting Project	Other	Deschape Ch. Co.	-	77.73			
				Community DEM: Acquisition of high resolution Digital Elevation Model data to	- Command porting Project	Uther	Brisbane City Council Department of Environment &	Finalised	\$50,000.00	\$50,000.0	\$50,000.00	\$150,000.00
23	1652	20080	9 NDMP	support accurate mapping over coastal and flood risk communities	Technical/Supporting Project	Other	Resource Management	Approved	\$1,422,200.00	E4 400 000 0		A CONTRACTOR OF THE PARTY OF TH
					1.000		The same of the sa	reproved	\$1,422,200.00	\$1,422,200.0	0 \$1,422,200.00	\$4,266,600.00

No.	ID No	Funding Year	Program	Project Title	Project Type	Categories	Organisation	Status	Applicant Proposed/ Approved Funds	State Proposed/ Approved Funds	Commonweath Proposed/ Approved Funds	TOTAL Proposed/Approve Funds
		200809		Digital Elevation Models for the Torres Strait Islands	Technical/Supporting Project	Other Storm Tide Flood Bushfire Cycl	Department of Environment & Resource Management Local Government Association of	Approved	\$5,000.00	\$300,000.00	\$300,000.00	\$605,000.6
		200809		Capacity and Capability Development in Queensland Councils	Technical/Supporting Project	one	Queensland	Approved	\$80,000.00	\$80,000,00	**** *** ***	****
26	1655	200809	NDMP	Gravel Floodway Upgrade at Greys Plain Road Mount Mort	Works/Construction	Floodway	Ipswich City Council	Approved	\$10,000.00	\$10,000.00	\$80,000.00 \$10,000.00	
		1		Reduction of Flood Vulnerability for the Albert Street/Lower James Street area				7.910100	\$10,000.00	\$10,000.00	\$10,000.00	\$30,000.
		200809		Goodna - Planning Study	Technical/Supporting Project	Flood	Ipswich City Council Department of Environment &	Approved	\$10,000.00	\$10,000.00	\$10,000.00	\$30,000.0
28	1657	200809	NDMP	Storm Tide Network Upgrade for Tsunami Monitoring	Technical/Supporting Project	Storm Tide	Resource Management	Approved	\$0.00	\$37,500.00	\$37,500.00	\$75,000.0
		200809		- Maximum Storm Tide Level Recorders (Pilot)	Technical/Supporting Project	Storm Tide	Department of Environment & Resource Management Department of Environment &	Approved	\$0.00	\$30,000 00		
	1659	200809		Tsunami Modelling for 5 Sites along the Queensland Coastal-line	Technical/Supporting Project	Other	Resource Management	Approved	\$50,000.00	\$50,000.00	\$50,000.00	\$150,000.0
31	1660	200809	NDMP	ALERT Flood Warning System for Nogoa River	Technical/Supponing Project	Flood	Central Highlands Regional Council	Approved	\$0.00	\$155,500 00	\$155,500,00	\$311,000.0
20				Regional Floodplain Dalabase (formerly the Moreton Bay Climate Risk & Flood	Name and the same of				40.00	\$100,000 00	\$155,500.00	\$311,000.0
32	1661	200809	NDMP	Mapping Project)	Technical/Supporting Project	Flood Other	Moreton Bay Regional Council	Finalised	\$270,466.66	\$270,466.67	\$270,466.67	\$811,400.0
22	1662	200809	NOME	Charters Towers Regional Council's Natural Disaster Risk Management Study		Flood Earthquake Bushfi				200.01.00.00	DE101500.01	\$011,400.0
					Technical/Supporting Project	re Cyclone	Chariers Towers Regional Council	Approved	\$20,000.00	\$20,000.00	\$20,000.00	\$60,000.0
34	1663	200809	NDMP	Cassowary Coast Regional Council Flying Fish Point Seawall	Works/Construction	Other	Cassowary Coast Regional Council	Finalised	\$0.00	\$9,000.00	\$9,000 00	\$18,000.0
	1664	200809		Gold Coast City Evacuation Plan	Technical/Supporting Project	Storm Tide:Flood:Bushfire Cycl one	Gold Coast City Council	Approved	\$11,000.00	\$11,000.00		
	1665	200809			Works/Construction	Other	Pioneer River Improvement Trust	Finalised	\$275,000.00	\$275,000.00		
		200809		Northern Queensland Wildfire Mitigation Project - Strand 6	Technical/Supporting Project	Bushtire	Tablelands Regional Council	Approved	\$40,597.00	\$40,597.00		
		200809		Lockyer Valley Regional Bushlire Mitigation Strategy Flinders Shire Council 'Natural Disaster Risk Management Study'	Technical/Supporting Project		Lockyer Valley Regional Council	Approved	\$20,000 00	\$20,000 00		
33	10/0	200009	NUMP	Princers Shire Council Natural Disaster Hisk Management Study	Technical/Supporting Project	Flood Bushfire	Flinders Shire Council	Approved	\$10,000.00	\$10,000.00		
Total	1626	200800	I NIDARD	Monto Flood Study	I Zakatawa na danan			SUBTOTAL	\$4,681,931.66	\$5,488,422.17	\$5,488,424.17	\$15,658,778.0
41	1637	200809	NOMP	Mundubbera Flood Study	Technical/Supporting Project		North Burnett Regional Council	Cancelled	\$60,000.00	\$60,000.00	\$60,000.00	
42	1619	200000	NIDMP	Local Disaster Coordination Centre Software Upgrade and Centre Fit-out	Technical/Supporting Project		North Burnett Regional Council	Cancelled	\$54,000.00	\$54,000.00	\$54,000.00	
43	1621	200809	NOME	Disaster Coordination Centre Sortware opgrade and Centre Fit-out	Works/Construction	Other	Cairns Regional Council	Ineligible	\$26,134.00	\$26,133.00	\$26,133.00	
44	1624	200809	NOMP	Community Messaging System for Disaster Events	Technical/Supporting Project	Other	Townsville City Council	Ineligible	\$26,640.00	\$26,640.00	\$26,640.00	
45	1625	200809	NDMP	Webber Esplanade Erosion Solution	Technical/Supporting Project Works/Construction		Townsville City Council	Ineligible	\$12,122.00	\$12,121.00		
-		200000	Holen	Dedicated Disaster Coordination Centre & Combined Emergency Services	WORKS/GORSTruction	Other	Cook Shire Council	Ineligible	\$210,000.00;	\$210,000.00	\$210,000.00	\$630,000.
46	1628	200809	NOMP	Training Centre	Works/Construction	Other						
		200809		Laglan Road Bridge Upgrade	Works/Construction	Other	Cassowary Coast Regional Council Isaac Regional Council	Ineligible	\$0.00	\$21,000.00	\$21,000.00	\$42,000.
		200809		IKarumba Co-ordination Centre	Works/Construction	Other	Carpentaria Shire Council	Ineligible	\$0.00	\$550,000.00		\$1,100,000.
-	-		-	Caloundra District Wildfire Pre-Suppression Control Plan Stage 1 Blackall Range	WORKS CONSTITUTION	Other	Carpentaria Shire Council	Ineligible	\$33,000.00	\$33,000.00	\$33,000.00	\$99,000.
49	1641	200809	NDMP	Hinterland	Technical/Supporting Project	Bushfire	Sunshine Coast Regional Council	Ineligible	\$100,000.00	\$100,000.00	\$100,000.00	\$300,000
	1642	200809	NOMP	Sunshine Coast Regional Council Emergency Communication System Strategy	Technical/Supporting Project		Sunshine Coast Regional Council	Ineligible	\$15,000.00	\$15,000.00		
				Bulcock Beach Esplanade Seawalls Critical Infrastructure Web Enablement	Works/Construction	Other	Sunshine Coast Regional Council	Ineligible	\$1,139,192.00	\$1,139,192.00		
25	1646	200809	NDMP	Chical Infrastructure Web Enablement	Technical/Supporting Project	Other	Brisbane City Council	Ineligible	\$10,000.00	\$10,000.00		
53	1647	200809	NDMP	CANCELLED - Regional Online Emergency Coordination Centre Tool	Technical/Supporting Project	Other	SEQDMAG / Council of Mayors (SEQ)					
		200809	1	CANCELLED - Regional Sandbagging Resource	O'T ALL THE WAY TO SEE		SEQDMAG / Council of Mayors	Cancelled	\$20,000.00	\$20,000.00	\$20,000 00	\$60,000.
-		200809	-		Works/Construction	Other	(SEQ) SEQDMAG / Council of Mayors	Cancelled	\$57,666.00	\$57,667.00	\$57,667.00	\$173,000.0
			10000	CANCELLED - Regional Evacuation Centre Database	Technical/Supporting Project	Other	(SEO) Pormpuraaw Aboriginal Shire	Cancelled	\$9,166.00	\$9,167.00	\$9,167.00	\$27,500.
		200809		Pormpuraaw Disaster Management Infrastructure Development Project	Works/Construction	Other	Council	Ineligible	\$61,000.00	\$18,632.00	800 000 00	
56	1651	200809	NDMP	Northern Queensland Fire Atlas	Technical/Supporting Project	Bushfire	Tablelands Regional Council	Unsuccessful	\$240,695.66	\$240,695,67	\$58,000.00 \$240,695.67	
							And the second s		91.70,090.00	3240,093.67	3240,695.67	\$722,087
57		-										
57	1666	200809	NDMP	Fernvale and Lowood Floodplain Risk Management Study and Plan	Technical/Supporting Project	Flood	Somersel Regional Council	Unsuccessful	\$25,000.00	\$62,500.00	4001000.00	
57	1666	200809	NDMP	Fernvale and Lowcod Floodplain Risk Management Study and Plan	Technical/Supporting Project	Flood	Somersel Regional Council	SUBTOTAL TOTAL	\$25,000.00 2,099,615.66 6,781,547.32	\$62,500.00 2,665,747.67 8,154,169.84	2,705,115.67	7,470,479

Natural Disaster Risk Management Studies Program All Projects

1	No.	ID Number	Funding Year	Program	Study Title	Project Type	Categories	Organisation	Status	Applicant Proposed/Approved Funds	State Government Proposed/Approved Funds	Australian Government Proposed/Approved Funds	Other Proposed/Approved Funds	Total Project Cost
1	1	9	200001	NDRMSP	Logan River Hazard and Vulnerability Study (Phase One)		Flood	Logan City Council	Approved	\$23,000,00	\$22,000,00		COUNTY OF	
5 5 500 1 1 1 1 1 1 1 1 1					Caloundra City Council Disaster Risk Management Study	Technical/Supporting Project	Other							
5 10 1000						Technical/Supporting Project	Other		Approved					
Formation Control Co							Other							
1	5	39	200001	NDRMSP		Technical/Supporting Project	Other							
Total Control Cont	6	14	200001	NDRMSP		Technical/Supporting Project	Flood		100000000000000000000000000000000000000					
1	7	15	200001	NDRMSP		Technical/Supporting Project	Storm Tide	Cairns City Council	Cancelled	\$40,000.00	\$30,000.00	-		
1	8	1	200001	NDRMSP	Burdekin Shire Town of Ayr Flood Study	Technical/Supporting Project	Flood	Burdekin Shire Council	Closed					
1	9	2	200001	NDRMSP					Closed					
10 10 10 10 10 10 10 10		4	200001	NDRMSP	Etheridge Shire Disaster Management Plan Project									\$75,000.00
1	11	5	200001	NDRMSP	Flinders Shire Council Road Network Risk Management Study									\$10,000.00
1	12	6	200001	NDRMSP		Technical/Supporting Project								\$15,000.00
10 10 10 10 10 10 10 10	13	8	200001	NDRMSP		Technical/Supporting Project							\$0.00	\$90.000.0
10 10 10 10 10 10 10 10	14	10	200001	NDRMSP						\$50,000.00			\$0.00	\$150,000 0
19 17 30000 0.000000 0.000000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.0000000 0.00000000	15	11	200001	NDRMSP								\$41,700.00	\$0.00	\$125,000.00
17 13 2000 COMMAD Purp Share Database Nat Management Supy Services/Supports Propriet Purp Share Country Services/Supports Propriet Purp Share Country Services/Supports Propriet Services/Supports Pr	16	12	200001	NDRMSP								\$35,000.00		
To 10 10 10 10 10 10 10 1				122 - 27					Closed	\$21,000.00	\$21,000 00	\$21,000.00		
The color	17		100000			Technical/Supporting Project	e e	Perry Shire Council	Closed	\$7,666.00	\$7,667.00	\$7,667.00		\$23,000.00
9 20 200001 NoReady Section Floridation Section Sect	18	18	200001	NDRMSP	Coast	Technical/Supporting Project	Storm Tide	Caloundra City Council	Closed	\$18,000.00	\$18,000 00	\$18,000 00	\$0.00	\$54,000.00
Control Cont						Technical/Supporting Project	Flood	Gold Coast City Council	Closed	\$29,000.00	\$29,000.00	\$29,000,00	50.00	
Company Comp					Roma Town Bungil Creek Flood Study	Technical/Supporting Project	Flood	Roma Town Council	Closed	\$20,000.00	The Period			
22 23 200000 Northern N	21	22	200001	NDRMSP	Ipswich City Disaster Risk Management Strategy Planning								\$0.00	\$80,000.00
27 24 20000 Northern Notes Daves Links Abborated ther Black Andreame Enterough-Specialist Press Notes Daves Council Control State Council	22	23	200001	NDRMSP									\$0.00	
24 25 20000 NORMINGP Notes Copyric Name New Park Search No. 10 No. 1	23		200001	NORMSP		Technical/Currenting Project					\$25,000.00	\$25,000.00		
25 250 20000 NOHMBAD Department Sharp Company Cry Burneton Plant Section Sharp Country Cry Burneton Sharp Country Sharp Sharp Country Sharp Country Sharp Country Sharp Country Sharp Country Sharp Sharp Sharp Country Sharp Sharp Sharp Country Sharp						Technical/Supporting Project				\$15,000 00	\$15,000.00	\$15,000.00		
1						Technical/Supporting Project			Closed	\$3,334.00	\$3,333.00			
Section Proceed States Proced States Proced States Process Proce	100			-		Technical/Supporting Project	Other	Burdekin Shire Council	Closed	\$16,667.00				
Formation Comment Co			1000000		Flood Study		Flood	Thuringowa City Council	Closed	\$13,334 00				
28 29 20000 NPRIASP Month Programs of the Prog	27	28	200001	NDRMSP		Technical/Supporting Project	Flood	Thuringowa City Council	Closed	\$10,000,00	\$10,000.00	840 000 00	- 1100	
29 30 200001 NOPHSP Months Shire Massare fleats Management Study Technolar/Supporting Project Other Months Shire Study	28	29	200001			Technical/Supporting Project	Flood	Thuringowa City Council					2006.27	1000
30 31 300001 NOTH-MISP Herbarron Strew Mintersam Estate Floor Prevention Study Herbarron Strew Council Closed \$11,000 00 \$10,000 00	29	30	200001	NDRMSP	Monto Shire Natural Disaster Risk Management Study	Technical/Supportion Project	Other	Monio Shire Council	Classed	4.0.000			50.00	421,000.00
31 32 200001 NOTHINSP Forgarry Strine Designer Flest Study Sectional-Supporting Project Other Contract Contract Section Strine - Designer Flest Management Study Sectional-Supporting Project Other Contract Section Strine - Designer Flest Management Study Sectional-Supporting Project Other Section Strine - Sectio	30	31	200001	NDRMSP	Herberton Shire Millstream Estate Flood Prevention Study								\$0.00	\$51,000.00
22 33 200001 NDFMSP Sachum Strive Disasser Res Management Study Technical/Supporture Protect Other Supporture Protect	31	32	200001	NDRMSP				Kingarov Chira Council					\$0.00	\$45,600.00
33 34 300001 NDFMSP Ferring Food Militagation Study Technical/Supporting Protect Flood Security Study Security Study	32	33	200001	NDRMSP									\$0.00	\$24,000.00
35 500001 NORHASP Compress Sine Risk Management Study	33	34	200001	NDRMSP							\$8,333.00	\$8,334.00	\$0.00	
36 200001 NOPHASP Winton Shee Netural Desaler Resk Management Study Schmids/Supporting Project Chief Schmids/S	34		200001	NDRMSP							\$20,000 00	\$20,000.00		\$60,000,00
36		36	200001	NDRMSP		Technical/Supporting Project				\$10,200.00	\$10,200.00			\$30,600,00
24 200001 NPAMSP Asmac Shire Risk Management Study 150hneal/Supporting Project Other Asmac Shire Council Spino 0.0 \$12,500.0 \$12,500.0 \$0.00 \$37,500.0 \$39,000.0 \$30,000.0					Barcon Chira Disk Management Cturk	Technical/Supporting Project				\$15,000.00				
28					Araman Chira Diek Management Chira			Barcoo Shire Council	Closed	\$12,500.00	\$12,500.00			
13 20001 NDRMSP Section 13 20001 NDRMSP Section 14 20001 NDRMSP Section 15		- 10			Diagnation State Oak Management Study			Aramac Shire Council	Closed	\$9,900.00	\$9,900.00			
49 3 300001 NDRMSP Douglas Shire Disaster Risk Management Study Technical/Supporting Project Other Douglas Shire Council Finalised \$5,750.00 \$30,000 \$0,000 \$0,000 \$17,250.0 \$1,000					Cairns Natural Disaster Risk Management Study -				-			\$3,500.00	\$0.00	\$10,500.00
1	40	7	200004	NODERO					Cioseo	\$22,000.00	\$13,500.00	\$13,500.00	\$0.00	\$49,000.00
1	40	3						Douglas Shire Council	Finalised	\$20,000,00	\$20,000.00	\$20,000,00	60.00	200 000 0
1 1 200001 NDRMSP Calourd's City Flood Study Technical/Supporting Project City Flood Study Flood Flood Study Technical/Supporting Project City Flood Study Flood Flood Study Technical/Supporting Project City Flood Study Flood Flood Study Flood Study Flood Study Flood Study F								Bundaberg Regional Council	Finalised				\$0.00	\$17,250.00
17 200001 NDRMSP Caloundra City Flood Study Technical/Supporting Project Flood Caloundra City Council Finalised \$105,570 00 \$105,580.00 \$0.00 \$3116,730.0 \$105,580.00 \$3.00.00 \$3.16,730.0 \$105,580.00 \$3.00.00 \$3.16,730.0 \$105,580.00 \$3.00.00 \$3.16,730.0 \$105,580.00 \$3.00.00 \$3.16,730.0 \$105,580.00 \$3.00.00 \$3.00.00 \$3.16,730.0 \$3.16,73	-					Technical/Supporting Project		Pormpuraaw Aboriginal Shire Council	Finalised	\$23,505.00	\$18,956.00	\$18,956.00	\$0.00	\$61,417.00
44 37 2000001 NDRMSP Unique String Council Risk Management Study Technical/Supporting Project Other Longreach Regional Council Finalised \$5,000.00 \$5,00					Caloundra City Flood Study	Technical/Supporting Project		Caloundra City Council	Finalised	\$106 570 00	\$400 can ov	2.00 000 000		
49 40 200001 NDRMSP Quilpie Shire Risk Management Study Technical/Supporting Project Other Quilpie Shire Council Finalised \$5,000.00 \$5,000.00 \$5,000.00 \$5,000.00 \$5,000.00 \$5,000.00 \$5,000.00 \$5,000.00 \$2,791,879.00 \$919,786.00 \$919,780.00 \$919,786.00 \$919,786.00 \$919,780.00 \$919,786.00 \$919,786.00 \$919,786.00 \$919,786.00 \$919,780.00 \$919,78			200001	NDRMSP	Ilfracombe Shire Council Risk Management Study	Technical/Supporting Project	Other							\$316,730.00
1 200102 NDRMSP Caloundra City Council Disasser Risk Management Study Technical/Supporting Project Other Sunshine Coasi Regional Council Approved \$5,000.00 \$519,720.00 \$919,720.00 \$919,720.00 \$2,791,297.00 \$2,7	45	40	200001	NDRMSP	Quilpie Shire Risk Management Study			Quilnie Shire Council						\$15,000.00
19 200102 NDRMSP Caloundra City Council Disaster Risk Management Study Technical/Supporting Project Other Sunshine Coass Regional Council Approved \$5,000.00							130.0	Towns or the property	17.77.00.00					\$15,000.00
1 9 200102 NDRMSP Caloundra City Council Disaster Risk Management Study Technical/Supporting Project Other Sunshine Coast Regional Council Approved \$5,000.00 \$5,000.												\$919,785.00	\$0.00	\$2,791,297.00
2 38 200102 NDRMSP Isolord Shire Council Risk Management Study Technical/Supporting Project Other Longreach Regional Council Approved \$5,000.00 \$5	1.	19	200102	NDRMSP	Calcundra City Council Disaster Bisk Management Study	Technical/Europetica Diagram	TOWAR .	10				\$919,785.00	50.00	
3 9 200102 NDRIMSP Blackall Shire Council Fisk Management Study Technical/Supporting Project Other Blackall Tambo Regional Council Approved \$6,000 00 \$6,000 00 \$6,000 00 \$10,000 \$15,000 00 \$5,000	2	38												
4 46 200102 NDRMSP Burdekin Shire Town of Home Hill Flood Study Technical/Supporting Project Flood Burdekin Shire Council Approved \$46,667.00 \$	3					Technical/Supporting Project								\$18,000.0
5 55 200102 NDRMSP Richmord Rural Road Flood Damage Study Technical/Supporting Project Flood Richmord Shire Council Approved \$46,667.00 \$46,666.00 \$46,666.00 \$40,000.00 \$14,000.00 \$9,027.00 \$9							Floor		Approved					\$15,000.0
6 56 200102 NDRMSP Barcaldine Shire Council Natural Disaster Risk Management Study Technical/Supporting Project Other Southern Downs Regional Council Approved \$9,027.00 \$9,027.					Richmond Bural Boad Flood Damana Study					\$46,667.00		\$46,666.00		\$140,000.0
7													130 700	\$27,080.0
8 64 200102 NDRMSP Inglewood/Stanthorpe Shire Council Joint Natural Disaster Risk Inglewood/S	7	61	200102	NDRMSP					3.0		100741976			\$15,000.0
Management Study	8		-		Inglewood/Stanthorpe Shire Council Joint Natural Disaster Risk				7.0	7 - 7 - 7	224-1-1	\$12,333.00	\$0.00	\$37,000.0
10 70 200102 NDRMSP Duarings Shire Council Natural Disaster Fisk Management Studies Technical/Supporting Project Other Central Highlands Regional Council Approved \$11,667.00 \$11,667.00 \$11,667.00 \$35,000.00 \$3	-				Management Study	CONTRACTOR SERVICES		The state of the s	- 1		1000000	- The state of the	107000	\$42,315.00
11 76 200102 NDRMSP Banana Shire Callide Valley Flooding Risk Study Technolar Supromo Brises 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	10							a State of the Control of the Contro	Approved	\$13,333.00	\$13,333.00	\$13,334.00	\$0.00	\$40,000.00
Technical Supporting Project Flood Banana Shire Council Approved \$25,000.00 \$25,000.00 \$25,000.00 \$25,000.00 \$75,000.00	17.5	- 72.		15-3 10-6			78.5	The Act of the Control of the Contro			100/100/10		\$0.00	\$35,000.00
			1 600102	1. to i mor	Today of the Cambe Yangy Flooding Plant Study	recrinical/Supporting Project	Flood	Banaria Shire Council	Approved	\$25,000.00	\$25,000.00	\$25,000.00	\$0.00	\$75,000.00

Number	Funding Year	Program	Study Title	Project Type	Categories	Organisation	Status	Applicant Proposed/Approved Funds	State Government Proposed/Approved Funds	Australian Government Proposed/Approved Funds	Other Proposed/Approved Funds	Total Project Cost
81	200102	NDRMSP NDRMSP	Nerang River Flood Mitigation Community Consultation Study Roma Town and Bungil Shire Councils Risk Assessment Study	Technical/Supporting Project	Flood	Gold Coast City Council	Approved	\$35,400.00	\$35,300.00	\$35,300.00	\$0.00	\$106,000.
82	200102	NDRMSP	Rockhampton City Council and Fitzroy Shire Council Natural	Technical/Supporting Project	Other	Maranoa Regional Council	Approved	\$3,000 00	\$3,000.00	\$3,000.00	\$0.00	\$9,000.
-	10000		Disaster Risk Management Study Tara Chinchilla and Munita Shire Councils Natural Disaster Risk	Technical/Supporting Project	Other	Rockhampton Regional Council	Approved	\$538.00	\$538.00	\$538.00	\$0.00	\$1,614.
83	200102	NDRMSP	Management Study	Technical/Supporting Project	Other	Western Downs Regional Council	Approved	\$32,000.00	\$32,000.00	\$32,000.00	\$0.00	\$96,000.
84	200102	NDRMSP	Logan River Hazard and Vulnerability Study (Phase Two)	Technical/Supporting Project	Flood	Logan City Council	Approved	\$105,000.00	\$105,000.00	\$105,000.00		200000
6	200102		Boulia Shire Natural Disaster Risk Study Herbert River Improvement Trust Herbert Flood Study	Technical/Supporting Project Technical/Supporting Project	Flood	Boulia Shire Council	Approved	\$5,000.00	\$5,000.00	\$5,000.00	\$0.00 \$0.00	\$315,000 \$15,000
11	200102	NDRMSP	Mackay City Disaster Risk Assessment and Management	Technical/Supporting Project	Other	Mackay City Council	Closed	\$70,000.00	\$70,000.00	\$70,000.00	\$0.00	\$210,000
21	200102	NDRMSP	Roma Town Bungil Creek Flood Study	Technical/Supporting Project	Flood	Roma Town Council	Closed	\$37,000.00 \$20.000.00	\$37,000 00 \$20,000 00	\$37,000.00 \$20,000.00	\$0.00	\$111,000.
33	200102	NDRMSP	Ipswich City Disaster Risk Management Strategy Planning Eacharn Shire - Disaster Risk Management Study	Technical/Supporting Project	Other	Ipswich City Council	Closed	\$40,000 00	\$40,000.00	\$40,000.00	\$0.00	\$60,000. \$120,000.
34	200102	NDRMSP	Jericho Town Flood Mitigation Study	Technical/Supporting Project Technical/Supporting Project	Flood	Eacham Shire Council	Closed	\$8,333.00	\$8.333.00	\$8,334.00	\$0.00	\$25,000
35	200102	NDRMSP	Longreach Shire Risk Management Study	Technical/Supporting Project	Other	Jericho Shire Council Longreach Shire Council	Closed	\$20,000 00 \$10,200 00	\$20,000 00	\$20,000 00	\$0.00	\$60,000
36	200102	NDRMSP	Winton Shire Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Winton Shire Council	Closed	\$15,000.00	\$10,200.00 \$15,000.00	\$10,200.00 \$15,000.00	\$0.00	\$30,600
42	200102		Barcoo Shire Risk Management Study Aramac Shire Risk Management Study	Technical/Supporting Project	Other	Barcoo Shire Council	Closed	\$2,000 00	\$2,000.00	\$2,000.00	\$0.00 \$0.00	\$45,000. \$6,000.
44		NDRMSP	Diamantina Shire Risk Management Study	Technical/Supporting Project Technical/Supporting Project	Other	Aramac Shire Council Diamantina Shire Council	Closed	\$2,000.00	\$2,000.00	\$2,000.00	\$0.00	\$6,000.
47	200102	NDRMSP	Hinchinbrook Shire Storm Surge Study	Technical/Supporting Project		Hinchinbrook Shire Council	Closed	\$6,166.00 \$55,000.00	\$6,167.00 \$55,000.00	\$6,167.00	\$0.00	\$18,500.
48	200102	NDRMSP	Burdekin Rivers Improvement Trust Town of Giru Flood Study	Technical/Supporting Project	Flood	Burdekin Shire Rivers Improvement Trust	Closed	\$70,000.00	\$70,000.00		\$0 00 \$0 00	\$165,000
50	200102		Burdekin Shire Storm Surge Study Toowoomba City Disaster Risk Assessment Study	Technical/Supporting Project	Storm Tide	Burdekin Shire Council	Closed	\$95,000 00	\$95,000.00	\$95,000.00	\$0.00	\$210,000 \$285,000
53	200102		Bauhinia Shire Natural Disaster Risk Management Study	Technical/Supporting Project Technical/Supporting Project	Other	Toowoomba Regional Council Bauhinia Shire Council	Closed	\$20,500 00	\$20,500.00	\$20,500.00	\$0.00	\$61,500
54	200102	NDRMSP	Sarina and Broadsound Shires Risk Management Study	Technical/Supporting Project	Other	Sarina Shire Council	Closed	\$15,000.00 \$20,000.00	\$15,000.00	\$15,000.00	\$0.00	\$45,000
57 58	200102		Jericho Shire Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Jericho Shire Council	Closed	\$3,500.00	\$20,000.00 \$3,500.00	\$20,000.00 \$3,500.00	\$0.00 \$0.00	\$60,000
60	200102		Kilkivan Shire Natural Disaster Risk Management Study Biggenden Shire Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Kilkiyan Shire Council	Closed	\$12,000.00	\$12,000.00	\$12,000 00	\$0.00	\$10,500 \$36,000
62	200102		Whitsunday Shire Natural Disaster Risk Management Study	Technical/Supporting Project Technical/Supporting Project	Other	Biggenden Shire Council Whitsunday Shire Council	Closed	\$13,333.00	\$13,334 00	\$13,333.00	\$0.00	\$40,000
65	200102	NDRMSP	Doomadgee Risk Management Study	Technical/Supporting Project	Other	Doomadgee Aboriginal Community Council	Closed	\$13,000 00 \$24,357 00	\$13,000 00		\$0.00	\$39,000
67	200102		Cardwell Shire Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Cardwell Shire Council	Closed	\$14,450.00	\$24,351.00 \$14,450.00	\$24,351 00 \$14,450 00	\$0.00	\$73,059
71	200102		Caloundra City Bushlire Strategy Cloncurry Shire Natural Disaster Risk Management Study	Technical/Supporting Project	Bushfire	Caloundra City Council	Closed	\$7,000.00	\$7,000.00	\$7,000.00	\$0.00 \$0.00	\$43,350 \$21,000
72	200102		Peak Downs Shire Natural Disaster Risk Management Study	Technical/Supporting Project Technical/Supporting Project	Other	Cloncurry Shire Council	Closed	\$24,905.00	\$24,905.00	\$24,905.00	\$0.00	\$74,715
73	200102		Croydon Shire Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Peak Downs Shire Council Croydon Shire Council	Closed	\$15,000.00	\$15,000.00		\$0.00	\$45,000
74	200102		Redcliffe City Natural Disaster Flisk Management Study	Technical/Supponing Project	Other	Redcliffe City Council	Closed	\$10,930.00	\$7,000.00 \$10,930.00		\$0.00	\$21,000.
79	200102	NDRMSP	Goondiwindi Town Levee Failure Study	Technical/Supporting Project	Flood	Goondiwindi Town Council	Closed	\$10,000.00	\$10,000.00	\$10,930.00 \$10,000.00	\$0.00 \$0.00	\$32,790 (
85	200102	NDRMSP	Atherton Tablelands Natural Disaster Risk Management Study Emerald Shire Natural Disaster Risk Management Study	Technical/Supporting Project Technical/Supporting Project	Other	Alherton Shire Council	Closed	\$20,630.00	\$20,630.00		\$0.00	\$61,890
86	200102		Wambo Shire Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Emerald Shire Council Wambo Shire Council	Closed	\$20,000 00	\$20,000.00	\$20,000.00	\$0.00	\$60,000
88		NDRMSP	Carpentaria Shire Drainage and Flood Study	Technical/Supporting Project	Flood	Carpentaria Shire Council	Closed	\$14,500.00 \$31,000.00	\$14,500.00 \$30,000.00	\$14,500.00	\$0.00	\$43,500
91	200102	NDRMSP	Broadsound and Sarina Shires Cyclone Risk Study	Technical/Supporting Project	Cyclone	Broadsound Shire Council	Closed	\$35,489.00	\$35,488.00	\$30,000 00 \$35,488.00	\$0.00	\$91,000
37	200102		Caloundra City Flood Study Ilfracombe Shire Council Risk Management Study	Technical/Supporting Project	Flood	Caloundra City Council	Finalised	\$73,334 00	\$73,333.00	\$73,333.00	\$0.00	\$106,465 \$220,000
40		NDRMSP	Quilpie Shire Risk Management Study	Technical/Supporting Project Technical/Supporting Project	Other	Quilpie Shire Council	Finalised	\$5,000.00	\$5,000.00	\$5,000.00	\$0.00	\$15,000
45	200102		Townsville City Flood Hazard Assessment and Development of Treatment Options Study	Technical/Supporting Project	Flood	Townsville City Council	Finalised	\$5.000.00 \$116,000.00	\$5,000.00 \$116.000.00	\$5,000.00 \$116,000.00	\$0.00 \$0.00	\$15.000 \$348.000.
51 52	200102		Belyando Shire Council Natural Disaster Risk Study	Technical/Supporting Project	Other	Isaac Regional Council	Finalised	\$20,500.00	\$20,500 00	\$20,500.00	\$0.00	- 0.7.14-0.20
59	200102		Tambo Shire Council Natural Disaster Risk Management Study Nebo Shire Natural Disaster Risk Management Study	Technical/Supporting Project Technical/Supporting Project	Other	Blackall-Tambo Regional Council	Finalised	\$5,000.00	\$5,000.00		\$0.00	\$61,500 (\$15,000 (
63	200102		Mirani Shire Council Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Nebo Shire Council Mackay Regional Council	Finalised	\$15,000.00 \$11,000.00	\$15,000.00	\$15,000.00	\$0.00	\$45,000.
66 75	200102		Clifton Shire Council Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Toowoomba Regional Council	Finalised	\$9,500.00	\$11,000.00	\$11,000.00 \$9,500.00	\$0.00	\$33,000.
			Capricorn Coast Storm Tide Hazard Investigation EPA Tropical Cyclone Wave Impact: Caloundra-Maroochy and	Technical/Supporting Project	Storm Tide	Livingstone Shire Council	Finalised	\$30,000 00	\$30,000.00	\$30,000.00	\$0.00 \$0.00	\$28,500. \$90,000.
89	200102	NDRMSP	Hervey Bay	Technical/Supporting Project	Cyclone	Department of Environment & Resource Management	Finalised	\$40,383.00	\$40,382.00	\$40,382.00	\$0.00	\$121,147.
78	200102	NDRMSP	Brisbane Water Flood Contingency Plan - The Supply of Potable Water	Technical/Supporting Project	Flood	Brisbane Water (Brisbane City Council)	SUBTOTAL	\$1,448,080.00 \$53,000.00	\$1,446,973.00 \$43,000.00	\$1,446,972.00 \$43,000.00	\$0.00	\$4,342,025.
90	200102	NDRMSP	Caloundra-Maroochy Water Board Lake Baroon Dam Break Risk Assessment and Treatment Study	Works/Construction	Other Other	Caloundra-Maroochy Water Supply Board	Ineligible	\$20,644.00	\$20,644.00	. 5.45.4	\$0.00	\$139,000.
92		NDRMSP	NO Water - Lower Ross River Hydraulics Study	Technical/Supporting Project	Flood	NQ Water	Ineligible	\$23,000.00			\$0.00	\$61,932.
93	200102	NDRMSP	NO Water Ross River Dam Options Study	Works/Construction	Other:Other		Ineligible	\$130,000.00	\$23,000.00 \$130,000.00	\$23,000.00 \$130,000.00	\$0.00	\$69,000
							SUBTOTAL	\$226,644.00			\$0.00	\$390,000. \$659,932.
39	200203	NDRMSP	Blackall Shire Council Risk Management Study	Technical/Connecting States	Town	Burney & Bur	TOTAL	\$1,674,724.00	\$1,663,617.00		\$0.00	\$5,001,957
56	200203			Technical/Supporting Project	Other	Blackall-Tambo Regional Council	Approved	\$2,000 00	\$2,000.00	\$2,000.00	\$0.00	\$6,000.
76	200203	NDRMSP	Barcaldine Shire Council Natural Disaster Risk Management Study Banana Shire Callide Valley Flooding Risk Study		Other	Barcaldine Regional Council	Approved	\$5,000.00	\$5,000.00	\$5,000.00	\$0.00	\$15,000.
77	200203		Nerang River Flood Mitigation Community Consultation Study	Technical/Supporting Project Technical/Supporting Project	Flood	Banana Shire Council Gold Coast City Council	Approved	\$25,000 00	\$25,000 00	\$25,000.00	\$0.00	\$75,000.
82	200203		Rockhampton City Council and Fitzroy Shire Council Natural	A STATE OF THE STA			Approved	\$25,000.00	\$25,000.00	\$24,000.00	\$0.00	\$74,000.
87	102100		Disaster Risk Management Study	Technical/Supporting Project	Other	Rockhampton Regional Council	Approved	\$15.660.00	\$15,660.00	\$15,660.00	\$0.00	\$46,980
95	200203	NDRMSP	Boulia Shire Natural Disaster Risk Study Bowen Shire Council Disaster Mitigation Plan Study	Technical/Supponing Project	Other	Boulia Shire Council	Approved	\$5,000.00	\$5,000.00	\$5,000.00	\$0.00	\$15,000
96	200203		Bower Shire Council Evacuation Plan	Technical/Supporting Project Works/Construction	Other Other	Whitsunday Regional Council Whitsunday Regional Council	Approved	\$31,000,00	\$31,000 00	\$31,000.00	\$0.00	\$93,000
97	200203		Woocoo Shire Council Natural Disaster Risk Management Study			Whitsunday Regional Council	Approved	\$12,000.00			\$0.00	\$36,000
	-000000	10000		Technical/Supporting Project	Other	Fraser Coast Regional Council	Approved	\$13,000 00	\$13,000.00	\$13,000.00	\$0.00	\$39,000
106	200203	NDRMSP	Mount Isa City Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Mount Isa City Council	Approved	\$26,000.00	\$26,000.00	\$26,000.00	\$0.00	\$78,000

o. Number	Fundin Year	Program		Project Type	Categories	Organisation	Status	Applicant Proposed/Approved Funds	State Government Proposed/Approved Funds	Australian Government Proposed/Approved Funds	Other Proposed/Approved Funds	Total Project Cost
1 108	200203		Boonah Shire Council Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Scenic Rim Regional Council	Approved	\$10,000.00	\$10,000.00	\$10,000.00		#20 000 B
3 132			Gatton Shire Council Natural Disaster Risk Management Study Burke Shire Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Lockyer Valley Regional Council	Approved	\$8,599.34	\$8.598.33	\$8,598.33	\$0.00 \$0.00	\$30,000.00 \$25,796.00
			cancelled - Eidsvold Shire Natural Disaster Risk Management	Technical/Supporting Project	Other	Burke Shire Council	Approved	\$20,000.00	\$20,000.00	\$20,000.00	\$0.00	\$60,000.00
4 100	200203	NDRMSP	Study Study	Technical/Supporting Project	Other	Eidsvold Shire Council	Cancelled	\$7,000.00	\$7,000.00			
5 129	200203	3 NDRMSP	Cancelled - Hervey Bay Community Vulnerability Database	Works/Construction	Other Other	Hervey Bay City Council	120000000			\$7,000.00	\$0.00	\$21,000.00
6 133	200203	NDRMSP	Caboolture Shire Council Natural Disaster Risk Management Study	Technical/Supporting Project	Other		Cancelled	\$7,000.00	\$7,000.00	\$7,000.00	\$0.00	\$21,000.00
7 11	200203		2002-03			Moreton Bay Regional Council	Cancelled	\$5,000.00	\$5,000.00	\$5,000.00	\$0.00	\$15,000.00
8 22	200200		Mackay City Disaster Flisk Assessment and Management	Technical/Supporting Project	Other	Mackay City Council	Closed	\$39,000.00	\$39,000.00	\$39,000.00		CI CA-COLL
9 47	200203		Ipswich City Disaster Risk Management Strategy Planning Hinchinbrook Shire Storm Surge Study	Technical/Supporting Project	Other	Ipswich City Council	Closed	\$20,000 00	\$0.00	\$0.00	\$0.00 \$0.00	\$117,000.00 \$20,000.00
0 57	200203		Jericho Shire Natural Disaster Risk Management Study	Technical/Supporting Project Technical/Supporting Project	Storm Tide Other	Hinchinbrook Shire Council	Closed	\$2,000.00	\$2,000 00	\$2,000.00	\$0.00	\$6,000.00
1 88	200203	3 NDRMSP	Carpentaria Shire Drainage and Flood Study	Technical/Supporting Project	Flood	Jencho Shire Council Carpentaria Shire Council	Closed	\$3,500 00	\$3,500 00	\$3,500.00	\$0.00	\$10,500.00
2 94	200203		Nanango Shire Disaster Risk Management Study	Technical/Supporting Project	Other	Nanango Shire Council	Closed	\$22,000 00 \$10,000 00	\$22,000 00	\$22,000 00	\$0.00	\$66,000.00
3 99 4 101	200203		Burnett Shire Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Burnett Shire Council	Closed	\$15,000.00	\$10,000 00 \$15,000 00	\$10,000 00	\$0.00	\$30,000.00
101			Maryborough City Council Disaster Risk Management Study	Technical/Supporting Project	Other	Maryborough City Council	Closed	\$13,334.00	\$13,333.00	\$15,000.00 \$13,333.00	\$0.00	\$45,000.00
6 104	20020		Esk Shire Natural Disaster Risk Management Study Isis Shire Disaster Risk Management Study	Technical/Supporting Project	Other	Esk Shire Council	Closed	\$12,000.00	\$12,000,00	\$12,000.00	\$0.00 \$0.00	\$40,000.00 \$36,000.00
7 107	200203		Mount Isa Breakaway Creek Flood Study	Technical/Supponing Project	Other	Isis Shire Council	Closed	\$8,018.00	\$8,018.00	\$8,018.00	\$0.00	\$24,054.00
8 109	200203	3 NDRMSP	Redland Shire Natural Disaster Risk Management Study	Technical/Supporting Project Technical/Supporting Project	Other	Mount Isa City Council Redland City Council	Closed	\$21,667.00	\$21,667.00	\$21,666.00	\$0.00	\$65,000 00
9 111	200203		Dalby Flood Mitigation Study	Technical/Supporting Project	Flood	Dalby Town Council	Closed	\$20,000.00	\$20,000 00	\$20,000.00	\$0.00	\$60,000 00
0 113			Kilcoy Shire Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Kilcoy Shire Council	Closed	\$8,000 00 \$12,000 00	\$8,000.00	\$8,000.00	\$0.00	\$24,000.00
11 114	-	3 NDRMSP	Balonne Shire Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Batonne Shire Council	Closed	\$15,000.00	\$12,000.00 \$15,000.00	\$12,000.00	\$0.00	\$36,000 00
13 118	20020		Gayndah Shire Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Gayndah Shire Council	Closed	\$13,400.00	\$13,300.00	\$15,000.00 \$13,300.00	\$0.00	\$45,000.00
123			Pine Rivers Shire Bushfire Management Strategy Cooloola Natural Disaster Risk Management Study	Technical/Supporting Project	Bushtire	Pine Rivers Shire Council	Closed	\$22,000.00	\$22,000.00	\$22,000.00	\$0.00 \$0.00	\$40,000.00
124	20020		Yarrabah Community Natural Disaster Risk Management Study	Technical/Supporting Project Technical/Supporting Project	Other	Cooloola Shire Council	Closed	\$10,000 00	\$10,000.00	\$10,000.00	\$0.00	\$56,000.00
126	200203	3 NDRMSP	Lake Placid/Caravonica/Kamerunga Flood Mitigation Study	Technical/Supporting Project	Flood	Yarrabah Aboriginal Shire Council Caims City Council	Closed	\$11,450.00	\$11,450.00	\$11,450.00	\$0.00	\$34,350.00
127	20020		Townsville City Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Townsville City Council	Closed	\$22,200.00	\$22,200.00	\$22,200.00	\$0.00	\$66,600 00
88 128	20020		Pittsworth Shire Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Pritsworth Shire Council	Closed	\$98,000.00 \$12,000.00	\$97,000 00	\$97,000.00	\$0.00	\$292,000 00
10 134	20020		Hervey Bay Natural Disaster Risk Management Plan	Technical/Supporting Project	Other	Hervey Bay City Council	Closed	\$8,000 00	\$12,000.00 \$8,000.00	\$12,000.00	\$0.00	\$36,000 00
11 135			Calliope Shire Natural Disaster Risk Management Study Cambooya Shire Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Calliope Shire Council	Closed	\$13,000.00	\$13,000.00	\$8,000.00 \$13,000.00	\$0.00 \$0.00	\$24,000.00
12 136		3 NDRMSP	Hervey Bay Evacuation and Community Recovery Plan	Technical/Supporting Project	Other	Cambooya Shire Council	Closed	\$12,000.00	\$12,000.00	\$12,000.00	\$0.00	\$39,000 00
13 137			Wonday Shire Natural Disaster Risk Management Study	Works/Construction Technical/Supporting Project			Closed	\$21,000.00	\$21,000.00	\$21,000.00	\$0.00	\$63,000 00
14 138	20020		Dairymple and Charlers Towers Natural Disaster Risk Management		Other	Wondai Shire Council	Closed	\$10,000.00	\$10,000.00	\$10,000.00	\$0.00	\$30,000 00
15 140	20020		Sludy	Technical/Supporting Project	Other	Dairymple Shire Council	Closed	\$25,000.00	\$25,000.00	\$25,000.00	\$0.00	\$75,000 00
16 141			Whitsunday Storm Surge Study Thuringowa City Council Toolakea Beach Flood Study	Technical/Supporting Project Technical/Supporting Project	Storm Tide Flood	Whitsunday Shire Council Townsville City Council	Closed	\$35,000 00	\$35,000.00	\$35,000 00	\$0.00	\$105,000.00
17 142	20020	3 NDFIMSP	Gladstone City Council Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Gladstone City Council	Closed	\$10,000.00	\$10,000.00	\$10,000.00	\$0.00	\$30,000 00
144	20020	3 NDRMSP	Abonginal Coordinating Council Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Aboriginal Local Government Association of Old	Closed	\$35,000 00	\$35,000 00	\$35,000.00	\$0.00	\$105,000.00
19 40	20020		Quilpie Shire Risk Management Study	Technical/Supporting Project	Other	Quipie Shire Council	Closed	\$55,333.00	\$55,333 00	\$55.334 00	\$0.00	\$166,000.00
50 52	20020		Tambo Shire Council Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Blackall-Tambo Regional Council	Finalised	\$2,000.00	\$2,000.00	\$2,000.00	\$0.00	\$6,000.00
51 98 52 102	20020		Brisbane City Disaster Risk Management Project	Technical/Supporting Project	Other	Brisbane City Council	Finalised	\$5,000 00 \$68,000 00	\$5,000.00	\$5,000.00	\$0.00	\$15,000 00
	-		Maropochy Shire Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Maroochy Shire Council	Finalised	\$16,667.00	\$87,166.00 \$16,667.00	\$67,166.00 \$16,666.00	\$0.00	\$202,332 00
105	1000000	The state of the s	Crows Nesi Shire Council Natural Disaster Risk Management Study	Committee of the Commit	Other	Toowoomba Regional Council	Finalised	\$13,000 00	\$12,500.00	\$12,500.00	\$0.00 \$0.00	\$50,000.00 \$38,000.00
112		NDRMSP	Tareom Snire Natural Disaster Risk Management Study Cook Shire Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Taroom Shire Council	Finalised	\$13,333.00	\$13,333.00	\$13,334.00	\$0.00	\$40,000.00
6 115		3 NDRMSP	Bulloo Shire Natural Disaster Risk Management Study	Technical/Supporting Project Technical/Supporting Project	Other	Cook Shire Council	Finalised	\$10,000.00	\$10,000.00	\$10,000.00	\$0.00	\$30,000.00
57 117	20020	NDRMSP	Murgon Shire Cherbourg Shire Joint Natural Disaster Risk		Other	Bulloo Shire Council	Finalised	\$15,000.00	\$15,000.00	\$15,000.00	\$0.00	\$45,000.00
8 119			Management Study Munduberra Shire Council Natural Disaster Risk Management	Technical/Supporting Project	Other	Murgan Shire Council	Finalised	\$13,000.00	\$13,000.00	\$13,000.00	\$0.00	\$39,000.00
9 120	-		Study Bundahara City Matural Dispeter Birth Management Charles	Technical/Supporting Project	Other	North Burnett Regional Council	Finalised	\$11,000.00	\$11,000.00	\$11,000.00	\$0.00	\$33,000.00
0 125		3 NDFIMSP	Bundaberg City Natural Disaster Risk Management Study Livingstone Shire Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Bundaberg City Council	Finalised	\$15,000.00	\$15,000.00	\$15,000.00	\$0.00	\$45,000.00
139			Laidley Shire Natural Disaster Risk Management Study	Technical/Supporting Project Technical/Supporting Project	Other	Livingstone Shire Council	Finalised	\$17,000 00	\$17,000.00	\$17,000.00	\$0.00	\$51,000.00
			The state of the s	President Supporting Project	Carrier	Laidley Shire Council	Finalised	\$15,000.00	\$15,000 00	\$15,000.00	\$0.00	\$45,000.00
32 121	20020	3 NDRMSP	Ipswich River Improvement Trust Disaster Management Study	Technical/Supporting Project	Flood	Promise Phone to account to	SUBTOTAL	\$1,066,161.34	\$1,043,725.33	\$1,042,725.33	\$0.00	\$3,152,612.00
3 122		2.75	Bremer River Carchment Burdekin Shire Combined River Flood and Storm Surge Study	Technical/Supporting Project		Ipswich Rivers Improvement Trust	Unsuccessful	\$99,000.00	\$99,000.00	\$99,000,00	\$0.00	\$297,000 00
145		C. Designation of the Control of the	HopevaleCommunity Council Natural Disaster Risk Management		Other	Burdekin Shire Council	Unsuccessful	\$48,000.00	\$48,000.00	\$48,000.00	\$0.00	\$144,000.00
35 146	20020		New Mapoon Natural Disaster Risk Management Study	Technical/Supporting Project	2001	Aboriginal Local Government Association of Old	Unsuccessiul	\$24,668.00	\$24,666.00	\$24,666.00	\$0.00	\$74,000.00
6 147	20020	0 NDRMSP	Umagico Natural Disaster Risk Management Study	Technical/Supporting Project Technical/Supporting Project	Other	Abordinal Local Government Association of Old	Unsuccessful	\$24,668.00	\$24,666.00	\$24,666.00	\$0.00	\$74,000.00
57 148			Wujal Wujal Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Aboriginal Local Government Association of Old Aboriginal Local Government Association of Old	Unsuccessful	\$24,668.00	\$24,666.00	\$24,666.00	\$0.00	\$74,000.00
				and index		Control Covernment Association of Old	SUBTOTAL	\$24,668.00 \$245.672.00	\$24,666.00	\$24,666.00	\$0.00	\$74,000.00
1	1						TOTAL	\$1,311,833.34	\$245,664.00 \$1,289,389.33	\$245,664.00	\$0.00	\$737,000.00
1 56	20030	The second second	Barcaldine Shire Council Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Barcaldine Regional Council	Approved	\$2,000 00	\$2,000.00	\$1,288,389,33	\$0.00	\$3,889,612.00
2 87	20030		Boulia Shire Natural Disaster Risk Study	Technical/Supporting Project	Other	Boulia Shire Council	Approved	\$2,000 00	\$2,000.00		\$0.00	\$6,000.00
3 150	20030	4 NDRMSP	Beaudesert Shire Council Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Scenic Rim Regional Council	Approved	\$22,000.00	\$2,000.00	\$2,000 00	\$0.00	\$6,000.00
100										\$22,000.00	\$0.00	\$66,000.00

Numbe	Funding Year	Program	Study Title	Project Type	Categories	Organisation	Status	Applicant Proposed/Approved Funds	State Government Proposed/Approved Funds	Australian Government Proposed/Approved Funds	Other Proposed/Approved Funds	Total Project Cost
156	200304	NDRMSP	Chinchilla Shire Council Community Vulnerability Study	Technical/Supporting Project	Flood Bushlir e	Western Downs Regional Council	Approved	\$12,000.00	\$12,000.00	\$12,000.00	\$0.00	\$36,000.0
160	200304	NDRMSP	Livingstone Shire Council Catchment Management Plan	Technical/Supporting Project	Storm Tide Flood	Rockhampton Regional Council	Approved	\$25,000.00	\$25,000.00	\$25,000.00	\$0.00	\$75,000.0
166	200304	17 400 - 1150-00-	Tara Shire Council Community Hazard and Vulnerability Study Mornington Island Council Road Flood Risk Assessment	Works/Construction	Other Other	Western Downs Regional Council	Approved	\$14,000.00	\$14,000.00	\$14,000.00	\$0.00	\$42,000.0
170	200304	NDRMSP		Works/Construction	Storm	Morningion Shire Council Department of Environment & Resource	Approved	\$47,400.00	\$47,400.00	\$47,400.00	\$0.00	\$142,200 (
715		20000	Guli of Carpentaria Tropical Cyclone Surge and Wave Impacts	Technical/Supporting Project	Tide:Cyclone	Management	Approved	\$0.00	\$90,000 00	\$55,000 00	\$0.00	\$145,000.0
743	200304	NDRMSP	Kowanyama Natural Disaster Risk Miligation Plan Palm Island Disaster Risk Management Study	Technical/Supporting Project Technical/Supporting Project	Other	Kowanyama Aboriginal Shire Council	Approved	\$11,500.00	\$11,500.00	\$11,500.00	\$0.00	\$34,500.0
158	200304	NDRMSP	CANCELLED - Severe Storm Surge Impact on the Resources of	Technical/Supporting Project	Storm Tide	Palm Island Aboriginal Shire Council Cairns City Council	Approved	\$13,334 00 \$6,000 00	\$13,333.00	\$13,333.00	\$0.00	\$40,000 (
161	200304	NDRMSP	the Caims' Emergency Agencies Study Mt Morgan Shire Council Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Rockhampton Regional Council			\$6,000.00	\$6,000.00	\$0.00	\$18,000.0
168	200304	NDRMSP	Cancelled - Kowanyama Lockhart River Mapoon Napranum				Cancelled	\$10,500.00	\$10,500 00		\$0.00	\$31,500.0
57	200304	NDRMSP	Palm Island NDRMS Jericho Shire Natural Disaster Risk Management Study	Technical/Supporting Project Technical/Supporting Project	Other	Aboriginal Local Government Association of Old Jericho Shire Council	Cancelled	\$62,000.00	\$62,000 00		\$0.00	\$186,000 (
88	200304		Carpentaria Shire Drainage and Flood Study	Technical/Supporting Project	Flood	Carpentana Shire Council	Closed	\$2,000 00 \$3,000 00	\$2,000.00	\$2,000.00	\$0.00	\$6,000
151	200304	NDRMSP	Booringa Shire Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Booringa Shire Council	Closed	\$11,000.00	\$3,000.00 \$11,000.00		\$0.00	\$9,000 (
152	200304	NDRMSP	Bowen Shire Council Storm Surge Risk Assessment Study Caboolture Shire Bushfire and Landslide Hazard Risk Assessment	Technical/Supporting Project	Storm Tide	Whitsunday Regional Council	Closed	\$43,000.00	\$43,000.00		\$0.00 \$0.00	\$33,000 (\$129,000 (
153	200304		Study	Technical/Supporting Project	Bushfire Land	Caboolture Shire Council	Closed	\$50,000 00	\$50,000.00		\$0.00	\$150,000
154	200304		Caboolture Shire Flood Hazard Risk Assessment Study Cardwell Shire River Improvement Trust Flood Risk Assessment	Technical/Supporting Project	Flood	Cabooliure Shire Council	Closed	\$40,000.00	\$40,000.00	\$40,000.00	\$0.00	\$120,000.0
155	200304	NDRMSP	Study	Technical/Supporting Project	Flood	Cardwell Shire River Improvement Trust	Closed	\$3,500 00	\$3,500.00	\$3,500.00	\$0.00	\$10,500 (
157	200304		Bremer River Catchment - Flood Risk Management Study Island Coordinating Council Natural Disaster Risk Management	Technical/Supporting Project	Flood	Ipswich Rivers Improvement Trust	Closed	\$32,000.00	\$32,000 00	\$32,000.00	\$0.00	\$96,000 0
159			Study Pine Rivers Shire Council Flood and Landslide Management	Technical/Supporting Project	Other	Island Coordinating Council	Closed	\$30,000.00	\$30,000 00	\$30,000 00	\$0.00	\$90,000.0
162	11	NDRMSP	Strategies	Technical/Supporting Project	Flood: Landsli de	Pine Rivers Shire Council	Closed	\$26,000 00	\$26,000.00	\$26,000 00	\$0.00	\$78,000 (
52	200304		Paroo Shire Disaster Risk Assessment Study Tambo Shire Council Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Paroo Shire Council	Closed	\$10,000 00	\$10,000.00	\$10,000.00	\$0.00	\$30,000
98	200304		Brisbane City Disaster Risk Management Project	Technical/Supporting Project	Other	Blackall-Tambo Regional Council	Finalised	\$2,000.00	\$2,000.00	\$2,000.00	\$0.00	\$6,000
164			Whitsunday Shire Council Landslip Risk Assessment Study	Technical/Supporting Project Technical/Supporting Project	Other	Brisbane City Council	Finalised	\$40,000.00	\$40,000.00		\$0.00	\$120,000
165	200304	NDRMSP	Miriam Vale Shire Natural Disaster Risk Assessment Study	Technical/Supporting Project	Other	Whitsunday Regional Council Minam Vale Shire Council	Finalised Finalised	\$50,000 00 \$48,300 00	\$50,000.00 \$48,300.00		\$0.00	\$150,000.
171	200304	NDRMSP	Townsville and Thuringowa Tropical Cyclone Surge Wave impacts and Inundation Study	Technical/Supporting Project	Storm Tide:Cyclone	Townsville City Council	Finalised	\$50,000,00	\$50,000.00	\$48,300.00 \$50,000.00	\$0.00 \$0.00	\$144,900.0
716	200304	NDRMSP	Lockhart River Aboriginal Council Disaster Risk Management Study	Technical/Supporting Project	Other	Lockharl River Aboriginal Council	Finalised	\$13,312.00	\$13,312 00		\$0.00	100000
		1	Insurab Complete and Total Complete and Comp				SUBTOTAL	\$681,846.00	\$771,845.00		\$0.00	\$39,935.0
121			Ipswich River Improvement Trust Disaster Management Study Bremer River Catchment	Technical/Supporting Project	Flood	Ipswich Pivers Improvement Trust	Unsuccessful	\$55,000.00	\$55,000.00	- Inches	\$0.00	\$165,000.0
136	200304		Hervey Bay Evacuation and Community Recovery Plan Beaudesen Shire Bushfire Risk Management Study	Works/Construction Technical/Supporting Project	Other Other Bushfire	Hervey Bay City Council Beaudesert Shire Council	Unsuccessful	\$7,000.00	\$7,000.00	\$7,000.00	\$0.00	\$21,000.0
169	200304	NDRMSP	Queensland Local Governments Storm Tide Mapping Project	Technical/Supporting Project	Storm Tide	Department of Environment & Resource	Unsuccessful	\$12,000,00	\$12,000.00	2100222	\$0.00	\$36,000.0
	100000		The image of the control of the cont	Toolanday Sopporting Project	Sionii Tige	Management	Unsuccessful	\$1.00	\$0.00		\$0.00	\$1.0
1	1	1			10		TOTAL	\$74,001.00 \$755,847.00	\$74,000.00 \$845.845.00	\$74,000.00 \$810,844.00	\$0.00	\$222,001.0 \$2,412,536.0
160			Livingstone Shire Council Calcriment Management Plan	Technical/Supporting Project	Tide Flood	Flockhampion Regional Council	Approved	\$82,500.00	\$82,500.00		30.00	\$247,500.0
167	200405		Mornington Island Council Road Flood Risk Assessment	Works/Construction	Other Other	Mornington Shire Council	Approved	\$66,140.00	\$64,500 00		\$0.00	\$195,140.0
	-		Bowen Shire Council Don River Sand Depth Surveys	Technical/Supporting Project	Flood	Whitsunday Regional Council	Approved	\$50,000.00	\$50,000.00	\$50,000 00	\$0.00	\$150,000.0
177	_	111111111111111111111111111111111111111	Beaudesen Shire Council Bushfire Risk Management Study 2004	Technical/Supporting Project	Bushfire	Scenic Rim Regional Council	Approved	\$20,000.00	\$20,000 00	\$20,000.00	\$0.00	\$60,000.0
179	200405		Caloundra City Council Landslide Risk Assessment Study Tiaro Shire Council Storm Tide Study	Technical/Supporting Project	Landslide	Sunshine Coasi Regional Council	Approved	\$15,000.00	\$15,000 00	\$15,000 00	\$0.00	\$45,000
189			Redland Shire Landslide Hazard Risk Assessment Study	Technical/Supporting Project Technical/Supporting Project	Storm Tide Landslide	Fraser Coast Regional Council	Approved	\$39,000.00	\$39,000.00	\$39,000 00	\$0.00	\$117,000
194			Burnett Shire Council Storm Surge Study	Technical/Supporting Project	Storm Tide	Redland City Council Bundaberg Regional Council	Approved	\$10,000 00	\$10,000.00	\$10,000 00	\$0.00	\$30,000
199	200405	NDRMSP	Richmond Shire All Hazards Risk Identification and Management Study	Technical/Supporting Project	Other	Richmond Shire Council	Approved	\$66,666.00 \$10,000.00	\$66,667 00 \$10,000 00		\$0.00	\$200,000
203	200405	NDRMSP	Rosalie Shire Council Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Toowoomba Regional Council	Approved	\$11,000.00	\$11,000.00		\$0.00	\$30,000
205	200405	NDRMSP	Dalrymple Shire Council Flood Damage to Gravel Roads Risk Assessment Study	Technical/Supporting Project	Storm Tide:Flood	Chaners Towers Regional Council	Approved	\$12,668.00	\$12,666.00		\$0.00	\$33,000.0
191	200405	NDRMSP	Cancelled - Maroochy Shire Council Siorm Tide and Freshwaier Flooding Study	Technical/Supporting Project	Storm Tide Flood	Maroochy Shire Council	Cancelled	\$0.00	\$0.00		\$0.00	
196	200405	NDRMSP	CANCELLED - Thuringowa City Council Infrastructure Risk Assessment Study	Works/Construction	Other Other	Townsville City Council	Cancelled	\$7,000 00	\$7,000 00			\$0.0
204	200405	NDRMSP	CANCELLED - Assessment of Hervey Bay housing vulnerability to	Works/Construction	Other Other	Department of Community Safety	1				\$0.00	\$21,000.0
159	200405	NDRMSP	severe winds Island Coordinating Council Natural Disaster Risk Management	Technical/Supponing Project	Other	Island Coordinating Council	Cancelled	\$0.00	\$40,000.00			\$75,000.0
			Study Bowen Shire Council Euri Creek Drainage Catchment Flood Study	Technical/Supporting Project	Flood		Closed	\$0.00	\$13,750.00		\$0.00	\$27,500.0
1		Lane and the	Cook trialiage Calcilliant Flood Study	reconicar supporting Project	Flood	Whitsunday Regional Council	Closed	\$30,000.00	\$30,000.00	\$30,000.00	\$0.00	\$90,000.0
173		NDRMSP	Bowen Shire Council Roads Risk Evaluation	Works/Construction	Other Other	White-order Beginned Council	Cinner					
173	200405	NDRMSP	Bowen Shire Council Roads Risk Evaluation Calliope River Flood Risk Assessment Study Redland Shire Flood Risk Assessment Study	Works/Construction Technical/Supporting Project		Whitsunday Regional Council Calliope Shire Council	Closed	\$25,000.00 \$43,000.00	\$25,000.00 \$43,000.00		\$0.00 \$0.00	\$75,000.0 \$129,000.0

Numb	ber 1	Year	Program	Study Title	Project Type	Categories	Organisation	Status	Applicant Proposed/Approved Funds	State Government Proposed/Approved Funds	Australian Government Proposed/Approved Funds	Other Proposed/Approved Funds	Total Project Cost
195		00405 N		Murweh Shire Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Murweh Shire Council	Closed	\$8,512.00	\$8.511.00	\$8,511.00	\$0.00	\$25,534.0
207		00405 N		Auckland Creek Flood Risk Assessment Study	Technical/Supponing Project	Flood	Gladstone City Council	Closed	\$36,668.00	\$36,666.00		\$0.00	
98				Monto Shire Council Disaster Mitigation Plan	Technical/Supporting Project	Other	North Burnett Regional Council	Closed	\$2,500.00	\$2,500.00			\$110,000.0
			NDRMSP	Brisbane City Disaster Risk Management Project	Technical/Supporting Project	Other	Brisbane City Council	Finalised	\$40,000.00	\$40,000.00		\$0.00	\$7,500 0
165				Minam Vale Shire Natural Disaster Risk Assessment Study	Technical/Supporting Project	Other	Miriam Vale Shire Council	Finalised	\$30,000.00	\$30,000.00		\$0.00	\$120,000 0
181			NDRMSP	North Stradbroke Island Bushtire Management Plan	Technical/Supporting Project	Bushfire	Redland City Council	Finalised	\$20,000 00	\$20,000.00		\$0.00	\$90,000.0
				Dalby Town Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Dalby Town Council	Finalised	\$12,000.00	\$12,000.00		\$0.00	\$60,000 0
183	3 20	00405 N		Tiaro Shire Council Lower Mary River Flood Study	Technical/Supporting Project	Flood	Tiaro Shire Council	Finalised	\$42,000.00	\$42,000.00		\$0.00	\$36,000 0
184		00405 N	ADRIMOR		Technical/Supporting Project	Flood	Waggamba Shire Council	Finalised	\$59,167.00	\$59,167.00	4.0000.00	\$0.00 \$0.00	\$126,000.0
186		00405 N		Gowne Creek Flood Flisk and Mapping Study	Technical/Supporting Project	Flood	Toowoomba Regional Council	Finalised	\$60,000,00	800 000 00	4000000		
188			NDRMSP	Hervey Bay City Council Flood Risk Reduction Study	Technical/Supporting Project	Flood	Hervey Bay City Council	Finalised	\$60,000.00	\$60,000.00	\$60,000.00	\$0.00	\$180,000 (
192	2 20	00405 N	NDRMSP	Ipswich Rivers Flood Study Rationalisation	Technical/Supporting Project	Flood	Ipswich Rivers Improvement Trust	Finalised	\$145,400.00	\$145,400.00		\$0.00	\$436,200.0
193		00405	100.0000	Caloundra and Maroochy Storm Tide and Freshwater Flooding Joint Probability Assessment	Technical/Supporting Project	Storm Tide Flood	Caloundra City Council	Finalised	\$66,000 00 \$60,087.00	\$66,000.00 \$60,087.00		\$9,660.00	\$198,000 0 \$189,921 0
197			NDRMSP	GIS Based Flood Mapping for Disaster Miligation	Technical/Supporting Project	Flood	Ipswich City Council	Finalised			400,00.00	\$9,660.00	2199,921.0
198			NDRMSP	Woogaroo Creek Flood Mitigation Study	Technical/Supporting Project	Flood	Ipswich City Council		\$30,000.00	\$30,000.00		\$0.00	\$90,000 0
200			NDRMSP	Maroochy Shire Council River Flood Study	Technical/Supporting Project	Flood	Sunshine Coast Regional Council	Finalised	\$25,000.00	\$25,000.00		\$0.00	\$75,000.0
201			NDRMSP	Logan City Council Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Logan City Council	Finalised	\$147,000.00	\$147,000.00		\$0.00	\$441,000.0
206			NDRMSP	Eidsvold Shire Natural Disaster Risk Management Study 2	Technical/Supporting Project	Other	Eldsvold Shire Council	Finalised	\$30,000 00	\$30,000.00		\$0.00	\$90,000
188	8 20	00506	NDFIMSP	Hervey Bay City Council Flood Risk Reduction Study	Technical/Supporting Project	Flood	Hervey Bay City Council		\$25,000.00	\$25,000 00		\$0.00	\$75,000.0
375			NDRMSP	Mapoon Natural Disaster Risk Management Study	Technical/Supporting Project	Other	Mapoon Aboriginal Shire Council	Finalised	\$93,666.00	\$93.667.00		\$0.00	\$281,000.0
197	7 20	00607	NDRMSP	GIS Based Flood Mapping for Disaster Mitigation	Technical/Supporting Project	Flood	Ipswch City Council	Approved	\$13,333.00	\$13,333.50		\$0.00	\$40,000 0
					resistant copporting respect	11000	ipswich City Council	Finalised	\$10,000.00	\$10,000.00	\$10,000.00	\$0.00	\$30,000 0
176	6 20	00405	NDRMSP	Molongle Creek Drainage Catchment Flood Study 2004-05 NDRMSP	Technical/Supporting Project	m. d		SUBTOTAL	\$1,477,641.00	\$1,529,747.50	\$1,514,747.50	\$19,660.00	\$4,541,796.0
-	-		100000000000000000000000000000000000000		Control of the contro		Bowen Shire Council	Unsuccessful	\$30,000.00	\$30,000.00	\$30,000.00		\$90,000.0
190		2015		Maroochy Shire Council Beach and Ocean Flisk Management Study	The state of the s	Storm Tide: Cyclone	Maroochy Shire Council	Unsuccessful	\$9,000.00	\$9,000.00	\$9,000.00		\$27,000.0
202	2 20	00405 [1	NDRMSP	Logan Disaster District Information Management System	Works/Construction	Other:Other	Logan City Council	Unsuccessful	\$15,000.00	\$15,000.00	\$15,000.00		
								SUBTOTAL	\$54,000.00	\$54,000.00			\$45,000.0
								TOTAL	\$1,531,641.00	\$1,583,747.50		\$0.00	\$162,000.0





Natural Disaster Resilience Program – Queensland Round 3 Applicant Guidelines

I Use this Guideline when completing a Natural Disaster Resilience Program Round 3 Application Form

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WHAT YOU NEED TO DO

- Carefully read this Guideline
- Complete the NDRP Round 3 Application Form and submit it no later than 30 June 2011.
- The application is available online from www.communitysafety.qld.gov.au/ndrp. The preferred means of lodging your application is via email emailto:emagrants.subsidies@dcs.qld.gov.au by 30 June 2011. Followed by submission of the original signed hardcopy by post; address details are listed below.

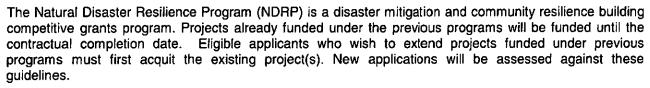
POSTAL ADDRESS:

Senior Program Officer
Natural Disaster Resilience Program
Governance and Management Branch
Emergency Management Queensland
Department of Community Safety
GPO Box 1425
BRISBANE QLD 4001

MORE INFORMATION?

- Visit www.communitysafety.qld.gov.au/ndrp
- Phone (07) 3635 3099
- Email: emqgrants.subsidies@dcs.qld.gov.au
 Our phone services are available from 9am to 5pm, Monday to Friday

Our phone services are available from 9am to 5pm, Monday to Friday (excluding public holidays).



Successful applicants will be required to enter into a funding agreement with the Department of Community Safety. The successful applicant will receive the first 50% of the NDRP cash contribution to the project on execution of the funding agreement; further payments will be made as milestone reporting requirements are completed.

The advice in this document relates to NDRP Round 3 and incorporates feedback from previous funding rounds. Applicants are therefore advised to carefully read the following before completing the NDRP Round 3 Application Form. An applicant's previous performance in successfully managing similar projects (to milestones and other reporting requirements) will be considered.

NDRP OBJECTIVES

To reduce Queenstand communities' vulnerability to natural hazards by supporting Local Governments and other stakeholders to build community resilience by:

- (1) reducing community vulnerability to natural hazards;
- (2) supporting community stakeholders to build community resilience and increase community self-reliance;
- (3) promoting innovation through a focus on building partnerships between sectors, supporting volunteering, encouraging a regional or catchment area approach to mitigation and potential impacts due to climate change; and,
- (4) ensuring that NDRP funding is used in an efficient way.

NDRP PRIORITIES

Specific priorities of the NDRP are:

- (1) Target NDRP funding to Queensland's highest natural hazard risks (in order: flooding, storm tide/surge, cyclone, severe storm and bushfire);
- (2) Enhance community preparedness for natural events through community education and awareness raising; and,
- (3) Strategic targeting to increase resilience across sectors.

NATURAL HAZARD RISK ASSESSMENTS

Local Governments are required to have undertaken a natural hazard risk assessment (NHRA) for their jurisdiction including consideration of climate change impacts1. Applicants who have not undertaken an NHRA for their area should do so before applying for NDRP funding to undertake other projects. Applicants may apply for NDRP funding to undertake an NHRA.

Applicants who have an out-dated (i.e. pre amalgamation and / or no climate change considerations) NHRA, or have not completed a NHRA funded under a previous round of the NDRP, may apply for project funding under round 3. However, these applicants must show how their project seeks to address a well-known natural hazard risk.

Applicants who previously provided a copy of their NHRA are not required to provide another copy unless it has been revised and updated.

INTELLECTUAL PROPERTY AND PRIVACY

Successful applicants will be required to enter into a funding agreement with the Queensland Government (Department of Community Safety). As per the NDRP relevant contract conditions and clauses, successful applicants will be required to grant a non-exclusive, royalty free licence in perpetuity to the Department of Community Safety to materials produced as part of the contracted project, for the Queensland Government's purposes including (but not restricted to): (a) local and regional natural hazard risk assessments; (b) natural hazard maps (including digital elevation modelling); and, (c) the raw data collected to produce these materials. Materials generated using NDRP funding, including (a)-(c) above, will be provided to the Department of Community Safety in a designated format (see below) upon request via written correspondence (letter or email). The Department of Community Safety may utilise the material for non-commercial purposes and may provide the material and raw data to other Australian governments for non-commercial purposes. Applicants must agree to the provisions of the Information Privacy Act 2009 (QLD). Where a third party is involved (either as partner or consultant), the applicant will seek their agreement to the provisions of the Information Privacy Act 2009 (QLD).

MAPPING - DESIGNATED FORMATS

Where mapping is an output from hazard modelling, both the input and output datasets are to be supplied along with any files such as scripts, models, code and configuration settings used in producing outputs.

Spatial Data Formats - Preferred hazard risk map (spatial) data formats are as follows: Vector data: ESRI Shapefiles, ESRI Geodatabases or MapInfo Tab files. Raster data: JPEG2000, GeoTiff or Imagine are preferred. Other acceptable raster formats include ESRI Grids and ECW files. All bands captured are to be included. When spatial data is highly dynamic, the use of live data feeds should be considered in place of a single data transfer. A live feed is to be timely and robust as to ensure a high level of access to support public safety. The Department of Community Safety uses WMS (web mapping service), WFS (web feature service), GeoRSS, and KML.



Symbology - Relevant symbology files are to be supplied to ensure correct presentation of spatial data. This may include ESRI layer files, ESRI layer package files, True Type Fonts and ESRI style files.

Spatial Metadata - All data supplied is to include relevant metadata meeting current Australian standards.

COMMUNITY PREPAREDNESS & VOLUNTEERING

A key NDRP priority is to enhance community preparedness for natural disaster events through community education, community awareness raising activities, and by promoting local volunteer capacity.

Community Preparedness

Applicants are encouraged to include community preparedness as part of their proposals and / or to submit proposals that focus exclusively on community preparedness. There are a range of internationally recognised, well established tools that can assist governments and communities to promote community preparedness. The internationally-accepted best practice standard is the Hyogo Framework 2005-2015 managed by the United Nations' International Strategy for Disaster Reduction (ISDR).²

¹ See Guidance for Considering Climate Change in Round 3 Natural Disaster Resilience Program – Queensland Applications (available from www.communitysafety.qld.gov.au/ndrp)

² See UN ISDR, Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters (www.unisdr.org/hfa) and UN ISDR, Words Into Action: A Guide for implementing the Hyogo Framework (www.unisdr.org/atf).

The practices and tools promoted by the ISDR can be customised to the Queensland context. The ISDR suggests the following community preparedness activities: provide relevant information on local natural hazard risk and means of protection to those in high risk areas; establish local taskforce to assess information needs and develop programs to raise community awareness of local natural hazard risk reduction; public awareness campaigns; target preparedness messages to all sectors in the community; encourage local universities to offer subjects in natural hazard risk reduction; include natural hazard risk reduction modules in formal and informal education at all levels including school curriculum; encourage private businesses to educate their employees about natural hazard risk reduction; involve businesses and their employees in awareness raising through sponsorship opportunities and advertising; strengthen local networks of experts from difference disciplinary backgrounds; use community-based programs and sites such as community centres, community or school fairs, festivals and commemorative events to communicate preparedness messages; work with the media to raise awareness about local natural hazard risk reduction; and use local knowledge and take local perspectives.

Local Volunteer Capability Building

Volunteers play a significant role in reducing community vulnerability to natural disasters in Queensland. Applicants are encouraged to submit project proposals that include initiatives that support and enhance the capacity and capability of local volunteer groups³ that have a role in disaster management.

Proposals might address one or more of the following aspects of local volunteer capacity building: reducing barriers to volunteering, attraction, retention, recognition, education and training, legal protection, young volunteers, managing spontaneous volunteers, and volunteer manager support.

Where the proposal is a study or natural hazard risk assessment, it can include a part focus on local volunteer capacity to prepare for, respond to, and recover from natural disasters. Study projects might address local volunteer trends and the contribution of volunteers to the local community.

Self-reliance

Applicants are encouraged to include community preparedness activities that seek to increase the self-reliance of communities, families and individuals and to reduce demand on government services. Government services include the provision of disaster recovery payments. Self-reliance may include: increased uptake of household and business insurance, development of household emergency plans, electrical redundancy for critical infrastructure (district or local disaster coordination centres, sewerage treatment works, etc), and local neighbourhood support networks.

Strengthening the relationship between mitigation and recovery

Applicants are encouraged to submit proposals that seek to strengthen the relationship between disaster mitigation and community recovery. The benefits of investment in disaster mitigation go beyond reducing the economic costs of natural disasters. Investment in mitigation can lead to a reduction in the community's need for recovery resources (e.g. as provided via the Natural Disaster Relief and Recovery Arrangements).

Community resilience can begin in the recovery period. Finding innovative and cost-effective ways to build back better after a disaster is part of enhancing community resilience. Research shows that people are receptive to mitigation messages and initiatives in the period after a disaster has occurred.

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³ Consistent with these guidelines including the sections on eligible organisations and eligible projects.

COMPLETING THE APPLICATION FORM

SECTION 1 - THE APPLICANT(S)

ELIGIBILITY

Eligible Organisations

Organisations considered eligible for NDRP funding are Local Government agencies as defined in the *Local Government Act (QLD) 2009* and *City of Brisbane* (QLD) *Act 2010*, Indigenous Councils, Regional Organisations of Councils (ROCs), Local Disaster Management Groups (LDMGs), River Improvement Trusts, government owned corporations, and other government bodies, including Queensland Government departments and other state agencies within Queensland. Incorporated non-government organisations (NGOs) (including volunteer groups), and Queensland-based not for profits⁴ are also eligible to apply for funding.

An eligible organisation may submit an application for NDRP funding in partnership with ineligible organisations. Ineligible organisations include: small businesses, for-profit volunteer groups, organisations based outside of Queensland, and any other group not specified as eligible in these guidelines.

Prospective applicants are strongly encouraged to contact the Department of Community Safety to confirm their eligibility before writing an application.



SECTION 2 - THE PROJECT

ELIGIBILITY

Eligible Projects

To be considered eligible, the proposal must explicitly conform to NDRP objectives and explicitly address one or more NDRP priorities (see above). Priority will be given to regional projects (i.e. those that benefit more than one region or Local Government area) that applicants may not otherwise be able to fund. Proposals involving land use change and / or development must ensure all necessary development approvals or preliminary formal advice has been obtained prior to applying for funding and included in the application.

Proposals considered ineligible for NDRP funding include those that:

- fail to meet NDRP objectives and/or fail to promote NDRP priorities
- do not produce a significant community benefit
- duplicate existing initiatives, or roles and responsibilities of other organisations
- cannot be completed within 2 years of funding approval.
- seek funding to purchase capital equipment such as motor vehicles



Proposals should not:

- seek to use NDRP funds to obtain development approval
- include development work but have failed to obtain necessary approvals and / or advice
- be eligible for more appropriate funding from other sources e.g. Gambling Community Benefit Fund
- be similar to incomplete projects already funded under NDRP or under previous programs

NGOs seeking funding for support to a Local Disaster Management Group (LDMG) must gain LDMG endorsement of their application.

Project Duration

The funding for the NDRP will cease at the end of the financial year 2012-2013. Therefore to be considered eligible for funding under NDRP Round 3.projects must require no more than 2 years from funding approval to completion

⁴ As defined in Regulation 3 of the Corporations (Review Fees) Regulations 2003 'This company is for charitable purposes only and its constitution will require the company to: apply its income in promoting those purposes; prohibit the company making distributions to its members and paying fees to its directors; and require its directors to approve all other payments the company makes to them.' (source: www.asic.gov.au)

Regional Projects

Proposals for regional projects (i.e. involving two or more Local Governments or multiple regions for NGOs) are particularly encouraged. These might include regional and / or catchment-wide disaster mitigation solutions, community resilience building, regional flood and / or other hazard risk mapping projects and studies, regional community education and awareness raising projects, or regional volunteer network-building projects.

CLIMATE CHANGE

It is expected that the patterns of Queensland's most significant natural hazards – flood, storm tide and cyclone, severe storm and bushfire – will alter as a result of climate change impacts. For example more intense rainfall events and increased intensity of cyclones are anticipated.

All project proposals must include a climate change component or explain how climate change is not relevant to the project. A project proposal submitted for NDRP funding will be assessed, in part, on the extent to which it goes toward addressing the likely impacts of climate change.

The NDRP provides one vehicle for eligible organisations to undertake resilience-building projects that include specific reference to managing expected climate change impacts. The NDRP indirectly targets the potential impacts of climate change by targeting funding to Queensland's natural hazard risk profile.



One goal of the NDRP is to provide funding to eligible agencies to reduce community vulnerability and build community resilience to natural hazards and expected impacts of climate change. In this way, the NDRP complements *ClimateQ*, the Queensland Government climate strategy which aims to support community and industry to prepare for and adapt to a changing climate.

Applicants must show how their project addresses the requirements provided in the *Guidance for Considering Climate Change in Round 3 Natural Disaster Resilience Program - Queensland Applications.* The Guidance is available from the NDRP website.

SECTION 3 - PROJECT BUDGET

CONTRIBUTIONS

These provisions apply to all eligible organisations.

Cost Sharing

As a general principle, NDRP projects are funded on a cost sharing basis with the Applicant, State Government, and Commonwealth Government each contributing an equal share. That is, the NDRP (comprising State and Commonwealth Government funds) contributes up to 2/3 (i.e. 67%) of the total project value and the applicant contributes at least 1/3 (i.e. 33%) of the total project value. The total value of a project includes in-kind contributions (e.g. time, facilities, expertise, etc) from the applicant and / or their partners.



Increased NDRP contribution

Applicants may request that the NDRP contribute more than 2/3 (i.e. 67%) of the total value of the project in the relevant section of the NDRP Round 3 Application Form. The Application Assessment Group will consider the rationale for the request and other relevant matters (e.g. a low rate base for a council or lack of operating cash for an NGO) in deciding whether to grant the increase or not.

BUDGET FORM

The following points are provided to assist applicants to complete the budget form:

- Expenditure represents all out-goings for the project. This includes all cash purchases and in-kind resources required to complete the project. Capital items must not be included as expenditure in the budget table.
- Income includes all in-kind contributions, and cash from the NDRP and other sources.
- In-kind contributions of goods and services are recognised at fair market value. In simple terms, ask yourself 'what would you pay if it was not donated?' They may include cash-equivalent goods or services considered essential to the project which if not donated would have to be purchased with project funds.
- In-kind contributions in the form of time are to be recorded at \$20 per hour for unskilled staff and \$50 per hour for skilled staff.

The completed example below shows a project with a total value of \$121,800 including \$46,200 worth of in-kind contributions from the applicant and their partners. In this case even though the NDRP is providing the majority of the cash for the project, the NDRP contribution as a percentage of the total project value is 54% therefore this application is within the acceptable range described above.

	Project Expenditure	
	Item	Value
	Application development (4.5 days @ \$50/hour)	\$1,800
	Administration / Project Management	\$5,000
	Materials	\$60,000
	On-going maintenance / support	\$15,000
	Acquittal audit	\$2,000
ĺ	Contingency	\$3,000
	Freight	\$5,000
	Printing	\$20,000
l	Promotion	\$10,000
I		
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ŀ	Total expenses (must equal total income)	\$121,800

Project Income			
Source	Туре		
	Çash	in-kind	
Lead Organisation (XYZ Shire Council)			
Administration		\$1,800	
Project manager (11 days @ \$50 per hour)		\$4,400	
On-going maintenance	\$10,000	\$5,000	
Partner Organisation (Bob's Trucking) Freight		\$5,000	
Partner Organisation (Fred's Printing) Printing		\$20,000	
Partner Organisation (Bev's Media Gurus) Promotion		\$10,000	
Sub totals	\$10,000	\$46,200	
otal applicant contribution (cash plus in-kind) \$5		200	
Plus NDRP cash contribution	\$65,600		
Total income (must equal total expenses)	\$121,800		

NDRP contribution as percentage of total project value 5

54%

SECTION 4 - PROJECT MILESTONES

Applicants are to provide indicative milestones with their application. These are expressed in the weeks / months required to achieve each milestone after the project is approved. For example, the project below is of 10 week duration.

	Milestone description	Schedule (i.e. approval + x weeks / months)
1	Recruit counsellor	+ 4 weeks
2	Design training program / identify trainees	+ 3 weeks
3	Deliver training	+ 1 week
4	Complete final report and audit funding	+ 2 weeks

Applicants are encouraged to rationalise the number of milestones as they link directly to progress reports and payments. Successful applicants will be asked to review their milestones for accuracy.

SECTION 5 - RISK MANAGEMENT

The Queensland Government supports a risk management approach to disaster mitigation and project management. Applicants are required to design their proposal so that it identifies a natural hazard risk or treat a natural hazard risk, consistent with NDRP Priority (1) Target NDRP funding to Queensland's highest natural hazard risks (flooding, storm tide /storm surge, cyclone, severe storm and bushfire).

Local Governments are required to provide evidence that their organisation has produced an up to date risk register that includes natural hazard risks and relevant risk treatments (consistent with ISO 31000:2009 — Risk Management Principles and Guidelines or equivalent e.g., a recognised risk assessment guideline) that forms part of the Local Disaster Management Plan and/or corporate plan or strategic plan.

Other eligible applicants are not required to provide or undertake a natural hazard risk assessment. However, they must seek advice from their Local Government on local natural hazard risks and show how their proposal seeks to mitigate a known risk.

NDRP Round 3 Application Checklist

- > Read the Applicant Guideline
- > Establish if you are an eligible organisation
- > Establish if your project is eligible
- > Complete an application form (one per proposal)
- > Attach a current natural hazard risk assessment including consideration of climate change impacts for the local area
- Have the application form signed by your CEO or equivalent



SPP 1/03 Review - Summary of Issues and Interests arising from Submissions

18 Feb 2011

Ge	neral issue	ISS	ue or interest
1.	Capacity – ways to improve in local government and community	(a)	Capacity and competency to undertake technical aspects of development proposals
		(b)	Case studies or examples to be included in guidelines
		(c)	Community capacity to enabled to undertake self risk assessments
		(d)	Consistency in implementation of new instrument needs to be greater than current SPP – need strategies to ensure this result
		(e)	Guidelines need to assist local government implementation of SPP
		(f)	Public education on SPP - Improve to raise compliance
		(g)	Register of agencies and resources available to assist local governments
2.	Disaster management - specific mitigation strategies to protect people	(a)	Cumulative impacts – need to embrace strategic approach to floodplain management
		(b)	Disaster management planning for new developments – how to achieve better outcomes
		(c)	Health impacts such as disease control, potential psychological impacts als need consideration
		(d)	Human life – Improve policies, guidance and tools to improve protection measures
3.	Institutional responsibility and relationships	(a)	Flood commission of enquiry – address relationship with
	Controlleripo	(b)	Public asset providers - improve links with
		(c)	Role of State in development approval – what is effective and efficient
		(d)	Role of State in risk and hazard assessment – clarity required
1.	Locations or types of development requiring special consideration	(a)	Communities with no opportunity to avoid development in flood prone areas
		(b)	Community infrastructure – scope to include all significant public assets and critical infrastructure
		(c)	Existing properties with unutilised development commitments in areas prove to be hazard prone since that commitment was provided may require special consideration
		(d)	Growth pressures V hazard reduction – how to reconcile competing objectives and reduce disaster risk
		(e)	Infill development applications in existing urban areas – risk mitigation requirements to be upgraded
		(f)	Land filling - minimise risks arising from
		(g)	Nature-based tourism Development, risk profiles need special consideration \ensuremath{SPP}
	a	(h)	Non-residential (commercial and industrial) land uses – risk mitigation requirements to be upgraded
		(i)	Partially affected properties need special consideration
		(i)	Refuse sites - may need special consideration
		(k)	Rural development applications - risk mitigation requirements to be upgraded
		(1)	Rural development applications isolated townships and single detached dwellings – risk mitigation requirements to be upgraded
250		(m)	Steep topography with growth pressures – risk mitigation needs to be upgraded
•	Minor wording or structural changes	(a)	Hazard assessment method - describe in single appendix
		(b)	LGA list – update or review requirement
		(c)	Protection measures apply only to areas of high or medium bushfire hazard
	Planning process or guidance	(a)	Adaptation strategy policies and guidelines for local government needed for exiting and climate change hazards
		(b)	Definition and coverage of flooding types
		(c)	Definitions to be consistent with QPP

Ge	neral issue	Issi	ue or interest
		(d)	Development outcomes to be more tightly defined
		(e)	Flowcharts and decision support tools be included in revised instrument
		(f)	Framework of new instrument to be expressed like more recent SPPs
		(g)	Indigenous Shire Planning schemes - acknowledge and address how to
		(9)	influence
		(h)	Injurious affection and associated legal and financial implications considered
		(1)	Legal implications arising from inadequate conditioning of development – mitigate risks
į		(i)	Minimum or mandatory requirement and best practice – improve distinction and provide examples
		(k)	Ongoing management and enforcement of development conditions
		(1)	Over-riding need definitions should be consistent across state planning policies having regard to case law
		(m)	Provisions should be applicable even where local government has not defined a local hazard management area
		(n)	State Development areas, industrial land and infrastructure corridors may need provisions different to other land tenures
		(0)	Urban footprint provisions need to be different to those for rural areas defined in Regional Plans
7.	Relationship between policies or programs	(a)	BCA QDC – Improve relationship with SPP
	programo	(b)	BCA QDC and AS 3959 – Improve relationship with SPP
		(c)	Coastal SPP and SPP 1/03 Flooding need strong alignment including sea tevel rise allowance and DM aspects
	<u>.</u> 8	(d)	Framework for more integrated application of SPP with other instruments
		(e)	National Disaster Resilience Strategy – improve links with SPP
		(f)	QPP - Improve relationship with SPP
		(g)	Queensland's Disaster Management Act 2003 - ensure effective links with
		(h)	State infrastructure providers – establish effective links with agency policies and regulations
		(i)	Timber Plantations QPP - increase connection with SPP
		(ii)	VMA – improve relationship with SPP
	b.	(k)	Wetlands SPP - Need to reconcile relationship
В.	Resilience - strategies to improve in balance with other objectives	(a)	Economic and social costs of alternative risk mitigation policies considered in decision making
		(b)	Outcome is a balanced and proportionate response to identified issues
			Planning and building standards – increase to improve resilience of new developments
			Transport infrastructure costs V hazard reduction – how to reconcile competing objectives and reduce disaster risk
).	Resillence - ways to improve in	(a)	Direct new development to areas of lowest risk
	balance with other objectives		Direct new development to areas with lower levels of risk with consideration of climate change and flooding up to PMF
			Economic benefits are included in criteria to select DFE and other significant development decisions
			Housing affordability V hazard reduction – how to reconcile competing objectives and reduce disaster risk
5		(e)	Multiple hazard zones instead of single zone approach
		• •	Nature conservation V hazard reduction – how to reconcile competing objectives and reduce disaster risk
		(g)	Outcome is a balanced and proportionate response to identified issues
			Planning and building standards - increase to improve resilience of new developments
			Social and economic costs of natural disasters included in criteria to select DFE and other significant development decisions
0.	Risk and hazard assessment	(a)	Climate change - Determine factor and methods to incorporate in
			22

General issue	Issue or interest
	assessment
	(b) Climate change – Incorporate factor and methods from IFS
8	(c) Coincident flooding – harmonise assessment methods and criteria for all sources of inundation - storm surge, river flooding, flash flooding, tides and sea level rise
	(d) Dynamics of risk - Recognise and consider in risk and hazard assessment
	(e) Flash flooding to be addressed separate to river flood risk
	(f) Flood study methods to be standardised, reliable, regionally appropriate, up to date
	 (g) Mapping methods and criteria - improve robustness consistency and regional applicability
	 (h) Mapping methods and criteria to align with site assessment methods and criteria
	(i) Risk assessment methodology needed in addition to hazard assessment
	(j) Risk assessment needed in addition to hazard assessment



Report on the Environmental Scan into A National Approach to Flood Modelling

of cM-39

Report prepared by:

Christopher Perry National Critical Infrastructure Capability Branch Attorney-General's Department

10 June 2011

Report on the Environmental Scan into A National Approach to Flood Modelling

Executive Summary

- Flood modelling is somewhat complex and involves a number of technical, legal, resourcing and financial factors. It is understood that these things need to be considered before Government can fund or recommend a national approach. This environmental scan was undertaken to help identify the scale and scope of activities in this area and determine what needs to be done.
- Some information received has been detailed, specific and technical while other information is indicative only, and information gaps are apparent. Further work is required to develop a full understanding of flood modelling in Australia.
- 3. The environmental scan highlighted that:
 - a. there are many agencies, organisations and individuals involved in flood modelling
 - b. there is coordination in some areas but the effectiveness varies between jurisdictions and in some instances it is often limited or ad hoc
 - flood modelling is a complex technical task that is reliant on good quality meteorological, hydrological, geomorphologic, digital elevation and land use data
 - d. some people are able to access data easily while others either cannot, or are unaware of how to, access it
 - e. there are limited mechanisms to discover data and there is duplication of effort looking for it
 - f. there are issues around the coordinated collection, cost, licensing and archiving of data
 - g. there is both consistency and inconsistency (or the perception of inconsistency) in the accuracy and methodology of flood modelling
- 4. In summary, there is no consistent or national approach to flood modelling and there are systemic issues that make if difficult or expensive to perform flood modelling. This limits how Australia is able to use information to support a safe, secure and resilient society.

Note: The term 'modelling' is used in this report generally instead of 'mapping'. The former is used as a holistic term to highlight that this is an ongoing process that takes account of many factors. The latter tends to focus on the 'map' output and could give the impression that the activity is complete when a map is produced.

Introduction

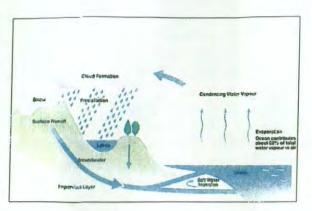
- 5. This past summer, Australia was hit with some of the most testing natural disasters the nation has ever faced. The sequence of floods, cyclones, bushfires and storms was relentless and they impacted on us physically and emotionally as well as financially. In economic terms, the Queensland floods are likely to be the most costly natural disaster in Australia's history.
- 6. On 13 February 2011, the Council of Australian Governments (COAG) endorsed a National Strategy for Disaster Resilience. The Strategy provides high level guidance to federal, state, territory and local governments, as well as the business community and the not for profit sector, on priority areas for action in building a more disaster resilient Australia.
- 7. The Strategy emphasises that governments cannot improve resilience alone the private sector, and in particular the insurance industry, has a vital role to play. The strategy is also about providing all Australians with a better understanding of the disaster risks we face, and the practical steps that we can take to better prepare and protect ourselves. This will help increase individual and

- community level empowerment and resilience rather than relying on post disaster recovery efforts and hand outs.
- 8. It is necessary to minimise our exposure to disaster risks over the short, medium and long term and focus as much on prevention and mitigation as on recovery. In regard to flood events, our ability to predict and monitor floods, and make decisions during a flood event, is critical. The ability to quantify flood risk and price insurance is also critical and will help ensure that people are better able to recover from floods and that costs are spread across communities. Flood modelling for the purpose of identifying this risk is a critical element here and, if done in a strategic manner, is able to serve a number of purposes.
- 9. To progress work in this area, COAG agreed to task the National Emergency Management Committee (NEMC) to report on a consistent national methodology to assess risk for priority hazards and the manner in which they will be published. In recognition of the severity of the recent flooding in Queensland and other eastern states, the Ministerial Council for Police and Emergency Management Emergency Management (now the Standing Council on Police and Emergency Management) asked the NEMC to prioritise the development of a program of work to map areas of risk relating to riverine flood, flash floods, storm surge and coastal inundation. The exercise is planned to take into account existing knowledge and initiatives; currency of information and identified information gaps; identification of the full scope of applications of modelling for flood risk identification and the need for consistent and robust methodologies.
- 10. At the Commonwealth level, this exercise is being led by the Attorney-General's Department (AGD). AGD commenced a high level environmental scan in March 2011 in cooperation with the Risk Assessment Mitigation and Measurement (RAMMS) Sub-Committee of the NEMC. AGD has consulted with key Government and industry stakeholders including the ICA to seek their input and perspectives.
- 11. This is the first step in the process as it is recognised that research, analysis and stakeholder consultation need to be undertaken before Government could recommend, agree or consider funding for a national approach to flood modelling. A proposal is expected to be completed later in the year.
- 12. The Government's Natural Disaster Insurance Review (NDIR) Panel are also addressing issues of flood-related issues as part of a broader review of insurance. To date, findings of the NDIR are consistent with this environmental scan. The NDIR will release its final report setting out its recommendations including insurance industry access and usage of flood modelling data to the Assistant Treasurer on 30 September 2011.
- 13. The environmental scan process is covered in more detail at Appendix A. Consultation is outlined at Appendix B. A summary of the role or involvement by various areas in flood modelling is provided at Appendix C.

Flood Modelling

- 14. Flooding results from a series of complex interactions between the natural and built environment. A clear understanding of flooding is critical to understanding what we can do to anticipate, mitigate, monitor and respond to floods.
- 15. Floods occur where water builds up or flows in places we do not want it or where it is not usually found. The processes that cause flooding are part of the hydrologic cycle that many people are familiar with. A simplified description follows.

16. Rain falls. It varies in intensity, frequency, duration and extent. As rain hits vegetation, a proportion of it is held by leaves. As it hits the ground, it can be absorbed or start to run off to varying degrees depending on the soil or surface type (eg. clay, loam, sand or asphalt). As the soil becomes saturated, water will run off more easily. Water evaporates due to wind and higher temperatures. If it falls as snow or hail, it can remain in place before melting and running off.



- 17. Water flows to lower areas in relation to topography or the elevation of the land. It naturally runs down valleys and flows into rivers but can also flow as larger sheets or bodies of water. It gets held in dams; and held back or diverted by structures like levees. Water can overflow river banks, dams, levees or block pipes. A dam might break and release a large amount of water that was collected over a period of time.
- 18. Cyclones regularly affect parts of Australia and often produce large amounts of rain. Tides and storm surges can produce coastal inundation and increase the impact of cyclones. Tsunamis may be rare in Australia but could push water to inland areas.
- 19. The predicted effects of climate change provide an additional layer of complexity and will amplify climatic conditions. As temperatures rise and there is more latent heat in the system, there will be increased frequency and intensity, and changes in the spatial distribution, of climatic events (including precipitation). As sea levels rise, there will be increased frequency and impact of coastal inundation. By way of example, a mid-range sea-level rise of 0.5 meter in the 21st century will mean that events that now happen every 10 years would happen every 10 days in 2100.
- 20. Flood modelling enables humans to understand and calculate probabilities of flooding in particular areas. Flood modelling has a range of uses, relies on various kinds of input data and makes use of a number of models and analytical tools. It also results in a number of different outputs. These are covered in more detail in the following paragraphs.

Uses of Flood Modelling

21. Flood modelling is useful to many people because flooding affects many aspects of our lives. Near real-time flood modelling used for emergency management is far more complex and data hungry than the modelling used for non emergency management activities such as environmental analysis and land use planning. Following is a short overview of some of the uses of flood modelling (in various forms) and a description of how it benefits people.

Use	Description	
Emergency Management	Emergency managers need to develop evacuation plans, identify safe areas and understand the population that might be affected by flood events. During a flood, they need to be able to anticipate where a flood is likely to be at a given point in time, understand the level of inundations and be able to prioritise activities. Accurate flood information enables them to identify access routes, plan evacuations or movements of people, and support isolated communities.	
Environmental Analysis	Environmental analysis involves development of environmental impacts statements, analysing effects on flora and fauna, understanding biodiversity and calculating economic impacts from various influences.	

	Floods affect the environment in the short and long term and can greatly affect the natural environment.				
Insurance	The pricing of insurance is a function of the risk and the uncertainty associated with estimating that risk. The price of risk depends on the likelihood and magnitude of losses and it is common for pricing to be based on the expected loss experience of a group of like risks. The more uncertainty there is about expected losses, the higher the cost of insurance. Flood modelling provides a way to estimate the frequency and extent of potential floods and therefore the consequent cost of repair or rebuilding. Generally, insurers with better flood information will be able to charge on average lower premiums. Ensuring that people have access to insurance increases resilience generally, and alleviates some of the direct financial impact to the nation.				
Land Use Planning	Floods affect the placement and design of roads, bridges, culverts, drainage systems, dams and other infrastructure. They can also influence building codes, land use planning and zoning. Understanding where flooding is likely to occur informs the development and prioritisation of mitigation projects such as placement of levees. Public access to flood information is necessary so that people can make informed decisions and build a resilient society. While it would likely affect communities generally and have an economic impact (eg. real estate prices), it will help mitigate the future costs and impacts of flooding. Flood modelling is an ongoing process because development of new infrastructure shifts or influences water flow, possibly shifting where floods occur.				

Case Study: Pricing of Insurance

Insurance companies need to be able to quantify risk in order to determine the price of insurance. This is achieved by understanding the probability of an event occurring and extent of potential floods (amongst other things) and therefore the potential financial impact of a flood to the insurance company. To the extent that data are of poor or unknown accuracy, not up to date and/or low resolution, then actuaries/insurers will increase prices to offset the lack of certainty. Insurance companies carefully monitor their exposure to any one event and buy reinsurance to limit exposure.

There are significant problems for insurers in obtaining the information needed to assess exposure to floods and the detailed data available in other countries are not available in Australia. A sound insurance market needs to be competitive to maintain affordability and equity for the insurance purchaser. It is conceivable that the smaller insurers in Australia will not have the resources to collect and analyse the data needed to allow them to properly price flood risks. Good and regularly updated publicly available flood mapping would give a common framework for consideration of a range of interests, including development and town planning and insurance needs.

Currently, most flood maps in Australia are outdated and refer only to 1 in 100 flood levels, which are defined in different ways. Flood modelling would ideally provide other levels (eg. 1 in 10, 1 in 20, and 1 in 50) and include detailed local topography. Insurers can use this information in conjunction with details about properties (construction type, is the house raised or built on the ground, cost of rebuilding etc.) and pay close attention to building codes in assessing insurance premiums.

The Insurance Council of Australia believes that a first step for them is to be able to access existing data held by LGAs which is not always available to them. Existing data is fine for their purposes now but access to higher quality data would allow more accurate pricing of insurance. Ideally, if flood maps exist, they would be able to access them so that they do not create another version with possible conflicts. There is also some uncertainty about the quality, accuracy and methodology of 'flood maps'.

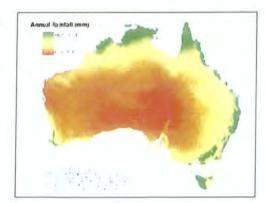
An interesting point to note is that the Australian share of international expenditure on reinsurance is 2% while recoveries from reinsurance are 6%. This means that reinsurance is relatively cheap and accessible in Australia. There may be less incentive for global reinsurance companies to be involved in the Australian market if there is limited access to information to support the accurate pricing of insurance and reinsurance.

Stakeholders

- 22. Many people have an interest in flood modelling (and associated aspects of it) including:
 - Residential home owners
 - Industry and business owners
 - Land us planners and property developers
 - Emergency managers and emergency services
 - Government and government agencies (including LGAs)
 - Scientists
 - Environmental groups
 - Engineers
 - Insurance companies and actuaries
 - Data providers
- 23. In general, flooding is a national issue that affects many people in society.

Data

- 24. Flood modelling requires a range of different data sets depending on the specific objectives of the modelling activity. Specific data sets may include:
 - Climate data
 - Hydrological data
 - Land cover data
 - Soil or surface type data
 - Elevation data
 - Demographic data
 - Building information
 - Information on flood management structures



- 25. Taking climate data as an example, this includes information design, rainfall intensity and other rainfall data, as well as information on cyclones, long term climate patterns, seasonal and cyclical variations (eg. el Niño). It also incorporates the predicted effects of climate change (which requires additional input data and models) and covers the frequency, intensity and distribution of climatic phenomena.
- 26. Models may be enhanced or updated in near real time by new or current input data including:
 - Rain gauge measurements
 - River gauge measurements
- 27. For any data type, one needs to consider the required resolution, accuracy and coverage of data. This will influence how and where one might be able to access data, or how much it will cost. It therefore feeds into and influences collection planning and collection methods. Higher levels of accuracy and resolution usually come at greater cost.

28. Historical data about past flood events (flood intelligence) can be very useful as a practical basis of understanding flooding and for validation of models. However, it has limited use for longer term predictions as climate patterns change and new infrastructure is built.

Models and Analytical Tools

- 29. Flood models and analytical tools make use of a range of input data sets to determine the probability, frequency, extent and depth of flooding in particular locations. In simple terms, they tell us how likely, how often, where and how deep flooding might be.
- 30. The results are often represented on a hardcopy map. This is useful for communication purposes and broad scale or indicative information but it cannot reflect changes in predictions that result from, for example, changes in infrastructure or new climate change predictions. The information becomes dated.
- 31. More importantly, results are often available in geospatial formats. This means that flood data can be used for a number of purposes (as outlined above). The flood data can be combined with demographic or building data, for example, for further modelling to understand and predict risk and impact on communities and infrastructure.
 - Growth
- 32. Geographic Information Systems are often used to collate, analyse, manipulate and visualise information. They can also be used to create maps using the latest data. This last point
 - highlights why the data and processes are the key considerations, not the 'map'.
- 33. Flood predictions are often expressed as, for example, a 1 in 100 year flood. Care is needed in interpretation here since it does not mean that the flood will only occur once in 100 years. Rather, it is a probabilistic expression of the likelihood of a particular flood event occurring at any given time period and could be expressed as a 1% chance of flooding occurring in a year. It is also possible that a 1 in 100 year flood could occur in consecutive years or even twice in the same year.
- 34. Modelling and analytical tools can also be used during a flood event for a number of purposes (also outlined above). In this situation, the models can be provided with new or current input data such as rain density derived from rain gauges and possibly radar, river gauge heights or observed flood levels. Satellite data can be used to identify moving bodies of water. Models can then be run again to update predicted flood extent and flood levels. These models are dynamic in nature and are often very different from the models that deal with more static information.
- 35. There are number of models of varying degrees of complexity. Simple bathtub models just increase the level of water and compare it against an elevation model to indicate where flooding will occur if, for example, a river reaches a height of 5m. There are also 2D and 3D models that may use 'smooth particle' analysis and take into account many more factors like obstacles, river levees or water interacting with itself. The choice of model depends on the purpose.
- Complex models produce more detailed and accurate results but require more detailed and accurate data. They take longer to produce and are likely to come at higher cost.

Modelling and Analytical Activities

- 37. A number of modelling and analytical activities have been undertaken around the country. These have been done by Local Government Areas, government agencies or by authorities like the Murray-Darling Basin Authority.
- 38. From a national perspective, activities appear to be somewhat patchy and incomplete in coverage, currency and/or accuracy. Activities also appear to be limited by funding, human resources and possibly technical expertise. However, the environmental scan was not able to gather enough specific and detailed information in the given timeframe and further work remains.



39. A number of flood related projects were previously funded under the Natural Disaster Mitigation Programme but the status or effectiveness of these has not been established yet. The National Flood Risk Advisory Group draws together some key participants in the areas of flood risk modelling and could provide a useful source of knowledge and experience. A number of related forums or workshops are planned to address the topic of flood modelling although they do not appear to be framed within a coordinated national approach.

Case Study: Building Community Resilience

Building community resilience to the impact of flooding events involves a range of measures. These can include physical mitigation of flood waters, such as with levees, off season advice of when and where waters are likely to rise in the event of a flood, and real time warnings and flood level advice as floods are occurring. Flood modelling can be used to assist in planning, design and placement of levees, rainfall stations, and river gauges, and assist with community education with regard to how to prepare for flooding that may still occur.

To build community resilience, flood warning systems and their related public education programs must emphasise the need for flood affected residents to remain proactive during the sometimes long periods between large flood events.

In 1993 and 1998, the Ovens and King River catchments in north-eastern Victoria experienced severe flooding. In September 1999, State and Australian Government funding provided a grant of \$408,000 to upgrade the flood warning system for the Ovens River, King River and Fifteen Mile Creek catchments. The primary aim of upgrading flood warning services was to help reduce flood damage through the provision of accurate and timely information to the community.

Features of the improved flood warning system for the Ovens and King River include:

- an increased number of automatic rainfall stations and river gauges to provide clearer information and real time data
- improved 'real time' modelling by the Bureau of Meteorology
- improved flood warning information flow from the Bureau to the Victorian State Emergency Service, local councils, agencies, community groups and individuals
- community education, including the distribution of flood response guidelines to all affected residents, and the development of a register for flood information providers.
- 40. There is scope for more rigorous cost/benefit analysis of the effects of doing or not doing flood mitigation projects in the future, especially to achieve the best return on investment. This would involve more rigorous modelling to help people understand and quantify the effects of flooding with or without specific mitigation strategies.

Key Points, Issues and Questions

41. As a result of this environmental scan, a number of key points, issues and questions have emerged. Identifying them early will help inform subsequent work in this area.

Data Accessibility and Quality

- For insurance companies, access to existing flood mapping data will meet their immediate need of being able to price flood insurance.
- b) Data that is poor or of unknown quality is likely to result in higher prices for premiums.
- c) The ICA would like to be able to access better quality data in the future, recognising that mitigation and resilience should be the key drivers behind flood modelling.
- d) Some flood mapping data is quite old and there are questions about the quality, accuracy or methodology of available information.
- e) Data that does exist is held by different organisations and is not often easy to discover.
- Government could consider establishment of a national data library with an online catalogue system (even if the data itself resides elsewhere in the country).
- g) Some fundamental data should be considered a national resource because it underpins many Government and business activities and enhances effectiveness, efficiency and productivity.
- h) There is a question as to whether Government has a role to coordinate or fund such data. (It is
 often beyond the ability or interest of smaller entities to coordinate or fund such data
 collection.)
- There is a question about what type, quality and resolution of data is required for national purposes and what arrangements could be developed to cost share the purchase or creation of data for particular interests.
- j) Data is often purchased multiple times with public money because of the way licenses are created. There would be cost benefits in better coordinated collection planning and data acquisition across Government. (Multiplying the base cost of data by about two or two and a half would often allow much greater use of data for a range of purposes.)

Data Discoverability

- k) There are many agencies, organisations and individuals involved in flood modelling and people are not always aware of where to source information (data, models and expertise) resulting in wasted time and money, and duplication of effort. Government could consider establishment of a national flood coordination group to provide strategic oversight of flood-related activities.
- Government could also establish a website that draws together flood-related information on funded projects, research activities, data and mapping products.

National Standards

- m) Standards are important to provide assurances about the accuracy, relevance, currency and consistency of (any) information. There do not appear to be any agreed national standards for flood mapping activities, particularly for flood mapping work in LGAs.
- n) There have been suggestions that Government funding for flood mitigation projects (for example) could be made conditional upon the recipient making the data available and meeting certain standards.

Risk and Planning

- Mitigation projects could be appraised in terms of how they modify risk (assuming data and models are available and accessible).
- p) There are questions as to whether issues may arise about inappropriate zoning or building approvals if more consistent or accurate flood modelling activities are undertaken and show that houses have been built in flood prone areas.
- q) There are questions about what impact this may have on property prices or about liability by land use agencies if this is the case.

- 42. The environmental scan only touched peripherally on international flood-related activities. While these present possible approaches, they would have to be adapted to the Australian context. A few additional points are:
 - a) In the United States, the following occurs:
 - i. Data purchased with public money is made available freely to the public for other uses.
 - ii. Flood insurance is mandatory but it is underwritten by the Federal Government.
 - iii. There are good faith provisions in legislation to stop litigation for best effort flood modelling activities.
 - iv. Properties have been bought back in areas of high flood risk.
 - There is a strong interest by the public and private companies in increasing the resilience of critical infrastructure.
 - b) The United Kingdom has undertaken a broad scale, flood risk assessment across the nation. This supports targeted investment in areas of greatest need, strategic flood management planning and understanding how mitigation projects modify risk.

Initial Recommendations

- 43. It is clear that there is no consistent or national approach to flood modelling and there are systemic issues that make if difficult or expensive to perform flood modelling. This report on the environmental scan is not intended to define the solution but to substantiate and inform further effort in this area.
- 44. It is recommended that:
 - a) All States and Territories take urgent steps to ensure the flood mapping data produced by local governments in their jurisdiction is made available to the insurance industry and other relevant stakeholders, including if necessary by legislation.
 - b) AGD and BoM lead a Strategic Coordination Group at the Commonwealth level in collaboration with States and Territories to progress longer term issues
 - The Strategic Coordination Group develop a proposal for Government on a national approach to flood modelling, with costed options
 - d) A workshop be held to identify specific objectives and possible project activities including:
 - better coordination of flood modelling activities
 - ii. addressing impediments to accessing existing data from local, state and Federal agencies (including the use of legislative, policy or other means)
 - iii. a coordinated approach to data collection (including factors such as data type, resolution, location, purpose, priority and cost)
 - iv. means to discover and access data and other relevant information more effectively
 - creation of national standards and a framework for developing and agreeing to these standards relevant to flood modelling and mapping (that address general and specific requirements)
- 45. The next phase of work will involve broad stakeholder engagement with the public and private
- 46. Consideration be given to how this work will be communicated more broadly, possibly through a dedicated website.
- 47. A Project Plan will be developed for the next phase of work.
- 48. A scoping study may need to be undertaken in order to:
 - a) define requirements for data, tools and products related to flood modelling
 - gather specific, detailed information about available data, models and analytical tools, modelling and analytical activities and products
 - c) identify gaps and possible solutions to filling those gaps

- d) consider the role of Government in regard to flood-related data and other activities
- e) explore the public benefits of data being available for free or at a minimal cost; and
- f) identify how other countries approach flood modelling and the provision of flood-related information to their communities
- 49. As a guiding principles, the proposed approach to flood modelling should aim to meet the needs of the majority of stakeholders at least cost.

Process

- 50. It is recognised that research, analysis and stakeholder consultation needed to be undertaken before Government could recommend, agree or consider funding for a national approach to flood modelling.
- 51. The first step in the process was to gain an understanding of what has been done, what needs to be done and the roles of respective agencies and organisations in this area. Specific information was requested as follows:

Item	Description
Data	Data already collected or available, planned collection or analysis of data requirements; coverage, release or use limitations, general costs (eg license restrictions), funding for data
Models and Analytical Tools	Models you use, are developing or plan to develop; release or use limitations, general costs (eg. license restrictions), funding for models or analytical tools
Modelling and Analysis	Modelling and analysis you have conducted
Outputs	Information about outputs of your work related to flood modelling including reports, databases, maps, analyses
Other Agencies	Other agencies or organisations whom you think we should approach in regards to flood mapping
Contact Officer	A contact officer in your agency responsible for this activity and whom we can contact for clarification or further information

52. A general overview of the process follows:

Date	Activity
01 Mar	AGD sent letters to relevant Commonwealth agencies, the Murray-Darling Basin Authority
	and ALGA requesting information on flood modelling
07 Mar	AGD sought legal advice about the Water Act to advise the Attorney's Office
22 Mar	RAMMS sent letters to jurisdictions requesting general information on flood modelling
23 Mar	AGD met with Treasury to discuss a national approach to flood modelling
30 Mar	AGD sent an update (submission) to the Attorney on a national approach to flood modelling
27 Apr	AGD met with the Insurance Council of Australia to discuss their requirements for flood risk mapping and activities in this area
27 Apr	AGD met with members of the Natural Disaster Insurance Review (NDIR) Panel to exchange ideas on flood modelling
06 May	Developed initial Project Schedule (current version shown at Appendix C)
13 May	RAMMS sent letters to jurisdictions requesting detailed information on flood modelling
18 May	Started draft Report
01 Jun	Finalised draft Report with initial recommendations
10 Jun	Final version of Report following review and comments

Consultation

- 53. The table below lists (in alphabetical order) agencies, organisations or individuals consulted as part of this environmental scan with an indication of who lead the consultation and whether input was received. This provided a broad perspective on the topic and helped identify common views and issues. It should be noted that not all areas were able to provide a response, or a detailed response, given the time constraints.
- 54. Consultation was extensive but not in great depth as the initial focus was to define the general scale and scope of flood modelling activities to inform scoping of a general work program and subsequent follow up consultation.

Agency, Organisation or Individual	Lead	Input
Australian Capital Territory	RAMMS	×
Australian Institute of Actuaries (informal discussions)	AGD	1
Australian Local Government Authority (ALGA)	AGD	x
Bureau of Meteorology	AGD	1
Cooperative Research Centre for Spatial Information (CRCSI)	AGD	1
CSIRO	AGD	1
Defence Imagery and Geospatial Organisation	AGD	1
Defence Science and Technology Organisation	AGD	1
Department of Climate Change and Energy Efficiency	AGD	1
Department of Innovation, Industry, Science and Research	AGD	1
Department of Regional Australia, Regional Development and Local Government	AGD	1
Department of Sustainability, Environment, Water, Pollution and Communities	AGD	1
Geoscience Australia	AGD	1
Insurance Council of Australia (ICA)	AGD	1
Murray-Darling Basin Authority	AGD	1
Natural Disaster Insurance Review (NDIR) Panel	AGD	1
New South Wales	RAMMS	1
Northern Territory	RAMMS	x
Queensland	RAMMS	1
South Australia	RAMMS	1
David Hocking - Spatial Industries Business Association (SIBA)	AGD	1
Tasmania	RAMMS	×
Victoria	RAMMS	1
Western Australia	RAMMS	1

RAMMS – The Risk Assessment Mitigation and Measurement Sub-Committee (of the NEMC) AGD – The Commonwealth Attorney-General's Department

- 55. Further, two documents were referred to in the preparation of this report:
 - a) Reforming flood insurance Clearing the waters, April 2011 (A Treasury report) and
 - b) Understanding flood risk Our National Flood Risk Assessment (A UK Environment Agency report).

Summary of Role and Involvement in Flood Modelling

56. The following table provides a summary of the roles and involvement of various agencies and organisations in flood modelling. It is based on input received. It provides no comment on input provided and should not be taken as necessarily complete.

Agency or Organisation	Role or Involvement
Australian Institute of Actuaries	Actuaries quantify risk on behalf of insurance companies in
(informal discussions)	order to determine the price of insurance.
	They try to understanding the probability of an event
	occurring and extent of potential floods (amongst other
	things) and therefore the potential financial impact of a
	flood to the insurance company.
Bureau of Meteorology	 The Bureau is the national flood forecasting and warning agency providing flood warning services in a cooperative arrangement with State, Local and other agencies. The Bureau gathers and stores climate and weather data from a range of sources. It is involved in developing the geofabric - a national data
	set that identifies the spatial relationships of important hydrological features such as rivers, lakes, reservoirs, dams, canals and catchments.
	 It maintains a range of observation systems including weather stations, river gauges and radar stations as well as satellite observing systems.
	It performs climate modelling and provides seasonal climate forecast updated monthly.
	 It provides seasonal flow forecasting service and is piloting 7-10 day streamflow forecasting services.
	 It performs hydrologic modelling to make predictions about flood levels at key locations on rivers as part of its flood warning role including a new water availability forecasting services.
	 Issues severe weather warnings including for very heavy rainfall.
	 It makes data available to the public through a website and other electronic forms including through web services.
Cooperative Research Centre for Spatial Information (CRCSI)	 The CRCSI was involved in creation of the Urban DEM – initially to focus on sea level rise but intended as part of a national elevation data framework (NEDF). The data is available through GA's NEDF-Portal. Future steps intend to focus on new data acquisition,
	hydrological conditioning, expansion of the portal and enhancing a visualisation tool. 4. Assisted in an audit of elevation data for GA
	5. According to DIISR, the CRCSI was also involved with mapping of the 2009 Victorian bushfires, and the 2008 Szechuan earthquake in China
CSIRO	 CSIRO conducts research using a range of data types and models. Research project relate to flood mapping, monitoring and prediction.

	 It has developed different methods depending on the requirement. Many of the tools are available only to researchers as they have not yet been operationalised. Research involves use of various satellite data sets. It has conducted a range of research activities and developed different models. It has used hydrodynamic modelling using various specific models of varying complexity. It is involved in research on better measurement of rainfall through the Water Information Research Development Alliance in conjunction with the BOM. It developed a clean SRTM DEM data set with BOM and the Australian National University resulting in a number of derived products. 	
Defence Imagery and Geospatial Organisation	DIGO is considering release of SRTM 2 DEM data across the whole of Australia.	
Defence Science and Technology Organisation	DSTO is not involved in flood modelling as it falls outside of their core capability areas.	
Department of Climate Change and Energy Efficiency	 DCCEE is involved in modelling the impacts of climate change. Key focus has been on storm surge and implications o sea levels It has invested in products that support national risk assessment There is likely to be future investment in developing a national wave data set and further analysis of rainfall intensity under changing climatic conditions It commissioned work that starts to identify the extent of coastal erosion. In partnership with the CRCSI and GA, acquired access to high resolution elevation data for key coastal urban areas. Had to negotiate broad access agreements. Looking at further acquisition. It invested in the NEDF-Portal Developed an interactive pilot Visualising Sea level Rise tool. It is looking at how DEM of varying resolutions can be stitched together. It invested in national storm tide modelling with the Antarctic and Climate systems CRC and the UWA. Invested in GA's NEXIS 	
Department of Innovation, Industry, Science and Research	DIISR mostly identified activities of the CRCSI. 1. CRC is coordinating the involvement of the Queensland Department of Environment and Resource Management (QDERM), Land & Property Management Authority NSW (LPMA), DIISR through the Space Policy Unit, Geoscience Australia, Department of Sustainability & Environment Victoria, and Landgate Western Australia to participate in the ongoing operational trial of a temporary mobile satellite reception and processing facility and its imagery products. The trial hopes to extend its capability to include very high resolution optical imagery from the Rapid Eye and Geo Eye satellites using the same mobile reception and mapping facility.	

 It produced a map of flooded areas Environment acquired a flood inundation data set from Centrelink using data from GA It conducted projects on several areas to assess probable inundation patterns to assess wetland health It has used different data types to support the TRaCK CERF Hub inundation modelling (using some free data). It has other planned activities on land use by determining extent of dams and flood events. There is a proposal to develop models for water use
compliance purposes and delivery of processed imagery to State agencies.
 GA acquires public good imagery from optical satellites on a daily basis and maintains an archive of imagery which provides a 20-year record of the land surface. GA and DIGO have established the Optical Geospatial Radar and Elevation (OGRE) panel which facilitates access to commercial imagery including radar data. Through GA Australia can access the International Charter for space and major disasters to access government and commercial satellite capabilities. Australia is not a member of the Charter, but would benefit from membership should this become possible under the Charter rules. GA is involved in improving DEMs and making it available through the NEDF Portal, though gaps still exist. GA hosts the Australian Flood Studies Database. This database is currently being updated and further enhanced to improve capability. GA has developed the National Exposure Information System (NEXIS) for generating national exposure data. GA deploys post disaster teams for significant natural hazard events. Data gathered may be used to validate hazard models and NEXIS, and to develop vulnerability models. GA and the ANU developed the ANUGA software which is being used to model tsunami, flood and storm surge. ANUGA is free and open source software and is under continual development and validation. GA has developed flood damage curves to estimate economic cost to repair a building under different conditions (with appropriate data). It has also developed other vulnerability models. GA has developed the National Exposure Information System (NEXIS) which provides comprehensive information about buildings and population for use in risk assessment applications. GGA uses satellite data to derive flood extents using automated analysis. GGA is working with other agencies to clearly define user

	 13.GA has experience modelling flood risk by combining flood hazard modelling with information on exposure and vulnerability. 14.GA is involved in and provides secretariat support for the National Flood Risk Advisory Group, a role shared with the Bureau of Meteorology. 	
Insurance Council of Australia (ICA)		
Murray-Darling Basin Authority	 MDBA conducts flood modelling projects over specific area Projects include assessment of floodplain inundation under a range of conditions including consideration of structures like weirs and regulators. Also, they include dam break studies and studies in relation to construction of a rail and highway bypass. It has gathered and uses a wide range of data types including hydrometric and bathymetric data, elevation data (of varying types), climate and imagery. It uses the RiM-FIM. It also uses commercial flood modelling software of varying complexities – MIKE 11, MIKE 21 and MIKEFLOOD. It also uses post-processing tools. MDBA also uses a monthly water balance model (MSM-Bigmod) and a daily flow and salinity routing model (BIGMOD). MDBA has produced various reports over project areas including a Hume Dam Assessment of Hydrologic Risk and 	
Natural Disaster Insurance Review (NDIR) Panel	The NDIR is looking at issues surrounding access to flood insurance as part of its review. It is not involved in flood modelling itself.	
	 Flood mapping is developed and used through the Floodplain Risk Management Process and recommended to local governments to determine and manage the flood risk in their communities. Floodplain management is achieved through the development and implementation of Floodplain Risk Management Plans by local councils. This plan provides inputs into the council Local Environment Plan and Development Control Plans, to support planning and mitigation activities. The floodplain management process is the responsibility of the relevant local council which may establish a Floodplain Risk Management Committee. Specialist technical assistance, advice and funding are provided to councils through the NSW Office of Environment and Heritage. A Floodplain Risk Management Plan is reviewed as works are implemented, more flood data or advanced modelling techniques become available, and flood events occur. The SES is assigned the responsibility to coordinate the collection, analysis, mapping and distribution of spatial 	

	 information regarding floods, storms and tsunami as prescribed in the NSW State Disaster Plan. As such the NSW SES maintains the SES Hazards Library, which includes an extensive list of publications, maps and data. 6. The data contained in the Hazards Library is classified 'SES - In Confidence' in accordance with the SES Information Classification Policy and should be used under guidance of trained and qualified emergency management personnel. Appropriate extracts may be shared with other Emergency Service Organisations and support agencies for emergency services use with approval.
Queensland	QLD has a majority of communities captured through the
Queensiano	Protecting Our Coastal Communities project (POCC) (should be finalised this year). 2. Inland flooding data is being collected, subject to council participation. QLD currently has around 25 areas already tendered and more than another 50 or more areas nearly ready to tender in the next few weeks. Data will likely be available late this year or early next year subject to weather. 3. Coastal inundation from storm tide or tsunami is relatively easy to map at a broad scale using the bathtub approach. Some Councils prefer to do proper modelling of these events which would give more accurate results. Different councils will bring different methodologies and obtain different results. These councils would also likely express concern with the 'bathtub' approach being released for their jurisdiction. 4. Inland inundation using the bathtub approach is less accurate. Modelling would therefore need to be a council responsibility. This has the same issue, as different councils may apply different methodologies resulting in inconsistencies. 5. The Digital Elevation data acquired from POCC is available for sale through the Dept. of Environment and Resource Management (DERM).
South Australia	 Adelaide, the Mt Lofty Ranges and the River Murray are identified as areas that have significant digital elevation data. Other areas such as the South East do have DEMs, but a very high level of resolution is required over large areas given the very flat terrain. Other regions have limited data that may not be sufficient for needs. Floodplain mapping studies are generally undertaken by Local Councils, usually with some funding support from the State Government. The work is therefore not undertaken in a strategic manner (e.g. Zone by Zone, catchment by catchment), and to date SA has not seen it has a responsibility to do so. As a result, there is a patchwork of floodplain studies of various ages across SA, often using different methods. The main impediment to a more strategic approach is the lack of resources across State and Local Governments to have a single uniform mapping program. This has been considered a medium priority in flood hazard management.

	Higher priorities including risk assessment, monitoring and warning, intelligence, and response capacity are being pursued. 4. Further floodplain mapping projects are currently managed by the Stormwater Management Authority and Local Councils, and there is no plan to alter these arrangements in the short term.		
David Hocking - Spatial Industries Business Association (SIBA)			
Victoria	 Victoria has indicated that its flood mapping data is spread across to agencies, the Department of Suitability and Environment (DSE), and Melbourne Water. DSE has available a series of GIS layers called the Victoria Flood Database (VFD) that captures the extent of known available flood information for Victoria outside the area managed by Melbourne Water. The data applies to riverine flooding. It does not include storm surge, storm water flooding or coastal inundation. Copies of the VFD can be provided free of charge (licensing restrictions apply.) Electronic copies of flood studies which contain flood mapping information and an explanation of how the mapping was obtained are being provided the Australian Flood Studies Database. Older studies Otten only looked at the 1% AEP standard. More recent studies consider a range of events, including ones rarer than the 1%. Melbourne Water also has available a series of GIS layers within Victoria's GIS that captures the extent of known available flood information for the region. The flood extents for 1% AEP events have been incorporated into Local Government Town Planning Schemes via overlays either Land Subject to Inundation Overlay (riverine flooding) or Special Building Overlay (storm water flooding.) The data applies to riverine and storm water flooding. It does not include storm surge or coastal inundation. Copies of this information are provided to companies conducing work for developers. Electronic copies of flood studies which contain flood mapping information and an explanation of how the mapping was obtained are held by Melbourne Water. The older studies often only looked at the 1% AEP standard. More recent studies consider a range of events, including ones rarer than the 1%. In addition some mapping was done in the late 1980s and early 1990s are has been based on recorded flood levels rather than being derived from model studies. There is a proce		
Vestern Australia	Landgate (Western Australia's primary source of land information and geographic data) aims to provide elevation data to government, business and the community on a		

three tiered solution.

- a) SRTM 30m hydrologically enforced DEM for the interior of the State
- b) SPOT 10m for the coastal 100km buffer; and
- c) LIDAR for targeted areas
- 2. The Department of Water (DoW) is the State Government's lead agency in floodplain mapping and providing floodplain management advice. This advice includes the development of floodplains with the object of promoting the wise use of floodplains while minimising flood risk and damage. DoW holds digital elevation data including LIDAR data sets to meets its needs. The main LIDAR data set collected and processed by DoW is for an area that includes the Swan Coastal plain to Busselton. There are other targeted LIDAR data sets near a number existing river gauging sites.
- 3. Main Roads WA also holds LIDAR data sets but the extent of their holdings are unknown. The only data set that is known is for an area around the town of Fitzroy Crossing in the Kimberley. Other State agencies and Local Government agencies may also hold data and information sets that would be of use to the insurance industry and other users including the communities at risk.

GLM-40

Department of Community Safety

State Planning Policy 1/03 Review

Inter-Departmental Committee (IDC) Meeting No 1

10:00 am-11:30 am Thursday, 9 December 2010

Conference Room C3.07
Emergency Services Complex
Corner of Kedron Park and Park Roads, Kedron

Attendance:

Present

Yolande Yorke, Executive Director, Policy & Legislative Reform (DCS) (Chair)
Michael Papageorgiou, Executive Director, Planning Policy (DIP)

Bruce Stewart, Director, Planning and Local Government (DPC)

Paul Kirkman, Manager, Planning Coordination (DERM) (proxy for John Lane)

Stephen Robbins, Senior Advisor (Policy), Planning Legislation Unit (TMR) (proxy for Randall Fletcher)

Stuart Grierson, Director Accommodation Office, Property Performance and Management Group (DPW)

Andrew Broadbent, Manager, Project Development and Facilitation Employment and Economic Development (DEEDI)

Malcolm Irwin, Principal Project Officer, Resource Planning, Geological Survey of Queensland (DEEDI)

Graham Wiltshire, Director, Strategy, Policy & Legislative Reform (DCS) (Chair of Working Group)

Robert Preston, Principal Project Officer, Policy & Legislative Reform (DCS) (IDC Secretary)

Apologies

John Lane, Director, Integrated Planning (DERM),

Randall Fletcher, Director, Planning Legislation Unit (TMR)

DRAFT MINUTES

1. Introduction

- All thanked for attending the inaugural meeting of the SPP 1/03 Review IDC.
- The review will require a good deal of collaboration and input from other agencies under leadership of DCS.
- This is the first state instrument to be reviewed under the Sustainable Planning Act (2009).

2. Overview

(a) Progress to date

The project is divided into five phases (see Attachment 1 to minutes) being
 (1) Pre planning (2) Prepare the draft instrument (3) Public consultation on
 the draft instrument and prepare the final instrument (4) Adopt final
 instrument and (5) Implementation.

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- The project in the early stages of Phase 1 and will produce an initial Policy Issues Paper in February 2011 and a second paper in June 2011.
- The first meeting of the Working Group on 30 Nov 2010 explored possible issues for the review and endorsed TOR for the WG and IDC for consideration at this meeting. LGAQ asked for an extension until 14 Jan 2011 to provide advice on issues. The WG suggested that this deadline flow onto other government stakeholders. DCS tabled key issues for the review including the need for land use planning to build community resilience and the need to improve links between disaster management planning and land use planning. The next meeting of the WG is Thu 27 Jan 2011.
- It is important that the IDC and relevant Ministers confirm the scope of the
 project and all significant issues at an early stage. Without early
 consideration of issues there is a risk that the project would take longer than
 the current timeline.

Resolution 2 (a) Progress to date noted. The review will place emphasis on definition of in-scope issues so that the project delivers essential outputs on time.

(b) Correspondence

 DCS has written to all state agencies, local governments, the LGAQ, and key stakeholders.

Resolution 2 (b) Outgoing correspondence noted.

3. Membership and Terms of Reference of committees

(a) Inter-Departmental Committee

- The IDC will provide an important strategic role for the project to keep Ministers and Executive informed of progress and any substantive issues.
- While the majority of state interests could be achieved through DCS, DERM, DIP and DPC, other agencies such as DEEDI, TMR, DPW and DOC may also wish to become involved. Other agencies will be in a better position to indicate their interests in IDC membership once they have considered all relevant issues and implications.
- The Purpose statement of the IDC would be improved by using a statement from the project plan regarding the coordination of agency and stakeholder interests.

Resolution 3 (a) TOR for the IDC endorsed subject to revision of the purpose statement. Membership to be finalised at next meeting of the IDC - 10 Feb 2011.

(b) Working Group

- The WG has an operational role in assisting DCS with papers for consideration by the IDC. It will meet more frequently that the IDC.
- DEEDI, TMR and DPW would like to participate in the Working Group.
 Participation should also be extended to DOC following discussion.

Resolution 3 (b) TOR for the WG endorsed. Membership to include DCS, DERM, DIP plus DEEDI, TMR, DPW and DOC (if available).

4. Project Plan

- The Project Plan defines the scope, processes and milestones for the project.
- The Project Plan is framed around the 2009 DIP SPI Guideline.
- The draft Project Plan was endorsed by the Working Group. It includes minor changes suggested by DIP to include a new Appendix A (Issues Analysis Framework) to link with the two policy issues papers (Feb 2011, June 2011).
- Membership of the IDC and WG should be amended to reflect the above decisions (Item 3a and 3b).
- Governance should be amended to include provision of regular briefings to the Growth Management CEO Committee and the Growth Management Cabinet Committee.
- The issues identification and analysis phase should not be restricted to development impacts but also include hazard impacts on land management issues (e.g. biodiversity). This will coincide with the scoping of state issues and identification of appropriate planning and non-planning mechanisms.
- While it is very likely that the review will develop a replacement SPP, the Project Plan should refer throughout to a future SPI not a future SPP.
- The Project Plan should also include a review of initiatives in other jurisdictions.

Resolution 4. Project Plan endorsed subject to amendments (i) governance arrangements to include GM committees, (ii) early issue identification and analysis phase to include land management and (iii) refer to a future SPI throughout not a future SPP.

5. Frequently Asked Questions

- FAO for the review have been prepared to provide consistent messaging.
- · The FAQ can be updated as the project moves forward.
- It is important to keep all stakeholders informed about the project. This could be achieved by including the FAQ on the DCS web site and invite LGAQ to post.
- The FAQ should also refer to a future SPI throughout and not a future SPP.
- Term 'multi-hazard zone' adopted from Inland Flooding Study may not be understood by the lay reader and should be amended accordingly.
- The FAQ should also include reference to a review of initiatives in other jurisdictions.
- It may be useful to include a glossary as time permits.
- FAQ should be finalised and released as soon as reasonably possible and amended as required throughout the project.

Resolution 5. SPP 1/03 Review FAQ endorsed subject to amendments (i) refer to a future SPI throughout instead of a future SPP, (ii) amend reference to 'multi-hazard zone' for lay readers, (iii) include references to review of initiatives in other jurisdictions. DCS to load on web site and invite LGAQ to also post.

6. Preliminary issues and interests

- The issue identification and analysis stage of the project will confirm the scope of state interests to be addressed in the review.
- DCS has received initial feedback from several agencies (DIP, DPC, DEEDI, TMR) about proposed issues for the review.
- It will be helpful for all agencies to also assess their full range of state interests for the review as they now understand the project, and provide additional feedback to DCS in line with the deadline for local government comment (14 Jan 2011).
- It may be useful for DIP to also define its interests in spatial planning outcomes e.g. development inside urban footprints of regional plans.
- The issues analysis should also identify state interests that have potential for conflict with the outcomes of SPP 1/03.
- Where possible, the review should seek outcomes that value add to the development process and not just add overly prescriptive regulation. Local governments need scope to implement innovative approaches.
- The review may need to look at implementation of State flood mitigation responses and the link with local government planning. There are some instances where the state has purchased land for community infrastructure in hazard prone areas. There may be greater opportunities for the state to lead by example.
- Once approved by relevant Ministers, final issues for the review will need to communicated to stakeholders and the public so that expectations are kept within scope.
- The definition of Landslides may need to be examined to include rock fall.
- The state has a low level of resident expertise in Landslides and external advice may be required.
- Local Government views on operation of the SPP will be critical as the have substantial experience with its application.
- Climate Change is an important dimension for the review as Queensland moves to a different climate environment. Developments need to be located and designed for the climate of 50 years hence (or more) not today's climate.
- There is a need to determine how data quality for hazard studies has impacted
 on implementation of the SPP and how this data can be upgraded. The review
 could also look at opportunities for the State to assist local governments in
 need of support to improve consistency across local government areas.
- The review will need to recognise the evolving nature of data on climate change recognising that SPPs need to be reviewed every 10 years.
- Coincident flooding or the additive risk of riverine flooding and storm tides is also a matter for the review.

Resolution 6. All agencies to assess their full range of state issues and interests for the review and provide additional feedback to DCS by 14 January 2011.

7. Other business

· Nil

8. Next meeting

10am-11:30am Thu 10 Feb 2011 (two weeks after WG meeting on 27 Jan 2011)

Department of Community Safety

State Planning Policy 1/03 Review

Project Plan December 2010

Version	2.1
Owner:	Robert Preston, Project Manager - SPP 1/03 Review
Contact Details:	Ph: 3635 3782; Email: robert.preston@dcs.qld.gov.au
Division/Unit: Strategic Policy Division / Policy & Legislative Reform Branch	
Document Status: Draft	

Revision History

Revision Date	Version No.	Author	Description of Change/Revision
18 Oct 10	1.0	Nathan Williamson	Original draft
19 Nov 10	1.1	Robert Preston	Amended to incorporate recent approvals
26 Nov 10	1.2	Robert Preston	Incorporates comments from NW, PW, BT
03 Dec 10	2.0	Robert Preston	Incorporates suggestions from Andrew Walls incl. new attachment A.
13 Dec 10	2.1	Robert Preston	Incorporates changes requested at IDC Meeting 9 Dec 2010

Endorsement

Name	Members	Date
Inter-Departmental Committee	Yolande Yorke (DCS), Michael Papageorgiou (DIP), Paul Kirkman for John Lane (DERM), Bruce Stewart (DPC)	9 Dec 2010
Working Group	Graham Wiltshire (DCS), Bernard Trembath (QFRS), Allison Godber for Nathan Williamson (EMQ), Andrew Walls (DIP), Alison Hamilton for Paul Kirkman (DERM), Tracy Haynes for Mark Piorkowski (LGAQ)	30 Nov 2010

Approvals

Name	Title	Signature	Date
Gary Mahon	Project Executive/Sponsor		
Yolande Yorke	Project Executive Director		
Graham Wiltshire	Project Director		
Robert Preston	Project Manager		

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1. Project Definition

1.1 Project Background

State Planning Policy 1/03 Mitigating the Adverse Impacts of Flood, Bushfire and Landslide (SPP 1/03) is one of four types of State Planning Instruments (SPIs) used to implement the Sustainable Planning Act 2009 (SPA) to influence land use planning and development in Queensland.

The four types of state planning instruments are:

- · state planning regulatory provisions (SPRP)
- regional plans
- state planning policies (SPP)
- standard planning scheme provisions, known as the Queensland Planning Provisions (QPP).

SPP 1/03 was originally drafted under the Integrated Planning Act (1997) and came into effect on 1 September 2003. Under SPA, SPPs expire ten years after they are made.

The purpose of SPP 1/03 is to describe the State's interest in ensuring that the natural hazards of flood, bushfire and landslide are adequately considered when making decisions about development. Its coverage of natural hazards is complementary to coastal hazards that will be managed through a State Planning Policy - Coastal Protection (i.e. coastal inundation, erosion and storm tide inundation - including the effects of climate change on sea level rise and increased storm intensity).

The Department of Community Safety is reviewing SPP 1/03 as part of the Statutory Instruments Program for 2010/11, as approved by Cabinet in March 2010. An action plan for the review of SPP has also been prepared for publication in the SEQ Regional Plan Climate Change Management Plan. This review is being conducted in accordance with the State Planning Instruments Program Guideline, produced by the Department of Infrastructure and Planning, and with the assistance of an Inter-Departmental Committee (IDC) and Working Group (WG). The working group includes a representative from the Local Government Association of Queensland (LGAQ).

1.2 Project Objectives

The objectives of this project are:

- (1) To provide advice to relevant Ministers on the state policy position with respect major interests and issues for the review of SPP 1/03 including:
 - · accurate definition of current state interests,
 - preferred planning and non-planning options,
 - · criteria and methods to delineate areas of interest, and
 - implications for the state government and local governments

by conducting a thorough analysis of state agency, local government, LGAQ and key stakeholder issues and interests (regarding development, land use and land management), with consideration of initiatives and approaches used in other jurisdictions, as outlined in Attachment A, including:

 priority issues that arise from an evaluation of the current SPP and current state policy (Policy Issues Paper 1),

 recommended policy issues that need to be addressed through the planning framework or other means. (Policy Issues Paper 2)

- (2) To ensure the state's interests in flood, bushfire and landslides are adequately addressed in accordance with recommendations endorsed from relevant Ministers by:
 - preparing planning instruments and other products as appropriate for cabinet approval and public comment

receiving and analysing public submission

- preparing final planning instruments and other products as appropriate for cabinet approval
- (3) To prepare drafting instructions for the preparation of SPI required to better reflect state interests.
- (4) To document possible implications for industry, the community or other stakeholders via preparation of a Regulatory Assessment Statement (RAS)
- (5) To coordinate the analysis of state agency and stakeholder interests and the timely provision of advice and recommendations to relevant Ministers and Cabinet as required.

1.3 Project Scope

The following are included in the scope of the project:

- state interests relevant to ensuring that the natural hazards of flood, bushfire and landslide are adequately considered when making decisions about development in accordance with the Sustainable Planning Act (2009).
- consideration of state, industry, community and stakeholder implications

The following are outside the scope of the project:

 Matters outside of scope of this project will be determined through preparation and endorsement of Policy Issues Paper and Policy Research Paper prepared during Phase 1 of this project.

1.4 Products

The Products that will be delivered by this project (also refer Attachment B) are:

- A first Policy Issues Paper (Milestone 1.5) that identifies priority issues for the review of SPP 1/03 - to be endorsed by an interdepartmental committee (IDC) and relevant Ministers and a second Policy Issues Paper (Milestone 1.7) that provides recommendations for the development of Statutory Planning Instruments (such as a replacement SPP) and other appropriate non-planning instruments, based on more detailed investigation of priority issues - to be endorsed by an interdepartmental committee (IDC) and relevant Ministers (output from Phase 1)
- A replacement Draft SPI and / or drafting instructions for modifications to other Statutory Planning Instruments (Milestone 2.6) to be endorsed by the IDC, approved by relevant Ministers or Cabinet for public consultation (output from Phase 2)
- Final replacement SPI, modifications to other Statutory Planning Instruments SPIs and other appropriate non-planning instruments (Milestone 4.2) endorsed by the IDC, relevant Ministers and approved by Cabinet - published by way of gazette and newspaper (output from Phase 3 and 4).

1.5 Assumptions and Constraints

The following assumptions have been made during the planning of this project:

- that agencies outside the control of the project, which need to provide input or undertake action needed by the project, are able to do so and within the timings allowed;
- approval from the relevant Ministers will be obtained within reasonable timeframes;
- Cabinet consideration to occur as scheduled:
- that there would be no additional tasks outside the current scope of the project plan placed upon the project during the course of the project;
- that external consultation does not identify significant issues not yet considered and which would delay project timeframes

The following constraints have been placed on this project:

 funding will depend on matters identified and agreed through consideration of a Policy Issues Paper (Phase 1). Funding is to be drawn by DCS from Natural Disaster Resilience Program subject to relevant approval processes.

1.6 Project Schedule

This is an indicative timeframe only and is subject to the above assumptions.

Phase	Deliverable	Est. Date of Completion		
1. Pre-Planning	An initial Policy Issues Paper and second Policy Issues Paper to be endorsed by an interdepartmental committee (IDC) and relevant Ministers.	June 2011		
Preparation of draft instrument	Draft replacement SPI to be endorsed by the IDC, approved by relevant Ministers or Cabinet for public consultation	November 2011		
Consultation and preparation of final instrument	Final replacement SPI, endorsed by the IDC	October 2012		
4. Adoption	The replacement SPI, endorsed by the relevant Ministers and approved by Cabinet, will be published by way of gazette and newspaper	January 2013		
5. Implementation	Initial implementation and ongoing monitoring and reporting of implementation	February- August 2013		

^{*} Ongoing implementation and related reporting not to be completed by project team.

An indicative timeline for this project is shown in Appendix C.

2. Project Roles

2.1 Relevant Ministers

The relevant Minister for the review of SPP 1/03 are:

- the Minister for Police, Corrective Services and Emergency Services
- · the Minister for Infrastructure and Planning

2.2 Growth Management Committees

The Growth Management CEO Committee and the Growth Management Cabinet Sub-Committee will consider and endorse all major proposals arising from the review.

Role	Responsibilities				
The Growth Management Sub- Committee of Cabinet (GMSCC)	Discuss and develop a whole-of-Government response to the review of SPP 1/03 in line with associated strategic growth management policy issues.				
Growth Management Chief Executive Officer Committee (GMCEOC)	Provide strategic direction and Whole of Government leadership for the review of SPP 1/03 in line with the Government's growth management agenda.				

2.3 Project Executive - Lead agency

The project executive of the lead agency (Department of Community Safety) is:

Role	Responsibilities			
Project Executive – Gary Mahon Assistant Director-General (DCS)	The Project Executive has ultimate responsibility for satisfactory completion of the project and provision of advice to the Minister for Police, Corrective Services and Emergency Services through the Director General, Department of Community Safety.			
Project Executive Director Yolande Yorke (DCS)	The Project Executive Director has responsibility for ensuring the Project Executive is fully advised of state and key stakeholder interests and concerns, and that the project is delivered in accordance with the approved project plan.			

2.4 Inter-Departmental Committee

The role of the Inter-Departmental Committee (SPP 1/03 review) will be ensure comprehensive cross-government identification and consideration of relevant issues. This committee will enable the coordination of state agency input to preparation of the replacement SPI outside the formal consultation stages.

The IDC representative from the Department of Infrastructure and Planning has responsibility for the provision of advice to the Minister for Infrastructure and Planning and the GMCEOC based on advice from the Chair of the IDC.

Agencies represented on the IDC and members nominated by respective Director Generals are:

Agency	Member				
Department of Community Safety (Lead agency)	Yolande Yorke, Executive Director, Policy and Legislation Reform (Chair)				
Department of Infrastructure and Planning	Michael Papageorgiou, Executive Director, Planning Policy				
Department of Environment and Resource Management.	John Lane, Director, Director, Integrated Planning, Strategy and Policy				
Department of Premier and Cabinet	Bruce Stewart, Director, Environment and Resources				

Membership by the Department of Employment, Economic Development and Innovation, Department of Transport and Main Roads, Department of Public Works, Department of Communities and other agencies to be confirmed at the next IDC meeting on 10 February 2010.

2.5 Project Team

The project team is responsible for the preparation of all reports and information considered by the IDC and Project Executive with the support of a Working Group. The project team also provides secretariat support to the IDC.

Agency / organisation	Member				
Project Director - Graham Wiltshire Director, Strategy (DCS)	The Project Director has responsibility for ensuring that the project is delivered on time and within budget and for reporting to the Project Executive.				
Project Manager – Robert Preston Principal Policy Advisor (DCS)	The Project Manager will manage the project on a day-to-day basis on behalf of the Project Executive and Project Director and will coordinate stakeholder consultation, the preparation of research and policy papers, and the draft and final instruments by team members and contractors.				
Project Team Member/s Peter Wojciechowski (DCS), Christina Sinnemann (DCS),	The Project Team Member/s will be responsible for the delivery of discrete components of the project, aspects of consultation, the preparation of research and policy papers, and the draft and final instruments. Project team members will report to the Project Director and Project Manager.				

2.6 Working Group

A working group has been established to support the project team, preparation of matters considered by the IDC and to incorporate views of the LGAQ and other key stakeholders as required. Members of the working group will coordinate agency / organisational input to the review of SPP 1/03.

Role	Member/s				
Department of Community Safety (Lead agency)	Graham Wiltshire (Chair) Bernard Trembath (QFRS) Nathan Williamson (EMQ) Robert Preston (Secretary)				
Department of Infrastructure and Planning	Andrew Walls				
Department of Environment and Resource Management.	Richard Saunders				
LGAQ	Mark Piorkowski / Tracy Haynes				
Department of Employment, Economic Development and Innovation	Andrew Broadbent				
Department of Transport and Main Roads	Stephen Robbins				
Department of Public Works	TBA				
Department of Communities	TBA				

3. Related Initiatives

The projects and other initiatives shown in the table below have a bearing, or are in some way dependent on this project:

Related Project/Initiative	Nature of Relationship					
Inland Flood Study	Recommendations of the study will influence the policy issues to be explored as part of this project.					
Queensland Coastal Plan and State Planning Policy Coastal Protection	As the Qld Coastal Plan also looks at issues involving flooding/inundation, there is a need to ensure consistency between the two instruments					
Victorian Bushfires Royal Commission and Queensland IDC Sub-group on Planning and Building	The recommendations of the Royal Commission include matters relating to land use planning and will be considered as part of this project.					
Coincident Flooding Research by QCCE using NDRM funds	The study will identify issues concerning coincident flooding including potential impacts; the extent that coincident flooding is already covered in flood studies and the most appropriate planning instrument to address coincident flooding.					
Assessment of Natural Hazard Disaster Risk in Queensland	An assessment of the current natural hazard risk profile, consideration of alternative risk mitigation treatments and potential climate change impacts (study by Risk Frontiers – Macquarie University- in prep).					

4. Stakeholder consultation

The following consultation with stakeholders will be undertaken during Phase 1 (Pre planning) and Phase 2 (Preparation of Draft Instrument) of the Project.

- The Local Government Association of Queensland (LGAQ) will be invited to identify issues considered in the review, and participate on the Working Group to assist with development of the Policy Issues Paper, draft replacement SPI, and final SPI.
- All of Queensland Local Governments will be invited to suggest issues that they would like to see addressed in the review of SPP 1/03 by way of completing a questionnaire.
- Key stakeholders (Appendix D) will be invited to also suggest issues that they would like to see addressed in the review
- · Additional public consultation as may be required,

Plans for stakeholder consultation during Phase 3, 4 and 5 will be developed during Phase 2 of the project.

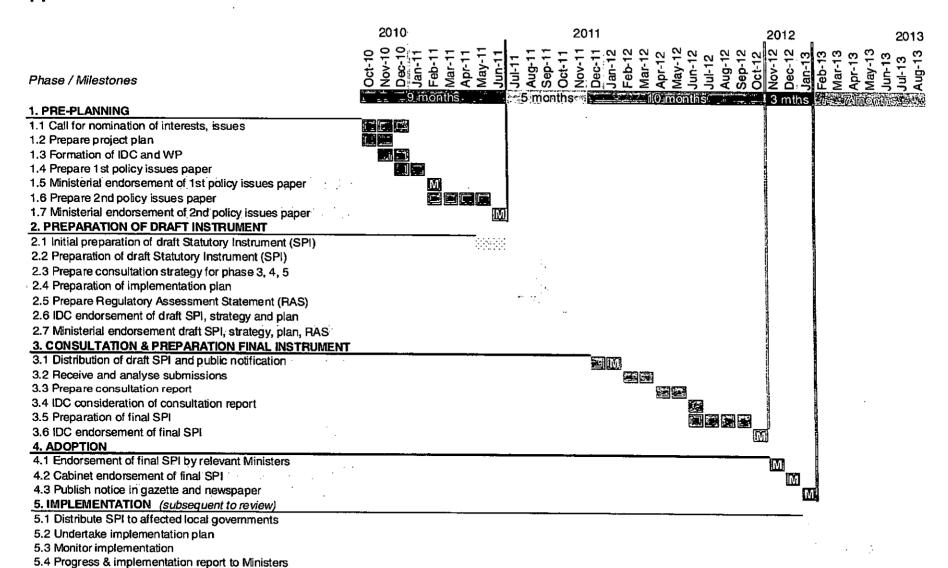
Appendix A – Issues Analysis Framework

- ppondix A		aco Analysis i latticwork			
Topic		Priority issues that arise from an evaluation of the current SPP and current state policy (Step 1.4 of flowchart - Policy issues paper 1)			Recommended policy issues that need to be addressed through the planning framework or other means (Step 1.6 of flowchart - Policy Issues Paper 2)
A Definition of state interests	₽	 What are the flood, bushfire and landslide issues that need to be addressed and why? What are the strengths and limitations of SPP 1/03 from the perspective of state government, local governments, LGAQ, industry and community stakeholders? What are the climate change factors or additional hazards that need to be included in policy consideration? What is the timeframe for acting on climate change scenarios? 	J.		What issues will be taken forward into other parts of the review?
· •		Û			Û
B. Preferred planning and non-planning options	₽	 5. Which issues could/should be addressed by the planning framework? 6. Which issues are more appropriately addressed by other means? 7. Which issues need to be addressed at the local, regional and state level? 8. What should be applied to plans and what should be applied through DA? 9. What are the most suitable planning instruments for SPA issues? 10. What are the most suitable means to progress non-SPA issues? 	5		2. Which issues will be addressed by the planning framework (SPA)? 3. Which issues will to be addressed through other means (non-SPA)?
Û.		Û		L	Û
C. Criteria and methods to delineate areas of interest	⇧	11. What criteria or spatial tools (mapping) are needed to support planning and non-planning mechanisms?	7	- 1	4. What supporting products (criteria, mapping, guidelines etc) are required?
Û		Û		L	Û
D. Implications	⇧	12. How would products be implemented?13. Is a 'package' or 'framework' response required?14. What are the anticipated impacts of products?15. Is a Regulatory Assessment Statement required?		- 1	5. What is an agreed course of action to consider in implementing proposed recommendations?
				_	

Appendix B – Indicative Flowchart

Phase 1		Phase 2		Phase 3		Phase 4		Phase 5
PRE-PLANNING	→	PREPARATION OF DRAFT INSTRUMENT	→	CONSULTATION AND PREPARATION OF FINAL INSTRUMENT	→	ADOPTION	→	IMPLEMENTATION
1.1 Call for nomination of interests, issues	.	2.1 Initial preparation of draft Statutory Plannnig Instrument (SPI)	l	3.1 Distribution of draft SPI and public notification	1	4.1 Endorsement of final SPI by relevant Ministers		5.1 Distribute SPI to affected local governments
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1.2 Prepare project plan		2.2 Preparation of draft SPI		3.2 Receive and analyse submissions		4.2 Cabinet endorsement of final SPI		5.2 Undertake implementation plan
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1.3 Formation of IDC and WP		2.3 Preparation of consultation strategy – phase 3, 4, 5		3.3 Prepare consultation report		4.3 Publish notice in gazette and newspaper		5.3 Monitor implementation
—	•	<u> </u>				<u> </u>		L
1.4 Prepare first policy issues paper		2.4 Preparation of implementation plan		3.4 IDC consideration of consultation report				↓ 5.4 Progress and implementation report to
+		*						relevant Ministers
Ministerial endorsement of first policy issues paper		2.5 Prepare Regulatory Impact Statement		3.5 Preparation of final SPI				
<u> </u>		+		V				
1.6 Prepare second policy issues paper		2.6 IDC endorsement of draft SPI, consultation strategy, implementation plan		3.6 IDC endorsement of final SPI			KEY	Milestones
	,	V						
1.7 Ministerial endorsement of 2 nd policy issues paper		2.7 Ministerial endorsement of draft SPI, consultation strategy, implementation plan						

Appendix C – Indicative Timeline



Appendix D – Community and Industry Stakeholders

Academic	CSIRO Climate Adaptation Flagship					
	Griffith University					
	James Cook University					
	National Climate Change Adaptation Research Facility					
	Queensland University of Technology					
	Sunshine Coast University					
	University of Queensland					
Bushfire	Australian Institute of Building Surveyors - Queensland/Northern Territory Chapter					
	Fire Protection Association Australia - Queensland State Committee					
Commonwealth	Attorney General's Department					
	Bureau of Meteorology					
	Department of Climate Change and Energy Efficiency					
Disaster Management	Emergency Services Advisory Council					
Environment	Environment Institute of Australia and New Zealand					
	Environmental Defenders Office					
	Queensland Conservation Council					
Flooding	Engineers Australia - Queensland Division					
	Institute of Public Works Engineering					
	The Board of Professional Engineers of Queensland					
Landslide	Australian Geomechanics Society					
Law	Queensland Environmental Law Association					
	Queensland Law Society					
Local Government	Local Government Association of Queensland					
Property	Planning Institute of Australia (Queensland)					
	Property Council of Australia - Queensland Division					
	Real Estate Institute of Queensland					
	Urban Development Institute of Australia (Queensland)					
	Urban Land Development Authority					
Utility	Brisbane Airport Corporation Pty Ltd					
	Energex Limited					
	Ergon Energy					
	Powerlink Queensland					





SPP 1/03 Review

Frequently Asked Questions (FAQ)

DRAFT - Version 1.1 - 13 December 2010

What is SPP 1/03?

- SPP 1/03 is a State Planning Policy (SPP) that influences how local governments constrain new development – including community infrastructure – to minimise the adverse impacts of flooding, bushfires and landslides on people and property in hazard-prone areas.
- This is achieved by requiring that local governments reflect SPP 1/03 in their planning schemes and apply these policies when assessing development applications.
- SPP 1/03 is a statutory instrument under the Sustainable Planning Act 2009 (SPA)
 which is administered by the Minister for Infrastructure and Planning. Under SPA, a
 SPP can be made by the planning Minister jointly with any other Minister to ensure a
 collaborative and coordinated approach to the development of a SPP.
- SPP 1/03 was jointly released by the Minister for Emergency Services and the Minister for Local Government and Planning in May 2003.
- A State Planning Instrument (SPI) to replacement SPP 1/03 needs to be in place before September 2013 – when the current SPP expires.

Who is leading the review?

- The review is lead by the Department of Community Safety.
- The review is being undertaken with the support of the Department of Infrastructure and Planning, the Department of Environment and Resource Management, and the Department of Premier and Cabinet through an Inter-Departmental Committee and a Working Group that includes a representative of the Local Government Association of Queensland.
- The Minster for Police, Corrective Services and Emergency Services and the Minister for Infrastructure and Planning will consider and endorse all major proposals arising from the review.

What will the review cover?

- The review will update and clarify outcomes that the Queensland Government would like to achieve through a replacement SPI in conjunction with other planning instruments such as Regional Plans.
- It will assess how well the SPP has worked to date, and develop improved planning mechanisms to deliver better outcomes for new communities.
- It will look at the strengths and limitations of current methods of delineating hazardprone areas and develop improved criteria to identify those locations that will be subject to flooding, bushfires and landslides in the future.
- It will identify major challenges that the State Government, Local Governments, the community and industry have faced in implementing the current SPP, and highlight opportunities for more effective implementation of a replacement instrument.
- It will initially consider a full range of development, land use and land management issues and take into account initiatives and approaches used in other jurisdictions.

What will it seek to change and why?

- A top priority for the review is to look at better ways to limit inappropriate development

 including community infrastructure through local government planning schemes to
 improve community resilience to flooding, bushfires and landslides. Mitigating the risk
 of natural hazards in the early stages of development planning will reduce future
 social and economic impacts.
- The review will identify improved linkages between land use planning and disaster management planning in an effort to reduce the risk of loss of human life, illness or injury to people. Any major gaps between land use planning and disaster management planning may place future communities at risk.
- The review will look at the need for more exact criteria and methods for identifying areas prone to flooding, bushfires and landslides, including a factor to take account of climate change. It will also look at the need to address the effects of additional

hazards in planning decisions because of climate change – such as heat waves and cyclonic winds. Early recognition of future climate change impacts will reduce the long term cost of climate change adaptation.

 Other important issue is to how to improve the integrated application of an SPP with other instruments such as building codes, Regional Plans and Standard Planning Scheme Provisions. A clear framework and interface between these different tools would improve local government and industry implementation of state policies.

The review will examine the advantages of a multiple zone approach for risk management (instead of a single line approach) that directs development towards areas that are less hazard-prone. It will identify better approaches for defining circumstances where a localised increase or decrease of default hazard levels and the risk mitigation response is warranted, and identify opportunities for improving the clarity of State mandatory or optional guidance to local governments.

The review will identify options for more effective State involvement in the approval of developments and how it can efficiently support hazard and risk studies for catchments and local areas. It will evaluate different approaches for ensuring that the level or resources used to support planning decisions are proportional to level of the risk from each hazard, and the effectiveness of land use planning to mitigate risks.

How will the review Incorporate findings of the Inland Flood Study?

- An Inland Flooding Study was conducted in partnership with the Local Government Association of Queensland (LGAQ) to improve Queensland's resilience to extreme flood events due to climate change.
- The review of SPP 1/03 will consider the recommendations of the study including the need to specify a preferred frequency for reviewing flood studies and the benefits of requiring a standard method for undertaking flood studies.

How will the review incorporate recommendations of the Victorian Bushfires Royal Commission?

 The Queensland Cabinet has requested that a number of planning related recommendations from final report of the 2009 Victorian Bushfires Royal Commission be considered during the review of SPP 1/03, taking into account the lower level of bushfire hazard in Queensland compared to southern Australia.

What are the important milestones?

- The project will prepare an initial policy paper on priority issues in early 2011 and a second paper that reports on an analysis of priority issues by June 2011.
- It will prepare a draft replacement SPI for public comment in late 2011.
- A final replacement SPI and other recommendations will be prepared in early 2013.

Progress to date

- The Department of Community Safety has written to all state agencies, local
 governments, the LGAQ, and key industry and community stakeholders inviting
 nomination of interests and issues they would like to see addressed in the review.
 Responses are due in mid January 2011.
- A Working Group including representatives of DCS, DIP, DERM and LGAQ has been formed. Its first meeting at the end of November 2010 discussed some of the possible key issues and organisation of the project. Its next meeting is scheduled for late January 2011.
- The first meeting of the Inter-Departmental Committee of senior representatives from DCS, DIP, DERM and DPC in early December 2010 endorsed terms of reference for committees and a project plan for the review. The next meeting of the IDC is scheduled for early February 2011.

GCM-39

Increasing Queensland's resilience to inland flooding in a changing climate:

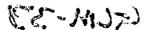
Final report on the Inland Flooding Study

A joint project of:

Department of Environment and Resource Management
Department of Infrastructure and Planning
Local Government Association of Queensland







Prepared by:

Office of Climate Change—Department of Environment and Resource Management
Department of Infrastructure and Planning
Local Government Association of Queensland

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Executive summary

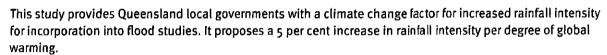
Flooding causes significant impacts on Queensland communities and the economy—and with our changing climate, flooding events are likely to become more frequent and more intense. Effective land use planning will ensure our communities are ready for the impacts of climate change.

The Local Government Association of Queensland (LGAQ) approached the Queensland Government to provide a benchmark figure for taking climate change into account when assessing inland flooding risk.

An Inland Flooding Study project was established by the Minister for Climate Change and Sustainability and the Minister for Infrastructure and Planning in partnership with LGAQ to deliver:

- 1. An improved methodology for assessing inland flooding risk while accounting for climate change.
- 2. Specific policy options for improved flood risk management in the case study area—Gayndah in the North Burnett Regional Council.
- 3. General policy options for consideration as part of the review of State Planning Policy 1/03 Mitigating the Adverse Impacts of Flood, Bushfire and Landslide (SPP 1/03).

As a result, this Inland Flooding Study combines the best available science and planning options to provide clear guidance and practical tools to enhance flood risk management by local governments.



This 5 per cent increase in rainfall intensity per degree of global warming can be incorporated into the 1 per cent (Q100), 0.5 per cent (Q200) and 0.2 per cent (Q500) Annual Exceedance Probability (AEP)¹ flood events recommended in SPP 1/03. For the purpose of applying this climate change factor local governments should use the following temperature increases and planning horizons: 2°C by 2050, 3°C by 2070 and 4°C by 2100.

This climate change factor will be reviewed and updated when a national position on how to factor climate change into flood studies is finalised as part of the current review of Australian Rainfall and Runoff Engineers Australia Publication (AR&R). The outcomes of this review are not expected to be available before 2014.

In the interim, local governments can use the recommended climate change factor from this project to better identify flood risks. Further technical information on how this climate change factor was derived can be found at www.derm.gld.gov.au.

Using this climate change factor, the Inland Flooding Study developed recommended policy options to incorporate climate change into the flood risk management framework for Gayndah. These options are included in a draft flood constraint code for assessing development applications, which defines four flood hazard areas linked to the 1 per cent (Q100), 0.5 per cent (Q200) and 0.2 per cent (Q500) AEP flood levels. The draft flood constraint code outlines the appropriate land uses for each of these hazard areas. This is a major step forward in shifting the focus from the 1 per cent AEP (Q100) as the only relevant flood level for residential development to the reality that there are varying levels of flood risk that local governments need to consider.

The recommendations also include two implementation options for addressing the increased flood intensity risk from climate change. These two options allow the North Burnett Regional Council to choose how best to represent this risk in its planning scheme.

The first option uses three new flood maps that include the climate change factor:

- Map 1: 1 per cent (Q100), 0.5 per cent (Q200) and 0.2 per cent (Q500) AEP flood extents projected for 2050.
- Map 2. 1 per cent (Q100), 0.5 per cent (Q200) and 0.2 per cent (Q500) AEP flood extents projected for 2070.
- Map 3: 1 per cent (Q100), 0.5 per cent (Q200) and 0.2 per cent (Q500) AEP flood extents projected for 2100.

These maps are used to apply development constraints based on the asset life and location of a development proposal in relation to the revised flood maps.

¹ The Annual Exceedence Probability (AEP) refers to the likelihood of occurrence of a flood of a given size (or larger) in any one year. The 1 per cent AEP flood event is also known as the 1-in-100 year Average Recurrence Interval (ARI) or Q100 event, the 0.5 per cent AEP is also known as the 1-in-200 year ARI or Q200 event, and the 0.2 per cent AEP is also known as the 1-in-500 year (ARI) or Q500 event.

The second option uses Gayndah's existing flood maps and increases the level of constraint on development proposals to account for the climate change factor. In effect this extends the area subject to current 1 per cent AEP (Q100) development constraints to:

- an area equivalent to the present day 0.5 per cent AEP (Q200) flood level for areas subject to a development commitment
- an area equivalent to the present day 0.2 per cent AEP (Q500) flood level for new urban development.

This approach is based on the current 0.5 per cent AEP (Q200) approximating the 1 per cent AEP (Q100) level by 2050 and the current 0.2 per cent AEP (Q500) approximating the 1 per cent AEP (Q100) level by 2100.

The two implementation options apply the same climate change factor of a 5 per cent increase in rainfall intensity per degree Celsius of global warming.

The recommended policy options provide the North Burnett Regional Council with interim guidance on how to better manage flood risk for the Gayndah township area in advance of the review of SPP 1/03. While these options are specific to the issues identified by this project for the Gayndah township, the policy approach underpinning the draft flood constraint code will be of interest to other local governments as an example of how the impact of climate change on flood risk can be addressed in planning schemes. A copy of the recommended policy options paper prepared for Gayndah can be found at www.derm.qld.gov.aux.

The Inland Flooding Study raised issues that will be considered by the Queensland Government as part of the review of SPP1/03, including:

- · the benefits of requiring a standard hydrological methodology for flood studies
- identifying how frequently flood studies should be reviewed and/or updated
- investigating the circumstances in which local governments should be able to have a Defined Flood Event (DFE)² that is higher or lower than the 1 per cent AEP (Q100)
- · clarifying which components of the SPP, as they relate to flood risk management, are optional or mandatory
- identifying how to better integrate land use planning and disaster management planning, for example making sure there are sufficient evacuation routes to get people to a safe and secure area in an extreme event (e.g. storm, flood or fire).

The key recommendations from the study are:

- Recommendation 1—Local governments should factor a 5 per cent increase in rainfall intensity per degree of global warming into the 1 per cent (Q100), 0.5 per cent (Q200) and 0.2 per cent (Q500) AEP flood events recommended in SPP 1/03 for the location and design of new development.
- Recommendation 2—The following temperatures and timeframes should be used for the purposes of applying the climate change factor in Recommendation 1:
 - 2°C by 2050
 - 3°C by 2070
 - 4°C by 2100.
- Recommendation 3—The Queensland Government will review and update this climate change factor when a
 national position on how to factor climate change into flood studies is finalised as part of the current review
 of AR&R.
- Recommendation 4—That North Burnett Regional Council consider the two implementation options identified
 in the paper Recommended Policy Options for Incorporating Climate Change into the Flood Risk Management
 Framework in Gayndah and implement its preferred approach in its planning scheme.
- Recommendation 5—The review of SPP 1/03 should consider the benefits of requiring a standard method for undertaking a flood study and determining a DFE.
- Recommendation 6—The review of SPP 1/03 should consider whether there is a need to specify how frequently a flood study should be reviewed or updated.
- Recommendation 7—The review of SPP 1/03 should develop criteria that outline the circumstances where a DFE higher or lower than the 1 per cent AEP (Q100) is appropriate for residential land use planning.
- 2 The DFE is the flood event adopted for the management of development in a particular locality. The 1 per cent AEP is the recommended DFE under SPP1/03.

- Recommendation 8—The review of SPP 1/03 should clarify what components of the SPP are compulsory and clarify what additional guidance local governments may need to meet those obligations.
- Recommendation 9—The review of SPP 1/03 should consider the applicability of the recommended planning response for Gayndah (as per recommendation 4) to other parts of Queensland.
- Recommendation 10—The review of SPP 1/03 should consider how to improve the integration of land use planning and disaster management planning.
- Recommendation 11—The review of SPP 1/03 should consider issues concerning coincident flooding including:
 the results of any research into the potential impacts; the extent to which coincident flooding is already
 covered in flood studies conducted by local governments; and the most appropriate planning instrument to
 address coincident flooding in the future.
- Recommendation 12—Working through the national Building Ministers' Forum (BMF) and the Australian Building Codes Board (ABCB), support the development of a national code for the design and construction of new building work in areas designated as flood prone in local planning schemes.

The Inland Flooding Study has been a joint project of the Queensland Government and the LGAQ. Further information on the project outcomes, including specific recommendations, are set out in the remainder of this report.



Methodology and project governance

Project methodology

The Inland Flooding Study comprised two components:

- 1. a climate change science component to incorporate climate change into flood studies
- 2. a planning policy component to recommend policy options for Gayndah and to carry forward to the review of SPP 1/03.

Both components included an analysis of approaches in national and international jurisdictions with a similar propensity for flooding and comparable planning frameworks and governance models.

Various scientific methodologies were examined to identify benchmark figures for planning to take account of the projected impacts of climate change on flood risks. These methods were based on the theory that precipitable water in the atmosphere will increase as global temperature increases. Analysis was undertaken to determine the extent of evidence in the Queensland historical record for this physical relationship. This analysis included both land surface temperatures and sea surface temperatures.



The recent work of Rafter and Abbs (2010)³ was also considered, which uses extreme value analyses to calculate the percentage increases of intense rainfall from a suite of Global Climate Models. The project also took into account the recently released report from the US National Academy of Sciences (2010) which concludes that: "Extreme precipitation is likely to increase as the atmospheric moisture content increases in a warming climate. Typical magnitudes are 3-10 per cent per degree C warming, with potentially larger values in the tropics, and in the most extreme events globally."

A desktop assessment of relevant planning policy responses in selected national and international jurisdictions identified a number of promising practices to improve Queensland's land use planning response to flood risk management. The most effective practices have informed the planning policy recommendations included in this report.

Gayndah case study

A case study was undertaken in Gayndah in North Burnett Regional Council to trial the increased rainfall intensity climate change factor and consider policy options for improved flood risk management. This was in addition to desktop analyses of relevant science and policy.

³ Rafter T. and Abbs D. (2010). Calculation of Australian extreme rainfall within GCM simulations using Extreme Value Analyses. Unpublished.

In 2008, the former Gayndah Shire Council undertook a flood study to inform its planning and development assessment. The consultant's report recommended that the Council adopt a climate change impact allowance of 20 per cent (i.e. increase river peak flow discharges from the Gayndah catchment by 20 per cent). This increased the area of Gayndah township that would be considered at flood risk for land use planning and development assessment purposes, effectively moving the current 1 per cent AEP (Q100) event up to the current 0.5 per cent AEP (Q200) event.

In January 2009, LGAQ approached the Queensland Government for verification of the advice given to Gayndah Shire Council and to obtain clearer guidance on how to factor climate change into flood studies and land use planning.

As a result, the Queensland Government, in collaboration with LGAQ, undertook this project to deliver a more definitive approach to managing inland flooding risks in a changing climate, based on the best available science and implemented via the Queensland land use planning framework.

Gayndah provides a useful case study area for Queensland on the basis that:

- It is an inland catchment that is not influenced by coastal inundation or sea level rise (therefore the impacts
 associated with potential changes in rainfall intensity can be clearly measured).
- A recent, calibrated flood study had been completed to current standards including consideration of climate change as a basis for assessment.
- Flood conditions in the area are sensitive to changes in peak discharge (with a secondary flow path opening up at a particular threshold) and therefore the potential impacts of climate change are significant.
- It is within a representative inland catchment being medium-large in size (23 350 km²).

Project governance

A Project Board was established to oversee both components of the project. The Project Board was chaired by the Office of Climate Change (OCC) and comprised senior representatives from:

- LGAQ
- CSIRO Climate Adaptation Flagship
- the National Climate Change Adaptation Research Facility
- · Griffith University
- · Department of Infrastructure and Planning
- . Department of Community Safety
- · Department of Environment and Resource Management.

The science component of the project was led by the Queensland Climate Change Centre of Excellence (QCCCE) within the Department of Environment and Resource Management. The science deliverables for the project were reviewed and endorsed by a Scientific Advisory Group (SAG), comprising scientists and flood specialists from leading scientific institutions and stakeholder organisations. Members of the SAG are listed in Appendix 1.

The recommended climate change factor derived through this project was also discussed and reviewed at an end user workshop on 27 September 2010. Organisations represented at the workshop are listed in Appendix 2.

The policy component of the project was led by the Planning Policy and Legislation Branch in the Department of Infrastructure and Planning (DIP). A Planning Policy Advisory Group (PPAG) reviewed and endorsed the deliverables for the policy component of the project. Members of the PPAG are listed in Appendix 3. Consultations with senior officers from North Burnett Regional Council also occurred on 5 August 2010 and 13 October 2010 to seek their feedback and endorsement of the recommended policy options.





Key findings and recommendations

Context

Flooding is number one in the hierarchy of risks from natural hazards in Queensland, and has significant economic impacts on Queensland communities.

In March 2009 floods occurred across North West Queensland and in Mackay, costing state and local governments approximately \$234 million in damage to infrastructure. This event saw one million square kilometres, or 62 per cent of the State underwater. In March 2010, serious flooding occurred across large areas of the State including south-west Queensland.

Although flooding is a natural occurrence, climate change science is indicating that despite a projected decrease in rainfall across most of Queensland, a projected increase in rainfall intensity could result in more flooding events⁴.

Effective land use planning can help reduce the impact of flood events by ensuring dwellings, critical infrastructure (such as hospitals) and sensitive land uses (such as storage of fuel) are located where there is a lower risk of flooding or are built to withstand the impacts of flood events (for example, building houses on stumps). This report looks at how the planning framework can assist and how it can be better integrated with disaster management.

By combining the best available science and planning options on climate change and flood risk, the Inland Flooding Study has provided clearer guidance and practical tools for local governments to better understand and manage flood risk in a changing climate when conducting flood risk assessments and developing or reviewing local planning schemes.

Scientific recommendations

Recommendation 1—Local governments should factor a 5 per cent increase in rainfall intensity per degree of global warming into the 1 per cent (Q100), 0.5 per cent (Q200) and 0.2 per cent (Q500) AEP flood events recommended in SPP 1/03 for the location and design of new development.

Recommendation 2—The following temperatures and timeframes should be used for the purposes of applying the climate change factor in Recommendation 1:

- z°C by 2050
- 3°C by 2070
- 4°C by 2100.

Recommendation 3—The Queensland Government will review and update this climate change factor when a national position on how to factor climate change into flood studies is finalised as part of the current review of AP&P.

More detailed information on the rationale for deriving the climate change factor can be found at www.derm.qld.gov.au.

In summary, the climate change factor is based on the proposition that as the lower atmosphere warms, the atmospheric water vapour also increases, which increases the risk of more intense rainfall events.

The rate of atmospheric warming over time is derived from the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report A1FI (high) greenhouse gas emissions scenario. The A1FI scenario assumes continued dependence on fossil fuels. Global temperatures for the past decade have been the warmest on record and are currently tracking at the upper limits of the A1FI scenario.

Using the A1FI emissions scenario, the best estimate of projected changes in annual global mean temperatures is outlined in Table 1.

Table 1: Global warming best estimate and representative ranges relative to 1990 for relevant planning horizons for the A1F1 scenario

	2050		2070		2100	
	Best estimate	Representative range	Best estimate	Representative range	Best estimate	Representative range
A1F1	1.8°C	1.08-2.88°C	2.9℃	1.74-4.64°(4.0°C	2.4-6.4°C

Local governments should use the temperatures and timeframes outlined in Recommendation 2 when producing new flood maps. However, local governments may be able to use their existing flood maps to approximate future flood levels that incorporate the recommended climate change factor for example, in the Gayndah case study area the following approximations were used⁵.

Table 2: Approximate change to flood level with climate change

Existing flood level	Temperature change scenario	Changes to a future flood level	
o.5 per cent AEP (Q200)	2°c warming by 2050	1 per cent AEP (Q100) by 2050	
o.2 per cent AEP (Q500)	2°c warming by 2050	0.5 per cent AEP (Q200) by 2050	
0.2 per cent AEP (Q500)	4°c warming by 2100	1 per cent AEP (Q100) by 2100	

This project acknowledges that the AR&R publication provides the nationally accepted methodologies for undertaking flood studies. However, the publication has not been updated for 23 years and does not consider the impacts of climate change.

While the Australian Government is supporting a review of the AR&R publication, the outcomes of this review are not expected to be available before 2014. This project was therefore undertaken to meet the needs of local governments on how to consider climate change and better identify flood risks.

In that context, the climate change factor identified by this project for incorporation into flood studies will be reviewed and updated when a national position on how to factor climate change into flood studies is finalised as part of the current review of the AR&R publication.

Issues not explicitly addressed by this project will also be considered by the the AR&R publication review. For example, how antecedent conditions (the wetness or dryness of the catchment) may impact on hydrological models with climate change. For the purposes of this project, the current evidence suggests that maintaining the existing antecedent characteristics of the catchment is reasonable and warranted.

Similarly, the review will consider the implications of revised global emissions scenarios provided in the IPCC's Fifth Assessment Report (AR5) on rainfall intensity and flooding. The AR5 is scheduled for release in 2014.

Advice on how to use the climate change factor in flood studies

To account for the impacts of climate change, the nationally accepted methodologies for undertaking flood studies outlined in the AR&R publication should be followed, with the only change being that design rainfall depths are increased by a climate change factor of 5 per cent per degree Celsius of global warming.

Design rainfall depths should be determined through an appropriate method such as the method in the AR&R publication or CRC-FORGE. Given that the climate change factor of 5 per cent is per degree Celsius of global warming, the actual percentage increase used will depend on the timeframe and temperature outlined in Recommendation 2. For example, there will be a 10 per cent increase in rainfall depth for a timeframe of 2050 (i.e. a 2°C increase in global warming by 2070), a 15 per cent increase for 2070 (i.e. a 3°C increase in global warming by 2070), and a 20 per cent increase for 2100 (i.e. a 4°C increase in global warming by 2100).

5 This is general guidance only and local governments need to check with flood hydrologists whether this is a valid approach for their existing flood studies and particular catchments.

The climate change factor of 5 per cent per degree of global warming should be applied to rainfall depths and not directly to hydrographs (i.e. the quantity of water flowing in the river). The scaled rainfall depths should then be applied to the hydrological model in the same way as the current event-based methods to produce design flood hydrographs for climate change scenarios.

There is currently no requirement to adjust the remaining data inputs (temporal patterns, loss models) or modify the hydrological model parameters. The determined climate change hydrographs should, in turn, be applied to the hydraulic model to calculate the flood level, depth and extents for climate change design events.

Note: This climate change factor is limited to flood risk management for planning purposes as described by the SPP 1/03 and does not extend to more frequent events (i.e. >2 per cent AEP or Q50) or more extreme events (i.e. probable maximum flood). The climate change factor applies to floods arising from rainfall events of at least one hour or more.

Policy recommendations

Recommendation 4—That North Burnett Regional Council consider the two implementation options identified in the paper *Recommended Policy Options for Incorporating Climate Change into the Flood Risk Management Framework in Gayndah and implement* its preferred approach in its planning scheme.

The Inland Flooding Study has identified two policy options for the North Burnett Regional Council to incorporate the effect of climate change on flooding into its planning scheme.

Both options comprise three components:

1. A policy that incorporates different approaches depending on a development commitment being in place or not

For proposals already subject to a development commitment, conditions will ensure that development is subject to stringent design and evacuation standards. To achieve this, development either has to be consistent with appropriate land uses for specific flood hazard areas or development must be designed and constructed to appropriate flood level and height of habitable rooms. In addition, evacuation routes must be maintained to specific flood levels.

For land that is not already subject to a development commitment, the policy directs development to areas of lowest flood hazard based on the proposed land use by requiring that new development is built above specific flood levels and that evacuation routes must also be maintained to specific flood levels.

2. A draft flood constraint code to address development in flood affected areas

A flood constraint code is a requirement within local planning schemes for flood affected areas. The draft flood constraint code developed through this project for Gayndah defines four flood hazard areas based on the three relevant flood levels described in the SPP1/03—the 1 per cent (Q100), 0.5 per cent (Q200) and 0.2 per cent (Q500) AEPs.

A land use table included in the draft flood constraint code outlines the appropriate land uses for each of these hazard areas. This is a major step in shifting the focus from the 1 per cent AEP (Q100) as the most important flood level for residential development to the reality that there are many flood hazard levels and associated risks that local governments need to consider.

3. A choice of flood overlay maps based on different planning horizons

Using the new climate change factor outlined in recommendations 1 and 2, flood overlay maps for different planning horizons were developed for the Gayndah township. These maps will allow North Burnett Regional Council to identify the geographic areas affected by flooding risks over time and will inform application of the draft flood constraint code.

The policy approach proposed for Gayndah is intended to minimise the risk to life and property in flood affected areas, including the accentuated risk from climate change, by:

- · reducing the adverse impacts of flooding by encouraging, for example, flood resilient design and layout
- · facilitating development in lower probability flooding areas
- maintaining local floodplain processes (water storage and flows; river discharge and capacity; banks of river, streams and water bodies protected from erosion)

- · maintaining a network of evacuation routes
- maintaining critical emergency infrastructure and services during flood events
- · maintaining functionality of community infrastructure during and immediately following flood events.

These policy options have been developed specifically for the Gayndah township and in response to a request by the North Burnett Regional Council and LGAQ for advice and guidance. While the outcomes of the study have been developed for Gayndah, the findings will be of interest to other local governments in Queensland. Further information can be found in the publication Recommended Policy Options for Incorporating Climate Change into the Flood Risk Management Framework in Gayndah available at www.derm.qld.gov.au.

The policy options provided for Gayndah are transitionary arrangements in advance of the current review of SPP 1/03 (due for completion in 2013). The review of SPP 1/03 will provide all Queensland local governments with definitive policy requirements on how to address flood, bushfire and landslide hazards in their planning schemes. Until this review is complete, any council seeking to amend their planning schemes must continue to reflect the current policy requirements in SPP 1/03.

General recommendations for consideration as part of the review of SPP 1/03

In the context of this review, planners, consultants, engineers and council representatives were consulted on the practical issues associated with implementation of the current SPP 1/03. The Project Board has had regard to all of the issues that were identified during those discussions in formulating the following recommendations for consideration as part of the broader review of SPP 1/03.

Recommendation 5—The review of SPP 1/03 should consider the benefits of requiring a standard method for undertaking a flood study and determining a DFE.

There is currently no requirement on local governments to use a standard calibrated engineering method for undertaking flood studies. Under the current SPP, local governments may elect instead to use, for example, historical flood data (including the lack of data) to determine their DFE. This discretion in how local governments assess their flood risk results in varying degrees of accuracy and predictive value of current and future flood hazards.

Development of a standard method for flood studies which includes advice on the Queensland Government's endorsed climate change factors and takes account of different catchment characteristics (e.g. large rural catchments and highly developed urban catchments) would improve the consistency and accuracy of flood studies in Queensland. On this issue, the Project Board and advisory group members identified that New South Wales appears to have overcome issues of accuracy in the assessment of flood hazards by requiring uniform state-wide application of a standard method for flood studies.

Recommendation 6—The review of SPP 1/03 should consider whether there is a need to specify how frequently a flood study should be reviewed or updated.

While SPP 1/03 requires that a flood study be undertaken for natural hazard management areas, there is currently no guidance on when local governments should review or update those studies. In practice, this means that local governments may be using flood studies that do not reflect recent development in the area and the impact of that development on potential flood risks.

Therefore it is recommended that the review of SPP 1/03 identify appropriate triggers to guide when local governments need to review and/or update their flood studies, taking into consideration the likely cost impacts on local governments of increasing the frequency of undertaking flood studies. Triggers could include undertaking a planning scheme review (review hydraulic components) and updated AR&R advice (update hydrological components).

Recommendation 7—The review of SPP 1/03 should develop criteria that outline the circumstances where a DFE higher or lower than the 1 per cent AEP (Q100) is appropriate for residential land use planning.

SPP 1/03 currently requires local governments to determine a DFE to set limits for land use and development in any floodplain area. SPP 1/03 specifies the 1 per cent AEP (Q100) as the preferred DFE for residential land use planning. SPP 1/03 guidelines indicate that the residual risk (the risk of a flood exceeding the DFE) should be addressed in local government counter disaster plans and emergency procedures.

However, there are currently no criteria to determine when it may be appropriate for a council to use another DFE (i.e. above or below the 1 per cent AEP or Q100). In practice this has led to local governments adopting varying flood levels to constrain development without reference to any consistent criteria. The review of SPP 1/03 should develop clear and transparent criteria for use by local governments and referral agencies on the circumstances where a DFE above or below the 1 per cent AEP (Q100) is appropriate.

Recommendation 8—The review of SPP 1/03 should clarify what components of the SPP are compulsory and clarify what additional guidance local governments may need to meet those obligations.

The review provides a useful opportunity to clarify the core components of what local governments must do to assess and manage their flood risk, as well as provide more detailed guidance on how local governments should meet those obligations (as per recommendations 1 and 2). This would help to address current inconsistencies in how local governments interpret and implement the SPP. More generally, the review provides an opportunity to provide clearer guidance to local governments on core requirements and standards, as well as those matters on which they continue to have discretion. This could include guidance on how the revised SPP should be reflected in statutory regional plans.

Recommendation 9—The review of SPP 1/03 should consider the applicability of the recommended planning response for Gayndah (as per Recommendation 4) to other parts of Queensland.

The recommended planning responses for Gayndah township should be considered for applicability in other local government areas and to establish if the policy options provide an appropriate planning response to direct new development to areas with lower levels of flood risk now and in the future under climate change.

This should include consideration of the utility of incorporating draft flood overlay codes (modelled on the draft flood constraint code developed for Gayndah) in the Queensland Planning Provisions (QPPs).

An assessment of the useability of the draft flood constraint code developed for Gayndah should form part of this broader consideration of state-wide applicability.

Recommendation 10—The review of SPP 1/03 should consider how to improve the integration of land use planning and disaster management planning.

The SPP 1/03 guidelines currently outline how residual risk can be addressed in disaster management plans and emergency procedures developed by local governments.

The review provides an opportunity to consider what changes need to be made to improve the integration of land use planning and disaster management planning, including whether any additional guidance is required and what, if any, elements of that guidance should become mandatory provisions under a revised SPP (for example, ensuring land use planning takes account of population growth and its impact on the efficient evacuation of people to a safe and secure area in an extreme event).

Recommendation 11—The review of SPP 1/03 should consider issues concerning coincident flooding including: the results of any research into the potential impacts; the extent to which coincident flooding is already covered in flood studies conducted by local governments; and the most appropriate planning instrument to address coincident flooding in the future.

The AR&R publication provides national guidance for undertaking flood studies. The publication is currently being reviewed to include consideration of climate change and incorporate new data and technological advances in rainfall/runoff assessment. This review is due for completion in 2014.

One component of the AR&R review includes examining the interaction of coastal processes and severe weather events and should result in guidelines for incorporating the joint effects of flood flows from storm rainfall and elevated ocean levels into flooding predictions (coincident flooding). Elevated ocean levels caused by the storm (storm surge) as well as those caused by climate change (sea level rise) will be considered.

The Department of Environment and Resource Management has been allocated National Disaster Resilience Program funding to examine the impacts of coincident flooding in Queensland.

The results of this research should be considered as part of the review of SPP 1/03 to determine how this issue should be addressed in Queensland's land use and disaster planning frameworks.

National guidance on coincident flooding is expected to be provided from the AR&R review in 2014.

Recommendation 12—Working through the national Building Ministers' Forum (BMF) and the Australian Building Codes Board (ABCB) to support the development of a national code for the design and construction of new building work in areas designated as flood prone in local planning schemes

Queensland is represented at the BMF by the Minister for Infrastructure and Planning. In 2009, the Minister sought recognition at the forum of the significant impact of flooding on buildings in Australia, the current lack of national building codes to address this issue, and for the ABCB to develop a national code for building in flood prone areas for regulatory adoption by individual States and Territories.

Subsequently, the ABCB has drafted a proposal to develop national design and construction requirements under the Building Code of Australia for new building work in designated areas vulnerable to flooding. Minimum requirements under the Building Code of Australia would include performance requirements and deemed-to-satisfy provisions to minimise damage to buildings and building materials from flooding.

The ABCB is expected to develop this new code by the end of 2012. This code would be referenced in Queensland under the *Building Act 1975* and, once developed, will specify the design and construction requirements that apply in Queensland for new building work in designated flood prone areas.

Conclusion

The outcomes from this project provide guidance to local governments on how to better manage their flood risks and land use planning responses in a changing climate. This has been done by providing a climate change factor for incorporation into flood studies, developing specific land use policy options to improve the flood risk management framework in Gayndah, and identifying a series of recommendations for consideration in the SPP 1/03 review.

The project provides all Queensland local governments with a climate change factor for incorporation into the 1 per cent (Q100), 0.5 per cent (Q200) and 0.2 per cent (Q500) AEP flood events recommended in SPP 1/03 for the location of new development. This approach will be reviewed and updated when a national position on how to factor climate change into flood studies is finalised as part of the current review of the AR&R publication. In the interim, Queensland local governments can use the approach from this project to better identify flood risks.

A progressive policy approach for the Gayndah township has also been developed that incorporates multiple flood hazard zones and reduces reliance on one flood level in local government planning. The broader applicability of this approach will be considered as part of the review of SPP 1/03.

The project also makes recommendations to address challenges in the planning framework and its consistent implementation through the review of SPP 1/03. These recommendations are designed to address challenges and gaps in the current planning framework and improve the connectivity between disaster management and land use planning.

By integrating the best available science and innovative planning options through multiple flood hazard zones and reducing reliance on one flood level in local government planning, this joint project between the Queensland Government and the LGAQ has delivered clearer guidance and practical tools for local governments so they are better positioned to manage flood risk for Queensland communities.

Appendix 1: Membership of the Inland Flooding Study Scientific Advisory Group

Name	Organisation
Prof Colin Apelt	University of Queensland (retired)
	Director, Walker Institute for Climate System Research
Peter Baddiley	Queensland Hydrology Manager, Bureau of Meteorology
	Chief Scientist, Coastal Impacts Unit, Queensland Climate Change Centre of Excellence
Dr Ryan McAllister	Research Scientist, CSIRO
Ken Morris	Principal Engineer, Water and Environment, Brisbane City Council
	Director, NCCARF (National Climate Change Adaptation Research Facility)
Jeff Perkins	Hydrologist, Bureau of Meteorology
	Director, Regional Water Supplies, Department of Environment and Resource Management
David Robinson	Director, Coastal Impacts Unit, Queensland Climate Change Centre of Excellence
John Ruffini	Director, Water Science, Department of Environment and Resource Management
	Director (Hydraulics), Department of Transport and Main Roads

Appendix 2: Organisations represented at the Inland Flooding Study Workshop

The following organisations were represented at the Inland Flooding Study Workshop held in Brisbane on 27 September 2010:

- Department of Environment and Resource Management
- · Department of Infrastructure and Planning
- · Office of Climate Change
- Queensland Climate Change Centre of Excellence
- · Bureau of Meteorology
- Local Government Association of Queensland
- SEQ Water
- Brisbane City Council
- · Ipswich City Council
- · Redland City Council
- · Moreton Bay Regional Council
- · Cardno Associates
- BMT WBM
- Sinclair Knight Merz
- Kellogg Brown and Root.

Appendix 3: Membership of the Inland Flooding Study Policy and Planning Advisory Group

Name	Organisation
	Project Manager, Industry Projects Facilitation, Department of Infrastructure and Planning
	Director, Planning Policy and Legislation, Growth Management Queensland
	Chief Scientist, Coastal Impacts Unit, Queensland Climate Change Centre of Excellence
	Senior Project Officer, Office of Climate Change
	Senior Advisor, Local Government Association of Queensland
	Principal Planner, Planning Services, Department of Infrastructure and Planning
	Director, Planning Services, Department of Infrastructure and Planning
	Principal Advisor, Building Codes Queensland
	Principal Advisor, Planning Policy and Major Development, Department of Transport and Main Roads
	Manager, Environment and Planning, Local Government Association of Queensland
	Manager, Climate Change, Planning Policy and Legislation, Growth Management Queensland
	Senior Project Officer, Climate Change, Planning Policy and Legislation, Growth Management Queensland
	Principal Policy Officer, Office of Climate Change
	Director, Strategic Policy, Department of Community Safety

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Floodplain management in Australia: best practice principles and guidelines.

SCARM Report 73



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MANAGEMENT IN AUSTRALIA

Best Practice Principles and Guidelines)

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Agriculture and Resource Management Council of Australia and New Zealand

The Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) consists of the Australian Federal, State/Territory and New Zealand Ministers responsible for agriculture, soil, water (both rural and urban) and rural adjustment policy issues.

The objective of the Council is to develop integrated and sustainable agricultural and land and water management policies, strategies and practices for the benefit of the community.

The Council is supported by a permanent Standing Committee, the Standing Committee on Agriculture and Resource Management (SCARM). Membership of Standing Committee comprises relevant Departmental Heads/CEOs of Commonwealth/State/Territory and New Zealand agencies as well as representatives of the CSIRO and the Bureau of Meteorology.

Members of the Floodplain Management Working Group (1998)

Mr Ross Walker, Department of Primary Industry and Energy

Mr John Stokes, Department of Primary Industry and Energy

Mr Jim Elliott, Commonwealth Bureau of Meteorology

Mr Neil Benning, Department of Land and Water Conservation, NSW

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Mr John Henley, Tweed Shire Council, NSW

For the Floodplain Management Working Group Terms of Reference, see Appendix A

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This document provides principles and guidelines for floodplain management in Australia. As a project, it was broad in scope and had a long and difficult history. It involved many people and often tried their patience. The Working Group thanks the many people who willingly gave their time to provide thoughts and information. Their contribution is gratefully acknowledged, especially John Wood, who started it all, and Mike Willis, Fred Barlow and Pat George who retired before its completion. A special acknowledgment also to Chas Keys who assisted with the emergency management issues.

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Preface

Floods are a natural phenomenon but they impose significant social and economic costs in Australia. These include:

- direct damage to property and facilities
- indirect losses due to disruption of economic activity including trade and transport
- · injury and death
- stress and anxiety on the part of those affected by flooding.

The average flood damages bill for the nation is at least \$350 million per year and at least 200 000 homes and offices are prone to flooding in the 1% annual exceedance probability (AEP) event. This number grows considerably when larger and rarer floods are considered.

1 Background to the document

This document arose from a need independently identified by both the Floodplain Management Working Group of the Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) and Emergency Management Australia (EMA).

In 1991 the Australian Water Resources Council (AWRC) formed a Floodplain Management Working Group. The Working Group, composed of representatives of all Australian States and Territories, reviewed floodplain management practices across Australia. One outcome of the review was recognition of the advantages of a "national approach" to floodplain management (Department of Primary Industry and Energy 1992). With the formation of ARMCANZ in 1993, the Floodplain Management Working Group was subsumed by the Standing Committee for Agriculture and Resource Management (SCARM). Under SCARM, the Floodplain Management Working Group continued to develop the need for, and nature of, a manual of Australian floodplain management practice.

EMA is the Commonwealth Government's agency responsible for coordinating emergency management across all Commonwealth government areas. EMA supports the development of national emergency management capabilities by providing Commonwealth resources to the States and Territories, developing and delivering education and training programs and by facilitating natural emergency management policies, plans and programs. EMA also plays a significant role in the identification and dissemination of

best practice principles in all facets of emergency management.

In 1995, EMA recognised the need for, and advantages of, a consistent national approach to flood emergencies. This approach could be achieved best through the preparation of manuals of best practice guidelines. To this end, EMA formed a Steering Committee consisting of representatives of State and Territory Emergency Services, water management agencies and the Commonwealth Bureau of Meteorology. The Steering Committee started to prepare a series of flood manuals as part of an Australian Emergency Manuals Series, one of which was assigned to general floodplain management. The manuals prepared are:

- Managing the Floodplain (Emergency Management Australia 1999a)
- Flood Preparedness (Emergency Management Australia 1999b)
- Flood Warning (Emergency Management Australia 1999c)
- Flood Response (Emergency Management Australia 1999d)

The overlapping backgrounds and objectives of SCARM's Floodplain Management in Australia: Best Practice Principles and Guidelines and EMA's Emergency Management Practice manuals were recognised. Both groups have collaborated in the production of a set of best practice guidelines for floodplain management in Australia. This document comprises the full and detailed discussion of best practice principles and guidelines of floodplain management in Australia.

Managing the Floodplain (Emergency Management Australia 1999a), a separate and far more condensed version, concentrates on the interrelationships between flood emergency planning and floodplain management planning, and has been published separately by EMA.

2 Objectives of the document

This document aims to provide a set of best practice principles and guidelines for the management of the risks associated with flooding across the floodplains of Australia. The floodplains are considered as land subject to flooding by the largest flood that could occur at a particular location. The principles define the context of floodplain management and the guidelines develop the principles further and deal with practical issues that should be considered as part of the

floodplain management process. Because flooding is site specific, not all issues will be appropriate to every situation.

These principles and guidelines have been developed to assist all levels of government, the private sector and the community to manage, in partnership, the flood risk associated with Australia's floodplains on a sustainable basis for the benefit of both present and future generations.

This document is directed to flood hazard management—the most critical aspect of floodplain management.

Although the importance of ecological and resource management issues is recognised and incorporated in floodplain management, this document does not discuss these issues in depth. The document does not address the issues of vegetation or wetland management, the protection of threatened species or biodiversity in any detail, except as they relate to the human occupation of the floodplain. However, these issues must still be accounted for in the production and implementation of a floodplain management plan. The management of the flood risk associated with the use of the floodplain is a critical part of the overall catchment management process and it is to this specific facet that this document is directed.

Flooding caused by overloaded stormwater pipe systems is not explicitly addressed in this document.

3 Best practice principles

Floodplain management is inevitably a compromise—trading off the social, economic and ecological costs and benefits of conducting certain activities on the floodplain against the risk, hazard and adverse consequences to these activities caused by flooding. The management of risk and hazard, however, is essential to responsible floodplain management. All best practice principles outlined in this document are aimed at better managing flood risk to optimise society's safe and sustainable use of Australia's floodplains in a cost-effective and ecologically responsible manner.

The hierarchy of best practice principles ranges from overall principles down to, for example, specific principles for the design and construction of retention basins.

This document is generic rather than prescriptive. It is prepared in the knowledge and recognition that legislative and organisational arrangements vary across the States and Territories, as will the precise application of the guidelines. However, as each State or Territory implements the guidelines in detail, their substantial nature as best practice does not change.

The document is subject to revision as technology develops, and as our understanding of floodplain management issues improves.

4 A national approach

Significant advantages to a national approach to floodplain management are as follows.

- Better and more efficient use of the nation's resources: floodplain management principles and practices have developed to a different degree and in different ways in the various Australian States and Territories. There are considerable cost savings and efficiencies in sharing information and experiences and in the coordination of floodplain management research among the States and Territories.
- Production by individual States and Territories of consistent floodplain management policies and manuals and better floodplain management practices: this, in turn, will reduce the nation's exposure to present and future flood risk.
- A pro-active response to floodplain management: potential problems and conflicts will be recognised and action taken to reduce them before they develop fully.
- Development of a national database of flood-related information for flood-prone communities: this database could contain, for example, details of flood levels and discharges, the number of people at risk of flooding, floor levels, potential and actual flood damages and historic flood data. Such information is essential to a better and more efficient allocation of resources to floodplain management.
- A consistent means of "benchmarking" floodplain management issues and practices: this will help to determine funding priorities and fund allocation by Commonwealth, State and Territory governments.
- Consistency with the Commonwealth Government's Council of Australian Governments (COAG) agreement.

5 Target audience

This document will be of interest to people in all levels of the public and private sectors who influence, or who are affected by, the risks and consequences of flooding. This includes the community at risk, Commonwealth, State and Territory agencies and consultants.

The aim of this document is to provide for each audience a better understanding of flood behaviour, flood risk and the consequences of flooding. It puts forward the ways in which these issues can be addressed at each level using best practice guidelines to foster the optimal use of the nation's floodplains.

In addition, this document serves to encourage and provides a basis for each State and Territory to prepare their own "Floodplain Management Manual" that reflects State and Territory specifics.

6 Document structure

This document consists of five Chapters and 16 Appendices, a glossary of technical terms and a list of references and further reading. Glossary terms are indicated in the text by italics. The main document is preceded by a Summary of best practice principles for floodplain management.

The main document is relatively short and contains some background information and the floodplain management process itself. Comprehensive background information, plus additional details of both general and specific aspects of floodplain management are given in the Appendices, which form an integral part of this document.

With respect to the main document:

 Chapter 1 is a general introduction about the importance and hazards of floodplains, the development of floodplain management in Australia, the need for a multi-objective planning process and the central role of risk management.

- Chapter 2 discusses the need for an integrated approach
 to floodplain management that encompasses the various
 floodplain management measures (see also Appendix B),
 the plethora of roles and responsibilities, the
 coordination of floodplain management and emergency
 plans, the inclusion of resource management
 considerations and interactions between stormwater and
 mainstream/river flooding behaviour.
- Chapter 3 describes a successful floodplain management process that has been adopted by several Australian States. This process has emerged after 15 years of trial and error. It represents current best practice for Australian conditions.
- Chapter 4 discusses general roles and responsibilities of the various stakeholders in floodplain management.
- Chapter 5 describes best practice legislative and administrative arrangements. Duty of care considerations are also outlined.

Summary of Best Practice Principles for Floodplain Management in Australia

....

1 Introduction

This document is concerned with the management of flood risk associated with the human occupation of the floodplain for both urban development and agricultural production. Management decisions taken in respect of the human occupation of the floodplain need to satisfy the social and economic needs of the community as well as being compatible with the maintenance or enhancement of the natural ecosystems that the floodplain sustains.

Floodplains are a resource of immense value. They are the sites of most of our towns and cities and provide the natural resources to support many of our most productive rural industries. Floodplains are areas of primary environmental significance and their well-being is essential to the survival of many ecosystems.

Recently the significance of floodplain ecosystems has been clearly recognised. Floods are a critical factor in the health of the floodplain itself, the rivers and coastal estuaries. Some of our historical uses of floodplains, and the infrastructure we have introduced, can interfere markedly with these ecosystems. The detailed management of floodplain ecosystems is beyond the scope of this document and is dealt with in the context of integrated catchment management, in particular by plans such as River Management Plans, Native Vegetation Plans and Wetland Management Plans. However, plans to manage flood risk should be developed in the context of the requirements of, and effects on, flood-dependent ecosystems.

The primary objective of floodplain management is to reduce the effect of flooding and flood liability on individual owners and occupiers of flood-prone property, and to reduce private and public losses resulting from floods. Implementation of the objective also recognises the benefits of floodplain occupation and the particular social, economic and ecological attributes of flood-prone land.

The best practice principles and guidelines presented in this document have been defined by floodplain managers from all States and Territories of Australia, together with representatives from the Commonwealth and local agencies, on the basis of practical on-going experience with floodplain management over the last 10 to 20 years. Government agencies, local, State or Commonwealth, should be bound by the best practice guidelines of this document.

Best practice principles

1 A pro-active response

Floodplain management in Australia needs to be pro-active.

Previously, floodplain management measures in Australia were introduced often only after a serious flood had occurred—a reactive approach. Typically, this approach was limited in scope and effectiveness and did little to control the growing levels of flood hazard across Australia. A proactive response recognises the various flooding problems and management issues described in this document, and proposes a course of action to tackle these issues and problems before they become extreme.

This document does not supply the solutions to the problems of flooding; it provides the methodology that can be followed to achieve a sustainable solution.

2 Community expectations

The community can expect that floodplains will be developed and used in an ecologically, economically and socially sustainable fashion and in accord with the broader principles of sustainable natural resource and environment management and of integrated or total catchment management.

Floodplain management needs to ensure that the community has the following expectations met.

- People are able to live and work on floodplains at no untoward risk to life and health or unacceptable risk of damage to goods, possessions and infrastructure because of flooding. This will require site-specific integrated management measures for existing, future and residual flood problems.
- People can be secure in knowing that in the event of inevitable future floods, effective arrangements will be made to alleviate the economic and social costs of flooding, both on an individual and community basis, and recovery of the flooded area and its residents and occupants fostered.
- The community is actively involved in the floodplain management process, both in developing management plans and in meeting their obligations under those plans.

3 Policy integration and Implementation

Effective policy and legislation are essential to providing a reliable social and legal foundation for floodplain management.

An integrated policy framework is required within all agencies (Commonwealth, State, local) to support the management of floodplains.

4 The flood problem

Modern floodplain management recognises three distinct types of "flood problems":

- existing—refers to existing buildings and developments on flood-prone land; these buildings and developments, by virtue of their presence and location, are exposed to an "existing" risk of flooding
- future—refers to buildings and developments that will be built on flood-prone land; these buildings and developments will be exposed to a "future" flood risk (i.e. a risk that does not materialise until the developments occur)

The requirements for future development need to consider the cumulative effect of such developments and not the impact of individual proposals. Evaluation of proposals at the individual level does not pick up the potential cumulative effect of a series of small impact decisions.

 residual— refers to the risk associated with floods generally and with those floods that exceed management measures already in place (i.e. unless a floodplain management measure is designed to withstand the probable maximum flood (PMF), it will be exceeded by a sufficiently large flood at some time in the future—it is not a matter of if, but of when).

Floodplain management measures to reduce flood risk can be grouped into four principal categories: structural flood mitigation works; land use planning controls; development and building controls; and flood emergency measures.

Some management measures are more appropriate to certain flood problems than others. For example, flood emergency measures are appropriate to all three flood problems, all measures can be used to address the future flood risk problem, and only flood emergency measures can be used to address the residual flood risk problem.

5 Risk awareness

For floodplain management to be successful, the local community needs to understand and appreciate the concept of flood risk and exposure to flood hazard—the local community needs to be flood aware.

Best practice principles to foster this understanding and awareness include the following.

- Appropriate flood risk terminology is adopted nationally.
 Terminology to describe the flood severity must also indicate the chance involved.
- Flood risk is documented by local agencies in an easily understood fashion on flood maps or action plans, certificates of title and information brochures to enable individuals and the local community to assess flood risk.
- Flood risk awareness is promoted and communicated in the local community by local agencies together with emergency management agencies.

6 The floodplain management plan

The best practice principle is that a comprehensive planning process to develop a floodplain management plan is the most effective and equitable way to realise the multiple objectives of floodplain management.

When developing a floodplain management plan, local and State agencies should consider specifying defined flood events (DFEs) and associated planning, development and building controls in terms of flood risk rather than the associated flood recurrence interval or exceedance probability. The use of the flood risk rather than some arbitrary flood recurrence interval or probability as the primary determinant for planning, development and building controls avoids much of the confusion and argument that can arise in a local community when flood levels "change".

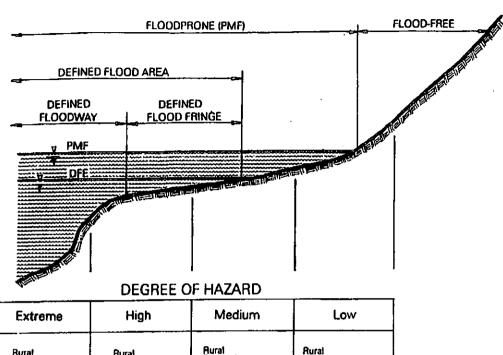
Care needs to be taken to ensure that strategies do not lead to public perception that flooding above selected standards will not occur. Larger floods do occur and are the primary source of damage and potential loss of life.

7 The flood emergency plan

Preparation of a flood emergency plan encompassing flood warning, defence, evacuation, clean-up and recovery arrangements is the most effective way to address the residual flood risks associated with floods. Flood emergency plans should be prepared by the appropriate State, Territory or local agencies together with all stakeholders.

8 Appropriate land uses

Land use needs to be appropriate to the level of hazard. The adopted land use for flood-prone land largely defines the resulting flood hazard. Land use needs to be matched carefully to flood hazard to both maximise the benefits of using the floodplain and minimise the risks and consequences of flooding.



Extreme	High	Medium	Low
Rural Recreation Open Space Environment	Rural Recreation Open Space Environment	Rural Recreation Open Space Environment	Rural Recreation Open Space Environment
	Commercial • Industrial • Clubs •	Residential * Commercial * Industrial * Clubs * Schools *	Residential Commercial Industrial Clubs Schools
		Public Institutions Caravan Parks Council Police	Public Institutions Cerevan Parks Council Police Telephone Exchange SES
	with special controls	with special controls	Hospitals Homes for Elderly Museums/Libraries

Figure 1 Appropriate land uses across the floodplain

Figure 1 shows, in principle, desirable locations of various land uses.

9 Flood maps

Flood maps that show the extent, depth, velocity and hazard of flooding for nominated flood events are an important tool for the preparation of floodplain management plans and flood emergency plans.

10 Floodplain management measures

An integrated and appropriate mix of measures need to be developed for each specific floodplain area including land use planning, structural measures, development and building controls and flood emergency plans.

Floodplain management measures can be grouped into the following four principal categories:

- structural flood mitigation works such as levees or channel improvements, which are aimed at modifying flood behaviour (i.e. keeping water away from people)
- land use planning controls such as zoning, which are aimed at ensuring that land use is compatible with flood risk (i.e. keeping people away from the water)
- development and building controls such as minimum floor levels and floodproofing, are aimed at reducing the risk of inundation and amount of damage that occurs when such a flood eventuates (i.e. the water will get to people at some time)

 flood emergency measures such as flood warning, evacuation and recovery plans, are aimed at reducing flood hazard by modifying the response of the population at risk so that they will be able to better handle actual flood events (i.e. teaching people what to do).

Some management measures are more appropriate to certain flood problems than others.

11 Urban infrastructure design

Urban infrastructure needs to be designed to minimise the effects of flooding, and is essential to flood response during the onset of a flood, evacuation, flood management and the clean-up and recovery phases.

Best practice principles with regard to urban infrastructure design include:

- recognition by local and State agencies that many items of urban infrastructure should be designed to minimise the effects of flooding on their operation and to facilitate clean-up and recovery
- essential facilities such as telephone exchanges, police stations, hospitals and flood management coordination centres should be sited in flood-free locations or above

- PMF level, or failing this, these facilities need to be protected with permanent or temporary banks
- electric motors of water supply and sewerage pumps need to be sited significantly above the DFE (ideally above PMF level), or designed so that these motors can be readily uncoupled for evacuation to flood-free areas.

12 Performance indicators and data collection

Floodplain management across Australia can only occur on an objective and equitable basis if appropriate performance indicators are defined and used to evaluate the progress and success of floodplain management programs.

Best practice principles regarding performance indicators and data collection require:

- collection of appropriate data concerning flood behaviour and flood hazard to provide an objective basis for the design and assessment of floodplain management programs; and
- establishment of a common national database to facilitate the appraisal of floodplain management priorities on both national, State-wide and Territory-wide bases.

Acronyms

AAD Annual Average Damage

AEP Annual Exceedance Probability

AFR Annual Flood Risk

AHD Australian Height Datum

ANCOLD Australian National Committee on Large Dams

ARI Average Recurrence Interval

ARMCANZ Agriculture and Resource Management Council of Australia and New Zealand

AWRC Australian Water Resources Council

DFE Defined Flood Event

EMA Emergency Management Australia

GH Gauge Height

NDMS National Disaster Mitigation Strategy

PMF Probable Maximum Flood

PMP Probable Maximum Precipitation

RL Reduced Level

SCARM Standing Committee on Agriculture and Resource Management

SMAUG Seriousness, Manageability, Acceptability, Urgency, Growth

Chapter 1 Introduction

1.1 Flooding and floodplains

In Australia, flooding can be caused by four different mechanisms: heavy rainfall, storm surge, tsunami and dam failure (dambreak). These mechanisms are described in Appendix C.

Rainfall and storm surge flooding create the most common and significant threats to the social and economic well-being of flood-prone communities. Whereas dambreak and tsunami flooding could cause catastrophic damage and high loss of life, the likelihood of such flooding is low in Australia (see Appendix C).

The floodplains of this document are defined in terms of the probable maximum flood (PMF). The area defined by the PMF event is flood prone. Land outside the PMF is truly flood free, at least with respect to rainfall floods (Fig. 1.1). However, floods caused by dambreak, extreme storm surge and tsunami may inundate areas outside the floodplains. Although this document concentrates on rainfall flooding, the principles developed here are equally applicable to the other three types of flooding. The term "flooding" as used in this document includes mainstream, stormwater and flash flooding.

In general, it is economically and practically infeasible to provide complete flood protection up to the PMF event. As a result, lesser flood events are typically adopted for planning and *development* purposes, that is, *defined flood events* (DFEs), and represent a compromise between the level of protection we can afford and the *risk* we are prepared to take with the *consequences* of larger floods (Fig. 1.1).

1.2 Floodplains—a national asset

Australia's floodplains are the commercial, social and ecological arteries of the nation. As such they constitute a national asset: an asset subject to damage when floods occur.

Most of Australia's towns and cities are located on floodplains, both inland and coastal. This is an historical fact, principally for reasons associated with water supply, transportation, waste disposal, advantageous points for river crossings, access to productive soils or recreation purposes. Hence, these towns are subject to flooding.

Floodplains are generally the more fertile areas of the continent. A significant proportion of Australia's intensive and extensive agricultural output is produced on floodplains including irrigated agriculture. Regular flooding of these areas enhances agriculture by increasing soil moisture,

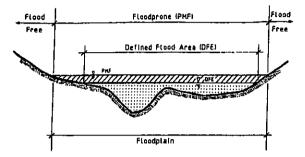


Figure 1.1 Flood-prone and flood-free land

recharging groundwater levels and depositing fertile silt. Typically, high value irrigated crops such as cotton, which can return \$20,000–\$30,000 per hectare, are protected from flooding by levees.

Many mining operations and transport-related infrastructure are partly or completely located on floodplains. Mining can range from small-scale sand and gravel extraction in the waterway itself or on the neighbouring floodplain, to massive open-cut metalliferous or coal mines. Tin is typically found together with alluvial sediments—several major gold and copper mines have been proposed close to principal waterways and wetlands of inland Australia.

Finally, in the late 1980s and 1990s, the interdependence of the health of the river and the floodplain and the role of periodic floods in maintaining this connection has been increasingly recognised. Waterways and their associated wetlands and floodplains provide habitat to native plants and animals. Floods move food sources and various aquatic faunas between river and floodplain—a critical event to the survival of many species. The ecological significance of floodplain habitat, much of which has been lost through past development, cannot be overemphasised.

A floodplain is an essential component of a catchment, and floodplain management is a critical part of overall catchment management. A catchment's natural resources include vegetation, wetlands and biodiversity and management is best achieved through applying the principles of Total or Integrated Catchment Management.

1.3 Floodplains—a national cost

In terms of tangible damages, or damages that can be relatively easily and meaningfully measured in dollar terms, the average annual cost of flooding in Australia is about

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Table 1.1 Estimated average annual cost of urban flood damage in Australia

	Stormwater		Mainstream		Total urban	
State	Properties	(\$ million)	Properties	(\$ million)	Properties	(\$ million)
NSW	41 000	18.8	69 000	81.2	110 000	100
Vic.	8 500	4.8	17 200	21.2	25 700	26
Qld	30 000	14.0	25 000	46.0	55 000	60
WA	3 000	1.4	6 500	5.2	9 500	6.6
SA	300	0.2	1 600	3.3	1 900	3.5
Tas.	1 000	0.4	1 000	2.0	2 000	2.4
NT	1 000	0.4	2 000	1.1	3 000	1.5
Total	84 800	40	122 300	160	207 100	200

Values have been adjusted for Consumer Price Index increases to 1998 \$ terms (Department of Primary Industry and Energy 1992). Queensland figures may be underestimated.

Table 1.2 Estimated average annual cost of rural flood damage in Australia

State	Rural enterprises ^A (\$ million)	Public Infrastructure ^B (\$ million)	Total rural (\$ million)
NSW	32.2	15.8	48.0
Vic.	1 <i>7</i> .0	5.3	22.3
Qld	32.7	33.2	65.9
WA	5.9	4.6	10.5
5A	1.3	0.7	2.0
Tas.	0.4	0.2	0.6
NT	0.5	0.2	0.7
Total	90	60	150

Values adjusted for CPI Increases to 1998 \$ terms (Department of Primary Industry and Energy 1992). Queensland figures may be underestimated.

\$350 million per year (Department of Primary Industry and Energy 1992). This represents the costs of urban damages caused by both *stormwater* and *mainstream flooding*, together with rural *flood damage* (Tables 1.1 and 1.2).

With respect to Tables 1.1 and 1.2:

- About 160 000 urban properties are susceptible to flooding by the 1% annual exceedance probability (AEP) mainstream flood event. A further 40 000 properties across the nation are susceptible to stormwater flooding by 1% AEP storm events. Many more properties are exposed to flooding by the PMF event. The average annual cost of urban flood damage to the nation is some \$200 million per year, most of which occurs in New South Wales (50%) and Queensland (30%).
- The average annual cost of rural flood damage is about \$150 million per year. It is made up of about \$90 million resulting from damage to rural enterprises and \$60 million of damage to public infrastructure. Again, Queensland and New South Wales account for most of the nation's total rural flood damage bill (about 45% and 30%, respectively).

 Massive infrastructure such as roads, railways, electricity distribution and telephone communications systems has been constructed across Australia's floodplains to service agriculture, urban, mining and other developments. This infrastructure is subject to the risk and consequence of flooding. Severe floods often cause massive disruption to transport and communication systems.

These estimates are uncertain, but are the best currently published (Department of Primary Industry and Energy 1992). A recent unpublished survey of potential flood damage in Queensland indicates that the situation in that State may be significantly underestimated. A similar caution regarding underestimation also applies to stormwater and rural damages.

The annual flood damage cost of \$350 million per year is not fully realised every year. Several years may pass before severe floods occur, such as the 1955 Hunter River Floods (\$500 million damage at 1998 values), the 1974 Brisbane Floods (\$700 million damage in 1998 values), the 1990 Floods in Western New South Wales and Queensland (\$150 million damage), and the Spring 1993 Floods in

A Livestock, agriculture etc.

^B Roads, railways etc.

Victoria (\$320 million damage). In the intervening years, less severe floods occur relatively frequently. The damage and disruption caused by these floods may be low per individual event, but collectively the damage is significant, although definitive data are not available. Damage caused by these lesser floods provides an on-going base level of national damage punctuated relatively frequently (e.g. every 5 years) by severe floods.

Not only is the average annual national damage figure of \$350 million per year a significant sum in its own right, but it is also a sum that will inexorably increase from year to year unless effective floodplain management measures are put in place on a national basis. This is because in the absence of effective floodplain management, more people will build on floodplains or more intensely develop and cause increases in the damage bill when a flood occurs.

1.4 Floodplain management—a planning process

Flood-prone land is often used for purposes that may be in conflict; for example, land clearing for agricultural or other types of development results in a loss of habitat. In attempting to control flood hazard at one location, we need to ensure that flood risk is not unjustifiably increased elsewhere. The use of levees to protect particular areas of the floodplain may increase flood levels or direct flood waters elsewhere and so increase hazard there.

Floodplain management involves the management of people, land use and the environment in areas subject to flood risk and other types of constraints. This is a complex multi-objective process that requires consideration of interrelated issues, such as community aspirations concerning the use of flood-prone land, the social, ecological and economic costs and benefits of possible land uses and management measures, as well as the hazard cost and social disruption caused by flooding.

In developing a floodplain management plan, several separate planning issues, each with individual objectives, need to be addressed. The issues for which planning is required include:

- economic—the nature and rate of future growth in the area of interest
- infrastructure—how well existing infrastructure can service future growth and the need for new infrastructure
- resource management—how best to use the natural resources of the floodplain
- risk management—how to deal most effectively with the likelihood and consequences of flooding across the floodplain

- flood emergency—how to deal with the management of actual floods
- land use—all of the above issues and how to achieve a
 balance between the multiple and often conflicting
 objectives of the community's desired use of the
 floodplain.

If floodplain management is to be successful, it needs to occur from within a broad planning framework that identifies and considers all factors and issues that affect the management process and its outcomes. Further, an appropriate planning horizon needs to be adopted. This should be of the order of 20 to 30 years. This document describes a planning framework for the development of successful floodplain management plans (see Chapter 3).

The principal outcome of the floodplain management process is the floodplain management plan. This plan embodies the community's considered opinions and balanced compromises regarding how best to manage floodplains on an objective, sustainable and equitable basis for the benefit of present and future generations.

1.5 A brief history of floodplain management

Floodplain management in Australia has evolved through four successive phases:

- structural works
- planning
- flood emergency management
- all-embracing planning.

During the structural phase, which persisted in most States and Territories up to the 1970s, structural works, typically leves, were used to protect existing properties at risk. Little consideration was given to land use planning, to environmental or habitat issues on the floodplain, or to risk management planning. Problems were typically addressed on an ad hoc and individual basis and usually in response to a particular flood event. This approach was essentially reactive.

In the 1970s, a series of severe floods in New South Wales, Victoria and Queensland caused widespread and significant damage. The aftermath of these floods warned authorities that despite significant expenditure on structural works, the flood damage bill continued to grow as new development occurred on floodplains. The importance and effectiveness of land use planning measures to control the growth of future damages was realised.

In the late 1980s and early 1990s the importance of flood emergency management was brought into sharp focus by two events. First, there was a realisation of the potential catastrophe that could result if Warragamba Dam, NSW, was breached (60 000 people at risk). Second, the occurrence of the Bogan River Flood in April 1990 that breached the levees around the central New South Wales town of Nyngan, requiring the forced evacuation by helicopter of virtually the entire town. This flood had an average return period of about 250 years and graphically demonstrated the reality of the residual risk associated with flood events more severe than the DFE used for planning and design purposes. These two events in New South Wales, and by inference other States, confirmed the importance of flood emergency planning as an essential component of responsible floodplain management.

Finally, from the early 1990s onwards, the importance of an all-embracing planning approach to floodplain management became apparent. This proactive approach incorporates the concepts of resource management and sustainable development, as well as flooding considerations. This awareness has been fostered and promoted by the States through the Floodplain Management Working Group that initially reported to the Australian Water Resources Council (AWRC) (until 1993) and now reports to the Standing Committee on Agriculture and Resource Management (SCARM).

1.6 Objectives of floodplain management

The principal objectives of floodplain management, as set out in this document, are to:

- limit to acceptable levels the effect of flooding on the well-being, health and safety of flood-prone individuals and communities
- limit to acceptable levels the damage caused by flooding to private and public property
- ensure that the natural function of the floodplain—to convey and store floodwaters during a flood—is preserved and where necessary enhanced, along with any associated flood-dependent ecosystems
- encourage the planning and use of floodplains as a valuable and sustainable resource capable of multiple, but compatible, land uses of benefit to the community.

With respect to administration and resource management, specific objectives of best practice floodplain management are to:

- streamline floodplain management
- capitalise on available technology to assist and improve floodplain management
- preserve and enhance the soil, vegetation and water resources of floodplains

 ensure that floodplain management and catchment management are fully integrated and compatible by adopting a whole-of-government approach in coordinating management activities across catchments and among all relevant agencies and the private sector.

1.7 Local agencies and their role

If floodplain management is to be successful, it requires the commitment and cooperation of individuals and local communities. This public involvement is best harnessed through an appropriate local agency.

In this document, local agency means the agency best suited to oversee floodplain management; that is, the agency that most strongly and effectively reflects the concerns and desires of the local community with respect to floodplain matters. In urban areas, the appropriate local agency will generally be a local council. However, in the case of the Territories, the local agency may be a Territory Government agency. In rural areas, the appropriate local agency might be a local council, a Catchment Management Board, a River Trust or a locally or regionally constituted Catchment Trust. Again, in the case of the two Territories, the local agency may be a Territory Government agency.

Local agencies generally are:

- composed of elected representatives who are in the best position to know or determine community wants and desires regarding development and management of floodplains
- responsible for local land use planning and for the subdivision of land approval and implementation processes
- able to command significant resources of labour, facilities and equipment that can be used in flood emergencies.

The pivotal role of local agencies needs to be recognised and acknowledged at the outset of discussions concerning better floodplain management in Australia. It is essential that an appropriate local agency lead the development of floodplain management plans.

1.8 Flood risk management

Ideally, society would like to be free of the risk of flooding, but this is neither practically nor economically feasible. What constitutes an "acceptable level of flood risk", however, is a vexed question. The immediate risk is borne by the local community, which must have a significant input into defining the acceptable level. To this end, public consultation and "risk communication" is very important. The concept of "affordable" risk management must underly considerations of acceptable levels of risk. Moreover, the local community is likely to be increasingly called upon to

fund floodplain management if the "user pays" principle becomes more widely applied.

Management of the risk associated with the human occupation of the floodplain lies at the core of floodplain management. A floodplain management plan is a risk management plan that more comprehensively embraces the social, economic and ecological issues associated with living and working on flood-prone land, not solely the issue of flood management.

Flood risk management, or how we deal with the likelihood and consequences of flooding, is a new and formal statement of an old concept. Flood risk management has been practiced since the consequences of flooding were appreciated and addressed by people and communities. Governor Lachlan Macquarie's 1817 proclamation about the dangers of flooding represents the first formal flood risk management measure taken by the European settlers of Australia (see Appendix D). Unfortunately, his advice was largely unheeded.

Floods are the most manageable of all natural disasters (Department of Primary Industry and Energy 1992). Unlike other natural disasters, we know specifically where floods will occur and we can estimate the likelihood of flooding, flood behaviour and the consequences of flooding generally to a high degree of reliability. For floods of a nominated likelihood of occurrence, we can estimate the extent of flooding, flood levels and flood velocities and the associated flood damage. Thus, society has no excuse for not managing flood hazard in a responsible manner. The key unknown is when an event will occur and there is often only a short lead time before response action is required.

1.8.1 What does flood risk management involve?

Flood risk management involves an analysis of the risk exposure of a flood-prone community; that is, a flood risk

analysis, followed by the identification and implementation of appropriate measures to manage existing, future and residual flood risks to acceptable levels. Flood risk management is discussed in detail in Appendix E.

If floodplain management is to be effective, it requires public consultation to address complex issues such as acceptable levels of risk, the *denial syndrome* and affordable risk management.

Major differences between today's "risk management" approach and past practice include recognition of the:

- need to investigate a full range of floods up to the PMF event
- importance of public consultation to encourage ownership of the resulting plan
- · risk attending developments on the floodplain
- need to incorporate an education/awareness creating process.

1.9 Stormwater flooding

This document does not provide explicit directions for better stormwater management. However, stormwater drainage issues are briefly discussed (see Appendix F), as are the interactions between stormwater and mainstream flooding (see Chapter 2.7).

The best practice principles of this document are equally as applicable to stormwater flooding as to mainstream flooding. Local authorities and other agencies responsible for stormwater management are encouraged to assess the existing, future and residual problems associated with stormwater flooding and to prepare integrated stormwater management plans to address these issues.



Chapter 2 An integrated approach to floodplain management

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An integrated approach to land use planning on floodplains is required to bring together the diverse issues and stakeholders that affect or are affected by floodplain management. This approach takes flooding behaviour, flood risk and flood hazard into account, along with all other relevant planning factors. Such an approach is described in Chapter 3 of this document.

The end product of this process is a floodplain management plan that facilitates the use of the floodplain for appropriate purposes, that limits flood hazard and damage to socially acceptable levels, enhances the waterway and floodplain environment, and fosters flood warning, response, evacuation, clean-up and recovery in the onset and aftermath of a flood.

With respect to specific issues, a best practice approach to floodplain management requires not only a total catchment approach to flooding but also integration of:

- individual floodplain management measures
- roles and responsibilities of all stakeholders
- · floodplain management plan and the flood emergency plan
- resource management considerations and programs
- stormwater flooding and mainstream flooding considerations.

2.1 Integration of policy and legislation

A policy framework to support the management of floodplains should be integrated within all agencies. Integration should be supported through:

- State, Territory and Commonwealth Governments working together to develop and implement integrated strategies against flood risk incorporating legislative, financial, logistical and technical support
- each State and Territory developing and promoting a comprehensive floodplain management policy, supported by appropriate legislation, regulations, standards, guidelines and planning policies that clearly and unambiguously defines the responsibilities and liabilities of all agencies
- all decision-makers involved in floodplain management being aware of their varying responsibilities for decisions regarding the development and implementation of

- floodplain management plans and their responsibilities regarding the use of flood-prone land
- responsible agencies preparing a floodplain management plan based on an understanding of the effects of the full range of possible flood events and dealing with existing, future and residual flood risk via a floodplain management process similar to the one described in this document
- integrating the development of floodplain management and emergency management plans in order to protect life and property and minimise the effects of floods—local agencies should liaise with the emergency management agency in regard to managing flood emergencies and actively contribute to flood emergency planning by providing labour, equipment and facilities in order for the community to prepare, respond to and recover from floods
- recognition by all agencies of the importance of public consultation in developing and implementing floodplain management plans and with regard to flood risk management
- ensuring the provisions of a floodplain management plan are implemented in a timely way after the plan has been finalised and adopted—in particular, land use planning measures should be incorporated into appropriate statutory planning instruments as a matter of course immediately the management plan has been adopted
- reviewing the floodplain management plan and its risk management provisions as required or at regular intervals of not more than five to ten years
- recognising that residual flood risk cannot be eliminated by structural or non-structural management strategies (e.g. river improvement works, levees, land use controls)
- continuing provision by the Commonwealth
 Government of specialist national resources relevant to
 floodplain management and flood emergency
 management (e.g. the flood forecasting activities of the
 Bureau of Meteorology, the use of the Armed Services in
 evacuation and recovery activities and the emergency
 training activities undertaken by Emergency
 Management Australia, EMA).
- provision of relief funding to assist in the recovery of areas devastated by severe floods.

2.2 A total catchment approach

Flooding needs to be considered from a catchment-wide perspective in order to manage effectively the result of existing development and the cumulative effects of future development on stormwater and mainstream flooding. This perspective includes both the upstream and downstream implications of proposed land use developments and floodplain management activities.

2.2.1 Urban flooding

In planning for future urban development, the increase in *peak* stormwater *discharges* and *runoff* volumes caused by the ultimate level of urbanisation need to be evaluated, as does the effect of these factors on downstream flood levels.

If detention basins are to form part of a future stormwater management system, land for these structures should be identified and preserved early in the planning process for urban expansion. If this is not done, the necessary land may not be available when required.

The incorporation of floodways and drainage infrastructure within multiple-use corridors and public open space also should be considered early in urban land planning. Landscaping of such corridors, detention basins and artificial wetlands to enhance aesthetics and contribute to improved habitat values in urban developments should not be overlooked.

The amelioration of stormwater drainage problems by increasing the capacity of piped or open-channel drainage systems is at best expensive and at worst infeasible because of limited access for equipment or non-availability of land for mitigation measures. Substantial future financial benefits will accrue to local agencies that define integrated stormwater management and floodplain management strategies based on a total catchment approach, especially when more than one council manages a particular catchment.

2.2.2 Rural flooding

Many floodplain areas used for extensive rural purposes are relatively flat. Hence, even minor impediments to the flow of floodwaters may significantly affect flooding behaviour, for example embankments alongside irrigation canals and levees to protect areas containing high-value cash crops.

In planning for future rural developments, it is essential to evaluate the effect of the ultimate level (and type) of agricultural operations on upstream and downstream flood behaviour and flow distribution, as well as possible effect on floodplain ecosystems. The effect of rural developments on flood behaviour should be assessed within a total catchment approach not on an individual and isolated basis.

2.3 Integration of floodplain management measures

Best practice floodplain management requires that an appropriate and integrated mix of floodplain management measures are identified and implemented to address the issues of existing, future and residual flood risk in the area of interest.

2.3.1 The three flood problems

Modern floodplain management recognises three distinct types of "flood problems":

- existing—refers to existing buildings and developments on flood-prone land; these buildings and developments, by virtue of their presence and location, are exposed to an "existing" risk of flooding
- future—refers to buildings and developments that will be built on flood-prone land; these buildings and developments will be exposed to a "future" flood risk (i.e. a risk that does not materialise until the developments occur)
- residual—refers to the risk associated with floods generally and with those floods that exceed management measures already in place (i.e. unless a floodplain management measure is designed to withstand the PMF, it will be exceeded by a sufficiently large flood at some time in the future—it is not a matter of if, but of when).

2.3.2 Management measures

Best practice for effective floodplain management requires that appropriate management measures are chosen (see Appendix B) and integrated for each specific floodplain area. Floodplain management measures are: land use planning, structural controls, development and building controls and flood emergency measures.

2.3.2.1 Land use planning

Land use planning controls are the most cost-effective means of reducing the growth in future flood damage. Other best practice aspects of land use planning measures include:

- incorporating the land use planning provisions of a floodplain management plan into statutory planning instruments in a timely and expeditious way
- recognising that voluntary property purchase may be the only feasible and economically justified management measure for the more hazardous areas of the floodplain
- ensuring measures based on cumulative impact can be adequately applied to individual proposals.

2.3.2.2 Structural measures

Structural floodplain management works need to be designed, constructed and maintained to appropriate standards if they are to reliably provide flood protection.

Unless designed for the PMF event, all structural works will ultimately be "overwhelmed" by a flood greater than the DFE adopted for their design. An appropriate flood emergency plan needs to be prepared to address this contingency. Structural works are a valuable community asset and need to be managed and maintained as such. Long-term plans for the maintenance of structural measures, including provision of funding, need to be prepared and included in a floodplain management plan.

With respect to levees, best practice involves recognising the need to:

- design levees for controlled overtopping by flood events larger than the design event to reduce the hazard associated with uncontrolled overtopping
- incorporate freeboard in levee design as a safety factor to ensure that the levee provides protection up to the DFE adopted for design purposes—freeboard should not be relied upon to provide protection against larger floods
- consider potential problems with local drainage within the protected area during a flood—generally, pumps will be required to remove internal local runoff and the operability and reliability of pumps needs to be assessed as part of the design process.

With respect to detention basins, best practice involves recognising the:

- possibility and hazard in urban areas of a cascade failure
 of a series of detention basins along the same waterway
 system—ideally, detention basins should be located on
 separate upper tributaries to eliminate the risk of cascade
 failure—if detention basins in urban areas act in series,
 using the PMF event for design purposes should be
 considered
- opportunities for detention basin areas to incorporate
 water quality improvement features and possibly playing
 fields in their design—if detention basin areas are also
 used for recreation, the hazard to recreational users that
 develops during floods needs to be evaluated for a full
 range of flood events
- impeding affects of detention basins on floods greater than the design event—even if a detention basin does not fail under a flood larger than the design event, upstream flood levels may be significantly increased because of the effect of the embankment impeding flows
- need to consult ANCOLD Guidelines (Australian National Committee on Large Dams 1994) with respect

to design, maintenance and degree of hazard protection required—the detention dam is a referable structure if the embankment is greater than 5 m in height and the dam has a capacity in excess of 50 ML (or 10 m in height and 20 ML capacity).

2.3.2.3 Development and building controls

Appropriate development and building controls can significantly reduce flood hazard and the amount of structural and internal damage to flood-prone properties when a flood greater than the DFE occurs. Best practice guidelines for development and building controls include:

- siting and designing floodplain developments
 appropriately, especially the location of buildings and the
 configuration of the road network on flood-prone sites,
 which can significantly reduce hazard and facilitate
 evacuation in the onset of an overwhelming flood
- local agencies considering the appropriateness of various types of construction for the more flood-prone areas of the floodplain—after flooding, slab-on-ground floors can take much longer to dry out than floors elevated above ground level
- local agencies considering the introduction and certification of formal floodproofing measures for the more flood-prone areas of the floodplain, particularly regarding appropriate wall linings and the material used for built-in fittings, both principal sources of structural flood damage.

Developments that create an island in the floodplain should be viewed circumspectly. Such developments may create a false sense of security in *minor flooding*, but will inevitably increase the demand on emergency services and increase the risk to residents when larger floods are experienced. Specific development and building controls need to be developed by the local agency if this type of development is to be pursued.

2.3.2.4 Flood emergency plans

Best practice guidelines in relation to flood emergency plans include:

- recognising that residual flood risk will generally exist across the floodplain and needs to be addressed by a flood emergency plan
- recognising that the flood emergency plan and floodplain management plan of a particular area of the floodplain are complementary (i.e. issues and decisions made in the development and implementation of each plan can facilitate outcomes and the reduction in risk in the other)
- the need to assess the behaviour and consequences of a range of flood events up to and including the PMF when developing a flood emergency plan.

Table 2.1 Applicability of floodplain management measures to the three flood problems

	-	Flood problem	
Floodplain management measure	Existing	Future	Residual
Structural measures	1		
Land use planning measures	√ A	/	
Development & building controls	√B	/	
Flood emergency plans	/	✓	/

Agemoval of building and development from unduly hazardous areas or floodproofing of existing structures. Bsome dwellings can be floodproofed after initial construction.

The uncertainties relating to storm surge [i.e. accuracy of surge height predictions, area likely to be affected (location of *landfall*), ability of people to move during cyclones] require special consideration in the planning and response phases of emergency planning. While there are similarities with mainstream flooding, the consequences of a major storm surge occurring are usually greater than those of mainstream flooding.

Some management measures are more appropriate to certain flood problems than others (Table 2.1). As shown in Table 2.1, flood emergency measures are appropriate to all three flood problems, all measures can be used to address the future flood risk problem, and only flood emergency measures can be used to address the residual flood risk problem.

With respect to the cost-effectiveness of the various groups of floodplain management measures, the following points should be noted:

- structural works are expensive but if well designed, constructed and maintained, they provide protection up to the DFE—when a larger flood overwhelms structural works (e.g. the overtopping of levees) considerable threat to life and limb, damage and social disruption can occur, such as happened at Nyngan, NSW, in April 1990
- land use planning measures are the most cost-effective floodplain management measure in controlling the growth of future flood damage
- appropriate development and building controls are costeffective floodplain management measures
- to realise the full benefit of flood emergency measures, the floodplain population needs to be "flood aware" (i.e. people know what to do and how to do it when a flood eventuates)
- in some situations, flood emergency measures may be the only economically justified management measure.

2.4 Integration of roles and responsibilities

The following stakeholders in the floodplain management process can be readily identified:

- local community
- · land developers
- local agencies
- State agencies, typically including agencies for water resources, natural resources management, planning, environmental protection, lead emergency management, road and rail transport and River Trusts
- Commonwealth agencies, including the Commonwealth Bureau of Meteorology for flood warning; the Department of Finance for natural disaster relief payments to assist States and Territories; the Department of Transport and Regional Services (or other appropriate Department) for the funding of floodplain management projects; and EMA that provides a national focus for flood emergency training.

The relevant roles and responsibilities of these stakeholders are discussed in detail in Chapter 4. The roles and responsibilities of all stakeholders need to be integrated in floodplain management to streamline the process and render it more effective. Legislative change may be required to achieve this integration (see Chapter 5).

Stakeholder roles and responsibilities can be most effectively integrated into the floodplain management process through the preparation of a floodplain management plan as a cooperative exercise between representatives of the three levels of government and the local community.

2.5 Integration of floodplain management plans and flood emergency plans

Flood emergency plans and floodplain management plans are complementary.

A floodplain management plan is a comprehensive document that addresses all issues related to land use on the floodplain and the associated existing, future and residual flood risks (see Appendix G).

A flood emergency plan (sometimes known as a flood plan) is prepared for the purpose of mitigating the risk to life and

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health and flood damage associated with actual flood events; that is, the hazards associated with flooding (see Appendix H). Such plans describe flood warning, defence, evacuation, clean-up and recovery arrangements.

Best practice requires that a floodplain management plan is prepared on behalf of the local community by the appropriate local agency (see Chapter 3). By legislation, regulation or Orders in Council, various State and Territory emergency agencies or local agencies are charged with the preparation of flood emergency plans.

The following aspects of floodplain management plans and flood emergency plans should be noted:

- cooperation and liaison between local agencies and the emergency agencies is essential in the preparation of both types of plans
- the flood emergency plan covers the entire floodplain (as defined by the PMF), whereas the land use planning provisions of a floodplain management plan may be restricted to that area of the floodplain inundated by the DFE
- both local agencies and State emergency agencies need to know about flood hazard—local agencies for determining land uses appropriate to hazard, and emergency agencies for determining operational response plans
- if the community is to obtain the best value from flood emergency plans and the floodplain management plans, planning needs to be integrated.

2.6 Integration of resource management considerations

Most State Governments have developed policies and programs to manage the State's soil, water, vegetation and mineral resources. Resource management considerations for floodplain areas, as addressed in floodplain management plans, need to be consistent with the objectives of broader resource management programs; that is, sustainable management of the effect of flooding on the use of Australia's floodplains.

2.7 Integration of stormwater and mainstream flooding behaviour

In engineering terms, stormwater drainage refers to the collection of runoff from local areas via a system of gutters, pipes and open drains (see Appendix F), whereas mainstream flooding refers to the passage of floodwaters down a catchment via both the main channel and floodplains of a creek or river.

Stormwater and mainstream flooding have been treated separately on the basis of catchment size and flood hazard. However, stormwater and main channel flows interact and can exacerbate the resultant flooding, as follows:

- "backwater" effects of mainstream flood levels can cause a piped drainage system to surcharge and lead to stormwater flooding
- additional runoff and increased peak discharge generated by newly urbanised areas can exacerbate mainstream flooding problems.

Thus, the interaction between stormwater and mainstream flooding needs to be evaluated and accounted for when preparing a floodplain management plan.

Chapter 3 The Floodplain Management Process

This chapter describes a recommended process for floodplain management in Australia; that is, the steps in formulating and implementing a floodplain management plan. This process is depicted in Figure 3.1 and is seen to encompass three separate systems:

- Statutory planning
- Floodplain management
- Flood emergency.

The development and implementation of effective floodplain management and flood emergency management plans requires the coordination and integration of various elements of these three systems.

Best practice for the floodplain management process needs to include the following:

- · public consultation at all stages of the process
- a suitable planning horizon (20–30 years) that encompasses and assesses opportunities for significant land use change and redevelopment of existing urban and rural areas
- planning process guided by a Floodplain Management Advisory Committee (the Committee), chaired by local agency(s), representing all principal stakeholders
- plans made in view of the multi-objective nature of floodplain management

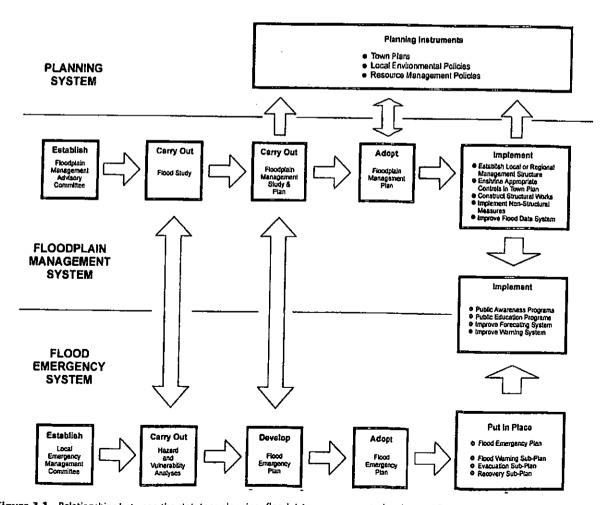


Figure 3.1 Relationships between the statutory planning, floodplain management planning and flood emergency planning processes

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- an assessment of flooding considerations together with environmental, ecological, economic, social and community expectations from within the broader principles of sustainable natural resource and environment management and of integrated or total catchment management
- recognition of existing, future and residual flood risk and flood hazard, and evaluation of these in the study area
- a formal risk management analysis to identify, evaluate and treat flood risk—this provides the most comprehensive assessment of these issues
- a risk-damage study to provide quantitative and reliable insights into the selection of floodplain management measures and DFEs, and the effects of proposed new developments on risk-damage relationships
- appropriate technical studies undertaken to adequate standards
- consideration of a full range of flood events up to and including the PMF so that residual flood risk can be assessed and an appropriate flood emergency plan devised to deal with residual risk
- assessment of effects of future development on flood hazard and behaviour on a cumulative basis
- identification and assessment of a full range of management measures and options that appropriately address the existing, future and residual flood problems of the study area
- precautions with respect to possible implications of the greenhouse effect on flooding
- implementation of adopted measures in an effective and timely way, especially land use planning controls, and the floodplain management plan is incorporated into the relevant statutory planning instruments
- recognition that a floodplain management plan is not a static document, but needs to be reviewed and updated regularly (e.g. every 5-10 years) to accommodate changes in, for example, community expectations and flooding behaviour.

3.1 Floodplain management policy

Floodplain management policies help raise and sustain local, State and Territory-wide levels of *flood awareness*. As part of the strategic planning and operational processes of all agencies, the following is recommended:

 all States and Territories develop floodplain management policies that reflect flooding problems and their management in that State and Territory

- all States and Territories develop flood emergency policies that reflect their management of flood emergencies in that State and Territory
- local agencies develop a local floodplain management policy that represents a succinct summary of the local agency's floodplain management plan and is part of its corporate planning and operational activity.

The local policy serves as a comprehensive introduction to flooding matters and the management of flooding in the local community. An important component of this policy is the local agency's views on the use and development of flood-prone land.

3.2 Statutory planning system

Appropriate land use controls need to be identified and their power and effectiveness preserved by incorporation in statutory planning instruments.

Town plans, local environmental plans and other formal planning instruments provide a basic foundation for the floodplain management process. Whereas floodplain management plans may have no statutory basis, the statutory planning process provides a suitable and effective vehicle for the preparation of floodplain management plans and for the implementation of their land use provisions. All States and Territories have a State planning (and development) agency of some type and a statutory planning system.

Floodplain management is an exercise in multi-objective land use planning that is best directed by the agency responsible for local planning, typically a local council or equivalent local agency (see Chapter 1.7). The preparation of a floodplain management plan is the same as any other land use planning, with the additional need to account for the constraints of flood risk and flood hazard; that is, risk management.

Land use planning controls are the most cost-effective floodplain management measure, particularly with respect to limiting the growth in future flood damage.

3.3 Floodplain management system

3.3.1 Floodplain Management Advisory Committee

The first step in the floodplain management process is to form a Floodplain Management Advisory Committee (the Committee). Such Committees are typically formed and chaired by the local agency.

3.3.1.1 Role

The principal objective of the Committee is to assist the local agency in developing and implementing a plan for the

management of the respective floodplain area. However, the Committee also needs to:

- formulate the objectives of the local agency's floodplain management policy and plan
- develop strategies for the implementation of floodplain management plans
- direct and monitor the progress and findings of any study being undertaken as part of the floodplain management process
- review the plan as required.

3.3.1.2 Membership

Membership of the Committee should comprise a balanced mix of elected, administrative and community representatives, together with technical experts.

A Committee could comprise elected members and engineering and planning staff from local agencies, local community representatives and technical representatives from the principal State agencies concerned with floodplain management (e.g. water resources, natural resource management, planning and emergency management). Officers from other government agencies may be appointed to the Committee as and when required (e.g. River Trusts, Road and Rail Transport).

A floodplain management plan forms part of a total catchment management plan. Hence, members of the Committee should include representatives of the local Catchment Management Committee or Catchment Management Trust.

The Committee should include community representatives from affected residential and business areas, and those who can effectively inform the affected community of the deliberations of the Committee and so foster a wider understanding of the floodplain management process.

If the existing, future and residual flood problems are to be managed effectively, there needs to be close liaison and integration between the floodplain management planning process and the flood emergency planning process (see Fig. 3.1). To this end, it is essential that a local representative (and possibly a regional representative) of the appropriate State or Territory emergency management agency is a member of the Committee.

It may be desirable to establish a Committee involving several adjoining local agencies; for example, when structural, land use or flood management measures in one local agency area are likely to influence the effectiveness of mitigation measures or flooding behaviour in another local agency area(s).

3.3.1.3 Initial tasks

The first tasks confronting the Committee are to:

- · establish policy and management objectives
- · initiate a flood study
- initiate studies to collect and interpret social, economic and environmental data of relevance to community aspirations for future development and use of the river and floodplain environment.

Data for the Committee to collect could include:

- past flood data, including flood behaviour in general, principal flow paths, peak flood levels and flood damage
- · current levels of flood awareness
- · likely community disruption caused by flooding
- current land use
- · proposed land use
- · population growth
- locations of spare capacity in existing infrastructure (roads, water supply, sewerage)
- · feasibility and costs of infrastructure expansion
- flora and fauna surveys of river and floodplain habitat, and the significance of this habitat within the context of the entire catchment.

3.3.2 The flood study

The flood study defines the nature and extent of flood hazard across the floodplain by providing information on the extent, level and *velocity of floodwaters* and on the distribution of flood flows. One of the first tasks of the Committee is to initiate a flood study that consists of a comprehensive technical investigation of flood behaviour (see Appendix I). The flood study forms the basis for subsequent management studies and needs to include the full range of flood events up to and including the PMF.

The two principal components of a flood study are to determine throughout the study area:

- flood discharges for floods of various severities (hydrologic aspects)
- flood levels and velocities for the various flood events (hydraulic aspects).

A variety of analytical tools can be used in flood studies, depending on the availability of data, the nature of the flow situation, the nature and extent of existing development on the floodplain, and the level of detail required (see Appendix I). It is strongly recommended that these tools be used by experienced practitioners.

Increasingly sophisticated computer models are being used to assess existing flood behaviour and the effects of management measures on flood behaviour, prepare flood emergency plans and for "real-time" flood management.

Best practice with respect to the use of computer models includes:

- awareness by local agencies of the limitations and capabilities of the particular computer model being used
- assessment of the model for use in real-time flood emergencies, and assuming responsibility for funding operating and maintenance costs
- liaison between local agencies and the Bureau of Meteorology to assess the effectiveness of various hydrologic and hydraulic simulation models to predict "real-time" flood behaviour and to generate flood warnings.

One objective is to determine for various flood events the extent of defined floodway and defined flood fringe areas of the floodplain and the variation of hazard across the floodplain (see Appendix J). Depending upon the degree of hazard, certain land uses are generally more appropriate than others.

The full range of possible flood events up to and including the PMF need to be investigated. This enables changes in the nature of flooding to be assessed as the severity of the flood increases. All of this information needs to be weighed in selecting DFEs for planning purposes (see Appendix K) and for emergency management plans (see Appendix H).

Finally, the warming of the earth postulated to occur because of the "greenhouse effect" will also affect flood behaviour: sea levels may rise and the pattern and rainfalls of flood-producing storms may intensify. These issues also need to be considered as part of a flood study (see Appendix I).

3.3.3 The floodplain management study

The floodplain management study identifies and compares options to manage flood hazard, including an assessment of social, economic and environmental costs and benefits, together with opportunities to enhance the river and floodplain environments. A successful floodplain management study requires a comprehensive multidisciplinary approach and active public consultation.

Selection of the optimum mix of management measures is no easy task. It requires compromises. Detailed studies and professional judgment is required. Flood risk management is a basic cornerstone of the floodplain management process of this document.

Once the results of the flood study are available, data collected and previous studies reviewed, the Committee oversees the floodplain management study (see Appendix L).

The hydrologic and hydraulic models developed during the flood study allow the assessment of the effect of structural mitigation measures and different land use options on flooding behaviour and flood hazard. The data collected provide the necessary information to assess the social, economic and environmental costs and benefits of the various mitigation measures and future land use possibilities.

Flood maps provide general guidelines for the appropriateness of different types of land use and developments across the floodplain. These guidelines, which are based on the hydraulic and hazard characteristics of the floodplain, are indicative only. The floodplain management plan, when complete, will identify constraints and opportunities for land uses and developments, while ensuring that existing flood levels and flood behaviour are not compromised.

3.3.3.1 Flood risk management

Flood risk management is a formal means of identifying and managing the existing, future and residual risks of flooding.

The flood risk management process is described in Appendix E. Key elements of the process include:

- identification of the stakeholders exposed to or affecting the risk of flooding
- identification of public and private property, social systems and environmental elements at risk of flooding
- estimation of flood risk (i.e. the likelihood and consequences of flooding)
- · assessment of the acceptability of flood risk
- definition of flood risk management strategies.

Earlier approaches to floodplain management were based on providing "protection" up to a predetermined flood event, typically the 1% AEP flood. Important differences from this earlier approach are that the risk management approach:

- recognises the need to explore the risks associated with a full range of flood events up to the PMF
- uses DFEs for planning and control that are not predetermined but emerge from the analysis itself
- explicitly recognises the residual flood risk and manages it via a flood emergency plan that is complementary to the floodplain management plan.

The risk management approach requires that "societal risk", or the risk to the community of fatalities caused by flooding, be reduced to "acceptable levels". These acceptable levels may be quite low if based on levels currently accepted for dambreak flooding and industrial and nuclear accidents (e.g. 1 fatality for the 0.001% AEP flood event), and if adopted for rainfall flooding, indicate the need to devote higher

levels of resources to risk management. This risk is much lower than the risk of death by flooding that society currently bears (see Appendix E).

3.3.3.2 Economic appraisal

Economic appraisal is essential to a floodplain management study. If government financial assistance is to be sought, a comprehensive economic analysis of options and impacts is generally a prerequisite. Economic appraisal provides a common framework for assessing the effects of management options—positive or negative, social, environmental or financial.

Proposed management measures will need to be appraised to ensure that "costs" are justified by associated "benefits". The economic appraisal usually follows conventional cost-benefit procedures, including division into private and public sectors. The economic appraisal should include social, environmental and equity costs and benefits, as far as these can be quantified.

Economic analysis can also be used to determine the optimum size of a single management measure or the optimum mix (and size) of multiple management measures. The "cost" of flooding itself needs to be included in an economic analysis (see Appendix M).

Economic appraisal deals principally with tangible costs readily quantified in dollar values (direct and indirect costs). However, it is not unusual to proceed with urban flood mitigation schemes on largely social grounds; that is, on the basis of the reduction in intangible costs and social and community disruption. Worldwide many flood mitigation schemes are only marginally economic or are even "uneconomic" in strict tangible cost-benefit terms, but may be justified, however, in other terms.

Benefits associated with flooding include improvements to soil fertility through the deposition of silt across agricultural floodplains. In addition, flooding episodes are essential to the well-being, growth and breeding of many riparian plants and animals along river and creek systems. Floodplain management measures that limit the extent of flooding or reduce the *frequency* and magnitude of flooding may diminish or even eliminate these benefits. These effects need to be assessed and taken into account in the economic analysis within a floodplain management study.

3.3.3.3 Environmental, ecological and resource considerations

Habitat

Human occupation of the floodplain for forestry, agriculture and urban development has led to the clearing and draining of vast areas of natural vegetation and the loss of much riparian habitat. Much of what remains is under threat.

Stream "improvement", or the clearing of bed and bank vegetation and obstructions from waterways to facilitate flood flows, has been a relatively common structural management measure. However, we now recognise that the riffles, pools, snags and immediate riparian vegetation of the bed and banks of natural waterways provide essential habitat for a wide diversity of creatures. The biological costs of any work or measure that affects the riverine biocommunity need to be assessed as part of a floodplain management study.

The floodplain management process provides the community with an opportunity to preserve, protect and extend remaining areas of habitat, and to improve or reinstate degraded habitat areas affected by past measures to reduce flood risk. Modification to natural channels such as vegetation clearing, channel formalisation or structural measures which interfere with natural sediment budgets or result in concentration of flows can all affect the stability of the riverine system. Instability causes loss of equilibrium, and the effect of the system seeking equilibrium is often degradation. The opportunity for and benefits from "environmental improvement" as part of the development and implementation of a floodplain management plan should not be overlooked.

Thus, an important part of the floodplain management study will be a scientific analysis of the habitat of the river and its floodplain, including its importance and relationship to other habitats within the catchment.

Water quality

The quality of creek, river, estuarine and coastal waters affects their use as habitat by flora and fauna, as well as the visual aesthetics and recreational use of these waterways and their surrounds.

Floodplain development for forestry, agricultural and urban purposes can be detrimental to water quality. Surface runoff may contain high levels of silt, nutrients, pesticides, heavy metals and organic matter, which degrade water quality and can lead to the eutrophication of waterways.

Some structural mitigation measures, if appropriately designed, can have associated water quality benefits; for example, detention basins can be designed to promote a reduction in suspended solids and adsorbed nutrients by settling within the basin.

Sustainable use

Soil, water, vegetation and mineral resources of the floodplain need to be managed on a sustainable basis.

A floodplain management study, as part of a total catchment management plan, provides an opportunity to consider sustainability in an effective and integrated fashion.

3.3.3.4 Social considerations

The floodplain management study includes the local community's wants and desires regarding the development and use of flood-prone land, integration of these factors with flood hazard and any regional or local development strategies, and the social effects of flooding on the community.

3.3.3.5 Planning horizon

An appropriate planning horizon needs to be adopted for the appraisal of future land use—20 to 30 years is appropriate. Although we cannot be certain of the state of the population, economy, society or technology 30 years into the future, the planning horizon needs to encompass possible future urban development (based on State and regional planning concepts, as well as local needs) and the possibility of urban renewal on a potentially large scale. All buildings ultimately have to be replaced or substantially renovated; land uses that were appropriate 50 years ago may no longer be so considered in a further 30 years.

One significant management option in a floodplain management plan is a complete change of land use through the redevelopment of large areas of existing development. It is essential that the floodplain management study look sufficiently far ahead to encompass and assess these options.

3.3.4 The floodplain management plan

The floodplain management plan comprises a coordinated mix of measures that address the existing, future and residual flood problems.

The plan should specify the objectives of managing the particular area of floodplain under consideration, as well as how this is to be done. It will include, in both written and diagrammatic form, information describing how particular areas of land are to be used and managed to achieve specified objectives. The plan should also include a description and discussion of various issues, problems, special features and values of the area, together with specific management measures to be implemented, along with the means and timing of implementation.

Appendix G describes various elements of a floodplain management plan.

3.3.4.1 Draft plan

Using the results of all studies undertaken as part of the Floodplain Management Study, a draft floodplain management plan is formulated. The draft plan should include:

 flood behaviour, including risk, prevailing hazard, changes occasioned by proposed future land developments arising from the results of the flood study and floodplain management study

- linkage of the floodplain management plan with the flood emergency plan
- · economic analysis of potential works and measures
- environmental factors, including enhancement and restoration of the river and floodplain environment
- social factors, including the needs of the local community and intangible flood costs
- local, regional and state planning needs, restrictions and opportunities.

The preparation of a draft floodplain management plan is probably the most important and most difficult task of the Committee.

3.3.4.2 Exhibition and public comment

Community consultation is essential in the formulation, acceptance and implementation of a floodplain management plan. Best practice principles require that local agencies actively involve representatives of the public, particularly owners of land in *defined flood areas*, in the preparation and review of the floodplain management plan.

Irrespective of any statutory requirements, the draft floodplain management plan should be exhibited and public comment sought and be taken into account before the plan is finalised.

3.3.4.3 Adoption and implementation

Once a floodplain management plan has been adopted by the local agency, the next phase is its implementation.

Statutory planning instruments are the most effective means of controlling the development of flood-prone land. Local agencies should foster as a matter of urgency the preparation or amendment of appropriate statutory planning instruments to give effect to proposed land use and development controls.

Not all provisions of a floodplain management plan can be implemented immediately. Certain components can be implemented relatively quickly, such as development and building controls, flood education and public awareness programs. Available funding will determine when certain options can commence (e.g. structural measures, voluntary property purchase). Consequently, a strategy needs to be developed to implement the various elements of the plan over time. The strategy should include the staging of components that depend on availability of funds and the adoption of interim measures.

If a local agency seeks State or Commonwealth Government financial assistance in the implementation of a floodplain management plan, it will be required to provide advice on the methods used to seek public comment, to take account of the submissions received, to formulate a balanced plan acceptable to the community, and the safeguards proposed to minimise any adverse environmental effects. The floodplain management study, if properly and thoroughly undertaken, should provide all the support necessary for the application of government funds.

3.3.4.4 Review of plan

The plan is not a static document and should be reviewed regularly, perhaps every five to ten years, or after a severe flood that gives rise to revision of the flood study results. Such reviews need to examine changes in:

- flood behaviour (perhaps a large flood has occurred since the plan was formulated, or an upstream dam has been constructed)
- roles and responsibilities of the various agencies concerned with floodplain management
- aspirations of the community regarding future growth and development.

3.4 The flood emergency system

Operation of the flood emergency system is the responsibility of emergency management agencies (see Appendix H) and is aimed at reducing the hazard during actual flood events. This is done by the development of a local flood emergency plan.

3.4.1 Flood hazard analyses

The first step in flood emergency planning is to carry out a hazard and *vulnerability* analysis of floodplain areas under consideration.

This requires information concerning the extent, depth, velocity, duration and rate of rise of floodwaters, as well as topographic information relating to loss of road access, the formation and/or submerging of "islands". The flood study generates all of this information. During the flood study, it is important that there is close liaison between the engineers undertaking the investigation and emergency services' staff, who may have specific requests of the flood study, such as estimates of the time available before key roads become untrafficable.

Once the hazard analysis is complete, the more hazardous areas of the floodplain will have been defined as will the population at risk. Note that the degree of hazard and the extent of hazardous areas will generally change with flood severity. In most Australian States and Territories,

emergency management agencies have recently adopted the PMF event as the basis for flood management planning.

3.4.2 Flood warning systems

Flood warning systems are being increasingly used in the implementation of floodplain management plans. Several points should be noted about such systems.

- To be effective, warnings need to be timely; that is, there
 needs to be sufficient time for emergency measures to be
 carried out, whether by individual landholders or by
 emergency agencies.
- Forecasts of peak flood levels are predictions of future flood behaviour. Such forecasts are based on a knowledge of progressive flood behaviour to date, either in terms of catchment rainfalls or upstream water levels. As such, forecast flood levels contain uncertainties; for example, additional rain falling in ungauged areas of the catchment is not "seen" by the forecasting system. Thus, forecast flood levels should be interpreted in terms of likely rather than absolute flood levels. Undue reliance on the accuracy of forecast flood levels can exacerbate damage if actual levels are higher than predicted.
- Flood warning by itself does not alleviate hazard and flood damage. Accompanying flood defence and evacuation arrangements are required (i.e. a comprehensive flood emergency plan).

3.4.3 Flood emergency plan

After completion of hazard analyses, emergency management agencies will prepare or amend the local flood emergency plan. This is a detailed document containing subplans that address among other things preparedness for, response to and recovery from flood emergencies (see Appendix H).

The primary aim of a flood emergency plan is to reduce hazard during an actual flood. Essential issues addressed in the plan are flood forecasting, flood warning, evacuation and initial recovery.

The flood emergency plan is complementary to the overall floodplain management plan. Again, close liaison is required between emergency management staff and other members of the Committee during the floodplain management study to ensure that proposed structural, land use planning, and development and building control measures do not unduly increase hazards or put unreasonable claims on emergency management agencies during an actual flood.

Local agencies generally have a significant role in flood emergency management with respect to flood warning, provision of labour and equipment, and the management of

the tasks that flooding requires to be met. These functions need to be worked out during the development of a flood emergency plan.

Typically, a flood emergency plan has several "trigger points" that result in activating and implementing of the plan as an actual flood develops. Close liaison is required between the Commonwealth Bureau of Meteorology (generally the provider of flood forecasts), the emergency management agency and the local agency to ensure that flood emergency measures occur smoothly and appropriately.

The flood emergency plan should also include activities to protect and reinstate essential infrastructure required during clean-up and recovery in the flood aftermath (e.g. sewerage, water supply, telephones).

Although there are some similarities with mainstream flooding, the destructive forces that accompany a major storm surge mean that the attendant risk to life and health and potential for structural damage can be expected to be substantially greater.

Uncertainties relating to storm surge are due to the inability to predict the route and speed of the accompanying cyclone with confidence. This has the following consequences:

- surge height cannot be predicted with any certainty
- areas likely to be affected cannot be clearly identified in advance.

Evacuation during a cyclone is nearly impossible and areas that conceivably may be at risk need to be evacuated well in advance. This can lead to much larger areas being evacuated than will be affected and false alarms which can lead to a loss of public confidence in the warning process.

The unpredictability and increased risk level suggest that the frequency for the defined event for development control purposes needs to be chosen carefully. Also, the planning and response phases of the emergency planning process need to be specifically tailored to address the higher risk and the uncertainties.

Best practice for flood emergency management needs to consider the following.

- Flood risk and flood hazard are assessed for a full range
 of flood events up to and including the PMF, to
 recognise that risk may change dramatically with
 increasing flood severity, and to formulate a "robust"
 flood management plan to deal with this changing risk.
- Hazard analysis of the floodplain is undertaken to identify areas of undue risk with respect to evacuation (e.g. "islands" that develop as floodwaters rise, caravan parks).

- Recognition that successful flood emergency management requires an integrated and dedicated effort by the community at risk, the local agency, the emergency services agency, other State agencies as appropriate, together with the Bureau of Meteorology and EMA.
- Local agencies, together with the emergency
 management agency, implement long-term, on-going
 education programs to raise the level of flood awareness
 in the community at risk. The cost of education
 programs need to be recognised as a "maintenance cost"
 of effective flood emergency management and be treated
 as such with respect to budgets.

More detailed best practice guidelines are available for flood warning (Emergency Management Australia 1995, 1999c), flood preparedness (Emergency Management Australia 1999b) and flood response (Emergency Management Australia 1999d).

3.4.4 Acceptance of plan

After a flood emergency plan has been developed by emergency management staff, the plan needs to be formally accepted and approved by the emergency management administration of the State or Territory in accordance with the relevant legislation regulation or order.

3.4.5 Implementation of plan

Public awareness and public education are important elements of a flood emergency plan. It is important that the community understands the flood emergency plan and its provisions.

The local emergency management representative should liaise with the local agency to instigate appropriate awareness and education programs, which need to be seen as an on-going, long-term "maintenance cost" of a flood emergency plan. Awareness and education needs to be fostered regularly if the community element of flood emergency management is to be effective.

In addition, the local emergency management representative should ensure that the local agency is aware of its role under the flood emergency plan and that all necessary steps have been taken to ensure easy implementation when required.

3.5 Defined flood events

3.5.1 Selection

This document recognises the need to adopt a risk management approach to the selection of DFEs, that is, the need to investigate a range of flood events up to the PMF and to possibly select different DFEs for different planning

purposes (e.g. residential, industrial, flood management planning).

Selection of DFEs for a flood-prone area is an important and fundamental decision that forms a basic foundation in the preparing a floodplain management plan. The adopted DFEs determine the area of land subject to flood related development and building controls (defined flood areas) and to some extent the nature of these controls.

Generally, the 1% AEP flood event has been adopted as the appropriate DFE for most Australian States and Territories. Appendix K describes factors that influence selection of DFEs according to best practice guidelines.

A DFE also defines the *defined flood levels* on which planning and building controls are based. The defined flood area can be divided into a *defined floodway* and a *defined flood fringe*.

Figure 3.2 illustrates these concepts. Because of the different levels of flood risk and flood hazard in these areas, different types of management measures are most appropriate to each area:

- · in defined floodway areas—land use planning controls
- in defined flood fringe areas—development and building controls and flood emergency measures
- in flood-prone land outside the defined flood area flood emergency measures (residual risk management).

Once the *probability(s)* of the DFEs have been "finalised" (a complex process involving economic appraisal and interdisciplinary compromise, see Appendix K) the DFEs will not change during the life of the adopted floodplain management plan. They form the basis for on-going planning and development decisions until the plan is revised. The DFEs may be changed in this review process to reflect additional flood data, changes in future developments or changes in flood behaviour (e.g. through the construction of an upstream dam).

3.5.2 Probable maximum flood

The consequences of the PMF event need to be assessed as part of the process of determining DFEs. The difference in flood levels and damages between selected DFEs and the PMF event will alert the local agency and emergency management agencies to the potential consequences of severe floods, especially with regard to providing emergency services.

Unless the PMF is selected as the DFE, by definition, a larger flood will always occur. The impact of a larger event needs to be assessed and flood emergency management plans put in place to prepare for, respond to and recover from the

effects of such floods. PMF events and their estimation are described in Appendix N.

3.6 Land use and hazard

The adopted land use for flood-prone land largely defines the resulting flood hazard. Careful matching of land use to flood hazard both maximises the benefits of using the floodplain and minimises the risks and consequences of flooding.

Table 3.1 provides general guidelines on the appropriateness of various land uses to different degrees of flood hazard.

In general terms, the defined floodway will be an area of extreme to high hazard and the defined flood fringe will be an area of high to medium hazard. The remainder of flood-prone land will be of medium to low hazard and the flood-free zone of low hazard. The general nature of Table 3.1 is stressed. Appropriately designed and constructed developments may be able to safely sustain a higher degree of hazard. Conversely, developments that are inappropriately designed and constructed may only be able to safely sustain a lower degree of hazard.

3.6.1 Open space and recreation

The multiple use of the more hazardous areas of a site (i.e. areas where floodwaters flow fastest and deepest) for open space and recreation is entirely appropriate and strongly recommended.

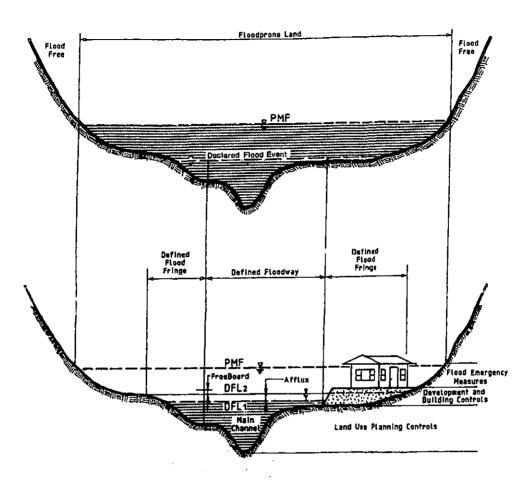
Recreational facilities such as school grounds, indoor sports centres and halls, may be an appropriate use within high flood risk areas (provided the sports centres and halls are floodproofed and not to be used as assembly or evacuation centres in a flood emergency).

Car parks and hard courts are appropriately sited in the higher flood risk areas of the floodplain.

3.6.2 Residential

Residential use is appropriate for areas of low hazard. If the development is carefully planned, designed and constructed to provide safe evacuation and not impede floodwaters to an unacceptable degree, and if residential buildings are appropriately designed and constructed to limit likely damage to acceptable levels, residential use may also be appropriate for medium hazard areas.

The cost of repair, reinstatement and clean-up after the flood needs to be assessed for all proposed residential developments on flood-prone land. In addition, careful attention to street layout, site planning and house design is important to minimise the risk to human safety and property damage. Issues for special consideration include:



DFL1- Level of Declared Flood Event Before Filling of Flood Fringe
DFL2- Level of Declared Flood Event After Filling of Flood Fringe
PMF Probable Maximum Flood

Figure 3.2 Flood zones across the floodplain

- housing for the aged and those with impaired mobility—these are best sited in flood-free areas higher up the floodplain because of the additional time involved and dangers of slower evacuation
- obstruction to flow—residential development should not obstruct flood flow and thereby increase flood levels, flood velocities and the risk to life, health and property unacceptably; it is desirable that housing clusters and terraces be kept as far as possible from the floodway and on higher ground; lower areas close to the river should be used for common open space
- housing density—this is important for residential
 developments in flood-prone areas (i.e. the greater the
 population, the greater the number of people to be
 evacuated, and the greater the potential property damage
 and social disruption caused by a flood); both local and
 regional evacuation routes must be able to adequately

- handle the proposed increase in the population at risk and these issues need to be discussed with the emergency management agency in the light of the local flood management plan:
- (i) if the present population at risk already overloads regional evacuation routes, additional residential development may not be appropriate or the proposed housing density may need to be curtailed
- (ii) where a risk of significant damage remains (e.g. due to deep inundation), dwellings should be designed to provide non-habitable rooms or car parking downstairs, and so reduce the risk of habitable rooms being flooded.

3.6.3 Commercial and industrial

The siting of commercial buildings such as shops and offices in flood-prone areas should be considered in relation to the

Table 3.1 Land uses appropriate to various degrees of flood hazard

		· - · · · ·							
	Degree of hazard								
Land use	Low	Medium	High	Extreme					
Open space/recreation	/		/	1					
Residential	✓	✓							
Commercial/industrial	✓	✓	√A						
Public institutions	/	/							
Hospitals	✓								
Homes for the elderly	✓								
Caravan parks	1	√							
Museums/libraries	✓								
Clubs	1	1	√ 8	√ 8					
Schools	/	1							
Police	✓								
Council	/	/							
elephone exchanges	1								
mergency services	/								

Acommercial/industrial operations can treat the cost of flood damage as a "business cost" and include it in their budgets.

^BClub houses may be appropriate to high hazard areas or even extreme hazard areas, provided they are appropriately floodproofed.

risk of flooding and the potential damage to goods and property. A site may have commercial or other advantages that justify its location (e.g. the siting of a shopping and community centre on the banks of a lake or river may have significant commercial and social benefits that outweigh the risk of flooding). Multi-issue considerations such as these are best addressed via the floodplain management plan.

Industries that involve the processing or storage of dangerous goods and substances should be sited away from flood-prone areas, as they may pollute waterways in the event of flood (e.g. petrochemical plants, waste disposal industries, paint, herbicide and pesticide manufacturers, quarantine stations and biochemical research establishments).

3.6.4 Public institutions

Hospitals, prisons and special institutions such as care centres for aged or disabled people should be sited away from high risk areas, where there would be difficulty evacuating occupants in emergencies. Ideally, these institutions would be sited in flood-free areas.

Consideration should be given to the use of public institutions as an evacuation gathering point on flood-free land (e.g. a community building). Again, this should be discussed with the emergency management agency.

3.6.5 Museums and libraries

In general, valuable items of cultural or historical significance should not be stored in flood-prone buildings.

Libraries and museums with collections of irreplaceable relics or documents should be located in flood-free areas.

3.6.6 Schools

Schools and other educational campuses often have large outdoor spaces and playing fields that can be located in drainage corridors subject to occasional flooding. This can provide an efficient multiple use of the land.

School buildings, especially those containing valuable equipment or records should be located in lowest risk positions, while hard courts, play areas and car parks can be located in higher risk areas.

Easy vehicle and pedestrian evacuation in the event of flooding is an essential consideration in school campus siting and design.

Schools are sometimes used as emergency refuge centres. If this is the case, the school desirably should be sited in a flood-free location. If it is intended to use a school on flood-prone land as a refuge, careful consideration needs to be given to planning for the loss of the "refuge" during a higher than expected flood event. Schools used as refuges need to be easily accessible and integrated into the local flood management plan. The need for new schools to serve as refuges should be discussed with the emergency management agency.

3.6.7 Essential services

Some services, such as fire, police, ambulance and hospitals, are essential and need to function continuously during

emergency response operations. A flood that causes these services to fail or become unreliable can result in chaos.

Operation centres for emergency services should desirably be located in flood-free areas, but certainly in low risk areas. In some countries, such as the United States of America, these services are located above the 0.2% AEP flood level.

3.7 Development and building controls

In implementing a floodplain management plan, local agencies often have full control over development and building controls in the flood-prone area. Best practice requires the timely introduction of appropriate and effective development and building controls to implement floodplain management plan requirements.

3.7.1 Controls incorporated in a floodplain management plan

General building and development considerations to be addressed and incorporated in the floodplain management plan include:

- risk to life, health and property at proposed developments
- · availability of evacuation access during flood
- effect of future subdivision or future land clearing on flood behaviour
- whether filling or other changes to ground levels are likely to interfere with flood behaviour
- whether consultation with, or the concurrence of, other authorities is required
- cumulative effects of, for example, infill and development
- · appropriate freeboard for floor levels.

3.7.2 Controls incorporated in individual building and development applications

Building and development issues to be considered in assessing individual building and development applications include:

- whether the floor heights in the proposed development are above the defined flood level
- suitability of proposed building materials
- whether minor structures, such as fences, are likely to affect or be affected by flood flows
- compatibility of any proposed flood control works within the overall floodplain management plan

 limiting runoff from the development site to predevelopment or "natural" levels.

It is generally unnecessary to impose conditions on minor developments and minor additions to existing buildings. However, the potential for damage may need to be considered and specific cases should be treated on their individual merits.

If building extensions are substantial and could lead to a significant increase in likely flood damage, an increase in the risk to occupants or obstruction to flood flow, they should be subject to more stringent conditions.

Developments that create islands in the floodplain should be viewed circumspectly. Such developments may create a false sense of security in minor floods, but will inevitably increase the demand on emergency services and increase the risk to residents when larger floods are experienced. Specific development and building controls need to be developed by the local agency if this type of development is to be pursued, especially if the island could be submerged in severe floods.

3.8 Flood maps

Flood maps that show the extent, depth, velocity and hazard of flooding for nominated flood events are an important tool. However, flood maps are necessarily inexact. Flood maps can be derived by a variety of techniques, for example aerial photography of actual floods, the use of hydraulic models of the floodplain to predict flood levels and the extent of flooding. Often flood maps are prepared on the basis of contours derived from aerial photography. The underlying inaccuracies in the topographic data used to derive flood maps need to be recognised and evaluated, as these inaccuracies affect the estimated boundaries of the area of inundated land. They therefore assist in developing floodplain management plans.

If flood maps are to become public documents, considerable care needs to be taken with the depiction and explanation of flooding features so that the map is easily understood by the local community and is not subject to misleading interpretation. To this end, flooding features such as the defined area of flooding, defined floodway, defined flood fringe and flood-prone land should not be depicted with unjustifiable accuracy (i.e. with "hard edges"). Rather, the boundary of flooding features should reflect the underlying uncertainty in analysis.

The land use planning controls that flow from flood maps should be incorporated into statutory planning instruments in a timely and expeditious manner.

Geographical Information Systems (GIS) should be used to prepare all flood maps, whether for internal use by a floodplain management agency or for public use. GIS

facilitates amendments to maps and the inclusion of subsidiary data that could be required in flood management (e.g. the location and floor levels of flood-prone buildings.

3.9 Freeboard

Freeboard acts as a "factor of safety" to ensure that full protection is provided against the DFE.

Errors in defined flood levels can arise from sources that include, for example, uncertainties in the estimation of flood discharges, in the estimation of flood levels themselves, through wave action and by the unforeseen variation in local flood behaviour across the floodplain.

A freeboard of 0.3 m to 0.5 m for minimum floor levels is commonly adopted by many local agencies across Australia. In addition, freeboard ensures that levees can provide the nominated level of protection. In constructing levees, it is essential that freeboard be carried through to "high spots" at the ends of the levee. Failure to do so may result in the ends of levees being outflanked during floods.

Freeboard should not be relied on to provide protection against floods larger than the DFE. Any added protection is a bonus, not a guarantee.

3.10 Levees

The height to which a levee is constructed is mainly dictated by economics, topographic limitations of the site and the height to which floods can rise relative to ground levels in the area. Unless levees are designed to exclude the PMF, considerable care must be taken to inform residents that

levees will be overtopped at some time and to clearly explain the purpose and need for a flood emergency plan.

Even when designed for the PMF, care needs to be taken in allowing land development and use in the area protected by a levee to occur on the basis of a zero residual risk.

Overtopping or failure of levees can result in catastrophic damage and undue hazard. A failsafe maintenance program for such levees is essential.

If a levee is not designed for the PMF, best management practice requires that the levee incorporates spillways to facilitate controlled overtopping and flooding of the protected area. Knowledge of this behaviour allows emergency management agencies to develop more certain flood emergency plans in case of overtopping.

3.11 Education, training and research

The floodplain management process described in this chapter represents a significant change from past practice. To foster the recommended process requires an on-going commitment to education and training of floodplain and flood managers by the three levels of government and by professional bodies, such as the Institution of Engineers, Australia.

The exchange of information, experiences, difficulties, problems and solutions between the States and Territories is essential to better floodplain management. This can be achieved by workshops and conferences, perhaps on a biannual basis. The Floodplain Management Working Group of SCARM has a central role in fostering education, training and research.



Chapter 4 Roles and responsibilities

Local agencies, together with State, Territory and Commonwealth Government agencies, property developers, flood-affected individuals and other groups, are all stakeholders in the responsible management of flood-prone land. Each State and Territory has its own specific jurisdictions and will need to determine its lead agencies. The roles and responsibilities of the parties given in Chapter 3 are described below.

4.1 Local agencies

Local agencies are essential to better management of Australia's floodplains (see Chapter 1.7). In most urban areas, the most appropriate local agency to undertake floodplain management is a local council. In rural areas, the most appropriate local agency may be a local council, a Catchment Management Board or a River Trust.

The roles of the local agency are to:

- form a Floodplain Management Advisory Committee (the Committee; see Chapter 3)
- prepare a floodplain management plan (see Chapter 3 and Appendix G)
- incorporate the planning provisions of floodplain management plans into statutory planning instruments or provide them with legal backing via incorporation into local by-laws (see Chapter 3)
- assist emergency services agencies at various levels in flood emergency plans (see Chapter 3)
- provide labour, equipment and facilities to assist in flood warning, evacuation and flood recovery as well as protect or readily reinstate public infrastructure under its control (see Appendix G)
- create a formal asset management program to manage and maintain floodplain management measures—that is, maintain not only structural mitigation works but also planning measures and flood management plans, measures in which public involvement, education and cooperation are essential
- undertake post-flood appraisal—flood damage and other data need to be collected expeditiously after a flood and flood emergency operations should be reviewed and modified where necessary.

4.2 State and Territory Governments

The principal floodplain management role of State and Territory Governments has been stated as follows (Department of Primary Industry and Energy 1992, Floodplain Management in Australia, 2 vols, Australian Water Resources Council, Water Management Series No. 21, Commonwealth of Australia copyright reproduced by permission):

to develop appropriate standards and strategic approaches for floodplain management and to ensure that they are applied in a coordinated and integrated fashion across the State. This role encompasses the provision of expert technical support via a principal water resources authority(s), of planning advice through a State Planning Agency and of effective counter-disaster and welfare services

4.2.1 Water resources agencies

All States and Territories have a water resources agency of some type that must be central in providing of floodplain management advice and guidance to local agencies. Usually these water resources agencies have been providing advice on flooding and flood behaviour for some time. They represent a repository of technical expertise and detailed local knowledge of flooding behaviour.

Because of this expertise and State and Territory-wide knowledge, water resources agencies have a **lead role** in fostering and assisting with the development and implementation of floodplain management plans.

With respect to the best practice guidelines of this document, the water resources agency could undertake the following activities:

- initiate and develop policy and regulations regarding floodplain management and develop and promote the use of best practice in this process
- encourage and assist local agencies with the formation of the Committee
- assist or advise local agencies, generally via the Committee, on the following matters:
 - (i) conduct of flood studies that investigate a full range of flood events up to the PMF
 - (ii) definition of the extent of flood-prone land
 - (iii) selection of DFEs for planning and design purposes on the floodplain
 - (iv) location and extent of defined floodway and defined flood fringe areas

- definition of the variation of flood hazard across the floodplain
- (vi) identification of the effect of various land uses and management measures on flood behaviour and hazard
- (vii) identification of the appropriate land uses within defined areas of the floodplain
- (viii) preparation and, when necessary, revision of floodplain management plans
- assist and advise other State agencies, generally via the Committee, on the following matters:
 - appropriate land uses within designated areas of the floodplain (planning agency)
 - (ii) flood behaviour and the variation of flood hazard across the floodplain (emergency service agency)
 - (iii) water management and preservation of flooddependent sensitive areas of the floodplain (natural resources and environmental protection agencies)
 - (iv) effect on flood behaviour of existing or proposed infrastructure (e.g. road and railway embankments, road and rail transport agencies)
 - (v) natural disaster relief needs with respect to the restitution of structural flood mitigation measures after an actual flood (State Treasury).
- Assist and advise Commonwealth agencies on the following matters:
 - (i) flood forecasting and the preparation of flood warnings (Commonwealth Bureau of Meteorology)
 - (ii) natural disaster and relief needs of the floodaffected community (Department of Finance).

4.2.2 Planning agencies

All States and Territories have a planning agency responsible for the preparation of regional plans, special issue plans and the broad administration of the local planning system. Planning agencies have several roles in the floodplain management process that could include:

- ensuring that local agencies take into account the provisions of regional plans and special issue plans (e.g. wetlands) when drawing up a floodplain management plan
- increasing awareness of flooding matters at the local agency and community level (possibly by developing model planning provisions for flood-prone areas)
- advising local agencies on land use planning matters for flood-prone land

acting as an arbiter for planning appeals.

4.2.3 Emergency services agencies

With respect to flood emergency management, State and Territory emergency services agencies have a responsibility to facilitate and assist local agencies to prepare plans for the management of emergencies, including flood events (i.e. flood emergency plans).

Effective flood emergency planning requires close cooperation between the emergency management agency, the local agency and the State water resources agency, as does effective floodplain management planning. Accordingly, local agencies should seek input from their relevant State or Territory emergency services agency when considering both the broad-scale plan and developments within the plan.

4.2.4 Natural resource and environmental protection agencies

Each State and Territory generally has several natural resource management agencies and an environmental protection agency with responsibilities for the management and conservation of the soil, mineral, water and vegetation resources of the State or Territory, including resources on floodplains. Generally, these agencies have responsibilities for protecting fauna and protecting and enhancing riverine corridor, river bank, wetland and floodplain habitats and water quality.

Natural Resource and Environmental Protection Agencies should advise local agencies, via the Committee, of any State or Territory-wide regional or local issues with regard to the conservation, enhancement and re-establishment of floodplain habitat or other environmental concerns.

4.2.5 Road and rail transport agencles

The construction of road and railway systems across floodplains can impede the flow of floodwaters and increase flood levels and flood hazard. State road and rail transport agencies responsible for these works have an obligation to liaise with local agencies and the water resources agency to ensure that proposed infrastructure does not have an unacceptably detrimental effect on flood behaviour and to foster design practices and strategies that protect and readily reinstate infrastructure after flooding.

Typically, the standard of flood protection adopted by both rail and road transport agencies has changed over time. For example, in the early days, rail infrastructure may have been built to provide protection up to the 2.5% AEP flood event, whereas these days protection to the 1% AEP flood event is provided. When significant upgrades of road and railway infrastructure are proposed, road and rail transport agencies should be aware of the opportunities to rationalise the level

of flood protection and increase the capacity of bridges and culverts so as to reduce the impeding effects of embankments.

4.2.6 Other agencies

Other State and Territory agencies can have a significant influence on flood behaviour and flood hazard. Often public housing agencies are responsible for the residential development of flood-prone land. Rural water authorities are responsible for the construction of irrigation channels (and their associated embankments) across floodplains, which can affect flood behaviour. All such activities can have a significant effect and must be assessed to minimise the effects on flood levels.

4.3 The Commonwealth Government

The Commonwealth Government has a general responsibility for the economic and social well-being of the nation. To this end, the Commonwealth Government provides the following services.

- Encourages the development of effective long-term strategies for the sustainable management of floodplains.
- Provides flood forecasting services by the Bureau of Meteorology.
- Supports the development of State and Territory
 emergency management capabilities through the
 activities of EMA. These activities include education and
 training, the development and distribution of best
 practice guidelines for emergency purposes, together with
 the documentation and funding of public awareness
 programs under the State Support Package. On request
 and when State or Territory resources are inappropriate,
 exhausted or unavailable, EMA coordinates the provision
 of Commonwealth assistance to the States in the event of
 severe natural, technological or civil defence emergencies.
- Provides financial assistance under the Natural Disaster Relief Arrangement (NDRA), which is administered by the Department of Finance together with State and Territory Treasury Departments when flood damage and disruption is greater than a preset amount.

Commonwealth financial assistance has been made available to undertake flood studies and floodplain management studies, to develop and implement floodplain management plans, and to construct structural mitigation works. This assistance is aimed at reducing the economic and social costs of flooding by encouraging local and regional acceptance of responsibilities for floodplain management, within the context of achieving broad natural resource management objectives.

4.4 Obligations of government agencies

Government agencies, be they local, State or Commonwealth, should be bound by the best practice guidelines of this document.

Government agencies, whether State or Commonwealth, undertaking works or developments on flood-prone land are expected to comply with the provisions of floodplain management plans. When planning such works or developments, the agency needs to account for the nature and extent of the flood problem, the effect of the development on flood behaviour, and the effect of flooding on likely hazard levels at the development site.

If the proposed development is or could form part of infrastructure required for flood emergency management (e.g. a police station, hospital, telephone exchange, school), relocating the development at a flood-free site (if possible) should be considered, or ensuring that the proposed development can meet its intended emergency use when a flood eventuates.

Government agencies should seek the advice of the local agency as well as the water resources agency with respect to flood behaviour, the emergency management agency with respect to flood emergency procedures, the planning agency in relation to planning considerations and the natural resource and environmental protection agencies in relation to environmental matters.

4.5 Developers

4.5.1 Conforming developments

Once a floodplain management plan has been prepared, most if not all of the provisions and conditions relating to suitable or *conforming developments* on the floodplain will be specified in the plan. This will assist developers in their preparation of applications for such developments.

Before preparing and submitting applications, developers are advised to liaise with the local agency regarding the provisions and conditions of conforming developments.

4.5.2 Non-conforming developments

A floodplain management plan does not necessarily exclude non-conforming developments. However, it serves to alert both local agencies and the developer that non-conforming developments are not appropriate to the flood risk and flood hazard at the proposed site.

Should a developer wish to propose a non-conforming development, detailed technical studies will need to be undertaken at the developer's expense to justify the proposal. These studies include:

- a flood study that addresses the following for a range of flood events up to the PMF
 - (i) effect of floods on the proposed development
 - (ii) effect of the development on existing flood behaviour and flood hazard at other locations
 - (iii) hazard levels at the proposed development site
 - (iv) any additional demands on emergency services associated with the development
- an economic study to demonstrate that the proposed development is equitable and is economically and socially justified on a local community and regional basis
- an environmental study to identify and address any adverse environmental effects
- a flood management study to demonstrate that the development does not exacerbate and ideally enhances current flood management arrangements and will not place people at undue risk.

Developers are strongly advised to liaise with the local agency, the water resources agency, the planning agency and the emergency services agency regarding the scope and detail of issues to be addressed in the supporting studies. If there are significant adverse effects, the proposal must specify hydraulic compensatory measures that reduce the impacts to acceptable levels. Compensatory measures may be subject to approval by consent authorities.

4.5.3 Financial contributions

Where required by the local agency, developers will be expected to contribute to the costs of floodplain management measures arising from the effects of their development.

4.6 The flood-prone community

Flood-prone individuals have a basic responsibility with respect to the management of residual flood risk.

Residual flood risk can best be addressed through flood emergency plans. If these plans are to be successful, the population at risk must know what to do and how to do it effectively when flood warnings are issued. Local agencies and emergency service agencies are important in raising flood awareness through public education campaigns.

In areas where structural flood mitigation works have been built, individuals should be aware that, in general, the works do not eliminate flood hazard, and that problems and danger can arise when floods greater than the DFE occur. When levees are overtopped, water levels within the protected area can rise quickly and evacuation routes may be cut, creating hazardous conditions.

All of these issues should be addressed in the flood management plan for the area. As part of these plans, flood-prone individuals should be made aware of the flood risk to which they are exposed, the functioning of the flood warning and evacuation systems, and appropriate actions to be taken when warnings are issued. This information should be freely available from the local agency. The general community—both flood-prone and flood-free—should be encouraged to inform themselves of flooding matters.

Flood-prone individuals have a responsibility to both inform themselves and keep up-to-date with appropriate action to take in the event of a flood.

4.7 Responsibility matrix

Figure 4.1 summarises the responsibilities of the various stakeholders in relation to different floodplain management activities. Four additional stakeholders (Other Stakeholders) have been identified as follows.

- The SCARM Steering Committee—the intergovernmental Floodplain Management Working Group that reports to SCARM, and was responsible for the production of this document. The SCARM Steering Committee has an on-going role to foster the acceptance and use of this document and its revision as necessary.
- The media distribute flood warnings and promote floodplain management and flood awareness.
- Professional bodies, such as the Institution of Engineers, Australia, EMA, the Royal Australian Planning Institute and the Australian Local Government Association educate and train floodplain managers and define and encourage research into better floodplain management.
- The Insurance Industry—provides flood insurance, even though insurance is available only on a very limited basis in most States and Territories (generally only to commercial and industrial establishments and to cover flood damage to motor vehicles). However, provision of residential cover is currently (1999) under review within the insurance industry.

Figure 4.1 emphasises the pivotal roles of local agencies and the *lead agency* roles of water resource and emergency management agencies.



COMMUNITY COMM	:	0	O Lead Agency • Responsibility / Contribution	/ Contribution	
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	4. FLOODPLAIN MANAGEMENT PLAN - Draf Plan	0			
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Figure 4.1 Stakeholder responsibility matrix

Chapter 5 Legislation, administration and liability

In most States and Territories, the responsibility for different aspects of floodplain management is fragmented across several pieces of legislation [e.g. a Water Resources Act, Planning Act(s), Local Agency Act(s), an Emergency Management Act(s), Natural Resources Management Act(s)]. Moreover, these different pieces of legislation are implemented by several agencies. This division of responsibility arises from the importance of floodplains and their associated waterways and wetlands to different aspects of our everyday needs and concerns. The scattering of responsibilities across different pieces of legislation can create substantial impediments to better floodplain management, not the least being difficulties in achieving an integrated approach.

Ideally, all legislation that deals with floodplain management should be formulated on a coherent and integrated basis. The legislative basis of floodplain management in the various States and Territories does not need immediate overhaul. Rather, as relevant legislation is reviewed, legislative and administrative needs of floodplain management should be taken into account.

5.1 State and Territory legislative requirements

Shortcomings have been identified in existing legislation across Australia. The legislative basis of floodplain management could be improved by the following principles.

- A single piece of coherent and integrated State or Territory legislation—single issue State policies could then be enabled and embodied under this single Act. In most States and Territories, responsibilities, actions and liabilities for floodplain management are scattered across several Acts. The existing State and Territory legislation is often cumbersome and responsibilities are unclear.
- Clearly defined responsibilities and liabilities of local agencies and the various State agencies involved in floodplain management.
- Clearly identified lead agencies with respect to key aspects of floodplain management (e.g. land-use planning, flood emergency management, flood warning, recovery operations).
- Clearly identified appropriate consent authorities and consent mechanisms for dealing with floodplain planning matters.

- Prompt implementation of floodplain management measures once a floodplain management plan has been finalised and adopted—especially regarding land use planning provisions, which need to be speedily incorporated into statutory planning instruments.
- Clearly identified appropriate mechanisms to ensure the coordination of land use planning and floodplain management measures on a catchment-wide basis.
- In emergency management legislation, clearly defined roles and responsibilities regarding flood emergency management of the peak State emergency management committee, the emergency management agency itself, and other State agencies such as police forces and fire brigades, and local agencies.

5.2 Floodplain management policy

Each State and Territory Government is encouraged to develop and promote a formal policy on floodplain management.

State and Territory policies indicate to the community the importance of floodplain management, unify the State or Territories' approach to floodplain management and describe how the activities of various State and Territory agencies and local agencies are to be integrated.

5.3 Administrative requirements

With respect to the administration of floodplain management programs, there is a clear need to:

- assess risk exposure across the floodplains of each State and Territory
- assess funding priorities within each State and Territory
- develop and use performance indicators to measure the effectiveness of State, Territory and Commonwealth funding programs.

Funding priorities can only be assessed if the population at risk and potential hazard are known for urban and rural areas across a State or Territory. Appropriate performance indicators that measure the success of floodplain management programs include the reduction in potential flood hazard associated with implementation of floodplain management measures, the cost-effectiveness of these measures and the abatement of adverse social and environmental effects of flooding.

Each State and Territory can address these issues by developing a floodplain management data collection program. States and Territories should adopt a common data collection program so that data are consistent and can be readily compared among States (see Appendix N).

5.4 Funding

State and Territory Governments are encouraged to foster floodplain management by providing financial assistance to local agencies. In general, State and Territory financial assistance is not available for works made necessary by new development. In these circumstances, the cost of works and any supporting studies (e.g. flood studies) should be met by the developer.

Local agencies typically meet development and implementation costs of the floodplain management plans from general rates. Levying "special rates" could be considered on properties beneficially affected by flood mitigation works.

5.5 Legal liability

The exposure of public authorities to claims for compensation by persons who suffer injury or loss due to flooding is governed by the common law and legislation. While the common law principles throughout Australia are shared and discussed in the following paragraphs, legislation has changed significantly the liability to claims. This legislation varies from State to State (or Territory) and this legislation is not discussed in this document. Contact the relevant legal authorities in each State or Territory if further information is needed.

Where common law still applies in the particular circumstances, the following can be said.

- A person may be liable who causes personal injury or damage to the property of another person in the contexts of nuisance, trespass or negligence. Whereas most attention tends to be given to the potential liability of parties for negligence, the risk of liability in trespass and nuisance must not be overlooked. Nuisance is an unreasonable interference with the use and enjoyment of land. Where the unlawful interference is direct, then the interference may constitute trespass.
- Negligence, however, arises when a person causes injury or loss by conduct (or, in some instances, failure to act)

in breach of duty of care. A duty of care exists when there is a relationship of care between the parties. A relationship of care exists when the parties are in "proximity" to each other. Generally, this will occur when it is reasonably foreseeable that the conduct of a party might cause the injury or loss to the other party. (This includes where it is foreseeable that a person might reasonably rely on another person.)

• Having established a duty of care, duty will be breached when it is found that the level of care shown by one party towards the other was not up to the standard of care that a reasonable person in the circumstances ought to have shown. If the person has a particular expertise (e.g. if the person is a technical expert) then the standard of care that person must show is the standard that a reasonable technical expert in the circumstances ought to have shown.

Where there has been a breach of the duty of care, there will be a liability when injury or damage is suffered by the other person as a consequence.

Accordingly, a person who is involved in floodplain management will be liable to a person who suffers loss or injury generally when it is foreseeable that a failure to meet the reasonable standard of care has caused the injury or loss. This applies regardless of whether the person who causes the loss is a technical expert, public authority, property owner or other.

Reasonable conduct must reflect the level of danger that exists. If the risk is of serious injury then the care to be taken must reflect this danger. Similarly, issues of frequency and imminence will also affect reasonableness of action/inaction. It is also necessary to take into account risks that might seem remote provided they are not fanciful or far-fetched.

The position of public authorities is different from that which binds the ordinary person or company in that public authorities are not under a duty of care in relation to decisions that involve or are dictated by financial, economic, social or political constraints (i.e. policy decisions). It is possible for a local authority to determine the standard of safety that it will require of itself or others in relation to floodplain activities as matters of policy.

Local authorities may have a discretion whether to become involved in an area of activity. Provided the exercise of discretion was without negligence a decision not to engage in a particular activity will not create a liability.

Appendix A Floodplain Management Working Group Terms of Reference

With direction from and advice to the Subcommittee on Water Resources:

- facilitate the development of national flood risk and management policies and guidelines aimed at minimising the vulnerability of existing and future developments to flooding
- recommend procedures to evaluate implementation of such policies and guidelines
- recommend for SCARM/ARMCANZ approval national standards for recording and comparing the impacts of flood damage
- coordinate a national performance monitoring and benchmarking system incorporating a flood damage (potential and actual) database and the level of flood risk exposure along with a mix of flood mitigation measures adopted on State and regional basis. This will comprise three components:
 - establishing and monitoring the extent of the problem
 - (ii) evaluating the relative effectiveness of the different measures (theoretical and experience based)
 - (iii) monitoring implementation of the measures, including ensuring the right mix is implemented and that they are coordinated and effective
- recommend for SCARM/ARMCANZ approval national research and development in floodplain management
- provide a national focal point for flood risk management best practice
- identify opportunities for the effective integration of floodplain management into government programs in the context of any National Disaster Mitigation Strategy (NDMS) that may be developed under the auspices of the NDMS Committee.

Appendix B Floodplain Management Measures

This Appendix provides general background information on the various categories of floodplain management measures and on individual measures themselves, including their advantages and potential disadvantages.

For convenience, the various measures have been described in isolation. However, a fundamental principle of good floodplain management is that management measures should not be considered in isolation. Rather, they need to be considered collectively on a risk management basis from within the all-embracing framework of a floodplain management plan that allows their interactions, suitability and effectiveness, and their social, ecological and economic effects to be assessed on a community-wide basis.

B.1 Land use controls

Land use controls, which include, *inter alia*, zoning controls and the voluntary purchase of properties located in unduly hazardous areas of the floodplain, are respectively aimed at shepherding inappropriate future development away from high risk areas of the floodplain and removing existing high hazard developments from the floodplain.

Appropriate land use controls are essential if the rate of growth of future flood damage is to be limited.

Planning measures will usually result in some community groups or areas of the floodplain being advantaged, while other groups or areas are disadvantaged. Planning measures need to be formulated and resolved within the context of an overall floodplain management plan so that contentious issues can be addressed objectively and as equitably as possible.

B.1.1 Zoning

The division of flood-prone land into appropriate land uses is an effective and sustainable means of limiting flood damage to future developments.

Local agencies should select appropriate zones and related development and building provisions when flood-prone land is being rezoned. Any flood-related zonings should be incorporated in Town Planning Schemes (and other planning instruments) once the floodplain management plan has been finalised and adopted.

Zones over flood-prone land should be based on an objective assessment of social, economic and ecological

issues, as well as flood risk. Examples of objective assessments include:

- · the objectives of the floodplain management plan
- · hazard rating
- potential for future development to adversely affect flood behaviour at existing developments, particularly the cumulative effects of future development
- whether adequate evacuation routes are available during floods
- whether to exclude certain activities because of additional or special risk to users (e.g. accommodation for aged people, hospitals)
- existing planning controls.

B.1.2 Voluntary purchase

In certain high hazard areas of the floodplain it may be impractical or uneconomic to mitigate flood hazard to existing properties at risk.

Under those circumstances it may be appropriate to cease occupation of such properties in order to free both residents and potential rescuers from the hazard of future floods. Properties can be bought and buildings removed or demolished as part of a floodplain management plan. Property should be purchased at an equitable price and only when voluntarily offered. Such areas should be rezoned to a flood-compatible use, such as recreation or parkland.

B.2 Structural measures

Common structural measures used to mitigate flooding include:

- levees
- bypass floodways
- channel improvements
- detention basins
- dams.

B.2.1 Levees

Levees are generally the cheapest way to protect existing development in flood-prone areas. The height or crest level of a levee is determined by factors that include economics

(including the nature of development requiring protection), physical limitations of the site and the height to which floods can rise relative to the ground levels in the area (important for safety).

A levee may used only rarely to achieve its design requirements. If it fails at that time because of poor design, improper construction or lack of maintenance, the money spent on its construction largely has wasted.

Even if design, construction and maintenance have been exemplary, all levees will ultimately be overtopped unless designed for the PMF event. Even if designed for PMF events, levees can still fail through lack of maintenance, inadequate construction or unforeseen circumstances. This emphasises the importance of flood emergency plans that detail the defence and evacuation of areas protected by levees.

When levees are used for flood mitigation, the following events, conditions and precautions need to be observed:

- the likelihood of catastrophic damage and unacceptable hazard levels when the levee is overtopped—when rising floodwaters breached the emergency sandbag levees at Nyngan, NSW, hazardous conditions developed rapidly within the protected area, lives were at risk (there were no fatalities) and the resulting damage and disruption cost about \$50 million
- spillways are provided so that levee overtopping is controlled to avoid uncontrolled high velocity overflows or even breaching when the levee is overtopped
- levee crest level, grass cover and spillways are maintained properly and damage by traffic or animals is avoided
- flood emergency plans for levee overtopping and evacuation are in place, particularly where escape routes can be severed (as in a ring levee situation, or where the protected area can fill rapidly once overtopping starts, e.g. Nyngan)
- flow conditions that may develop inside the protected area when overtopping occurs and the flood continues to rise are analysed—high hazard conditions can develop within protected areas, particularly around breaches in the levee, the occurrence and location of which cannot be predicted
- community receives on-going education to ensure that
 people are aware of the risk of overtopping, informed
 about flood emergency plans, and do not lapse into the
 common belief that levees "provide total protection
 against all floods"
- that levees may increase flood levels elsewhere on the floodplain—this needs to be considered when formulating any levee proposal

 drainage of local runoff water that collects within the protected area needs to be taken into account—pumps and sumps may be required to remove this water during floods, and if they fail, "internal" flooding may occur.

Not all of the above precautions apply when the PMF is adopted as the defined event for levees. In such cases, important factors to consider include the proper maintenance of the levee, providing adequate freeboard against wave action and subsidence and management of internal drainage.

Despite the above concerns, levees are a common, important and effective management measure for existing flood problems. However, at best they are a partial solution and should be supplemented by comprehensive flood emergency measures.

B.2.2 Bypass floodways

Bypass floodways redirect a portion of the floodwaters away from areas at risk, and reduce flood levels along the channel downstream of the bypass floodway offtake. Bypass floodways are commonly used together with levees.

Opportunities for the construction of bypass floodways are limited by the topography of the area, ecological considerations and the availability of land. Bypass floodways may exacerbate flood problems along the bypass channel itself and at locations downstream of the bypass channel through facilitating the downstream transfer of floodwaters. Despite these shortcomings, bypass floodways can provide a useful management option, especially together with levees.

B.2.3 Increased hydraulic capacity

The capacity of a river channel to discharge floodwater can be increased by widening, deepening or realigning the channel, and by clearing the channel banks and bed of obstructions to flow.

Such improvements increase not only the velocity of flow and possibly the depth of flow, but also the hazard of the situation. It is essential (duty of care) that signage be erected to warn the public of any untoward hazard associated with "channel improvements".

In urban situations, particularly where drainage channels have degraded over time, channel improvements can provide the community with other positive benefits, such as enhanced visual aesthetics (by landscaping) and providing recreation facilities, such as linear parks.

Channel improvements are likely to be most effective (including reducing the need for other structural works) along creeks and rivers with low mainstream channel velocities caused by overgrown beds and banks. Channel improvements are unlikely to be significant in floods where there are extensive areas of overbank flooding or where flooding effects are dominated by increased tide levels.

As a mitigation measure, channel improvements have several potential disadvantages. First, like bypass floodways, they facilitate the transfer of floodwaters downstream and can accentuate downstream flooding. Other disadvantages include the cost of maintenance, the destruction of riparian habitat and the visual effect of replacing naturally varying channel sections with a section of more uniform geometry.

B.2.4 Dams

Dams, even if full, can significantly reduce downstream flood discharges. As the flood wave passes through a dam, the dam is progressively filled to the point of overflow, and then provides temporary storage above the spillway crest level for floodwaters subsequently passing through the dam. The ability of a dam to mitigate floods depends largely on the surface area of the dam at spillway level and its spillway capacity. The larger the surface area and the smaller the spillway capacity, the greater the reduction in downstream discharges. This effect is most beneficial immediately downstream of the dam and the benefits reduce as the floodwave travels downstream.

Most dams are multi-purpose. They provide water for irrigation, domestic supply and other purposes, as well as possibly providing flood mitigation potential. Generally, the construction of a dam purely for flood control cannot be justified economically. The mitigating effects of even large dams on severe floods is often surprisingly small for the following reasons:

- the surface area of the dam at spillway level is relatively small and the spillway capacity is large
- the volume of water in a severe flood may be much greater than the storage capacity of even a large dam
- floods may result from rainfall in parts of the catchment that are not commanded by dams, consequently the benefits of flood mitigation dams are generally limited to mitigating the effects of a flood generated in only one portion of the catchment.

B.2.5 Detention basins

A detention basin is a small dam that provides temporary storage for floodwaters. It behaves in the same way as a large dam, but on a much smaller scale. In urban areas, detention basins are most suitable for small streams that respond quickly to stormwater flooding.

Detention basins have inherent disadvantages that need to be carefully evaluated:

 they require a substantial area of land to achieve the necessary storage

- where used for multiple purposes (e.g. as playing fields, as well as for flood mitigation), public safety aspects during flooding need to be considered
- long duration or multi-peak storms (when the basin is partly or completely filled from a previous peak) can increase the risk of overtopping, breaching and the resulting downstream hazard
- depending on their size, detention basins may attenuate discharge only slightly when overtopping occurs.

Detention basins, therefore, need to be properly designed, constructed and maintained and their effect on the hazard of a range of flood events investigated fully.

With appropriately designed outlet works, detention basins act as sediment traps. There may be adverse downstream effects associated with this loss of sediment. Such issues need to be assessed when considering the use of detention basins.

B.3 Development and building controls

Development and building controls refer to the conditions attached to the development of defined flood areas and the construction of buildings within these areas. Such controls are aimed at reducing the risk of a building being flooded above floor level and at reducing the resulting damage when above floor flooding occurs. Typical development and building controls include minimum floor levels, floodproofing and house raising. Careful and creative strategic site planning can reduce hazard and facilitate evacuation when required.

B.3.1 Strategic site planning

Developers and local agencies are urged to recognise the importance of strategic site planning. Developers are advised to liaise with local agencies and emergency management agencies to determine relevant issues during strategic site planning and the type of data and analysis required.

Important factors for planning strategic sites include:

- provision of suitable evacuation routes
- · site topography
- fence type and orientation.

The provision of evacuation routes appropriate to the proposed land use is fundamental to the development of defined flood areas. If safe and effective evacuation routes cannot be provided, the proposed land use is inappropriate.

Flood hazard may vary significantly across the site because of topography. For example, higher areas further away from the river will be flooded to shallower depths and may experience lesser velocities than lower areas closer to the river. By locating buildings in the higher, more benign areas of the site, their effect on flood behaviour will be reduced, potential flood damage will be lessened and evacuation can be facilitated.

Fences also significantly obstruct flood flow, increase flood levels and perhaps hamper evacuation. Solid or open mesh fences are the worst, but may be appropriate if they are aligned in the direction of flow. (During a flood, open mesh fences tend to become clogged with debris and act as solid fences). Fences aligned transverse to the flow may require special treatment. Local agency planners need to investigate the type of fences appropriate for the site.

B.3.2 Floodproofing buildings

Floodproofing refers to the design and construction of buildings with appropriate water-resistant materials such that flood damage to the structure of the building itself (i.e. structural damage) is minimised when the building is flooded.

At best, floodproofing is an adjunct to other management measures.

The decision to adopt floodproofing as a formal mitigation measure is best made from within the framework of a floodplain management plan. Although floodproofing can minimise structural damage to flood-affected buildings, the occupiers of flood-affected buildings still suffer the social disruption of flooding.

To prevent or minimise structural damage from flooding, buildings should be designed to withstand water immersion, debris and flotation forces. Particular methods of construction and certain types of materials are better able to withstand immersion than others. For example, plasterboard and chipboard, materials commonly used for internal wall linings and built-in cupboard fittings, respectively, generally are irreparably damaged on immersion—even to a minimal depth—and have to be replaced. In contrast, double brick construction can withstand immersion and may require only washing and scrubbing when the flood subsides.

B.3.3 Minimum floor levels

The most effective floodproofing measure is to raise habitable floors to some defined floor level. However, in commercial buildings the choice of floor level is also affected by economics and commercial risk-taking considerations. A commercial enterprise may prefer to build the cost of flood losses into its operating costs in exchange for the savings in capital costs associated with not having to raise floors to some higher level.

Local agencies have a duty of care in approving such nonconforming developments and in deciding on appropriate conditions. They may require the proponent to submit detailed advice of measures proposed to avoid or cater for flood losses.

Irrespective of the proponent's desires, the overriding consideration should be that the proposed development will not adversely affect flood behaviour or increase the risk to life, limb or property, whether public or private.

The proper course is to determine levels of acceptable risk for specific areas of the floodplain and for specific land uses from within the overall framework of the floodplain management plan. Further, decisions for non-conforming developments must not be made on an *ad hoc* or isolated basis. Rather, such decisions must be taken on the basis of the cumulative development of the floodplain.

B.3.4 House raising

Generally home owners have very strong emotional attachments to their dwellings, which represent a large capital investment. Avoidance of flood damage by house raising, which is another form of floodproofing, reduces:

- personal loss
- risk to life and the costs of servicing isolated people who remain in their homes during floods to protect possessions
- stress and post-flood trauma.

House raising is a suitable mitigation measure usually only for low hazard areas. In high hazard areas, structural means of protection are generally required, or voluntary purchase.

Not all houses are suitable for raising. Usually houses built with single or double brick or slab-on-ground construction are either impossible or too expensive to raise. Houses best suited to raising are timber framed and clad with non-masonry materials.

B.3.5 Freeboard

At times, there is confusion about the need for and amount of freeboard to be adopted, for example in setting floor levels. Freeboard incorporates the following factors:

- uncertainties in estimates of flood levels—these can arise from a relatively short database of past floods, together with uncertainties and simplifications in the models used to predict flood discharges and flood levels
- differences in water levels across the floodplain because of "local factors" not included in hydraulic models
- the cumulative effect of subsequent infill development
- increases in water level as a result of wave action—waves can be of two types: wind induced (across fetches of open

water) and wave induced (powerboats and vehicles moving through flooded areas)

 increases in coastal water levels as a result of the greenhouse effect—for example, increased storm rain will result in increased downstream flood levels in coastal rivers, with associated increases in storm surge.

In addition, freeboard also reduces the likelihood of sewer surcharges into buildings and provides an in-built factor of safety for floods slightly higher than the designated flood event.

B.4 Flood emergency measures

Flood emergency measures include flood forecasting, flood warning, plans for the defence and evacuation of an area, for the relief of evacuees, and for the recovery of the area once the flood subsides (see Appendix H). All of these flood response measures are incorporated in the flood emergency plan for the area, which is prepared by the lead emergency services agency in consultation with the floodplain management advisory committee and complementary to the floodplain management plan.

The importance of flood emergency planning has become apparent in recent years, and was recently confirmed by experiences at Nyngan in New South Wales (1990) and Katherine in the Northern Territory (1998). Unless the PMF is adopted as the DFE, all structural and planning measures will be made ineffective eventually by a larger flood. The development and implementation of effective flood emergency plans are the only means of reducing the damage and hazard associated with residual risk.

Preparedness measures, such as flood warning and evacuation plans, can be of substantial benefit in their own right. These plans are effective in reducing the intangible as well as the tangible costs of flooding. Such plans may be the only economically justified management measure where a few people are subjected to an unacceptable degree of flood risk.

B.5 Flood awareness

The flood-prone community must be made aware—and remain aware—of their role in the overall floodplain management strategy for their area, including the defence of their town and the evacuation of themselves (and possibly personal goods and possessions). Sustaining an appropriate level of flood awareness involves a continuous effort by council together with emergency services. The cost of such efforts can be regarded as the "maintenance cost" of a flood emergency plan.

Irrespective of the available warning time, generally there is widespread variation in flood awareness, both between households and communities. Surveys of people's response to the August 1986 floods in the Georges River, NSW, where there was next to no effective warning time for these floods, showed that two person-hours of effort by a household with a high degree of flood awareness reduced damages by \$3000-\$4000 more than a household with a low degree of flood awareness. In a very flood-aware community, for example Forbes, NSW, flood-affected residents typically evacuate all their goods and possessions with little fuss or bother, even down to removing internal doors. (These residents have ample warning time, 2–3 days).

The principal factor determining the degree of flood awareness of a community is usually the frequency of moderate to large floods in the recent history of the area. The more recent and frequent the flooding, the greater the awareness. Residents of Forbes, NSW, are flooded frequently (3 times in 1990).

One challenge with flood emergency planning is to maintain an adequate level of flood awareness during the extended periods when moderate to severe flooding does not occur, particularly in the face of population turnover. A continuing awareness program must be put in place to inform new residents, maintain the level of awareness of old residents and to cater to changing circumstances of, for example, flood behaviour and new developments. An effective awareness program requires an on-going commitment by local agency.

Appendix C Flooding in Australia

This Appendix provides background information to the causes of flooding, types of floods and the occurrence of recent significant floods in each of the States and Territories.

C.1 Causes of flooding

Flooding can be caused by four different mechanisms: heavy rainfalls, storm surge, tsunami and dam failure.

Communities along the coastline and the tidal reaches of Australia's rivers are exposed to both rainfall and storm surge flooding. While storm surge usually precedes rainfall flooding, both types of flooding can occur together and exacerbate the increase and duration of increased water levels.

Tsunamis occur regularly around the Australian coastline, about every two years. However, the increase in coastal water levels is usually insignificant (less than 0.1 m). The two largest tsunamis to reach Australia were generated by the explosion of the Indonesian Island of Krakatoa in 1883 and the Sumba Earthquake in Indonesia in 1977. In both cases, it was the north-west coastline of Western Australia that was most affected with a maximum increase in coastal water levels of 6 m. In 1994, a 3 m to 4 m tsunami occurred on the north-west coast of Western Australia.

Although these increases in water levels are dramatic, the north-west coast of Western Australia has a high tidal range (the Spring Tide range at Derby, WA, is 9.4 m). The impact of tsunamis (and tropical cyclones) along this region of the coast depends very much on the state of the tide when they occur. Further, the damage and hazard caused by tsunamis (and tropical cyclones) in this area are limited by the low levels of population and development (although the 1994 tsunami caused a minor oil spill during ship refuelling).

Thus, to date, tsunamis have not caused significant hazard and damage to communities along the Australian coast. The threats from rainfall and storm surge flooding are far more significant. For this reason, tsunamis are not discussed further in this document.

Dambreak flooding is a much rarer event than rainfall and storm surge flooding, and is generally caused by the poor design, construction or maintenance of the dam, or exceptionally severe (and rare) rainfall events. When dam failure does occur, the consequences can be catastrophic with respect to loss of life and flood damage. The only significant dam failure in Australia to cause loss of life occurred at Breisis, Tas., in 1929. A 24 m high dam constructed for mining purposes failed after torrential inflows with the loss of 14 lives. The ensuing flood had a severity of 10 000 years average recurrence interval (ARI), that is, it was of PMF severity. These days, rigorous design, construction and maintenance standards, together with safety checks, are implemented throughout Australia routinely in dam engineering. Dambreak flooding is not further discussed in this document.

C.2 Mainstream, stormwater and flash flooding

Throughout this document, the term flooding includes mainstream, stormwater and flash flooding.

C.3 Rainfall, storm surge and flood severity

The severity of rainfall and storm surges varies between storms in response to the random meteorological characteristics of each storm event. Some storms are more severe and cause more severe flooding than others.

The likelihood of occurrence or severity of a rainfall and storm surge or flood events is usually measured in terms of AEP, ARI or annual flood risk (AFR). For example, the 1% AEP flood level in the Gascoyne River at Nine Mile Bridge near Carnarvon, WA, is 8.0 m gauge height (GH). This means that in any year, there is a 1% chance that the highest flood level recorded at this location during the year will equal or exceed 8.0 m GH. The ARI for this flood is 100 years, that is, an average period of 100 years will elapse between floods with flood levels equal to or greater than 8.0 m GH. The AFR for this flood is 1 in 100 (1/100).

C.3.1 The 1% AEP flood

The 1% AEP flood, or the 100 year ARI flood, is sometimes called the "100 year flood". This can be misleading, as it implies that 100 years elapses between such floods. Whereas this is true in terms of long-term averages (over several thousand years), it is **not true** in terms of the immediate future:

 in the 1890s, three floods with severities of the order of the 1% AEP flood occurred in the Brisbane River over five years

- floods with severities of the 1% AEP flood or higher occurred in the Upper Macquarie River at Bathurst, NSW, in 1986, 1990 and 1998
- floods of the 1% AEP severity occurred eight months apart in the Macleay River at Kempsey in 1949 and 1950.

Thus, it is possible (but unlikely) for "100 year floods" to occur in consecutive years or within relatively short periods. Certainly, there is no guarantee that a 100 year period will elapse between such floods.

Even if the 1% AEP flood occurred last year, there is a 1% chance that this flood will occur this year—and in each and every future year.

C.3.2 Probable maximum flood

In assigning a likelihood of occurrence to rainfalls, storm surges and the resultant floods, we acknowledge a continuous range of severities for these events, that is, there is always a more severe flood event. The likelihood of such floods occurring diminishes as the severity of flooding increases.

The question then arises: Is there an upper limit to flood severity? Is there an absolute maximum flood? The answer is a qualified "yes" (Laurenson 1994). Flood producing rainfalls (and storm surges) are caused by meteorological processes, all of which have physical upper limits; for example, the probable maximum precipitation (PMP) and resultant flood, the PMF.

The likelihood of PMP and PMF occurring is remote. Several semi-independent physical processes have to simultaneously achieve their most extreme outcomes. Although it is not possible to attach a meaningful measure of severity to PMPs or PMFs, such events have been assigned an AEP of 0.01% to 0.00001% (i.e. I chance in 10 000 to 1 chance in 10 000 of occurring in a given year (Nathan & Weinmann 1999).

C.4 Factors affecting rainfall flooding

C.4.1 Rainfall duration and intensity

Some of the rain falling on a catchment will soak into the soil through infiltration and the remainder will be shed as surface runoff, which drains into local creeks and ultimately flows to the catchment outlet. The amount of runoff depends upon the duration and intensity of rainfall, and upon catchment conditions when the storm occurs. (If the catchment is "dry", a greater amount of rainfall will infiltrate into the soil and the runoff volume will be less than if the catchment is "wet").

The longer the duration of the storm and the more intense the rainfall, that is, the amount of rainfall that occurs in a given time, the greater the amount of surface runoff that will be generated and the more serious the resultant flood.

C.4.2 Critical storm duration

Each catchment has a critical storm duration which is determined by the size and topographic features of the catchment. This critical duration is the time required for maximum discharge to be realised at the catchment outlet.

The smaller and steeper the catchment, the more quickly runoff will arrive at the catchment outlet, that is, the shorter the critical storm duration. Conversely, the larger and flatter the catchment, the greater the time required for runoff to arrive at the outlet, and the longer the critical storm duration.

Other things being equal, a storm of critical duration will cause more severe flooding than storms with durations shorter or longer than "critical".

C.4.3 Rainfall intensity/frequency duration data

The Commonwealth Bureau of Meteorology has made an Australia-wide study of rainfall intensity and temporal patterns for storms of different durations (ARR 1987). From these date, the duration, intensity and temporal patterns for storm events of different severities can be estimated.

C.5 Historical floods in Australia

Australia suffers from a highly variable climate. Because of this, flooding in Australia's river systems occurs sporadically, unlike the regular flooding in river systems elsewhere. In Australia, years or even decades can elapse before a severe flood occurs in a river system of interest.

In "dry times", the flood awareness of the local community falls and a complacent and often ill-judged attitude to flood risk and flood hazard tends to develop. The problem is exacerbated by the turnover in population; residents subjected to the last severe flood move away from the area to be replaced by newcomers, often with no experience of flooding. As a consequence of this diminished flood awareness, developments may occur on unsuitable areas of the floodplain. Further, developments approved elsewhere may unwittingly exacerbate flooding when it occurs.

C.5.1 Years of occurrence

Table C.1 shows details of severe floods in the Australian States and Territories. This catalogue of floods is incomplete. Although moderate to severe floods may only occur sporadically in individual river systems, they occur fairly regularly across each State and even more regularly across Australia. For example, in New South Wales,

Victoria, Western Australia, South Australia and the Northern Territory, there have been at least 63 flood events with severities of 5% AEP or greater since 1960. In this same period, there have been 28 events with severities of 2%

AEP or greater and 10 events with severities of 1% AEP or greater. These recurrence intervals are approximate only and detailed studies need to be undertaken to have confidence in the estimates.

Table C.1 Details of severe floods across Australia

New	New South Wales		New	New South Wales			New South Wales			Queensland		
River	Year	% AEP	River	Year	% AEP	River	Year	% AEP	River	Year	% AEP	
Barwon	1890	0.8	Macintyre	1991	6.670	Peel	1955	1,25	Border Rivers	1996	1.05	
				1955	1		1910	2		1976	2.9	
Bega	1971	0.83		1872	2							
	1934	2.9				Richmond	1974	1.33	Brisbane	1974	0.83	
			Macleay	1950	1.67		1955	1.33		1955	3.3	
Bellinger	1950	2.22		1949	3.3					1931	2.22	
	1875	1.43		1875	2.5	Shoalhaven	1925	2.9				
	1870	0.7	Macquarie, Lower	1956	2		1873 1870	1.25 0.7	Bulloo	1974	2	
Bogan	1990	0.5		1955	1				Burdekin	1991	3.3	
-	1976	2.5				Tweed	1954	2.5		1958	1.43	
	1955	2	Macquarie, Upper	1990	1.43							
				1986	0.91	Australian	Capital 1	erritory	Burnett	1954	2.9	
Brunswick	1978	2.5				River	Year	% AEP				
			Moruya	1925	0.670	Cotter	1974	4	Culgoa	1971	2.9	
Clarence	1950	2.9		1914	2.5		1956	5				
	1890	1.43		1898	1.25		1950	1	Cooper Ck	1974	2.5	
	188 <i>7</i>	2		1870	1.25		1925	0.5				
							1922	5	Diamantina	1974	1.67	
Darling	1890	1	Murray, Lower	1956	1		1915	6.670				
	1876	1.43		1870	0.56				Fitzroy	1954	1.05	
-						Molonglo	1988	5		1918	2.9	
Edward	1956	1	Murray, Upper	1956	2		1976	2.5				
	1917	2		1917	1.11		1974	2.5	Flinders	1974	2.22	
	1870	0.670	Murrumbidgee	1974	1.67		1959 1925	4	r			
Georges	1889	1	Lower	1956	0.8		1923	2 5	Eyre Ck	1974	2.9	
Octoriges.	1887	1,11	CONC	1750	0.0		1722	,	Herbert	1977	2	
	1873	1	Murrumbidgee	1974	1.11	Murrumbidgee	1991	5	Herbert	1967	0.77	
			Upper	1956	1.43	···		-		1955	3.3	
Gwydir, Lower	1976	1.43	.,			Queanbeyan	1978	4		,,,,,	3.3	
	1955	0.56	Nambucca	1963	2.22	_	1974	5	Mitchell	1974	3.3	
				1954	2.5		1945	5				
Hunter	1955	0.5		1950	1.11		1925	0.5	Moonie	1974	2.5	
	1820	0.5					1922	2				
			Namoi	1955	1.25				Norman	1976	2.9	
Lachian, Lower	1990	2		1910	2	Yarralumla Ck	1971	1				
	1952	0.5		1864	0.670				Paroo	1976	2	
	1950	2.5										
			Namoi, Lower	1955	1				Warrego	1990	2	
				1910	0.7							

Table C.1 Details of severe floods across Australia (Continued)

Victoria		Victoria			Western Australia			South Australia			
River	Year	% AEP	River	Year	% AEP	River	Year	% AEP	River	Year	% AEF
Avoca .	1995	4	Snowy	1971	1.82	Blackwood	1982	0.8	Bremer	1992	1.67
	1983	3.3					1964	2			
	1956	1.43	Traralgon Ck	1993	2		1963	5	Cooper Ck	1974	3.3
	1909	1					1955	6.67			
			Werribee	1983	1.43				Gawler	1992	2.5
Avon	1990	2				Brunswick	1964	2.5		1937	4
			Tas	mania							
Barwon	1995	3.3	River/Area	Year	% AEP	Collie	1982	4	Murray	1956	0.625
	1952	1.11	Derwent Valley	1960			1964	2.5		1931	3.3
	1880	0.56	•								
			Hobart	1958		Irwin	1988	6.67	Onkaparinga	1992	2
Broken	1993	1		1954			1971	0.83			
				1923					Sturt	1981	2.5
Campaspe	1983	2.5		1911		Fitzroy	1991	5			
				1872			1983	1.67	Torrens	1992	2
Cann	1971	1		1854							
						Gascoyne	1 96 1	2.0	Northe	ern Territo	ory
Goulburn	1993	4	Huon	1960	4		1960	5	River	Year	% AEP
	1974	1.43		1948	1.4				Adelaide	1977	3.3
	1916	1,11				Murray	1945	4			
			Mersey	1970	<0.01		1862	0.83	Daly	1998	1
Latrobe	1993	5		1929						1976	2.9
	1978	3.3				Swan/Avon	1963	5.6		1974	2.5
	1952	2.5	Midlands	1960			1958	2.9			
	1934	1		1956			1955	5	Katherine	1897	1
				1929			1926	2.22		1957	1
Little	1973	2.5		1926			1917	4.6		1998	6.670
				1923			1872	0.7			
Loddon	1987	4		1911			1862	1.33	McArthur	1975	2.9
	1983	5		1872							
	1975	5		1852		Preston	1964	0.5	Roper	1976	2
	1933	2									
	1909	1	South Esk	1969	5	Greenough	1971	3.3	Todd	1988	2
				1960			1963	5			
Merriman Ck	1993	2		1958			1953	1.67	Victoria	1991	1.33
				1956			1927	2.5		1975	2.5
Mitchell	1990	3.3		1946			1888	0.59			
				1929	2.0						
Murray	1956	1		1926							
	1917	1.11		1911	0.5						
	1870	0.56		1863	0.5						
		2.5		1852	1.4						
ieven Cks	1993	2.5									

C.5.2 Seasonality of flooding

In terms of the flood size or severity, flooding in Australia can be considered to vary randomly from year to year, that is, a flood of any size can occur in any year. However, seasonal effects generally exist in most States, that is, floods are more likely to occur in certain seasons of the year. This is well demonstrated by Western Australia, which has a climate that varies from tropical in the north-west of the State to Mediterranean in the south-west.

Figure C.1 shows the distribution of severe floods in the north-west, central-west and south-west regions of Western Australia. Floods in the north-west are more likely to occur in the late summer wet season, floods in the south-west are more likely to occur in winter. Floods in the central-west region can occur throughout the year, depending upon which weather system prevails.

While there is a "seasonal pattern" throughout Australia, there is no surety as to when a flood may occur, or what its severity might be. It can be clearly established where it will flood, what flood height may occur but there is no method of determining when it may flood.

C.6 Tides along the Australian coast

Ocean tides, which are caused by the gravitational pull of the moon and the sun on the water mass of the oceans, affect water levels and flooding along the lower tidal reaches of coastal rivers. Tides along the Australian coast are typically semi-diurnal, that is, there are two high tides and two low tides during every 24 hours and 50 minutes.

Table C.2 shows standard tidal planes at 11 locations around the Australia. Spring tides (mean high water spring, MHWS; mean low water spring, MLWS), or higher than normal tides, occur twice each lunar cycle (of about a month) at the times of new and full moon. At these times, the moon and sun are in alignment with the earth and their gravitational pulls on ocean waters are in concert. Neap tides (MHWN, MLWN), or smaller than normal tides, occur at times of "quarter moon", when the sun and moon

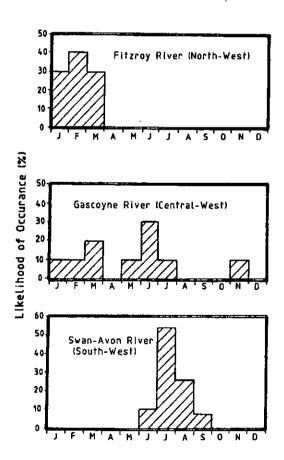


Figure C.1 Seasonity of flooding in Western Australia

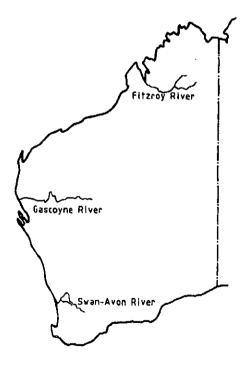


Table C.2 Tidal planes around the Australian coast

	Water level (m Australian height datum)										
Location	HAT	MHWS	MHWN	MSL	MLWN	MLWS	LAT	– tidal range (m)			
Darwin ^A , NT	4.0	2.8	0.9	0.0	-0.9	-2.7	-4.1	5.5			
Derby, WA	4.74	3.94	1.44	-0.86	-3.36	-5.46	-5.76	9.4			
Fremantle, WA	0.54	0.14	-0.06	-0.06	-0.06	-0.26	-0.66	0.4			
Esperance ^A , WA	_	0.4	0.0	0.0	-0.1	-0.3	-0.7	0.7			
Port Lincoln ^A , 5A	_	0.07	0.2	0.0	-0.2	-0.6	-1.0	1.3			
Lorne ^A , Vic.	_	0.6	0.3	0.0	-0.3	-0.6	-0.9	1.2			
Devonport ^A , Tas.	_	1.3	1.0	0.0	-1.0	-1.3	-1.7	2.6			
Eden ^A , NSW	_	0.7	0.1	0.0	-0.2	-0.8	-0.9	1.5			
Coffs Harbour ^A , NSW	_	0.7	0.4	0.0	-0.3	-0.6	-0.9	1.3			
Cairns, Qld	1.65	0.82	0.16	+0.01	-0.34	-1.00	-1 <i>.7</i> 3	1.8			
Weipa, Qld	1.63	1.15	0.45	+0.10	-0.25	-1.05	-1.75	2.2			

A MSL assumed to be 0.01 m AHD.

are in a more-or-less perpendicular configuration to the earth and their gravitational pulls on ocean waters oppose each other. Neap tides also occur twice each lunar cycle. Highest and lowest astronomical tides (HAT, LAT) occur about once very 19 years, but water levels approach to within 20 cm of HAT and LAT around mid summer and mid winter ("King tides").

The tidal range varies significantly around the Australian coast (Table C.2). The north-west of the continent experiences the greatest spring tidal range (5.5 m, Darwin; 9.4 m, Derby); the smallest spring tidal range occurs around the south-west coast (0.4 m, Fremantle; 0.7 m, Esperance). The spring tidal range around the rest of the coast is between 1 m and 2.5 m.

Tidal effects along an estuary or river usually diminish with distance inland. The higher the water level at the mouth of a coastal river, the greater the effect on upstream water levels. Thus, if a rainfall flood occurred together with HAT, water levels will be higher along the lower reaches of the river than if the same flood occurred together with MLWN.

C.7 Storm surge flooding

Storm surge is another mechanism that affects water levels around the Australian coast and flooding along the lower

reaches of coastal rivers. Whereas storms of all types can increase coastal water levels, the greatest increases are usually associated with tropical cyclones. When a severe storm affects coastal waters:

- barometric pressure in the centre of the system falls, sometimes by over 50 hPa in the case of cyclones, compared with the surrounding environment
- strong winds start, normally near the storm centre, but occasionally at large distances from the centre
- strong winds can generate large waves (depending on the strength, direction and duration of the winds)—waves breaking as they approach the shore leads to increases in water level.

All three effects increase coastal water levels, as described below. Storm surge is a combination of the *inverted* barometer effect and wind setup.

C.7.1 Inverted barometer effect

The inverted barometer effect is caused by significant differences in barometric pressure between the inside "low" and outside of the developing cyclone, producing increased coastal water levels. The amount of the increase (1 cm for each hPa reduction in barometric pressure) depends upon the reduction in barometric pressure and the extent of the

area of low pressure. In a typical cyclone, the central pressure may be reduced, for example, from 1015 hPa to 965 hPa—50 hPa. This could increase water levels by up to 0.50 m.

C.7.2 Wind setup

The amount of wind setup that occurs depends upon the strength and duration of the wind, the wind fetch, the shape of the coastline and the bathymetry of the coastal area. (Wind setup tends to be highest in enclosed shallow bays). Wind setup can be as high as 10 m in an extreme case and often exceeds 2 m to 3 m in typical tropical cyclones.

C.7.3 Wave setup

The amount of wave setup depends upon the bathymetry of the offshore areas and the wind fetch, being greater in shallow enclosed bays than along deep open coasts. Wave setup inside the breaker zone can amount to 20% to 40% of the representative open ocean height of the waves reaching the beach. Ocean wave heights of 10 m or more occur off the north-west coast of Western Australia during tropical cyclones, creating potential wave setups of 2 m to 4 m.

C.7.4 Storm surge water levels

The three mechanisms described above are approximately additive and produce a total increase in coastal water levels, which supplement tidal effects, that is, if a storm occurred at the spring tide phase of the tidal cycle, peak water levels would be higher than if the same storm occurred at the neap tide phase of the tidal cycle. The combination of all four effects is known as storm surge water level.

C.8 Factors affecting storm surge water levels

Several factors affect the storm surge water level recorded at a specific location on the coast:

- cyclone (storm) characteristics
- the near-shore bathymetry, particularly the width of the continental shelf and any embayment around the point of interest
- tidal range and phase of the tide when the storm occurs.

C.8.1 Cyclone characteristics

Storm surge varies directly with central pressure deficit, with the speed and angle of approach of the cyclone to the coast and a depth factor that reflects offshore bathymetry (e.g. Trajer 1973). The greater the central pressure deficit, the stronger the resultant winds and the higher the associated waves. The smaller the storm size, the smaller the area of

ocean and coastline affected by the cyclone, but the peak surge may still be very high.

C.8.2 Off-shore bathymetry

The general off-shore bathymetry has a significant effect on storm surge: the shallower, flatter and more extensive the off-shore area, the greater the storm surge. Thus, storm surge on the coast will be greater where the continental shelf is wide. Near-shore bathymetry also affects wave setup in the same way, the shallower the near-shore area, the greater the wave setup.

Bathymetric effects on surge heights vary widely around the Australian coast (Hopley & Harvey 1979). However, they are generally high in the Gulf of Carpentaria and around the population centres of Bundaberg, Gladstone, Mackay and Townsville in Queensland, Darwin in the Northern Territory, and Geraldton, Carnarvon, Port Headland and Wyndham in Western Australia.

C.8.3 Range and phase of tide

The range and phase of the tide have a marked effect on the likely severity of storm tide water levels.

To achieve peak storm tide levels for a given storm surge:

- storm surge peak must coincide with the high tide peak
- phase of the tide should be such that tidal peaks are at a maximum, that is spring tides or HATs.

Because peak storm surge water levels only persist for several hours, it is more likely that the storm surge peak will not coincide with high tide levels. Figure C.3 shows a typical storm surge hydrograph. Storm surge levels are above 50% of the peak surge level for only about four hours and above 75% of the peak level for only about two hours. Thus, assuming a 12-hour tide, the likelihood of peak surge levels coinciding with high tide is perhaps 2 in 12, or about 15%.

C.9 Characteristics of storm surge flooding

C.9.1 Length of affected coastline

Land-falling cyclones typically induce storm surges over a considerable reach of coast. Measured from the point of landfall of the cyclone centre, the affected coast typically stretches less to the right of landfall than to the left (directions measured facing inland). Peak surge height depends on the cyclone size (Fig. C.2). Considerable research will be required to ensure that other cyclone affected areas in Western Australia, the Northern Territory and the Gulf of Carpentaria have similar guides to that being undertaken (1999) for the east Queensland coast.

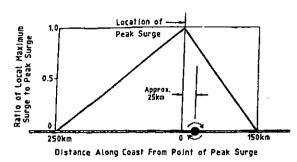


Figure C.2 Indicative surge profile for the Queensland coast (Irish 1977)

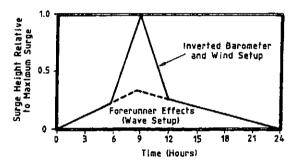


Figure C.3 Indicative storm surge hydrograph close to cyclone landfall (after Irish 1977)

C.9.2 Storm surge hydrograph

Figure C.3 shows an indicative storm surge hydrograph based on Queensland data (Irish 1977). Close to landfall or close to the coast water levels gradually increase, followed by a rapid rise to peak water level and an equally rapid fall, and then gradual decay. Significant peak surge levels at locations close to landfall persist for only three to four hours. Peak storm surge level depends on the state of the tide when peak surge occurs. Surge hydrographs at locations more remote from the landfall site are characterised by lower peak heights and by a more gradual rise and fall in storm surge levels around the peak.

C.9.3 Tidal effects

Tidal range is a key parameter that determines the degree of hazard associated with storm surge, the greater the tidal range, the lower the degree of hazard (Hopley & Harvey 1979). High storm surge water levels only persist for several hours (Fig. C.3). Thus, the greater the tidal range, the less the likelihood that peak surge levels will exceed MHWS or HAT. For example, Cyclone Tracy produced a 1.6 m surge at Darwin in 1974, which coincided with high water of the neap tide. The spring tidal range at Darwin is 5.5 m and the resulting peak storm surge water level was about 0.2 m below MHWS. These measurements were taken on the right of the landfall. Estimates only are available for the

Casuarina Beach area (to the left of landfall) where storm surge was estimated to be about 4 m. In contrast, areas of low tidal range will be exposed to a greater risk of storm surge flooding for the same tropical cyclone climatology.

C.10 Combined effects of rainfall and storm surge flooding

C.10.1 Severity of resultant flooding

Coastal areas and coastal waterway systems around Australia are subject to both rainfall and storm surge flooding, and both these flood-producing mechanisms can and do occur at the same time. For example, a cyclone that crosses the coast close to a river mouth is likely to generate heavy rainfalls over the tributary catchment and increase coastal water levels by storm surge effects.

If flooding is caused by heavy rainfall and storm surge combined, the question arises of how severe will be the resultant flood, for example, for rainfall severity of 1% AEP and storm surge severity of 5% AEP. If both effects are caused by the same storm, the more extreme severity is chosen as representative of the resultant flood severity (i.e. 1% AEP for the above example). However, heavy rainfalls and storm surge may not be generated by the same storm, and even if they are, the relative severity of each effect may be independent of the other.

This problem is solved by assuming that it is unlikely that extreme rainfalls and extreme storm surges will occur simultaneously. Experience bears this out. A single storm may generate 1% AEP rainfalls or the 1% AEP storm surge, but it is unlikely to generate both together. (There is a question about the relative timing of both effects. To maximise flood levels, peak storm surge has to occur at the time of peak flood discharge into coastal waters). If the rainfalls are severe, it is assumed that any accompanying surge will be significantly less severe, and vice versa. Thus, if an extreme rainfall situation is adopted for analysis (e.g. 1% AEP rainfalls), a considerably less extreme accompanying storm surge situation is typically selected (e.g. 10% AEP storm surge) and vice versa. This approach recognises that both flooding mechanisms are likely to occur together, but it is unlikely that both mechanisms will achieve extreme severity simultaneously.

C.10.2 Dominant type of flooding

Flooding in the upper reaches of coastal rivers is dominated by rainfall flooding; storm surge influences are negligible. In the lower reaches of coastal rivers, especially in the areas of regular cyclonic activity such as the north-west, the north and the north-east of the continent, storm surge flooding generally dominates. Rainfall flooding is still important in these areas, but storm surge effects generally result in higher flood levels. In the mid-reaches of such systems, both rainfall and storm surge flooding effects are important and both can generate similar flood levels.

C.10.3 Storm surge uncertainties

The uncertainties related to storm surge are:

- · accuracy of surge height predictions
- · area likely to be affected (where landfall will occur)
- · ability of people to move during cyclones

These uncertainties require special consideration in planning and response phases of the emergency planning process. While there are similarities with mainstream flooding, the consequences of a major storm surge occurring are usually greater than those of mainstream flooding.

Appendix D Lachlan Macquarie's 1817 Admonition Concerning Floods

2.5

Government and General Orders.

Government House, Sydney, Wednesday, 5th March, 1817.

Civil Department.

The Governor's official Communications from the Interior within the last few Days have excited in His Excellency's Mind the most sincere Concern and Regret for the recent Calamities, in which the unfortunate Settlers on the Banks of the Nepean and Hawkesbury have been once more involved by the late dreadful Inundations of those Rivers.

Whilst it does not fall within the Reach of human Foresight or Precaution to be able to guard effectually against the baneful Recurrence of such awful Visitations, or to avoid being more or less involved therein, yet when the too fatal Experience of Years has shewn the Sufferers the inevitable Consequence of their wilful and wayward Habit of placing their Residences and Stock Yards within the Reach of the Floods (as if putting at Defiance that impetuous Element, which it is not for Man to contend with); and whilst it must still be had in Remembrance that many of the deplorable Losses, which have been sustained within the last few Years at least, might have been in great Measure averted, had the Settlers paid due Consideration to their own Interests, and to the frequent Admonitions they had received by removing their Residences from within the Flood Marks to the Townships assigned for them on the High Lands, it must be confessed that the Compassion excited by their Misfortunes is mingled with Sentiments of Astonishment and Surprize that any People could be found so totally insensible to their true Interests, as the Settlers have in this instance proved themselves.

His Excellency, however, still cherishes the Hope that the Calamities, which have befallen the Settlers, will produce at least the good Effect of Stimulating them to the highly expedient and indispensible Measure of proceeding to establish their Future Residences in the Townships allotted for the Preservation of themselves, their Families, and their Property, and that they will, one and all, adopt the firm Resolution of forthwith erecting their Habitations on the High Lands, cheered with the animating Hope and fair Prospect of retrieving at no very distant Day their late Losses, and securing themselves from their further Recurrence. Those, who, notwithstanding, shall perversely neglect the

present Admonition and Exhortation to their own Benefit, must be considered wilfully and obstinately blind to their true Interests, and undeserving any future Indulgencies; whilst, on the contrary, those, who shall meet this severe Dispensation of Providence with manly Fortitude and unbroken Spirit, may rest assured that their Exertions and Industry will not only merit but obtain the favorable Consideration and Protection of this Government.

These Orders are to be read during the Time of Divine Service at each of the Churches and Chapels throughout the Colony, on the three next ensuring Sundays.

By Command of His Excellency, Lachlan Macquarie.

John Thomas Campbell, Secretary. (Commonwealth of Australia 1917)

Appendix E Flood Risk Management

The process of floodplain management planning described in this document is a risk management process aimed at identifying and managing the risk associated with the human occupation of the floodplain. This Appendix provides an introduction to the formal concepts and principles of risk management and describes how they can be applied to floodplain management. An essential difference between the risk management approach and earlier floodplain management philosophies, with their concentration on the "100 year event", is that risk management requires the consequences of floods to be investigated for a range of flood events up to and including the PMF.

E.1 Overview

The general risk management process, which can be applied to all types of risks and to the organisations exposed to these risks or who are charged with managing them, is described in Standards Australia (1995) and Emergency Management Australia (1997). As applied to the preparation of floodplain management plans, the risk management process consists of the following:

- identifying the stakeholders exposed to or affected by the risk and severity of flooding
- identifying public and private property, social systems and environmental elements at risk of flooding
- establishing flood risk evaluation criteria
- estimating flood risk (i.e. the likelihood and consequences of flooding)
- assessing the acceptability of flood risk
- defining flood risk treatment strategies
- monitoring and reviewing flood risks and effectiveness of risk treatment
- communicating risk.

The above steps are not sequential and are described in more detail in this Appendix.

E.2 Identify stakeholders

Commonwealth, State, local agencies and landholders are responsible for decisions concerning land use, development and the construction of works across the floodplain. Their decisions influence the population at risk of flooding and the nature and severity of flood risk. Other organisations have explicit responsibilities with respect to the management of flood risk (e.g. the Bureau of Meteorology with respect to

flood forecasting, emergency management agencies with respect to flood response and recovery).

All organisations involved in and affecting flood risk have a duty of care to manage risk appropriately. This can be done most successfully from within the framework of a floodplain management plan, which provides an effective framework for:

- identifying and evaluating the various social, economic, financial, ecological and other factors in the risk management process
- developing an appropriate organisational structure for integrated risk management across the various organisations.

E.3 Identify elements of risk

Flood risk identification consists of identifying "elements" at risk of flooding, that is, anything the community values that is exposed to flood hazard. At this point, the concern is to identify the elements themselves and not the hazards (see Appendix E.4). Principal elements of the floodplain exposed to flood hazard include:

- · people who use the floodplain
- communities located on the floodplain
- built asset and natural resource bases of the floodplain, including private and public property and public infrastructure
- floodplain ecology
- intangible elements such as quality of life.

The above elements can be divided into subelements (e.g. private property comprises land uses such as residential, commercial and industrial properties; public infrastructure, water supply, sewerage, roads, electricity, telephone). All the principal elements and subelements exposed to flood hazard need to be identified and documented.

E.4 Flood risk analysis

Analysis of flood risk involves an appraisal of:

- likelihood of flooding
- associated consequences of flooding (hazards) to each of the elements at risk
- · associated vulnerability of the flood-prone community.

We do not know when the next flood will occur or how severe it will be. Hence, the risk management process requires a range of floods up to the PMF to be investigated in terms of likelihood of occurrence, associated hazards to elements at risk and the associated vulnerability of the community.

Unlike many other risks, the likelihood of flooding can be rigorously quantified as part of the hydrological investigations of the flood study. Further, flood behaviour (e.g. velocities, flood levels, rates of rise, duration and extent of flooding) is also quantitatively assessed as part of the hydraulic investigations of the flood study. This information provides a reliable base (compared to many other risks) for assessing the hazards of flooding.

Additional studies of the following are required to assess the hazards to elements at risk and include:

- numbers of people affected by flooding and the threat to life and health
- flood damage—the economic cost of damage to public and private properties and to public infrastructure
- social impact—effects of flooding on the community in terms of, for example, community disruption, loss of services, intangible damages
- ecology and geography of the floodplain (either adverse and/or beneficial)
- any other studies necessary to assess qualitatively or quantitatively the effects of flooding on elements at risk.

In evaluating hazards to elements at risk analysis needs to be applied to the entire flood episode, encompassing onset, response, aftermath and recovery. Different sets of elements at risk will emerge in the different phases of the flood episode. For example, the threat to life and health of flood-prone residents is mainly important during the response phase, whereasthe ready return of water supply, sewerage and telephone systems to serviceability is relevant during the recovery phase.

Vulnerability is the degree of susceptibility and resilience to flooding of flood-prone communities and the floodplain environment. Vulnerability determines how well a community can cope with flooding. This depends upon the size of the flood, the flood awareness of the community and topographic, infrastructure, social and economic specifics which determine the social and economic disruption caused by flooding. Vulnerability can only be assessed subjectively. One means of assessment is by comparing potential flood situations to the consequences of past floods on the community in question or other communities that have recently undergone flooding.

If a community is especially vulnerable to flooding, extreme risk treatment measures may be required to reduce flood risk to acceptable levels. The New South Wales towns of Gundagai and Moama were judged to be so vulnerable to flooding after severe flood events in 1852 and 1870, respectively, that in both cases the entire town was relocated to a less flood-prone location.

E.5 Flood risk acceptability

In the flood risk acceptability phase the risks defined during the risk analysis phase are compared with to previously established risk criteria to decide whether the risks are acceptable or require risk management.

Appropriate risk criteria and assessment of what constitutes an "acceptable risk of flooding" are vexed questions (see Appendix E.10–E.12).

The risk management approach to floodplain management differs considerably to earlier approaches, which tended either to provide "protection" up to a nominated flood event (typically the 1% AEP flood) or to be based on costbenefit analyses in terms of the net reduction in average annual damage (AAD).

Cost-benefit analyses are still essential in floodplain management. However, after management measures have been selected and implemented, the risk management approach explicitly identifies, assesses and, if necessary, manages the remaining residual risk. Another difference from earlier approaches is by assessing the effect of flooding on individual elements at risk, the risk management approach can assist in determining appropriate DFEs.

E.6 Flood risk management

In the flood risk management phase, options for managing risk are identified and evaluated. A flood risk management plan is developed, which includes measures to manage the risk to existing development, to proposed development and the residual or continuing risk.

Risk management options include:

- avoiding risk (e.g. the adoption of land use planning controls to prohibit high risk activities from hazardous areas of the floodplain)
- reducing the likelihood of occurrence (e.g. structural measures to provide protection up to some DFE)
- reducing the consequences (e.g. use of development and building controls to floodproof buildings, the design and fabrication of fittings to facilitate the ready removal and replacement of electric motors used to drive water supply and sewerage pumps)

- transfering risk (e.g. through insurance)—given the general non-insurability of flood risks in Australia, this is an academic rather than practical option for floodplain management
- financing risk (e.g. the Natural Disaster Relief Arrangements of the Commonwealth Department of Finance)
- accepting risk—a residual or continuing risk needs to be explicitly recognised and addressed via flood emergency measures, if necessary.

Risk management options should be evaluated on the basis of risk reduction, especially in light of the adopted risk evaluation criteria, together with the costs and benefits of risk reduction measures and additional opportunities created by risk reduction.

Selection of the most appropriate option involves balancing the cost of implementation against the benefits derived from it.

Where large reductions in flood risk may be achieved for a relatively low expenditure (e.g. the use of land use planning measures to control future risk) such options should be implemented as a matter of course.

Rare, but severe, risks such as the 1 chance in 1000 (0.1% AEP) or more severe flood events, which may warrant special risk reduction measures need to be carefully considered. The consequences of these rare events need to be evaluated fully and weighed against the likelihood of occurrence and adopted risk evaluation criteria. In such cases, flood emergency management may be the only practical means of risk management.

E.7 Implement risk management strategies

The adopted flood risk management plan will define an integrated range of management measures to address existing, future and residual flood risks and flood hazards. These measures form the core of the floodplain management plan and the need to be implemented as resources and priorities determine.

E.8 Monitor and review risks

Few risks remain static, flood risks included. Circumstances and conditions change with time and effect flood risk. Floodplain management plans need to be reviewed every 5 to 10 years. As part of this process, flood risks and flood hazards should also be reviewed to determine if significant changes have occurred and if it is necessary to revise risk treatment measures.

E.9 Risk communication

Risk communication between the general public and risk management agencies is important in gaining community acceptance of risk (risk acceptance; "socially acceptable risk"). Experience in New South Wales (Haddad 1994) has indicated:

- community involvement in the decision-making process generally makes the risk more tolerable
- community's tolerance of risk is higher when it knows that such risks are being reduced or managed
- communities are likely to tolerate risks when some benefit accrues to them from the activity generating the risk
- communities tolerate natural risks more readily than industrial and other human-generated risks.

During the risk management process that forms an integrated part of the preparation of a floodplain management plan, it is important that the concept of flood risk and risk management measures are discussed within the community.

E.10 Flood risk evaluation criteria

A set of flood risk evaluation criteria are needed to firstly assess the severity of defined flood risks as part of the risk evaluation process and secondly, to assess the effectiveness of risk management options in reducing flood risk.

Risk evaluation criteria can be based on technical, financial, legal, social, humanitarian, equity and other criteria. These criteria need to be developed in consultation with all stakeholders in the risk management process ("risk communication").

Key factors in the development of risk evaluation criteria are as follows (Table E.1, see Emergency Management Australia 1997):

- seriousness—effect of the flood risk in terms of the magnitude and nature of potential loss (e.g. a flood risk involving a potential loss of life is more serious than a risk involving only economic loss)
- manageability—our capability to influence the
 magnitude and nature of the flood risk—future flood
 risk is one of the most manageable risks and can be
 effectively and relatively inexpensively controlled by
 appropriate land use planning provisions for flood-prone
 land
- acceptability—ability of the community to perceive and accept flood risk—the community is more accepting of risks that it understands (i.e. risks that have been clearly and effectively explained)

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Table E.1 Factors affecting risk evaluation under the SMAUG model of key issues

Seriousness	Manageability	Acceptability	Urgency	Growth
Consequences	Community capability	Legal considerations		
Fatalities Serious Injury Economic effects Financial cost Scope & scale Asset, resource degradation Environmental degradation Continuity of function	 Available resources Readiness Knowledge & skills Values & benefits 	 International law, conventions & treaties Statutory provisions Common law precedents Recommendations of boards of enquiry Land use Exposure to litigation 	 Existing level of hazard Growth in hazard 	 Past levels of growth Future levels of growth
		Social & political Government policy Community expectations Values & attributes Community perceptions Special group interests Equity		
Fechnical judgments	Technical judgments	Technical judgments	Technical judgments	Technical judgments
International standards National standards Codes of practice Guidelines Professional judgment, individual & institutional	 International standards National standards Codes of practice Guidelines Professional judgment, individual & institutional 	 International standards National standards Codes of practice Guidelines Professional judgment, individual & institutional 	 International standards National standards Codes of practice Guidelines Professional judgment, individual & institutional 	 International standards National standards Codes of practice Guidelines Professional judgment, individual & institutional

- urgency—perceived need for action—management of flood risk does not require immediate action but the longer the time that passes before a floodplain management plan is developed, the greater the risks to be managed (in terms of numbers of flood-prone people and properties) and possibly the less manageable or more expensive the risks become to manage
- rate of growth—potential of the risk to increase in seriousness over time, particularly when the development of flood-prone land continues without taking management measures to reduce the consequences of flooding (the "future problem").

E.11 Risk of death

The most serious hazard of flooding is the risk of fatality to flood-prone individuals.

E.11.1 Death from various causes

Data on the risks of death associated with various types of voluntary activities and modes of transportation, together

with the average risk of death from various causes were assembled for New South Wales for 1981–86 (Table E.2, Higson 1990) and include an assessment of the risk of death from flooding (see Table E.2, Cataclysmic storms & floods). Several points about the results should be noted:

- risk of death by flooding in New South Wales over the study period was 0.2 "per million person years" (pmpy) or less
- risk of death by flooding is several orders of magnitude lower than death from everyday risks (e.g. the risk of death by an accident at home is 550 times greater; the risk of death due to being struck by a motor vehicle is 175 times greater)
- whereas everyone is exposed to the risk of death from an accident in the home, only the flood-prone population of New South Wales is exposed to the risk of cataclysmic flooding (the flood-prone population of New South Wales as a proportion of the total population is not known)—even if the risk of death in a flood is increased

Table E.2 Risk of death from various causes, New South Wales, 1981–86

Voluntary risks (Average to those who take the risk)	Chances (pmpy) ^A
Smoking (20 cigarettes/day)	
All effects	5000
All cancers	2000
Lung cancers	1000
Drinking alcohol (average for all drinkers)	
All effects	380
Alcoholism and cirrhosis of the liver	115
Swimming	50
Playing rugby football	30
Owning firearms	30

Transportation risks (Average to travellers)	Chances (pmpy) ^A			
Motor vehicle	145			
Train	30			
Aeroplane	10			

Average risks over the whole population of New	
South Wales	Chances (pmpy) ^A
Cancers of all types	1800
Accidents at home	110
Accidental falls	60
Pedestrians struck by motor vehicles	35
Homicide	20
Fires and accidental burns	10
Electrocution (non- industrial)	3
Falling objects	2
Therapeutic use of drugs	2
Cataclysmic storms and floods	0.2
Lightning strikes	0.1
Meteorite strikes	0.001

From Higson (1990).

tenfold on the basis that one-tenth of the New South Wales population is flood-prone, the risk of death by flooding is still significantly lower than for most other forms of death shown in Table E.2

 probability of death from any cause increases over a person's lifetime (e.g. there are 1800 chances pmpy) of

Table E.3 Projected loss of life caused by dam failure flooding

	Projected loss of life				
No. of people at risk	Warning time <1.5 h	Warning time >1.5 h			
50	10	<1			
100	15	<1			
200	25	<1			
500	40	<1			
1 000	65	<1			
10 000 .	250	2			
20 000	380	4			
50 000	660	10			

From United States Bureau of Reclamation (1989).

death by a cancer of some type, therefore, for any one person, there is a 1 in 555 risk of being killed by cancer in any one year (1 000 000/1800), over 20 years the risk of death from this cause increases to 1 in 28 and over 50 years the risk increases to 1 in 11.

E.11.2 Death from dambreak flooding

Overseas data are available for dambreak flooding situations, which relate potential loss of life to the population at risk and the available warning time (United States Bureau of Reclamation 1989, Table E.3). Data are based on actual loss of life experienced in dam failures in the United States of America. Only one dambreak flood incident in Australia has resulted in loss of life (see Appendix C.1), when 14 people (miners) were drowned when Breisis Dam in Tasmania failed in 1929 with apparently little or no warning. This figure is not inconsistent with the data of Table E.3.

E.11.3 Death from rainfall flooding

On the basis of experience in Australia, rainfall (or "natural") floods are dangerous, but not particularly so. Bushfires cause more loss of life in Australia than floods. Moreover, most of the lives lost during floods are lost by misadventure, by exposure to unrecognised risks, or by foolhardiness. Improved flood awareness could reduce loss of life caused by flooding. With respect to recent severe floods in Australia:

- in the Hunter Valley Flood of February 1955, some 14 lives were lost (0.5% AEP flood)
- seven people were drowned in the Woden Valley stormwater flood of 1971 in the Australian Capital Territory (1% AEP flood)
- 12 lives were lost in the Brisbane flood of January 1974 (1.33% AEP flood), all by electrocution when aluminium boats struck live power lines

A pmpy (per million person years).

- no lives were lost in the Nyngan flood of 1990 (0.5% AEP flood)
- no lives were lost in the Western Queensland floods of 1990 (1% AEP flood or greater) or the Spring 1993 floods in Victoria (about 1.0% AEP flood)
- no lives were lost in the Townsville floods of January 1998 (1%–0.2% AEP flood)
- three lives were lost in the Katherine floods of February 1998 (0.67% AEP flood)—one from drowning, one from a heart attack and one from a lack of medication.

E.11.4 An acceptable risk of death

A review of risks arising from many voluntary and involuntary lifestyle activities indicates that a risk of fatality of 1 pmpy is not large compared to many of the everyday risks accepted by individuals without concern (Table E.2). An additional risk of death of 1 pmpy from some new cause would not make a discernible difference to our longevity. Thus, a risk of 1 pmpy is deemed to be acceptable or negligible to an individual.

E.12 Individual and societal risks

The risk to an individual specific member of the community is known as "individual risk". As noted above, a risk of I pmpy is deemed acceptable to an individual. But what of the willingness of society to bear additional risks?

Societal risk is more complex because "society" weighs up how many people might die and the fact that we do not know who these people might be. This leads to the concept of "societal risk" in which the level of acceptable risk depends upon the projected number of fatalities. Societal risk reflects society"s aversion to disasters.

Figure E.1 shows a societal risk plot in which the probability of an event (flooding) is plotted against the number of fatalities likely to accompany that event. Figure E.1 is based on interim societal risk criteria for dam failure recently published by the Australian National Committee on Large Dams (ANCOLD) (Mackenzie 1994) and curves presented elsewhere, for example, for industrial hazards and nuclear hazards (Haddad 1994; Tweedale 1994).

There are three risk zones on the risk-fatality plot:

- "acceptable risk" zone is bounded by a single fatality at a risk of 10 pmpy and 100 fatalities at a risk of 0.01 pmpy
- · outer zone where risk is unacceptable
- middle zone where risk is to be reduced according to As Low As Reasonably Practical (ALARP) principles, although this raises the question as to specific quantitative meanings attached to the words "low", "reasonable" and "practical" (see Melchers 1993).

Are the same risk-fatality relationships for rainfall flooding (a "natural" disaster) as acceptable for dambreak flooding as those described for industrial and nuclear accidents, which are human-made disasters? In relation to acceptable levels of flood-related societal risk (Fig. E.1):

- it is difficult to assess objectively how many lives might be lost in floods (the US guidelines of Table E.3 are for dam failure and not rainfall flooding)
- on the basis of Appendix E.11.3, lives probably will be lost during urban floods with severities of 1% AEP or greater (the associated risk of the 1% AEP flood event is 10 000 pmpy—results of Figure E.1 indicate that even a single fatality is unacceptable at this level of risk)

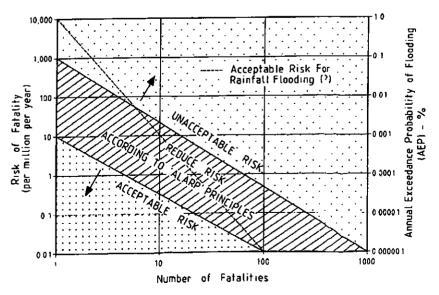


Figure E.1 Risk-fatality plot for societal risk

 if we assign the PMF an AEP of 0.0001%, the equivalent risk is 1 pmpy and according to Figure E.1, if the number of fatalities is 6 or fewer, this is an acceptable risk.

The risk-fatality relationship of Figure E.1, if deemed appropriate for rainfall flooding, will impose much more severe controls on floodplain development and floodplain management than in the past.

Society has accepted a much higher risk of fatality from flooding than indicated on Figure E.1. This was probably because society was not aware of the risks, rather than accepting known risks. Also shown on Figure E.1 is a provisional relationship that may be appropriate for the acceptable societal risks of death by rainfall flooding. This has been defined on the basis of currently accepted flood risks and centres on one fatality for the 1% AEP flood, 10 fatalities for the 0.001% AEP year event and 20 fatalities for the 0.0001% event (an upper limit to the PMF). If the expected fatalities are greater than these numbers, ALARP principles should be used to reduce risk.

An adequate flood emergency plan to address residual risk needs to be put in place to meet duty of care obligations.

E.13 Risk-damage study

The risk of fatalities during flooding needs to be considered despite the difficulty in meaningfully quantifying these risks. Guidelines already exist on how to assess and evaluate "difficult" risks in qualitatively (see Standards Australia 1995).

As a single fatality is acceptable only for the 0.0001% AEP flood event (Fig. E. I) all other risks need to be evaluated. A risk-damage study can provide considerable insight into an appropriate and economically justifiable level of flood protection. In a risk-damage study, all consequences are evaluated in dollar values. The flood damage to public and private properties is evaluated for a range of flood events and the AAD is extracted (see Appendix M). The costs to construct and maintain various management measures and the benefits that accrue from reducing flood damage can then be used to compare various management measures and to assist in the selection of a DFE.

The advantage of a risk-damage study is that is that the economic consequences of flooding can be assessed relatively reliably in dollar terms compared to the number of likely fatalities. This greatly facilitates risk considerations. Moreover, the effects of proposed new developments on the risk-damage relationship are relatively easily and reliably assessed in economic terms. This facilitates the evaluation of the effects of proposed new developments.

Appendix F Urban Stormwater Flooding

Within Australia, urban stormwater drainage systems generally are designed on a minor/major storm basis. The piped drainage system is designed to cater for frequent minor storms of low severity. A system of overland flow paths is provided to cater for severe storms which exceed the capacity of the piped system. The detailed design of urban stormwater drainage systems in Australia is discussed elsewhere (chapter 14 of ARR 1987). This Appendix highlights the need to prepare stormwater management plans to manage stormwater flooding, a similar procedure to the floodplain management planning process described in this document, and points out several issues specific to stormwater management.

F.1 Background

Today's "mixed design" for stormwater drainage is a tradeoff between convenience and costs. Piped drainage is expensive, especially if designed for large storms. Thus, a typical stormwater drainage system enables the runoff from small storms to enter the piped drainage system with no inconvenience to townspeople, whereas the occasional large storm results in overland flow, which may disrupt and damage dwellings, businesses and other properties.

Most stormwater flooding problems are caused by the inadequate capacity of trunk piped drainage systems or overland flow systems.

F.2 Defined storm events

The defined storm event adopted for stormwater drainage planning and design depends on factors including land use. Table F.1 shows storm event AEPs commonly adopted in Australia for street drainage systems in different types of urban areas (ARR 1987, p. 296). Whereas the AEPs of Table F.1 reflect current practice, they may not reflect

Table F.1 Severity of storm events commonly adopted for design purposes, street drainage planning, Australia

Type of urban area	AEP (%)	
Intensely developed business, commercial & industrial areas	2-5	
Business, commercial & industrial		
areas and intensely developed residential areas	10	
Residential and open space areas	20	_
From ARR (1987).		

damage implications in specific circumstances. In a minor/major drainage system, it may be appropriate to reduce the severity of DFEs for the piped system while increasing the severity of DFEs for the overland flow system.

With respect to stormwater management, designed overland flow paths are the most important element in catering for flows greater than street drainage capacity and trunk drainage systems.

F.2.1 New urban areas

In selecting a storm event AEP for street and trunk drainage in newly developing areas, the consequences of large floods need to be assessed (as with mainstream flooding). Hazard and damage implications with respect to depths and velocities of flow along the overland flow system, and the likelihood of surcharging and overtopping of any detention basins, are particularly important. If a detention basin is overtopped, the likelihood of the embankment being breached and the hazard and damage associated with the resulting "dam" failure need to be evaluated in determining an appropriate DFE. The upgrading of inadequate urban stormwater drainage systems can be very expensive—it is far better to design and build an appropriate system.

F.2.2 Older urban areas

Stormwater drainage in many older urban areas was designed to standards that are no longer appropriate. In particular, formal overland flow paths to cater for flows that exceeded the capacity of the piped drainage system were not considered. The upgrading of piped and trunk drainage systems within older areas is, at best, expensive and, at worst, may be infeasible because of restricted access and limited availability of land. Often there is no alternative but to adopt a lower standard of performance.

A further issue that arises is the redevelopment of older urbanised areas. If the redevelopment results in a loss of porous areas, or a greater concentration of runoff into the existing drainage system, the standard of performance of the drainage system will be lowered.

F.3 Administration

Where urban catchments are administered by multiple local authorities, stormwater drainage conflicts can emerge when drainage standards differ. Newly urbanised areas within one local authority can give rise to additional stormwater runoff volumes and higher peak discharges within another. Conflicts can arise among authorities regarding the source, management and contribution of funds used for the mitigation of stormwater runoff. These disputes highlight the need for a total catchment approach.

When several local agencies are responsible for stormwater management within a catchment area, it can be more effective to form a single authority, such as a stormwater management trust, to provide integrated and coordinated stormwater management catchment-wide, for example, The Upper Parramatta River Catchment Trust of New South Wales.

F.4 Stormwater management plans

If stormwater drainage and flooding problems are to be controlled effectively, this needs to be done via the development and implementation of a stormwater management plan. This process is similar to floodplain management planning and involves:

 forming an advisory committee representing all stakeholders

- recognising existing, future and residual stormwater management problems
- evaluating the behaviour of existing stormwater systems under a range of flood events (equivalent to a flood study)
- identifying and evaluating management options, including social, environmental and economic effects (equivalent to a floodplain management study)—options comprise structural measures, land use controls and building controls, but also include emergency measures where undue risks may develop
- implementing the provisions of the stormwater management plan.

It is only by planning for the management of stormwater on a total catchment basis and by assessing both existing and likely future land uses that coordinated management measures can be identified and implemented to ameliorate existing stormwater problems and ensure acceptable future levels.

Appendix G The Floodplain Management Plan

A floodplain management plan forms the heart of effective floodplain management. This Appendix describes various elements of a floodplain management plan and describes a procedure to assist in assessing options with conflicting consequences. A specific set of guidelines for formulating a floodplain management plan cannot be provided because of the wide variety of issues and their changing significance among communities. However, general elements of a plan can be identified and discussed.

G.1 Definition of issues

Both the objectives and issues of a floodplain management plan must be identified and defined at the outset. Failure to do so will lead to confusion and wasted effort. These issues can be of a social, economic, ecological and community nature, quite apart from flooding considerations.

It is the responsibility of the Floodplain Management Advisory Committee (the Committee), in consultation with State agencies, expert advisers and the local community, to define appropriate objectives and identify significant issues associated with the use of flood-prone land.

G.2 Potential management measures

Floodplain management measures are described in detail in Appendix B. Key issues concerning various management measures are highlighted here.

G.2.1 Land use planning controls

Land use controls are essential to ensure that land use on flood-prone land is compatible with flood risk if the rate of growth in future flood damage is to be reduced.

Once flood-related planning measures have been finalised, flood-related zonings need to be formalised and the measures incorporated into statutory planning instruments.

Zonings need to be defined so that requirements based on cumulative effects can be adequately applied to individual proposals that may, in isolation, have minimal impact (see Appendix G.5.2).

G.2.2 Structural works

The feasibility, effectiveness and economics of various structural means of control need to be considered.

Structural measures modify flood behaviour. Although they may reduce flood discharges and levels in one area, such works may increase flood discharges and levels elsewhere. The hydrologic and hydraulic models developed in the flood study are used to assess the effect of structural works on flood behaviour.

The various State water resources agencies can provide guidance and advice on technical aspects of structural works. Structural works have associated environmental, economic and social costs, which need to be evaluated. The Committee may need to engage specialist consultants to undertake these studies.

When contemplating and evaluating structural works, local agencies should be aware of the possible environmental benefits. For example, detention basins can also serve to improve water quality; river improvements can incorporate wetlands.

G.2.3 Development and building controls

Development and building controls are essential to limit the resultant damage to flood-prone buildings.

G.2.4 Flood emergency planning

A flood emergency plan to address residual flood risk is essential. Such a plan is complementary to the broader auspices of the floodplain management plan (see Appendix H).

Local agencies have access to many of the resources necessary for flood emergency planning and response (e.g. labour, plant and machinery, buildings). A cohesive working relationship needs to be established between local agencies and emergency service agencies to fully utilise the available resources.

Flood emergency plans are aimed at modifying the community's response to the onset and aftermath of a flood. No matter how accurate and timely a flood warning, and no matter how well thought out the emergency plan, much effort will be wasted unless the community responds effectively. Thus, there is a real need to make the community fully aware of its responsibilities in the onset and aftermath of a flood, and moreover, to maintain this awareness by a program of regular re-education of people living in flood-prone areas.

G.3 Assessment of options

The formulation of a floodplain management plan involves consideration of various options concerning land use and the mitigation of flooding, flood risk and flood hazard, together with an assessment of the social, economic and environmental consequences of proposed land uses and mitigation measures.

The risk management approach can assist in selecting DFEs and measures to address existing, future and residual risks. However, these measures will generally have different economic, social and environmental effects.

The formulation of a floodplain management plan is an exercise in decision making aimed at achieving multiple and often conflicting objectives. Assessment can be difficult because of the different nature of the underlying issues (e.g. one plan of development may be preferable from a community point of view, but at an increased risk of flooding, but an alternative plan may be environmentally preferable, have a lesser risk of flooding, but may be less desirable from the community viewpoint). How can two plans be compared?

The easiest way is to use a "matrix method" of comparison. A matrix is prepared in which the columns consist of the various management options and the rows consist of the various floodplain management objectives and issues.

How well the various management options meet the objectives and issues is assessed and the information entered into the matrix. Where possible, the advantages and disadvantages of each option should be quantified. This can be done relatively easily in terms of the costs of flood mitigation measures and the associated reduction in flood damage. In other areas, such as the environment and community desires, a quantitative estimate is difficult. A qualitative estimate of the advantages and disadvantages of the option needs to be made and entered into the matrix, for example, ranking outcomes on an ordinal scale of (say) 1 (best) to 5 (worst).

Once the matrix has been prepared, it provides a framework for comparing the various options on an issues basis. The best option for each issue can then be determined; issues still in doubt can be identified and further investigated. This process facilitates the comparison of options, both individually and collectively, leading to a balanced decision regarding the "best" option(s).

G.4 Adopted plans

A floodplain management plan is never truly finished. Social and economic circumstances change; flooding behaviour may be substantially altered by future developments or measures adopted in other areas of the catchment. A

floodplain management plan represents the "best" appraisal of existing and likely future circumstances at the time that the plan is adopted. For this reason, floodplain management plans are not considered final, but "adopted" for the immediate future. Plans should be reviewed regularly (e.g. every 5 to 10 years) to ensure that their provisions remain current and appropriate.

G.5 Specific issues of concern

Preparation of floodplain management plans in the State and Territories of Australia over the last 5 to 10 years has identified specific issues of concern. These issues are described below and should they arise in a particular flooding situation, need to be treated with diligence because of their potential significance.

G.5.1 Future planning considerations

Preparation of a floodplain management plan involves a realistic appraisal of desired and realisable future land uses. If future land use is not considered and appropriately incorporated in the plan, the benefits of measures implemented today may be overrun by the impacts of future development. To encompass the possibility of large-scale land use change and urban redevelopment, the planning horizon should be 20 to 30 years.

Future land use planning provisions of a floodplain management plan need to be well researched, well publicised and based on community consultation.

G.5.2 Cumulative effects

A common problem on many floodplains is the cumulative effect of development. As developments are built, each may have an small effect on flood behaviour individually but become significant cumulatively. Common examples of cumulative adverse effects are the progressive blocking of floodways and flow paths by individual developments, the ad hoc filling of inappropriate floodplain areas, and the increase in the at-risk population living and working in the more hazardous areas of the floodplain.

A total catchment approach allows cumulative effects to be evaluated before they occur. This involves identifying the location and encroachment of "allowed development", undertaking hydraulic and hazard studies to assess the impact of cumulative development in these areas, and the formulation of planning, building and development controls to ensure that future developments conform to the adopted plan. Conforming developments may proceed; non-conforming developments should not be allowed unless compensating measures are both fully investigated and implemented.

G.5.3 Infrastructure protection

Essential infrastructure services, such as water supply, sewerage, telephone and electric power need to be protected during the onset of a flood. The ready restoration of these services in the flood's aftermath will facilitate clean-up and recovery, thereby minimising social disruption to the community.

Examples of protection methods include building temporary banks around sewage treatment plants, water treatment plants and electricity substations. Alternatively, design and fabrication to allow the uncoupling and removal of electric motors from pumps in flood-prone sections of the sewerage and water supply systems will facilitate the reactivation of these systems in a flood's aftermath.

If new or upgraded infrastructure facilities are proposed, all endeavours should be made to locate them in flood-free areas, render them flood proof or ensure that services can be easily restored after a flood.

G.5.4 Larger floods

All floodplain management plans need to consider the implications of the full range of flood sizes—up to and including the PMF—on flood risk and the management process. Management measures that may be appropriate for the DFE may be inadequate for larger floods.

The choice of DFEs is often a difficult compromise between increasing marginal costs of structural measures and decreasing marginal benefits. Although it is desirable to adopt the highest level of protection, this is not always economically possible. What this means is not the unthinking acceptance of the limited level of protection provided by structural measures, but the need for flood emergency plans to mitigate the hazard associated with larger floods. The definition of the floodplain and floodprone land should always be based on the PMF event and not on the more limited area inundated by DFEs. In this way, the community will be aware of the possible extent of flooding and of their own need for appropriate action in the case of extreme events.

G.5.5 Levees

Levees are a tried and true flood protection measure—as long as they are not overtopped in an uncontrolled fashion and do not fail. Consequences of levee overtopping need to be assessed in detail, and appropriate emergency plans put in place.

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In considering levees, any increase in velocity resulting from the constriction of flow should also be examined. Increased velocities may result in erosion of the bank or bed of the stream, causing the foundations of the levee to be undermined and collapse.

G.5.6 Islands

The formation of islands on the floodplain during a flood is always potentially hazardous and is to be avoided. People trapped on the island may be safe for small floods, but are at high risk in extreme floods. The development of land that becomes isolated prior to inundation increases the load on emergency services during flood events. Furthermore, the rescue of people from islands may place rescuers at undue risk.

G.5.7 Detention basins

Detention basins are being used increasingly as a means of controlling the peak discharge from newly urbanised areas. Some basins are becoming quite large; they are more properly regarded as small dams and have to be designed as such.

The potential hazard to downstream areas associated with the potential overtopping and breaching of detention basin embankments (i.e. dambreak) needs to be carefully allowed for in basin design.

Special care needs to be taken when a system of basins is built on the tributaries of urban catchment. The likelihood and consequences of a cascade failure of these basins needs to be assessed (i.e. the flood wave associated with the failure of an upper basin causing downstream basins to fail, so magnifying the resulting dambreak flood).

Appendix H Flood Emergency Planning

Flood emergency planning refers to the preparation of formal plans of action to deal with the threat, onset, occurrence and aftermath of a flood. All States and Territories have a State or Territory emergency service (S/TES) organisation that typically leads emergency management, including flood management. This Appendix discusses the role of S/TES agencies, other State and local agencies and the Commonwealth Bureau of Meteorology in flood emergency planning and describes key aspects of flood emergency plans.

H.1 Background

All State and Territory emergency management agencies recognise four distinct components of emergency management, including flood management. These are:

- prevention (see Appendix H.4)
- preparedness (see Appendix H.5)
- response (see Appendix H.6)
- recovery (see Appendix H.7).

Emergency measures dealing with the actual occurrence of flooding are now recognised as essential, being both necessary and complementary to the more traditional management measures of a floodplain management plan. Of all management measures, it is only emergency measures address the residual risk associated with all floods. In some cases such measures may be the only feasible way to deal with existing risk where structural measures are either impractical or not economically justified. Even minor floods require some management responses, even if they are only providing information to the community.

Flood emergency planning should involve the coordinated activities of:

- S/TES agencies
- State agencies
- Commonwealth Bureau of Meteorology
- · Local agencies (including Councils, where they exist)
- volunteer groups, including the S/TES and other organisations (e.g. service clubs, charities).

H.2 The State/Territory emergency service agencies

Emergency management arrangements differ between the various States and Territories. However, generally the S/TES agency in each State and Territory is the lead agency (combat authority) for the operational management of flooding. In some jurisdictions this responsibility has been extended to preparing flood emergency plans that detail preparedness, response and recovery arrangements.

H.3 Preparation and content of flood emergency plans

Ideally the agency responsible for preparing flood emergency plans should be responsible also for collecting, compiling flood intelligence and for coordinating response activities. Having such broad responsibilities encourages the agency to develop expertise in managing flood episodes. Other agencies will also be involved in flood emergency planning, but the lead agency should have the coordinating role.

Flood emergency plans can be written for different levels of jurisdiction—States, regions and local areas (Council areas, or parts of Council areas) or amalgamations of these areas. Plans at different levels will have differing contents, partly reflecting the responsibilities of the principal participants at these different levels.

State flood emergency plans may detail:

- responsibilities of key agencies (e.g. S/TES and departments of planning and water resource management) with respect to prevention, preparedness, response and recovery measures
- requirements for flood emergency planning at the regional and local levels—these plans would define the appropriate scope and content of such plans and any special flood emergency plans which may be needed (e.g. to cater for potential dam failures)
- requirements for specific flood emergency activities (e.g. warning and information provision)
- emergency management structures that supports flood operations
- control mechanisms and the responsibilities of key staff (e.g. S/TES Controllers or Managers).

Regional flood emergency plans may detail:

- arrangements for coordinating flood responses occurring simultaneously in several Council areas within the region
- arrangements for coordinating the provision of extra resources required at local level
- activities at regional level on behalf of agencies involved in operations at local level (e.g. the transmission of flood forecasts and the provision of information to the media)
- · control arrangements.

Local flood emergency plans may detail:

- nature of the flood threat
- areas which could be affected by flooding
- · sources of flood intelligence
- roles and responsibilities of listed agencies before, during and after flood episodes
- · control arrangements
- · trigger conditions for plan activation
- · liaison and communication arrangements
- arrangements for public education, warning, the passage
 of information to flood-affected communities, road
 control, sandbagging, evacuation, resupply, rescue, the
 registration and welfare of evacuees, initial recovery and
 post-flood debriefing.

All levels of the plan should detail arrangements for plan review.

H.4 Flood prevention

The most important prevention measure is land use planning (i.e. the need to ensure that the various land uses on the floodplain are appropriate to the flood risk and associated damage and hazard). Structural measures to control flood waters and building controls are also important in some areas.

The most comprehensive prevention activity that a local agency can undertake is the preparation and implementation of an effective floodplain management plan. In the interim period before the plan is complete, the local agency should liaise with S/TES, other agencies and the community in relation to proposed new developments on the floodplain. In particular, emergency service organisations will be able to provide safety advice on such matters as rescue and evacuation.

H.5 Flood preparedness

Flood preparedness refers to the affected community (the flood-prone population and the various flood and floodplain management authorities) knowing what to do and how to do it effectively during the onset of a flood.

With regard to combat agencies, preparedness includes the training of staff in sandbagging, flood warning, evacuation, rescue, resupply and other flood emergency tasks, and ensuring the provision and reliability of equipment to be used in a flood.

With regard to the flood-prone population, preparedness, or flood awareness, is especially important. Studies in New South Wales have shown that flood-aware people are much more effective in reducing damage to their goods and possessions than people who are not prepared (Water Studies 1986). Equally, they are more likely to understand the need for evacuation and will understand what to take with them and which route to utilise when evacuation becomes necessary.

In some jurisdictions, the S/TES has the responsibility for fostering and maintaining flood awareness and preparedness in the local population. However, this can only be done effectively with the cooperation and whole-hearted support of the local agency. This commitment by the local agency can be thought of as a "maintenance cost" of flood emergency planning.

Raising and maintaining flood awareness is not easy. The natural turnover of properties and residents in flood-prone areas results in people who have experienced floods being replaced by those who may have no experience in flooding. In the often long periods between severe floods, flood awareness erodes and may even disappear. This is especially so for communities protected by levees, which generally provide protection from all but the more serious and infrequent floods. Ukimately, however, a flood that overtops the levees will occur.

Local agencies can enhance flood awareness through, for example, regular public education programs via newspaper articles, videos, pamphlets, meetings and messages accompanying rate notices. Local agencies should liaise with the S/TES for advice on the design and execution of such programs, for which flood emergency plans themselves may provide useful information. A growing range of innovative methods is available for the delivery of educational messages.

H.6 Flood response

Flood response refers to the operations that may be initiated to reduce the hazard of an actual flood. These operations include flood forecasting, flood warning, road control, sand bagging, evacuation, resupply and rescue and providing

information and advice to communities affected by flooding.

The Bureau of Meteorology is generally the lead agency in all States and Territories for flood forecasting (see Appendix G.8). Usually the forecasting will initiate flood warning activity by other agencies. However, for very low levels of flooding, these agencies may initiate warnings without the trigger of Bureau-provided forecasts.

State water resources agencies provide data and additional "field" information on the development of a flood (e.g. water levels, rates of rise, rainfall). Such information is passed to the Bureau of Meteorology to assist in the formulation of forecasts.

Local agencies and S/TES units are also increasingly collecting and forwarding information to the Bureau of Meteorology to assist in the formulation of forecasts and warnings.

The Main Roads Department, the Police Department or local agencies are responsible for signposting and closing flooded roads and determining detours.

Local agencies (usually Councils or the S/TES) assist in distributing flood warnings to the affected population and provide labour, equipment and facilities for conducting a range of response tasks, such as sandbagging, lifting or moving furniture and commercial stock, monitoring and supplementing levees and performing rescue, evacuation and resupply activities.

Flood emergency plans need to be based on a thorough understanding of likely flooding behaviour. Strategies to guide flood combat activities appropriate at one level of flooding may become hazardous or otherwise inappropriate at higher levels. Hence, representatives of the State water resources agency or other agencies need to have an intimate technical knowledge of flood behaviour in the area to assist with preparing these plans.

H.7 Flood recovery

Flood recovery refers to clean-up, welfare, restoration of services and other forms of assistance provided by volunteers and by Local, State and Commonwealth Government agencies in the aftermath of a flood. Traditionally, recovery functions are divided into those which deal with human welfare and those relating to infrastructure and facilities. The local flood plan should contain details of initial clean-up and recovery operations.

In general, the S/TES agencies are responsible for providing immediate relief post-flood until specialist welfare providing agencies are activated and ready. Local agencies may be involved in providing some welfare services, together with

representatives of welfare organisations (Local, State, Federal), charities and services clubs. Clothing, food, accommodation and personal services may need to be arranged.

The importance of volunteers, both local and regional, needs to be recognised in the recovery process. In the Nyngan flood of April 1990, volunteers from across New South Wales provided the bulk of labour required for cleanup of both public and private properties. Volunteer welfare agencies such as St Vincent de Paul and The Salvation Army were untiring in providing, for example, food and clothes (WRC 1990).

Sensible planning with respect to essential services can assist the recovery process. Services essential to speedy recovery include those relating to electricity supply, water supply, sewerage, telephones, police stations and hospitals. The integrity of these services can be maintained or their recovery promoted by locating them in flood-free locations, by siting them above PMF levels, or by floodproofing them (e.g. ensuring that the electric motors of water supply and sewerage pumps can be readily uncoupled and shifted to flood-free locations). Such measures do not need to be instigated urgently. Rather, as essential infrastructure is renewed and upgraded, the opportunity to relocate to a flood-free location or to floodproof should be taken by Local, State or Commonwealth agencies.

H.8 Flood forecasting and flood warning

The Commonwealth Bureau of Meteorology is generally the lead agency with respect to flood forecasting and the initiation of flood warnings.

The terms "flood forecasting" and "flood warning" tend to be interchanged, although they refer to separate processes:

- flood forecasting refers to the process of predicting the severity of flooding at a particular location (i.e. how high the flood waters will rise, what area of land will be inundated and when peak flood levels will occur)
- flood warning refers to the process of alerting the occupants of flood-prone areas of the immediacy and severity of the flood risk and persuading those at risk to take action to prevent flood losses.

Although the two processes are separate—it is possible to forecast floods without issuing any warnings—an appropriate forecasting system is essential to an efficient and effective warning system.

H.8.1 Forecasting

Flood forecasting is a specialist activity that requires the services of trained and experienced meteorologists and hydrologists. Typically, computer models are used to

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provide forecasts. Since the late 1980s flood forecasting technology has improved. Rain gauges and water level recorders can gather and transmit data automatically via telemetry (telephone, radio, satellite link) to a central receiving station, where the data can be automatically incorporated in computer-based forecasting models.

In all States and Territories, several agencies contribute to the flood forecasting and warning process via the Flood Warning Consultative Committee as follows:

- the Commonwealth Bureau of Meteorology (CBM) is responsible firstly for collecting and analysing rainfall and river data and secondly for formulating and issuing forecasts on a river basin scale (i.e. regional scale)
- in general, the S/TES agency is responsible for coordinating the dissemination of flood warnings issued by the CBM at regional and local levels, and for developing and issuing specific local flood advices for communities not receiving warnings from the CBM
- the State water resources agency generally is responsible for providing the CBM with river height data from manual and telemetered stream gauges, information concerning local flood behaviour, information concerning off-shore ocean data in coastal areas, and information concerning the operation of irrigation storages on the various river systems
- several local agencies now operate their own computerbased recording and forecasting systems that monitor rainfall and water levels and telemeter this information to a central computer—the CBM generally has direct access to such systems to assist the local agencies in making forecasts.

Flood forecasting products issued by the CBM include:

- generalised forecasts, which are issued whenever a
 developing meteorological situation is anticipated to
 cause flood-producing rainfall or when flood-producing
 rains are occurring—these forecasts sometimes are issued
 only for areas that have no specific flood forecasting
 system installed and can be very general in their coverage
- preliminary flood forecasts generally are issued for specific catchment areas whenever a developing meteorological situation is anticipated to cause floodproducing rainfall—the form of these warnings can be different in the various States to suit the needs of the State agencies and special flood advices can be issued as an alerting mechanism to S/TES staff in some cases and are designed to provide time for S/TES staff to begin preliminary mobilisation procedures
- flood predictions are issued at regular intervals during a flood and normally include a river height or flood classification (minor, moderate, severe) prediction for

specified times at key forecast points on the river—predictions continue until river levels drop to a level where further forecasts are not warranted (i.e. flood warnings cease when the flood falls below the designated minor flood level)

- a final flood forecast
- flash flood forecasts are issued when the flood occurs
 within six hours or less of the causal rainfall—these are a
 special form of the generalised warnings in most cases,
 although where local flash flood warning systems have
 been established, more specific information may be
 provided.

S/TES agencies or local agencies may issue local flood advices based on local information. Local information may include more detailed information at gauges for which the CBM issues river height predictions, or river-height predictions at gauges not covered by the CBM service.

The available flood warning time often may be inadequate for small coastal rivers or for towns in river headwaters. Flood forecasting and warning systems for these areas can be limited in their effectiveness. However, technological improvements—especially radar-based systems—are likely to enhance effectiveness.

All flood predictions contain a degree of uncertainty. Therefore, operational decision-makers need to account for the possibility of predictions being too low. This becomes critical as predicted heights approach key heights, such as the top of a levee.

H.8.2 Warning

Flood warnings can be disseminated in several ways and by a variety of agencies: by radio, television, telephone, facsimile and/or doorknocking by the S/TES, police and Council staff, by loud-hailer and even by newspapers. The S/TES is generally responsible for coordinating the flood warning effort at the community level. Where they exist, local flood plans specify the flood warning activities to be undertaken by the various agencies.

Flood warning should include:

- maintaining flood intelligence records indicating what
 effects occur at particular levels of flooding as measured
 at nominated stream gauges, including road closures,
 inundation of farmland and other property, flooding of
 buildings over floor levels—this information provides a
 basis for providing advice before specific heights are
 attained
- defining the "clients" of warnings at different flood levels—clients may include farmers, caravan parks, tourists and travellers, business and industrial interests, aboriginal communities and townspeople

- identifying the information needs of different client groups and the means by which warnings and advice will be transmitted to different clients at a range of possible flood heights—generally, high-quality warning requires more than one method of dissemination the ability to confirm messages
- determining who will undertake warning tasks and what local networks (e.g. warden systems and community leaders) are needed.

More detailed best practice guidelines are available for flood warning (Emergency Management Australia 1995, 1999c), flood preparedness (Emergency Management Australia 1999b) and flood response (Emergency Management Australia 1999d).

Appendix I The Flood Study

f.1 Introduction

A flood study is a comprehensive technical investigation of flooding behaviour that defines the extent, depth and velocity of floodwaters for floods of various magnitudes. This enables both the hydraulic category and hazard category of the defined flood area to be determined. A flood study constitutes the principal technical foundation from which a floodplain management plan is formulated.

In addition, a flood study identifies aspects of flooding behaviour that require special consideration. For example, if the rate of rise of floodwaters is especially rapid, the degree of hazard is increased because of shortened warning and evacuation times. Similarly, the degree of hazard is increased if rising floodwaters create islands from which evacuation is difficult or impossible.

There are two principal components to a flood study:

- hydrologic analysis or estimation of flood discharges for floods of various magnitudes
- hydraulic analysis or determination of the extent, depths and velocities of flooding.

I.2 Hydrologic analysis

The discharge of floodwaters varies throughout the course of a flood event (Fig. I.1). The hydrographs are characterised by a relatively rapid rate of increase in discharge on the rising limb up to the peak discharge, followed by a slower decline in discharge on the falling limb. Blunder Creek at King Avenue, Brisbane, has a catchment of 52 km²; the Clarence River at Grafton, New South Wales, has a catchment of 19 900 km², hence the much higher peak discharge of the Clarence River and its slower rate of increase in discharge.

Before the depths and velocities of floodwaters can be determined it is necessary to know the peak flood discharge, and in some situations, the entire discharge hydrograph. Two techniques are commonly used:

- flood frequency studies
- rainfall-runoff models.

I.2.1 Flood frequency studies

A flood frequency study is a way to determine the relationship between peak flood discharge at a location of

interest and the likelihood of occurrence of a flood event of that size.

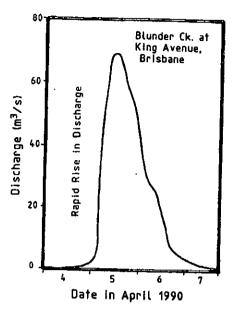
Flood frequency studies generally are based on peak annual discharges determined at a stream gauging station close to the location of interest. (The peak annual discharge is the highest discharge occurring in each year of record). Generally, creek and river discharges are not measured directly. Rather, discharges are estimated from water levels, which can be measured relatively easily and inexpensively (e.g. automatic water level monitors to record the change in water levels as a flood passes downstream). A rating curve is derived to relate measured water level to inferred discharge.

The rating curve is based on actual measurements of discharge (made with a current meter) and on hydraulic analyses.

Most discharge measurements made with a current meter are taken in the low discharge range (i.e. at discharges which may amount to only 10%-20% of the 1% AEP flood discharge). Further, while water during low flows is often confined to the main river channel, high discharge behaviour is often characterised by extensive areas of overbank flow and multiple major flow paths. Thus, while a rating curve may be reliable for low discharges, it becomes increasingly unreliable for higher discharges, especially for severe flood discharges. Hydraulic analyses are used to extend the rating curve into the range of water levels characteristic of larger floods. These analyses are approximate rather than exact for reasons outlined above. As a consequence, estimates of peak annual flood discharge—as obtained from recorded water levels at a gauging stationare accurate to within about 20%, even when made by an experienced hydraulic engineer.

Figure I.2 shows the rating curve for the stream gauging station at Walyunga [gauging station (GS) 616 011) on the Avon River, WA. The curve indicates that for a GH of 5.0 m, the discharge is some 350 m³/s. The Avon River at Walyunga is a "well-gauged" river. The highest gauged discharge is 650 m³/s, which is about 40% of the 1% AEP flood discharge of 1700 m³/s.

Once a rating curve has been defined, the peak annual flood levels recorded at a stream gauging station can be converted to peak annual discharges and a frequency analysis of the discharges can be undertaken. Figure I.3 shows the frequency distribution of peak flood flows in the Avon River at Walyunga for the 13 largest floods from 1862 to 1985.



15000 Clarence River at Grafton, NSW

10000 11 12 13 14 15 16 17 18 19

Date in June 1967

Figure 1.1 Discharge hydrographs

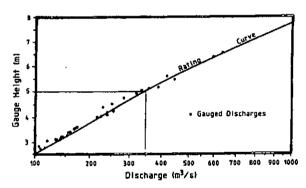


Figure 1.2 Rating curve—Avon River at Walyunga, WA

Hydraulic models (see Appendix I.3) were used to estimate discharges at high flood levels.

According to Figure I.3, the discharges of the 10% AEP and 1% AEP flood events are 650 m³/s and 1700 m³/s, respectively.

Because of the generally short periods of record at most gauging stations (20-50 years on average), there is always some uncertainty in the estimates of peak discharges obtained from a flood frequency analysis. These uncertainties are statistical and additional to inaccuracies arising from an unreliable rating curve.

These statistical uncertainties are illustrated in Figure I.3, which shows the 95% and 5% confidence limits. These confidence limits provide a measure of the statistical reliability of flood frequency discharge estimates and reflect the effects of a limited body of data (only 13 flood events) being used to estimate discharges. The 1% AEP flood estimate for the Avon River at Walyunga is 1700 m³/s. The

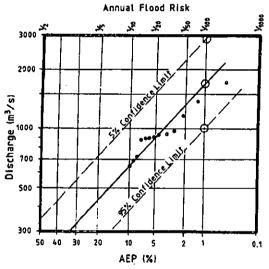


Figure 1.3 Flood frequency curve for Avon River at Walyunga, WA

5% and 95% confidence limits are 3000 m³/s and 1000 m³/s, respectively (i.e. there is a 5% chance that the "true" 1% AEP discharge is greater than 3000 m³/s and a 95% chance that it is greater than 1000 m³/s. Needless to say, the "best" estimate of the 1% AEP discharge is 1700 m³/s.

Therefore, flood frequency studies are a relatively rapid means of estimating the peak discharge of "standard" flood events of interest. Additional studies enable the hydrographs associated with these peak discharges to be defined. Significant errors can arise through inaccuracies in rating curves and from the use of relatively short periods of record to determine flood discharges.

I.2.2 Rainfall-runoff models

A rainfall-runoff model is a *mathematical* representation of the various catchment processes that transform rainfall into runoff. A nominated rainfall event is input to the model, which then simulates the associated discharge hydrograph at locations of interest in the catchment.

The two main carchment processes that affect the size and shape of discharge hydrographs are rainfall losses and storage routing effects as the runoff travels down the carchment. Rainfall-runoff models can only approximate these processes, and to obtain reliable estimates of discharge hydrographs, it is necessary to calibrate the model to a flood event for which both rainfall and discharge data have been recorded.

Calibration consists of adjusting rainfall loss rates and routing parameters to obtain agreement between the recorded and simulated hydrographs. Calibration is often lengthy and difficult; also calibration should be verified against several other recorded flood events to ensure that the model acceptably reproduces recorded results. Once calibrated, the rainfall-runoff model can then be used with some confidence to predict discharge hydrographs associated with rainfall events of known severity.

Rainfall data throughout Australia are available as intensity—duration—frequency data, from which it is possible to determine the intensity of rainfall (in mm/h) for a given duration of storm (in hours) with a specified annual chance of occurrence for any given location (ARR 1987).

Therefore, rainfall-runoff models are useful for simulating discharge hydrographs and for estimating peak discharges. However, reliable results will only be obtained if the model is calibrated against a recorded flood (hopefully large) and verified against other floods. Rainfall-runoff models provide a convenient way of estimating discharge hydrographs in catchments containing dams or reservoirs (the effects of these storages on discharge hydrographs can easily be incorporated in the model).

I.2.3 Comparison of methods

If recorded flood data are available at a representative stream gauging station, and the period of record is adequate, a flood frequency study provides a rapid estimate of peak flood discharges. Actual flood hydrographs can be determined by the investigation of recorded hydrographs.

Generally, rainfall records are longer and far more extensive than stream flow records. Hence, rainfall data has a greater degree of statistical reliability than discharge data. Consequently, it is usual to use a rainfall-runoff model to estimate peak discharges and hydrographs. Such a model can also simulate the effects of different land use developments on discharge hydrographs (e.g. urbanisation, dams, mitigation works).

1.3 Hydraulic analysis

Once the peak discharges (and the discharge hydrographs if necessary) of flood events of interest have been estimated, water levels, velocities and the extent of flooding along the reach of river under consideration can be determined. This requires an hydraulic model.

Hydraulic models are of two main types: numerical and physical. In numerical models, a computer is used to solve the equations representing the flow of water down a river system and so to predict water levels and velocities. A physical model is a scaled down version of the actual river system being studied. Although useful in complex flooding situations, physical models are only rarely used now in flood studies. Before describing numerical models, the factors that affect water levels and velocities are discussed.

I.3.1 Water levels and velocities

The water level and velocity associated with a discharge of water past a given point on a river system depends principally upon three factors:

- the available energy driving the flow
- the loss of energy associated with frictional effects as the flow moves over the bed and banks of the river channel and floodplains
- · the cross-sectional area of flow.

Water flows because of a difference in energy levels. In broad terms, the available energy is defined by the slope of the river channel ("hydraulic gradient"). The greater the slope, the greater the gravitational energy available to cause water to flow from upstream to downstream and the faster the water flows. Flowing water uses energy to overcome frictional resistance as it moves along the river channel and over the floodplains.

Rough surfaces, such as outcrops of rock, trees, tree roots, fallen logs and tangled and matted vegetation, produce much greater frictional resistance than smooth surfaces, such as grass, croplands and concrete-lined channels. Where the frictional resistance is low, water flows faster and shallower.

The area and depth of flow also affect water levels and velocities. The larger the area of flow, the smaller the velocity needed to pass a given discharge; shallower flows are slowed down by friction to a greater extent than deeper flows.

Generally, the slope of the river channel will change along its length. In addition, the frictional resistance usually varies across the width of a cross-section and along the reach of interest. Further, the width and shape of cross-section will also change along a river.

Because of these variations, the factors that affect water levels and velocities interact in a complicated way, further complicated by raised road embankments or bridges across flood-prone lands, and the presence of any significant flow constrictions along the river.

I.3.2 Development of numerical models

In a numerical model, the equations that relate available energy to friction losses and the area and depth of flow are solved by computer. This process provides estimates of water levels, velocities and the extent of flooding.

Numerical models require data concerning the bed slope, frictional resistance and topography of the river channel and floodplains. These data are obtained as follows. First, the river reach of interest is studied closely, both from topographic maps and from field inspection, to obtain a general understanding of likely flooding behaviour. Next, cross-sections that represent the topography are selected and are measured by field survey. This enables channel slopes and the depth and areas of flow at these locations to be determined for any water level. Finally, the frictional resistance at the various cross-sections is estimated by a visual inspection of the area, noting, for example, type and nature of bed and bank materials, presence of trees, scrub, rocks and logs.

All these data are fed into the model, which is then ready for calibration. If the downstream end of the model is non-tidal, then a rating curve is used to determine the downstream water level. If the downstream end of the model is a tidal river reach or the sea, it is necessary to incorporate the rise and fall of downstream water levels in the model.

I.3.3 Calibration of numerical models

Calibration consists of adjusting various parameters in the model to obtain agreement between recorded and simulated water levels during a severe flood. Firstly, a flood suitable for calibration purposes is adopted. Next the peak discharge or discharge hydrograph of the flood is estimated and entered into the model. Information on peak flood levels and flood behaviour is sought from, for example, long-standing residents, newspapers and council records. All of this information is used in calibration as a basis for adjusting frictional resistance parameters and modifying cross-sections to achieve agreement between recorded and simulated water levels.

There are uncertainties in the calibration process. Firstly, the most recent large flood suitable for calibration may have occurred some years ago and hydraulic conditions may have changed in the interim. Time will have reduced the number of long-standing residents still living in the area and clouded their memories of the flood. Calibration of hydraulic models

requires both detective work and judgement to uncover facts. Inconsistent facts have to be identified and discarded; discrepancies have to be studied and explained.

The calibrated model needs to be verified against other flood events as no two floods are identical and the floods cannot be perfectly reproduced by the mathematical model. Verifying the model against other floods, both severe and lesser, will allow the hydraulic analysis of design floods to proceed with confidence.

I.4 Bridge afflux

The construction of road embankments and bridges across floodplains impedes the flow of floodwaters. This results in the water level upstream of the bridge being higher than it would be without the bridge. This difference in water levels is referred to as "afflux".

The greater the constricting effects of the embankments and bridge, the greater the afflux, and the greater the effect of the bridge on upstream flood levels. The effect of bridges on flood behaviour is incorporated in hydraulic models through relationships between the hydraulic characteristics of the waterway section of the bridge and upstream and downstream flood levels.

1.5 Coastal effects

On inland streams and in the non-tidal areas of coastal rivers, the size and frequency of a flood at any point depends on the volume and timing of runoff from the catchment. However, in the lower tidal reaches of rivers, flooding is more complex as it depends not only on rainfall, but also on increased ocean levels arising from ocean tides and storm surge effects (see Appendix C).

Elevated ocean levels increase flood levels in the lower reaches of river by either impeding floodwaters from discharging into the ocean or by filling up low lying land and estuarine areas before river flooding arrives.

Flooding around coastal lakes and lagoons can arise from a combination of elevated ocean levels (as discussed above), constriction of the lagoon entrance by sedimentation, inflowing floodwaters from rivers and streams discharging into the lake or lagoon, and wind generated waves in the lake itself.

All of the above influences need to be assessed and appropriately incorporated in the hydraulic models used to estimate flood levels.

I.6 The greenhouse effect

A flood study should also address the possible implications of the greenhouse effect on flooding behaviour.

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The greenhouse effect refers to the inferred warming of the earth and its atmosphere due to the accumulation of certain gases, such as carbon dioxide, nitrous oxide, methane and chlorofluorocarbons in the atmosphere (Institution of Engineers, Australia a, b and c).

Because of the greenhouse effect, the temperature of the atmosphere may rise by 1.5°C to 4.5°C over the next 30–50 years. Greenhouse changes may have possible adverse effects on flooding behaviour:

- storms may intensify and so increase the severity of the resulting floods
- tropical cyclones and subtropical low pressure systems may increase their southern excursion by another 200– 400 km and increase in intensity

 coastal sea levels may rise by 0.2 m to 1.4 m over the next 50 years and exacerbate flooding problems in coastal areas, estuaries and along the tidal reaches of coastal draining rivers.

The consequences of increases in sea levels and more severe flood behaviour should be assessed as part of a flood study. The degree to which these changes are incorporated in flood level estimates should be decided after discussion with representatives from the various State water resources agencies.

A floodplain management plan needs to be able to incorporate the possibilities of the greenhouse effect so that if in 30 years the greenhouse effect is worse than anticipated, the adopted plan should not be unduly disrupted.

Appendix J Flood Hazard

Flood hazard varies both in time and place across the floodplain. Floodwaters flow swift and deep at some locations; in other places, they are shallow and slow moving. The variation of hazard and flood behaviour across the floodplain needs to be understood by flood-prone landholders, floodplain managers and flood emergency staff.

This Appendix describes how the floodplain should be divided first into defined floodway and defined flood fringe areas that reflect flooding behaviour, and the likely effect of future developments on this behaviour, and second, into areas reflecting the degree of hazard.

J.1 Factors affecting flood hazard

Factors that affect the hazard and disruption caused by a flood can be grouped into the four broad categories:

- flood behaviour (i.e. severity, depth, velocity, rate of rise, duration)
- · topography (i.e. evacuation routes, islands)
- population at risk (i.e. no. of people, no. of developments, type of land use, flood awareness)
- emergency management (i.e. flood forecasting, flood warning, flood response plans, evacuation plans, recovery plans).

J.1.1 Flood severity

The severity or size of a flood is generally the principal determinant of hazard. Not only does it affect aspects of flooding behaviour that individually influence hazard (e.g. depths, velocities, rates of rise), it also determines the number of people at risk. It is impossible to predict when flooding will occur or the size of the flood. Further, there is no guarantee that, if a severe flood has occurred recently, another flood, perhaps larger, will not occur in the near future.

J.1.2 Floodwater depth and velocity

The threat to life and gross structural damage (i.e. houses being washed away) caused by floods depends largely upon the velocity of flow and depth of floodwaters. These, in turn, depend upon both the size of the flood and the hydraulic characteristics of the river and its floodplain.

 Wading by able-bodied adults becomes difficult and dangerous when the depth of still water exceeds 1.2 m,

- when the velocity of shallow water exceeds 0.8 m/s, and for various combinations of depth and velocity between these limits.
- In assessing the safety of wading, factors other than depth and velocity need to be taken into account such as evenness of the ground surface or presence of depressions, potholes, fences or major stormwater drains.
- Small, light, low motor vehicles crossing rapidly flowing causeways can become unstable when water depths exceed 0.3 m. Evacuation by larger, higher sedans is generally only possible and safe when water depths are less than 0.4 m.
- As the depth of floodwater increases, caravans and buildings of light construction will begin to float. In these circumstances the buildings can be severely damaged when they settle unevenly in receding floodwaters. If the flood velocity is significant, buildings can be destroyed and cars and caravans can be swept away. In certain areas, the build up of debris and the impact of floating logs can cause significant structural damage to buildings and bridges.
- At velocities in excess of 2 m/s, the stability of foundations and poles can be affected by scour. As grass and earth surfaces begin to erode, scour holes can develop.
- At depths in excess of 2 m, lightly framed buildings can be damaged by water pressure, flotation and debris impact, even at low velocities.
- Depth of flooding—and hence overall degree of flood damage—can be increased by obstructions to floodwater movement (e.g. buildings, embankments and bridges, areas built up by landfill, and the blocking effect of trees, shrubs, fences and debris). The increase in flood levels depends upon the velocity of the floodwaters and the degree to which they are obstructed.

J.1.3 Rate of rise of floodwater

Situations where floodwaters rise rapidly are potentially far more dangerous than situations where flood levels increase slowly. Typically, the rate of rise of floodwaters is more rapid in small, steep catchments than in their larger, flatter counterparts. Extremely high rates of rise of floodwaters have been recorded in Australia e.g. during the 1894 floods in the Kimberley District of Western Australia, the Lennard

River rose at 0.9 m/h for 20 hours, the Fortescue River rose a reported 9 m in 30 minutes and the Fitzroy River rose 18 m in a "few hours"; Commonwealth Bureau of Meteorology 1929).

J.1.4 Duration of flooding

The duration of flooding or length of time a community, town or single dwelling (e.g. farm house) is cut off by floodwaters can have a significant effect on the costs and disruption associated with flooding. Extended periods of isolation in stressful situations can exacerbate post-event anxiety and trauma-related disorders; shortages of water and food may occur thereby placing high demands on limited emergency services; medical emergencies may occur with treatment delayed or at worst prevented.

The duration of flooding generally correlates with the rate of rise of floodwater, typically being longer for slow rates of rise (larger, flatter catchments) and shorter for rapid rates of rise (smaller, steeper catchments).

J.1.5 Evacuation problems

The levels of damage and disruption caused by a flood are also influenced by the difficulty of evacuating flood-affected people and property. Evacuation may be difficult because of:

- number of people requiring assistance
- · depth and velocity of floodwaters
- wading problems, which can be exacerbated by, for example, uneven ground, fences, debris, localised high velocities
- distance to flood-free ground
- loss of trafficability on evacuation routes because of rising floodwaters
- bottlenecks on evacuation routes (i.e. roads cannot cope with the increased volume of traffic, the large number of people and great volume of goods that have to be moved)
- inability to contact evacuation services
- unavailability of suitable evacuation equipment such as boats, heavy trucks and helicopters.

J.1.6 Effective flood access

The availability of effective access routes from flood-prone areas and developments can directly influence the resulting hazard when a flood occurs.

"Effective access" means a high level exit route that remains trafficable for sufficient time to evacuate the population at risk (i.e. evacuation can be undertaken solely by motor vehicle).

In some urban situations, access to flood-prone residents can be lost relatively early in the flood episode, where:

- evacuation routes lead downhill onto and across the floodplain—access to the evacuation route and trafficability can be lost early in the flood because of rising floodwaters
- cul de sac residential developments built on rising land have only downhill access—vehicular access is likely to be lost early in the flood although it may be possible to evacuate residents by walking to high land behind the development (motor vehicles and the possessions the vehicles could have transported will have to be abandoned)
- roadways are used as overland flow paths to cater for severe stormwater flooding—if these roadways also act as "preferred" flow paths for mainstream flooding, their trafficability will be reduced, probably relatively early in a flood event.

Thus, there is considerable benefit to be gained from taking possible evacuation needs into account in designing regional and local road networks for flood-prone areas.

Access is generally divided into two categories: pedestrian and vehicular. The provision of road access trafficable in all weathers will obviously assist in reducing the flood hazard and enhance the effectiveness of emergency services. Pedestrian access is far less effective due to problems with moving elderly people, children and the disabled.

The suitability of access routes needs to be investigated for a range of flood events. Arrangements and evacuation routes which may be suitable for flood events up to the DFE may become unsafe or inoperable for more severe floods. In potentially hazardous situations, pedestrian access routes at least should be provided in extreme flood events. Without such access, the danger to the entrapped and their rescuers may be unacceptable.

A potentially hazardous situation develops when rising floodwaters isolate an area of land, leaving it as an island in a sea of floodwater. The degree of hazard depends on the depth, velocity and rate of rise of floodwaters between the island and possible places of refuge. Vehicle access may be cut rapidly. Rescue by boat, helicopter or large vehicle may be necessary, so putting the rescuers' lives at risk. Although such a situation may not develop for "normal" floods, a check should be made to see whether rare flood events cause islands to develop, or even worse, to subsequently be submerged.

J.1.7 Population at risk

The degree of hazard and social disruption varies with the size of the population at risk. The larger the population at

risk, the greater the flood damage and the greater number of people that need to be evacuated.

J.1.8 Land use

Land use also influences hazard. There are considerably greater difficulties in evacuating a hospital or a retirement village than an industrial area. Conversely, the flooding of industrial areas might result in the escape of toxic industrial products.

J.1.9 Flood awareness

A flood aware population is effective in evacuating itself and its possessions, thereby reducing hazard.

Flood awareness is largely related to past experience with flooding. Flood awareness greatly influences the time taken by flood-affected people to respond effectively to flood warnings.

In communities with a high degree of flood awareness, the response to flood warnings is prompt, efficient and effective. On receipt of a flood warning, the community knows what to do; individuals know how to respond; residents and property owners have developed personal evacuation plans and can implement them.

The promotion of flood awareness by public education campaigns is an essential component of flood emergency planning.

J.1.10 Warning time

Flood hazard can be reduced by evacuation if adequate time is available. However, even if people and possessions are fully evacuated, a flood will still cause significant damage to buildings, to infrastructure and still wreak substantial community disruption.

Available warning time is determined largely by catchment characteristics. The larger the catchment and the slower the rate of rise of floodwaters, the longer the available warning time. In small steep catchments, there is often no available warning time, as the catchments respond too quickly.

In large catchments, flood warnings can be based on rates of rise and peak water levels at upstream gauges. In smaller, more responsive catchments, flood warnings need to be based on rainfall measurements. Automatic monitoring equipment is now available to measure water levels and rainfall.

In the smallest catchments, warnings need to be made on predictions of likely rainfall made before the rainfall occurs. Radar can assist by detecting the location and extent of heavy rainfall cells and provide the basis for short-term forecasts of rainfall combined with meteorological forecasting models. Radar suitable for this task has been

installed at various locations around Australia, although additional infrastructure including ground-based observations and processing systems are also needed.

Effective warning time, or actual time available for people to evacuate themselves and their possessions, is always less than the available warning time because of the time needed, first, to alert people to the imminence of flooding (e.g. by radio, loud-hailer, television, word-of-mouth), and second, to have them commence effective evacuation procedures.

J.2 Degree of hazard

The degree of hazard varies across the floodplain in response to the above factors. As part of the floodplain management process, it is necessary to determine hazard. This is of considerable significance to the appropriateness or otherwise of various land uses.

This document recognises four degrees of hazard.

- Low there are no significant evacuation problems. If necessary, children and elderly people could wade to safety with little difficulty; maximum flood depths and velocities along evacuation routes are low; evacuation distances are short. Evacuation is possible by a sedan-type motor vehicle, even a small vehicle. There is ample time for flood forecasting, flood warning and evacuation; evacuation routes remain trafficable for at least twice as long as the time required for evacuation.
- Medium—fit adults can wade to safety, but children and the elderly may have difficulty; evacuation routes are longer; maximum flood depths and velocities are greater. Evacuation by sedan-type vehicles is possible in the early stages of flooding, after which 4WD vehicles or trucks are required. Evacuation routes remain trafficable for at least 1.5 times as long as the necessary evacuation time.
- High: fit adults have difficulty in wading to safety; wading evacuation routes are longer again; maximum flood depths and velocities are greater (up to 1.0 m and 1.5 m/s respectively). Motor vehicle evacuation is possible only by 4WD vehicles or trucks and only in the early stages of flooding. Boats or helicopters may be required. Evacuation routes remain trafficable only up to the minimum evacuation time.
- Extreme boats or helicopters are required for evacuation; wading is not an option because of the rate of rise and depth and velocity of floodwaters. Maximum flood depths and velocities are over 1.0 m and over 1.5 m/s respectively.

J.3 Estimation of hazard

An appropriate procedure for estimating flood hazard needs to involve an assessment of all the components (see

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Appendix J.1). Stability is a key component of this procedure. The two principal factors that affect the stability of pedestrians wading through floodwaters and motor vehicles traversing flooded roads are the depth and velocity of the floodwaters.

Pedestrians can be swept away by two mechanisms:

- loss of friction (grip) between their shoes and the roadway (sliding)
- · being overtopped by flowing water (toppling).

Motor vehicles lose stability through loss of friction between their tyres and the roadway, leading to the vehicle being swept downstream.

There is a broad range of stability estimation procedures available. The procedures are, however, inconsistent and inadequate in covering the depths and velocities likely to be encountered, and the data used may be significantly outdated (Walsh et al. 1998). For this reason, no relationships between depth and velocity are recommended in this document. A comprehensive testing program of people, vehicles and structures is needed before definitive design guidelines can be presented.

Any study on the effects on people needs to consider not only the physical issues of flooding but also the psychological effects.

J.3.1 Hazard graphs

The emergency services agencies are responsible for undertaking hazard analyses as part of the preparation of a flood emergency plan. This can be lengthy as it requires detailed results from a flood study and an assessment of all factors affecting hazard, such as flood behaviour, flood awareness and possible evacuation problems (see Appendix J.1).

Figures J.1 and J.2 provide a simple graphical means of making a preliminary estimate of hazard along proposed evacuation routes based on the depth and velocity of floodwaters (Fig. J.1) and on the relative evacuation time (Fig. J.2).

With regard to Figures J.1 and J.2:

The four degrees of hazard shown on Figure J.1
correspond to the hazard descriptions of Appendix J.2.
Also shown on Figure J.1 are depth and velocity
combinations for small, low motor vehicles and 4WD (4
wheel drive) vehicles. These are based on Keller &
Mitsch (1993) and are used here for demonstration only.
The constraints on this type of data described earlier
remain.

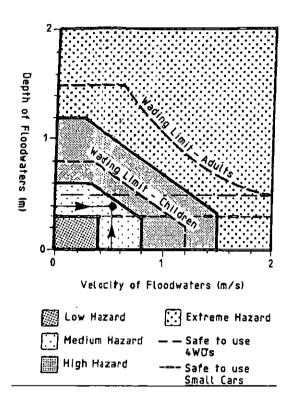
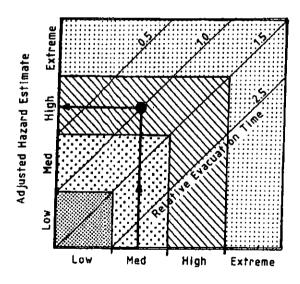


Figure J.1 Estimation of hazard along evacuation routes



Initial Hazard Estimate

Figure J.2 Effect of relative evacuation time on hazard rating.

Note: the adjusted hazard assessment is not to be a lower hazard

 "Relative evacuation time" is the ratio of the time available for evacuation (as determined by flood behaviour and topography) to the minimum time required for orderly evacuation, which depends largely

than the original assessment

on the number and age of people involved. The time available for evacuation is measured from when the order to evacuate is given until evacuation routes become untrafficable because of rising floodwaters. Thus, a relative evacuation time of 1.0 means that the available evacuation time (as determined by flood behaviour) just balances the required time for evacuation. A relative evacuation time of less than 1.0 means that not enough time is available for an orderly and controlled evacuation.

To use Figure J.2, from the "Initial hazard estimate" axis draw a vertical line to the appropriate isoline of relative evacuation time. The "adjusted hazard estimate" is given by the hazard region where the end of the line falls. This procedure does not allow an initial hazard estimate to be reduced in severity. For example, consider the degree of

hazard associated with wading through water 0.3 m deep and flowing at 0.5 m/s. According to Figure J.1, the degree of hazard is medium (i.e. fit adults can wade to safety over distances of up to say 200 m, but children and the elderly will have difficulty). If the relative evacuation time is unity (1.0), then according to Figure J.2, the initial estimate of hazard (medium) should be upgraded to high.

J.4 Hazard maps

Hazard maps of the floodplain are generally useful to both local agencies and emergency services agencies. In preparing such maps, hazard zones should be defined broadly and that any excessively detailed variation of hazard be "smoothed" out.

Appendix K Defined Flood Events

The extent of flood-prone land, or land susceptible to flood risk, is defined by the PMF. It is often neither physically feasible nor socially or economically justifiable to adopt the PMF purposes of general floodplain management. In adopting a lesser DFE for planning and flood mitigation, the benefits of the adopted land uses, together with the cost of the mitigation measures, need to be balanced against the residual risk and the economic and social consequences of a larger flood event.

Several DFEs might be defined for floodplain management purposes; for example different DFEs might be selected for general land use planning, for emergency planning, for the design of structural controls. Thus, in speaking of DFEs it is important to state what they relate to.

This Appendix describes various factors that affect the selection of DFEs.

K.1 Selection of DFEs—the risk management approach

Selection of DFEs is not straightforward. Floods of various sizes occur from year to year, larger floods being rarer than smaller floods. With any flood there is an associated level of inconvenience, flood damage and risk to life and limb. These adverse consequences are greater for large floods and for land uses sensitive to flooding.

The selection of appropriate DFEs involves considering flood behaviour and the social, economic and environmental consequences associated with the occurrence and management of floods of various sizes. Flood-prone land can be used for several purposes; the social and economic consequences of flooding differ among land uses and DFEs vary accordingly. Several management options are possible, each with different social, economic and environmental effects.

In selecting DFEs, the consequences of a range of flood sizes, land uses and management options need to be investigated. To ensure that all consequences of flooding are identified and considered, the range of floods must encompass "rare" floods and include the PMF.

The risk management process, as applied to floodplain management, is a formal means of:

· identifying flood risks

- · analysing the risks
- · assessing and prioritising the risks
- managing the risks.

The risk management process enables existing, future and residual flood risks to be assessed and treated objectively. As such, it provides the floodplain management advisory committee and the general community with confidence that there are no undue risks with living and working in flood-prone areas. The risk management process is described in Appendix E.

K.2 The likelihood of flooding

In some parts of the world, such as along the River Nile and in parts of Asia, the occurrence of flooding is regular, predictable and seasonal. By contrast, rainfall and flooding in Australia are erratic, although seasonal effects do exist (see Appendix B). In the context of this document, flooding may be considered as a random annual phenomenon, that is, floods of any size can occur in any year and, over much of Australia, at virtually any time throughout the year.

The magnitude of flood discharges can vary from small up to the probable maximum discharge. Large floods are rarer than small floods. The "likelihood of flooding" is a measure both of the frequency of the flood and its relative size. As such, it is essential to include the likelihood of flooding when selecting a DFE.

Although the likelihood of occurrence of a given sized flood remains the same from year to year (unless new data leads to a revision of the statistical estimates), the chance of such a flood or a larger event occurring at least once in any continuous period of years increases as the period becomes longer.

Table K.1 summarises the probabilities of experiencing various sized floods at least once and at least twice over a 70 years, an average human lifetime. For example, there is a 75% chance that the 2% AEP flood will occur at least once during 70 years, and a 40% chance that the same flood will occur at least twice in that period.

K.3 Probable maximum flood

The PMF is the largest flood that could physically occur at the location of interest. It is an extremely rare event and defines the extent of flood-prone land. The annual

Table K.1 Probability of experiencing a given size flood one or more times in a lifetime (70 years)

	Percentage probability of experiencing a 70 year period (%)			
Likelihood of occurrence in any year (AEP)	At least once	At least twice		
10% (1 in 10)	99.9	99.3		
5% (1 in 20)	97.0	86.4		
2% (1 in 50)	75.3	40.8		
1% (1 in 100)	50.3	15.6		
0.5% (1 in 200)	29.5	4.9		

likelihood of occurrence has been assessed as between 1 in 10 000 and 1 in 10 000 000 (Laurenson 1994), that is, on average, a PMF will occur once every 10 000 to 10 000 000 years. Although extremely rare, storms with rainfall of the order of probable maximum precipitation (PMP) events have occurred in Australia (e.g. the 1984 storm at Dapto, NSW).

The PMF discharge or some substantial proportion of it is often adopted as the DFE where many lives are at risk (e.g. dam failure). Alternatively, the PMF event may be adopted for planning purposes where it is possible to provide protection up to that level for little additional cost, for example some levees protecting towns on the flat inland floodplains of New South Wales could be designed to exclude floods up to and including the PMF.

The adoption of rare floods for planning purposes assumes that the associated hazard is unacceptably high, or upon the need to ensure that essential services function during, and in the aftermath of, a severe flood. For example, emergency services such as police, hospitals and telephone exchanges should be located above PMF flood levels, if possible. This should be borne in mind in the siting and construction of new facilities and in the upgrading of existing facilities. Thus, for emergency services planning, the DFE may be the PMF event or some other very large flood.

The consequences of floods larger than the selected DFE are discussed in Appendix K.5.3.

The PMF discharge is usually estimated by running the PMP storm of critical duration through a rainfall-runoff model (see Appendix I). The estimation of PMP storms is highly technical (see chapter 13, ARR 1987). The Commonwealth Bureau of Meteorology has produced guidelines for the estimation of rainfall intensities and durations for PMP thunderstorms (Commonwealth Bureau of Meteorology 1994). In estimating the PMP of other rainfall mechanisms, transposition of historical storms to the site of interest may be necessary. This requires considerable experience and a sound understanding of meteorological principles. It is best left to specialists in the Bureau of Meteorology.

K.4 The 1% annual exceedance probability flood

The 1% AEP flood has tended to become the traditional DFE used for planning purposes in Australia, particularly for residential development in urban areas.

The 1% AEP flood was first adopted as the standard DFE by the Australian Capital Territory in the early 1970s. A significant factor in this decision was the loss of seven lives during the 1971 Woden Valley flood, which had an AEP of 1%.

In the mid 1970s, the Australian Water Resources Council (AWRC) proposed the adoption of the 1% AEP event as an appropriate standard for Australia. The Council's preference for this event was based on its widespread use in the United States of America. During the early and mid 1970s a series of large floods with severities from 2% AEP to 1% AEP occurred in Australia and caused considerable damage and devastation. The 1% AEP flood was seen, therefore, as being indicative of a "big" flood with potentially disastrous consequences. Moreover, there was about an even chance that this flood would be experienced at least once in a lifetime (see Table K.1).

The 1% AEP event was progressively adopted as the DFE by the various States as they revised their floodplain management procedures: by New South Wales in 1977, by Victoria in 1978; by the Northern Territory in 1981, by 3 South Australia in 1983 and by Western Australia in 1985.

The problem with adopting a standard level of risk, such as that embodied in the 1% AEP flood, is that it invariably precludes investigation of other (particularly rarer) levels of risk, that is, it negates a risk management approach and the selection of DFEs that are most appropriate to the particular circumstances of a flood-prone area or community.

The need to adopt different levels of flood risk for DFEs has been recognised both in Australia and other countries:

 occasionally the DFE has been reduced below the 2% AEP flood (e.g. in the older areas of Canberra, which were developed before floodplain management guidelines were revised, the 2% AEP flood was retained as the DFE, but the 1% AEP event is adopted for newly developing areas)

- in Adelaide, the 0.5% AEP event has been adopted for floodplain management and planning purposes along the River Torrens
- in the United States of America, some States around the Gulf of Mexico have adopted a more severe event for planning purposes, namely the 0.2% AEP storm surge flood.

K.5 Selection of defined flood events

K.5.1 Size of flood

In selecting a DFE, it is necessary to investigate floods with a range of severities. Once numerical models for predicting flood discharges and water levels have been developed and calibrated (see Appendix I), these models can be applied easily to a range of floods. Information concerning a range of floods is necessary for flood emergency planning.

It is recommended that the behaviour and consequences of the following eight flood events as well as the PMF are investigated at a preliminary level (i.e. predicted water levels and a qualitative appraisal of consequences). A preliminary appraisal of results will allow this range to be reduced to three to four flood events of interest to the specific situation and then these floods can be subject to a quantitative appraisal of consequences:

- 50% AEP
- 20% AEP
- 10% AEP
- 5% AEP
- 2% AEP
- 1% AEP
- 0.2% AEP
- 0.1% AEP
- PMF events.

K.5.2 Land use

Present and proposed land use may also affect the selection of the DFE.

Once land has been developed, the options for its management are greatly reduced. This is due to the significant investment, both public and private, in existing development and associated services, such as roads, drainage,

water supply, sewerage and electricity. The size of investment generally is such that the development cannot be abandoned realistically.

Undeveloped land is another matter: there is much more flexibility with respect to management options and the adverse consequences of development controls are not imposed on existing residents. There is also the opportunity to implement appropriate planning measures that will avoid damage to both private and public property. These factors need to be considered in determining the DFE for undeveloped land.

K.5.3 Consequences of larger floods

Selection of the DFEs for planning and development control is one of the most critical decisions in the preparation of a floodplain management plan. In making the selection it must be recognised that bigger floods will occur (unless the PMF has been selected as the DFE).

When a flood larger than the DFE occurs, the risk to life and property can increase significantly by:

- water entering buildings constructed above the defined flood level or located behind levees
- · people becoming isolated on "islands"
- high hazard or floodway conditions developing in areas which were benign at lower flood levels.

People occupying buildings on land above the DFE, or people protected by levees, tend to develop a false sense of security against flood risk, that is, their level of flood awareness tends to be low. This exacerbates damage, hazard and evacuation risks when larger floods occur.

If people are isolated on islands during the DFE, the situation will tend to be far worse during a larger flood event, particularly where the "island" can be totally submerged by a severe flood. Emergency plans to rescue isolated people during flood events up to and including the DFE may place the affected people and their rescuers at undue risk during rater floods. In these circumstances, it may be better to restrict development to the edges of the floodplain where safe and effective evacuation uphill routes can be maintained during large flood events.

The occupants of riverside caravan parks often experience isolation and undue risk during large floods. Overbank flow may occur and cut evacuation routes before the park itself is inundated. Emergency services staff can rescue people, but vans tend to be washed away and create hazards downstream as well as financial losses. In these circumstances, it would also be better to locate caravan parks on the edge of the floodplain so that an avenue of retreat exists for both people and their vans during all floods.

Finally, the possibility that benign areas may become highly hazardous during large floods needs to be acknowledged and explicitly taken into account in flood emergency plans. An emergency plan that is appropriate for the DFE may not be appropriate for larger floods.

Management options

The need for, and consequences of, management measures can also affect the selection of the DFE. The adoption of relatively expensive structural mitigation measures may be offset by enabling the development of greater areas of floodprone land or by a greater intensity of land use in existing floodplain areas.

K.6 Land subject to flooding

Once a DFE has been determined, it must not be treated as defining the limit of land subject to flooding. The PMF defines the limit of flood-prone land, not the DFE. Occupants of floodplain areas above the DFE level are entitled to know their level of risk and the measures to be

implemented in the case of severe flooding (flood emergency plans).

K.7 Flood information provided by local agencies

With regard to possible legal implications in respect of the consequences of future floods, local agencies need to provide clear and factually correct flood information. To this end, local agencies will need to:

- explicitly inform flood-prone property owners and others living and working in flood-prone areas of their risk of flooding
- clearly and objectively inform people of flood emergency arrangements to deal with residual risk
- recognise the difference between flood-prone land and declared flood areas
- be factually correct on all written notifications to, for example, ratepayers and property developers concerning flood information (e.g. Fig. K.1).

On the basis of present information prepared for council by State Gove	rnment agencies and consultants, estimated floor
levels at your property are as follows:	
Annual Exceedance Flood Level (m AHD)	
Probability (AEP)	

5% 5.7

2% 6.1

1% 6.6

Probable Maximum Flood 8.5

Note (a)

The defined flood event for planning purposes at your property is the 1% AEP flood. To allow for uncertainties in flood level estimates, council requires a specified freeboard to be added to the defined flood level for planning, development and building purposes.

Note (b)

Flood levels at your property can rise significantly higher than the indicated 1% AEP flood level. The probable maximum flood level is an estimate of the highest possible flood level that could occur at your property. The probable maximum flood is an extremely rare event. The chance of a probable maximum flood occurring in any year are 1 in 10 000 or greater. Nevertheless, such events have occurred in the past on 2-3 occasions in Australia.

Note (c)

The above flood level estimates may be revised from time to time as additional information comes to hand.

Figure K.1 An example of a notification containing flood information

Appendix L The Floodplain Management Study

A floodplain management study aims to identify all relevant issues, quantify them and weigh them appropriately into an overall plan by which the community is better off. Risk management planning plays a key role. Like any social planning process, undertaking a floodplain management study and formulating an appropriate plan involves discussion and trade-off with various groups of stakeholders within the community.

L.1 Prior decisions and supporting studies

By the time a floodplain management study starts, several important decisions in the floodplain management process have already been made:

- a Floodplain Management Advisory Committee (the Committee) has been appointed
- supporting studies should have started, that is, the flood study (see Appendix I), socioeconomic studies, environmental studies and land use studies.

Socioeconomic and environmental studies are important elements of a floodplain management study as they provide essential background for assessing the effects and effectiveness of potential management measures.

L.1.1 Socioeconomic studies

Floods and management measures to reduce flood risk can impose socioeconomic costs on flood-affected communities. The cost of management measures needs to be weighed against the benefits of reducing flood risk and flood damage—management measures may have quite high associated economic and social costs in themselves.

To objectively compare issues and management measures, the following types of studies may be required:

- flood damage assessment (see Appendix M)
- social impact studies (i.e. the community's vulnerability to flooding) (e.g. regularity of flooding, level of flood awareness and degree of disruption cased by flooding).

The Committees should be aware of the need for socioeconomic data and instigate appropriate studies as early as is practical.

L1.2 Environmental studies

Structural floodplain management measures, such as levees, detention basins and stream clearing, may have significant effects on the floodplain environment. Environmental impact studies may be required.

Quite apart from potential adverse environmental effects, under the provisions of various State and Territory environmental policies, local and State agencies are required to consider the enhancement of the river and floodplain environment. Thus, flora, fauna and habitat surveys may be required in their own right, together with studies that place the existing river and floodplain environment into the wider context of the total catchment (in terms of, e.g. relative importance, potential for enhancement).

The Committees should be aware of the need for the above types of environmental information and instigate appropriate studies as early as is practical.

L.1.3 Land use studies

Land use studies should include, for example, existing land use, likely future land use, location of existing urban infrastructure services and any excess capacity therein. (Excess capacity in the water and sewer mains serving a flood-prone area may well justify the cost of additional management measures, this cost possibly being offset by savings in not having to provide additional infrastructure elsewhere).

An important aspect of these studies is the desired or likely mix of future land use. Only by the effective management of future land use can the rate of growth in flood damage can be reduced.

Land use studies must also address the community's aspirations for the use of flood-prone land. Local aspirations may be affected by State and regional land use policies, including integrated catchment management policies. The Committees need to be aware of, and take into account, broader land use policies. Again, any supporting local land use studies need to be started as early as practical.

L.2 Defined flood events

An important aspect of the floodplain management study is selection by the Committee of DFEs. Before selecting DFEs, the potential behaviour, hazard and damage of a

range of flood events up to and including the PMF need to be investigated.

Selection of DFEs is not easy: selection of too mild a flood will intensify the frequency and adverse consequences of larger floods whereas selection of too severe an event will maximise the cost of management and mitigation measures.

Furthermore, the DFE used for the setting of residential floor levels may not be appropriate for determining the location and floor levels of key infrastructure facilities, such as hospitals, telephone exchanges and police stations (see Appendix K).

By definition, flood-prone land is all land flooded by the PMF. DFEs generally define areas of land to which development and building controls and conditions apply.

L.3 Risk management

Risk management provides an objective means of assisting in the selection of DFEs. By considering the likelihood of occurrence of a range of flood events and their associated hazards, that is, risks to life, health and damage, together with the cost and benefits of various management options, the risks and costs of floods of various sizes can be weighed against the benefits (i.e. reduction in risk) of various management measures (see Appendix E).

L.4 Hydraulic and hazard categories

An important aspect of the floodplain management study is the identification of defined floodway and flood fringe areas of the floodplain and areas of low and high hazard. The identification of these areas is essential for responsible land use planning across the floodplain.

A flood study provides much of the detailed information necessary to define the hydraulic and hazard categories of flood-prone land. See Chapter 3 for factors that influence the extent of the defined floodway and defined flood fringe areas and Appendix J for factors that affect flood hazard such as depth, velocity and rate of rise of floodwaters.

Future developments can influence hydraulic and hazard ratings and their effects need to be considered cumulatively when defining hydraulic and hazard categories.

L.5 The floodplain management plan

Once background studies have been completed, the Committee oversees the development and implementation of the floodplain management plan (see Appendix G).

This is not easy. Management measures have both advantages and disadvantages: while a proposed control (e.g. a levee) may alleviate flood damage, it may be detrimental to the environment generally (e.g. loss of habitat, visual intrusion), and particularly in that it may affect flood levels elsewhere (see Appendix G).

L.6 Local floodplain management policy

Another key outcome from a floodplain management study is the formulation by the Committee of a local floodplain management policy. This policy should present succinctly the local agency's considered view on the use and development of flood-prone land.

L.7 Public consultation

The public is important in improving floodplain management, especially with respect to flood emergency management. To effectively meet their obligations, the public need to be informed about flood risk, hazard and behaviour in their community and of what actions they should take when a flood threat arises.

Public consultation during a floodplain management study facilitates the flow of information between the Committee and the community concerning relevant flooding matters, and of the advantages and disadvantages of potential management measures. Public meetings during the study allows the Committee to inform the public of study progress and to seek public opinion on specific issues.

The Committees need to facilitate public consultation during the floodplain management study.

Appendix M Flood Damage Assessment

This Appendix introduces various categories of urban flood damage and briefly describes how flood damage is estimated. Much of this material is taken from the Australian Water Resources Council (Department of Primary Industry and Energy 1992) and from the Draft New South Wales Floodplain Management Manual (NSW 1999). The importance of local agencies collecting flood damage data after a flood event is also discussed.

M.1 Flood damage categories

There are numerous categories or types of flood damage (Fig. M.1). Each of these categories is now described.

M.2 Tangible and intangible damages

The most basic subdivision of flood damages is into tangible and intangible damages.

Tangible damages are financial and can be measured in monetary terms. Tangible damages include the cost of repairing items damaged by floodwaters or the loss in value caused by floodwaters wetting goods and possessions (direct damages), together with the loss of wages and extra outlays incurred during clean-up and in post-flood recovery (indirect damages) (see Appendix M.3 for more details about direct and indirect damages).

Intangible damages include the increased levels of physical and psychological illness and emotional distress caused by the flood. A flood is a traumatic experience for many. There is the sense of personal loss and despondency caused by the sight of houses and furniture covered in mud, the destruction of memorabilia (family photographs and documents). There is the stress caused by additional and at times quite large financial outlays to replace flood-damaged possessions. A flood can be a terrifying experience for young children; many suffer nightmares for a considerable time after the event. There is the stress caused by families having to function in a different way: they may have to live in temporary accommodation; children may have to attend different schools.

It is difficult, if not impossible, to meaningfully estimate intangible damages in financial terms. Intangible damages are real and represent a significant "cost" to flood-affected persons, a cost which can be quite long lived. Most flood studies acknowledge intangible damages but do not attempt to quantify them. However, it may be possible, for example,

to estimate how many flood-affected people may require additional medical treatment for depression (see Appendix M.4).

M.3 Direct and Indirect damages

The two basic categories of tangible damages are direct and indirect damages. A further two categories are "actual" and "potential" damages (see Appendix M.5).

Direct damages are caused by floodwaters wetting goods and possessions, thereby either damaging them irreparably or reducing their value. Some items might be capable of repair; other items will be damaged beyond repair. In the first case, the direct damage is equal to the cost of repairs plus the loss in value of the repaired item. In the second case, the direct damage is equal to the preflood value of the item or its replacement cost.

Indirect damages are the additional financial losses caused by the flood. These can include the extra cost of food and accommodation for evacuees (i.e. the additional cost in a non-flood situation); any loss of wages by employees; the loss of actual and prospective production or sales by flood-affected commercial and industrial establishments; and opportunity loss to the public caused by, for example, the closure or limited operation of public facilities.

M.3.1 Direct damage categories

Direct damage to a property is commonly divided into three categories:

- contents (e.g. for residential properties, damage to carpets, furniture)
- structural (e.g. damage to foundations, walls, floors, doors and windows)
- external (e.g. damage to parked motor vehicles).

M.3.2 Indirect damage categories

Indirect damage can be divided conveniently into three cost categories:

- financial (e.g. loss of wages, loss of production and loss of income inflicted on flood victims and businesses)
- opportunity (e.g. school closures, limited telephone facilities)

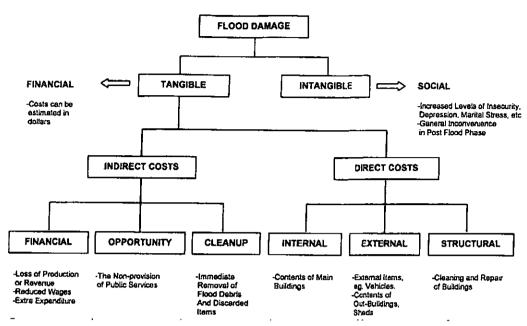


Figure M.1 Categories of urban flood damages

 clean-up—can be treated as an indirect cost (as in this Appendix) or as a third category of tangible damages—much of this cost arises from the time spent by people in this activity.

M.3.3 Sector costs

Tangible flood damage costs—direct and indirect—can be classified into different land use sectors (e.g. residential, commercial, industrial, public institution, public utility, recreational, primary production). In most urban flood damage studies, typically only three or four sectors are recognised: residential, commercial, industrial (or commercial-industrial combined) and public properties.

M.4 Physical, psychological and emotional health costs

A flood imposes a range of intangible costs on flood victims. These include physical and psychological ill-health and the emotional distress of the victims. Although it is impossible to fully measure these costs in financial terms, they are reviewed here because of their significance to victims and to the post-flood "recovery" of the community.

M.4.1 Emotional costs

The emotional behaviour of many flood victims is in keeping with the "disaster syndrome" identified by Wallace (1953, 1956), which comprises four phases:

 shock—immediately after a flood; people report feelings of incredulity and disbelief that such a thing (the flood) could happen to them

- suggestibility—people are grateful for help and responsive to suggestions and directions
- euphoria—people are optimistic and happy, they have had an adventure, they feel part of the community and contribute to clean-up
- frustration—people as individuals become aware of their losses and future difficulties, tend to become depressed, resentful and blame authorities and others for their plight, and may experience marital and family difficulties.

These four phases were observed after the Brisbane floods of 1974 (Cameron McNamara 1977; Chamberlain et al. 1981). These four phases also occurred during and after the devastating April 1990 flood in the central New South Wales town of Nyngan. The shock phase took place on the night of the flood when people were evacuated to raised buildings in Nyngan. The suggestibility phase ran from evacuation the next day by helicopter and bus through the period of temporary accommodation in Dubbo and elsewhere. The euphoria phase commenced during temporary accommodation and during clean-up, which were assisted greatly by an enormous volunteer effort. The frustration phase occurred over several months after people had returned to their homes and the volunteers and other helpers were finishing up.

The emotional costs of flooding can be long lived. In April-May 1975—about 15 months after the 1974 Brisbane flood—a follow-up survey found that about one-quarter still had not recovered from the emotional trauma of the event (Chamberlain et al. 1981). Factors that contributed to

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non-recovery included the severity of flooding, the degree of the resulting financial hardship, age and socioeconomic status. Elderly people on low incomes whose houses were deeply flooded were the most ill-affected.

Thus, a severe flood can impose a range of emotional "costs" on flood victims, many of them quite severe. Moreover, the emotional strain may linger for up to several years after the event.

Flood-aware communities can be expected to suffer less social and financial disruption than communities with a low level of flood awareness. The emotional stress of flooding should also be less in flood-aware communities. A recent survey of flood-prone residents in Forbes, NSW, supports this expectation (Water Studies 1992). Most surveyed residents were married couples with young families. Their flood losses were small, but household disruption was great—all had packed, unpacked and moved in and out of their houses three times during floods in 1990. Nevertheless, when surveyed after the third flood, their spirit was good and their enthusiasm undamped.

M.4.2 Physical and psychological costs

Whereas severe rainfall floods in Australia are spectacular and are often dangerous, they are generally accompanied by surprisingly little loss of life. In the January 1974 Brisbane River floods, which had an AEP of 1.33%, 12 people died by misadventure (rather than drowning) and some 20 000 homes were inundated by floodwaters. In recent Australian floods, loss of life generally has been due to accidents and misadventure (typically electrocution) rather than through people being swept away (see Appendix E).

Evidence for the effects of floods on the mental and physical health of flood victims is inconsistent.

While the effects of a flood must be expected to be detrimental to the health of flood victims, the question is in what way and to what degree. The effects of flood hazard on health have been reviewed by Smith et al. (1980) and Handmer & Smith (1983). The 1974 flood in Lismore, NSW, had no overall effect on the number of hospital admissions or the number of deaths, but after the flood a higher percentage of people were admitted for mental disorders). Abrahams et al. (1976) examined the effects of the 1974 Brisbane flood on the health of flood victims. There was no increase in mortality in the post flood, but the number of visits to general practitioners, hospital and specialists "were all significantly increased for flooded persons in the year following the flood". Complaints were more psychological than physical, and included irritability, nervous tension and depression.

Some studies in other countries have identified a consistent pattern of long-term increased psychological problems of

flood victims for up to five years after the flood (French & Holt 1989).

Thus, it can be concluded, perhaps expected, that a severe flood will tend to result in an increased incidence of psychological disturbances in flood victims. A trigger for these illnesses would appear to be the emotional strain resulting from the financial and social costs caused by the flood

The question of the effects of floods on physical health appears more tenuous.

There appear to have been no outbreaks of infectious disease associated with flooding in Australia, although reports from other countries identify increased levels of malaria, typhoid, para-typhoid and hepatitis (French & Holt 1989). These outbreaks are associated with poor public hygiene in the recovery phase.

In a study of the health effects of the 1968 Bristol floods in England, Bennet (1970) found that there was a significant increase in the physical ill-health of flood victims: a 50% increase in the deaths of flood victims, and a marked rise in deaths from cancer. Careful statistical analysis of health data is required to validly separate out the effects of flooding on health.

Apart from physical injury during evacuation and clean-up operations, floods and flooding per se can have no direct effect on physical health. However, floods can be expected to be detrimental to physical health to the extent that disease is stress related, especially for sufferers predisposed to stress-related diseases.

M.5 Actual and potential damages

There are a further two categories of tangible damages, namely actual and potential damages.

Actual damages are the damages caused by an actual flood. Potential damages are the maximum damage that could occur should a flood eventuate. In assessing potential damages, it is assumed that no actions are taken by the flood-affected population to reduce damage, such as lifting or shifting items to flood-free locations and shifting motor vehicles.

Potential damages are easier and more convenient to measure than actual damages (see Appendix M.6). Typically, "damage reduction factors" are used to convert potential damage estimates to actual damage estimates. Two important parameters affecting the relationship between actual damage and potential damage are the length of the flood warning period and the flood awareness of the affected population. The longer the warning period, the greater the time available for evacuating goods and possessions; the

more flood aware the population, the more effective these measures will be.

Experience with actual flood surveys indicates the following.

- Flood awareness is probably the single most important factor in damage reduction. An aware person will reduce losses far more in 1-2 person-hours of activity than a non-aware person will in 6-8 person-hours (Water Studies 1986, 1988). This has significant ramifications for education programs aimed at raising flood awareness.
- 2. In flood-aware towns where residents have at least 12–24 hours warning, many inhabitants have damage reduction measures down to a fine art. Typically, flood-prone residents at Forbes, NSW, evacuate everything moveable from their homes, including carpets, furniture, doors and in one case the kitchen stove, which was electric with plug-in connector (Water Studies 1992).

M.6 Flood damage estimations

To compare the benefit and effectiveness of proposed floodplain management measures, it is generally necessary to undertake a flood damage survey to estimate firstly, the existing level of damage, and secondly, the reduction in damage associated with specific management measures.

M.6.1 Flood damage surveys

In flood damage surveys, a sample of representative properties is first identified and then damages to these properties are determined, either by questionnaire or by personal inspection by a trained valuer. In questionnaire surveys, property owners estimate their own damages. Although relatively inexpensive to obtain, such estimates can be in considerable error. The most reliable and consistent way to estimate both actual and potential damages is through inspection and assessment by a trained valuer experienced in such surveys.

M.6.2 Potential damage

Potential damage surveys are typically undertaken in non-flood times. In such a survey, the valuer estimates damage on an item-by-item basis for each room of the building. This is done for three or four possible flood depths (typically about 5 cm, 0.5 m, 1.0 m and 2.0 m above floor level). The damage estimates are made on the basis that nothing is moved should a flood occur. Detailed survey forms are required to record these data. Because of the absence of flooding and the presence of all goods and chattels, it is relatively straightforward for a trained valuer to estimate potential damage.

M.6.3 Actual damage

Surveys of actual flood damage should be undertaken as soon as practical after a flood has occurred. The same

approach is adopted as in a potential damage survey, except there is only a single flood depth for each room. Actual damage surveys are made more difficult by the disposal of many items before the survey, during clean-up. These items have to be identified and their value established, sight-unseen. Further, many flood-affected occupants are often dazed by the flood episode and confused as to the contents of rooms. In these circumstances the survey form needs to contain a detailed list of items likely to occur in each room. The valuer then leads the occupant through this list to ascertain the preflood contents of the room and an indication of their value.

M.7 Average annual damage

A flood-prone community will be subject to a succession of floods. In many years, no floods may occur or the floods may be too small to cause damage. In some years, the floods will be large enough to cause damage, but the damage generally will be small because the floods are small to medium. Rarely, severe floods will occur which cause great damage, for example the Nyngan flood of April 1990 had an AEP of 0.5% and caused some \$50 million in damage (see Appendix O).

Thus, the more frequent the flood, the smaller its size and the less damage it causes. The rarer the flood, the more severe it is and the greater damage it causes.

The AAD is a convenient yardstick to compare the economic benefits of various proposed mitigation measures. For example, consider two structural measures, a proposed house raising scheme and a proposed levee, that respectively reduce the current AAD by \$0.5 million per year and \$1.5 million per year. The levee is clearly more effective in reducing flood damages (i.e. it generates greater benefits than the proposed house raising scheme) but it also costs more to construct and maintain. Also, there may be different environmental and social costs associated with both schemes. All cost factors have to be weighed up and evaluated in determining the relative economics of possible mitigation measures. The AAD provides a consistent means of evaluating the economic costs and benefits of different mitigation measures.

How is AAD determined? We do not know the actual sequence of floods that will occur over time at a particular flood-prone community. However, we do know, for example, that on average, the 5% AEP flood event will occur once every 20 years, the 2% AEP flood will occur on average once every 50 years. Further, by examining a range of floods, we can estimate the potential and actual damages caused by floods of different severities, as described in Appendix M.6. The variation of flood damage with the annual likelihood of occurrence of the flood (AEP) can then be plotted. Flood damage only starts at the 10% flood event

and the more extreme the flood, the greater the flood damage (Fig. M.2). The AAD for Figure M.2 is equal to the area under the damage-annual likelihood of occurrence curve, about \$50,000 per year.

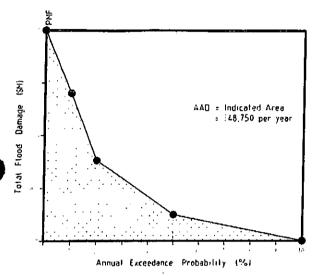


Figure M.2 Variation of flood damage with annual exceedance probability (AEP)

M.8 Rural flood damage

The deposition of silt by floods increases the fertility of floodplain soils and makes floodplains a focus of farming activity. Floods can also cause enormous damage to rural areas, both to infrastructure and enterprises. The Spring 1993 floods in Victoria caused extensive damage to the towns and rural areas of Gippsland and north-eastern Victoria (Table M.1). The rural component amounts to some \$265 million or over 80% of the total damage.

Table M.1 Flood losses, Victoria, Spring 1993 floods

Amount (\$M)	_
55	-
220	
45	
320	
	55 220 45

From Department of Natural Resources and Environment (1995).

Rural agronomists can assess rural damages in much the same way as values assess urban damages. There are, however, several significant differences between urban and rural flooding (see Appendix E) and lead to differences in rural and urban flood damages, as follows.

- In urban areas, the level of flood damage depends principally on the type of land use and the depth of flooding. In rural areas, flood damage depends upon both the type and growth stage of crops, and duration and depth of flooding. Table M.2 shows the loss of yield by a cotton crop for various depths and durations of flooding (in terms of percentage total yield). Irrespective of the depth of flooding, a flood duration of 10 days will kill off all of a seedling stage crop. To kill a growing stage crop, however, requires a depth of flooding of 1 m or more for 10 days.
- In addition to obvious losses, such as crop and stock losses, other types of flood damage suffered by rural enterprises include loss of topsoil and fertiliser, damage to fences and weed infestation.
- The indirect costs of rural damage can persist for several years (e.g. loss of mature orchards).
- Compared to urban flood damage, the cost of rural flood damage per unit area of affected land is significantly less.
 The greater intensity of urban flood damage means that more expensive mitigation measures can be justifiably employed to limit urban damage. With respect to rural damage, levees are often the only structural measure that can be justified economically.
- Although flood emergency planning is an effective mitigation measure for urban areas (stock and equipment can be moved), it is less so for rural areas because of the "fixed nature" of crop, horticultural and other assets.
 Most farmers have individual flood emergency plans for the evacuation of stock from flood-prone areas.
- Typically, the level of protection provided to rural areas
 is significantly less than that provided to urban areas.
 Because of this, rural areas tend to experience flood
 damage more frequently than urban areas.

Table M.2 Percentage yield reduction for cotton caused by flooding

	Seed	iling (0–40	days)	Grov	ving (40–80	days)	Finish	ing (80–130) days)
Depth of	Days of flooding		Days of flooding		Days of flooding				
flooding (m)	2	5	10	2	5	10	2	5	10
0.25	10	20	100	10	15	30	10	15	20
0.50	15	25	100	20	30	60	15	20	30
1.00	20	30	100	30	50	100	25	30	50

M.9 Flood damage reporting—local agency responsibilities

M.9.1 General

Floods are expensive phenomena. The average annual cost of flooding in Australia is estimated to be about \$350 million per year (Department of Primary Industry and Energy 1992). The data used to derive this figure are uncertain, especially the cost of urban stormwater damage and the cost of rural damage (both probably significantly underestimated). To improve floodplain management—and more importantly, to allow the effectiveness of management measures to be assessed—more reliable flood damage data are needed at the Commonwealth, State and local levels. Local agencies are in the best position to gather these data.

Collection of relevant flood data is neither lengthy nor costly. It involves the use of local agency staff to document flood depths and simple property characteristics. Technicians, surveyor's assistants, draftspersons and junior engineers are all appropriate for this task. The survey itself involves local agency representatives visiting flooded properties on a property-by-property basis to interview landholders or occupants and record salient details. The

survey should take place as soon as practical after the flood has passed while memories are still fresh.

M.9.2 Urban flood damage data

Basic flood damage data to be collected from urban areas—irrespective of whether the damage is caused by stormwater or mainstream flooding—relate to the number and type of flooded properties and depths of flooding within and outside buildings. No estimates of flood damage or flood loss per se are required. Each urban property partially or fully covered by floodwaters should be included in the survey, irrespective of whether or not buildings are flooded above floor level.

M.9.3 Rural flood data

Basic flood damage data to be collected from rural areas relate to crop and stock losses on a farm-by-farm basis. The local agency does not have to collect data on main rural infrastructure damage; this will be done by the appropriate State authorities. In the case of local roads, or roads under the control of the local agency, the local agency will need to report the relevant damage. In the case of rural flood damage, the property owner is asked to estimate the value of the losses. Rural flood surveys may take longer than urban surveys because of the larger areas involved.

Appendix N Data and Performance Indicators

This Appendix briefly reviews the need to collect, store and use appropriate data for better floodplain management across Australia. The need for States and Territories to collect consistent data on a common basis is advocated, that is, the development of a national database.

N.1 The need for data

An earlier review of floodplain management in Australia by the Australian Water Resources Council identified the need for better and more comprehensive data if floodplain management in Australia is to be improved. According to Department of Primary Industry and Energy (1992):

A reliable and adequate database is an essential foundation of effective management. The poor availability and unreliability of flood damage data and management data makes the economic justification for devoting more resources to floodplain management difficult to justify. It also makes the objective allocation of limited resources between competing flood 'problems' impossible.

An adequate database is also essential to the definition and measurement of appropriate performance indicators to monitor the success and effectiveness of floodplain management activities.

N.2 A national approach

A wide variety of data can be collected and stored on a computer database. The existence of a national database of flood damage and floodplain management data will foster better floodplain management across Australia.

Various States and Territories would collect consistent data in a common format and store them on their own State databases. Elements from the State databases could be collated into a national database as and when required. Such an approach would facilitate comparison of problem areas, both between and within States and Territories, and lead to a more objective and equitable allocation of Commonwealth, State and Territory resources for floodplain management.

N.3 Data to be collected

Flooding situations relevant to better floodplain management include the effect of:

- mainstream flooding on urban areas
- stormwater flooding on urban areas

- mainstream flooding on rural enterprises
- · mainstream flooding on rural infrastructure.

Descriptive and performance data need to be collected for these four situations.

The data to be collected will be of two types:

- potential—arise from theoretical assessments of flooding situations, as made via flood studies and floodplain management studies
- · actual-effects of actual floods.

Both types of data need to be collected. All of the potential data become available during the floodplain management process when it is a relatively simple matter to capture and record these data.

Data that could be collected for the national database encompass the three broad areas of flood behaviour, flood hazard and floodplain management measures.

N.3.1 Flood behaviour data

Flood behaviour data required are:

- peak flood discharges and water levels at key locations for a range of floods
- · areas of inundation for a range of floods
- rate of rise of floodwaters (for hazard appraisal)
- · velocity of floodwaters (for hazard appraisal).

N.3.2 Flood hazard data

Flood hazard data required are:

- risk to life and health for a range of flood events
- urban mainstream flooding data, including the number, type of properties, potential damage and average depths of flooding associated with a range of flood events, AAD
- urban stormwater flooding data, as for urban mainstream flooding
- rural flooding data, including the area, types of rural enterprises, potential damage and average depths of flooding for a range of flood events, AAD
- rural infrastructure data, including type and amount of damage for a range of floods.

N.3.3 Floodplain management data

Floodplain management data required are:

- initiation and progress of floodplain management studies and various elements of these studies
- frequency and employment and costs and effectiveness of various floodplain management measures.

The various State and Territory water resource agencies should liaise to determine appropriate data to be collected for the national database. This will depend to some extent upon the type and nature of data collected so far. However, data already collected should not dictate the total design of the national database, which will become a floodplain management tool into the future. The database, like this document, is not static but will need to be reviewed regularly (e.g. every 5 years).

N.4 Data collection responsibilities

The local agency is the appropriate organisation to collect floodplain management data in both urban and rural areas. potential data become available during the floodplain management process. The local agency is in the best position to collect and record actual data after a flood event and this activity is essential.

State and Territory water resource agencies should prepare standard data collection forms for both potential and actual data to assist local agencies in the collection of these data.

The State or Territory water resource agency is also the appropriate agency to operate and maintain each State or Territory's database. Flood and floodplain management studies will normally be undertaken or supervised by the water resources agency. Water resource agencies also help to ensure that local agencies undertake appropriate damage surveys after actual flood events. Hence, the water resources agency can oversee the collection of both potential and actual data for the database.

N.5 Performance indicators

Substantial Commonwealth, State and local agency resources are required to meet national objectives for the management of flood risk and flood hazard (see Appendix B.1.1). Performance indicators are essential to ensure that resources allocated to floodplain management and flood emergency management activities are spent in an effective and equitable fashion and to measure the success of floodplain management programs.

The States and Territories need to liaise to define a set of simple, common and effective performance indicators as part of a design of a national database for floodplain management. Such performance indicators need to measure the long-term trends in program outcomes rather than

short-term program outputs. A long-term program outcome, such as the proportion of flood-prone urban areas with floodplain management plans in place, is a more meaningful measure of success in meeting basic program objectives than, for example, the number of flood studies started in the last 12 months, which is simply a measure of activity or program output. Further, adopted performance indicators need to be relatively simple and reliable to measure.

N.5.1 Urban performance indicators

Appropriate urban performance indicators to measure longterm State, Territory and national outcomes of urban floodplain management programs include the proportion of:

- flood-prone urban areas and towns with completed floodplain management plans in place
- flood-prone urban areas and towns with completed flood emergency plans in place
- flood-prone urban areas and towns actively implementing post-flood recovery activities, including infrastructure design activities to facilitate the post-flood reactivation of infrastructure
- flood-prone urban areas and towns with dedicated flood forecasting and warning systems in place.

Appropriate urban performance indicators also include the ratio of:

- current number of urban properties susceptible to flooding by a flood event(s) of nominated severity(s) to the number of properties susceptible in a nominated base year
- current value of average annual potential or actual flood damage to the value in a nominated base year.

Some more limited but useful performance indicators can be defined to measure specific program outcomes such as the success of flood emergency activities in actual flood events and the reduction in potential damage associated with specific management measures.

N.5.2 Rural performance indicators

Appropriate rural performance indicators to measure the long-term state-wide and nation-wide outcomes of rural floodplain management programs include the proportion of:

- flood-prone rural areas with completed floodplain management plans in place
- flood-prone rural areas with integrated and coordinated levee systems in place.

Appropriate rural performance indicators also include design and construction activities implemented by State and local

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agencies to foster the return of rural infrastructure to operation after a flood as well as the ratio of:

- the area and type of farming activity susceptible to mainstream flooding by a flood event(s) of a nominated severity(s) to the area and type of farming activity in a nominated base year
- current value of average annual potential or actual flood damage to the value in a nominated base year.

N.5.3 Social and environmental performance indicators

Appropriate social and environmental performance indicators need to be defined to measure the outcomes of urban and rural floodplain management strategies on social and environmental objectives. Social indicators could relate to the reductions in the intangible costs of flooding. Environmental indicators could relate to the environmental costs, benefits and sustainability of management measures.

There has been very little previous work carried out on the development of social and environmental performance indicators and further research is necessary before any strong recommendations are made concerning these.

N.6 Geographic information system software

Available GIS software for computers facilitates data entry, manipulation and presentation, together with the ready incorporation of data in flood emergency plans.

Best practice principles require that the flexibility and opportunities of GIS software should be fully realised in data collection and presentation. In particular, adopting a common GIS system should be considered, or systems that are not mutually exclusive, for the presentation of flood data and performance indicators.

Appendix O The Nyngan Flood: Costs and Lessons

0.1 Background

On 23 April 1990, floodwaters from the Bogan River overwhelmed the emergency sandbag defences of the central New South Wales town of Nyngan. Over the preceding five days, the townspeople and volunteers had filled some 200 000 sandbags and placed them atop permanent levees around the town. But to no avail: the townspeople lost their extended and tenacious fight. The sandbag levees breached and within six hours, the town was inundated to 2 m or more depth.

The 1990 flood was 0.9 m higher than the previous flood of record (1976). The chance of a flood of this size occurring in any one year was estimated to be about 1 chance in 200 (i.e. an AEP of 0.5%).

Some 93% of all buildings in Nyngan were flooded above floor level. The townspeople were forced to flee to safety to the upper storey of two-storey buildings. The next day the entire population of 2500 was evacuated to Dubbo by helicopter and bus. Three to four weeks of intense relief, clean-up and recovery were necessary before residents could resume living in Nyngan.

The cost of urban flood damage to the town was some \$47 million (see Table O.1 and Appendix M for a description of the various flood damage categories).

Nyngan is representative of many inland towns in Eastern Australia, where levee banks are used for flood protection. Some important points were learned from the Nyngan flood; some already known were reinforced; and some new factors assumed significance.

This Appendix briefly describes the most important points learned at Nyngan. They are relevant to all urban centres protected by levees.

O.2 Flood forecasts and flood warning

Flood warning systems are being used increasingly for floodplain management. Several points should be noted about such systems.

- To be effective, warnings need to be timely (i.e. there needs to be sufficient time for evacuation measures to be carried out).
- Forecasts of peak flood levels are a prediction of future flood behaviour. Such forecasts are based on a knowledge

of progressive flood behaviour to date, either in terms of catchment rainfalls or upstream water levels. However, forecast flood levels contain uncertainties (e.g. because additional rain falling in ungauged areas of the catchment is not included by the forecasting system). Thus, forecast flood levels should be interpreted in terms of likely rather than absolute flood levels. Undue reliance on the accuracy of forecast flood levels can exacerbate damage if actual levels are higher than predicted.

- Flood warning by itself does not alleviate hazard and flood damage. Accompanying flood defence and evacuation arrangements are required (i.e. a comprehensive flood emergency plan).
- The flood emergency plan should include activities to protect and reinstate essential infrastructure required during clean-up and recovery operations in the flood aftermath (e.g. sewerage, water supply, telephones).

Flood damage at Nyngan was exacerbated by reliance placed on the perceived accuracy of forecast flood heights and by the absence of a local flood emergency plan that incorporated evacuation provisions for the town.

With the advantage of hindsight, it can be appreciated that the faith the townspeople of Nyngan placed in forecast peak heights became critical during the onset of flooding. Local heavy rainfall that occurred immediately prior to the peak of the flood caused the actual peak to be some 0.4 m higher than the forecast value of 4.85 m GH. On the basis of the forecast peak, the continuing and extended efforts of the townspeople to protect their town were justified. If the possibility of higher than forecast flood levels had been considered, a more orderly evacuation of people and their possessions could have been arranged earlier.

The floodplain management plan and flood emergency plans need to recognise that forecast peak flood levels represent a prediction of future flood behaviour, are not necessarily exact and may well be exceeded.

0.3 Flood emergency plan

Although the efforts of the townspeople were nothing short of heroic, Nyngan did not have a formal flood emergency plan to defend and evacuate the town or to protect essential infrastructure from flooding. Again with the advantage of hindsight, the existence of a properly thought out and fully

Table 0.1 Details of damage caused by the April 1990 flood, Nyngan, NSW (1990 values, Smillion)

			sector cost		
Damage	Туре	Resid.	Comm.	Public	Total
 Direct	Internal	6.4	2.7	4.8	13.9
	External	3.5	0.1	4.7	8.3
	Structural	3.7	0.3	2.3	6.3
	Total	13.6	3.1	11.8	28.5
Indirect	Financial	3.8	8.0	4.1	15.9
	Clean-up	1.6	0.2	0.3	2.1
	Opportunity	0	0	0.8	0.8
	Total	5.4	8.2	5.2	18.8
Totals		19.0	11.3	17.0	47.3

documented plan would have facilitated these functions and recovery of the town. Further, such a plan could have reduced the emotional distress and damage caused by the flood.

The extent of damage at Nyngan was such that the Premier of New South Wales appointed his own representative, Rear Admiral Peter Sinclair AO, RAN EM, to oversee the recovery process. Notwithstanding the tremendous job done by all concerned, including volunteers and donors of goods and money, the recovery process would have been expedited by appropriate plans for clean-up and recovery (see Appendix H).

Local authorities need to realise that all floodplain management measures can be overwhelmed by a flood larger than the DFE. The only exception is when the PMF is adopted as the DFE, but even then levees and other measures may fail through lack of maintenance or through unforeseen circumstances.

Thus, to be fully prepared for flooding, a comprehensive flood emergency plan is required that addresses the defence, evacuation, relief and recovery of flood-prone areas.

O.4 Sandbagging

At best, sandbagging is a stop-gap emergency measure that provides limited additional protection.

There is an art to the construction of strong and effective sandbag levees. Simple techniques like keying the bottom layer into the existing levee, buttressing and not overfilling sandbags all help.

Plans for the protection of urban areas with sandbags should include a manual of simple sandbagging techniques. A core of workers trained and practised in these techniques should be maintained. Several techniques are available to facilitate the filling of sandbags (e.g. buckets with bottoms cut out and mechanical fillers).

0.5 Floodproofing

Plasterboard wall linings and built-in cupboards and fittings constructed from "particle board" sustained high levels of damage in Nyngan. Table O.2 shows details of the average structural damage to 23 surveyed houses in Nyngan that were flooded above floor level (Department of Water Resources of New South Wales 1990). The average value of the total structural damage was \$5150, of which the plasterboard component (internal wall linings) was \$2600, or 50% of total, and the damage to particle-board built-ins was \$2230, or 44% of total.

Manufacturers of building materials should consider the development of inexpensive, waterproof building products to serve as wall linings and for built-ins. In the interim, local agencies should consider requiring or promoting the use of flood-resistant materials for these purposes in areas of flood risk.

Finally, with respect to construction techniques, experience in Nyngan showed that slab-on-ground houses took much longer to dry than houses on stumps or piers with free underfloor airflow. Local agencies should consider requiring the latter type of construction in flood-prone areas.

O.6 Levees, defined flood events and flood levels

The permanent earthen levee at Nyngan was designed in the late 1970s. The design flood event was the 1976 flood, which had a peak flood level of 4.33 m gauge height (GH) at the Nyngan gauge. A freeboard of 1.0 m above 1976 levels was originally specified, (i.e. 5.33 m GH on the Nyngan gauge). The constructed levees around the western, southern and eastern sides of the town were some 7.5 km long. Where roads ran along the top of the levee (a total of 2.4 km), freeboard was reduced from 1.0 m to 0.4 m. The temporary sandbag levees were obviously highest and most prone to failure in these low spots, and indeed the sandbag levees failed by breaching at these locations.

Table 0.2 Details of average structural damage to residential properties, Nyngan, NSW (1990 values)

	Da	таде
Type of damage	(\$)	(%)
Foundations	170	3.3
External Wall Linings	0	0
Internal Wall Linings	2600	50.5
Floors	20	0.4
Doors/Windows	130	2.5
Built-ins	2230	43.3
Total	5150	100.0

The peak flood level recorded at the Nyngan gauge during the April 1990 flood was 5.23 m GH (i.e. some 0.9 m above the design flood level). The permanent levee remained structurally sound throughout the flood as confirmed by post-flood inspection and soil testing.

To prevent floodwaters entering the town, it would have been necessary to defend a water level some 1.2 m above the design flood level. (The afflux, or additional height of floodwaters resulting from the complete exclusion of floodwaters from Nyngan, was 0.3 m).

0.7 Whose fault?

The design of the Nyngan levees has now been the subject of a court case and appeal. Several people of Nyngan sought damages from the local Council and the (then) Department of Water Resources on the bases that firstly, the levees were not designed according to appropriate standards (the lowering of freeboard to 0.4 m along the 2.4 km length of roadway on the levee crest), and secondly, that if the levees were constructed with a freeboard of 1.0 m everywhere, the townspeople could have successfully defended the town and kept out the floodwaters.

This raised the central question of the purpose of freeboard. Is it to provide a safety margin against the effects of settlement, erosion and wave action on the levee, so that the levee provides certain protection against the design flood event, or is freeboard to provide protection against floods higher than the design event?

The court found that:

- the purpose of freeboard is to ensure certain protection against the design flood event—any protection against higher flood events is a bonus and should not be relied upon
- the design flood event adopted for Nyngan was in accordance with standard engineering practice of the time
- it was justifiable to reduce the freeboard to 0.4 m where
 roads ran along the levee crest because of the greater
 width and compaction of the levee in these circumstances
 (i.e. better protection against settlement and erosion, a
 wider platform from which to mount defensive activities
 against floods larger than the design event)
- even if the levees had 1.0 m freeboard everywhere, the flood would still have overwhelmed the defences (i.e. sandbagging would have started later; the full 7.5 km length of levees would have required protection; the town would have flooded from the unprotected north side).

The principle to emerge from this court case is that despite the best floodplain management intentions and defence and evacuation efforts, floods larger than the design flood event—at times much larger—can and will occur. Moreover, at such times, our floodplain management and flood response measures are put to the ultimate test. The need for effective flood emergency plans to deal with these situations is self-evident.

Appendix P Urban and Rural Issues

The broad concepts and principles of floodplain management are identical for urban and rural areas. However, there are specific issues that arise from differences in the nature of flooding and development in these areas. Floodplain management measures that are appropriate to urban areas may not be necessarily so for rural areas. This Appendix identifies significant issues of difference between floodplain management in urban and rural areas.

P.1 Differences between urban and rural flooding

A basic difference between rural and urban flooding involves the area, duration and to some extent the depth of flooding. In general, rural flooding is much more extensive (by several orders of magnitude) and may persist for a much longer period than urban flooding. Much rural flooding is shallow in nature. This generates differences between urban and rural floodplain management, as follows.

- In general, appropriate and practical management measures to reduce rural damage include structural works to protect crops (typically levees) and flood emergency measures to shift livestock. Any flood emergency planning to shift livestock is generally done by individual farmers.
- Broadacre agriculture, just by the scale of the operation, may have a much more significant effect than urbanisation on flood behaviour, loss of habitat and water quality.
- Farmers are more central to the operation of rural floodplain management schemes than their urban counterparts. For example, farmers may be directly responsible for the construction and maintenance of rural levee schemes (see Appendix P.3). Unauthorised levees constructed by farmers can significantly reduce the effectiveness of rural levee schemes. To satisfactorily manage rural floodplains requires an integrated and coordinated system of structural works that is "owned" and "operated" by local groups of farmers who affect and are affected by each others actions. Hence, public consultation is even more important in rural floodplain management than in urban floodplain management.
- A significant amount of rural flood damage occurs in the form of damage to rural infrastructure. It is generally impossible to implement specific design features to facilitate the return of rural infrastructure to normal after flooding (unlike urban infrastructure). However, rural

- infrastructure should be designed carefully to incorporate all practical features that will minimise damage and facilitate its reinstatement after flooding.
- In rural areas, flood damage to crops and horticulture depends as much on the duration of flooding as on the depth of flooding (unlike urban damage), as discussed in Appendix M.8. Conversely, as long as the duration of flooding does not affect crop or horticultural yields, rural areas are more "tolerant" of flooding than urban areas (e.g. rural flooding can persist for several days in rural areas with little inconvenience or economic damage to landholders, an unacceptable situation in urban areas).
- It is appropriate for defined floodway areas to be "farmed", as long as the farming practices do not interfere with the flow of floodwaters to an unacceptable degree. It is up to individual landholders to assess the risks and financial loss of farming these areas.

P.2 Urban issues

With respect to specific management measures for urban areas, the following issues should be noted.

- To date, floodproofing has not been widely embraced by local agencies as a bona fide flood damage reduction measure. To a certain extent, this has arisen because of the absence of a suitable floodproofing code. Currently, the Commonwealth Scientific and Industrial Research Organisation is testing the effects of immersion on building materials. These results could form the basis of a floodproofing code. When suitable information is available, local agencies are encouraged to incorporate floodproofing requirements in their building regulations for flood-prone areas.
- On-site detention measures are being increasingly used by some local agencies in New South Wales and South Australia to reduce the volume and peak rate of urban stormwater runoff. Satisfactory on-going maintenance of these measures is essential to their effectiveness. In implementing on-site detention measures, local agencies need to put in place effective long-term maintenance plans.

Local agencies can facilitate clean-up and recovery operations in the aftermath of a flood through appropriately designed and maintained urban infrastructure. Examples of

urban infrastructure design to reduce damage and facilitate recovery include:

- where possible and practical, key infrastructure facilities such as telephone exchanges, electricity substations and emergency management facilities should be located above PMF level, or such facilities should be protected to an appropriate degree by, for example, permanent banks and levees
- where key infrastructure facilities are exposed to flood risk, a key design principle should be the return of these systems to full operation as quickly as possible after a flood (e.g. electric motors used to drive water supply and sewerage pumps should be designed and maintained for immediate uncoupling and transport to flood-free locations in the onset of a flood)
- development of effective and well-rehearsed flood emergency management plans for the protection and reinstatement of essential urban infrastructure.

P.3 Rural issues

Most of the significant areas of remaining natural floodplain habitat are located on rural floodplains. Rural floodplain management is made even more difficult by the additional issues of water allocation and soil conservation, together with increased focus on ecology and habitat.

Many rural floodplains are flat. Typically, extended areas of such floodplains are flooded to shallow depths by relatively slowly moving floodwaters. Even relatively low structural works can prove to be a significant impediment to flood flows and lead to a significant redistribution of flood flows across the floodplain. For this reason, care needs to be taken to carefully assess the effect on flood behaviour of land forming operations (especially laser levelling) and road and rail embankments.

The construction of unauthorised levees by individual farmers to protect their crops can be detrimental to flood behaviour. This is also true of the construction of temporary levees to provide protection during an actual flood event (such levees tend to become permanent).

With respect to rural levee schemes, best practice principles require:

- · ownership and operation by farmers
- an integrated and coordinated system of levees that provides an agreed level of protection on an equitable basis
- effective and sustainable maintenance plans
- the absence of "new" illegal levees and the integration of existing illegal levees, where practical and appropriate, into the adopted levee system
- an awareness by farmers and agencies of the potential effects of land-forming operations on floodplain flows.

References

- Abrahams, M.J., Price, J., Whitlock, F.A. and Williams, G. 1976, 'The Brisbane floods, January 1974: their impact on health', Medical Journal of Australia, 2: 936-939.
- ARR 1987, 'Australian rainfall and runoff', In: A Guide to Flood

 Estimation, Eds D.H. Pilgrim et al., Institution of Engineers,

 Australia.
- Bennett, G. 1970, 'Bristol floods 1968, controlled survey of effects on health of local community disaster', *British Medical Journal*, 3: 454–458.
- Brown, C.A. and Graham, W.J. 1988, 'Assessing the threat to life from dam failure', Water Resources Bulletin, 24(6): B3-B9.
- Commonwealth Bureau of Meteorology 1929, Results of Rainfall Observations Made in Western Australia, Commonwealth of Australia, Bureau of Meteorology.
- Commonwealth Bureau of Meteorology 1994, The Estimation of Probable Maximum Precipitation in Australia: Generalised Short-Duration Method, Bureau of Meteorology, Department of Environment, Sport and Territories, Bulletin 53, December 1994.
- Commonwealth Bureau of Meteorology 1995, Weather Services Handbook, Bureau of Meteorology, Melbourne.
- Commonwealth of Australia 1917, Historical Records of Australia, Series I, Governor's Despatches To and From England, Volume IX, January, 1816-December, 1818, pp. 360-361, The Library Committee of the Commonwealth Parliament.
- Chamberlain, E.R., Handshorn, A.E., Mugglestone, H., Short, P., Svensson, H. and Western, J.S. 1981, Queensland Flood Report—Australia Day 1974, AGPS, Canberra.
- Department of Conservation and Natural Resources 1995, Documentation and Review of 1993 Victorian Flooding, Volume 1, Statewide summary of floods 1993 (HydroTechnology, Armadale, Vic.), Department of Conservation and Natural Resources, Melbourne.
- Department of Primary Industry and Energy 1992, Floodplain Management in Australia, 2 vols, Australian Water Resources Council, Water Management Series No. 21, DPIE, Commonwealth of Australia, AGPS, Canberra.
- Department of Water Resources of New South Wales 1990, The Cost of Flooding, Nyngan, April 1990 Flood (Water Studies Pty Ltd, Queensland), Department of Water Resources New South Wales, Sydney.
- Emergency Management Australia 1995, Flood Warning—An Australian Guide, EMA, Commonwealth of Australia.
- Emergency Management Australia 1997, Guidelines for Applying Risk Management to Emergency Management, EMA, Commonwealth of Australia.
- Emergency Management Australia 1999a, Guide 3—Managing the Floodplain, Part III Emergency Management Practice, Volume 3—Guidelines, EMA, Commonwealth of Australia.

- Emergency Management Australia 1999b, Guide 4—Flood Preparedness, Part III Emergency Management Practice, Volume 3—Guidelines, EMA, Commonwealth of Australia.
- Emergency Management Australia 1999c, Guide 5—Flood Warning, Part III Emergency Management Practice, Volume 3—Guidelines, EMA, Commonwealth of Australia.
- Emergency Management Australia 1999d, Guide 6—Flood
 Response, Part III Emergency Management Practice, Volume
 3—Guidelines, EMA, Commonwealth of Australia.
- French, J.G. and Holt, K.W. 1989, 'Floods', In: The Public Health Consequences of Disasters, Eds M.B. Greg et al., Chapter 10, United States Department of Health and Human Services, Public Health Service Centre for Disease Control and Prevention, Atlanta, Georgia, 1989.
- Haddad, S. 1994, 'Risk criteria for land use safety planning in New South Wales'. In: Acceptable Risks for Extreme Events in the Planning and Design of Major Infrastructure, Australian National Committee on Large Dams (ANCOLD) Seminar, Sydney, April, 1994.
- Handmer, J.W. and Smith, D.I. 1983, 'Health hazards of floods: hospital admission for Lismore', *Australian Geographical Studies*, 21: 221-230.
- Higson, D.J. 1990, Risks to Individuals in New South Wales and Australia as a Whole, Australian Nuclear Science and Technology Organisation, Sydney, NSW.
- Hopley, D. and Harvey, N. 1979, Chapter 10, In: Regional Variation in Storm Surge Characteristics around the Australian Coast: A Preliminary Investigation, Symposium on Natural Hazards in Australia, Australian Academy of Science, Canberra, ACT.
- Institution of Engineers, Australia, a. Environmental Impacts of the Greenhouse Effect, Institution of Engineers, Australia, undated, Barton, ACT.
- Institution of Engineers, Australia, b. Impact of Energy Use on the Greenhouse Effect, Institution of Engineers, Australia, undated, Barton, ACT.
- Institution of Engineers, Australia, c. The Coastal Impacts of the Greenhouse Effect, Institution of Engineers, Australia, undated, Barton, ACT.
- Irish, J.L. 1977, Surge and Storm Tide Frequency Estimation for Coastal Locations Subject to Cyclones, 3rd Australian Conference on Coastal and Otean Engineering, Melbourne, 18–21 April 1977, Institution of Engineers, Australia, Barton, ACT.
- Keller, R.J. and Mitsch, B. 1993, Safety Aspects of the Design of Roadways as Floodways, Research Report No. 69, Urban Water Research Association of Australia, November 1993, Melbourne, Victoria.
- Laurenson, E.M. 1994, 'The probability of extreme floods in Australia', In: Acceptable Risks for Extreme Events in the Planning and

- Design of Major Infrastructure, Australian National Committee on Large Dams (ANCOLD) Seminar, Sydney, April, 1994.
- Mackenzie, P. 1994, 'ANCOLD and its interest in risk assessment', In: Acceptable Risks for Extreme Events in the Planning and Design of Major Infrastructure, Australian National Committee on Large Dams (ANCOLD) Seminar, Sydney, April, 1994.
- Melchers, R.E. 1993, 'Society, tolerable risk and the ALARP principle', In: *Probabilistic Risk and Hazard Assessment*, pp. 243–252. Balkema, Rotterdam.
- Nathan, R.J. and Weinmann, P.E. 1999, Australian Rainfall and Runoff—A Guide to Flood Estimation. Vol. 1. Book VI. Estimation of Large to Extreme Floods, The Institution of Engineers, Australia, Barton, ACT.
- NSW Government 1999, Floodplain Management Manual (Draft), Department of Land and Water Conservation, Sydney, NSW.
- Rowe, W.D. 1990, 'Perspective on Rare Events for Decision Making', In: Proceedings of a Conference on Risk Based Decision Making in Water Resources, pp. 1–15, Santa Barbara, California, 15–20 October 1989, American Society of Civil Engineers (ASCE), 1990.
- Smith, D.I., Handmer, J.W. and Martin, W.C. 1980, The Effects of Floods on Health: Hospital Admissions for Lismore, ANU Press, Camberra.
- Standards Australia/Standards New Zealand 1995, Risk Management, Australia/New Zealand Standard, AS/NZS 4360: 1995, November.
- Trajer, F.L. 1973, 'A manual storm surge forecasting scheme', In: First Australian Conference on Coastal Engineering, pp. 82–88, Institution of Engineers, Australia, Sydney, 1973.

Further reading

- Appleyard, L. 1996, Risk Communications as an Essential Feature of Risk Management, First Annual Risk Engineering Seminar, Munro Centre for Civil and Environmental Engineering, University of New South Wales, 11 April 1996.
- Bewsher, D. and Still, D. 1995, On-Site Stormwater Detention in NSW—Past, Present and Future, 2nd International Symposium on Urban Stormwater Management, Melbourne Australia, 11– 13 July 1995.
- Cameron McNamara and Partners 1977, Brisbane Suburban Creeks: Report on Flood Warning and Flood Education, report prepared by Cameron McNamara and Partners for Co-ordinator Generals Department of Environment and Planning, NSW, August 1977.
- Dexter, P.E. 1975, Computing Extreme-Value Statistics for Cyclone Generated Surges, 2nd Australian Conference on Coastal and Ocean Engineering, Gold Coast, 1975, Institution of Engineers, Australia, Barton, ACT.
- Joy, C.S. and Markar, M.S. 1991, 'Local Council responsibilities in the estimation of flood damage', Paper presented at the 31st

- Tweedale, M. 1994, 'Acceptable risk in petrochemical and hazardous chemical plants', In: Acceptable Risks for Extreme Events in the Planning and Design of Major Infrastructure, Australian National Committee on Large Dams (ANCOLD) Seminar, Sydney, April, 1994.
- United States Bureau of Reclamation 1989, Policy and Procedures for Dam Safety Modification Decision Making, USBR, Denver, Colorado.
- Wallace, A.F.C. 1953, Memorandum on Worchester Study, National Academy of Sciences-National Research Council, Washington.
- Wallace, A.F.C. 1956, Tornado in Worchester: An Explanatory Study of Individuals and Community Behaviour in an Extreme Situation, Disaster Study No. 3, National Academy of Sciences— National Research Council, Washington.
- Walsh, M., Benning, N.J. and Bewsher, D. 1998, 'Defining flood hazard in urban environments', In: Proceedings of the 2nd SIA Regional Stormwater Conference, Stormwater Industry Association, Sydney, NSW.
- Water Studies 1986, Flood Damage along the Georges River, 1986
 Flood Event, Report prepared by Water Studies Pty Ltd for the
 Public Works Department of New South Wales, Sydney, NSW.
- Water Studies 1988, Flood Damage Along the Georges River, 1988

 Flood Event, Report prepared by Water Studies Pty Ltd for Public Works Department of New South Wales, Sydney, NSW.
- Water Studies 1992, Forbes Flood Damage Study, August 1990 Flood, Report prepared for New South Wales Department of Water Resources by Water Studies Pty Ltd, February 1992, Sydney, NSW.
- Annual Flood Mitigation Authorities Conference, Port Macquarie, New South Wales, 15-17 May 1991.
- Macdonald, L. 1994, 'ANCOLD Risk Assessment Guidelines', In: Acceptable Risks for Extreme Events in the Planning and Design of Major Infrastructure, Australian National Committee on Large Dams (ANCOLD) Seminar, Sydney, April, 1994.
- National Landcare Program 1997, Sharing Responsibility for Solutions to Urban Drainage Problems, Department of Primary Industries and Energy, Canberra.
- Nelson, R.C. 1975, Tropical Cyclone Surges in Australia, 1880 to 1970, In: Second Australian Conference on Coastal and Ocean Engineering, pp. 193–199, Gold Coast, 1975, Institution of Engineers, Australia.
- O'Loughlin, G., Beecham, S., Lees, S., Rose, L. and Nichols, D. 1995, 'On-site stormwater detention systems in Sydney', Water Science Technology, 32: 169-175.
- Water Studies 1990, The Cost of Flooding, Nyngan, April 1990, Report prepared for New South Wales Department of Water Resources by Water Studies Pty Ltd, August 1990, NSW.

Glossary

Annual exceedance probability (AEP)

the likelihood of occurrence of a flood of a given size or larger in any one year; usually expressed as a percentage. For example, if a peak flood discharge of 500 m³/s has an AEP of 5%, it means that there is a 5% risk (i.e. a probability of 0.05 or a likelihood of 1 in 20) of a peak flood discharge of 500 m³/s or larger occurring in any one year (see also Average recurrence interval, Flood risk, Likelihood of occurrence, Probability).

Annual flood risk (AFR)

a way of specifying the likelihood of flooding on an annual basis. For example, the 1% AEP flood has a probability of 0.01 of occurring in any year. The risk of this flood occurring in any one year (AFR) is 1 in 100 or 1/100.

Astronomical tide

the variation in sea level caused by the gravitational effects of (principally) the moon and sun. Includes highest and lowest astronomical tides (HAT, LAT) that occur when relative alignment and distance of the sun and moon from the earth are "optimal". Water levels approach to within 20 cm of HAT and LAT twice per year around mid-summer and mid-winter ("King tides").

Australian height datum (AHD)

the survey height datum adopted by the National Mapping Council of Australia as the reference datum for defining reduced levels (0.0 m AHD is approximately mean sea level).

Average annual consequences

the average consequence associated with a series of annual events, each with its own probability of occurrence and consequence (see also Average annual damage).

Average annual damage (AAD)

the total damage caused by all floods over a long time divided by the number of years in that period. (It is assumed that the population and development situation of interest does not change over the period of analysis).

If the damage associated with various annual events is plotted against their probability of occurrence, the AAD is equal to the area under the consequence-probability curve. AAD provides a basis for comparing the economic effectiveness of different management measures, (i.e. their ability to reduce the AAD) (see also Average annual consequence).

Average recurrence interval (ARI)

a statistical estimate of the average period in years between the occurrence of a flood of a given size or larger (e.g. floods with a discharge as big as or larger than the 100-year ARI flood event will occur on average once every 100 years). The ARI of a flood event gives no indication of when a flood of that size will occur next.

Bathymetry

the configuration of the bed of a waterbody, as measured by depth contours.

Catchment

the area of land draining to a particular site. It always relates to a specific location and includes the catchments of tributary streams as well as the main stream.

Chance

the likelihood of something happening that will have beneficial consequences (e.g. the chance of a win in a lottery). Chance is often thought of as the "upside of a gamble" (Rowe 1990) (see also Rick).

Conforming development

Sec Development, conforming

Consent authority

the authority or agency with the legislative power to determine the outcome of development and building applications.

Consequence

the outcome of an event or situation, expressed qualitatively or quantitatively. Consequences can be adverse (e.g. death or injury to people, damage to property and disruption of the community) or beneficial.

Critical storm duration

the duration of the storm event of nominated severity (e.g. the 2% AEP flood) that produces the largest flood discharge at the location of interest. Critical storm duration depends upon catchment size, topography and land use and on the temporal pattern of rainfall.

Dambreak flooding

flooding caused by the breaching of a dam embankment. Note that dambreak flooding may inundate areas outside the floodplains defined in this document.

Defined flood area

the area of the floodplain covered by floodwaters during the DFE (see also *Defined flood event*).

Defined flood event (DFE)

the flood event selected for the management of flood hazard, as determined in floodplain management studies and incorporated in floodplain management plans. Selection of DFEs should be based on an understanding of flood behaviour and the associated risk and consequences of flooding. The DFE should also take into account the social, economic and environmental consequences associated with floods of different severities. Different DFEs may be appropriate for structural measures (e.g. levees), different categories of land use and for emergency services planning. The concept of a range of DFEs supersedes sole focus on the 1% AEP flood event, as in earlier practice. DFEs do not define the extent of flood-prone land, which is defined by the PMF (see also *Probable maximum flood*).

Defined flood fringe

the remaining area of land inundated by the DFE after defined floodway areas have been defined (see also Defined floodway).

Defined flood level

the flood level associated with a DFE.

Defined floodway

the area of the floodplain where significant discharge or storage of water occurs during a DFE. Floodways are areas which, if filled or even partially blocked, would cause a significant redistribution of flood flow, or significant increase in flood levels. Floodways are often aligned with naturally defined channels and are often, but not necessarily, areas of deeper flow or areas where higher velocities occur, and also include areas where significant storage of floodwaters occurs. Each DFE has a defined floodway and the extent and behaviour of floodways may change with flood severity. Areas that are benign for small floods may experience much greater and more hazardous flows during larger floods (see also Defined flood fringe).

Detention basin

a generally small self-draining storage constructed on a creek or drain that mitigates downstream flood discharges and flood levels by providing temporary storage to floodwaters.

Development

the erection of a building or the carrying out of work, including the placement of fill; or the use of land or a building or work; or the subdivision of land.

Types of development include:

- conforming—developments that are in accordance with the current provisions of the floodplain management plan
- infill—the development, within an existing subdivision, of vacant blocks of land that are generally surrounded by developed properties; conditions may be imposed on infill development (e.g. minimum floor levels)
- new—development of a completely different nature from the one associated with the former land use (e.g. urban subdivision of an area previously used for rural purposes), involves rezoning and typically requires significant extensions of existing urban services (e.g. roads, water supply, sewerage, electric power)
- non-conforming—developments that are not in accordance
 with the current provisions of the floodplain management
 plan—can be approved by the consent authority but the
 developer must demonstrate to the consent authority that the
 development is justified on the basis of social, economic,
 environmental and flooding considerations
- redevelopment—rebuilding an area under the current or a similar land use zoning—as urban areas age, it may become necessary to demolish and reconstruct buildings.

Discharge

the rate of flow of water, as measured in terms of volume per unit time [e.g. cubic metres per second (m³/s)] (see also *Hydrograph*).

Effective warning time

the time available for the evacuation of people and their goods and possessions before the onset of flooding. The effective warning time available to a flood-prone community is equal to the time between the delivery of an official warning to prepare for imminent flooding and the loss of evacuation routes due to flooding.

Improved flood forecasting systems and warning delivery systems increase the available warning time.

Exceedance probability

a quantitative measure of the likelihood of occurrence of an event of a nominated or greater size (e.g. the exceedance probability of throwing a number equal to 4 or greater on the roll of a die is 3 in 6, or 0.5, or 50%) (see also *Annual exceedance probability*, *Probability*).

Flash flooding

sudden and unexpected flooding caused by local heavy rainfall or rainfall in another area. Often defined as flooding which occurs within six hours of the rain which causes flooding.

Flood

relatively high water levels caused by excessive rainfall, storm surge, dambreak or a tsunami that overtop the natural or artificial banks of a stream, creek, river, estuary, lake or dam.

Flood awareness

the ability of flood-affected landholders to defend themselves, their property and their community from flood threats and to effectively evacuate themselves and their possessions when necessary (i.e. an appreciation of the likely effects of flooding and a knowledge of the relevant flood warning, response and evacuation procedures). In communities with a high degree of flood awareness, the response to flood warnings is prompt and effective. In communities with a low degree of flood awareness, flood warnings are liable to be ignored or misunderstood, and residents are often confused about what they should do, when to evacuate, what to take with them and where it should be taken. The principal factor determining the degree of flood awareness of a community is usually the frequency of moderate to large floods in the recent history of the area.

Flood damage

the tangible (direct and indirect) and intangible costs (financial, opportunity costs, clean-up) of flooding. Tangible costs are quantified in monetary terms (e.g. damage to goods and possessions, loss of income or services in the flood aftermath). Intangible damages are difficult to quantify in monetary terms and include the increased levels of physical, emotional and psychological health problems suffered by flood-affected people and attributed to a flooding episode.

Flood emergency

a condition or situation caused by flooding that requires urgent action or assistance.

Flood emergency plan

an agreed set of toles, responsibilities, functions, actions and management arrangements to deal with flood events of all sizes. Such plans describe flood warning, defence, evacuation, clean-up and recovery arrangements. A local flood emergency plan forms an essential component of a floodplain management plan.

Flood fringe

See Defined flood fringe

Flood hazard

potential loss of life, injury and economic loss caused by future flood events. The degree of hazard varies with the severity of flooding and is affected by flood behaviour (extent, depth, velocity,

Floodplain Management in Australia: Best Practice Principles and Guidelines

duration and rate of rise of floodwaters), topography, population at risk and emergency management.

Floodplain

area of land adjacent to a creek, river, estuary, lake, dam or artificial channel, which is subject to inundation by the PMF (i.e. flood-prone land).

Floodplain Management Advisory Committee

a Committee formed and chaired by local agency(s) or other appropriate body(s) to oversee the development and implementation of a floodplain management plan (referred to in the document as "the Committee"). The Committee should include representatives of all stakeholder groups and all agencies responsible for floodplain management, living in, using or undertaking developments on the floodplain.

Floodplain management measures

the full range of measures (land use controls, structural measures, development and building controls, flood emergency measures and flood awareness) available to prevent or reduce flood hazard and disruption, as canvassed in a floodplain management study.

Floodplain management options

measures which might be feasible for the management of a particular area of the floodplain. Preparation of a floodplain management plan requires a detailed evaluation of management options (see also *Floodplain management plan*).

Floodplain management plan

the recommended means of assessing and managing the flood risk associated with the use of the floodplain for various purposes. It represents the considered opinion of the local community, local agency and State agencies on how best to manage flood-prone land and provides a long-term path for the future development of the community. Usually includes both written and diagrammatic information. It fosters flood warning, response, evacuation, clean-up and recovery in the onset and aftermath of a flood and suggestions on organisational structure for integrated risk management for existing, future and residual flood risks. A floodplain management plan should be developed in accordance with the principles and guidelines of this document. Plans need to be reviewed regularly to assess progress and to consider the consequences of any changed circumstances that have arisen since the last review.

Flood-prone land

land subject to inundation by the PMF. Floodplain management plans should encompass all flood-prone land, rather than being restricted to land subject to DFEs.

Floodproofing

a combination of measures incorporated in the design, construction and alteration of individual flood-prone buildings or structures to reduce or eliminate flood damage.

Flood risk

See Annual flood risk

Flood severity

a qualitative indication of the "size" of a flood and its hazard potential. Severity varies inversely with likelihood of occurrence—the greater the likelihood of occurrence, the more frequently an

event will occur, but the less severe it will be. Reference is often made to major, moderate and minor flooding.

Flood storage areas

those parts of the floodplain that are important for the temporary storage of floodwaters during the passage of a flood. The extent and behaviour of flood storage areas may change with flood severity. Flood storage areas should be treated as part of the floodway (see also Floodway).

Flood study

a comprehensive technical investigation of flood behaviour. It defines the nature and extent flood hazard across the floodplain by providing information on the extent, level and velocity of floodwaters and on the distribution of flood flows. The flood study forms the basis for subsequent management studies and will need to address the above issues for a full range of flood events up to and including the PMF.

Floodway

See Defined floodway

Freeboard

the height above a defined flood level, typically used to provide a factor of safety in, for example, the setting of floor levels and levee crest levels (i.e. design flood event). Freeboard compensates for effects such as wave action, localised hydraulic behaviour and settlement of levees, which increase flood levels or reduce the level of protection provided by levees. Freeboard also provides protection from floods that are marginally above the defined flood level. However, freeboard should not be relied upon to provide protection for flood events larger than the DFE.

Frequency

the measure of likelihood expressed as the number of occurrences of a specified event in a given time. For example, the frequency of occurrence of a five year ARI flood event is once every five years on average (see also Likelihood and Probability).

Gauge height

height of a flood level at a particular gauge site related to a specified datum. The datum may or may not be the AHD (see also Australian height datum).

Habitable room

any living or working area, such as a lounge room, dining room, rumpus room, kitchen, bedroom or workroom, or any area in an industrial or commercial establishment used for offices or used to store valuable possessions susceptible to flood damage.

Hazard

See Flood hazard

Hydraulic analysis

the study of the flow of water in waterways. In particular, the evaluation of flow parameters such as water level, extent and velocity.

Hydrograph

a graph that shows for a particular location, the variation with time of discharge (discharge hydrograph) or water level (stage hydrograph) during the course of a flood.

Hydrologic analysis

the study of water and its constituents as they move through the natural processes that constitute the hydrological cycle (i.e. rainfall, runoff, evaporation, infiltration).

Inverted barometer effect

the increase in ocean water levels around the low pressure area of a storm or cyclone caused by the difference in atmospheric pressure. A reduction of 1 hPa below normal atmospheric pressure (1010 hPa) can result in a sea level rise of about 1 cm.

Landfall

the process and location of a cyclone crossing the coast.

Lead agency

the agency identified as being primarily responsible for a specific aspect of floodplain management. For example, State and Territory emergency management agencies are the "lead agency" with respect to flood emergency management, State and Territory water resource agencies may be the "lead agency" with respect to the provision of technical advice on flooding matters.

Likelihood

a qualitative description of probability and frequency (see also Frequency and Probability).

Likelihood of occurrence

the likelihood that a specified event will occur. With respect to flooding see also Annual exceedance probability and Average recurrence interval.

Local agency

the agency that most strongly and effectively reflects the concerns and desires of the local community with respect to floodplain matters and is responsible for preparation of a floodplain management plan. Typically a local council in urban areas; may be a local council, catchment management board or River Trust in rural areas. Subject to the various legislation /regulation in States and Territories, a local agency may also be a State or Territory agency. The local agency collects floodplain management data in both urban and rural areas.

Mainstream flooding

inundation of normally dry land, generally short lived, that occurs when water from a creek, river, lake, estuary or coastal waters overflows the natural or artificial banks of the principal watercourses in a catchment. Mainstream flooding generally excludes watercourses constructed with pipes or artificial channels considered as stormwater channels.

Mathematical/computer model

the mathematical representation of the physical processes involved in, for example, runoff generation and stream flow. Computers are often required to solve the underlying equations. In this document, the models referred to are mainly involved with rainfall, runoff and stream flow.

Minor, moderate and major flooding

the State Emergency Services Organisations of the various States and Territories and the Bureau of Meteorology use the following definitions in flood warnings to give a general indication of the types of problems expected with a flood:

- major—extensive rural areas are flooded with properties, villages and towns isolated and/or appreciable urban areas are flooded
- moderate—low-lying areas are inundated requiring removal of stock and/or evacuation of some houses, main traffic bridges may be covered
- minor—causes inconvenience such as closing of minor roads and the submergence of low level bridges.

Non-conforming development

See Developmens, non-conforming

Peak discharge

the maximum discharge occurring during a flood event past a given point on a river system (see also Discharge, Hydrograph).

Probability

the likelihood of a specific outcome, as measured by the ratio of specific outcomes to the total number of possible outcomes. Probability is expressed as a number between zero and unity, zero indicating an impossible outcome and unity indicating an outcome that is certain. Probabilities are commonly expressed in terms of percentage. For example, the probability of "throwing a six" on a single roll of a die is 1 in 6, or 0.167, or 16.7%.

Probable maximum flood (PMF)

the largest flood that could conceivably occur at a particular location, resulting from the PMP. The PMF defines the extent of flood-prone land. Generally, it is not physically or financially possible to provide general protection against this event. It is difficult to define a meaningful annual exceedance probability for the PMF event. It is commonly assumed to be of the order of 10^{-4} to 10^{-7} (i.e. a flood risk of 1 in 10 000 to 1 in 10 000 000, Laurenson 1994) (see also *Probable maximum precipitation*).

Probable maximum precipitation (PMP)

the greatest depth of precipitation for a given duration meteorologically possible over a given size storm area at a particular location at a particular time of year, with no allowance made for long-term climatic trends (World Meteorological Organization). It is the primary input to the estimation of the PMF (see also Probable maximum flood).

Rainfall depth

the total amount of rain that falls over the duration of a storm.

Rainfall flooding

flooding caused in non-tidal waterbodies by heavier than usual rainfall.

Rainfall intensity

the rate at which rain falls, typically measured in mm/hour.

Rainfall intensity varies throughout a storm in accordance with the temporal pattern of the storm (see also Temporal pattern).

Rainfall severity

a qualitative indication of the intensity of rainfall and its potential to cause flooding.

Residual flood risk

the remaining level of flood risk that a community is exposed to after floodplain management measures to reduce risk have been

implemented (i.e. "untreated" flood risk. Residual risk varies with flood severity and may be substantial for flood events that are larger than the DFEs adopted for planning purposes or for the design of structural works.

Risk

is defined (Standards Australia/Standards New Zealand 1995) as the chance of something happening that will have an impact on objectives. It is measured in terms of consequences and likelihood. For example, if the 50 year ARI flood event causes \$20 million in flood damage, the risk of a flood causing \$20 million damage is 1 in 50. Risk is often thought of as the "downside of a gamble" (Rowe 1990) (see also *Chance*).

Risk acceptance

an informed decision to accept the likelihood and consequences of a particular risk.

Risk analysis

the systematic use of available information to determine how often specified (flood) events occur and the magnitude of their likely consequences. Flood risk analysis is normally undertaken as part of a floodplain management study and involves an assessment of flood levels and hazard associated with a range of flood events (see also Flood study).

Risk management

the systematic application of management policies, procedures and practices to the tasks of identifying, analysing, assessing, treating and monitoring flood risk. Flood risk management is undertaken as part of a Floodplain management plan. The floodplain management plan reflects the adopted means of managing flood risk (see also Floodplain management plan).

Runoff

the amount of rainfall that drains into the surface drainage network to become stream flow, also known as rainfall excess.

Stage

equivalent to "water level". Both are measured relative to a specified datum.

Stage hydrograph

a graph which shows how the water level at a particular location changes with time during a flood. The stage hydrograph must be referenced to a particular datum.

Storm severity

a qualitative indication of the destructive potential of storms. Storm severity is usually measured in terms of AEP or ARI). Tropical cyclones have five categories of severity (see also *Tropical cyclone warnings*).

Storm surge

the increase in coastal water levels caused by the inverted barometer effect and wind setup. Some analyses of "storm surge" also include wave setup (see also *Inverted barometer effect*, *Wave setup*).

Storm surge flooding

flooding along coastal areas and the tidal reaches of rivers caused by storm surge and wave setup. May also be referred to as storm tide flooding. Storm surge flooding may inundate areas outside floodplains defined in this document.

Storm surge water levels

Water levels experienced in tidal waters during storms. Storm surge water levels include the inverted barometer effect, wind setup, wave setup and astronomical tidal waves, together with any other factors that increase tidal water levels (see also Astronomical tide).

Stormwater flooding

inundation by local runoff caused by heavier than usual rainfall. Stormwater flooding can be caused by local runoff exceeding the capacity of an urban stormwater drainage system or by the backwater effects of mainstream flooding causing urban stormwater drainage systems to overflow.

Temporal pattern

the variation of rainfall intensity with time over the course of a rainfall event.

Tidal amplification

an increase in high tide level (and possibly tidal range) above astronomical high tide caused by the bathymetry of coastal waters (especially converging inlets) and by storm surge and wave setup.

Tidal anomaly

the difference between recorded storm surge levels and predicted astronomical tide level.

Tropical cyclone warnings

the Australian Tropical Cyclone Scale (Commonwealth Bureau of Meteorology 1995) recognises five categories or severities of cyclones, details of which are shown below. The potential damage associated with cyclones relates more to wind damage than to storm surge damage.

Category	Maximum wind gust (km/h)	Central pressure (hPa)	Potential damage
1	<125	>985	Minor
2	125-170	970-985	Moderate
3	170-225	9 45– 9 70	Major
4	225-280	920-945	Devastating
5	>280	<920	Extreme

Tsunami

low crested waves generated in the oceans by underwater volcanic or landslide activity or by underwater earthquakes. As tsunamis move into shallower coastal waters, their height can increase dramatically and extensive coastal areas may be subject to inundation and extreme hazard.

Tsunami flooding

flooding caused by a sunami. Tsunami flooding may inundate areas outside the floodplains defined in this document.

Velocity of floodwater

the speed of floodwaters, measured in metres per second (m/s).

Vulnerability

the degree of susceptibility and resilience of a community and the environment to flood hazards. Vulnerability is assessed in terms of the ability of the community and environment to anticipate, cope with and recover from flood events. Flood awareness is an important indicator of vulnerability.

Water surface profile

a diagram showing the variation of surface water level along a water course.

Wave setup

the increase in water levels in coastal waters (within the breaker zone) caused by waves transporting water shorewards. The zone of

wave setup against the shore is balanced by a zone of wave "setdown" (i.e. reduced water levels) seawards of the breaker zone. Wave setups of 2m to 4 m could occur during tropical cyclones.

Wind fetch

the horizontal distance in the direction of the wind (i.e. the distance across a waterbody available to generate wind waves).

Wind setup

the increase in water levels in coastal waters caused by the wind driving the water shorewards and "piling it up" against the shore. Wind setup can be as high as 10 m in an extreme case and often exceeds 2 m to 3 m in typical tropical cyclones.





GOVERNMENT ADVISORY COMMITTEE MEETING State Planning Policy Natural Disaster Mitigation

2:00 pm Thursday 24 May 2002

Media Room, Block E, Emergency Services Complex, Cnr Kedron Park Road and Park Road, Kedron

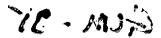
MINUTES

Attendees

Queensland Government Agency	Nominated Representative	Attendee
Department of Local Government and Planning		
Department of Main Roads		
Department of Natural Resources and Mines	Russell Cuerel	Russell Cuerel
Department of Premier and Cabinet		,
Department of Primary Industry		
Department of Public Works		
Department of State Development		
Environmental Protection Agency		
Queensland Transport		
Department of Emergency Services		

Agenda Item 1:	Welcome/Introduction				
	, Acting Director, Disaster	Mitigation Unit,	welcomed and the	anked attendee	s.
Apologies were re Murphy, Arthur O'	ceived from Brien and Frank Pagano.	,	, Frank Turvey,	Col Bunker,	Chri

The purpose of the meeting was to update the Government Advisory Committee (GAC) representatives on the Focus Workshop held on the 10 May 2002 with the Urban Development Institute of Australia (UDIA), the Royal Australian Planning Institute (RAPI) and the Local Government Association of Queensland (LGAQ). The next Focus Workshop with key stakeholders is scheduled for 29 May 2002. A further GAC workshop is planned for the week commencing 4 June 2002. The draft SPP and Associated Guideline are proposed to be finalised by 21 June 2002.





The Workshop on the 10 May 2002 was successful and focused on how to identify natural hazard prone areas and the costs and resource issues involved in doing this. Another issue raised by stakeholders was that the SPP applies the day after the SPP is gazetted ('Day 1') so its needs to be able to be used effectively from 'Day 1'.

Agenda Item 2: Feedback from Key Stakeholder's Workshop

An outline of the discussion at the Key Stakeholder's Workshop held on 10 May 2002 was provided. Key issues raised were:

- Specified Natural Hazard Prone Areas (Annexe 3)
 - a. Flooding The Key Stakeholder's Workshop discussed "What is a reasonable definition of a natural hazard prone area for land subject to flooding?" Concern was raised about the availability of information within some Local Governments and whether the SPP could apply to flooding on 'Day 1'. Discussion also focussed on the longer-term benefits of requiring Local Governments to undertake flood studies in particular whether the benefits justify the costs and resources required (in particular in areas of low development/low flooding).
 - b. Bushfire Current direction is a cascading approach where the 'best' outcome is where Local Government undertakes a bushfire hazard assessment study. Where there is no study, Local Governments can adopt an area reflecting the Medium and High hazard area of the Bushfire Risk Analysis Maps produced by Queensland Fire and Rescue Service (QFRS) following a review (eg. ground truthing). Alternatively, where no area is adopted, the Medium and High hazard areas of the QFRS maps would apply.
 - c. Landslide. The Key Stakeholder's Workshop thought that landslide should be determined with a similar approach as bushfire. That is, the best outcome is adopting areas determined by a geological stability study, secondly where no study exists, a Local Government adopts an area that includes all land of 15% and greater slope and other land known or suspected of being geologically unstable and where an area is not adopted all land with slope greater than 15%.
- Legal liability The Key Stakeholder's Workshop discussed Local Government's concern on the release of natural hazard information to the community. The GAC recognised that legal liability is a whole-of-Government issue rather than a SPP issue, however consideration should be given to incorporating the legal liability issue into the SPP and Associated Guidelines.

ACTION: SPP Team to investigate the legal liability issue including areas of responsibility.

 Costs/resource capacity – A key concern at the Key Stakeholder's Workshop is that the cost of studies could challenge some Local Governments.

Agenda Item 3: Revised Draft State Planning Policy

A current version of the Draft SPP was distributed to meeting attendees. The following key changes were explained:

Application of the Policy - It is proposed that the SPP applies throughout Queensland, however
the application of the SPP for bushfire would exclude some areas. QFRS is to provide advice on
those areas to be excluded. The committee suggested that the annex outlining those areas
excluded from the SPP, should include reason(s) why some areas are excluded (eg. those areas

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prone to only grassfire, or low bushfire hazard). Committee members also thought that excluding areas for the landslide hazard would be beneficial.

- Section 6 Development Outcomes and Development Assessment this section previously related to a development table. The current thinking has moved away from the development table concept to a performance criteria approach.
- Annexe 3 Potential Natural Hazard Affected Areas The SPP allows for Local Government to select from several options. Both bushfire and landslide can be identified on Day 1. However, for flooding, if no floodline has been adopted by the Local Government for a particular locality then the SPP does not apply from Day 1. At the planning scheme stage the floodline should be determined by a study.
- Mapping for Urban and Rural Residential Areas The SPP currently does not require Local Government to do a natural hazard mapping exercise for the entire Local Government area, but just in areas to where there is development to which the SPP applies. It was suggested that 7.1, Outcome 2 should be changed to read: "Potential natural hazard affected areas that overlay or are adjacent to areas potentially allocated for development to which this SPP applies are identified in the planning scheme".

The committee agreed that even though it would be ideal to map natural hazards for the whole Local Government area this is not practicable. The question was then raised on how Local Governments can say an area is not hazard prone if they have not mapped it? Local Governments should focus the assessment of natural hazards on those areas under development pressure.

- The Committee also raised the following points:
 - Outcome 3 dot point 3 'seek to reduce' perhaps it should be 'non-worsening'
 - Outcome 3 dot point 4 'does not increase' perhaps it should read 'minimise the impact' or 'not adversely effect'.

ACTION: It was agreed that Outcome 2 be reworded and further investigation should be undertaken on where the SPP requires mapping.

Agenda Item 4: Guidelines

O Workshop participants were provided with an update of the associated Guideline and a copy of the associated Guideline's Table of Contents and advised that a draft Associated Guideline should be available at the next GAC meeting. A copy of the draft SPP and Associated Guideline will be distributed to GAC members for comment.

Agenda Item 5: Other business

Nil

Agenda Item 6: Workshop on 4 June

Note: The 4 June 2002 meeting was postponed. The meeting closed at 4:00pm.



GOVERNMENT ADVISORY COMMITTEE WORKSHOP

Discuss an INITIAL DRAFT of the

STATE PLANNING POLICY (SPP) FOR NATURAL DISASTER MITIGATION

Thursday 11 April 2002 10:00 am - 4:00 pm Liaison Room, Block E, Emergency Services Complex, Kedron

MINUTES

<u>Attendees</u>

Queensland Government Agency	Nominated Representative	Attendee
Department of Local Government and Planning		
Department of Main Roads		
Department of Natural Resources and Mines	Russell Cuerel	Russell Cuerel
Department of Premier and Cabinet		
Department of Primary Industry		
Department of Public Works		
Department of State Development	<u> </u>	
Environmental Protection Agency	<u> </u>	
Queensland Transport	<u></u>	
Department of Emergency Services		

Actions Arising

No.	Action	Responsible Officer	Due Date
1	Bushfire Hazard Planning Paper to be emailed to Richard Wood.		17/4
2	Meeting to be organised with Ray Robinson, and a DPI representative to further develop the definition on bushfire hazard prone areas.	SPP Team	17/4
3	Change wording for flood prone areas (Annexe 2) 2 nd dot point to read: "a floodplain management study to determine the potential consequences of the full range of floods and development scenarios:"		19/4
4	Investigate the need for reference to areas of close proximity in the definition of flood hazard prone areas (Annexe 2).	Russell Cuerel	24/4



No.	Action	Responsible Officer	Due Date
5	All information and sources of possible reference documents on siting design and engineering requirements to enable compatible development to be provided to Richard Wood.	All	26/4
6	Advise the SPP Team on the need to include reference to agricultural infrastructure in the SPP.	Dinesha Emmery	24/4
7	Meeting to be organised to discuss Main Roads and Transport Department issues.	SPP Team	24/4
8	Written feedback to be provided to Richard Wood on Outcome 7.	All	ASAP

Apologies:	

Agenda Item 1: Introduction

the Director Disaster Operations and Acting Director Disaster Mitigation Unit opened the workshop, welcoming attendees and advising that the completion date for a draft of the State Planning Policy is set for mid-June.

Agenda Item 2: Outline of the SPP including its broad concepts

gave a presentation on the direction of the initial draft of the State Planning Policy (SPP) including its objective, framework and application. A copy of this presentation can be found in Attachment 1.

Agenda Item 3: Discussion of SPP's broad direction

Workshop attendees generally indicated support for the direction of the SPP. Some attendees advised that they are still in the process of forming a comprehensive response from their organisations and that these written comments would be forwarded as soon as possible. There was general agreement that the SPP needed to clarify the policy position in some instances and that the detail of the Guidelines would assist in understanding process and procedure.

Agenda Item 4: Review of sections 2 and 5 (Development Assessment) of the SPP:

4.1 Developments to which the SPP applies

Bushfire

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- o The issue was raised of possible exclusion of bushfire hazards from west of the Great Dividing Range. This was due to the low risk to human settlement.
- commented on Option 1 (Annexe 2) that existing Rural Fire Service maps can only be used as a guide. He explained that Option 2 showed reference to a New South Wales paper on bushfire and cautioned that the risk differences between States needs to be recognised.
- o be reviewed to determine whether it could be used as an assessment tool in Queensland. Another issue is that the same criteria would not be used for assessment in all Queensland.
- Option 1 was not supported by (bushfire mapping), as this map is a guide to bushfire hazard not to risk. Broad mapping needs to be defined at local level.

OUTCOMES:

- Workshop members expressed reluctance for bushfire hazard to be excluded from any areas of the State.
- It was agreed that areas of close proximity be determined around bushfire prone areas.
 ACTIONS:
 - o to email a copy of NSW Bushfire Hazard Planning paper to



Meeting to be organised with an analysis of the definition on bushfire hazard prone areas.

Flooding

- o Russell Cuerel outlined Option 1 (Annexe 2)
- The inclusion of flood inundation by storm surge was discussed. Russell Cuerel advised that this is considered best practice in a flood study.
- o The issue was raised that Option 1 may be of concern to some Local Governments. It was explained that the SPP is aiming to improve practice and that the definition needs to be clear so that Local Governments are able to meet objectives.
- o Whether to include close proximity in the Option 1, A.2.3.1 was discussed. Russell Cuerel advised that without doing a full flood study it is difficult to determine the close proximity zone.
- o The Environment Protection Agency indicated that the SPP was not considered to be in conflict with the State Coastal Management Plan.

OUTCOMES!

o. It was agreed that the relationship of flood inundation by storm surge to the SPP/should be addressed in the Guidelines.

ACTIONS!

- Change to wording of dot point 2 to read "a floodplain management study to determine the potential consequences of the full range of floods and development scenarios:"
- Russell Cuerel to investigate the need to include areas of close proximity in the definition of flood hazard prone areas.

Landslide

advised the workshop that the definition of landslide is still being worked on following consultation with Gold Coast City Council.

- 4.2 Natural Hazards (i.e. bushfire, flooding, landslide) what are they and how are they determined? Identification of hazards and measuring of risk
- o If the responsibility for assessment of natural hazards rested with the development applicant, how would the assessment manager ensure authenticity of these assessments? Geoff Beare advised that an applicant could apply the precautionary principle under IPOLA.

 Assessment Manager was entitled to refuse applications.
- o It was commented that Local Governments required clarification on the identification of natural hazards and measuring risk to give them some certainty. The recommended that the SPP should provide advice on defining hazard prone areas and that the applicant should only have to determine whether proposed development is in or out of those areas. It was agreed that this should be on a criteria basis rather than prescriptive. The advised that criteria must be acceptable by Local Government. Commented that the expectation is for Local Governments to identify hazard areas in their planning schemes.
- then went through a series of diagrams illustrating the concepts for degrees of natural hazard for bushfire, landslide and flooding. It was agreed that the SPP needed to define the boundaries in the diagrams for the practitioner.
- O Discussion then focussed on what a reasonable request for information from the Local Government/Development Applicant might be. Concern was expressed that a small development application might give cause to an entire floodplain study. It was agreed that the SPP needed to give Local Governments guidance from day 1 on the determination of specified natural hazard prone areas.
- O Determining risk from landslide is a grey area that raises funding issues. Richard Wood advised that the Gold Coast City Council have a process to assess landslide areas but this requires an assessment from a geotechnical engineer. The process can be done by the Council or individually by the proponent. A possible funding avenue for Local Governments would be the Natural



Disaster Risk Management Studies Program (NDRMSP). Also the proponent has an obligation to assess their land.

OUTCOMES:

- Guidelines to provide siting design and engineering requirements to enable development to be compatible. This could include referencing existing documents.
- o SPP to provide guidance for Local Governments to determine hazard prone areas.
- o SPP to define what constitutes a certain degree of hazard (low, medium, high). ACTIONS:
- All information and sources of possible reference documents to be provided to Richard Wood by workshop attendees.

4.3 "Acceptable risk"

- Discussion focussed on the difficulty in defining acceptable/tolerable level of risk, including the requirement for a large consultative risk assessment process.
- o If the Development Table is used then it will need support by State Government. It will also require definition of low, medium, high, extreme hazard.
- Faye Smith defined tolerable risk as "a risk you are prepared to live with but don't accept".
 Possible the terminology to use is 'compatibility to the degree of natural hazard'.
- Phil Kohn advised that this could be too ambiguous and leaves too much interpretation up to the developer.
- Defining acceptable risk should be determined at the local level.

4.4 The Development Table

General approval was given to the layout of the Development Table. The meeting discussed how it should be incorporated in the SPP. Concern existed about the basis on which development was classified. Some meeting attendees found the table prescriptive but at the same time unquantifiable/undefinable (e.g. what is medium, low and high?). It was also suggested that the table become an attachment to the Guidelines and that an extra column be including on types of issues covered and expectation.

OUTCOMES:

It was agreed that the following issues be addressed:

- Variation of impacts resulting from different land uses, e.g. Modification to vegetation clearance may not apply in relation to bushfire prone areas but does have an impact on landslide areas.
- Clarification of groupings, e.g., it is possible that some infrastructure developments may have a beneficial rather than negative effect on hazard risk.
- of Referencing throughout table, e.g., Definition of Dangerous Goods be considered.

Dinesha Emmery to advise the SPP Team on the need to include reference to agricultural infrastructure.

4.5 Community Infrastructure

- O Designated community infrastructure: The meeting discussed whether designated infrastructure developments appropriately considered natural disaster mitigation. advised that Main Roads addresses as part of its design procedures.
- A clear statement of expectations for community infrastructure was sought. Need guidelines to resolve this issue.

4.6 Other issues



- o Close Proximity: has not yet been defined.
- o Infrastructure: the impacts of infrastructure on increasing hazard risk could be further discussed in the Guidelines, e.g., development adjacent to State Forest Parks etc.
- Reconfiguration: Suggestion that reconfiguration should be specified as a development type (Annexe 2 dot points).
- Overriding Need: Determination of overriding need in public interest needs to be made more explicit. Does the Department of Local Government and Planning has a policy on what constitutes overriding need?
- COAG review and NDRA funding: The meeting was advised that as long as a clear decision-making process is evident, NDRA payments would not be affected.
- o Contradiction with accepted documents/guidelines: Russell Cuerel clarified that the SPP should not contradict national flood guidelines, either using extracts or straight references.
- O Cost Effects of SPP on State Government Agencies: Frank Turvey expressed concern over the extra financial cost to State Government Agencies for Public Works.
- o Requirements of Local Government were discussed, i.e., what do Local Governments require to effectively implement the SPP, e.g., funding, tools, guidance. The key is the guidance and definition of how they apply the knowledge that most of them have in some form or another.

OUTCOMES: That the above issues be considered.

o Meeiling to be organised as soon as possible to further discuss Main Roads and Queensland Transport issues.

Agenda Item 5:

Review of Section 6 (making and amending Planning Schemes):

Mechanisms for implementing the SPP in Planning Schemes

Planning Schemes

ACTION: Aftendees to provide feedback to Richard Wood on Outcome 7 ASAP.

Agenda Item 7: Other Business

A further meeting will be organised with Royal Australian Planning Institute, the Local Government Association of Queensland and Urban Development Institute of Australia (Queensland) representatives.

Agenda Item 8: Next Meeting

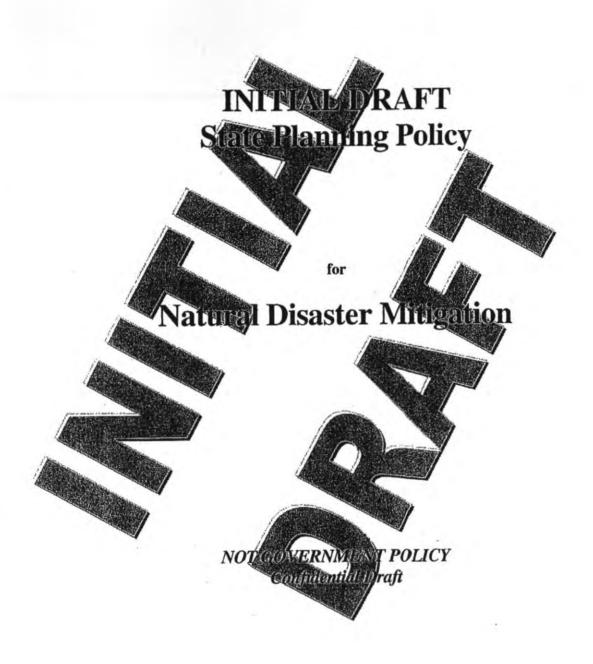
To be advised.

ATTENDEES

SPP WORKSHOP INITIAL DRAFT 11 APRIL 2002

Nominated Representative	Attendee	Comments	Dietary Requireme nts
	<u> </u>		Vegetarian
		. [J South
		8/4 LM_FOR	
Russell Cuerel	Russell Cuerel	X42719 - LM WITH FREE - RUSSEL IN MELB UNTIL WED.	
			Vegetarian
	half)		No Mayo
			<u></u>
		40585	
		LM 8/4 BACK ON WED	Low fat milk
C H		Regional Inspector (South)	
			Vegeterian
	Representative Russell Cuerel	Representative Russell Cuerel Russell Cuerel (1st halt)	Representative Solution Solu

TOTAL AS AT 9/4: 24



March 2002

- POSITION STATEMENT

The Queensland Governmen considers that development should minimise the potential adverse impacts of natural hazards on people, property, economic activity and the environment,

Overall issues for supporting information with SPP Guideline are:

- · Defining natural hazard areas and decore of materal hazard.
- Determining development to which the Still applies to and whether these developments are conditionally compatible of mempatible development for particular degrees of natural hazard.
- · Defining acceptable and untraceptable with
- · The level of analysis given throughout cost constraints.

1. PURPOSE OF THE POLICY

1.1 This State Planning Policy ('the SPP') sets out the State vinterest in ensuring that certain natural hazards are victorially considered when making decisions about development.

2. APPEACATION OF THE POLICY

2.1 Under the Integrated Planning Act 1997 (IPA), the SPP has offee when development applications are assessed, when planning schemes are made of an ended, and when land is designated for community infrastructure.

Areas to which the policy applies

2.2 This SPP applies, throughout Queensland, except as specified in Annex 1.

Development to which the policy applied

2.3 The SPP applies to development distribution of activities described in Annex2.

SPP Guideline provides advice on:

- how-to determine land that is applicable to the SPP, in particular "specified natural hazard prone areas".
- reasoning for areas to which the SPP applies.
- Reasoning for development to which the SPP applies.
- What constitutes natural hazard studies?

CONFIDENTIAL DRAFT - NO OFFICIAL STATUS page 2, 28/03/2002
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The SPP Guideline describes in more detail how the SPP applies.

3. USING THE POLICY

- 3.1 The main outcome statements are depicted in bold type (Outcome 1 Outcome 7) and must be read in conjunction with the rest of the text.
- 3.2 Technical terms are explained or defined in Section 9: Glossary.
- 3.3 The Draft SPP 3/02 Guideline: Natural Disaster Mitigation, provides advice about how to implement the SPP, and is declared to be 'extrinsic material' under the Statutory Instruments Act 1992.

4. THE NEED FOR NATURAL PISASTER MITIGATION

Section 4 is being drafted. Possible proposfor inclusion include:

THE NEED FOR NATURAL DISASTER MITIGATION

Role of Land Use Planning in Natural Disaster Mitigation

- o Objective is to keep natural hazards from becoming that ral disasters.
- O Natural disasters are the result of the impact of natural hazards on communities. SPP aims to minimise the error its of natural disasters on people of openty, economic activity and the environment² and create settlement patients that are resulted to natural disasters.
- o boss of life has decordised from natural disasters but cost line just in for restoration and rehabilitation due to the community having more assets the population having increased and intere development in natural hazard prome areas.
- o Facis and figures on costs of natural disperses
- The SPR is one natural disaster mitigation regulatory tool, which complements the implementation of the Standard Building Regulation and the State Coastal Management
- Land use planning can make a stanificant proactive contribution to natural disaster mitigation by identifying in advance of development, the areas at risk and putting suitable planning measures into place.
- SPP will address floods, bushfires, landshide, and, for essential community
 infrastructure, also earthquakes and strong winds. The impacts of cyclones and severe
 storms will be addressed in the SPP (floods and severe winds), the SBR, and the State
 Coastal Management Plan (SCMP).
- O Development and associated infrastructure should be directed away from or avoid specified natural hazard prone areas. Within specified natural hazard prone area(s), development applications should outline the measures required to minimise risk to make the proposal compatible. Exceptions to this are when the proposal is an existing development or an overriding pubic need.

² Environment includes social and cultural considerations.

reasonably practical. Where that information is not provided, it should be the subject of an information request under IDAS⁸.

5.9 The SPP Guideline provides planning, siting and design measures that could be used to modify development, to which this SPP applies, within specified natural hazard prone areas to minimise risk to make proposals compatible.

Outcome 3: Development in close proximity to a specified natural hazard prone area does not increase the degree of the hazard of any land inside those areas or extend the hazard prone area.

- 5.10 When assessing development, particularly inclose proximity to specified natural hazard prone areas, the off-site impacts of that development must be considered, including planning, siting and design measures that particularly of the property of the
- 5.11 The SPP Guideline provides planning, siting and design measures, that could be used to modify development, to which this SPP applies, so development does not adversely affect the existing or future use of other land.
- Outcome 4: Common ty infrastructore, to which this SDI applies, is able to perform its function when afflooding, bushfire, landslide, earthquake of strong wind events occurs consistent with the degree of hazard(s) applicable to the intrastructure's site.
- 5.11 In areas prone to flooding bushfire, landslide, earthquakes on shooting winds, community infrastructure should be located and designed to having regard to the tole of the community infrastructure and the consequences and risk to people, properly economic activity and the environment if the community infrastructure was not able to transport by cause of a natural hazard event.
- 5.12 When developing community infrastructure, proponents should identify the degree of natural hexard(s) for the development site and the measures required to ensure the infrastructure is able to function. Where the information is not available, it should be the subject to an information request under IDAS SEP (duideline provides advice about the natural hazard issues to be taken into consideration when assessing community infrastructure.

The SPP Guideline to provide:

- o Advice on how-to determine the deposit of national azard.
- A table outlining development that is conditionally compatible at certain degrees of natural hazard.
- o How to interpret overriding need.
- Assessment criteria for conditionally compatible and incompatible development (including risk management considerations).
- Planning, siting and design measures to modify conditionally compatible, incompatible development and development located in close proximity to specified hazard prone areas.
- Advice on converting developments within specified natural hazard prone areas from potential liabilities to assets.
- Advice on the applicability of the SPP on community infrastructure (eg. roads, rails and ports).
- Advice on information required to assess development.

⁸ See Section 9, Glossary.

⁹ See Annex 2.

5. DEVELOPMENT OUTCOMES AND DEVELOPMENT ASSESSMENT

5.1 This section sets out the development outcomes expected. When development applications are assessed against this SPP or land is being designated for community infrastructure, regard must be had to Outcome 1 to 4, and the remainder of Section 5. However, this SPP is not to be used when assessing development applications for building work assessable only against the Standard Building Regulation.

Outcome 1. Within specified natural hazard prone areas, development to which this SPP applies³ is compatible with the particular degree of natural hazard, except where:

the proposed development is a development commitment⁴;

• there is an overriding public need for the development in the public interest, and no other site is suitable and reasonably available for the proposal.

Determining natural hazard

5.2 Information on the lecation of specified natural hazard profit reas and degree of the hazard is available from the State of book government, or will need to be determined when preparing a development application. Annex 2 identifies characteristics of areas prone to flooding, bushful and landslide. The SPP Guideline provides uniteral information on how to determine specifies natural distract prone areas and degree to the baserd.

5.3 When assessing applications for development in the vicinity of specified natural hazard prone areas, the assessment Manager should confirm whether the proposed development is located within a specified mitural hazard prone area and it see that displee of natural hazard applies. Whose further classification is necessary, it should be the subject of an information request under 10.

Determining Development Compatibility

hazard whomsonsistent with the SPP Guideline dassilication of land use compatibility within specific degrees of natural hazard. The Guideline's classification reflects what is an acceptable level of risk for particular types of decelorment and land with specified degrees of natural hazard.

³ See Annex 2.

⁴ See Section 9, Glossary.

Development commitments and overriding need

5.5 While this SPP aims to minimise the community's exposure and vulnerability to natural hazards, this aim may not be achievable in certain circumstances:

First, existing development commitments⁵ for particular material changes of use should not be

nullified by applying this SPP.

Second, in some cases it may be possible to demonstrate that a proposed development would
fulfil a particular public interest to an extent that would override the public interest in the
development being compatible with the degrees of patural hazard.

Nevertheless, the potential adverse impacts of natural becards should be mitigated to be as low as is reasonably practical by the use of appropriate conditions on development permits to achieve

Outcome 2.

- 5.6 Determining an overriding need in the public interest will depend on the circumstances of the particular development proposal. The proposal should result in a significant overall benefit to the community in solution economic terms that outweighs the idverse impacts arising from the development's exposure construction and reasonably divallable sites. Also, it should be shown by the applicant that a similar benefit could not be achieved by developing other suitable and reasonably divallable sites.
- Outcome 2. Within specified natural hazard prone areas development to which this Policy applies in cludes planning, siting and design measures that minimise the risk from natural hazard(s) to people, property, economic activity and the on decomment.
- 5.7 Planning, sump and design measures that minimuse its. Bommatural hazards should be required for any development associated with uses the SEP Guideline states are:

· conditionally compatible within a specified degree of the hazard; or

Such measures should be required as conditions on development opprovals for material changes of use, subdivision and works as appropriate. It comparishes should only be permitted as a development containment or on the grounds of oversiding most in accordance with Outcome 1.

5.8 Applications for development in specified natural hazard prone areas should identify the location of the development site in relation to the degrees of hazard for flooding, bushfire or landslide. If the development is classify as conditionally compatible, the development application should outline the measures required to imprimise risk to make the proposal compatible. If the development is classified as incompatible, the development application should outline the measures required to minimuse the risk from the hazard to as low as

a valid, current development approval;

 development that is exempt development self-assessable development or is only assessable against the Standard Building Regulation;

development clearly consistent with the relevant zone (or equivalent) in a planning scheme;

 an allocation in a planning scheme (e.g. strategic plan, development control plan or local area plan) where the development intent is clear and unqualified; or

 a subdivision or other reconfiguration of allotment boundaries consistent with the requirements of the relevant planning scheme;

a designation for community infrastructure.

⁷ See Annex 2.

⁵ "Development commitment" includes any of the following:

⁶ The SPP 3/02 Guideline provides advice about interpreting 'overriding need'.

Advice on where information is available.

Advice on where community infrastructure, needed in an emergency, should be located (Some community infrastructure plays an important role in responding and recovering to a natural disaster, for example, emergency service facilities and hospitals. Community infrastructure essential to responding and recovering to a natural disaster to be located away from areas prone to natural hazard.)

Advice about location, siting and design of community infrastructure that provides important links and services to communities (Some infrastructure provides important links and services to communities, which if severed or reduced, would have significant economic and social consequences. The siting and design of this community infrastructure to ensure that the infrastructure is able to community in the irrespective of the natural hazard.)

Advice on designating land for community in the year.

MAKING AND AMENDING A PLANNING SCHEME

Planning schemes should him to achieve the outcomes in seal on the recentifying particular information and containing appropriate planning strategies and development assessment measures

Identifying a cess properto natural hazards in the planning scheme

Outcome 5 This planning scheme identifies natural hazard prone are is.

Natural hazard provide areas should be identified in standing solionies using the information in Annex 2. Jointifying and mapping of a profit in a ural hazards is necessary to assist in formulating planning strategies and detailed planning heasures to minimise risks to people property capacity activity and the environment.

Reflecting the SPP in planning strategies

Outsome 6. The planning scheme contains planning strategies that:

direct major urban and semi-urban development away from specified natural hazard prone areas;

contributes towards minimising the risk to people, property, economic activity and the environment in existing areas; and

give preference to development which is compatible with specified degrees of natural hazard.

6.3 Future urban and semi-urban development and associated community infrastructure should be directed away from natural hazard prone areas as far as practicable. Allocated land uses and associated development within specified degrees of natural hazard is to be consistent with Outcome 1 and the recommendations of the SPP Guideline regarding the compatibility of particular land uses within specified degrees of natural hazard.

7. LINKS

- Australian Standards, Building Code of Australia,

Bushfire Hazard Planning in Queensland 1993 (Queensland Fire and Rescue Services),

A F A C guidelines,

 Dam safety, dam emergency action plans – links to and implications of the Queensland Safety Management Guidelines for Referable Dams and guidelines for failure impact assessment of water dams (Department of Natural Resources and Mines),

CSIRO Floodplain Management in Australia

- State Coastal Management Plan (Environmental Protection Agency),

- State Counter Disaster Organisanon Act - requiring Local Government Counter Disaster Plans and Disaster Mitigation Plans,

- Disaster Risk Management and Guidelines and

- Reliable information on cliquete change

8. INFORMATION AND ADVICE ON THE POLICY

Queensland Department of Local Government and Planning can provide advice on the interpretation and implementation of the policy, and the relevant contacts in appropriate agencies for specific up ural disaster murigation issues.

Queensland Department of Local Government and Planning Can provide advice about reflecting the SPR in planning schemes and the operation of ID SS

RFS fire map DNRM on landslip geology floodplain management

9. GLOSSARY (Glossary is being drafted)



Reflecting the SPP in detailed planning scheme measures

Outcome 7. The planning scheme measures:

a) include a code(s) designed to achieve development outcomes that are consistent with Section 5; and

b) ensure that development to which this SPP applies is assessable or self-assessable against that planning scheme code(s); while the planning scheme or planning scheme policy(s) should specify the

information expected to be submitted with development applications subject to the

code(s).

The combination of development assessment ables and code(s) in the planning scheme need to ensure that all relevant development is assessed against specific development requirements that are consistent with Section 5, irrespective of the assessment process prescribed by the planning scheme

6.5 Section 5 describes the information that should be submitted with development applications that are to be assessed against the code(s). The planting scheme or supporting planning scheme policy(s) should make i clear that where such and matron is not provided with a development application, that information will be subject to an information request under IDAS 16. In this way, an appropriately rigorous level of the entification and analysis is made available to assist development assessment decisions

SPP Guideline provide advice on:

Natural Aurard Trapping techniques to determine the desagrafinatural Mazard including assessment of commitative affects (eg. buildings on five up from the fing water flow). and regional factors affecting the area oss-boundary coordination between Local Government areas and missing d catchment management

terchingues de on a semental prical and predicted officer (its climate sharke)

directing development and infinity fuction areas prone to specified natural

hazard prome areas.
Mitigation of tions for each natural hazard in the faling, bushfire and landslide). on a transfer mation expected to be provided with an application including:

outlining proposed development is located within pecified natural hazard prone areas, outlining proposed planning many massic miligate the natural hazard risks and consequences to acceptable s.

o Provide advice on the assessment or the popularity of the provide advice on the assessment of the provide advice of including natural hazard risk assessment (ked book).

Information that could be included in could

o Provide advice on precautionary principle (as referenced in Section 1.2.3 (1) (iii) and (2) of

Land management techniques that complement planning scheme measures (eg. Fire Management Plan, Floodplain Management Plan, Disaster Mitigation Plan)

¹⁰ See Section 9, Glossary.

Annex 1

For Bushfire hazard, the SPP applies to the following local government areas:

- possibly excludes areas west of the Great Dividing Range (list of local governments)

Annex 2

Development To Which This Policy Applies

A2.1 This SPP applies:

- a) in specified natural hazard prone areas (flooding bushfire or landslide) to development that:
 - · increases the number of people living, working, or congregating in those areas;
 - involves institutional uses notably to hospitals, child care, aged care, nursing homes and high secondary correctional centres;
 - increase the amount of flammable, explosive or novious transferials that are manufactured or store in bulk;
 - . stores valuable records or items of cultural or historic significance;
 - involve ve estation clearance or landscaping that has the potential to increase the level of his possed/by the natural hazard; or
 - change the ground level or redirects the natural flow of water in flood and landslide
- b) in close proximity to natural hazard prome are as to development that:
 - of risk in natural hazard prone areas on
 - changes the ground level or redirects the platural flow of water in natural hazard prone treas prone to flood and landslide.
- c) throughout Queensland to development to community infrastructure that involves important links (eg roads and maille services, leg. powerlines, telecommunications) or which performs an essential function during an emergency response (eg. hospitals, fire and ambulance stations).

Specified Natural Hazard Prone Areas

A2.2 Specified natural hazard prone areas are:

A2.3.1 FLOOD

Option 1: The SPP applies to land inundated by the defined flood event(s) - DFE - adopted by the relevant local government for land-use planning purposes. The defined flood event(s) should be determined for each locality in the local government area through a comprehensive floodplain management study including.

a flood study to determine flood believed to for the full range of flood events (up to and including the probable maximum flood).

a floodplain management still atto-determinest e potential consequences of the full range of floods eg:

- Flood damages and economic japanes

- Social impacts

- Community desires and expectations

- Emergency respense requirements (ie warning times, refused, exaculation routes, recovery mensures, etc.)

- management and mitigation in sures

a balanced assessment of the social, economic and environmental impacts of the occurrence and management of illegating for the full range of floods vents.

Where the above studies have <u>not</u> been undertaken, or are incomplete, and it is considered an unreasonable condition on an individual development proposal to require such studies, a DFE based on one of the following may be adopted by the local proposal to

. the mandation extension he 1 in 100 year ARI flood (where tage and

· the inundation extent of the flood of record (or highest record d flood)

of the ordinated frequency and consequences) associated with the chosen flood are acceptably low. Where 1 in 100 year AVII thou are magnituded in available, and in the absence of arguments study to support a DFE of less remained the State Government is unlikely approve a planning scheme that is passociated with the chosen flood are

Adoption of one of the above as the DFE should be an interim measure, until such time as a floodplain management study has been completed.

Option 2: The SPP applies to flood-prone land

- Defined by a comprehensive hydraulic study (or similar) satisfactory to the assessment manager; or
- Where these studies do not exist land that is subject to a 1:100 year ARI year flood; or
- The highest recorded flood level.

Option 3: The SPP applies to flood-prone land:

 Defined by a comprehensive hydraulic study (or similar) satisfactory to the assessment manager; or

¹¹ All terms defined in Glossary

- Where these studies do not exist land that is subject to a 1:100 year ARI year flood (defined flood event for land use planning purposes) or an alternative defined flood event for land use planning purposes defined by the Assessment Manager having considered the social, economic and environmental consequences of a flood of that level and the risks of developing in the defined flood event12, or
- The highest recorded flood level.

Option 4: The SPP applies to flood prone land:

- Defined by a comprehensive hydrauthe study (or similar) satisfactory to the assessment manager; or
- Which is flood prone land that the size dium, high or extreme degrees of hazard as defined in Appendix K of the Woodplain Management in Australia: Best Practice Principles and Guidelings. Hazard is identified by an assessment manager having ward to the lowing factors:
 - Flood behaviour that is its severity, depth, velocity, ate of rise or duration);
 - Topic raphy;
 - Population at risk;
 - Emergency management.3
 - of flood (range of events from 2-year Aka to PMF);
 - interactions with storm surge;
 - regional complexity of the stream network and in r-relationship of flows; effective warming time;
 - flood readings
 - rate of rise of floodwaters;
 - depth and velocity of floodwate
 - duration of flooding;
 - evacuation problems;
 - effective flood access; and
 - of development.
- Option 5: The SEP applies to the defined flood event in land se planning purposes. The flood event is defined by:
 - accomprehensive hydraulic study (or similar) satisfactory to the assessment manager; or
 - where such a study has not occurred the Assessment Manager shall determine the defined flood event having regard to flood behaviour and the social, economic and environmental consequences associated with the occurrence and management of floods of various size. The assessment manager must in determining the defined flood even be satisfied that there are no undue risks associated with development of the flood prone land.

A2.3.2 BUSHFIRE

Option 1: The SPP applies to bushfire-prone land identified as being low, medium or high bushfire hazard on the Rural Fire Service - Bushfire Risk Analysis maps or a different area that has been defined by a comprehensive bushfire study satisfactory to the Assessment Manager.

¹² refer to Appendix K of Floodplain Management in Australia: Best Practice Principles and Guidelines 3 refer to Appendix J of Floodplain Management in Australia: Best Practice Principles and Guidelines

Option 2: Areas prone to bushfire hazard are those areas that can support a bushfire or is likely to be subject to bushfire attack. Assessment managers determine Bushfire prone areas after considering the following criteria:

- · frequency of fire season;
- · length of fire season
- slope
- aspect
- vegetation
- fire history
- · availability of evacuation replies
- fire fighting services available

Note: Fire Hazard Mapping 1988 (Column VIR) Authority – Victoria) provides a technique to assess fire hazard and the degree of that and or land.

Rural Fire Service - Bushine Risk Analysis maps identify low, medicin of high bushfire hazard prone areas throughout Obsernsland.

A26 STILANNOISTEDDE

Option 1. The SPP applies to landslide-proje and which is land with a slope greater than 1.5% on other landsly own or suspected of being geologically unstable.

Option 2 1116 SPP applies to landslide prone land, which is land that:

- · las a slope greater than Is
- · has concave slope shape.
- has foundation material of soil 1 -3 me res deep;
- has a concentration of surface water on the mid, lower, crest or upper slope);
- has evidence of groundwater (eg surface springs, generally wet or minor moistness);
- has evidence of instability (eg. minor or major irregularity or active instability);
- has existing development modifications (eg. changes to slop, materials or water);
- has a history of landslides (eg. active, recent or ancient landslide events).

Option 3: The SPP applies to landslide-prone land, which is land defined by a comprehensive geotechnical assessment of site conditions to the satisfaction of the Assessment Manager, following a consideration of:

- the ground surface slope;
- the slope shape and features;

 the engineering properties and distribution of the different foundation materials in the subsurface profile;

the depth of the groundwater table and potential for surface run-off

concentration;

- the extent of modification of natural ground by excavation and filling of the natural surface;
- the method of support (retaining) of cut and fill slopes;
- the modification of the natural drainage of development;

disposal of storm water and sewage.

Note: For further information in developing a comp chensive geotechnical study, refer to the "Landslip study for the City of Gold Coast", Final Report, August 1999.



¹³ Reference: Guidelines for Control of Slope Instability, Gold Coast City Council

Development Table DRAFT

Development	Relevant SPP aspect of development	Degree of hazard ✓ compatible ★ conditionally compatible, × - incompatible			Explanation/Comments (for GAC comment)	
idannid imponie ipo impociblinto						
Material change of use (MCU)				H. W.L. CORNE		
Residential (including caravan parks)	Development that has the potential to increase the number of people living,	1	*	×	×	
Commercial	working or songregating.	1	*	*	×	
General Industry	Community in a sucture has provides	1	*	*	×	
Education institutions (eg. universities, schools)	di sentia di en durin in emergenti esponso	1	*	×	×	
Public buildings (eg. Council Chambers)		78/4	**	×	×	
Emergency response (eg. police/ ambulance/fire stations)			×	×	×	
Hospitals, child care, aged care, nursing homes, high security correctional centres	Development where it would be constructed to evacuate occupants in an energy ncy.	1			1	
Dangerous and hazardous industrial General Industry (which store dangerous or hazardous substances).	Description that the potential to	*	×	×	×	
Museums/Libraries/Art Galleries/valuable record stores	Developmen the store valuable records or items of cultural or historic significance.	*	×	×	×	
Works			10		100	
Infrastructure (eg. roads, railways, pipelines, electricity, telecommunications).	Community infrastructure that provide important links or services.	1	*		*	
Vegetation clearance or landscaping.	Has the potential to increase hazard on subject land and other land.	1	***	*	*	
Changing the ground level or redirects the natural flow of water.		1	*	*	*	

Development	Relevant SPP aspect of development	Degree ** condition	e of haz			Explanation/Comments (for GAC comment)
LAND PRONE TO BUSINFURD						
Material change of use		The Art of	it i	Sales Issaelini		
Residential (including caravan parks)	Development that has the potential to increase the number of people living, working or congregating.	*	*	*	x	
Commercial	Communa infinitementure that provides	*	*	*	×	
General Industry	an segural force of during an	*	*	*	×	
Education institutions (eg. universities, schools)		*	*	×	×	
Public buildings (eg. Council Chambers)			*	X	×	
Emergency response (eg. police/ambulance/fire stations)		*		×		
Hospitals, child care, aged care, nursing homes, high security correctional centres	Development where it would be distribut to evacuate occupants in an eral soncy	*	×	M	7	
Dangerous and hazardous industrial	Do donnieus mat in sine potential to	*	×	×	X	
General Industry (which store dangerous on hazardous substances).	stuse and distinctions, harm.					
Museums/Libraries/Art Galleries/valuable record stores	Development that store valuable records or itens of column as its local significance.			×	×	
Works				2.15		E Daniel Commence of the Comme
Infrastructure (eg. roads, railways, pipelines, electricity, telecommunications).	Community infrastructure that provides important links or services.	*	*	*	*	
Vegetation clearance or landscaping.	Has the potential to increase hazard on subject land and other land.	*	*	*	*	

Development	Relevant SPP aspect of development	Degree of hazard ✓ companible ★ conditionally compatible, ★ - incompatible			Explanation/Comments (for GAC comment)	
LAND PRONG TO LANDSLEY		******				
Material change of use	医布尔克氏征 医电影 工业数据	1821	的 对于200	4 (3)	34, 3	
Residential (including caravan parks)	Development that has the potential to increase the number of people living,	*	*	×	×	
Commercial	working or congregating.	*	*	×	×	
General Industry	Community infrastructure that provides	*	*	×	×	
Education institutions (eg. universities, schools)	an essential finetion during an	*	*	×	×	
Public buildings (eg. Council Chambers)			*	×	×	
Emergency response (eg. police/ambulance/fire stations)				×	×	
Hospitals, child care, aged care, nursing homes, high security correctional centres	Development where it would be difficult to evacuate occupants in an intercency.	*			1	
Dangerous and hazardous industrial General Industry (which store dangerous or hazardous substances).	Description has the potential to	*	×	×	×	
Museums/Libraries/Art Galleries/valuable record stores	Developmen had slove valuable recognition that the significance.	*	×	×	×	
Works			AND AND B			The state of the s
Infrastructure (eg. roads, railways, pipelines, electricity, telecommunications).	Community infrastructure that provides important links or services.	*	*		*	
Vegetation clearance or landscaping.	Has the potential to increase hazard on subject land and other land.	*	*	×	×	
Changing the ground level or redirects the natural flow of water.		*	*	×	×	

WORKSHOP AGENDA

Thursday 11 April 2002 10:00 am - 4:00 pm

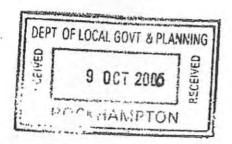
Discuss an INITIAL DRAFT of the

STATE PLANNING POLICY (SPP) FOR NATURAL DISASTER MITIGATION

Liaison Room, Block E, Emergency Services Complex, Kedron

- 1. Welcome and Introduction
- Outline of the SPP including its broad concepts
- 3. Discussion of SPP's broad direction
- Review of sections 2 and 5 (Development Assessment) of the SPP: Issues to be discussed:
 - o Developments to which the SPP applies
 - Natural Hazards (ie bushfire, flooding, landslide) what are they and how are they determined?
 - o "Acceptable risk"
 - The development table
 - o Community Infrastructure
 - o Other issues
- 5. Review of Section 6 (making and amending Planning Schemes):
 - Mechanisms for implementing the SPP in Planning Schemes
- 6. Issues that require resolution following above discussion.
- 7. Other Business
- 8. Next meeting/workshop

Saved on G.





Your Ref: TPA22507 Our Ref: P131501 Strategic Policy and Executive Services

Department of Emergency Services

29 September 2006

Principal Planner
Central Queensland Statutory Planning
Department of Local Government,
Planning and Sport
PO Box 113
ROCKHAMPTON QLD 4700

Dear

Re: Second State Interest Check of Emerald Shire Council Draft Planning Scheme

Thank you for your letter dated 8 September 2006, regarding the Emerald Shire Council Draft Planning Scheme Second State Interest check.

After a Department of Emergency Services (DES) review of the Draft Planning Scheme including amendments, it is clear that the scheme does not completely reflect State Planning Policy 1/03 (SPP 1/03). The issues identified regarding bushfire, landslide and flood hazards are dealt with in the attached comments table.

Should you have any queries regarding this matter, please do not hesitate to contact
Senior Policy Officer, Strategic Policy, Strategic Policy and
Executive Services, on telephone number of the services or via email,
who will be pleased to assist.

Yours sincerely



Strategic Policy Unit

Emergency Services Complex
Emergency Services Complex
Con Kedron Park Road & Park Road

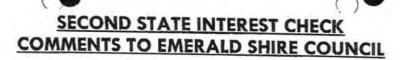
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The table is comprised of the following columns:

Section

Document Reference (i.e. Planning Scheme, Policies), the section and the relevant page number.

Interest / Comment

Issues of interest or comments.

Suggested Solution

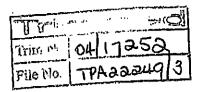
A suggested solution or further course of action, if provided.

Section [Document/ section and page number]	Interest / Comment & Legislative / Policy Basis	Suggested Solution / Outcomes Sought	
Department of: Emergency Services Gayn, McGullagh Ph. (07):3247-8782			
Map NDIS 1 (No Longer Present in Scheme)	Map not present in the amended scheme sent out for Second State Interest Check comments	To comply with SPP 1/03, a bushfire hazard map must be included. The minimum default level of bushfire hazard mapping can be obtained through the Rural Fire Service.	
Table 5.4.1 P/A 6.1 4, P/A 6.2 1	 This table lists all development as being bound by the bushfire overlay. However, SPP 1/03 states development to which the policy applies includes only material changes of use and associated reconfigurations of lot. (This comment also applies to landslide and flood, with the addition of earthworks, vegetation clearing, filling and redirecting the existing flow of surface or ground water) 	• Refer to Annex 1 of SPP 1/03 for correction details OK for MCU. Talke. 5 PP 1/03: decent apply to all "Officialize privat apply to all "Officialize privat as sting a matter for council	
V	 P/A 6.1 4 and P/A 6.2 1 are conflicting. P/A6.2 comes from SPP 1/03 and is the preferred setback. Also, Appendix 5B, SPP 1/03 Guideline states 'all development' not non-residential buildings 	 Delete P/A 6.1 4 and Refer to Appendix 5B of SPI 1/03 Guideline for preferred setbacks and development specifications. Amend Scheme 	



Section [Document/ section and page number]	Interest / Comment & Legislative / Policy Basis	Suggested Solution / Outcomes Sought
Table 5.4.2 P/A6.1 (3), P/A1.1 (B) (a), S2, S7, S8, P7.1	 P/A6.1 (3) "where the land has a slope generally less than 15%" P/A1.1 (B) (a) "not result in an in the number of people living, working or congregating at the site or in the area; and " Probable solutions should be included for S2, reflecting Appendix 5B of the SPP 1/03 Guideline. S7 and S8 should have their order reversed in the table P7.1 add "minimum pressure and flow is 10L a second at 200 kpa" as per Appendix 5, SPP 1/03 Guideline. 	 Remove the word "generally". Change to – not result in an increase in the number of people living, working or congregating at the site or in the area; and Amend Scheme Amend Scheme Amend Scheme
Table 5.4.2 P/A10. 1	SPP1//03 Comments Landslide For complete adherence to SPP 1/03 regarding landslide, DES recommends the inclusion of a landslide hazard map in the scheme. P/A10.1 – Add acceptable solution which reflects solution found in Appendix 5C of the SPP 1/03 Guideline	Amend Scheme Amend Scheme
	SPP 1/03 Comments - Flood	
Kis Bichail.	DES is aware that Council undertook a Natural Disaster Risk Management Study which included flood investigations for the Shire. Council adopted the Report and the associated mitigation strategies on 26 June 2002. Results of this report should have informed the development of the Emerald IPA planning scheme particularly in relation to flood issues.	Use the results from this report to amend the scheme with regard to tlood and other hazards, so that compliance with SPP 1/03 is achieved
	There is no flood hazard map included in the amended scheme	 To adhere with SPP 1/03, DES recommends the inclusion of a flood hazard map for the Shire.
	 There is no natural hazard overlay regarding flood included in the scheme 	 It is recommended that a natural hazard overlay regarding flood that reflects the requirements of Appendix 5A of the SPP 1/03 Guideline be included.

Gum-33



Judy Randali Ph: 3247 8468

1 October 2004



Counter Disaster and Rescue Services

Department of Emergency Services

Western and Central Old Planning Division
Department of Local Government, Planning, Sport and Women
PO Box 113
ROCKHAMPTON QLD 4700

Dear

1st State Interest Check - Emerald Shire IPA Planning Scheme

I refer to your request seeking comments from this Agency on the draft Emerald Shire IPA planning scheme prior to the public notification period.

The Department of Emergency Services' (DES) responsibilities include the Queensland Ambulance Service (QAS); Queensland Fire and Rescue Service (QFRS) including the Rural Fire Service; Counter Disaster and Rescue Services (CDRS) including the SES and Volunteer Marine Rescue Support; Chemical Hazards and Emergency Management; Aviation Services, and Disaster Mitigation. This is a coordinated whole of Department response.

The Department's interests in plan making and amending relate to natural disaster mitigation and emergency management issues. DES is responsible for the implementation of State Planning Policy 1/03 Mitigating the Adverse Impacts of Flood, Bushfire and Landslide (SPP 1/03). The review of the draft Emerald planning scheme has been undertaken according to these interests.

SPP 1/03 requires planning schemes to achieve specific outcomes that ensure development minimises the impacts on people, property, economic activity and the environment. With regard to the Emerald draft IPA planning scheme, Council should be aware of the following SPP 1/03 requirements for making and/or amending a planning scheme.

- To appropriately reflect SPP 1/03 in the Emerald IPA planning scheme it should aim to achieve outcomes 1 to 6 outlined in the policy. Outcomes 1, 2 and 3 relate to development outcomes and development assessment. Outcomes 4, 5 and 6 address Natural Hazard Management Areas (NHMAs), planning strategies and planning scheme measures.
- The SPP 1/03 Guideline provides assistance in how a planning scheme may achieve the specific outcomes and Appendix 5 provides a guide for detailed measures for achieving Outcome 1. For further information refer to SPP 1/03 Guideline.
 Disaster Mitigation Unit

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Until NHMAs are identified in the Emerald planning scheme, the default NHMAs outlined in Annex 3 of SPP 1/03 should be used for development assessment.

Part 5 of the draft Emerald Planning Scheme contains a Natural Disaster Overlay Code for bushfire and landslide. A number of changes are suggested at 5.4.2(2) to more accurately reflect the requirements of SPP 1/03.

- At 2, community infrastructure is stated as being listed at point 4. It should read 5;
- At 3, the SPP requires development to be compatible with the nature of the natural hazard not the NHMA; and
- At 4, remove management area and include a reference to the State Planning Policy 1/03 Mitigating the Adverse impacts of Flood, Bushfire not the draft policy.

Flood

The Emerald draft planning scheme has not addressed the natural hazard associated with flooding. The intention of the SPP 1/03 is to minimise the adverse impacts of flood, bushfire and landslide on people, property, economic activity and the environment. For flood this is done by identifying NHMAs for parts of the Shire that have existing development or are likely to be developed during the life of a planning scheme. This will enable SPP 1/03 to apply to development assessment in flood prone areas providing appropriate measures to ensure the safety of community and property.

Emerald Council should be aware that SPP 1/03 recommends as an appropriate flood event the 1% Annual Exceedance Probability (AEP) flood as the Defined Flood Event (DFE) for determining an NHMA (flood). It is not clear from the draft Emerald planning scheme whether council has adopted a DFE for the Shire. It is noted that a Nogoa River Flood Plain Study (including Emerald) was completed in 1996 and this study, in conjunction with other studies may assist Council in adopting an appropriate DFE. DES is aware that Council recently undertook a Natural Disaster Risk Management Study which included flood investigations for the Shire. Council adopted the Report and its associated mitigation strategies on 26 June 2002. Results of this report should have informed the development of the Emerald IPA planning scheme particularly in relation to flood issues.

Council should adopt a DFE and map the DFE in developed areas and areas likely to be developed during the life of the planning scheme. Overlay flood mapping should also show the flood level or levels of the DFE to ensure an appropriate freeboard height can be determined therefore appropriately reflecting the requirements of Appendix 5A of the SPP 1/03 Guideline.

An overlay code for flood outlining the specific outcomes and probable solutions for development in flood prone areas of the Shire, linked to a flood map, should be added to Part 5 of the Emerald planning scheme.

Bushfire

Map NDIS 1

It is noted the mapping data acknowledges being provided by the Queensland Fire and Rescue Service. Council should be aware that this data was provided as a guide only for Council to Identify bushfire risk in the Emerald Shire. It was not intended to identify site specific lots. Map NDIS 1 makes reference to Planning Policy No.1 which provides descriptions of lots affected by bushfire. This policy was not available to this Agency for inspection at the time of this review. However DES recommends Council consider the implications of Identifying site specific lots and attributing a specific bushfire risk. DES is not aware of any other local government that has chosen to identify site specific lots.

it could prove problematic for Council as bushfire hazard is not static and where specific lots have been attributed a medium or high risk, this may change over time. The intent of the mapping information provided by QFRS is that the indication of medium or high bushfire

hazard in a development area triggers a site specific assessment of the hazard existing at the time of the development proposal. DES strongly recommends removing Planning Policy No.1 and deleting any reference to it on Map NDIS 1.

Council should also be aware that for the purposes of the Standard Building Regulation, local governments declare an area "bushfire prone". This will then trigger certain building requirements for that area. However, SPP 1/03 requires specific building design requirements in areas of high bushfire hazard only. To ensure that stringent building design requirements are not applied to areas of low and medium and therefore placing onerous requirements on building in these areas, DES recommends that two overlay maps are included in the Emerald Planning Scheme as follows:

- Bushfire hazard map indicating areas within the Shire that have a medium and high bushfire risk; and
- Bushfire prone map indicating areas with the Shire that have a high bushfire risk to satisfy the requirements of the Standing Building Regulation.

Bushfire Prone Land Overlay

It is recommended that the title of the overlay be changed from "bushfire prone" for the reasons stated above.

It appears as though Council has combined previous superseded bushfire methodology with the draft SPP to produce probable/acceptable solutions. The danger in this approach is that much of the previous bushfire requirements have been superseded and replaced with updated requirements outlined in SPP Guideline 1/03 and in the policy. It is acknowledged that Council has attempted to reflect the specific outcomes of SPP 1/03 in its Natural Disaster Overlay however some parts, particularly, the Bushfire Prone Land Overlay, is overly complex and difficult to follow.

The following changes are recommended:

- Changes need to be made throughout the overlay where reference has been made to the "draft" state planning policy. Should be State Planning Policy Mitigating the adverse impacts of Flood, Bushfire and Landslide (SPP 1/03).
- Table 5.4.1 lists all development as being bound by the bushfire overlay. However, SPP 1/03 states development to which the policy applies includes material changes of use and associated reconfigurations of a lot. In addition, for areas prone to flood and landslide, earthworks, vegetation clearing, filling and redirecting the existing flow of surface or groundwater are also included. Refer to Annex 1 of SPP 1/03 for further details.
- Part 5.4.2 (2) 3 states Development is compatible with the nature of a natural hazard management area... SPP 1.03 states that development should be compatible with the nature of the natural hazard not the natural hazard management area. Refer to Annex 4 for further details on how the Emerald Bushfire Prone Overlay can simply achieve the specific outcomes for bushfire.
- P/A 6.1 3 slope should read less than 15% not 20%. The SPP default of 15% is now
 the preferred slope gradient. Council is reminded that SPP 1/03 supersedes any
 previous QFRS or DLGP documents on siting and design. The diagrams shown at
 P/A6.1 should be removed. Refer to SPP Guideline 1/03 Appendix 5B for
 information on detailed measures that may be used.
- P/A 6.1 4 and P/A 6.2 1 are conflicting. P/A6.2 comes from SPP 1/03 and is the preferred setback. Again, Council should check Appendix 5B as it states all development not non-residential buildings.

- No requirements for accessible water supply for fire fighting in medium bushfire hazard areas. Refer to Appendix 5B.
- Reword S5 and P5 to reflect SPP 1/03. Refer Appendix 5B.

Having two bushfire maps would simplify this section and only require a building code response for the high hazard areas. The provisions within 5.4.2 may be arranged in order of the following:

Avoid building in high hazard areas but if this is not possible then separate
development from the hazard by roads, firebreaks and clearing of building
envelopes plus provision for water supply. Only in high hazard areas, is there the
additional requirement for building design response and bushfire management
plans.

Generally, this section is problematic because of mixing of terminology and failing to step up requirements from medium to high bushfire risk areas. Overall, the Emerald Shire has mostly low and medium, with pockets of high, bushfire risk areas. SPP 1/03 requires only those areas with medium and high bushfire risk and with types of development that are likely to increase the number of people living or working there or involve the manufacture of storage of hazardous materials in bulk, to be protected from the impacts of natural hazards.

Council could simplify this overlay by ensuring development proposed in the medium and high bushfire risk areas is compatible with the nature of bushfire hazard. This information is available from Annex 4 of SPP 1/03 and Appendix 5B SPP Guideline.

Landslide

The Landslip Prone Land Overlay regulates all uses and works occurring on slopes greater that 15%. Council is reminded that development to which the SPP 1/03 applies includes material changes of use and associated reconfigurations of a lot and for landslide, building or other work that involves earthworks exceeding 50 cubic metres or vegetation clearing or redirecting the existing flow of surface or groundwater (Appendix 5 C:SPP Guideline). SPP 1/03 requires development to be compatible with the nature of the natural hazard, Council may want to consider that the application of the code to all uses and works may be excessive.

It is noted that Division 4 Schedule C contains information regarding how to determine slope analysis. This information appears to reflect the information contained in Appendix 10 of SPP Guideline 1/03. Rather than duplicate this information and to keep this section succinct, Council may like to consider removing Division 4 Schedule C and rewording P10.2 accordingly.

Conclusion

Prior to this scheme being publicly notified, DES requires the following issues to be addressed:

- DES recommends Council not to publicly notify the site specific lots affected by the Bushfire Prone Land Overlay. If agreed, Planning Policy No 1 should be removed and reference to it deleted from Map NDIS 1; and
- The inconsistencies outlined in the Bushfire Prone Land Overlay need to be addressed. Ideally, this overlay should be rewritten to better reflect the specific outcomes of SPP 1/03.

It is acknowledged the outstanding matters relating to flood will be addressed by Council as information becomes available.

Should you wish to discuss these matters further please contact Judy Randall on 3247 8468.

Thank you for the opportunity to be involved in the development of the Emerald IPA planning scheme. We look forward to our continued involvement.

Yours sincerely

A/Assistant Director Disaster Management Services From:

Sent:

Wednesday, 20 June 2007 3:07 PM

To:

Subject: Ipswich Planning Scheme Amendments

the amendments to the Ipswich Planning Scheme proposed by ICC do not raise any issues for the Department of Emergency Services.

Strategic Policy
Department of Emergency Services

ph GPO Box 1425 BRISBANE QLD 4001

Australia

F. JSA: GKN

H:\IPA Planning Scheme Draft Amendments\2007 Major Centres and Ops\Draft Amendments\Operational Amendments\Committee Report\Committee Report Initial State Interest Review April 07.doc

ITEM

Became Item 02.03

Environment Committee

Mtg Date: 17/04/2007 OAR:

Authorisation: Gary White

Committee to prepare letter: No

Program No: 02

Planning, Development &

YES

5 April 2007

MEMORANDUM

TO:

CITY PLANNER

FROM:

PLANNING MANAGER

RE:

PLANNING SCHEME AMENDMENT PACKAGE 02/2007

INTRODUCTION:

This is a report by the Planning Manager dated 5 April 2007 concerning proposed amendments to the Ipswich Planning Scheme.

BACKGROUND:

The amendments relate to a number of operational matters and to the outcomes of the Goodna Town Centre Master Plan.

On 21 February 2007, Council adopted 'in principle' that the Goodna Town Centre Master Plan form the basis for amendments to the Ipswich Planning Scheme for the central area of Goodna.

Owing to the lengthy timeframes involved in amending a planning scheme, a number of operational amendments have also been included to form Amendment Package 02/2007.

OVERVIEW OF AMENDMENTS:

Amendment Package 02/2007 addresses a number of amendments to the planning scheme, including zone changes, planning scheme policy amendments and changes to zone codes. These amendments are outlined in detail in Attachment A and its associated documents.

The following summarises the proposed amendments:

- O Amendments to the Major Centres Zone to incorporate the Karalee centre as a Major Centre owing to work on the draft Local Growth Management Strategy which has revealed a need to review the status of the Karalee centre from a local centre to a major centre.
- o <u>Amend the Special Opportunity Zone</u> to reflect the changes to the Major Centres Zone as described above for the Karalee Centre, encompassing adjoining land which is zoned Special Opportunity (SA16).

o 3rd pipe (recycled water) at Walloon – removal of reference to the 3rd pipe recycled water at Walloon at the request of Ipswich Water.

o Environmental Planning

- retention of vegetation on visually prominent ridgelines, hillsides and watercourses in Urban Areas;
- review of assessment categories and assessment criteria for residential zones where involving Reconfigurations of a Lot, clearing and earthworks not associated with a Material Change of Use to make these activities code assessable against the Vegetation Management Code; and
- an extension to the difficult topography provisions to apply to 15%-20% slope areas.
- Planning Scheme Policy 2 (Appendix 2 Infrastructure As Constructed) minor amendments to as-constructed information standards.
- O School Parking Rates to include a note clarifying issues associated with the provision of a set-down and pick-up area.
- o <u>Candy Soils, Morris St, Tivoli:</u> review Special Use zone wording owing to the sunset clause in Condition 7 of development approval 296/97 which required the cessation of the Stage 1 uses as at July 2006.
- O <u>Large Lot Residential Zone (s.4.4.5(3))</u>: amendment to list General Industry as an inconsistent use as per the Assessment Table.
- o Figure 16.6.1 Ebenezer-Willowbank Precincts (Regional Business and Industry Investigation Zone): reconcile the precinct boundary with the Ipswich Motorsports Precinct Masterplan for the motorsport component only. In addition it is proposed to facilitate minor motor sports industries (i.e. up to 500m2 Gross Floor Area) within the motorsports precinct as code assessable development.
- o Goodna Town Centre Amendments to the Major Centres Zone to incorporate:
 - the outcomes of the Goodna Town Centre Master Plan (new Sub Area provisions and zone maps); and
 - amendments to include South East Queensland Regional Plan terminology.

These amendments are consistent with the outcomes of the Goodna Town Centre Master Plan and have been based on the Vision, associated Key Themes and land use opportunities that form the framework for the Master Plan.

The amendments include the following zones and sub areas:

Major Centres Zone

- Goodna Primary Business Area (Sub Area MC4P1) Town Centre Core;
- Goodna Primary Business Area (Sub Area MC4P2) Goodna Rail Station Transit Oriented Development Precinct;
- Goodna Secondary Business Area (Sub Area MC4S1) Barram Street;
- Goodna Secondary Business Area (Sub Area MC4S2) William Street North;
- Goodna Secondary Business Area (Sub Area MC4S3) Ipswich Motorway West Precinct:
- Goodna Secondary Business Area (Sub Area MC4S4) Ipswich Motorway East Precinct;
- Goodna Secondary Business Area (Sub Area MC4S5) William Street South;
- Goodna Secondary Business Area (Sub Area MC4S6) Live Work William Street:
- Goodna Secondary Business Area (Sub Area MC4S7) Queen Street West;
- Goodna Secondary Business Area (Sub Area MC4S8) Queen Street East; and
- Goodna Secondary Business Area (Sub Area MC4S9) Mill Street.

Special Opportunity Zone

- SA44 Woogaroo Street, Goodna

Character Housing Mixed Use Zone

- The Character Housing (CMU16) Zone has been extended south along Layard Street to include additional land, fronting the proposed new connection through to Bertha Street.

The amendment package includes the following maps and figures within the Major Centres Zone:

- o 4.9.1 Building Heights;
- o 4.9.2 Building Setbacks;
- o 4.9.3 Access and Circulation;
- o 4.9.4 Road Network; and
- o 4.9.5 Conceptual Illustrations.
- O Amendments to the Residential Medium Density Zone at Salisbury Road, Ipswich. These amendments reflect the inclusion of the land within the RM1 sub area (as per current planning scheme text reference) as opposed to the RM2 sub area currently shown on Zone Map Z14.
- O Character Areas Housing Zone: a Single Residential use is currently Code Assessable in this zone. An amendment is recommended to enable proposals that involve the change of use (for a single residential use) of a building which was originally designed for use as a dwelling to be Self Assessable.

o Schedule 2 - Character Places: At the request of the property owner, it is recommended to add the dwelling house at 1058 Ipswich-Rosewood Road, Rosewood (Lot 1 RP140572) to Schedule 2 - Character Places.

Grammatical/Formatting Errors

- o <u>Figure 4.8.5 Walloon Thagoona Strategic Pedestrian/Cycleway Network</u> amend the incorrect spelling of 'network' in map legend.
- o <u>Future Urban Zone (FU4- Walloon/Thagoona)</u> amend footnote numbering inconsistencies.
- o <u>Development Constraints Overlays Code</u>: page 11-19, Note 11.4.5A(3) add missing word 'be'.
- o Special Opportunity (SA41) Zone: spelling of Naomai Street to be corrected.
- o Note Boxes in Residential Code: Note boxes 12.6.4J through to 12.6.4N should read 12.6.5A through to 12.6.5E.

Development Constraint Overlays

- OV2 (Key Resource Area): amend wording in the assessment table for clearing of vegetation. Currently refers to 'primary buffer area'. Should be amended to refer to "Known Resource area".
- OV11 (High Pressure Pipelines): amendment of the assessment category for Single Residential use to be Self Assessable.
- OV13 (High Voltage Electricity Lines): amend the location of the high voltage electricity line owing to incorrect mapping data provided by Powerlink/Energex compared to actual built high voltage line location.
- OV7E (UXO's): amend the mapping to remove the UXO overlay from Lot 116 School Road, Redbank Plains (Lot 116M3172) as a clearance letter has been received.

WHERE TO FROM HERE?

This report seeks Council approval to move on to the next stage of the Planning Scheme amendment process, being forwarding of the proposed amendments to the Minister for 'State Interests' review in accordance with the *Integrated Planning Act 1997* (IPA).

The draft planning scheme amendments (Attachment A) are required to be submitted to the Minister for Local Government and Planning for formal 'consideration of state interests'.

Once approved by the Minister the actual planning scheme amendments are required to be placed on public display for 30 business days. Council is required to consider all submissions received during the public display period and to advise all submitters of the outcome of their submissions.

The planning scheme (including any modifications proposed as a result of the public display process) is then again required to be submitted to the Minister for 'final approval'.

Once the Minister grants 'final approval' Council may then adopt the planning scheme amendments allowing them to take affect.

The full IPA Plan Making Process is outlined in Attachment B to this report.

RECOMMENDATION:

Amended PD&E Ctee No. 2007(04) of 17.04.07. ncm

- A. That Council resolve to amend the Ipswich Planning Scheme and the associated planning scheme policies by adopting the proposed amendments as outlined in Attachment A to the report by the Planning Manager dated 5 April 2007.
- B. That the proposed amendments be forwarded to the Minister for consideration of State interests in accordance with the provisions of the *Integrated Planning Act 1997* (IPA).
- C. That the Planning Manager be requested to attend to all relevant matters associated with the proposed amendments to the planning scheme and planning scheme policies, including:
 - giving public notice of the proposals;
 - advising affected landowners; and
 - advising relevant government agencies.

John Adams
PLANNING MANAGER

I concur with the recommendations contained in this report.

Gary White CITY PLANNER

LIST OF ATTACHMENTS

ATTACHMENT A: PROPOSED AMENDMENTS TABLE



Attachment A. Operational Amendm

ATTACHMENT B: IPA PLAN MAKING PROCESS



Attachment B IPA Plan Making Process.c



No	Section/ Clause No.	Key Issue	Explanation	Recommended Amendments
	Assessment Tables and Assessment Criteria – References to the Vegetation Management Code	Earthworks – not associated with a material change of use and reconfiguring a lot do not call up the vegetation management code in the assessment tables.	Amendments to call up the Vegetation Management Code for Recongifuring a Lot and Earthworks are recommended in all zones where Clearing of Vegetation is Assessable Development under the planning scheme.	The following tables are amended to include the wording below: Tables: 4.5.2; 4.5.7; 4.8.2; 4.12.2; 4.13.2; 4.14.2; 4.15.2; 4.16.2; 4.17.2; 4.18.2; 4.19.2; 4.20.2; 4.21.2; 6.2, 6.5; 6.7; 6.10; 7.2; 8.9; 8.11; 8.15; 8.17; 8.20; 9.2; 9.4; 9.6; 9.8; 9.15; 10.6; 10.8; 10.10; and 10.13. To include in Column 3 of each table for "Earthworks – not associated with a material change of use" and "Reconfiguring a lot":-
3	4.3.3(3) Specific Outcomes for the Urban Areas, as a whole – Environmental Management 11.4.6 Difficult Topography Overlay	Reference to the retention of significant vegetation and minimising earthworks. Aligning difficult topography requirements with the State Planning Policy 1/03 – Mitigating the Adverse Impacts of Flood, Bushfire and Landslide.	An additional clause is recommended to achieve further integration of important vegetation within development sites. Review the difficult topography provisions to extend these from the current 20% slope to 15% slope in accordance with State Planning Policy 1/03 – Mitigating the Adverse Impacts of Flood, Bushfire and Landslide.	"Vegetation Management Code (Part 12, division 4)" Insert the following clause as 4.3.3(3)(d):- "Vegetated areas with strong scenic amenity or biodiversity values are retained where possible within development sites as open space areas, large lots or expanded road reserves." That the following clause be added at 11.4.6(1)(a): "Development on land greater than 15% slope maintains the safety of people and property from the risk of landslide." Renumber existing clauses 11.4.6(1)(a) to (d) as (b) to (e).

TABLE 1: Planning Scheme Amendments Package to 2 of 2007.

No	Section/ Clause No.	Key Issue	Explanation	Recommended Amendments
4	Planning Scheme Policy 2 – Information Local Government May Request (6A)(a)	Typographical error.	Currently reads "at breast height (DBH) or 200mm or"	That the wording be amended to read "at breast height (DBH) of 200mm"
5	Planning Scheme Policy 2 — Information Local Government May Request (6A)	Reference to biodiversity values such as hollows in trees.	An additional clause is recommended to clarify the importance of biodiversity values.	Insert new clause (6A)(d) in Planning Scheme Policy 2 as follows: (d) identifies any biodiversity values such as nests or hollows. Also add "and" at the end of clause (6A)(c) and remove
6	Table 11.3.2 Building Work Not Associated with a Material Change of Use, Column 2 (s)	Grammatical error	Currently reads: 'other an a building,' (Located in Line 2 of this clause).	"and" from the end of clause (6A)(b). That the wording be amended to read 'other than a building'
7	Large Lot Residential Zone Code - 4.4.5(3)Consistent and Inconsistent Uses, Use Classes and Other Development.	General Industry is not listed as an inconsistent use as per the Assessment Table for the Large Lot Residential Zone.	General Industry should be listed as an inconsistent use as per the Assessment Table for the Large Lot Residential Zone.	That General Industry be included as an inconsistent use in Section 4.4.5(3)(as (h)) and the following points (h) to (r) be renumbered to (i) to (s).

TABLE 1: Planning Scheme Amendments Package to 2 of 2007.

No	Section/ Clause No.	Key Issue	Explanation	Recommended Amendments
8	Schedule 2- Character Places	Rosewood CWA Hall is incorrectly listed.	The hall is currently listed as being located on 15 Railway Street, Rosewood. However, owing to a reconfiguration of the land the hall is now located on 4 John Street, Rosewood.	That Schedule 2-Character Places listing details be amended to include the CWA Hall as "CWA Building, 4 John Street, Rosewood, Lot 6 SP145185".
9	Zone Map – Z16	Reconfiguration with dedication to Ipswich City Council.	The reconfiguration has resulted in land at 15 Ascot Street and 1 Cordella Place, Goodna (Lots 201 and 202 SP184562) dedicated to Council having a split zone of Recreation and RL2.	That the zoning maps be amended to include Lots 201 and 202 SP184562 wholly within the Recreation Zone.
10	Part 4 Urban Areas – Major Centres Zone	Amendments to reflect the outcomes of the Goodna Town Centre Master Plan	Amendments to the Major Centre Zone are recommended to further support the outcomes of the Goodna Town Centre Master Plan. The amendments relate to extensions of the zone to encompass additional land in both Primary and Secondary Business Areas.	That the Major Centres Zone be amended as outlined in Attachment A1.
11	Part 4, Special Opportunity Areas	Amendments to reflect the outcomes of the Goodna Town Centre Master Plan	An amendment in the form of an additional sub area is recommended to reflect the outcomes of the Goodna Town Centre Master Plan. This sub area is between Woogaroo Street and the Railway Line east of Church Street.	That the Special Opportunity Zone be amended to include an additional sub area (SA44 – Woogaroo Street) as outlined in Attachment A2.

No	Section/ Clause No.	Key Issue	Explanation	Recommended Amendments
12	Zone Maps Z16 and Z17	Amendments to reflect the outcomes of the Goodna Town Centre Master Plan	Amendments to reflect the outcomes of the Goodna Town Centre Master Plan are recommended. These amendments predominantly relate to the Major Centres Zone and the Special Opportunity Zone, as outlined for items 11 and 12 above. It is also proposed to extend the Character Housing Mixed Use Zone south along the eastern side of Layard Street to include additional land fronting the proposed new connection through to Bertha Street.	That zone maps Z16 and Z17 are amended as outlined in Attachment A3.
13	Section 12.6.5 – Effects of Development – Specific Residential Uses	Note box references refer to Section 12.6.4	The note boxes in s.12.6.5 are incorrectly headed with s12.6.4. This needs to be changed to correctly refer to the section in which they are located.	That the numbering of Note Boxes 12.6.4J through to 12.6.4N be amended to read 12.6.5A through to 12.6.5E.
14	Springfield Structure Plan	Change to the alignment of the Centenary Highway extension.	The Springfield Structure Plan (Map 2) boundary requires amendment owing to the Centenary Highway extension alignment variation.	That the Springfield Structure Plan (Map 2) be amended to reflect the Centenary Highway extension alignment variation. Attachment A4 shows the proposed designation boundaries.

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No	Section/ Clause No.	Key Issue	Explanation	Recommended Amendments
15	Schedule 2- Character Places	Incorrect listing for 1231-1269 (Lot 25SP192747) Ipswich Boonah Road, Peak Crossing	As a result of a reconfiguration of a lot, Schedule 2-Character Places identifies the property at 1231-1269 Ipswich Boonah Road, Peak Crossing as containing a character listed farmhouse, whereas the farmhouse is located at 1275 Ipswich Boonah Road, Peak Crossing (Lot 5 SP109181). The lot that contains the house was a result of the reconfiguration.	That Schedule 2-Character Places listing details be amended to delete:- (a) the listing for 1231-1269 Ipswich Boonah Road, Peak Crossing (Lot 25SP192747); and include a listing for the farmhouse at 1275 Ipswich Boonah Road, Peak Crossing (Lot 5 SP109181).
16	Overlay OV13 – High Voltage Electricity Lines	Incorrect location of high voltage electricity line buffer.	Incorrect mapping data was provided from Powerlink/Energex as to the proposed location of the high voltage power line compared to the actual built location of the line.	That Overly Map (OV13) – High Voltage Electricity Lines be amended to align the high voltage power line buffer with the actual built location of the line as shown in Attachment A5.
17	4.21.4(41) – Sub Area SA41	Grammatical error	Incorrect spelling of Naomai Street with reference to the location of the sub area.	That Section 4.21.4(41) be amended to replace 'Naomi' with 'Naomai'.
18	Zone Map – Z16	Incorrect zoning for 35 and 37 Brisbane Road, Riverview.	Incorrect zoning of Special Uses (SU4- Place of Worship) zone on the residential lot containing a single residential use at 35 Brisbane Road. An incorrect zoning of RL zone has been applied to the property at 37 Brisbane Road which contains a church. The zoning of the neighbouring properties should be switched to reflect the actual uses on the land.	That the zoning maps be amended to include:- 1. the land at 35 Brisbane Road, Riverview (Lot 3 RP845588) wholly within the Residential Low Density (RL2) Zone; and 2. the land at 37 Brisbane Road, Riverview (Lots 1 and 3 RP88779) wholly within the Special Uses (SU4 – Place of Worship) Zone.

TABLE 1: Planning Scheme Amendments Package to 2 of 2007.

No	Section/ Clause No.	Key Issue	Explanation	Recommended Amendments
19	Zone Map – Z15	Incorrect zone boundary for 200 Brisbane Street, Booval	The zoning boundary needs to be amended to correspond with the new lot boundary and development approval for the land.	That the zoning maps be amended to include the land at 200 Brisbane Street, Booval, Lot 24 SP197437, wholly within the Major Centres Zone, Sub Area MC1S.
20	Schedule 2 – Character Places	Listing of Depression Relief Work trees at 135 Brisbane Terrace, Goodna.	Part of the land at 135 Brisbane Terrace, Goodna (Lot 128 SP178961) comprising Council parkland, should be listed in Schedule 2 – Character Places due to the location of Depression Relief Work trees on the land. The current listing boundary is wholly within the Brisbane Terrace Road Reserve.	That Schedule 2 – Character Places be amended to list 135 Brisbane Terrace, Goodna (Lot 128 SP178961) as containing Depression Relief Work trees by amending Map 42 of Schedule 2 to include the subject land (see Attachment A6).
21	Overlay Map (OV7E) – Unexploded Ordinances	Clearance Certificate Received.	Notification has been received from the State Government (21/8/06) advising that the land described as Lot 116 M3172, School Road, Redbank Plains has now been cleared of all ordinance. Overlay Map (OV7E)-Unexploded Ordinances should be amended accordingly.	That Overlay Map (OV7E) – Unexploded Ordinances be amended to remove Lot 116 M3172, School Road, Redbank Plains from the affected properties included on the Overlay Map.

No	Section/ Clause No.	Key Issue	Explanation	Recommended Amendments	
22	Zone Map – Z14	Zoning of Council Water Infrastructure	The land at 22 Chelmsford Avenue, Ipswich includes Council's water reservoirs and is currently zoned Conservation. The zone should be amended to the Special Uses (SU19 - Water Supply Purposes) zone to reflect the actual use of the land.	That the zoning maps in respect of land at 22 Chelmsford Avenue, Ipswich (Lot 24I16262) be amended to include the land in the Special Uses (SU19 - Water Supply Purposes) Zone.	
23	Table 11.4.3 – Assessment Categories and Relevant Assessment	Assessment Category for Single Residential Use affected by the High Pressure Pipelines Overlay	An amendment is recommended to the assessment category for Single Residential use to be Self Assessable where affected by the High Pressure Pipelines Overlay (OV11).	That Table 11.4.3, Column 2 be amended in respect of Single Residential use to read as follows: "Self Assessable, if-	
	Criteria for Development Constraints Overlays – Making a Material Change of Use,	(OV11).	erial (OV11).		 (a) within the High Pressure Pipelines Overlay (refe Map OV11); or (b) if situated within a Residential Zone, and- (i) between the 1 in 20 development line and the 1 in 100 flood line constraints overlays (refer

Map OV5); or
(ii) within the rail corridor overlay (refer Map

OV14).

Code Assessable otherwise."

Column 2.

No	Section/ Clause No.	Key Issue	Explanation	Recommended Amendments
24	Table 11.4.4, Column 2.	Amend wording associated with Clearing of Vegetation.	The amendment is required to correct an error with the description of Primary and Secondary Buffers in Table 11.4.4 which is inconsistent with the terminology used in Overlay Map (OV2). The terms primary and secondary buffer should be removed and substituted with Known Resource and Key Resource Area.	That Table 11.4.4, Column 2 in respect of the key resource areas, haul routes and existing mines development constraint overlay be amended as follows: "Exempt, if land affected by the - (b) key resource areas, haul routes and existing mines development constraint overlay and comprising a Known Resource (refer Map OV2); or Self Assessable, if- (c) (i) key resource areas, haul routes and existing mines development constraint overlay and comprising a Key Resource Area; or"
25	Section 11.4.5 – Land Affected by Key Resource Areas, Haul Routes and Existing Mines - Note 11.4.5A(3), p. 11-19.	Grammatical error	The word 'be' has been omitted before the word 'submitted'.	That Note 11.4.5A(3) be amended to read as follows: "In some cases, further information will need to be submitted to the local government, such as site specific geotechnical assessment, for consideration as part of the development assessment process."

No	Section/ Clause No.	Key Issue	Explanation	Recommended Amendments
26	Zone Map - Z16	Incorrect zone boundary.	New lots have been approved in Augustine Heights requiring an amendment to the zone boundary to remove the lots (or part thereof) from the Recreation Zone and to include the lots wholly within the Residential Low Density (RL2) zone.	That the zoning maps be amended as shown in Attachment A7to wholly include the new residential lots within the Residential Low Density (RL2) Zone.
27	Table 4.20.1, SU54 Zone (81 Tantivy Street, Tivoli)	Existing approved use wording.	Development approval 296/97 (Candy Soils)granted the following uses over the subject land (81 Tantivy Street, Tivoli): The Rezoning of Land – to exclude the land from the 'Non-Urban' zone and to include the land in the 'Special Facilities' (removal and treatment of reject mine material; production, loading and dispatch of plant propagation and production; wholesale plant nursery; and ancillary buildings, structures and access) zone, and Permitted Development Subject to Conditions – for the removal and treatment of reject mine material; production, loading and dispatch of plant growth medium; plant propagation and production; wholesale plant nursery; and ancillary buildings, structures and access.	That Table 4.20.1 be amended in respect of the Existing Approved Use for the SU54 zone to remove reference to the uses subject to the time limit set out in Condition 7 of Development Approval 296/97. The SU54 Zone is therefore proposed to read as follows: "Plant propagation and production, wholesale plant nursery and ancillary buildings, structures and access."

TABLE 1: Planning Scheme Amendments Package o 2 of 2007.

No	Section/ Clause No.	Key Issue	Explanation	Recommended Amendments
1			This approval included a 'sunset clause' of seven (7) years from the date of the approval (end of 7 July 2006) for the following uses: " the use of existing mining reject stockpiles for the production, loading and dispatch of plant growth medium." This site has also been the subject of numerous resident complaints over the time that the use has been in operation.	
28	Table 4.8.2 – Assessment Categories and Relevant Assessment Criteria for Future Urban Zone, footnote number references.	Footnote numbering inconsistencies.	Table 4.8.2 contains inconsistent footnote numbering. This requires amendment to ensure the footnote numbering is in sequential order.	That the footnote numbering in Table 4.8.2 be amended to ensure that it is in sequential order.
29	Figure 4.8.5, Walloon Thagoona Strategic Pedestrian/Cyclew ay Network.	Spelling error.	Spelling error in respect of 'Metwork' rather than 'Network' in the legend of Figure 4.8.5.	That the spelling of 'Metwork' be amended to 'Network' in the legend of Figure 4.8.5.

TABLE 1: Planning Scheme Amendments Package o 2 of 2007.

No	Section/ Clause No.	Key Issue	Explanation	Recommended Amendments
30	Part 12, Division 9, – Parking Code (Table 12.9.1)	School Parking Rates.	Review school parking rates in light of recent development applications.	That Part 12, Div. 9 – Parking Code (Table 12.9.1) Other Community Use (o) School, be amended to include the following Note in Column 3: "When determining need for pick-up and set-down areas, and the type of facility to be provided, consideration should be given, to factors including: (a) the number of students attending the school; (b) the location of the school and its catchment area; (c) trip lengths and the mode/s of travel; (d) the age of the students; (e) potential for a bus interchange area as well as a pick-up and set-down area; (f) the type and function of surrounding roads; and (g) surrounding land uses. The number of car parking spaces can be determined by estimating the number of cars likely to arrive at any one time. Heaviest demand usually occurs on wet days and may be up to 20% greater than normal. At schools where car travel is predominant, approximately 10 spaces per 100 students may be required."

No	Section/ Clause No.	Key Issue	Explanation	Recommended Amendments
31	Standard Drawings	Review of Standard Drawings for Water, Sewerage and Roadworks.	Proposed changes to the Standard Drawings as detailed below. Roadwork's Standard Drawings SR.01. Index Standard Drawings Roadworks a) Date and Amendments columns changed to match amended plans. b) Drawing numbers for Guidelines for the installation of tactile indicators have been added to the Approved Queensland Government Department of Main Roads Standard Drawings For Roads.	That the Roadwork's and Water and Sewerage Standard Drawings be amended as per Attachment A8.
			SR.02. Typical Cross Sections, Residential Streets a) Cycle Lanes added. b) Cycle Lane notes added. c) Trunk Collector Street and Dual Trunk Collector Street Split into Access and No Access options.	

TABLE 1: Planning Scheme Amendments Package to 2 of 2007.

No	Section/ Clause No.	Key Issue		Explanation	Recommended Amendments
			SR.03.	 Typical Cross Sections, Industrial Streets a) Extra footpath added to the Industrial Collector Street. b) Notes added for footpath options. 	
			SR.04.	Typical Cross Sections, Sub- Arterial & Arterial Roads with Kerb & Channel a) Cycle Lane details added. b) Notes added for cycle lanes.	
			SR.05.	Typical Cross Sections, Sub- Arterial & Arterial Roads without Kerb & Channel a) Cycle Lane details added. b) Notes added for cycle lanes.	
			SR.06.	Standard Verge and Access Profiles, Access Streets, Collector Streets, & Industrial Streets a) Footpath Reinforcing shown. b) Concrete Footpath alignment distance changed to correspond with SR22 and SR23.	

TABLE 1: Planning Scheme Amendments Package o 2 of 2007.

No	Section/ Clause No.	Key Issue		Explanation	Recommended Amendments
			SR.11.	Standard Kerb & Channel Profiles Including Edge Restraints, Median and Inverts a) Dimensions amended as there were incorrect dimensions on previous revision.	
			SR.12.	 Standard Residential Driveway, Driveway Invert and Slab or Tracks a) Reinforcing size amended from F72 to SL62 for Section A-A. 	
			SR.17.	Standard Kerb and Channel Roofwater Drainage Connections a) Notes Altered to Cast Alloy instead of Hot Dipped Galv.	
			SR.18.	 Standard Kerb Ramp a) Tactile Indicators removed from drawing. b) Drawing numbers for Guidelines for the installation of tactile indicators have been added to the Approved 	

TABLE 1: Planning Scheme Amendments Package To 2 of 2007.

No	Section/ Clause No.	Key Issue		Explanation	Recommended Amendments
1				Queensland Government Department of Main Roads Standard Drawings For Roads	
			SR.19.	Standard Concrete Strip Pathways a) Pathway Width Table modified to increase width of shared pathway from 2.0m to 2.5m on Sub-Arterial and Arterial Roads.	
			SR.20.	 Subsurface Drainage a) Pipe Class was changed from Class 1000 to Class 400. b) Notes altered due to grammatical errors. 	
			SR.21.	Subsurface Drainage Flushing Points a) Pipe Class changed from Class 1000 to Class 400.	
			SR.22.	Public Utilities in Subdivisions, Typical Service Corridors & Alignments a) Service Corridors Altered.	

Attach 3b - Ipswich City Council Planning Scheme Amendments 0207 (2)

TABLE 1: Planning Scheme Amendments Package o 2 of 2007.

Section/ Clause No.	Key Issue	Explanation	Recommended Amendments
		b) Drawing Redrawn to reflect new Service Corridor widths. c) Footpath reserve widened from 3750 to 4250.	
	·	SR.23. Public Utilities in Subdivisions, Typical Service Conduit Sections a) Drawing modified to show new Service Corridor widths. b) High and Low Sides Shown Clearly. c) Pipes and Service Conduits modified to fit into respective Service Corridors.	
		Water and Sewerage Standard Drawings	
		SS.01. Index Standard Drawings - Sewerage a) Date of Amendments column	

b) Amendment Revision column

added.

added.

TABLE 1: Planning Scheme Amendments Package o 2 of 2007.

No	Section/ Clause No.	Key Issue	Explanation	Recommended Amendments
: : : : : : : : : : : : : : : : : : : :			SW.01. Index Standard Drawing Water a) Date of Amendments of added. b) Amendment Revision added.	column
			SW.13. Water Service Conduits a) Service conduits adjust coincide with Standard Drawing SR22 and SR2 b) Offset service conduits to suit zero lot line construction.	23.
			SW.14. Water Connections 20 ar 25mm Single and Double Ground Meter Installation a) Service conduits adjust coincide with Standard Drawing SR22 and SR2 b) Offset service conduits to suit zero lot line construction.	e Below on ed to 23.

Attach 3b - Ipswich City Council Planning Scheme Amendments 0207 (2)

TABLE 1: Planning Scheme Amendments Package o 2 of 2007.

No	Section/ Clause No.	Key Issue	Explanation	Recommended Amendments
			SW.15. Water Connections 32, 40 and 50mm Single Below Ground Meter Installation a) Service conduits adjusted to coincide with Standard Drawing SR22 and SR23. b) Offset service conduits added to suit zero lot line construction.	
			SW.16. Water Connections 80, 100 and 150mm Single Ground Meter a) Note added to make dismantling joints optional when using copper pipe.	
			SW.17. Water Connections Metered 80, 100 and 150mm Fire Services a) Note added to make dismantling joints optional when using copper pipe.	

No	Section/ Clause No.	Key Issue	Explanation	Recommended Amendments
32	Schedule 2 – Character Places	New Listing.	The land at 8 Byrne Street, Bundamba contains 'Byrneville' a building identified by the 1991 Ipswich Heritage Study as being of character significance. The property should be listed in Schedule 2 – Character Places.	That Schedule 2 – Character Places be amended to include a listing for 8 Byrne Street, Bundamba, 'Byrneville', on Lot 8 RP868820, with the extent of significance being 'whole lot'
33	Zoning Map – Z17	Review of zone boundary – Mica Street, Carole Park.	The zone boundary should be amended to correspond with the new lot boundary and the associated Recreation Zone 'shifting boundary' should be removed.	That the zoning maps be amended to include Lot 1 SP178513 wholly within the Regional Business and Industry Buffer (RBB) Zone and include Lot 2 RP178513 wholly within the Regional Business and Industry – Low Impact (RB4L) Zone.
34	Schedule 2 – Character Places	Amendment to listing.	The Schedule 2 listing for the Redbank Rifle Range includes land at 9 Chalk Street and 53 Cross Street, Redbank. Research of Survey Plans indicates that these properties were not originally included in the Rifle Range and therefore should be removed from the listing.	That the listing for the Redbank Rifle Range in Schedule 2 – Character Places be amended to remove the land at 9 Chalk Street and 53 Cross Street, Redbank.
35	Schedule 2 – Character Places	Amendment to listing.	The listing incorrectly refers to Lot 38 Paynes Road, Ebenezer (Lot 38 RP123059). This listing was based on the information in the Expanded Ipswich Heritage Study. The house of character significance is actually located on 23 Lees Road, Ebenezer (Lot 23 RP123059).	That Schedule 2 - Character Places be amended to:- a) remove Lot 38 Paynes Road, Ebenezer (Lot 38RP123059); and b) include 23 Lees Road, Ebenezer (Lot 23 RP123059) described as 'dwelling', extent of significance 'house and rear wing.'

TABLE 1: Planning Scheme Amendments Package to 2 of 2007.

No	Section/ Clause No.	Key Issue	Explanation	Recommended Amendments
36	Schedule 2 – Character Places	Removal of Schedule 2 listing.	The listing for land at 62 Downs Street, North Ipswich should be removed as the church, manse and other buildings of character significance were destroyed by fire.	That Schedule 2 – Character Places be amended to delete the listing for 62 Downs Street, North Ipswich.
37	4.8.5C Sub Area FU4 – Walloon/ Thagoona	Third Pipe (Recycled Water) System.	Ipswich Water has advised that all references to the third pipe recycled water network at Walloon/Thagoona should be removed from the Planning Scheme given the new strategic focus on developing a major western corridor waste water centre at Rosewood.	That Section 4.8 be amended as follows: Note 4.8.5CL(1) – remove "recycled water,". S4.8.5C(3)(c) – remove "and recycled water" from the heading. S4.8.5C(3)(c)(i) – remove "recycled water". S4.8.5C(3)(c)(i)(C) – remove "and the use of recycled water". 4.8.5C(3)(c)(iii) – delete entire clause. 4.8.5C(3)(c)(viii) – delete entire clause. Existing Clauses 4.8.5C(3)(iv) to (vii) to be renumbered (iii) to (vi). Table 4.8.1, Single Residential – Column 2 – Assessment Category – replace "Self Assessable if

TABLE 1: Planning Scheme Amendments Package to 2 of 2007.

No	Section/ Clause No.	Key Issue	Explanation	Recommended Amendments
38	Planning Scheme Policy 2 — Information Local Government May Request (Appendix 2 — Infrastructure As Constructed)	Amendments to asconstructed information standards.	Minor amendments to as-constructed information standards.	(a) the lot is 450m2 or more in area; and (b) if in FU4, the use is connected to a Council approved recycled water system" with "Self assessable if the lot is 450m² or more in area." That Planning Scheme Policy 2 (Appendix 2 – Infrastructure As Constructed) be amended as per Attachment A9.

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No	Section/ Clause No.	Key Issue	Explanation	Recommended Amendments
39	Part 6 - Regional Business and Industry Investigation Zone: Figure 16.6.1 Ebenezer Willowbank Precinct Plan and Table 6.4 - Assessment Categories and Relevant Assessment Criteria for Regional Business and Industry Investigation Zone - Making a Material Change of Use.	Reconcile Precinct Plan to be consistent with Ipswich Motorsports Precinct Masterplan and amend the assessment table to make minor sports industries code assessable development.	The precinct boundary needs to be reconciled with the Ipswich Motorsports Precinct Masterplan for the motorsport component only as per Attachment A10. In addition it is proposed to facilitate minor motor sports industries (i.e. up to 500m2 Gross Floor Area) within the motorsports precinct as code assessable development.	 That Figure 16.6.1 be amended to reconcile the precinct boundary with the Ipswich Motorsports Precinct Masterplan for the motorsport component only as per Attachment A10. That Table 6.4 be amended such that Column 2 in respect of "General Industry" and "Services Trades Use" reads as follows: "Code Assessable if:- (a) within Precinct 3 of sub area RBIA1, Ebenezer Willowbank; and (b) involving activities relating to motorsports; and (c) involving the use of 500m2 or less of gross floor area. Impact Assessable otherwise."

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No	Section/ Clause No.	Key Issue	Explanation	Recommended Amendments
40	Zoning Map – Z14	Incorrect zone label.	The Residential Medium Density (RM1) Sub Area refers to land situated in the area between Short and Lion Streets and Warwick and Salisbury Roads, Ipswich. However, the zoning map label refers to this precinct as being included in the Residential Medium Density (RM2) Sub Area. The zone label should be amended to include the land in the RM1 sub area.	That the zoning maps be amended to include the Residential Medium Density (RM2) area situated between Short and Lion Streets and Warwick and Salisbury Roads, Ipswich in the RM1 sub area.
41	Zoning Maps – Z47 and Z48	Unzoned land.	Two properties have been included in the Ipswich local government area as part of the recent DCDB upgrade from DNRM and are currently unzoned. The properties are located at: Lot 2 Charles Chauvel Drive, Harrisville (Lot 2 RP187860) Lot 102 Forsyths Road, Limestone Ridges (Lot 102 CH3160)	That the zoning maps be amended to include Lot 2 RP187860 (Harrisville) wholly within the Rural A (Agricultural) Zone. That the zoning maps be amended to include Lot 102 CH3160 (Limestone Ridges) wholly within the Rural B (Pastoral) Zone.

No	Section/ Clause No.	Key Issue	Explanation	Recommended Amendments
42	}	Zoning. Updated information from ICC Works Department regarding Flooding and Urban Stormwater Flow Path areas.	Kholo Gardens is currently included in the Rural Conservation Zone. A zoning of Special Uses (SU 62 – Park) is more allied to the actual use of the land. (A)The Works Department have provided updated information regarding flooding and urban stormwater flow path areas (see Attachment A11) recommending: • some small amendments to the 1 in 20 development line in the upper reaches of Woogaroo, Goodna, Six Mile, Bundamba, Sandy and Deebing Creeks which do not significantly impact the affected properties; • amendment of the 1 in 100 flood map within the Ripley Valley Master Planning area adjoining Bundamba Creek upstream	That the zoning maps be amended to include Lot 223 SL3149 (Kholo Gardens) in the SU (62 - Park) Zone. That Overlay Map (OV5) – Flooding and Urban Stormwater Flow Path Areas be amended to reflect the updated information on flooding and urban stormwater flow path areas as outlined in the report by the Senior Engineer dated 23 March 2007, as contained in Attachment A11. That section 11.4.7 (c) (xi) and (d) (viii) be deleted and replaced with the following text in both circumstances: (c)(xi)/(d)(viii) Clearing of native vegetation within the stream banks is avoided.
			of Cunningham Highway as a result of further technical studies; extension of the 1 in 100 flood line for upper Six Mile Creek within the Redbank Plains area which matches the green space layer within the South Redbank Plains Planning Study; extension of the 1 in 100 flood line for the Upper Woogaroo Creek from the current	 (A) the land is located within the 1 in 100 flood line designated 'indicative and subject to further detailed assessment' on Overlay Map OV5 - Flooding and Urban Stormwater Flow Path Areas; and (B) such filling results in the rehabilitation and repair of the hydrological network and the

No	Section/ Clause No.	Key Issue	Explanation	Recommended Amendments
			boundary to Augusta Parkway in Bellbird Park/Brookwater and Springfield based on the flood study undertaken by the developer; and inclusion of an additional Urban Stormwater Flow Path within the Redbank Plains area over the following properties: Lot 73 School Road, Redbank Plains (Lot 73S151854); Lot 69 Cedar Road, Redbank Plains (Lot 69RP861531); Lot 72 Cedar Road, Redbank Plains (Lot 72RP861531); and School Road, Redbank Plains (Lot 1 SP194799). (B) An amendment is required to the text associated with Overlay OV5 to incorporate the updated flood information.	riparian ecology of the waterway; and (C) an assessment, undertaken by a suitably qualified consultant, demonstrates that the reforming of the land does not adversely impact on the overall hydrology and flood capacity of the waterway.

TABLE 1: Planning Scheme Amendments Package No 2 of 2007.

No	Section/ Clause No.	Key Issue	Explanation	Recommended Amendments
44	Table 4.7.1 – Character-Areas Housing Zone	Assessment Category for Single Residential use.	A Single Residential use is currently Code Assessable in the Character-Housing Zone. An amendment is required to enable proposals for a Single Residential Use that involve the change of use of a building which was originally designed for use as a dwelling to be Self Assessable.	That Table 4.7.1 be amended in respect of "Single Residential" to read as follows: "Self Assessable where involving the change of use of a building which was originally designed for use as a dwelling.
45	Zone Map Z16	Change of zone owing to change of ownership and lodgement of development application	The subject site, 70 Old Ipswich Road, Riverview, is currently located within the Special Use (SU7 – Place of Worship and Educational Establishment) Zone. This land has been sold to a private owner and is the subject of a current development application before Council for residential uses.	Code Assessable otherwise." Remove Lot 2SP172023, 70 Old Ipswich Road, Riverview, from the Special Uses Zone and include the land wholly within the Residential Low Density (RL2) Zone.
46	Major Centres Zone	Change of centre hierarchy for Karalee.	Work on the Local Growth Management Strategy has revealed a need to review the status of the Karalee centre from a local centre to a major centre to reflect the ultimate growth in the surrounding area.	That a new sub area for the Karalee Primary Business Area be included as a new clause 4.9.4(7) within the Major Centres Zone as per Attachment A1, and that the zoning maps be amended as outlined in Attachment A12.

TABLE 1: Planning Scheme Amendments Package No 2 of 2007.

No	Section/ Clause No.	Key Issue	Explanation	Recommended Amendments
47	Special Opportunity Zone - SA16 Sub Area	Zone changes and hierarchy changes in relation to the land adjoining the Karalee Centre.	Further to item 46 above, it is recommended to amend the Special Opportunity Zone (Sub Area SA16) to reflect the change in status and zoning for the Karalee centre.	That Special Opportunity Area, SA16 Karalee, be amended as per Attachments A12 and A13.
48	Residential Low Density Zone	Zone changes and hierarchy changes in relation to the land adjoining the Karalee Centre.	Further to item 46 above, it is recommended to amend the Residential Low Density Zone (RL2) to reflect the change in status and zoning for the Karalee centre and the approvals for residential development on the nearby lands to the north.	That the following lots are included wholly within the, Residential Low Density (RL2) Zone: Lot 274 SP183103; Lot 71 C3441; Lot 144 S31118; Lot 145 S31118;and Lot 148 S31118.
49	Strategy Map 1 and Strategy Map 2	Amend the Strategy Maps to reflect changes to the status for the Karalee centre.	Amend Strategy Maps 1 and 2 to include reference to the Karalee centre as "Other Major Centres".	That Strategy Maps 1 and 2 be amended to designate the Karalee centre as "Other Major Centres".
50	Section 1.12(1) Clause (iv)	Addition of zone map reference.	Owing to recommended changes to the zoning in and around the Karalee centre, reference to the Major Centres Zone is needed as a result of inclusion of this zone on Zone Map Z8.	That reference to Zone Map Z8 be included in clause 1.12(1)(iv).

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No	Section/ Clause No.	Key Issue	Explanation	Recommended Amendments
51	Section 1.12(1) Clause (vii)	Removal of Zone Map reference.	Owing to recommended changes to the zoning in and around the Karalee centre, reference to Zone Map Z8 is required to be deleted from the Local Retail and Commercial clause.	That reference to Zone Map Z8 be removed from clause 1.12(1)(vii).
52	Section 1.13(f) Clause (vi)	Inclusion of a reference to a new sub area.	Owing to recommended changes to the zoning in and around the Karalee centre, reference to the recommended sub area in the Major Centres Zone is required.	That an additional clause in section 1.13(1) be included as follows: "(vi) Sub Area MC7 – Karalee Primary Business Area;
53	Section 1.13(m) Clause (vi)	Inclusion of a reference to a new sub area.	Owing to recommended changes to the zoning in and around the Goodna centre, reference to the recommended sub area in the Special Opportunity Zone is required.	and" That an additional clause in section 1.13(m) be included as follows: "(xliv) Sub Area SA44 – Woogaroo Street, Goodna; and"

TABLE 1: Planning Scheme Amendments Package No 2 of 2007.

No	Section/ Clause No.	Key Issue	Explanation	Recommended Amendments
54	Schedule 2 – Character Places	Addition of a Schedule 2 listing.	At the request of the property owner, it is recommended to add the dwelling house at 1058 Ipswich-Rosewood Road, Rosewood (Lot 1 RP140572) to Schedule 2 – Character Places.	That Schedule 2 – Character Places be amended to include a listing for 1058 Ipswich Rosewood Road, Rosewood (Lot 1 RP140572) as Dwelling House with the extent of significance being 'whole lot'.
55.	Zone Map Z14.	Current zoning is inconsistent with current land use.	The subject land, 112 Gladstone Road, Coalfalls (Lot 75I120729) is currently wholly located within the Recreation Zone. The land is adjacent to Council parkland and Residential Low Density Zoned properties which are currently being used for residential purposes. The subject site is also improved by a single residential dwelling. It is recommended that the subject land be wholly included within the Residential Low Density Zone to achieve consistency with the land use and surrounding residential properties. It should be noted that the subject property is almost totally covered by the 1 in 100 Flood Line. The flooding impacts however are able to be addressed via the flooding overlay map (OV5).	That 112 Gladstone Road, Coalfalls (Lot 751120729) be removed from the Recreation Zone and included wholly within the Residential Low Density (RL2) Zone.



Attachments:



A1 Div 09 - Major Centres Zone.doc



A2 SA44 Text Only.doc



Goodna_Proposed_ZI



A4 Map 2 SSP 200704.pdf Voltage Transmission











A8 Changes to 42_200704 .pdf AugustineHeights_PriStandard Drawings.pi



















A10 Fig 6-16-1 EWP A11_Senior Engineer A11 Amendments to A11 Amendments to A11 Amendments to Report_23March2007OV5 - 1in100_AffecteOV5 - 1in100_BenefitOV5 - 1in20_BenefiteOV5 - Urban_Stormw:Karalee_Proposed_ZI



Your Ref:

Our Ref: Contact:

TPA24097 Nicole Polzi

Telephone Facsimile: (07) 3898 0344 (07) 3237 1738

Email:

Nicole.Polzi@dlgpsr.qld.gov.au

24 May 2007

Records & Dr

Policy Officer Strategic Management and Policy Unit Department of Emergency Services **GPO Box 1425** Brisbane OLD 4001

Department of Local Government, Planning, Sport and Recreation

On 2 April 2007, the second amendment to the Ipswich Planning Scheme, prepared in accordance with the Integrated Planning Act 1997 (IPA) was submitted to the Minister for Local Government, Planning and Sport for consideration of State interests and approval to notify in accordance with Part 2 of Schedule 1 of the IPA. Your agency is now formally requested to review the proposed amendments to the Ipswich Planning Scheme to assist the Minister to determine if the scheme amendments adversely affect State interests as per section 11 of Schedule 1 of the IPA. In this regard, a Whole of Government review is considered to be an appropriate method for guiding the Minister's determination.

The amendments relate to a number of operational matters and outcomes of the Goodna Town Centre Master Plan. In summary, the proposed amendments include changes to zoning and zone codes, environmental planning, and operational matters in relation to editorial, grammatical, and typographical inconsistencies.

Please find enclosed a copy of the proposed second amendment Ipswich Planning Scheme text and supporting comments. Your agency's formal comments on the proposed amendment to the IPA planing scheme are requested in writing, preferably via email to by close of business Thursday 21 June 2007. response has been received by this date it will be assumed your agency has no comments.

If you have concerns with this requirement or if you have any questions regarding the proposed amendment to the IPA planning scheme or review process please contact

Yours sincerely

A/Principal Planner South East Queensland Planning Division

Level 14 Mineral House 41 George Street Brisbane

PO Box 31 Brisbane Albert Street Queensland 4002 Australia

Telephone +61 7 3237 1809 Facsimile +61 7 3237 1812 Website www.dlgp.qld.gov.au

ABN 61 331 950 314

Tuesday, 11 April 2006 12:11 PM

From: Sent: To: Subject:

ICC planning scheme amendments - Walloon Thangoona

Please note the DES has no comment to make on the proposed amendments with regard to SPP 1/03

Policy Officer Strategic Policy Unit

Your Ref:

Our Ref: TRIM

Contact:

Ms Dominique Gallagher

Telephone Facsimile: 323 71212 323 71738

Email:

Dominique.Gallagher@dlgpsr.qld.gov.au

2 March 2006



Planning Services

Department of
Local Government, Planning,
Sport and Recreation

Planning and Project Officer
Department of Emergency Services
GPO Box 1425
BRISBANE QLD 4001

Dear

Re: Draft Ipswich City Planning Scheme Amendments - Walloon Thagoona Master Plan Amendment Package 1 of 2006

On 24 February 2006, Ipswich City Council submitted the Walloon Thagoona Master Plan amendments to the Ipswich City Planning Scheme to the Minister for Local Government and Planning, for consideration of State interests and approval to adopt in accordance with section 18 of Schedule 1 of the IPA.

Your agency is now formally requested to reconsider the proposed amendment to the Ipswich City Planning Scheme to assist the Minister to determine if the amendment adversely affects State interests.

Please find enclosed a CD copy of the proposed amendments. Your agency's formal comments on the proposed amendments are requested in writing (preferably via email to the above email address) by 30 March 2006. If a response has not been received by this time, it will be assumed your organisation raises no issues with the proposed Walloon Thagoona Master Plan amendments.

If you have concerns or questions regarding the proposed amendment please contact me on (or via the above email address.

Yours sincerely

Senior Planner
South East Queensland - Wide Bay Burnett Planning Division

Enc.

Level 14 Mineral House 41 George Street Brisbane PO Box 15031, City East Qld 4002 Telephone +61 7 3237 1809 Facsimile +61 7 3237 1812 Website www.lgp.qld.gov.au ABN 61 331 950 314



4006268



Contact: Ph: Ref: QES/2236

Counter Disaster and Rescue Services

26 August 2005

Department of Emergency Services

Senior Planner
South East Queensland – Wide Bay Burnett Planning Division
Department of Local Government, Planning Sport and Recreation
PO Box 15031
City East Qld 4002

Dear

Re: Draft Ipswich City Planning Scheme Amendments

I refer to your advice of 4 August 2005 seeking this Agency's comments on whether the Ipswich City Plan Amendments adversely affect State interests, particularly State Planning Policy 1/03 *Mitigating the adverse impacts of flood, bushfire and landslide* (SPP 1/03).

The Department of Emergency Services (DES) responsibilities include the Queensland Ambulance Service (QAS); Queensland Fire and Rescue Service (QFRS) including the Rural Fire Service (RFS); Counter Disaster and Rescue Services (CDRS) including the Chemical Hazards and Emergency Management; and Disaster Mitigation and Management. This is a coordinated whole of Department response. Consultation with officers of the Department of Natural Resources and Mines (NR&M) has been undertaken in relation to flood requirements of SPP 1/03.

Please be advised that DES raises no issues to the Draft Ipswich City Planing Scheme Amendments including the Walloon Thagoona Master Plan 2005.

Thank you for the opportunity to be involved in the development of the Ipswich City Plan. Should you wish to discuss these matters further, please contact Planning and Project Officer, on telephone number

Yours sincerely

Exécutive Manager Disaster Mitigation and Management Community Safety and Sustainability

Emergency Services Complex Cnr Kedron Park Road and Park Road Kedron Qld 4031

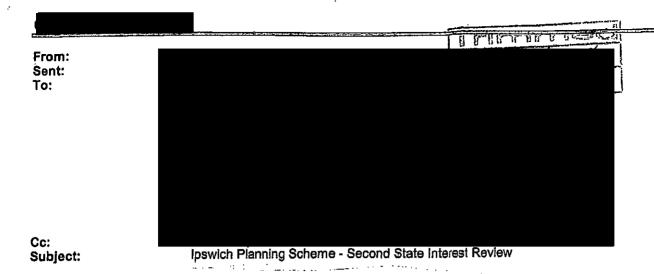
GPO Box 1425 Brisbane Queensland 4001 Australia

Telephone +61 7 3247 8481 Facsimile +61 7 3247 8475 Website www.emergency.qld.gov.au

ABN 92 265 149 823



GLM-26



Dear State Agency contacts,

On 11 December 2003 Ipswich City Council si to submit the draft IPA planning scheme for the reconsideration of State interests and approval to adopt in accordance with section 18 of Schedule 1 of the Integrated Planning Act 1997 (IPA).

Council has advised changes subsequent to public notification relate to three main areas; the conservation Zoné,

In consideration of the changes to the draft planning scheme and compliance with the Ministerial conditions, it is envisaged that a full State interest review will not be required. The Department of State Development, Environmental Protection Agency and the Department of Main Roads have been identified as agencies which have an interest in changes made to the notified planning scheme.

The Department would like to progress the reconsideration of State Interests in a timely manner considering the June 2004 dead line, the coming Local Government elections and a possible State Government election.

If you believe your agency needs to review the final draft of the IPA planning scheme or should you wish to discuss the matter further could you please notify me on the could you please not you have not you please not you have not you have not

Departmental officers will be meeting with Council officers on 11 December 2003 and would like to invite the EPA to join discussions in relation to the changes to the Conservation Zone. This will occur at 11-30pm at Level 14, Mineral Youse. If EPA could please confirm attendance at this meeting it would be appreciated.

The Department would like to take this opportunity to thank all State agencies for their assistance in the review of the diraft IPA Ipswich Planning Scheme, and wish you all a very Merry Christmas.

Regards,

Planner - Central-Southern Team

Department of Local Government and Planning

Phone-

AA 3



Department of Local Government and Planning

1 n MAR 2003

RECEIVED

Queensland Government

Strategic and Executive Services Obision

Department of Emergency Services

David Heyden Phone: 3109 5021

5 March 2003

SEQ Planning Division
Department of Local Government and Planning
PO Box 31
BRISBANE ALBERT STREET QLD 4002

Dear

State Interest review of the draft ipswich IPA Planning Scheme

I refer to your advice of 6 February 2003 seeking this Agency's comments on Council's draft IPA planning scheme prior to its public notification period.

The Department of Emergency Services (DES) responsibilities include the Queensland Ambulance Service (QAS); Queensland Fire and Rescue Service (QFRS) including the Rural Fire Service; Counter Disaster and Rescue Services (CDRS) including the SES and Volunteer Marine Rescue Support; Chemical Hazards and Emergency Management; Aviation Services, and Disaster Mitigation. This is a coordinated whole of Department response.

DES interests in IPA planning schemes relate to Emergency Response and Service Delivery and Disaster Mitigation. Please refer to Attachment for our specific comments. The attachment outlines the preferred approach to addressing the draft State Planning Policy in the Ipswich draft IPA planning scheme. Any queries regarding the draft State Planning Policy and its application to the Ipswich IPA planning scheme should be made to on telephone

Thank you for the opportunity to be involved in the development of the draft lpswich IPA Planning Scheme. We look forward to our continued involvement.

Yours sincerely



Director
Strategic Management and Policy Unit

Attach.

Creating a safer Queensland

Strategic Management and Policy Uni

Emergency Services Complex Cnr Kedron Park Road & Park Road Kedron Qld 4031

GPO Box 1425 Brisbane Queensiand 4001 Australia

Talephona +61 7 3247 8787 Facsimila +61 7 3247 8798 Website www.emergency.qld.gov.au

ABN 11 577 654 890

ATTACHMENT

Ipswich Draft IPA planning scheme

First State Interest check

Department of Emergency Services

Reference	Issues	Solution/Outcome Sought
General comments	,	
 The most desirable outcor so the SPP's interpretation 	ing Policy Natural Disester Miligation. The will be to reflect the SPP into planning schemes at the earliest opportunity in the local context can be used in development assessment and the scope SPP and planning schemes are avoided.	It is not expected that the draft IPA planning scheme for Ipswich City will fully reflect the requirements of the draft SPP. However, when the SPP is adopted the Ipswich IPA planning scheme may require amending to achieve Outcomes 4-6 of the draft SPP.
occurred or is about to oc to amend an advanced development assessment	nd the planning scheme should be completed before public consultation is anning scheme. This may be impossible because consultation either has cur, or impracticable because an excessive amount of work would be required draft planning scheme. In such circumstances, the SPP will be used in alongside the planning scheme until the latter can be amended.	
Specific Comments		
Overlay map 1 – Bushfire risk areas, map 4 – Difficult topography, and map 5 – Flooding and urban stormwater flow path areas. Chapter 11 – Overlays, Division 4 – Developments Constraints Overlay Code	 The draft ipswich IPA planning scheme has adequately addressed the mapping of natural hazard areas - flood, bushfire and landslide (in the three applicable overlay maps), as specified under the draft SPP. 	• Ipswich Council should be aware that the Rural Fire Service has recently updated its bushfire risk analysis mapping. A copy is attached for Council's information and consideration. Council should be aware that the SPP, when adopted, will require the RFS mapping be used as a bushfire hazard default where no studies or assessment have been undertaken. Therefore it is important that Council is satisfied with the RFS mapping prior to adopting its IPA planning scheme. Council should notify this Department Immediately if there are any discrepancies.
	 The 'Development Constraints Overlay Codes' have Identified the specific outcomes and probable solutions, which will minimise the amount of people put at risk from flood, bushfire and landslide natural hazard areas. However, the codes have not fully reflected the performance criteria contained in the draft SPP. 	for the draft ipswich IPA planning scheme will fully reflect the
Part 4 - Urban Areas to Part 10 - Rural Areas - 'Assessment Categories and Relevant Assessment Criteria' tables and Part 11 - Overlays, Table 11.4.3 - 'Assessment Categories and Relevant Assessment Criteria' tables for Development Constraints Overlays—Making a Material Change of Use	important during and immediately after natural disasters and their location should be assessed on this basis.	schools to realise (I the state of



Your Ref: Our Ref: Contact: Telephone Faosimile: Emeil:



PLANNING SERVICES

 ρ_{131159}

Department of Local Government and Planning

6 February 2003

Policy Officer Department of Emergency Services **GPO Box 1425 BRISBANE OLD 4001**

Dear

Re: State Interest Review of the Draft Ipswich IPA Planning Scheme

The draft Integrated Planning Act 1997 (IPA) planning scheme for Ipswich City has recently been submitted to the Minister for Local Government and Planning for consideration of State interests and approval to commence public notification.

In accordance with section 11 of Schedule 1 of the IPA, the draft scheme requires a 'Whole of Government' review to enable the Minister to determine if the planning scheme adversely affects State interests.

The scheme has been prepared in accordance with the Department's template as set out in IPA Guideline 1/02 and IPA Guidelines 1/00 to 4/00 "Processes for Preparing Planning Schemes". As the structure and drafting of the planning scheme is generally consistent with these guidelines, it is requested that your agency confine its review and comments to 'policy' issues only. On this basis, comments should not address issues relating to the scheme's format or structure, Strategic Framework, planning Policies or extrinsic material.

A CD copy of the proposed planning scheme is enclosed in addition to a preferred format (see letter attachment) for your agency's comments. It would be appreciated if this format was utilised to assist in the Department's collation and assessment of State interests.

In conjunction with Council officers, the Department is conducting a State agency briefing session to provide attendees with an overview of the draft scheme's concepts and structure. Details regarding this meeting are as follows;

Date: Wednesday, 12 February 2003

Time: 2.00 pm - 4.00 pm

Venue: Level 18 Conference Room, Mineral House (41 George Street)

Confirmation of your attendance via phone or email would be appreciated by Monday 10 February 2003.

Subsequent to the above meeting, and given your review will focus on policy issues only, it is currently requested that agency comments will be provided to the Department by Friday 7 March 2003. It would be appreciated if comments were submitted via hardcopy in addition to being emailed to

Should you have further questions regarding these matters please contact of the Department on

Yours sincerely

for

PRINCIPAL PLANNER
SOUTH EAST QUEENSLAND PLANNING DIVISION

Encl

C.C. Mr John Adams
Planning Manager
Planning & Development Department
Ipswich City Council
PO Box 191
IPSWICH QLD 4305

From: Sent: To:

Friday, 21 November 2003

Subject:

E: Bundaberg P_S

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Trim No. File No.

I have reviewed the revised 'flood management code' and in light of the LAPD comments, DES has provided the following comments which support their comments. As LAPD has been closely involved with DES and policy workability issues, DES supports the assistance that has been provided on how SPP 1/03 can be appropriately reflected.

DES expresses that it is understood that amendments to the Flood Management Code within the Bundaberg City Plan (BCP) has meant that SEP 1/03 has been appropriately reflected. However, Council should amend the 'Purpose of the Code' to state -...... protected from {specified} flood event'. This was the purpose of dentifying a DPE, to identify an appropriate flood level for the City through a risk ssessment process. By stating 'protection from all flood events', it is understood to elude to all possible floods for the City - Probable Maximum Flood (PMF), not their

The following comments are provided to ensure increased workability of the BCP, however it is understood that they don't impact on achieving the desired outcomes of the SPP.

1. P7 and P8:

***Consider incorporating P7 and P8 together, as A7.1 and A8.1 does not reflect the Solutions for 1.4, to ensure that the safety of people and property from DFE is maintained in non-residential developments. Therefore, the only probable solution that must be included to get the desired community safety outcome is A 8.2 safe warning times. Council may also consider incorporating the other appropriate provision of 'safe refuge areas'.

2. P11:

***DES encourages that Council include a defined list of the types of community infrastructure that are impacted from floods, as is listed in Annex 1.2, page 13 of the SPP. All of these community infrastructures may be adversely impacted from flood waters. As has been seen in other local government planning schemes that I have eviewed, the inclusion of the list within the Code improves the readability of the Scheme, so applicants can clearly identify whether their type of development applies to the Flood Management Code.

Thanke

Keep me in touch.

Project officer

Strategic Management and Policy Unit

Phone: Fax:

Department of Emergency Services

Not propert to prosent

From: Sent:

Wednesday, 12 November 2003 10:23 AM

To:

Subject:

Bundaberg P_S



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Trim No.	04	83	39	
File No.	PP	21	560	16

I have a list of questions which we can discuss further over the phone.

1. I have contacted DNRM who will provide DES with technical information to whether the provided explanation for the 2% Burnett River Flood Level is appropriate to the City.

2. I agree with Jeremy's resolution for the Council to include the detailed mapping as a PSP. However, as this mapping is not completed, it is assumed that it would not be ossible in this round of plan making/amendments. Therefore, if the detailed mapping is not completed, whether within the PSP or not, future development assessments would not be able to meet the solutions in the flood management code, and therefore the planning scheme has not reflected SPP 1/03.

3. In relation to Solution 1.4 of Appendix 5A, this may be achieved as Council has stated that there is an extensive flood warning system in place for the Burnett River. Therefore, this may satisfy 50 1 (Solution 1.4 (c)) for non-residential developments. Further justification would be needed on their flood warning system.

4. In relation to Council's explanation for not ensuring essential service infrastructure are built above the DFE, it must still include a measure that ensures new developments built above the DFE, also have essential service infrastructure built at that same level (words to that effect). It is understood that the SPP states wherever practicable, however it should still be identified as a criteria within the scheme.

5. At this current phase of plan making it was not expected that the 0.2 % and 0.5% flood mapping be identified. However, what is expected is that these flood levels are identified in the future. Once again, SPP 1/03 does state that if it is not practicable to obtain this higher level of flood immunity, this is appropriate to DES (with adequate justification). However, it is not acceptable that Council find it not racticable because of the lack of flood mapping. It may well prove in the future that this higher level flood immunity is not practicable for the City, however the mapping must be available to prove this.

I think that's about it.

I will give you some time to read over it, and I will give you a call later toda

Thanks .

Assistant Project Officer
Strategic Management and Policy Unit
Strategic and Executive Services Division
Department of Emergency Services
Level 3 Block F, Healy Wing
Cnr Kedron Park & Park Rds, Kedron Q 4031
GPO Box 1425 Brisbane O 4001
Telephone:
email:



Cullen Sean

From: Sent: To:

Friday, / November 2003 3:42 PM







DMR comments -BUCC reply 7-11...

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Trim No.	64	83	22	_
File No.	TPF	21	560	[19

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•	Item No.	Section [Document/ section and page number]	Interest / Comment & Legislative / Policy Basis	State Agency Suggested Solution (Outcomes sought	DLGP Categorisation	Local Government's Response	DLGP decision (no further action/Ministeria
	Section 1	हिण्डि सन्तर्भ छन्त			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		condition etc).
	Aviation	n - State Planning P	Outcome 5 and 6 of the ODDAYOR	Vicinity of Certain Airports			
	1.		requires aviation facilities listed in Appendix 2 of the SPP1/02 Guideline be appropriately identified and protected in planning schemes. The non-directional beacon (NDB) located at Bundaberg Airport needs to be protected. This facility is not shown or adequately protected in the scheme. The facility is impacted by uses outside Bundaberg Airport land.	Include a map showing the location and sensitive area of Airservices Australia's NDB. The location and sensitive area for this facility is shown on the attached map (Attachment 2). AND Add a performance criteria and probable solution for the NDB like: Performance criteria: "Development does not impair the function of the non-directional beacon (NDB) at the airport." Probable solution: "Works or uses are not located within the sensitive area of the NDB site (as depicted on overlay map X) that involves any buildings, structures or other works that exceed 7.9 metres in height."	State interest	Agreed NDB location / buffer map to be included. Agreed: Performance criteria and probable solution as suggested to be inserted in Airport Code.	
	-	Local Areas	Paragraph 13 refers to the State	Amend the section to refer to	State interest	Agreed amend as suggested.	
ļ	Ll	3.1.2.1	Planning Policy 2/92. This policy	SPP1/02 and its new title.			

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Item No.	Section [Document/ section and page number]	Interest / Comment & Legislative / Policy Basis has been replaced.	State Agency Suggested Solution /Outcomes sought	DLGP Categorisation	Local Government's Response	DLGP decision (no further action/Ministerial
	Page 3-10	паз весттерысец,				condition etc).
3.	Overtays Map 3.14 Bundaberg Airport Page 3-60	Map 3.14 is not appropriate since all of Bundaberg City is included in the airport's operational airspace, and for that reason is affected by SPP1/02.	Map 3.14 needs to show the airport affects all land in Bundaberg City.	State interest	Not Agreed as it is not practicable	
4.		Development assessment table 3.13 uses this map to trigger the airport overlay code.				
4.	Overlays Table 3.13 Page 3-61	The assessment table has reconfiguring a lot as exempt development. Lot reconfiguration can create lighting in straight parallel lines 500m to 1000m long. Street lighting can be a hazard for aircraft if it appears like a runway.	Amend the assessment table 3.13 to make reconfiguring a lot code assessable development, where new streets or roads are created.	State Interest	Agreed	
5.	Bundaberg Airport Code 4.3.13 Pages 4-65	The purpose of the code refers to the airport's operational airspace. Operational airspace is not defined within the scheme. SPP1/02 defines operational airspace as the obstacle limitation surfaces (OLS) for Bundaberg Airport.	Define operational airspace within the scheme.	State interest	Don't consider this necessary as purpose of code incl. "and efficiency of the Airports operational airspace"	
6.	Bundaberg Airport	Probable solution A2.1 does not	Amend probable solution	State Interest		



. . . .



Item No.	Section [Document/ section and page number]	Interest / Comment & Legislative / Policy Basis	State Agency Suggested Solution /Outcomes sought	DLGP Categorisation	Local Government's Response	DLGP decision (no further action/Ministerial
	Code 4.3.13 Pages 4-65	cover all of the requirements of SPP1/02 or CASA regulations. Any significant external lighting and straight parallel lines of lighting 500m to 1000m long can be a hazard for aircraft within 6km of the airport.	A2.1 to read "Lighting within 6km of the airport complies with the guidelines and doesintensity of light sources Map 4.2 or distract pilots or appears like airport runways."		Agreed Amendments as per suggestion	condition etc).
7.	Bundaberg Airport	Probable solution A2.1 also refers to map 4.3 instead of map 4.2. Table 4.8 Building Site				
8	Code 4.3.13 Pages 4-66	Acceptability Based on ANEF zones contains some errors and omissions. The current version for AS2021 is 2000 Public buildings are compatible below 20 ANEF Commercial buildings are compatible below the 25 ANEF The required application column does not refer to the all the requirements of AS2021 (SPP1/02).	Amend the table.	State interest	Agreed Table to be amended	
8.	Map 4.3	The obstacle limitation surface	Amend the map 4.3 to show	State interest		





,	Îltem No.	Section [Document/ section and page number]	Interest / Comment & Legislative / Policy Basis	State Agency Suggested Solution /Outcomes sought	DLGP Categorisation	Local Government's Response	DLGP decision (no further action/Ministerial
į į		Obstacle Limitation Surface Layout Page 6-69	(OLS) for Bundaberg Airport extends to 15km from the airport. This is not shown or referred to on Map 4.3.	the edge of the outer horizontal surface of the OLS or include a note that refers to the height restrictions for the outer horizontal surface.		Agreed	conditioπ etc).
	9.	Planning Scheme Mapping	The scheme's mapping does not show buffers for Bundaberg Airport: - 3km and 8km wildlife buffers - 6km lighting buffer.	Include the 3km and 8km wildlife buffers, and 6km lighting buffer on the mapping overlays. Attachment 3 shows the wildlife and lighting buffers for Bundaberg Airport.	State interest	See Map 4.2 (light control) any further mapping to be negotiated	·
	10.	jeurou snergeney	Development of an adequate Natural Hazard Management Area (NHMA) for flood. Bundaberg City Council has had direct correspondence with this Department to determine the appropriateness of their flood immunity level for the Burnett River. Currently, Council has been asked to provide additional information on the methodology used to prove that a lesser DFE is appropriate.	To ensure that SPP 1/03 applies for development assessment purposes, the Flood Management Overlay — Map 3.11 must meet the criteria for a NHMA for flood. This can be achieved by:	State interest	As you are aware Council has had considerable discussions with respect to this matter and it has been determined that the purpose of the map in the Planning Scheme is to trigger assessment against the flood management code. The actual flood mapping is of extensive detail and will occupy numerous maps which it is felt are best outside of the scheme to allow for easy amendment, eg. The flood mapping will map every individual allotment and the associated house floor level. This work is currently being undertaken and is not yet complete. When complete it will be adopted by Council for purposes of the Standard Building Regulation.	





item No.	Section [Document/ section and page number]	Interest / Comment & Legislative / Policy Basis	State Agency Suggested Solution /Outcomes sought	DLGP Categorisation	Local Government's Response	DLGP decision (no further action/Ministerial
		·	appropriate freeboard height above the DFE, for, e.g. residential developments; and			condition etc).
		·	b. providing the DES with the additional information that is required to identify, through consultation with the Department of Natural Resources and Mines, if the current Burnett River flood		The following information is provided for your on forwarding to DES. Bundaberg City Council has proposed a 2% AEP flood immunity level associated with flooding at the Burnett River and a !% AEP flood for localized flooding • The Council has adopted the 2% AEP level because:	·
			level is appropriate.		 An extensive flood warning system is in place on the Burnett River; There is historical acceptance of the 1942 flood level as being an acceptable level for flood plain management. The 1942 current flood level is 	
					in most cases slightly below the 2% AEP flood proposed in the Planning Scheme. The communities acceptance of the 1942 flood level is reflected in the strong public reaction against increases in flood levels above the 1942 flood level by the proposed 2% AEP.	
		·			 The Burnett Basin Flood Hydrograph at Bundaberg is relatively flat as shown on the attached hydrograph. The approach of a flood is thus not rapid and unexpected. 	





•••	Îltem No.	Section [Document/ section and page number]	Interest / Comment & Legislative / Policy Basis	State Agency Suggested Solution /Outcomes sought	DLGP Categorisation	Local Government's Response	DLGP decision (no further action/Ministerial condition etc).
	11.		Amendments to flood measures Bundaberg City Council has not fully reflected the Specific Outcomes of Appendix 5A of the	(a) Ensure the safety of people in non-residential developments (SO 1 - Solution 1.4).	State interest	There is a considerable lead time, triggered by upstream flood warning stations, associated with a flood reaching Bundaberg eg. the flood peak measured at Gayndah is approximately 36 hours prior to the flood peak at Bundaberg. A point halfway up the flood rise on the Mundubbera hydrograph is some 60 hours before the flood peak in Bundaberg. The nature of the flood hydrograph in Bundaberg, the flat local topography and nature of escape routes, together, result in a significant amount of time being available for the movement of persons and chattels to safety, if necessary. The majority of affected urban land in Bundaberg is affected only in major flood events. The Planning Scheme deals with land levels road access and floor levels of commercial, business and industrial uses at (a) 7.1 and (a) 8.1. The Council can see no reason why	
			SPP 1/03 Guideline. The following points identify specific areas that must be reflected in the City Plan. It also identifies the relevant Specific Outcome (SO) and Solution in Appendix 5A.	A7.1 and A8.1 in Part 4.3.8 does not meet the appropriate solutions of 1.4. To meet the Specific Outcome, Council should include one of the solutions outlined in Solution 1.4.		other non residential buildings such as, farm sheds should be regulated with respect to floor levels. The risk associate with such given the nature of Burnett River flooding above is very small	





Îtem No.	Section [Document/ section and page number]	Interest / Comment & Legislative / Policy Basis	State Agency Suggested Solution /Outcomes sought	DLGP Categorisation	Local Government's Response	DLGP decision (no further action/Ministerial
			(b) Ensure essential services infrastructure maintains its function during a DFE (SO 5 - Solution 5.1 and 5.2). A2.3 in Part 4.3.12 has identified that on-site effluent will be above the Q100 flood level. This meets the requirements of SPP 1/03, however other essential services infrastructure (described in the Scheme as 'Utilities'), for example. on-site electricity, gas, water supply		Given that substantial existing urban and commercial areas of the city are subject to flooding and below the DFE, it is necessary for Council and other utility operators to build, operate and maintain infrastructure below the DFE. Council thus finds it difficult to place requirements that all utilities be above the DFE when it is necessary to service areas below the DFE.	condition etc).
			telecommunications should also be addressed in the City Plan.			
12.	·	Amendments to community infrastructure measures for flood Flood terminology	Bundaberg City Council has not reflected Specific Outcome 1 of Appendix 9 of the SPP 1/03 Guideline. Council should amend Part 4.2.7 or 4.3.8 to address that wherever practicable, community infrastructure listed in SPP 1/03 meets Specific Outcome 1.	State interest	Given that no mapping exists for 0.5 or 0.2% Flood Events it is not practicable to require specific critical items of infrastructure to be above these levels as reflected in SPP1/03 Guidelines. Council would suggest that these items of infrastructure be required to be above the DFE as in the Planning Scheme.	
		. Took Carrier Gogy	To ensure a consistent and unambiguous approach to flood mitigation, Council is encouraged to change their current presentation of flood levels as an 'Average Recurrence Interval, e.g. 1	State interest	Agreed	



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	Item No.	Section [Document/ section and page number]	Interest / Comment & Legislative / Policy Basis	State Agency Suggested Solution /Outcomes sought	DLGP Categorisation	Local Government's Response	DLGP decision (no further action/Ministerial
				in 100 or 1 in 50, to an 'Annual Exceedance Probability', e.g. 1% or 2%.		·	condition etc).
•	Deparin		્રાહ્ટકરાળું ભાષ્ટ				
	14.	4.2.8- Rural Activity code	As aquaculture facilities (particularly marine aquaculture) are considered to alienate areas of Good Quality Agricultural Land (GQAL), this matter may need to be addressed in the Scheme to ensure consistency with stated DEOs and accompanying strategies regarding the protection of GQAL.	Amend Rural Activity Code to note that aquaculture should not be located on areas of GQAL.	State interest	Agreed	
	15.	4.3.10 – Acid Sulfate Soils Code	The Department supports the amendments of this code from the previous version, to be expressed generally in accordance with the Planning Guidelines to SPP2/02 Planning and Managing Development involving Acid Sulfate Soils. However, the following changes are recommended: P1contaminants from ASS is avoided or does not significant adverse impacts	Amend the Acid Sulfate Soils Code as follows: Purpose: The generation or release of acid and metal contaminants from acid sulfate soils does not have significant adverse effects on the natural and built environment and human health. Performance Criteria P1 Works do not disturb acid sulfate soils; or	State interest	Agreed as suggested P1 Agreed	
				P2 Works are managed to		P2 Agreed	





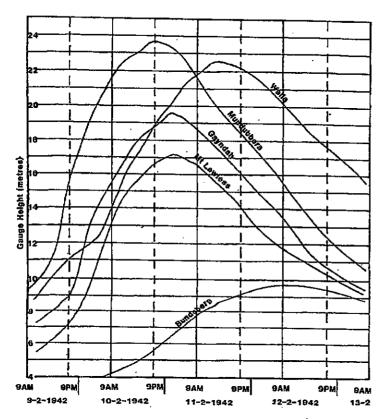
avoid of minimise the release of acids and metal contaminants.	Item No.	Section [Document/ section and page number]	Interest / Comment Legislative / Policy Basis	&	State Agency Suggested Solution /Outcomes sought	DLGP Categorisation	Local Government's Response	further action/Ministerial
								condition etc).





BURNETT BASIN HYDROGRAPHS

FEBRUARY 1842 FLOOD



SOURCE: BUREAU OF METEOROLOGY



Second State Interest Review of Bundaberg IPA Planning Scheme – November 2003

Item No.	Section [Document/ section and page	Interest / Comment & Legislative / Policy Basis	State Agency Suggested	DLGP	Local Government's Response	
Depris	number] inianû dî ivkan ko		Solution /Outcomes sought	Categorisation	The second of the sports of th	DLGP decision (no further action/Ministerial condition etc).
1.	4.3.3 Lot Reconfiguration Code Pg 4-34	The code does not adequately provide for the protection of arterial roads, in particular, the future State controlled road bypass.	In the purpose of the code, insert as a final dot point: • The protection of arterial roads. In P5 amend to read: New residential allotments must be located so as to be adequately buffered from any adjacent incompatible land uses, and any adjacent arterial roads.	State interest	Council considers buffering to future arterial roads should be contained in the MRD road reserve Suggest - and any adjacent existing arterial roads	
2.	4.2.2 Medium Density Residential Code Pg 4-6	The code does not adequately provide for the protection of medium density development against the noise impacts from arterial roads.	Insert performance criteria: Residential development adjacent to arterial roads is not adversely affected by road traffic noise. Insert corresponding solutions: Residential development adjacent to arterial roads is subject to external noise levels equal to or less than: 63 dB(A) L10(18hour),	For information	Agreed	



Second State Interest Review Bundaberg IPA Planning Scheme - November 2003

	<u> </u>					eriic - Movellinel 2003
Item No.	Section [Document/ section and page number]	Interest / Comment 8 Legislative / Policy Basis	State Agency Suggested Solution /Outcomes sought	DLGP Categorisation	Local Government's Response	DLGP decision (no further action/Ministerial
			where the L90 (8 Hour) between 10pm and 6am is greater than 40dB(A); or, 60dB(A) L10(18hour) or less, where the L90 (8 hour) between 10pm and 6am is less than or equal to 40dB(A).			condition etc).
3.	Map 3.7 Sheet 1 Local Area 6 Sheet 1 of 2 Eastern Bundaberg	The providing of the land shown on Map 3.7, known as Gympie Estates off Telegraph Road, in the Residential A precinct is in direct conflict with the proposed State Controlled Road bypass.	Remove this land from the Residential A precinct and return to the Non Urban precinct, in accordance with the advertised version of the scheme.	State interest	Land was shown as future urban in transitional planning scheme. Future state controlled bypass has no planned construction date and may never proceed as proposed. Council wishes this land in the Residential A precinct. Council has invested several million dollars in providing infrastructure to the eastern section of the City to enable residential expansion. Council requires a return on its investment and this land is required for residential expansion.	



Strategic and Executive Services Division

Government

Department of **Emergency Services**

16 September 2003

South East Queensland Planning Division Department of Local Government and Planning PO Box 31 **BRISBANE ALBERT STREET QLD 4002**

Dear

State Interest review of the Bundaberg IPA Scheme

I refer to your advice of 28 August 2003 seeking this Agency's comments on whether the Bundaberg City Plan appropriately reflects State Planning Policy 1/03: Mitigating the Adverse Impacts of Flood, Bushfire and Landslide (SPP 1/03).

As you are aware the Department of Emergency Services (DES) is responsible for the implementation of SPP 1/03, which took effect on 1 September 2003. The Departments previous comments on the draft Bundaberg City Plan on 13 November 2002 outlined how SPP 1/03 can be appropriately reflected. Flood is the only natural hazard needed to be addressed, and to reflect these specific requirements of SPP 1/03, Council was asked to:

- 1. Demonstrate that the proposed Defined Flood Event (DFE) of 1 in 50 year ARI for the Burnett River is appropriate to the circumstances of the locality;
- 2. Amend the Flood Management Code (Part 4.3.8) to incorporate the performance criteria set out in SPP 1/03; and
- 3. Amend the Community Activity Code (Part 4.2.7) to ensure that community infrastructure, for example, emergency services and shelters, hospitals can function effectively during and immediately after SPP1/03's recommended flood event.

Strategic Management and Policy Unit

Emergency Services Complex Cnr Kedron Park Road & Park Road Kedron Qld 4031

GPO Box 1425 Brisbane Queensland 4001 Australia

Telephone +61 7 3247 8787 Facsimile +61 7 3247 8798 Website www.emergency.qld.gov.au

ABN 11 577 654 890

The Department has reviewed the final draft of the Bundaberg City Plan, and has identified that SPP 1/03 has not been appropriately reflected. Identified below are specific issues that still need to be addressed by Council.

1. Development of an adequate Natural Hazard Management Area (NHMA) for flood

Bundaberg City Council has had direct correspondence with this Department to determine the appropriateness of their flood immunity level for the Burnett River. Currently, Council has been asked to provide additional information on the methodology used to prove that a lesser DFE is appropriate.

To ensure that SPP 1/03 applies for development assessment purposes, the *Flood Management Overlay* – Map 3.11 must meet the criteria for a NHMA for flood. This can be achieved by:

- identifying the flood level or levels of the DFE, as was indicated as Australian Height Datum levels on Map FM1 in the draft Bundaberg City Plan. This will ensure Council can pinpoint an appropriate freeboard height above the DFE, for, e.g. residential developments; and
- providing the DES with the additional information that is required to identify, through consultation with the Department of Natural Resources and Mines, if the current Burnett River flood level is appropriate.

2. Amendments to flood measures

Bundaberg City Council has not fully reflected the Specific Outcomes of Appendix 5A of the SPP 1/03 Guideline. The following points identify specific areas that must be reflected in the City Plan. It also identifies the relevant Specific Outcome (SO) and Solution in Appendix 5A.

- (a) Ensure the safety of people in non-residential developments (SO 1 Solution 1.4).
- A7.1 and A8.1 in Part 4.3.8 does not meet the appropriate solutions of 1.4. To meet the Specific Outcome, Council should include one of the solutions outlined in Solution 1.4.
- (b) Ensure essential services infrastructure maintains its function during a DFE (SO 5 Solution 5.1 and 5.2).
- A2.3 in Part 4.3.12 has identified that on-site effluent will be above the Q100 flood level. This meets the requirements of SPP 1/03, however other essential services infrastructure (described in the Scheme as 'Utilities'), for example, on-site electricity, gas, water supply and telecommunications should also be addressed in the City/Plan.

3. Amendments to community infrastructure measures for flood

Bundaberg City Council has not reflected Specific Outcome 1 of Appendix 9 of the SPP 1/03 Guideline. Council should amend Part 4.2.7 or 4.3.8 to address that wherever practicable, community infrastructure listed in SPP 1/03 meets Specific Outcome 1.

4. Flood terminology

To ensure a consistent and unambiguous approach to flood mitigation, Council is encouraged to change their current presentation of flood levels as an 'Average Recurrence Interval', e.g. 1 in 100 or 1 in 50, to an 'Annual Exceedance Probability', e.g. 1% or 2%.

As was stated in the previous comments to the Bundaberg City Council, it is not expected that they fully reflect the requirements of SPP 1/03, given the timing of SPP 1/03 and the advanced preparation of the Bundaberg City Plan. However, Council is encouraged to make the adjustments to Map 3.11 and appropriate justifications for the lesser DFE, prior to adoption of the City Plan. It is the Department's understanding that this would not be too onerous on Bundaberg City Council, and will ensure that once the Bundaberg City Plan is effective, SPP 1/03 will apply.

Until the Bundaberg City Council makes the appropriate amendments, the Bundaberg City Plan has not appropriately reflected SPP 1/03. However, it is understood that the City Plan does not conflict with any requirements of SPP 1/03. Therefore, if an appropriate NHMA (flood) is included into the City Plan, the Scheme will be able to run in parallel with SPP 1/03 for development assessment purposes, until the City Plan can be amended to fully reflect SPP 1/03.

If you should have any queries regarding the implementation of SPP 1/03 please contact

Thank you for the opportunity to be involved in the development of the Bundaberg IPA Scheme.

A/Diréctor

Mire sinceraly

Strategic Management and Policy Unit



Taringa-St Lucia Draft Renewal Strategy

Informal State interest comments - due 6 June 2011

*Sustainable Planning Act 2009 (SPA)

State interest as defined by SPA means-

(a) an interest that the Minister considers affects an economic or environmental interest of the State or a part of the State, including sustainable development; or Example of an interest the Minister might consider for paragraph

(a)—a tourism development involving broad economic benefits for the State or a part of the State

(b) an interest that the Minister considers affects the interest of ensuring there is an efficient, effective and accountable planning and development assessment system.

State planning instruments (SPI) are also a State interest under SPA. SPIs include:

- State planning regulatory provision (SPRP)
- a designated region's regional plan
- State planning policy (SPP)



Part A - State interests

No.	Reference (Section/page number)	Comment	Suggested outcome	DLGP Categorisation/Comment	Local Government comment
Conta	rtment: Community act Name: act Number: I: LandUsePlanning				
	3.1 Land use and activity	Key strategies of the land use and activity strategy include facilitating a moderate level of change in appropriate residential areas including "rezoning pockets of "relatively flood-free land".			
	3.1.1 Flooding considerations	This section describes the broader initiatives currently underway across the state and temporary standards in place in Brisbane as a result of the January 2011 floods. A paragraph to explain how these events and standards is reflected in the Renewal Plan would be beneficial.	This section could be strengthened to clearly separate the two distinct issues: 1. what the renewal strategy proposes for achieving flood immunity of new development within the flood-prone precincts, and 2. ensuring that development does not create additional flood hazard for adjacent		

			properties.		
	Overall	There is no mention of	Given that much of this land		
		habitable floor levels and	flooded during the January	l	
		other design			
	•	requirements aimed at	clear on the mitigation that will		
}		improving flood resilience	protect people and property in		
		that will be required for	the mixed use developments		
		redevelopment to higher	proposed along the river.		
		density along the river in	-		
		the Guyatt Park Precinct.	It is noted that Council has		
			articulated a requirement for		
			above-ground car parking in		
			flood-prone areas.		
			Appendix 5A Specific Outcome		
			5 in SPP 1/03 Guideline		
}			requires that essential services		
			infrastructure (e.g. on-site		
			electricity, gas water supply,		
			sewerage and		
			telecommunications) maintain		
			its function during a defined		
			flood event		
j	Overali	DCS understands the	*Brisbane Council City Plan is	and the second s	
			reminded that SPP 1/03	ande Di	
		would be called up for:			
			assessment tool for planning	# - [
			schemes that are not compliant	\	
			with SPP 1/03, as is the case	<u>. </u>	
		subject to flooding during	i willi Gity Pian 2000.		
		These Codes include the			
		Subdivision Code			
		Stormwater Management	K		
		Code and the Waterway			
	· · · · · · · · · · · · · · · · · · ·	TOUGH AND THE CONTRACT	The set of the second of the s	(35)22 2	<u> </u>

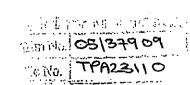
Code.		

Part B - Advice

Part B outlines other advice including best practice and editorial matters that should be incorporated or considered by the Local Government.

No.	Reference (Section/page number)	Comment	Suggested outcome	DLGP Categorisation/Comment	Local Government comment
Conta	tment: Community of Name: lot Number: LandUsePlanning				
3.4	Connectivity and Transport	For future reference regional offices of Queensland Fire and Rescue Service, Queensland Ambulance Service and Emergency Management Queensland should be consulted (through Council's existing emergency service liaisons) during detailed design and construction phases of major development within the Renewal Precincts regarding the following issues: Permeability including traffic calming impacts; Site access and	Effective emergency services operational response is maintained.		

egress; Road dimensions; Construction staging; Road closures and traffic hazards; Storage and location of hazardous goods on-site; and Other concerns as identified. Regional Contacts for EMQ, QFRS, and QAS are attached.		
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RAPSON Lyndy

From: Sent:

Subject:

To:

Dear State agency contacts

The Brisbane City Council has forwarded the proposed Mid 2004 Amendment Package for reconsideration of State Council has forwarded the proposed Mid 2004 Amendment But and Council has forwarded the proposed amendment Package for your perusal and comment. Attachment But provides a summary of the proposed amendments included in Attachments C to H.

A Whole of Government first State interest review was coordinated in June/July 2004. Council subsequently prepared a 'modified version' of the Amendment Package to address concerns raised by State agencies and publicly notified the amendments from 11 February to 29 March 2005. Council received 2 submissions.

In order for the team to coordinate a response back to Council, we would appreciate your comments on the proposed amendments by COB Thursday 23 June 2005. If the Department has not received a response from your agency by COB 23 June 2005 it will be assumed your agency has no issues. Your assistance in the review of the draft local plan is appreciated. If you require further information please do not he sitate to contact me.

Regards

Planner - Central Southern Team

South East Queensland -Wide Bay Burnett Planning Division

Planning Services

partment of Local Government, Planning, Sport and Recreation

ivial to

Telephone:















Mid 2004 Att B summary.doc

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tachment C (Legislatachment D (buildinachment E (Bowen lachment F (New Faachment G (Newsteachment H (EC - sn

From:

Sent:

Monday, 16 August 2004 11:50 AM

To: Cc: 'Malcoim Lehmhase' Sinclair Meredith

Subject:

RE: MID 2004 Brisbane City Plan Amendments



DES commment and Council respo...

Good morning

Thank you for providing comment with regard to the proposed Mid 2004 Amendment package first State Interest review. Your comments were duly forwarded to Council. Please find attached a response from Council stating there is no objection to deleting the reference to SPP 1/03 as proposed in Attachment C, amendment C6. To enable me to progress this proposed amendment package could you please advise at your earliest convenience if your agency has further comment.

Régards

----Oridinal Message----

From:

Sent: Monday, 26 July 2004 6:15 PM

To:

Subject: MID 2004 Brisbane City Plan Amendments

(4)



I refer to your request of 22 June 2004 seeking confirmation that the draft Mid 2004 amendments to the Brisbane City Plan 2000 (City Plan) reflect the Department of Emergency Services's interests and the requirements of State Planning Policy 1/03" Mitigating the Adverse Impacts of Flood, bushfire and Landslide.

It is noted that Council proposes to amend the core matters of the Scheme to indicate that the Scheme reflects SPP 1/03(s.4.3) as outlined in Attachment C).

Whilst it is acknowledged that City Plan includes some codes which aim to ensure that development is compatible with the nature of the natural hazard, the dearth of published information on hazard consistent with the methodology adopted in the Australian and New Zealand Standard for Risk Management (AS/NZS4360) and natural hazard mapping precludes agreement to the position that SPP 1/03 is reflected in the Scheme.

Please do not hesitate to contact me to discuss these matter further.

Regards

A/Senior Policy and Research Officer Disaster Mitigation Unit

Phone: Fax:

Email:

Counter Disaster and Rescue Services

Department of Emergency Services

GPO Box 1425

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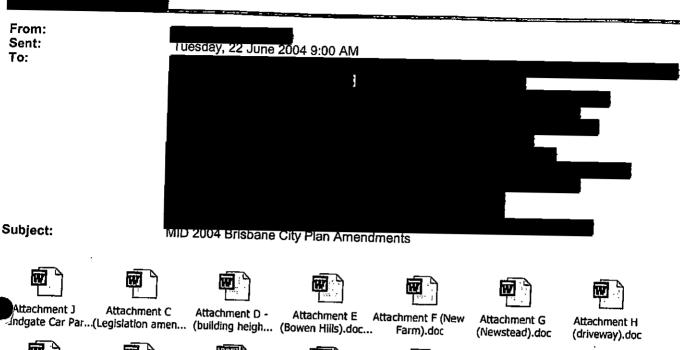
Mid 2004 Amendment Package to Brisbane City Plan

Fist State Interest Review

Department of Emergency Services comment and Council Response

STECC ANGOLGY Department	Sign On Attachment	Sets Asarcy broken / Comment	Sinie Arginis Luggraddu Soliddion/ Luggraddu Sonidd	enekogango Zaogucesi	Canci Comman:
of Emergency Services	Amendment number C6	It is noted that Council proposes to amend the core matters of the Scheme to indicate that the Scheme reflects SPP 1/03(s.4.3 as cutlined in Attachment C). Whilst it is acknowledged that City Plan includes some codes which aim to ensure that development is compatible with the nature of the natural hazard, the dearth of published information on hazard consistent with the methodology adopted in the Australian and New Zealand Standard for Risk Management(AS/NZS4360)and natural hazard mapping precludes agreement to the position that SPP 1/03 is reflected in the Scheme.	Delete reference to State Planning Policy 1/03- Mitigating the Adverse Impacts of Flood, Bushfire and Landslide in proposed amendment number C6	State interest	Council has no object to deleting the reference to State Planning Policy 1/03 in proposed amendment C6.





Attachment I (EC).doc

Att B summary.doc newstead teneriffe waterfront_...

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new farm teneriffe



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Dear State Agency Contacts,

On 17 June 2004, Brisbane City Council (Council) submitted the Mid 2004 amendments to the Brisbane City Plan 2000 (City Plan) to the Minister for Local Government and Planning for consideration of State interests and approval to publicly notify in accordance with section 11 of Schedule 1 of the IPA. Your agency is now formally requested to review the proposed amendments to the City Plan to assist the Minister to determine if the amendments adversely affects State interests.

ase find attached a copy of the proposed amendments, comprising Attachments B, C, E, F, G, H, I, J and 6 associated maps. Your agency's formal comments on the proposed amendment are requested in writing (preferably via email) to Ms by 20 July 2004. If no response has been received by

If you have concerns or questions regarding the proposed amendments please contact me

Yours sincerely

Planner - Central-Southern Team South East Queensland - Wide Bay Burnett Planning Division Department of Local Government and Planning

Phone-<u>Fax-</u> (E mail-



GUIDE TO USING THE IDAS DEVELOPMENT APPLICATION FORMS

Guide 6

Referral coordination

Referral coordination was deleted from the IPA from 31 March 2007. Referral coordination only applies to applications made up until 30 March 2007.

Referral coordination, as a process for the coordination of information requests by the chief executive of the Department of Local Government, Planning, Sport and Recreation, no longer applies to development applications made after 31 March 2007. Instead, applicants are responsible for the referral of applications to any applicable referral agencies, and responding to any information requests made by the referral agencies or the assessment manager.

Impact assessable applications that previously were required to undergo referral coordination, are still required under the IPA to be publicly notified for 30 business days, instead of a 15 business day notification period. A 30 day public notification period applies if any of the following apply to the application [IPA s6.7.1A]-

- 1, there are 3 or more concurrence agencies;
- 2. all or part of the development-
 - · is assessable under a planning scheme; and
 - · is prescribed under a regulation;
- 3. all or part of the development is the subject of an application for a preliminary approval mentioned in section 3.1.6 of the IPA

The Integrated Planning Regulation 1998, schedules 7 and 8 outline the developments or areas prescribed under a regulation, where a 30 business day notification period is required for development that is subject to impact assessment and is assessable under a planning scheme.

The following information about the Referral Coordination process only applies to development applications made prior to 31 March 2007.

What is referral coordination?

Referral coordination is a process where the chief executive of the Queensland Department of Local Government, Planning, Sport and Recreation makes a State coordinated information request for a development application.

This coordinated information request replaces the need for individual requests from the assessment manager and any IDAS referral agency.

The chief executive decides whether to issue an information request and if so, the content of the request after consulting with the assessment manager and each

IDAS referral agency for the application. Advice may also be sought from third parties to assist with the preparation of the information request.

Referral coordination applies to applications following code or impact assessment processes and those for preliminary approval or a development permit.

If triggered, referral coordination occurs after an application has been lodged with the assessment manager and all referrals have been made to relevant IDAS referral agencies.

When is referral coordination triggered?

There are three (3) ways in which referral coordination may be triggered for your application if -

- 1. it involves three (3) or more concurrence agencies;
- 2. it involves development for a prescribed purpose or in a prescribed area; or
- is for a preliminary approval pursuant to section 3.1.6 of the IPA.

Three (3) of more concurrence agencies

Regardless of the aspects of development applied for, referral coordination must be undertaken if three (3) or more concurrence agencies are triggered for the application (rather than the proposal as a whole).

When determining if an application triggers referral coordination in this instance it is important to distinguish between three (3) or more concurrence agencies and three (3) or more referral triggers. For example, an application involving a non-devolved environmentally relevant activity (ERA) and contaminated land matters involves 2 referral triggers but not 2 referral agencies. This is because the Environmental Protection Agency (EPA) had jurisdiction for both non-devolved ERAs and contaminated land matters. So, while the application involves two (2) referral triggers, this situation only equates to one (1) referral agency.

If the ERA was a devolved activity making the local government the administering authority for its assessment and the local government is also the assessment manager for the application, the local government is not considered to also be a concurrence agency with respect to the ERA for the purpose of determining the number of concurrence agency for referral coordination.



Prescribed purposes and areas

A development application may involve a purpose prescribed in schedule 7 of the Integrated Planning Regulation 1998 (IP Regulation) or an area prescribed in schedule 8 of the IP Regulation. In these instances, referral coordination applies regardless of whether or not the local government has an IPA scheme or a transitional planning scheme.

Schedule 7 triggers (Prescribed Purposes)

Schedule 7 of the IP Regulation prescribes that an application will trigger referral coordination if the application involves a material change of use for any of the following *purposes* -

- aerodrome that is (or proposed to be) used by commercial operators not normally living at the premises;
- large outdoor sport and recreation facility
 including, for example, a golf course, major sporting
 venue or racing circuit, but not including a golf
 course of 30ha or less or a golf driving range;
- 3. tourist resort -
 - (a) with accommodation for more than 1000 people, including staff; or
 - (b) on an offshore island;
- 4. a body of water, including for example, an artificial lake, that has, or would have after the change of use, a total surface area of more than 5000m².

Schedule 8 triggers (Prescribed Areas)

Schedule 8 of the IP Regulation prescribes that an application will trigger referral coordination if the application involves a material change of use (other than for a dwelling house, outbuilding or farm building) assessable against a planning scheme, or reconfiguration a lot, if the premises -

- are wholly or partly below a floodline adopted by the local government if the application involves filling an area greater than 5000m² below the floodline;
- shares a common boundary with a protected area or registered place under the Queensland Heritage Act 1992;
- contains or shares a common boundary with or is within 100 metres of the boundary of:
 - an area that is critical habitat, a protected area, subject to a conservation agreement or an area of major interest under the Nature Conservation Act 1992;
 - (ii) the wet tropics area under the Wet Tropics
 World Heritage Protection and Management
 Act 1993; or
 - (iii) a fish habitat under the Fisheries Act 1994 if the proposed development:
 - (A) has impact on riparian vegetation; or
 - (B) results in alteration of natural flow patterns;
 - (C) requires the construction of a levee;
 - (D) does not contain stormwater management;

- (E) allows contaminated runoff;
- (F) requires drainage of fish habitat;
- (iv) an area listed as a wetland of international importance under the Ramsar Convention as defined under the Environment Protection and Biodiversity Conservation Act 1999 (Cwlth);
- (v) an area listed as a wetland of importance within the Queensland chapter of A Directory of Important Wetlands in Australia as published by the Australian Nature Conservation Agency, 2001, Canberra
- (vi) an area of permanent, periodic or intermittent inundation, whether natural or artificial (other than an area for liquid waste disposal), with water that is static or flowing, fresh, brackish or salt (including areas of marine water the depth of which is not more than 6m at low tide) that -
 - (A) under the document called the State of the Environment Report 1999, is a good example of a wetland type occurring within a bioregion under the report;
 - (B) plays an important ecological or hydrological role in the natural functioning of a major wetland system or complex;
 - (C) is important as the habitat for terrestrial and aquatic animal taxa at a vulnerable stage in their life cycles, or provides a refuge when adverse conditions, such as drought, prevail;
 - (D) supports a significant number of the bioregional populations of any native terrestrial and aquatic animal or plant taxa;
 - (E) supports native terrestrial and aquatic animal or plant taxa, or communities that are endangered or vulnerable at the bioregional level.

However, the referral coordination arrangements for prescribed purposes and areas do not apply to an application if the assessment manager is of the opinion that the proposal would be <u>unlikely</u> to have a significant effect on the environment. In this instance the standard IDAS process and timeframes apply (including the standard notification period of 15 business days if applicable).

(Note: Reference to the term 'minor' was removed through the IPOLAA 2003. This term caused confusion and its removal acts to confirm that it is the environmental effects of the proposal, rather than simply its scale, which are the key factors in determining whether referral coordination is appropriate)

Examples - Here are some examples of development that could reasonably be considered to be unlikely to have a significant effect on the environment and therefore not trigger transitional referral coordination -

- the erection of a golf buggy storage shed at a golf course adjoining prescribed land; and
- alterations to a sugar mill to include a staff cafeteria.

Section 3.1.6 trigger



If an application seeks (either in whole or in part) preliminary approval to override a local planning instrument, the application will trigger referral coordination.

What to do if referral coordination is triggered

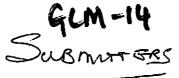
If an application triggers referral coordination the application will need to -

- 1. refer the application to all IDAS referral agencies (if there are any);
- 2. send the following items to the chief executive of the Department of Local Government and Planning -
 - a complete copy of the application that was sent to the assessment manager;
 - (ii) a copy of the acknowledgement notice you received from the assessment manager;
 - (iii) pay the fee (there is currently no charge); and
 - (iv) provide a notice stating the day all referrals were completed to each referral agency (if any).

The chief executive has <u>20 business days</u> to conduct referral coordination for an application. This period starts automatically the day after the items detailed above are received.

Does anything else in IDAS change?

For applications requiring impact assessment i.e. where the notification stage of IDAS applies, the notification period must be a minimum of 15 business days. If referral coordination is triggered and the application requires notification, the notification period is a minimum of 30 business days.







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MIN 47860.03 (TPA 21815)

FILE COPY

Minister for Local Government and Planning

Minister for Emergency Services and Minister Assisting the Premier in North Queensland

«delTitle» «delFirstName» «delLastName» «delPosition» «OrgName» «OrgPostAddress» «OrgPostAddress» «OrgPCode»

Dear «delTitle» «delLastName»,

In October 2002, we published a draft State Planning Policy: Natural Disaster Mitigation (draft SPP) and Guideline for public consultation, and invited submissions. You made a submission and we are now writing to inform you of the outcome of our deliberations on those submissions.

Almost all the 68 submissions received following the public consultation expressed support in principle for the draft SPP, and most submissions also made suggestions about the technical content. All the submissions were carefully considered, and further technical work was done to address the issues raised.

As a result, the title and detailed content of the draft SPP and its supporting Guideline have been significantly amended (see attachment 1), although the basic intent and policy approach remain the same. However, some submissions raised matters that are beyond the scope of the SPP and/or the *Integrated Planning Act 1997*.

State Planning Policy 1/03: Mitigating the Adverse Impacts of Flood, Bushfire and Landslide (SPP 1/03) has now been adopted with effect from 1 September 2003. In the meantime, local governments and other interested parties have the opportunity to become familiar with the documents prior to the new SPP taking effect.

SPP 1/03 is supported by the State Planning Policy 1/03 Guideline: Mitigating the Adverse Impacts of Flood, Bushfire and Landslide. Copies of both documents are enclosed for your information, together with a leaflet setting out the details of the information workshop program on the SPP and Guideline.

Level 18 Mineral House
41 George Street Brisbane QLD 4000
PO Box 31 Brisbane Albert Street
Queensland 4002 Australia
Telephone +61 7 3227 8819
Facsimile +61 7 3221 9964
Email localgovernment&planning@ministerial.qld.gov.au
Website www.dlgp.qld.gov.au

Level 3 Emergency Services Complex
Cnr Kedron Park Road and Park Road QLD 4031
PO Box 1377 Brisbane Albert Street
Queensland 4001 Australia
Telephone +61 7 3247 8190
Facsimile +61 7 3247 8195
Email emergency@ministerial.qld.gov.au.......
Website www.emergency.qld.gov.au

Finally, thank you for your interest in the SPP and for making a submission. The comments received were invaluable in shaping the final documents. If you have any questions about the SPP, the Disaster Mitigation Unit of the Department of Emergency Services can be contacted on 3109 5076.

Yours sincerely

Hon Nita Cunningham MP Minister for Local Government and Planning Hon Mike Reynolds AM MP Minister for Emergency Services and Minister Assisting the Premier in North Queensland

Main issues raised in submissions and key amendments:

The main issue raised in submissions was the lack of a 'default' mechanism for flood. This would enable the SPP to be considered in assessments of development applications for areas prone to serious floods until the local government's planning scheme identifies a natural hazard management area (flood). Unlike the situation for bushfire and landslide, it has not been possible to identify a workable default natural hazard management area for flood because there is a lack of reliable State-wide data on flooding. Also the flood studies that are required to generate reliable flood data can be resource intensive for local governments. In the absence of reliable flood data, it is not feasible to mandate a specific level of flood immunity that would be equally applicable to all parts of the State.

For these reasons, the approach adopted in the consultation draft has been retained. The SPP states that: "... the appropriate flood event for determining a natural hazard management area (flood) is the 1% annual exceedance probability (AEP) flood" (formerly expressed as 1:100 annual recurrence interval). However, the SPP retains the flexibility for local governments to adopt a different Defined Flood Event (DFE) depending on the circumstances of individual localities. Local governments proposing to adopt a lower DFE than 1% AEP will be required to demonstrate to the satisfaction of the Departments of Emergency Services and Natural Resources & Mines that the proposed DFE is appropriate to the circumstances of the locality.

As noted above the detailed contents of the SPP and Guideline have been amended to address issues raised during the consultation process, and to provide additional advice to assist local governments, development proponents and State agencies implementing the SPP. These amendments include:

- Amending the title to reflect more clearly the scope of the SPP;
- Amending the definition of "flood" to clarify that the SPP is not concerned with local drainage problem areas or flooding associated with dam break;
- Including explanatory information to make it clear that the requirements of the SPP must be considered in balance with other policy considerations such as conservation and amenity values;
- Including a definition of vegetation clearing that is compatible with the provisions of the Vegetation Management Act 1999 and the IPA;
- Providing further guidance on determining an "unacceptable level of risk";
- Amending the flood evacuation requirements to improve their operation throughout Queensland;
- A refined and clearer definition of "development commitment";
- Improving the operation of Outcome 1 by removing the requirement that development proposals have a "lower level of risk" than other development in the vicinity; and
- Including precise thresholds to more clearly identify the types of development to which the SPP applies.



State Planning Policy 1/03

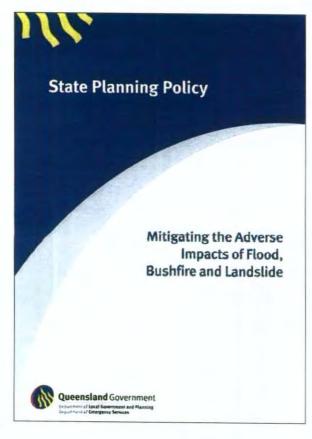
Mitigating the Adverse Impacts of Flood, Bushfire and Landslide

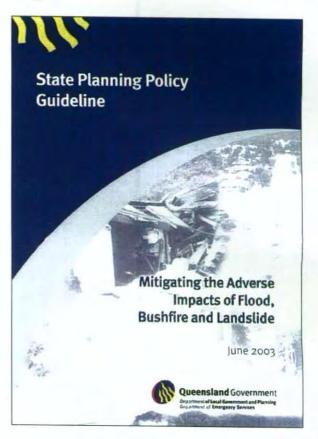




SPP 1/03 Adopted **19 May 2003**

Came into effect 1 September 2003







Problem



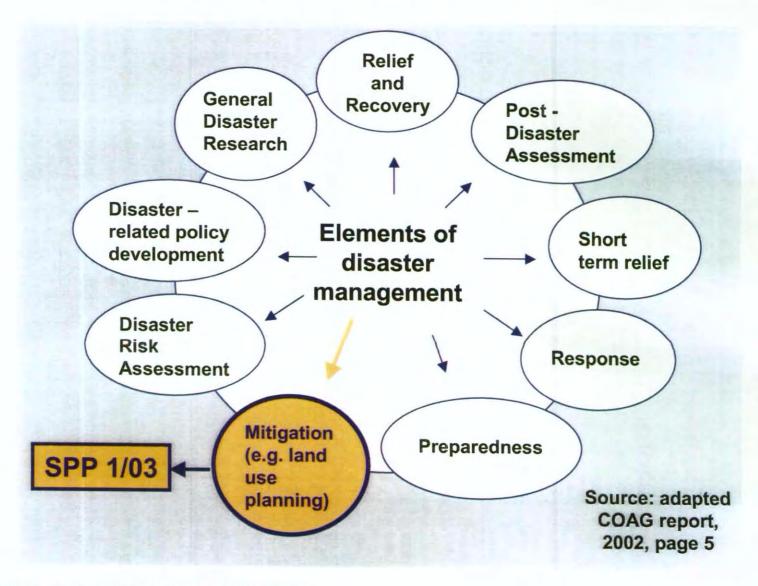


- Natural Disasters rising cost to the community (average \$239M per year)
- Development Pressures

 (e.g. coast, waterways,
 bushland, views)



COAG Framework





Disaster Mitigation Australia Package

To help reduce natural disaster threats:

- Natural Diaster Risk Management Studies Program
- Regional Flood Mitigation Program
- Natural Disaster Relief Arrangements

Federal government "funding is conditional on…the implementation by the State, territory and local governments of more effective land use controls", Wilson Tuckey.



Natural Disaster Risk Management Study Program

- Can provide funding assistance for natural hazard assessment studies.
- Funding assistance is on a 1:1:1
 Commonwealth, State and applicant (usually a local government).
- Further information contact
 Anne Brierley on 3109 5099.



State Government Initiatives

- Beattie Government priority:
 'safer and more supportive communities'
- State Flood Risk Management Policy
- Local Governing Bodies Capital Works Subsidy Scheme
- Local Government Finance Standard 1994



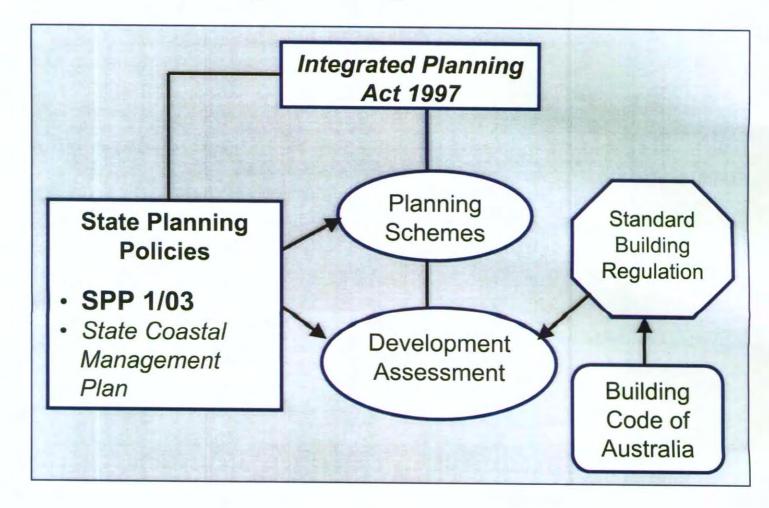
How SPP 1/03 Developed

- Two Staged Public Consultation:
 - 2001 and 2002
- SPP developed in consultation with:
 - GAC (10 State agencies), LGAQ, PIA, UDIA and QFRS
- Strong support from key stakeholders (including EMA)

Many suggested improvements have been incorporated in SPP 1/03 and Guideline.



Integrating SPP 1/03





Role of SPP 1/03

- Make clear State's interest in land use planning as it relates to natural hazards.
- Guide planning schemes and development decisions to reduce community vulnerability and the financial impacts of natural hazards.
- Provide a State policy context and increased support for Local and State Government in dealing with natural hazards.
- Encourage consistency of approach throughout Queensland



SPP 1/03 cannot

- Consider issues other than land use planning and development assessment.
- Affect past land use decisions, such as development approvals.
- Replace other mitigation strategies

 (e.g. education strategies, early warning systems and construction of infrastructure such as levees).
- Eliminate all risks to communities.



Overall Policy Objective of SPP 1/03

Position Statement:

The Queensland Government considers that development should minimise the potential adverse impacts of flood, bushfire and landslide on people, property, economic activity and the environment.



SPP 1/03 Guideline

- Provides advice and information on interpreting and implementing SPP 1/03.
- Has some legal status as 'extrinsic material'.
- Is not intended as a complete technical guide.



What hazards are addressed?

- Flood
- ✓ Bushfire
- ✓ Landslide
- X Earthquakes and strong winds addressed through the SBR.
- Storm tide inundation is addressed through the SCMP EPA is preparing a Guideline consistent with SPP 1/03.



When does SPP 1/03 apply?

- Assessing development applications (but not those only assessable against SBR).
- Making or amending planning schemes.
- Designating land for community infrastructure.



From 1 September 2003

SPP 1/03 must be considered when assessing development applications as follows:

- Transitional planning schemes
 - all DA
- IPA Schemes
 - Now, impact assessable DA
 - When IPOLA 2003 commences, both code and impact assessable DA



What does SPP 1/03 apply to?

- Actions or activities in natural hazard management areas – SPP 1/03 Annex 1, A1.1 (p 13)
- Certain community infrastructure anywhere in Queensland – SPP 1/03 Annex 1, A1.2 (p 13)



Where does SPP 1/03 apply?

- Flooding throughout Queensland
- Bushfire
 Annex 2 of SPP 1/03 and Map 1 in SPP 1/03 Guideline
- Landslide
 Annex 2 of SPP 1/03 and Map 2 in SPP 1/03 Guideline



Key Concepts in SPP 1/03

- 1. Identification of Natural Hazard Management Areas (NHMA) (other names acceptable).
- Development proposals in NHMAs should be compatible with the nature of the natural hazard (Annex 3 of SPP 1/03).



Key Concepts in SPP 1/03

- Development should not result in unacceptable risk to people or property (Annex 5 of SPP 1/03).
- 4. Specified community infrastructure should function during and immediately after hazard events wherever practicable.



NHMA (Flood)

- Is land inundated by a Defined Flood Event (DFE) and identified in a planning scheme?
- Appropriate DFE is 1% AEP (see Annex 3 of SPP 1/03).
- No default NHMA for flood

 SPP 1/03 does not apply until a LG has identified
 NHMA (flood) in its planning scheme.





NHMA (Bushfire and Landslide)

- 'Cascading' definitions of NHMAs (see Annex 3 of SPP 1/03).
- Where no natural hazard assessments, default NHMA allows SPP 1/03 to take effect immediately for development assessment purposes.
- Default NHMAs take effect on 1 Sept 03.



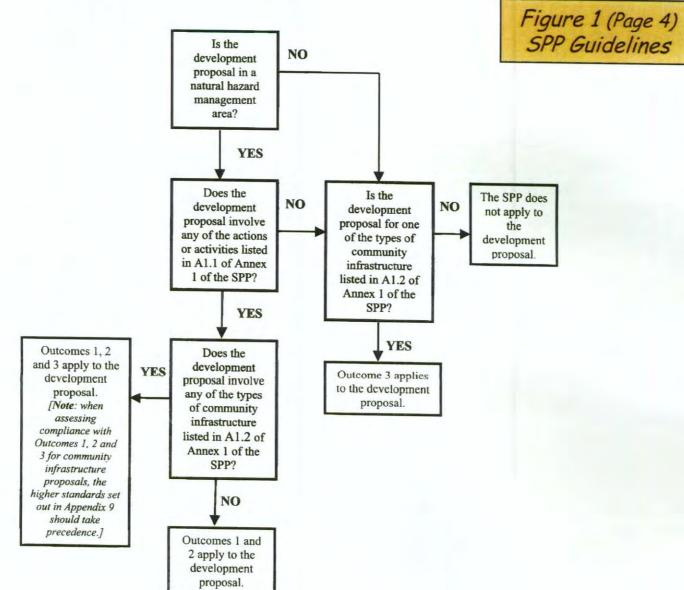


Development Assessment

- Development to which the SPP applies should be assessed against Outcome 1 and, where necessary, Outcome 2 of SPP 1/03.
- Community infrastructure to which SPP 1/03 applies should be assessed against Outcome 3.









Development Assessment

SPP, page 6

and

Outcome 1:

Guideline, Requires development to which the page 10 SPP applies to be compatible with the nature of the natural hazard, except where development proposal:

- is a development commitment; or
- Can demonstrate an overriding need.



Development Assessment

Outcome 2: applies to the two exceptions to Outcome 1 and requires such development to:

SPP, page 7 and Guideline, page 17

- minimise as far as practicable the adverse impacts from natural hazards; and
- not result in an unacceptable level of risk to people or property.

The assessment process involves 6 key steps (Figure 2).

Figure 2: Achieving Outcomes 1 and 2 of the SPP Queensland Guideline, Page 11 Government Is the proposed development in a Outcomes 1 and 2 of natural hazard management area NO the SPP do not apply (flood, bushfire, landslide)? to the development Refer to Annex 3 of the SPP. application. YES NO Does the SPP apply to the development? Refer to A1.1 of Annex 1 of the SPP. YES Can overriding need for the development in the Is the development Is the development proposal NO public interest be proposal a development 0 compatible with the nature of the demonstrated and are commitment? natural hazard? (Assess against R there no other sites the relevant Specific Outcomes suitable and reasonably and planning scheme codes). available? YES NO YES Document the facts and The development application Does the development does not achieve Outcomes 1 circumstances that support the proposal achieve Outcome 2 and 2 of the SPP and should not development application. of the SPP? YES be approved. NO Assessment manager to assess the information provided with the development application (some of the information may have been provided in response to an Information Request) and determine whether the development application achieves or can be modified to achieve Outcomes 1 and 2 of the SPP.



Guideline, Page 12, 13

 Is the proposed development in a NHMA (either in the planning scheme or default as per the SPP)?

Step 2

 Does SPP 1/03 apply to the development? (refer to SPP 1/03 Annex 1, A1.1)

If the answer to either of these questions is "No", then Outcomes 1 and 2 do not apply to the development proposal



- Is the development proposal compatible?
- Should achieve the relevant Specific Outcomes in Annex 4 of SPP 1/03.
- Appendix 5 of Guideline provides
 Solutions that help the assessment.
- If compatible then Steps 4, 5 and 6 do not apply.



- Is the proposal a development commitment?
- Refer to definition of development commitment (Guideline, p 26).
- Applicant to demonstrate through an assessment of the proposal against the planning scheme.
- Assessment Manager to confirm.



- Can overriding need be demonstrated?
- Requires an assessment of:
 - net benefits to the community (e.g. improved access, services, economic or environmental benefits); and
 - alternative sites (with lower hazard risk).
- Applicant to undertake assessment, assessment manager to confirm.



- Does the development proposal achieve Outcome 2?
- Outcome 2 applies to the two exceptions to Outcome 1 and requires such development to:
 - minimise as far as practicable the adverse impacts from natural hazards; and
 - not result in an unacceptable level of risk to people or property.



- "As far as practicable" and "unacceptable risk" were discussed earlier.
- The minimum requirements for unacceptable risk are set out in SPP Annex 5 and Guideline Table 1 (page 17).
- Assessment managers may impose more stringent requirements (see para 6.31).



Community Infrastructure

SPP, page 8

and

Outcome 3:

Wherever practicable, community infrastructure to which this SPP applies is located and designed to function effectively during and immediately after natural hazard events commensurate with a specified level of risk.

 Applies throughout Queensland, including in NHMAs for certain community infrastructure (Annex 1 of SPP 1/03, page 13).



Community Infrastructure

Outcome 3 - continued

- Applies higher standards of hazard protection.
- Specific Requirements are set out on Guideline Appendix 9.
- Incorporates the concept of "where ever practicable", discussed earlier.
- Required essential community infrastructure to have an emergency rescue area.



Planning Schemes

SPP, page 8 and Guideline, page 20 and Appendices 1 to 4.

Outcome 4:

Natural Hazard Management Areas are identified in the planning scheme.



Planning Schemes

SPP, page 9 and Guideline, page 21.

Outcome 5:

The planning scheme contains planning strategies that aim to:

- Ensure development in NHMAs is compatible with the nature of the natural hazard;
- Minimise the impacts from natural hazards on existing developed areas; and
- Prevent development from materially increasing the extent or severity of natural hazards.



Planning Schemes

Outcome 6:

The planning scheme measures:

- Include a code(s) to achieve development outcomes consistent with Section 6.
- Ensure development to which this SPP applies is assessable or self-assessable against that planning scheme code(s).
- The planning scheme, or planning scheme policy(ies), specifies information to be submitted with development applications subject to the code(s).

SPP, page 9 and Guideline, page 23 and Appendices 5 and 9.



Further Information



Go to the DES website:

www.emergency.qld.gov.au/publications/spp

for Frequently Asked Questions and Responses



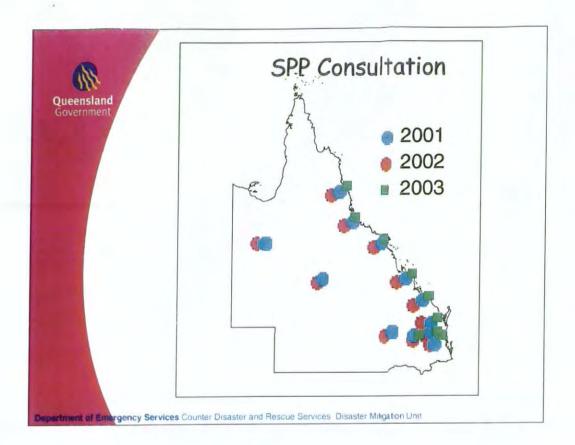
OR

Phone: (07) 3109 5076



Fax: (07) 3247 8480

Email: stateplanningpolicy@emergency.qld.gov.au



This slides illustrates the extensive community consultation programs for the SPP that have occurred throughout Queensland.

In 2001, community consultation focused on a Discussion Paper about the intent to prepare a SPP and in 2002 was about seeking stakeholder feedback on a Draft SPP and Guideline. In both consultation programs, workshops were held in 12 regional centres, talking to over 650 people.

The green squares show where training and information sessions occurred in 2003 in 10 regional centres to over 350 people.

Draft Planning Scheme / Planning Scheme Amendment/ Master Plan developed by Council Developed under the repealed Integrated Planning Act 1997 or the Sustainable Planning Act 2009 DCS provides advice on Planning First State Interest Review Scheme Coordinated by DLGP compliance with SPP 1/03 DLGP provides State Agency advice to Councils Councils consider State Agency advice and provide response back to DLGP DCS contributes to Planning Scheme DCS provides reviews but does Second State Interest Review advice on Planning not review Coordinated by DLGP Scheme Development compliance with Assessments* SPP 1/03 DLGP has final sign off on Planning Scheme/Planning Scheme Amendment/Master Plan **Councils assess Development Applications** (DA) against Local Planning Scheme developed under the repealed Integrated Planning Act 1997 or the Sustainable Planning Act 2009

Referral Agencies

Advice Agency – the State Agency provides non-binding advice to Council on the DA Concurrence Agency – the State Agency has a role in approval of the DA With respect to SPP 1/03, DCS is neither a Concurrence nor Advice agency

^{*}Prior to 31 March 2007 DCS provided advice on development applications triggered under a referral coordination process coordinated by the former DLGPSR. An average of 23 referrals were received annually by DCS in the period 2002 to 2006. This referral process ceased in 2007 and subsequently DCS has not been involved in providing advice on development assessments.

New State Planning Policy

Integrated Planning Act 1997 Adoption of State Planning Policy 1/03 Mitigating the Adverse Impacts of Flood, Bushfire and Landslide

The Honourable Mike Reynolds, AM MP, Minister for Emergency Services and Minister Assisting the Premier in North Queensland and the Honourable Nita Cunningham MP, Minister for Local Government and Planning have made State Planning Policy 1/03: Mitigating the Adverse Impacts of Flood, Bushfire and Landslide ("SPP1/03").

The Honourable Nita Cunningham MP, Minister for Local Government and Planning adopted SPP1/03 on 19 May 2003.

SPP 1/03 takes effect from Monday 1 September 2003

Areas of Queensland to which SPP 1/03 applies:

The whole of Queensland, in relation to flood hazard, and to the local governments listed in Annex 2 of the SPP for bushfire and landslide hazard.

Purpose and general effect of SPP 1/03:

Development should minimise the potential adverse impacts of flood, bushfire and landslide on people, property, economic activity and the environment by:

- being compatible with the nature of the natural hazard except in certain specified circumstances;
- avoiding unacceptable levels of risk to people or property; and
- locating and designing certain types of community infrastructure so they are able to function effectively during and immediately after natural hazard events wherever practicable.

Inspecting or obtaining copies of SPP 1/03:

The Policy and supporting Guideline can be inspected at:

- your local government office;
- Queensland Department of Local Government and Planning; and
- Queensland Department of Emergency Services.

An information program will be conducted in key centres during July and August. See the websites below for further information.

To obtain a free copy of the Policy contact:

The SPP Officer
Disaster Mitigation Unit
Department of Emergency Services
GPO Box 1425 Brisbane QLD 4001

Phone: (07) 3109 5076 Fax: (07) 3109 5060

Or visit: www.emergency.qld.gov.au or www.ipa.qld.gov.au

NOTICE

Premier's Office Brisbane, 20 June 2003

His Excellency the Governor directs it to be notified that, acting under the provisions of the Constitution of Queensland 2001, he has appointed the Honourable Rodney Welford MP, Attorney-General and Minister for Justice to act as, and to perform all of the functions and exercise all of the powers of, Minister for Natural Resources and Minister for Mines from 21 June 2003 until the Honourable Stephen Robertson MP returns to duty.

TERRY MACKENROTH MP ACTING PREMIER AND MINISTER FOR TRADE

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- E-mail—gazette@goprint.qld.gov.au
- -Posting to Locked Bag 500, Coorparoo DC, Qld, 4151; or
- —Facsimile transmission directed to (07) 3246 3384.
 A covering letter must be supplied with all facsimile copy.
- -Phone 3246 3350.

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Departmental Notices: 3.00 p.m. on the preceding Wednesday.

Final Corrected Proofs: 3.00 p.m. on the preceding Thursday.

Private Notices and Advertisements: 9.00 a.m. on the preceding Thursday.

Vacancies and Appointments: 12 noon on the preceding Tuesday.

WHEN A PUBLIC HOLIDAY OCCURS "CLOSING TIMES" WILL BE ONE DAY EARLIER.

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The Queensland Government Gazette is available by Mail Order Subscription or from the Bookshops at SDS EXPRESS, 41 George Street, Brisbane or GOPRINT, 371 Vulture Street, Woolloongabba each Friday after 4.00 p.m.

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1	1	severe winds and wave action at	potential conflict with the SCMP. EPA and DES decided that the SPP not address storm tide hazard, except the cumulative flood immediate.	1
1		and out City	address storm tide by the SCMP. EPA and DES decided that a	1 ' 1
- -			inundation. EDA : except the cumulative food immunity food	1 1
		Include reference 'Quantitative landslide risk assessment of Caims'. Planning Institute of Australia (PIA) is impressed it.	DES for the Currently developing Guidation thipsets of storm tide	1 1
-	Police and Sharon Boyle	Planning Institute of Australia (PIA) is impressed with commitment to consultation of SPP, and supports the range of hazards addressed and the structure of the cost impacts on local or the cost impacts or the co	approach taken by the SPP for rainfall flooding. No amendments required. Noted No.	!!
	I TOTICA NUM COLO C "		Include The SPP for rainfall flooding. No are with the	
		The cost impacts on local governments to accurately identify hazards must be addressed by the State Government as part of implementing the arrival must be Councils that are		
	(Yuversigna Reviews)	addressed by the source governments to account the same of the SPP.	Noted. No amendments required.	
	1 r U Box 272	Company use of the covernment as part of implement useros must be		Y
	BRISBANE AT DEDT OFF	any additional are cuttering well progressed in progressed		Y
	QLD 4002 (Peak Industry)	Differentian Work associated with reflecting the STM meir planning schemes and	Studies Program. No amendments required. The completion date for the Management	- 1
	(andustry)	desdine for The	The completion date for IPA planning schemes has been extended to June preparation will not be seen as the seen extended to June preparation will not be seen as the seen as	1
		deadline for IPA planning schemes should be extended. Noted specific inclusion of climate and the March 2003	2004. Nevertheless, planning schemes has been extended to June preparation will not be amended to reflect the Spp if this significant delegation.	1
	1	Noted specific inclusion of climate change, which PIA strongly support. PIA is anticipated that the outcomes the project into climate change and clemate change and clemate change.	preparation will not be amended to reflect the SPP if this will result in Noted no wave dearers adoption. No amended to in their	
		cutiently undertaking a research project into all PIA strongly support. PIA is	significant delays in the school to reflect the SPP if this will result in	
7		currently undertaking a research project into climate change, which PIA strongly support. PIA is anticipated that the outcomes of the project would be in a form suitable and it is incorporation into or at least the project would be in a form suitable.	significant delays in the schemes' adoption. No amendments required.	i
1 [anticipated that the outcomes of the project would be in a form suitable for List of community infectors. List of community infectors.	reducer reducer	i
	Opposition of Grand Services	List of community infrastructure in Annex 1, Part (b) should be expanded to include storage areas for public records under the Public Records Act 2002. The Act states that a public second sudder the Public Records Act 2002.		1
- 1		storage areas for public records under the Public Records Act 2002'. The Act states that 'a public authority is responsible of the public Records and presentations.		1
- 1		The Act states that 'a realist inder the Public Records Act 2002'	Agree CDD 4	1
]	SUNNYBANK HILLS QLD 4109 (State Government)	and present the paster authority is recognition.	Agree, SPP to be amended accordingly.	1
J	(State Government)	The Act states that 'a public authority is responsible for ensuring the safe custody and preservation of records in its possession.' Queensland Government Information Standard 40 Recordkeeping supports the Act Recordkeeping states 'miblic authority.'	• Noted	Y
	•	and the Old o	Noted, no amendments required.	Y)
		Recording states (Information Architecture Bost Description Supports the Act		- 1
		disaster remains a product and offices should design a state for	Noted, no amendments required.	i
		Official submission and recovery strategies and non-		ľ
77	Offector Civil Operations	Official submission to be sent Conneil be.		1
		matterns and resolved to generally support the gaps		1
- 10	Chief Executive Officer	Whether a verbal definition of a hazard risk management area would be sufficient to The basis of the default 15% store or the default 15% st	<u></u>	1
	O BOY 25	Trigger AL - con-	• Noted.	
JE	BEAUDESEPT OF THE	2. The bosis and or must an area be defined east it is management area would be sufficient to	Seeks advice/clarif	į
10	Local Government)	2. The basis of the default 15% slope as the default for triggering the SPP. 3. Whether a uniform average Recurrence Interval (ARI) must be chosen for the What justification, if any Council and the Council	Seeks advice/clarification only. No amendments required. Advice has been provided by letter to Beandesert Shire Council.	Y
- 1	- continuent)	Defined in average Recurrence Internal for triggering the SPP	provided by letter to Beaudesert Shing	1
	i	4. What invited Event (DFE).	Same Confect.	i
				[
4		What justification, if any, Council would need to have a DFE of ARI lower than the Confirmation that funding will be provided to		1
		Confirmation that funding will be available for Councils needing to undertake Outlined experiences of Parki		
8	ellicoe Street	Outline to define NHMAs.	1	1
RO	OCKHAMPTON QLD 4700	Outlined experiences of Rockhampton flood that occurred in 1991. Supports received that a levy bank would have prevented down in 1991.	, i	1
l (er	ommunity)	Mentioned that a levy bank would have prevented devastation and inconvenience. Supports measures that reduce adverse impacts of flood.		j
		Supports measures that reduce adverse impacts of flood.	Noted expression of	1
	C. D. C.	sports of flood.	Guideline No.	1
SE	Q Water (Wittenham	SPI Woten :-	Noted, expression of support but no specific comments on the SPP or Guideline. No amendments required.	Y
and	Q Water (Wivenhoe, Somerset North Pine Dams)	Wiveshoe and Somerator of Wiveshoe, Somerset and North Pine Dams. Brisbane City. SEQWater operate dams in accordance with a Floral Metal.	_	-
PO	Box 236	Erisbane City. SEOWater operate designation dams for Esk Shire Investment.	Noted commercial	J
	~~~ £30	Brisbane City. SEQWater operate dams in accordance with a Flood Mitigation SEQWater's interests contents.	Guideline No. of support but no specific	1:
•	•	SFOW	Noted, expression of support but no specific comments on the SPP or Guideline. No amendments required.	Y
1	R-CDRS DMINPminutes	SEQWater's interests - operation of dams and flood risk management.  Beautiful Policy\Stage 2 - Consultation\Administration\Submissions\030307 - Analysis of issues.doc	• -	<b>x</b>   ;
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Sub No.	Submitter Details	Issues	Analysis and Recommended Response	Support for SPP Yes/No/?
	ALBERT STREET BRISBANE QLD 4002 (Industry)  Chief Executive Officer Kingaroy Shire Council PO Box 336 KINGAROY QLD 4610 (Local Government)	<ul> <li>SEQ owns land surrounding these dams and works with RFS to combat bushfires. Appendix 3 — very informative.</li> <li>SPP does not impact on SEQWater responsibility.</li> <li>SEQWater undertakes and keeps up to date hydrological and flood studies related to these dams, which is available to LG and Counter Disaster Plans.</li> <li>Section 6.12 — "An existing development commitment that is not compatible with the nature of the natural hazard is consistent with Outcome 1 provided it would have a lower level of risk than generally applies in the locality". Considers this SPP position is erroneous, as it does not take into account existing use rights (preapproved developments which are not subject to new regulation) and otherwise may still result in development in hazardous areas.</li> <li>Section 6.14 — "Development achieves Outcome 2 when it is brought as near as practicable to the level required to comply with the Performance Criteria for compatibility with Outcome 1, and the development would not result in unacceptable levels of risk to people or property." Council disputes the phrase "as near as practicable to the level required" as it may still result in development subject to significant levels of risk.</li> <li>Suggested approaches to development commitments:         <ul> <li>Approved Development — SPP could only be applied to a requested change to an existing approval or a request to extend the currency period of an approval.</li> </ul> </li> </ul>	<ul> <li>Amend the definition of development commitment to clarify.</li> <li>Unacceptable level of risk should be determined by the community through a Disaster Risk Assessment to determine what level of risk the community is not going to accept. An assessment manager needs to make a judgement as to whether the proposed development will result in unacceptable risk and whether the proposed development can be modified to reduce the adverse impacts of natural hazards. If not the assessment manager can refuse the proposed development. Amend SPP to include more advice on determining unacceptable risk.</li> <li>Paragraph 6.1 of the SPP states that it applies only when development applications are assessed or when land is designated for community</li> </ul>	Support for SPP Yes/No/?
		<ul> <li>Self-Assessable Development - SPP must be incorporated into the PS codes. Development not consistent with any provisions of the code triggers code assessment and AM then assesses the merits of the particular development.</li> <li>Exempt Development - provisions of the PS cannot be applied to exempt development. "Exempt" stafus would indicate the LG considers the land use to be compatible with the nature of the hazard.</li> <li>Development clearly consistent with the intent of the zone - provisions for Self-Assessable or Exempt Development apply.</li> <li>Subdivision in accordance with the provisions of the PS - must be made assessable against the provisions of the SPP.</li> <li>Development consistent with a designation for Community Infrastructure - must be consistent with Outcome 2 of the SPP.</li> <li>Appendix 5B - Bushfire (Indicator of Compatibility, section 1) - should recognise that bushfire risk can be effectively reduced from Medium to Low via appropriate on-site management, especially of vegetation around the activity. Include a clause: "or It can be demonstrated the site can be managed to maintain bushfire risk to a LOW hazard level."</li> <li>1.22 - 20% increase in gross floor area is arbitrary - a limit to extensions to a building is not relevant to bushfire and flood risk and should not be defined. Any increase in gross floor area in a landslide hazard area should be assessed on its merits and a report prepared by a Registered Professional Engineer of Queensland if relevant.</li> </ul>	<ul> <li>infrastructure. Requests to change or extend an approval are not development applications under IPA. No amendments required.  This would be a suitable approach. More detailed guidance to be included in SPP Guideline re devising detailed planning scheme measures to clarify.  These terms form part of the definition of "Development Commitment" which is one of the two exceptions to Outcome 1. The definition of development commitment will be amended to remove reference to exempt development. No other changes are required.</li> <li>If the site is in a High or Medium Hazard area then the development is in a NHMA (bushfire) and the provisions of the SPP apply. These are intended to reduce the risk of bushfire to an acceptable level. No amendments required.</li> <li>Submission should refer to 20 m² increase in gross floor area. This provides an exemption for minor development. Other development potentially increases the risk to people/property and is required.</li> </ul>	
12	Director Facilities Development and Management	<ul> <li>Concern with Table 1 (section 6.37) and section 7.10 because of implication that all recreation and open space areas may be appropriate land uses across all levels of severity of a flood plain. May lead LGs to allocate recreation to floodable areas. Important that land used for open space and recreation uses, is use primarily for this</li> </ul>	<ul> <li>Table 1 (section 6.37) is sourced from the Flood Plain Management in Australia — Best Practice Principles and Guidelines. Table 1 is an example of how to allocate land uses appropriately in a flood plain. There would be a wide range of other matters that would need to be considered when locating</li> </ul>	Y

Sub No.	Submitter Details	Issues	Analysis and Recommended Response for S
1	Sports and Recreation Queensland PO Box 187 ALBERT STREET BRISBANE QLD 4002 (State Government)	<ul> <li>Concern that SPP promotes just one perspective of land use planning and other relevant factors may be overlooked. Allocating recreation activities is part of the planning process to assess the landscape and identify appropriate land for different activities. Concerned that flood hazard would impact on certain recreation activities.</li> <li>Suggestion made to include an additional note to Table 1 – "Not all forms of recreation or open space should be located in areas at risk. Appropriate land assessment and planning should be carried out."</li> <li>Suggestion made to amend section 7.10, to include a recommendation to undertake</li> </ul>	Yes/N  However further detailed guidance on open space planning issues is not a relevant matter that requires amplification in this SPP. No amendments required.  The SPP is about a single issue - natural disaster mitigation and not about allocating recreation and open space land uses. Land use planning integrates many planning matters (ie. recreation and open space requirements) when determining land use allocation.  Add a footnote as requested.
13	A/Director-General Department of Tourism, Racing and Fair Trading GPO Box 1141 BRISBANE QLD 4001 (State Government)	SPP is a significant natural disaster mitigation measure that will complement the development of a Tourism Industry Crisis Management Plan (TCMP). TCMP will better prepare government and industry to reduce or respond to the impacts of shocks on the tourism industry.      Development of the TCMP is being progressed in a consistent and complementary manner to the SPP.      Reiterated the importance for the SPP to continue to take into account the impact natural disasters have on tourism generally.	inclusion in the SPP. No amendments required.  Noted, expression of support but no specific comments on the SPP or Guideline. No amendments required.
15	Program Manager (Property Services) Property and Facilities Branch Queensland Police Service GPO Box 1440 BRISBANE QLD 4001 (State Government)	• Concerned with wording in Appendix 7 that promotes design solutions eatering to a 1:200 year flood event for police facilities. The performance criteria should also provide confirmation that there will be numerous circumstances where it will not be possible to achieve this standard. Recommended that Appendix 7 be modified to reinforce information in Outcome 1, namely "except where: there is an overriding need forreasonably available for the proposal".	The Recommended Flood Levels in Appendix 7 should be read in young time the conjunction with Outcome 3 — 'where practicable'. These concerns area already addressed in SPP Guideline (paragraphs 6.47 to 6.49). No amendments required.
ıs .	Office James Cook Drive TOWNSVILLE QLG 4811 (Community)	<ul> <li>Concerned about the validity of IPA and its inconsistency with the principles of ESD.</li> <li>Concerned about State moving responsibilities on to LG, with no increases in funding to LG.</li> <li>Concern about process in considering submissions.</li> <li>Concern that public consultation on SPP was inadequate.</li> </ul>	Disagree and issue is not relevant to content of SPP.  Formalising natural hazard mitigation into development assessment and PS processes. Funding is available under the Natural Disaster Risk Management Studies Program to do risk and natural hazard assessments.  Misunderstanding - Minister for Emergency Services and Minister for LGP will consider submission and decide whether to adopt, amend or not adopt SPP and Guideline.  The development of the SPP and Guideline has involved extensive
		<ul> <li>Concern about public notice in notice in newspapers not complying with IPA.</li> <li>Concern about access to disaster relief and mitigation funding and requirement to show evidence of mitigation.</li> </ul>	consultation that exceeds the public notice requirements in Schedule 4 of IPA.  Public notice was prepared in consultation with DLGP and complies with IPA.  Incorporating the SPP outcomes is one way to provide evidence of mitigation. The Natural Disaster Relief Arrangements are used for relief of natural disasters. The NDRMSP provides funds to assist in implementing the SPP.
		<ul> <li>Concern that those local governments not covered by the proposed SPP (re: Maps I and 2 in the Guideline) will be excluded from Commonwealth assistance programs.</li> </ul>	Some LG areas are exempt from applying to the SPP for bushfire and landslide hazard, based on the level of bazard in these areas being considered low and not of state significance. This does not stop these LGs being proactive in addressing bushfire and landslide. These LG areas still

Sub No.	Submitter Details	Issues	Analysis and Recommended Response	Support . for SPP Yes/No/?
	=	<ul> <li>Concern that SPP and Guideline are two separate statutory instruments and that the SPP is to be made under the Guideline would be meaningless as IPA only provides for making of a SPP and does not give stand alone power to make a Guideline.</li> </ul>	need to address flood hazard and incorporate the SPP for flood.  Commonwealth assistance funding for disaster relief is available to these LG where they have evidence of mittgating flood (the likely or recurring natural hazard in these areas). The NDRMSP also provides commonwealth assistance for risk and hazard assessment studies.  The SPP declares the SPP Guideline to be 'extrinsic material' under the Statutory Instruments Act 1992, thereby giving the SPP Guideline legal status in assisting in the interpretation of the SPP. Extrinsic material is 'relevant material not forming part of the statutory instrument or the Act	resinton:
	,	<ul> <li>Concern about IoC (pages 66, 67) and use of word "OR". The provisions in 1.2 allow for a development proposal to otherwise comply, do not say the proposal is not required or comply with the IoC at 1.1.</li> <li>No definition of "comprehensive assessment". A definition will have to be applied,</li> </ul>	Inc 1.2 provides an alternative way of achieving PC 1, to the satisfaction of the assessment manager. Not necessary to repeat the requirements in 1.1, as this allows other ways to achieve PC 1.  Not necessary to provide definition of comprehensive assessment as words.	·
		which could lead to disputes and subsequent litigation, as to what is the appropriate definition.  Raised issue of words "concentration of flood flows or ponding of floodwaters" (section 3.2). Concern about LG approving development that could interfere with	are in common usage and can be interpreted with the assistance of a dictionary.  The SPP is concerned solely with hazard mitigation issues. This needs to be balanced with a range of other relevant matters including natural waterway	
	,	<ul> <li>natural water systems (eg. drainage works).</li> <li>Concerned that SPP and Guideline will have no real control over development and might not meet the Commonwealth requirements. Only effective way to deal with natural disaster mitigation is on a regional basis in developing RCMPs under the SCMP.</li> </ul>	values through the development assessment process.  • Disagree. The SPP will bind Local and State Governments, and development to which the SPP applies will need to achieve the SPP Outcomes. The RCMPs under the SCMP only deal with coastal hazards and not the natural hazards dealt with in the SPP (ie. Flood, Bushfire and Landslide). Also, SCMP/RCMP are SPPs for purposes of making planning schemes & development assessments.	
		<ul> <li>Concern about suggestions raised made at Townsville workshop to amend the SPP.</li> <li>Do not support the proposed SPP or Guideline, as it seems to be completely ad hoc and absolutely ultra vires. Process is ad hoc, null and void. SPP will he another set of issues to a Court Case of William "Billy" Peter Tait v Townsville City Council".</li> </ul>	<ul> <li>Suggestions raised at workshop will be considered.</li> <li>Noted.</li> </ul>	
		Declared no responsibility for opinions expressed in submission.	Noted.     This submission raises no issues that would require an amendment to the SPP.	
	Director, Regional Services (South) Department of Primary Industries PO Box 102 TOOWOOMBA QLD 4350 (State Government)	<ul> <li>Proposed SPP may impact on DPI Forestry operations.</li> <li>Forestry business group shall submit, if necessary, a response.</li> <li>Other forestry staff shall not be submitting a response.</li> </ul>	Noted, no specific comments on the SPP or Guideline. No amendments required.	Υ.
	Chief Executive Officer Stanthorpe Shire Council PO Box 402 STANTHORPE QLD 4380	<ul> <li>Consider that Stanthorpe Shire should not be included where SPP applies for landslide. Shire contains slopes in excess of 15%, however, landslide risk are small.</li> <li>No incidences of landslide in recent history and no evidence of instability. The geology of the Shire mitigates against landslide.</li> </ul>	<ul> <li>Disagree. Determining landslide risk should be based on a geological stability study, in particular for areas where future development is likely. DNRM and global assessment of DES identified Stanthorpe Shire as including land over 15% and concluded that the SPP should apply to this area for landslide. No amendments required.</li> </ul>	<b>Y</b>
	(Local Government)	<ul> <li>Considers that an integrated approach is needed between DES and DNRM for fire break creation and maintenance and the clearing of 'endangered' remnant vegetation. Response from DNRM — 'any clearing of vegetation for fire breaks should limit the clearing of any vegetation mapped as "endangered" remnant vegetation on the Regional Ecosystem Map.'</li> </ul>	This is a single issue SPP. It does not address environmental values. These values need to be considered in relation to any development application. There may be circumstances where the environmental values preclude clearing for development. Include advice in the SPP that a range of other matters including vegetation values need to be considered in the development assessment process.	
لــــا		Considers SPP should clarify the various State Agency responses to clearing for	<ul> <li>The SPP applies to development applications and includes measures to</li> </ul>	

Sub No.	Submitter Details	Issues		Analysis and Recommended Response	Support for SPP Yes/No/?
		firebreaks. Some strategic, permanently maintained firebreaks are necessary to limit progress of wildfires. Firebreaks are positioned in response to bushfire behaviour and not necessarily located to protect properties or buildings. In some cases, firebreaks involve clearing of 'endangered' remnant vegetation.		achieve acceptable levels of risk for particular developments. Larger, strategic fire-breaks of the nature described cannot be addressed by the SPP (although where they exist they should be considered when assessing a development application). No amendments required.	
	2 Uba Street MOUNT PLEASANT QLD 4740 (Community)	<ul> <li>General discussion of the impacts of flood, storm tide inundation, bushfire and landslide in Mackay region (eg. evacuation and impact to sewerage treatment plants, property and environmental damage).</li> <li>Pioneer River has a levee bank on the southern bank to protect Mackay City from flood waters.</li> <li>Cost of flood insurance is expensive and compensation.</li> <li>Concerned about upgrading a road that will provide access to a new hospital.</li> <li>General support for the mitigation of natural hazards (eg. flood levies, proper drainage to divert water in landslide prone areas, reducing fuel load in bushfire prone areas, fire breaks).</li> <li>Concerned about development within hazard prone-areas (eg. flood and landslide). Many houses have been built on hill-sides.</li> </ul>	•	Noted, no specific comments on the SPP or Guideline. No amendments required.	Y
·	Chief Executive Officer Winton Shire Council PO Box 288 WINTON QLD 4735 (Local Government)	<ul> <li>Council notes that drought has been excluded from the policy and understand the reasoning behind excluding drought.</li> <li>Their mitigation analysis considered drought to be a real matter of concern (eg. secondary risks to community and public safety), in particular for unscaled roads (eg. bull dust).</li> <li>Other than excluding drought, Council is satisfied with SPP.</li> </ul>	•	Drought is outside the scope of land use planning and development assessment processes. It is a chronic hazard and not a sudden hazard like flood, bushfire or landslide. Drought is addressed through other Government arrangements.  The safety of roads is the responsibility for Council and if State-controlled roads — Department of Main Roads.  No amendments required.	Y
	Principal Project Officer Capital Asset Management Unit Arts Queensland (State Govt.)	Noted the requirements in respect of cultural facilities.  Arts Qld does not intend making a further submission at this time.	•	Noted. No amendments required.	Y
	District Director North Coast-Hinterland Department of Main Roads PO Box 183, GYMPIE QLD 4570 (State Government)	Main Roads North Coast-Hinterland District has no comment to make.  .	•	Noted. No amendments required.	¥
	Manager Planning and Strategy Caboolture Shire Council PO Box 159 CABOOLTURE QLD 4510 (Local Government)	<ul> <li>Council supports SPP.</li> <li>Recognises significant study required to implement the SPP. Lack of existing spatial data on natural hazards affecting Shire. Cost of studies is a major cost impact to Council. State Government must address this as part of implementing SPP.</li> <li>Council currently advanced in preparing IPA Scheme and considers it not possible to satisfy requirements of draft SPP within timeframes. Significant resources required to accurately map flood, bushfire and landslide. The time, availability of resources and advanced stage of draft IPA scheme should be considered in State Agency review of IPA schemes.</li> </ul>		Noted. The Natural Disaster Risk Management Studies Program (NDRMSP) provides funding to assist LGs in undertaking hazard assessment studies.  Council is encouraged to do studies over time to achieve the Outcomes of the SPP. If this is not possible for the preparation of draft IPA schemes, then LGs should indicate that they intend to do achieve the SPP Outcomes over time to be included in the next review of IPA schemes in about 8 years time.	x
	Geological and Resource Planning Advice 179 Victoria Avenue CHELMER QLD 4068 (Consultant)	<ul> <li>Given lack of information of areas at risk from landslide, SPP approach to ensure landslide risk is considered in PS and DA is supported.</li> <li>Refinement required as to how a NHMA is shown on PS. Outcome 4 is unclear – describing such areas in writing only, or actually mapping them. If mapping, LG should at least prepare slope maps for the whole of their area of slopes &gt;15% (to comply with A3.3(e)). Maps need to be prepared at a detailed scale to be useful –</li> </ul>	•	Noted.  Amend Appendix 5 of the Guideline to clarify that mapping of natural hazard management areas is required. The task of mapping a NHMA (landslide) should not be too onerous given the capability of modern GIS systems.	Y

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Sub .	Submitter Details	Issues	-		Support
No.				Analysis and Recommended Response	for SPP Yes/No/?
		onerous for many LGs, given time frames.  If LG has a geological stability survey (A3.3(a)), complex mosaic likely result — difficult to depict on PS maps in meaningful detail.  Considers clarification required that PS only need to describe what constitutes a	•	Ditto above.	723/110/
		<ul> <li>Considers clarification required that PS only need to describe what constitutes a NHMA (landslide), with reference to other maps where available. Eg. NHMA (landslide) is defined as "all land with slope over 15%" or "Zones B, C and D shown on maps of the landslide risk study of the Shire".</li> </ul>	•	Ditto above.	
		<ul> <li>Land clearing is now classified as development, all applications for clearing on land over 15%, even for rural purposes, subject to SPP – could generate considerable work for LG in assessing proposals (eg. requiring consultant reports).</li> <li>Overlap assessment of rural clearing proposals for vegetation protection under</li> </ul>	•	A definition of "vegetation clearing" has been prepared for inclusion in the SPP and Guideline. The proposed definition aligns closely with the approach in the VMA and excludes vegetation clearing for a range of maintenance purposes as well as clearing associated with management	
24	36 Dec D	Vegetation Management Act 1999 (VMA). Need to rationalise assessment of clearing proposals under this Act and SPP.		practices for forestry or agricultural use.	
	Bundaherg City Council PO Box 538 BUNDABERG QLD 4670 (Local Government)	<ul> <li>Generally supportive of SPP.</li> <li>Surprised SPP does not cover earthquake. Recognises that SBR specifies construction standards for buildings (eg. earthquake loadings). Considers that infrastructure (eg. trunk water supply infrastructure) may have significant roles following earthquake events. No standards or guidelines exist for this.</li> <li>Bundaherg City in region specifically affected by earthquake and come guidance from State through SPP as to how Councils should be addressing earthquake is considered appropriate.</li> </ul>	•	Noted.  SPP does not cover earthquake, as adequately covered by SBR, BCA and Australian Standards for buildings. While there may be a need for standards or guidelines for the types of infrastructure described in the submission, this is outside the scope of the SPP. No amendments required.	Y
25	Caims Port Authority PO Box 594 CAIRNS QLD 4870 (Industry)	<ul> <li>Caims Port Authority does not wish to lodge a submission on draft SPP.</li> <li>Would appreciate a copy of the document when SPP is released.</li> </ul>	•	Noted. No amendments required.	Y
26	Department of Industrial Relations	1 October 2002 – Electrical Safety Act 2002 commenced – imposes electrical safety obligations to ensure electrical safety.	•	Noted. No amendments required.	Y
	GPO Box 69 BRISBANE QLD 4001 (State Government)	Electricity entities must ensure 'works' are electrically safe. Works of an electricity entity means the electrical equipment and electric line associated equipment, controlled or operated by the entity to generate, transform, transmit or supply electricity. 'Operating works' under the Electricity Act 1994 (Annex 1(b) of SPP) also includes non-electrical equipment such as fuel stocks, operated by an electrical entity. In view of this the definition of the types of electricity related community infrastructure should be reviewed.	•	The definition of community infrastructure in Annex 1, Part (b) is consistent with IPA, Schedule 5. However, the Electrical Safety Act 2002 definition better targets the type of infrastructure with which the SPP should be concerned. Amend the SPP to include the Electrical Safety Act 2002 definition of "works".	
		<ul> <li>Electricity entities' works must be able to perform under the physical environment in which the works operate. Act contains requirements for works (eg. clearance distances for exposed conductive parts and overhead electric lines, to control fire hazard. No conflict between intent of Act and SPP.</li> </ul>	•	Noted. No amendments required.	
		Design, building and maintenance of electric lines regulated under Electricity Act 1994. Treasury Department may wish to provide comment.      Energy Engage Country Energy Powerlink developing and electricity.	•	Noted. No amendments required.	
		electricity infrastructure - May provide useful comment in applicant achieving Outcomes 1 to 3 of SPP.	•	Noted. No amendments required.	
27	Network Asset Management	<ul> <li>Energex required to deliver a safe/reliable energy supply. Core matter under IPA – electrical infrastructure is essential community infrastructure – integrate into planning system.</li> </ul>	•	Noted, no amendment required.	Y
	Energex GPO Box 1461 BRISBANE QLD 4001	<ol> <li>Energex must 'follow'/support development patterns and must connect to an exiting network – requiring sometimes electricity assets constructed in areas restricted by SPP. Unlike roads, SPP makes neither specific exemption nor recognition of this</li> </ol>	1.	Exempt development is not affected by the SPP. Appendix 7 currently includes 1:500 ARI Recommended Flood Levels for power stations, major switch yards and substations. In view of the submitters arguments re:	

Sub No.	Submitter Details	Issues	Analysis and Recommended Response Support for SPP Yes/No/?
	(Industry)	aspect of an electricity network. Application of the SPP to substations not reflective of development process causing need for substations and an unnecessary cost. Certain aspects of electricity infrastructure are exempt development for IPA:  - operational work for a public sector entity,  - addition of transformers within an existing sub-station, and  - Electricity distribution lines up to 66 kv.  Energex requires removal of reference to electricity infrastructure from SPP.  2. Section 5, 5.8 - States position — 1:100 ARI conflicts with Appendix 7, part A — power stations, major switch yards and substations — AS of 1:500 ARI. Energex submits that 1:100 ARI is State's position & should be applied throughout Appendix 7 (in reference to electricity infrastructure).  3. Section 2, part 8, 8.3 appears to conflict with section 2, part 6, 6.47:  o 8.3 directs AM not to approve development applications that are unable to achieve Outcomes 1 to 3.  o 6.47 recognises the situation where a development application should proceed even though it does not meet the requirements of Outcome 3.  4. Appendix 5, table A, 4.1 — infrastructure is designed to exclude floodwater intrusion conflicts with Table A, 2.1 — development does not detrimentally affect flood storage capacity or flood conveyance characteristics.	substations, it may be appropriate to reduce the RFL to 1:200 (consistent with that proposed for the electrical components of a water treatment plant), and to include a fifth dot point, "electricity works (not specifically listed in this table)" below State-controlled roads in Appendix 7. The proposed requirements for power stations and major switch-yards appear reasonable. Amendments to SPP as noted above.  2. Outcome 3 is about ensuring certain essential community infrastructure remains effective during and immediately after a natural hazard event. It is reasonable to apply higher immunity levels to key infrastructure items. The 1:100 ARI is the State Government's position only for determining NHMA's (flood). No amendments required required.  3. Paragraph 6.47 amplifies the "where practicable" element of Outcome 3. There is no conflict and no amendments required.  4. There is no inconsistency between these requirements. Intrusion of floodwater can be achieved by a variety of design solutions including raising susceptible elements above the flood level. No amendment is required.
28	Plaming and Policy Redland Shire Council PO Box 21 CLEVELAND QLD 4163 (Local Government)	<ul> <li>Generally supportive of the SPP and indicates that Council is already meeting the SPP requirements in the preparation of its draft PS for flood, bushfire and landslide. There will be no additional costs to Council as work required to implement the SPP (eg. hazard mapping) has already been done.</li> <li>Definition of flooding includes "dam break", but it is not addressed further in the SPP. Suggests that dam break flooding be removed as were earthquake and strong winds.</li> <li>Need to clarify self-assessable activity under the Standard Building Regulation (eg. filling associated with building works). Should such activities be exempt from the SPP? Plauning should take precedence over the SBR.</li> <li>Guidelines for storm tide inundation under the State Coastal Management Plan must be consistent with the SPP. Council is keen to participate in the development of this guideline.</li> </ul>	Noted.      Agree. Amend the definition of flooding to exclude reference to dam break.      Building regulation has separate mechanisms for achieving hazard mitigation outcomes (eg. SBR & Queensland Development Code). It is intended to amend SBR to achieve consistency with SPP intents & terminology. No amendments required.      EPA and DES have agreed that the guideline for storm tide inundation should be consistent with the SPP. No amendments required.
		Not clear in the SPP whether the State Government will have a referral role for development applications within a NHMA.	State Government will not have a referral role at this stage. This could only be achieved through an amendment to the IPA Regulations, and could be considered later if found necessary to ensure proper implementation of the SPP.
29	Sargent Consulting. 11 Redwood Place THE GAP QLD 4061 (Consultant)	<ul> <li>Submitter was project manager for the Western Queensland Towns Flood Study that examined flood and flood mitigation in six towns including Charleville.</li> <li>Proposes that a "default" NHMA should be introduced (as with bushfire and landslide). The default DFE should be based on the "flood of record", that is the largest flood since records began at that particular locality. This would prevent under development in the period until a detailed flood assessment becomes available. For example, this would have been beneficial in Charleville.</li> <li>Considers that the definition of "floodplain" is inappropriate as it is based on the PMF (Probable Maximum Flood) which is not necessarily representative of the current extent of the floodplain.</li> </ul>	Noted.  Noted.  This would be a major shift in approach with significant ramifications for LGs. The current approach reflects the lack of reliable flood data in many areas, and is supported by local government. No amendment proposed.  The definition is from the "green book" Floodplain Management in Australia — Best Practice Principles and Guidelines. While the submitter's arguments appear to have merit, it seems advantageous to retain consistency in definitions. No amendment proposed.

		· /		Support
Sub No.	Submitter Details	Issues	Analysis and Recommended Response	for SPP Yes/No/?
30	Assets and Development	<ul> <li>A2.1 refers to 'Dam break'. Clarification is needed here, as dam break can result in flood. Recent NDRMS, Council was requested by DES to exclude dam break as this was deemed not to be a natural disaster.</li> </ul>	Term 'dam break' is to be deleted from the SPP and Guideline.	Y
	Pine Rivers Shire Council PO Box 5070 STRATHPINE QLD 4500 (Local Government)	<ul> <li>Need to distinguish between Appendix 2 and Appendix 7 for PC that relate to Flood Plain Management and Stormwater Management. Most Councils have design standards for stormwater. Stormwater flooding can be surcharge from pipe or open channel drainage, not just from watercourses.</li> </ul>	Amend the definition of flood to clarify that local drainage problems are not addressed under the SPP.	
		Appendix 3, Table 1 — no reference to dry scleropbyll forest.	QFRS advise that dry sclerophyll forest can carry a range of risks depending mainly on the understorey and grass layers, so the generic term was not used. No amendments required.	
		<ul> <li>Appendix 3, Figure 1 – Compass degree ranges may need further consideration to fully reflect conditions applying throughout Queensland.</li> </ul>	QFRS advise that the compass is accurate. No amendment proposed to SPP Guideline.	
		Appendix 3 – does not consider techniques for bushfire risk assessment. Hazard assessment is a planning issue whereas risk assessment is a management issue. Consideration might be given to further explanation of this.	DES already provides guidance on disaster risk management (i.e. the Red book). This is also addressed briefly in the Guideline Appendix I. There would not appear to be any advantage in making this a more significant issue in the SPP. No amendments required.	
31		<ul> <li>Appendix 8 – diagram and text are contradictory as the diagram shows a line which is at an angle to the contours and item 2 of the text refers to a line perpendicular. Diagram and text need to be consistent and made clearer.</li> </ul>	Agreed, amend the diagram in Appendix 8 to make the measured line perpendicular to the contours.	
31	Association Inc PO Box 3133 SUNNYBANK QLD 4109 (Chairman: Mr Ian Olsen) (Community)	<ul> <li>9,000 existing owners of bay island land will be affected by the SPP as they are in an area of high and medium bushfire risk. States that Redland Shire Council's VPO has made the islands a vertiable tinder box. The SPP should accept basic tenets to protect owners' right to clear vegetation from Residential A land, and not create more obstacles to clearing.</li> <li>The SPP requires a lot more thought, and is considered unworkable due to the following problems:</li> </ul>	Noted. The SPP does not create any obstacles to clearing. However some additional text will be added to the Guideline to explain that the SPP needs to be interpreted and applied in the context of other planning and policy requirements.	N
ļ.		Under Outcome 1 an assessment manager is required to refuse assessable development that is not compatible with the nature of the natural hazard.	This is a correct interpretation of the way the SPP is intended to work. It appears that the submitter's concern is related to the Performance Criteria and Indicators of Compatibility discussed below.	
		Under Appendix 5B, landholders in High severity bushfire hazard areas will only be able to get approval if they prepare a comprehensive Bushfire Management Plan to the satisfaction of the AM.	This requirement appears onerous for a single dwelling house on an existing lot. Amend Appendix 5B to remove this requirement from proposals for a detached dwelling on an existing allotment.	
		Submitter also proposes other measures including:  Retrospective legislation to amend the IPA to allow clearing on all Res A land  Remove amendment 14 to the Redland Town Plan.  Minister for Emergency Services should immediately order the clearing of bay island land that is of any bushfire risk.	These proposals are not directly related to the SPP. Also note that Redland Shire Council support the SPP. No amendments required.	
32		Supports the SPP in principle and raises a number of issues:		Y
	Planning Officer Planning Services Thuringowa City Council PO Box 86	Questions the inclusion of the 1:100 ARI and advises of Thuringowa's approach     (uses 1:50 with 450mm freeboard to habitable floor levels). Suggests the     Thuringowa could justify continued use of 1:50 ARI DFE.	The example of the approach used by Thuringowa may be reasonable and supports the flexibility for choice of DFE (subject to justification) adopted in the SPP. No amendment is required.	¥
	Thuringowa Central Q 4817 (Local Government)	Questions requirement (Appendix 7, Table A) for road access to nominated community infrastructure to be passable for all flood events up to the Recommended Flood Level. Says most roads are passable in a 1:10 ARI event.     Suggests that slope calculation example (Appendix 8) requires line to be	The current requirement appears unworkable, amend Appendix 7 to require an emergency evacuation area in lieu of current access requirements in the consultation draft.	
33	Ouecusland Regional Office	perpendicular to contours.	Agreed, amend the diagram in Appendix 8 to make the measured line perpendicular to the contours.	<u>,                                     </u>
ا بد	Bureau of Meteorology GPO Box 413	<ul> <li>Policy is seen as a significant advance in NDM in QLD.</li> <li>Title of SPP is misleading because the SPP only addresses three hazards and is only one element of disaster mitigation.</li> </ul>	Noted.     Agree. Amend title of SPP to reflect its scope i.e. to flood, bushfire and landslide.	Y
<u> </u>	Brisbane Q 4001	Suggests - SPP should require consideration of public safety in areas above DFE	These are legitimate concerns but these residual risks are a counter disaster	

Sub No.	Submitter Details	Issues		Analysis and Recommended Response	Support for SPP
	(Federal Government)	(e.g. 500 year flood), and consideration of unacceptable modifications to flood behaviour that may adversely impact on DFE or lesser floods.		issue rather than a matter to be addressed through the planning system.  Would only confuse the key issues in the policy if included. No amendments required.	Yes/No/?
		Use of ARI (average recurrence interval) terminology is not consistent with a risk management approach & should be replaced, or at least used in conjunction with the use of AEP (annual exceedance probability) terminology. Also suggests there should be some explanation of the probability of various AEP events occurring over a design or planning timescale.	•	DNRM support this proposal, amend SPP and Guideline to use AEP terminology.	
	·	<ul> <li>The definition of climate change in Glossary does not agree with the Framework Convention on Climate Change international definition: "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods".</li> </ul>	•	Agree, minor change to wording to be included.	
		<ul> <li>Suggests minor changes to the text in the Guideline on climate change (paras 4.6 and 4.8).</li> </ul>	•	Changes to be made as proposed.	
1		<ul> <li>Appendix 5 – reference is made to the need to consider the impacts of developments on flood warning times. Consider including a reference to consulting with the Bureau of Meteorology if there is a flood warning system in place.</li> </ul>	•	This is a coordination issue that is not directly linked to the planning assessment of a development application. It's addition here is unnecessary and would add to the complexity. No amendments required.	
		<ul> <li>Definition of PMF is the flood that "could conceivably occur" whereas the         Institution of Engineers use "could reasonably occur". Also IE (Aust) refer to the         PMF as the "PMP Design Flood". Need to ensure consistency with nationally         agreed definitions.</li> </ul>	•	The definition used in the SPP is taken from SCARM report 73 "Floodplain management in Australia, Best Practice Principles and Guidelines" published in 2000. No amendments required.	
		<ul> <li>A2.20 - indicates that BoM data is available from DNRM. This may not be the most current data, refer to BoM only. Change phrase "hydrologic models where BOM operates a flood warning ssystem" to "possible hydrologic models or flood forecasting studies where BoM operates a flood warning system".</li> </ul>	•	Agree, amend as suggested.	
		<ul> <li>Definition of flood includes dam break. There should be some reference here to document on dam safety in A9.4.</li> </ul>	•	Remove reference to dam break from the definition of flood for the purposes of the SPP.	
		<ul> <li>A9.4 – Include reference to the EMA Flood Warning Guide, and emphasise the need for all flood mitigation strategies to be integrated – perhaps under a separate heading "An Integrated Approach".</li> </ul>	•	Include reference to the EMA publication, but no expansion of integrated flood strategies proposed as it would increase the complexity of the document and detrimentally affect its focus on the land use planning and development assessment issues.	:
34	Mr John Adams	A2.44 Include BoM as a source of clunate change information.	•	Agree, include reference as proposed.	
34	Planning Manager Ipswich City Council (Local Government)	Expresses support for the SPP, particularly: Financial and in-kind support for the preparation of hazard studies Limiting of scope to flood, landslide, and bushfire Recognition of differences in planning for greenfield as opposed to infill or committed development The flexibility provided for the implementation of the SPP.	٠	Noted, no amendments required.	Y
		<ul> <li>Appendix 5B requires a water reserve for fire fighting purposes of 5,0001. This is considered inadequate, the minimum water reserve should be 10,0001.</li> </ul>	•	QFRS have confirmed that 5,000 litres is adequate. No amendments required.	
		<ul> <li>Draft SPP uses both ARI (Average Recurrence Interval) and AEP (Annual Exceedance Probability). Using the term year in relation to flood events (as ARI does) is likely to cause confusion in the community about when such an event may occur. Would prefer the use of a probability measure (e.g. 1:100 or 1%).</li> </ul>	•	DNRM support this proposal, amend SPP and Guideline to use AEP terminology.	
		<ul> <li>Consideration should be given to amending IPA (e.g. s5.4.2 of Part 4 Compensation) to ensure a LG is not liable for compensation for loss of yield as a result of incorporation of the SPP.</li> </ul>	•	SPP allows development commitments to proceed on basis of maximising protection from hazard & avoiding unacceptable risk. If achieving latter raises compensation issue, S5.4.4 of IPA. states compensation is not payable for a change affecting development "that, had it happened under the superceded planning schemewould have led to significant risk to persons	

Sub No	Submitter Details	Issues	Analysis and Recommended Response	Support for SPP Yes/No/?
35	Mc James 1		or property from natural processes (including flooding, land slippage or erosion) and the risk could not have been reduced by conditions attached to a development approval". This existing provision provides adequate protection for local governments in implementation of the SPP.	
	Environmental Protection Agency PO Box 155 BRISANE ALBERT STREET QLD 4002 (State Government)	Position Statement says "development should minimise the potential adverse impacts of flood bushfire and landslide onand the environment". Environmental impacts are not fully reflected in Outcomes, PC and IoC.	<ul> <li>Add new text to the SPP to clarify that the SPP does not support hazard mitigation works that would result in unacceptable impacts on environmental or amenity values. It would not be appropriate to add performance criteria and indicators for this issue as they are not directly related to bazard mitigation and would be more appropriately addressed under other measures.</li> </ul>	Y
	(State Government)	SPP should not adversely impact the outcomes of the Koala Coast SPP.	<ul> <li>The two SPPs need to be interpreted in conjunction. There is no specific conflict between them. Redland SC's submission supports the SPP. No amendments required.</li> </ul>	
;		Recommends that SPP liaise with SEQ Consortium for Fire and Biodiversity at Griffith University. Consortium has undertaken research relevant to balancing the needs of fire management and hazard minimisation.    Conservation values	Advice on these matters has been taken from the QFRS. The consortium has not made a submission on the SPP. No amendments required.	
		Section 2.3.2 (p. 67) of SPP Guideline refers to the need for the hydraulic report to assess the "cumulative impacts of all existing and likely future development in the floodplain". It is considered imperative that the "existing situation" and 'cumulative impacts' of development be addressed in the hydraulic report. This should be explicitly stated in the notation.	<ul> <li>This appears adequately covered in the existing wording. No amendments required. However, this section of the draft document has been extensively revised in any case.</li> </ul>	
 		In some areas of the State, flooding is likely to be exacerbated by vegetation loss and extensive hard surfacing resulting from development. It is suggested that the SPP and Guideline provide specific comment in relation to this issue.	The SPP addresses loss of flood storage through filling on the flood plain, and changes to floodways including vegetation clearing. Vegetation clearing is otherwise addressed in the Vegetation Management Act It would be inappropriate to expand the focus of the SPP to address environmental issues beyond these. No amendments required.	
		<ul> <li>Redcliffe City has not been listed in Annex 2, A2.3 for Landslide (p 13 of SPP). It is understood that Redcliffe Council have commissioned a report entitled "Redcliffe Peninsula Foreshore Cliffs Study", which has indicated the potential for failure of cliff faces in a number of locations.</li> </ul>	<ul> <li>Landslide has been assessed as not of State significance in Redeliffe.</li> <li>Nothing in the SPP prevents Redeliffe CC addressing local landslide issues in a manner consistent with the SPP. No amendments required.</li> </ul>	
		There appears to be conflict between section 4.6 of SPP and section 4.8 of SPP Guideline concerning whether or not the State has a position concerning climate change. Section 4.6 of the SPP (page 2) refers to the Queensland Greenhouse Policy Framework. Para 4.6 of the SPP should also make reference to the SCMP — Queensland's Coastal Policy (State Coastal Plan), particularly, the policies contained in section 2.2.1 'Adaptation to Climate Change'.	<ul> <li>Remove the conflict by deleting the first sentence in Guideline para 4.8.</li> <li>Where reference is made to climate change in section 4, insert 'and the State Coastal Plan (Policy 2.2.1 Adaptation to climate change)' in the SPP and SPP Guideline.</li> </ul>	
		Use of SPP requires a lot of cross-referencing between SPP and Guideline. Simplification process would be beneficial. Section 4.6 of SPP refers to 'precautionary principle' Recommended that a	<ul> <li>This may be assisted by including the performance criteria as an annex to the SPP.</li> <li>Add a footnote referring to the definition of precautionary principle in the</li> </ul>	
	+ d	definition of 'precautionary principle' be included in Glossary. Definition needs to be consistent with the definition contained in the National Strategy for Ecologically Sustainable Development and IPA.	PA.	
		<ul> <li>Section 6.4 (p 4. of SPP) refers to the need to calculate slope of the 'development site'. Due to the nature of landslide and bushfire hazard, it may be necessary to consider slope and bushfire issues on adjoining land. Recommended that SPP explicitly state this.</li> </ul>	<ul> <li>The para refers only to the slope calculation to determine if the site is in the default natural hazard management area for landslide. This can only be done on a site specific basis. No amendments required.</li> </ul>	
		Definition of development commitment: Further clarification is needed in relation to what constitutes "development that is clearly consistent with the relevant zone" and the words "or equivalent" need clarification.	<ul> <li>Clarification of the first mentioned is provided in para 6.17 of the Guideline.         The term "zone" is used in DLGP documents to refer to the area categories that allocate levels of assessment. Some planning schemes use other terms instead of zone (hence the inclusion of "or equivalent"), however they are     </li> </ul>	

o.	Submitter Details	Issues		Analysis and Recommended Response	Support for SPI Yes/No/
·		L		apparent from their use in the planning scheme. No further clarification is required.	
		Section 6.7 (p 27) of Guideline, sentence - "Information about the severity of the	•	The offending para provides information on the development proponent's	1 !
		bazard may be available for the development site. If so, this information should be		responsibilities to provide information required by the SPP. There is no	1
- 7	•	provided to the AM by the proponent" appears to be superfluous. It should be		conflict with the "information request" provisions of IPA. No amendments	1 1
-1		amended to clarify that the Assessment Manager has the ability to request further		required.	1 1
		information.			1 1
		Section 6.37, Table 1, of Guideline indicates that "Environment" is an appropriate	•	Agree, amend to "conservation" as proposed.	I !
-1		land use across all levels of severity in the flood plain. Recommended term		- •	1 :
		'environment' be replaced by 'conservation' - more accurate description of the intended outcome.			1
- 1					i :
1		In addition, Table 1 (p 33) of Guideline identifies Rhiral uses and activities as appropriate development across all levels of severify in the floodplain. It is	•	Insert a foomote along the lines of "some high impact rural uses such as	!
.1	•	considered that in areas subject to High to Extreme levels of flood, rural uses should		feedlots and poultry farms may not be appropriate depending on their nature	
`	•	only be permitted subject to special controls. For example, Rural uses such as		and levels of potential impact".	
		intensive animal husbandry (feed lots, poultry farms etc.), involve the provision of		•	
		structures and storage of materials and chemicals, all of which could potentially		•	l .
4	•	present a hazard in times of flood			•
ı	£*		_	Access to the Control of the Control	1 :
		Section 8.11 (p 40) of Guideline - amend to read "The EPA provides information about storm tide inundation issues, protection of flood plain biodiversity and	•	Agree, amend as proposed.	;
- 1		planning for climate change."			1 .
		Table 1(p 58) of Guideline - recommended - fire behaviour for intact minforest and	_	The transfer of the control of the c	
J		mangrove communities be amended to read "virtually fire proof except under	•	The term "virtually fireproof" as currently used would appear to convey	1
- 4	· <u> </u>	extreme weather conditions" and the corresponding hazard score be amended from		sufficient information. No amendments required.	
		1 '10' to "0.5".		•	1 1
		Bushfire Code (p 71) of Guideline, the practicality of implementing and ensuring	•	This isome has been discussed and DY OD.	1
-		ongoing compliance with acceptable solution 7.2 is directioned. The assessment	_	This issue has been discussed with DLGP who confirm that the requirement to pass information on to future purchasers is unacceptable. Remove this	1
::	2	manager has the ability to condition the preparation of and compliance with a fire		requirement from the Guidelline,	1
	•	IDENTIFY THE DISTRICT PROPERTY OF A PROPERTY			}
1		also having the legal ability to ensure continuing compliance. However, it is understood that this may not be the case for development approvals for			
	<del>'</del>	understood that this may not be the case for development approvals for			i i
- 1		reconfiguration. In the absence of a material change of use, once the subdivision has			:
٠,		I DOWN CONSULTED IN COMMITTEE OF THE PROPERTY OF THE PROPERTY WAS A STATE OF THE PROPERTY OF T			l I
-4		Therefore, for effective implementation of land management conditions, such conditions need to be attached to an approval for a material change of use to ensure			
• 1		all future landholders are legally bound to complying with the approved fire			!
1	•	management plan.			1 :
	Let	Section 3.2 of Guideline indicates - for assessable development not addressed by a	_	Th	1 .
:	•	planning scheme and subject to assessment under IPA Regulation, assessment	•	The assessment manager must have regard to the SPP. No amendments	!
		manager must have regard to SPP when assessing relevant development proposals		required.	
.]	· •	Clarification is sought on the application of SPP to assessable development pursuant			!
	•	to IPA where Council is the assessment manager and the development is not			1 .
_		addressed under the PS.			1
	N. C.	DMR is generally satisfied with draft SPP and Guideline, but has the following	•	Noted.	Y
1	Director-General	detailed comments.			1 .
į	Department of Main Roads GPO Box 1549	SPP:			1
:	BRISBANE QLD 4000	Definition of "development commitment" should exclude exempt development,	•	Definition should be amended to remove reference to exempt development	,
	(State Government)	refers to development only assessable against the SBR (para 6.1 says the SPP not to		and development only assessable against the SBR. The reference to	1 :
	- form continuents	be used for building work only assessable against the SBR), and refers to		development that has a valid development approval (i.e. either a preliminary	$\mathbf{I} = i$
إ	i.   •	development with a valid development approval (this includes preliminary approvals  — if the intent is for SPP to only consider preliminary approvals then this should be		approval or a development permit) being a development commitment is	] ;
		— In the intent is for SPP to only consider preliminary approvals then this should be		reasonable and should be retained. This will enable proposals for minor	,

	·			
Sub No.	Submitter Details	Issues	Analysis and Recommended Response for :	pport SPP Moi?
		SPP applies to community infrastructure anywhere in the State. DMR will need to respond to information requests involving more than one LG and involving fundamental issues such as:  Level of risk in a particular vicinity  Degree to which development proposes an unacceptable level of risk  Degree to which development would increase the natural hazard. More certainty regarding likely information requirements and consistency is required.  Amend Outcome 3 as follows: "Wherever practicable and affordable, community	modifications to an approved development to be considered as an exemption under Outcome 1.  Nothing in the SPP would prevent local governments from having different information requests depending on their particular concerns. However it is proposed to amend Outcome 1 by removing the words "lower level of risk than generally applies to development in the vicinity". Also more information on "unacceptable risk" will be included in the Guideline. These changes should assist to provide the greater certainty required by the submitter.	
		<ul> <li>infrastructure with a specified level of risk and the nature of the community infrastructure."</li> <li>Bushfire hazard assessment methodology is not comprehensive, the SPP should allow alternative methodologies to be approved by DNRM.</li> </ul>	Wherever practicable includes the notion of affordability as indicated by the reference to "available resource allocations" in para 6.47. Para 6.48 refers to "the role and function of the infrastructure". No amendment is required. The QFRS is the responsible agency for bushfire hazard assessment. Para A3.6 states that alternative methodologies may be appropriate if acceptable to QFRS. No amendments required.	
		<ul> <li>The SPP should not place any undue impost on DMR to upgrade access for emergency services in NHMA's.</li> <li>Why are LG roads not included in Annex 1.1(b).</li> </ul>	This is not a matter that could be achieved by the SPP. No amendments required.  The intention was to address major roads of State significance as these are the vital lifelines for the community.	
		<ul> <li>Paras 4.2-4.4 do not explain the need to mitigate natural disasters but define the scope of the SPP and should be relocated to a new section.</li> <li>Second sentence in 7.5 - unnecessary and should be deleted.</li> </ul>	We prefer to keep all of this background information on the nature and consequences of natural hazards in one section. No amendments required.  The seutence amplifies and explains the requirement in relation to flooding.	
		• Para 9.1 (inter alia) - ARI is a generic term, may be better to use "Flooding ARI".	and should be retained. No amendments required.  The term is only used in sections of the SPP relating to flood. The suggestion is unnecessary. No amendments required, however note that the term has now been amended to AEP.	
		<ul> <li>Definition of mitigation says "or eliminate the risk". It is not possible to eliminate all risk, use "reduce risk" instead.</li> </ul>	Agree, definition to be amended accordingly.	
	•	Annex 1 – the term "increases the number of people" needs to be clarified.  GUIDELINE:  Para A 2.1 – consider including "tidal influence" in the definition of flood.	Amend terminology to refer to "any increase in the number of people".	
		Appendix 7 – requirement for emergency access requires re-assessment as it is unrealistic to expect any road system to be able to meet the RFL's stipulated for the nominated types of community infrastructure.	This is a coastal process which should be addressed under the proposed SCMP guideline. No amendments required. Agree, the emergency access requirements need to be reviewed. Propose to amend to require an emergency rescue area instead.	
	4 4 4	<ul> <li>Appendix 7 – A suitable level of service for State roads is not defined, suggest that the words "as defined by the State" be added.</li> <li>Consideration of flood risk should not be dependent on local governments adopting a DFE.</li> </ul>	Not necessary as the words "having regard to the processes and policies of the administering government agency" are already included.  This was the best process that could be devised given the lack of reliable flood information around the State. No amendments required.	
!	1 1 9	<ul> <li>Para 4.6 – given the uncertainty in assessing climate change, the word "assessed' should be changed to "considered" in the last sentence.</li> <li>Para 6.11 (inter alia) – a material change in the number of persons needs to be better</li> </ul>	Agree, amend as proposed.	
		defined.  Appendix 5A (Flood) IC 2.3.2 – delete note - no explanation given.  Appendix 5A (Flood) IC 4.2 – delete the word "all".  Appendix 5B (bushfire) – if roads are constructed to State and LG standards, IC 3.2 should be deleted.  Map1, p20 – the exclusion of Belyando and Peak Downs appears inconsistent.	<ul> <li>Amend terminology to refer to "any increase in the number of people".</li> <li>Can't see any rationale for this. No amendments required.</li> <li>Agree, this makes the requirement too onerous. Amend as suggested.</li> <li>Some local road standards would allow greater slopes but these would not be acceptable for fire fighting purposes. Retain as is.</li> <li>This has been investigated previously and is based on an assessment of hazard severity. No amendments required.</li> </ul>	

Sub No.	Submitter Details	Issues		Analysis and Recommended Response	Suppor for SPP
37	Integrated Transport Planning Division Regional transport Planning Branch Queensland Transport	<ul> <li>Why does the definition of development commitment exclude strategic planning designations in transitional PSs.</li> </ul>	•	These forward designations usually indicate the general suitability of land for a particular use or range of uses subject to detailed assessment. They do not allocate use rights (or levels of assessment) as zones do. No	Yes/No/
	GPO Box 1549 BRISBANE QLD 4000 (State Government)	<ul> <li>Concerned about the delay in implementing the SPP's flood elements and recommends that the 1:100 ARI flood be used as the default flood NHMA.</li> </ul>	•	amendments required.  There is a lack of reliable State-wide flood data that precludes the use of such a standard, also the 1:100 ARI DFE may not be suitable in some areas. No amendments required.	
		<ul> <li>Regional mapping would overcome a concern about potential inconsistencies in DFE's at LG boundaries.</li> </ul>	٠	Waiting for regional mapping would delay matters further. Appendix 2 Para A2.36 already includes a reference to consistency with adopted DFEs in adjoining localities.	!
		<ul> <li>Appendix 7 – PC should be amended to require at least one means of emergency access to be useable (not necessarily road). E.g. in case of Karumba hospital it may be air access.</li> </ul>	•	The emergency access requirements will be amended to require provision of an emergency rescue area for specified types of community infrastructure.	,
	School of Tropical Environment Studies and Geography James Cook University PO Box 6811 CAIRNS QLD 4870 (Academic)	His research into natural hazards (NHs) has shown that the assumption that NHs are time dependent phenomena is incorrect. A study of the natural record of NHs in a region (physical records may extend back for tens of thousands of years) should form part of the initial investigations to determine a NH area. The submitter offerred copies of his published reports that give examples of miscalculations of risk if this is not done. His work appears to relate mainly to landslides.	•	Add a reference to "review of available data about the history of landslide events in the region" to Appendix 4.	<b>v</b>
39	Air Transport Management Public Transport Division Queensland Transport PO Box 673 FORTITUDE VALLEY QLD 4006 (State Government)	Reviewed for impact on aeronautical facilities and has no comments	•	No amendments required.	Y
40	Toowoomba City Council  .g. (Local Government)	<ul> <li>Need for a mechanism (either in SPP or IPA) to allow Minister for LGP to sign off on PSs for particular parts of SPP due to the 3 clearly defined separate elements of the SPP (i.e. flood, bushfire and landslide).</li> <li>Role of the SPP, once reflected in a LG PS, needs to be clarified. The PS should become the sole instrument for triggering assessment etc.</li> </ul>	•	There would be significant practical/legal difficulties with a 'partial sign- off' by the Minister ie. defining precisely for legal purposes which parts of the SPP are reflected & which are not. No amendment to the SPP required.  Amend SPP to clarify that when Minister formally declares SPP has been reflected in the planning scheme, the latter is the local interpretation o&	Y
41	Ipswich Rivers Improvement Trust PO Box 191 IPSWICH QLD 4305 (Community)	<ul> <li>SPP should recognise DFE adopted for the purposes of identifying a NHMA may need to be lower than 1:100 ARI for reasons other than the "circumstances of the locality". Eg. often need to stage flood mitigation projects over many years. At the same time a scheme for something less than 1:100 immunity can often provide very significant benefits.</li> </ul>	•	expression of the SPP for development assessment purposes.  This would be considered a local circumstance, there is no need to amend the current wording in the SPP.	Ŷ
	,	<ul> <li>Amax 1, A1.1 – suggests adding "lowering" to dot point 4 (e.g. filling, lowering, or vegetation removal).</li> <li>Mention River Trusts as potential sources of data (A2.20) and as potential members of Floodplain Advisory Committees (A2.15 and A2.16).</li> <li>Table 1 in Section 6.37 – should recognise that flood mitigation works change the level of severity which would influence planning decisions at the LG level.</li> </ul>	•	This is not necessary as these are examples only. No amendments required.  Agree, amend A2.20 as proposed. Paras 2.15 and 2.16 are general in nature and do not require amendment.  Unnecessary as the table links levels of severity and land uses. If the level of severity changes so will the appropriate land uses. No amendments	
		<ul> <li>Clarify numbering of tables in Guideline, perhaps by using the prefix "A" for tables in the Appendices.</li> </ul>	•	required.  Agree. Table numbering to be amended in final version.	
	North Queensland River Trusts	As per submission 41	•	As per submission 41	Y

b - Submitter Details	Issues	Analysis and Recommended Response	Suppor for SPP
Association Inc. Po Box 5318 MC TOWNSVILLE QLD 4810 (Community)		·	Yes/No/
Chief Executive Officer Sarina Shire Council PO Box 219 SARINA QLD 4737 (Local Government)  Secretary Rural landholders Conservation Council PO Box 243 PALMWOODS QLD 4555 (Community)	<ul> <li>Storm tide hazard should have been addressed under SPP, important that EPA guideline is compatible with SPP and do not just have an ecological focus.</li> <li>SPP could have proposed measures such as set back distances to control development and unitigate the spread of plagues, pestilence and exotic diseases.</li> <li>SPP should include clear definitions or standards on what constitutes an "unacceptable level of risk".</li> <li>Recommends QFRS, DES, DNRM and EPA become concurrence agencies to ensure the provisions of the SPP are met State-wide.</li> <li>Documents need to be redrafted to address the real issues from a public point of view. The whole policy aims to avoid responsibility by those in authority. It treats local governments favourably and differently to the public. The submission also gives some examples of particular concerns in Maroochy Shire.</li> <li>Why are planning schemes approved by State Government contrary to the SPP What link is established through this policy in regard to land zoning and valuation.</li> <li>Agencies should not have separate overlapping agendas, when a SPP sets a guideline to be noted equally.</li> <li>Planning schemes should address these natural hazards, include areas and conditions.</li> <li>Why are LGs allowed to have local laws protecting vegetation if this policy is to achieve its intent.</li> <li>Paras 4.7 and 5.2 – Natural disaster mitigation should be of prime concern to all planning schemes not just community infrastructure.</li> <li>Paras 6.3 and 6.5 – caused some community concern and the intent has several interpretations.</li> <li>Annex 1, Al.1 particularly dot points 4 and 5 – raised extensive public comment and needs clarification.</li> <li>No modifications or changes proposed.</li> </ul>	<ul> <li>EPA is committed to preparing a guideline on storm tide inundation that is compatible with the SPP.</li> <li>These are matters that are not addressed under the SPP. No amendments required.</li> <li>SPP will be more specific on this issue e.g. it would be unacceptable to have habitable floor levels below the DFE.</li> <li>This is not proposed at this time and would need to occur by way of legislation changes. No amendments required.</li> <li>Noted, local governments are given particular prominence in the SPP as they are the main vehicles for implementing the SPP through their roles as assessment managers and making and amending planning schemes. No amendments required.</li> <li>The SPP has not yet taken effect. No amendments required.</li> <li>The SPP operates under IPA which sets the legislative framework for planning and development assessment matters.</li> <li>The SPP is a single issue policy which needs to be balanced with a range of other matters at the local government level.</li> <li>This is the purpose of Outcomes 4, 5 and 6 of the SPP.</li> <li>Because protecting natural values is also a key responsibility of local governments. No amendments required.</li> <li>Not clear if there is a specific issue, maybe concern that the flood aspects of the policy do not take effect until a local government has adopted a DFE for a locality. No amendments required in response to this aspect of the submission.</li> <li>Amend to include a 50m³ threshold for earthworks to clarify.</li> </ul>	?
Assistant Commissioner Queensland Police Service North Coast Region PO Box 553 MAROOCHYDORE QLD 4558 (State Government)	No modifications or changes proposed.	No amendments required.	Y
Principal Policy Officer Department of Primary Industries — Forestry C/O Forest Office Red Road BEERBURRUM QLD 4517 (State Government)	<ul> <li>Amend Appendix 5A Bushfire, IoC 6.1 by including the same setback requirements for residential buildings as apply to non-residential buildings under IC 6.2.</li> <li>A definition of risk is included in the Glossary. The definition in para 6.34 is unnecessary and should be deleted.</li> <li>Para 6.47 – queries if this means that development can be refused on the basis of service times.</li> <li>Appendix 5A (flood) – should include mention of the need to stop net increases in hard surfaces in the landscape (if already addressed in DNRM's Floodplain Management Guidelines please disregard).</li> </ul>	<ul> <li>QFRS consider this would be reasonable. Amend SPP as proposed.</li> <li>Agree. Remove para 6.34</li> <li>This interpretation is incorrect. The para allows community infrastructure development to be approved where it may not meet hazard mitigation requirements that would result in its providing poor overall levels of service to the community.</li> <li>This is a floodplain management rather than hazard management issue and is not appropriate for inclusion in this SPP. No amendments required.</li> </ul>	¥

Sub No.	Submitter Details	Issues		Analysis and Recommended Response	Suppor for SPF Yes/No/
	Secretary	Strong support for policy. Raises following issues:  SPP	•	Noted.	Y
	Environment Australia GPO Box 787 CANBERRA ACT 2601	Para 4.4 – Recommends that SCMP guideline on storm surge recognises role of climate change and takes account of the full range of risk assessment and mitigation issues.	•	Matter for storm tide guideline.	
	(Federal Government)	Para 4.6 — should include reference to the potential for increased intensity in cyclones (as reported in the IPCC Third Assessment Report).  GUIDELINE	1	Para 4.6 includes a number of examples of predicted impacts of climate change, and would not be improved by adding further examples. No amendments required.	
		<ul> <li>Para 4.7 – this section says it is not feasible to take climate change into account for bushfire hazard assessments. CSIRO has estimated future projections in temperature, rainfall and evaporation (taking into account uncertainties in future global warming and model responses). These data would assist to identify those areas likely to be subject to increased bushfire risk.</li> <li>Section 8 – Include reference to the Environment Protection and Biodiversity (EPB) Act under which approval is required for proposals or actions likely to have a</li> </ul>	•	Bushfire hazard maps will be updated periodically to take account of changes in vegetation, and can be incorporated in scheme reviews. This is a more useful approach than using the broad CSIRO estimates in an effort to predict likely changes in hazard. No amendments required.  The EPB Act is not directly related to hazard management issues and (like the Emission entertails).	
		significant impact on matters of national environmental significance.  • Appendix A2.44 – should note that climate change information may also be sought	l	the Environmental Protection Act) would be inappropriate for inclusion in the SPP. No amendments required.  Agree, include reference to Bureau of Meteorology as proposed.	
		from the Burean of Meteorology.  • AppendixA9.7 – the recently released CSIRO Climate Change and Australia's Coastal Communities (2002) could be added as a reference document and quoted as appropriate.	!	Agree, add as reference document.	
	Assistant Director Development	<ul> <li>Queensland is to be congratulated for this initiative, the SPP is possibly a benchmark</li> </ul>	•	Noted.	Y
	Strategies Emergency Management Australia	for Australian planning and sets the standard for other States/Territories to consider.  The EMA manual, "Planning Safer Communities – Land use planning for NHs", is complementary to the SPP and promotes the role of land use planning to mitigate NHs. Add to references in SPP.	•	Add EMA manual, "Planning Safer Communities Land use planning for NHs" to Appendix 9.	
	CANBERRA (Federal Government)	<ul> <li>Role of the Commonwealth include in Roles and Responsibilities of Guideline (words provided).</li> <li>Detailed comments:</li> </ul>	•	The proposed text is not directly relevant to the SPP and should not be included.	
	,	<ul> <li>SPP, section 4, p2 — should integrate location, design and construction standards.</li> </ul>	•	Noted. Construction standards are in SBR and the Building Code of Australia. No amendments required.	
		<ul> <li>4.3, p2 - earthquake is not amenable to clear spatial definition is challengeable on the basis of soil type (see Geoscience Australia); GA have a general map of earthquake risk and recognises that data may not be sufficiently detailed to use.</li> <li>Design and siting should be considered with respect to strong wind.</li> </ul>	•	Earthquake and strong winds are not included in the SPP, as the Building Code of Australia, Australian Standards and SBR adequately cover building and construction requirements. No amendments required.  Ditto.	
		c 4.4, p2 — Concern that sections relating to storm tide inundation in SCMP are policies only and that actions are to be developed. The SPP has a formal process in the Guideline, the storm tide inundation hazard should be included in the SPP.		The draft SPP requires that when assessing flood hazard, this includes an assessment of the cumulative impacts from storm tide inundation on the extent and severity of rainfall flooding. The EPA are preparing Guidelines on storm tide inundation under the SCMP that will be consistent with the rainfall flooding addressed in the draft SPP. The SCMP has the same status	
		o Outcome 1, p4 - could this be phrased in risk management terms?	•	as the SPP. No amendments required.  Outcome 1 is phrased in land use planning and development assessment terms consistent with its role in the SPP.	
	• *	<ul> <li>6.4, p4 – with respect to NHMAs, there is a need to understand risk factors for these hazards.</li> </ul>		This is the preferred approach (see para 7.3 of the Guideline).	
		<ul> <li>6.5, p4 - there is a need to consider residual risk to PMF. At the end of the section - would this be considered best practice - not necessarily 1:100.</li> </ul>		Adopting the 1:100 DFE is the preferred minimum set by the SPP for land use planning and development assessment purposes. This is appropriate for the SPP. Residual risk is addressed via other means (eg. counter disaster plans etc.).	

Sub No.	Submitter Details	Issues	Analysis and Recommended Response	Support for SPP Yes/No/?
		<ul> <li>6.6 &amp; 6.7 - there is a need for specialist information on hazards (BoM, GA, others).</li> <li>6.10, p5 - overriding need in the public interest - how this is determined is critical (what processes). Also, risk management still needs to be applied to this overriding need (ie the residual risk, or protection for facilities) - a potential loophole for unscrupulous developers to use to justify a dev. and for legal types to use to challenge an application refirsal. The process for determining overriding need must be robust and legally watertight.</li> <li>Development commitment and overriding need - suggest that SPP stipulate that a</li> </ul>	<ul> <li>Specialist information on hazards is referenced in Appendix 9 of the SPP Guideline and in Appendices 2 to 4 for identifying NHMAs.</li> <li>The SPP Guideline sets out a process to determine overriding need. This approach has been used before to good effect in other SPPs. No amendments required.</li> </ul>	
		rigorous process and precise and complete documentation needed, as could have longer term detrimental consequences for public interest.  o 6.12, p5— example? development commitment is defined in the glossary, but it again needs to be derived through a robust process, or it could be another potential loophole (though perhaps not as bad as above).  O Outcome 2, p5— also consider accumulative effects of development on hazard/risk (eg increases risk).  7.2, p37— variation in scope will also depend on the nature of the development planned & activities associated with the development and any vulnerability of the activities  o 8.14, p41— define community?	<ul> <li>SPP defines 'development commitment' and requires that exceptions to Outcome 1 achieve Outcome 2. Overriding need (see above). Step 8 of Figure 2 outlines the information required to assess an application.</li> <li>Development commitment is set by the planning scheme and existing development approvals. The risk management process can be used to achieve the outcome.</li> <li>Para 6.14 refers to both on-site and external impacts. No amendments required.</li> <li>This would be covered by the existing phrase 'degree of risk to people, property, economic activity and the environment'.</li> <li>Community is a word in common usage that it is not necessary to define</li> </ul>	
		<ul> <li>9 Glossary, p 42 - need something on resilience or vulnerability? also include susceptibility (vulnerability is the susceptibility and resilience of a community)</li> <li>footnote 39, p 48 - the reference should be to p 13, not page 3.</li> <li>A4.11, p64-65 - Suggest add NHs and the risks they pase to South-East Queensland, Granger and Hayne (ed), 2001, Geoscience Australia.</li> </ul>	<ul> <li>specifically for the purposes of the SPP.</li> <li>The words 'resilience', 'vulnerability' and 'susceptibility' are terms in common usage for which the dictionary definitions are appropriate in the context of the SPP.</li> <li>Amend footnote to "p13".</li> <li>Add reference to A9.6 instead as this appears to be a general reference rather than an example of a landslide hazard assessment technique.</li> </ul>	
49	Mr Russell Cuerel Principle Policy Officer Water Use Department of Natural Resources and Mines GPO (State Government)	<ul> <li>Dam safety group and Burean of Meteurology consider need to emphasis managing dev. within 1 in 100 year flood "line" does not eliminate flood all risk and that significantly larger floods can occur.</li> <li>Considers description of "development commitment" confusing. Maybe add words like 'when there is a dev. commitment because of a zoning etc., but actual dev. requires further approvals, there should only be given where lower than existing risk etc.</li> </ul>	This is already noted in the definition of NHMA. No amendments required.  This definition should be clarified and simplified.	Y
		<ul> <li>Format: Need concise SPP scope statement. No heading in SPP on scope of SPP. Scope dealt with under 'The Need to Mitigate the Adverso Impacts of NHs" - too long, not clear statement of scope of SPP. More logical to refer first to planning schemes then DA, under 'Application of Policy' section.</li> <li>Questioned Outcome 1 - 'and it would have a lower risk in the vicinity'. Development commitment includes development with a valid development approval. This means SPP applies when committed development does not have a lower risk than development in the vicinity, in spite of having a valid approval seems to run counter to normal principles of administrative law regarding lawfulness of decisions made prior to when a new law is promulgated.</li> </ul>	<ul> <li>The title of the SPP is to be changed to clarify that it addresses flood, bushfire and landslide hazard. 'Application of Policy' section consistent with format of SPP, which addresses development assessment first, then preparation of planning schemes.</li> <li>Noted. Outcome 1 is to be amended to remove the requirement for a lower level of risk, and the definition of 'development commitment' will be amended to clarify.</li> </ul>	
		<ul> <li>Climate Change (CC) (p.23) - Inappropriate for SPP to suggest that LG form a view about their local area in relation to risks from CC when State has no agreed position. This may weaken position by LG in the P&amp;E Court where a decision on a dev. application based on precautionary approach to CC is being defended.</li> <li>Roles/responsibilities of LG. Questioned why role of regional planning not considered - NHs extend well beyond LG boundaries. Recommend SPP include</li> </ul>	The reference to "no State position on climate change" will be removed.  SPP operates through planning schemes and IDAS under IPA. SPPs are considered in any regional planning mechanisms as part of State interest.	

Sub No.	Submitter Details	Issues		Analysis and Recommended Response	Support for SPP
		section on relevance to regional land use plans.  Role of State Agencies - SPP focused on role of LG in planning process - appropriate due to responsibility of LGs under IPA. SPP should also acknowledge State agencies' important role in land use planning aspects of NDM, including:  Areal extent of natural disaster issues - beyond LG boundaries.  Expertise/traditional role of State agencies on management of natural disasters.  Traditional role of State agencies to mitigation, particularly in relation to information to back up any planning measures.  Expectation by LG of the prominent role to be adopted by State agencies.  Concern - should not be ambiguity of role of local government and State in relation to natural disaster mitigation. Should also recognise role of State agencies and regional planning.	•	SPP operates under IPA and deals with land use planning and development assessment. The various roles and responsibilities of State agencies are outlined in Section 8 of the Guideline. No amendments required.  See above. No amendments required.	Yes/No/?
50	President Gold Coast and Hinterland Environment Council 139 Duringan street CURRUMBIN QLD 4223 (Community)	<ul> <li>The submitter is concerned that the SPP does not "properly protect the environment in all its aspects from the impact of dev. in or near disaster prone areas". The submission proposes a number of amendments including the addition of two new appendices (Conserving Nature and Landscapes) as well as significant number of specific amendments that are nearly all directed at protecting environmental values.</li> <li>Appendix 8 - Includes a comparison of methods of calculating slope and suggests that 28% of the land shown in the map is steeper than 15%.</li> </ul>	•	Propose to add new text clarifying that the SPP does not support hazard mitigation works that would result in unacceptable impacts on environmental or amenity values. It would not be appropriate to add PC and IoC or lots of new text about this issue as they are not directly related to hazard mitigation and would be more appropriately addressed under other measures.  Not sure what the point of this is. Appears to confuse 15% as per the SPP	2
51	Solicitor Freehills Level 38, Central Plaza One Brisbane QLD 4000 (Consultant)	<ul> <li>SPP is based upon sound principle of discouraging dev. that might otherwise increase threat to life and property on account of bushfire, flood and landslide.</li> <li>SPP an appropriate mechanism for managing dev. that could be affected by natural hazards of bushfire, flood and landslide.</li> <li>SPP will place an important check in development assessment regime of Queensland.</li> <li>Support SPP.</li> <li>Submitted changes that could be made to IPA requiring local governments to notify whether property is in a NHMA on Planning and Development Certificates.</li> <li>Duty to consider impacts of SPP – Government to consider SPP impact upon the development regime of Queensland. SPP encourages cooperation between local governments and state departments.</li> </ul>	•	Noted.  Noted.  Noted.  Noted.  Noted.  DLGP to consider suggested changes to IPA made in submission. No amendment to the SPP.  Noted.	Y
52	132 Valley Drive TALLEBUDGERA QLD 4228 (Community)	<ul> <li>Submitter is a Gold Coast developer who has had a development application refused by Gold CC Council on grounds including landslide and bushfire risk which he claims independent assessment have shown to be unreasonable.</li> <li>SPP increases red tap but doesn't solve problem. NHs should be addressed through regional planning and providing adequate resources other than making individual dev. applications carry the burden.</li> <li>QFRS Bushfire Risk Analysis maps are too broad and even though the SPP allows for "ground truthing", they will exclude areas that are suitable for dev. Most bushfire risk areas are National Parks and other Government reserves so the SPP should be directed at Government rather than individual developers.</li> <li>Landslide is not a major bazard (37 fatal landslides since 1842 with 83 fatalities) and should not be assessed through dev. applications but through the SBR (engineering design issues).</li> <li>The 15% slope default mechanism for landslide is arbitrary, the State should fund geotechnical studies for each LG area included in SPP. Otherwise because of local</li> </ul>	•	Noted.  The SPP's preferred approach is for NH matters to be addressed comprehensively in planning schemes. The development assessment provisions of the SPP will only be relevant until this occurs. No amendments required.  As submitter notes the QFRS maps are the default mechanism. The preferred approach is to identify the NHMA (bushfire) through a comprehensive analysis. This will occur progressively as planning schemes are made and amended. No amendments required. In addition to loss of life, landslides can cause considerable property damage and distress. DLGP has investigated addressing landslide through the SBR and found that this approach is not feasible at present. No amendments required.  LGs will undertake geotechnical studies when preparing planning schemes. Over time the 15% default will be absented out.	N
			•	and found that this approach is not feasible at present. No amendments required.	

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Sub No.	Submitter Details	Issues	Analysis and Recommended Response for	Ipport r SPP s/No/?
		<ul> <li>Outcome 1 requires development to be "compatible with the nature of the natural hazard". How can this be assessed without definition and appropriate criterion.</li> <li>What is the point of Outcome 2, which applies only when development "is otherwise consistent with Outcome 1", when Outcome 1 requires development to be compatible.</li> </ul>	<ul> <li>Performance criteria and indicators of compatibility are in the Guideline. It is proposed to move the PC (to be called specific outcomes) into the SPP. This should clarify the issue.</li> <li>Outcome 2 applies to development that meets either of the exceptions to Outcome 1 (ie. development commitment or overriding need). This is explained in Guideline, Figure 2 and accompanying text. No amendments</li> </ul>	evini s
-		<ul> <li>Outcome 5 and para 7.7 almost prevent any development in NHMAs. What is the point of consultants' reports and mitigation measures if determining appropriate levels of safety lie with the assessment manager.</li> <li>Concern that the SPP will add to the proliferation of codes that in combination will prevent any development from occurring by adding to the cost and uncertainty of</li> </ul>	These issues are related to making and amending planning schemes that are naturally the responsibility of local government. No amendments required.  The SPP uses the planning scheme measures and IDAS process set out in the IPA. The draft Gold Coast planning scheme already includes codes dealing	
53	Caims City Conneil PO Box Caims QLD (Local Government)	development applications.  Supports the SPP with following specific comments:  QFRS should become a referral agency for development applications.  Indicators of Compatibility require preparation of reports. This is contrary to advice from DLGP that states requesting reports cannot be considered an acceptable measure.	With flood, bushfire and landslide. No amendments required.     Noted.     This matter is currently under consideration. DES may become an Advice Agency for development in NHMA for bushfire.     The requirement for technical reports will be removed from the Indicators (to be referred to as Probable Solutions) and incorporated as advice notes	Y
54	Bundaberg District Office Queensland Police Service PO Box 1214 BUNDABERG OLD 4670 (SG)	No comments.	only in Appendix 5  No amendments required.	Y
	Manager City Planning Urban Management Division Brisbane City Council GPO Box 1434 BRISBANE QLD 4001 (Local Government)	<ul> <li>Council considers SPP is very important and is confident that Brisbane City Plan 2000 already incorporates the principles. Council will further address land stability and bushfire hazard when preparing local plans for emerging community areas.</li> <li>Para 6.20 – need to define "habitable" and "non-habitable" floor levels.</li> <li>Para 7.10 – Council does not support extensive parking areas or low density residential uses in floodway or drainage corridors.</li> <li>Glossary – the terms 'flood', 'floodway' and 'floodplain' do not take into account the issues of overland flow paths and pipe overflow paths that are common in urban areas. Provision should be made for a definition of "local flooding" which includes these concepts.</li> <li>Appendix 2 (p 46) – clarify whether flood hazard mapping requires depiction of both the ARI flood line and design flood line or if they can be substituted for one another.</li> </ul>	<ul> <li>Noted.</li> <li>The term 'habitable rooms' is defined in the BCA. This will be clarified in the SPP.</li> <li>Delete reference to extensive parking areas, but retain existing reference to low density residential (ie. " or even low density residential uses with appropriate safeguards".</li> <li>Agree, amend the definition of flooding to exclude local drainage issues by linking it to watercourses.</li> <li>Appendix 5 will provide more advice on devising detailed planning scheme measures, and will clarify that only the natural hazard management area needs to be mapped.</li> </ul>	
	Infrastructure Projects and Land Management, Department of State Development (SG)	Advises that DSD has no State Interest issues on the draft SPP.		Y
57	Burdekin Shire Council Per email (Local Government)	<ul> <li>Supports the objective of the SPP but concerned that it shifts responsibility for a State issue from State to local government without transfer of adequate resources.</li> <li>Requires further clarification of "as far as practicable" and "unacceptable risk" especially since Council's decisions may be subject to appeal.</li> <li>Suggests that the SPP should include a suite of generic strategies and measures that individual LGs could adjust for their particular circumstance.</li> <li>Suggests that the State government should provide information to enable implementation of the policy in particular. OFRS should ground truth the fire hazard</li> </ul>	Local Governments are primarily responsible for planning schemes and DA under IDAS.     These will be further clarified.      Further guidance on reflecting the PC and IoC in planning scheme measures will be provided.      Some of these matters need to be addressed at the local level. Funding support is provided through the NDRMSP. No amendments required.	N

Sub No.	Submitter Details	Issues		Analysis and Recommended Response	Support for SPP Yes/No/?
		maps as BSC and many other Councils do not have the skills or resources. State Government should provide flood immdation maps for areas not covered under current flood mitigation studies in their area.  Questions the ability of State agencies to provide advice about reflecting the SPP in PSs especially as DLGP has advised them that it cannot provide interpretation of legislation/regulation, and that Council should not rely on any advice given. Will future advice be able to be relied upon in a Court of Law as an authoritative	•	DES is providing advice on the draft SPP already. No amendments required.	
58	Queensland State Archives	<ul> <li>interpretation of the SPP and the operation of IDAS.</li> <li>Many questions about Council's legal liability e.g.:         <ul> <li>For landslide purposes can Council rely on the certification of a properly qualified person and what qualifications should that person have?</li> <li>If Council does not advise a builder/owner of an identified bushfire hazard, is Council liable for any subsequent losses?</li> </ul> </li> <li>If Council selects a lesser return period than 1:100 ARI, would it be liable for any subsequent losses?</li> </ul>	•	Local governments can manage legal risk by taking appropriate care when identifying natural hazards, assessing development applications and providing advice. The SPP and Guideline may assist local governments to demonstrate that their actions were reasonable and appropriate. Local governments may still be liable if they make errors, omissions or negligent statements. This risk could exist regardless of the SPP. A number of other local governments have expressed support for the SPP. No amendments required.	
30	PO Box 1397 SUNNYBANK HILLS QLD 4109 (State Government)	<ul> <li>Annex 1 (b) should include "storage of public records under the Public records Act 2002"</li> <li>Appendix 7A – Include stores of public records in the Recommended Flood Levels table with an ARI of 1:200.</li> </ul>	•	Agree, amend as proposed  Agree, amend as proposed	<b>Y</b> 1
	Manager Strategic and Environmental Planning Gold Coast City Council (Local Government)	<ul> <li>Comments are limited specifically to flood events and reflect experiences in developing and implementing GCCC floodplain management strategy.</li> <li>Definition of 'floodplain' - PMF varies significantly from location to location and debate exists as to what constitutes a PMF. Suggest that the floodplain should be defined as per the term "Rare" or "Extreme" floods as outlined in the latest revision of Australian Rainfall and Runoff (ARR, 2000) outlines application under the PS.</li> <li>No recommendations for the 'NHMA'.</li> <li>SPP does not require a LG to adopt a flood event within a specified timeframe, until such time the SPP does not come into effect. Proactive local governments with adequate funding likely develop floodplain management strategies in the absence of SPP. SPP needs to make provision to encourage remaining local governments to adopt a flood event within specified timeframes. Emphasis needs to placed on assessing flood hazard and risk from the specified event.</li> <li>Mapping, 'where practicable' suggested limited support for publicly available flood maps. Guidelines refer to 'IPA Plan Making Guidelines 1/01'. This issue more specifically addressed in SFRMP Discussion Paper where publicly available flood maps are proposed as one means of enhancing flood information. If becomes a requirement of SPP, legal protection may be secured for local governments.</li> <li>Defining 'flood' if the definition recognised the temporary nature of water coverage in areas not normally covered, may avoid confusion with, eg. newly created waterbodies.</li> </ul>	•	Noted.  The definition is that used in the SCARM Report 73 "Floodplain management in Australia – Best Practice Principles and Guidelines" published in 2000. No amendments required.  Noted. No amendments required.  Local governments will be required to identify NHMAs and include suitable measures when making and amending planning schemes. This effectively introduces an 8 year (under IPOLA) timeframe. Pro-active local governments will have addressed already or by way of amendment within the 8 year period. No amendments required.  Agree that it would be preferable to require NHMAs to be mapped. This will be clarified in the final SPP.	¥
		<ul> <li>Floodplain Management Study (Appendix 2, A2.33) includes ' adoption of a flood mitigation program'. More appropriate to include the 'recommendation of a flood mitigation plan' with subsequent dev. of a flood mitigation program approved by Council – requires detailed technical investigations should be considered by community. Is there are need to make a statement about future reviews of flood management study &amp; its effectiveness in achieving its stated goals?</li> <li>Outcome 2 – unacceptable risk is to be determined by the community. This should form part of the progressive development of a flood management plan and future</li> </ul>	•	The issue of Council approval is a procedural matter which is captured by the existing words (i.e. "adoption of"). The need for periodic reviews is already addressed in para A2.43. No amendments required.  Noted. This is the most desirable approach, however it is intended to provide more guidance on "unacceptable risk".	

ub lo.	Submitter Details		Issues		Analysis and Recommended Response	Support for SPP Yes/No/
		•	Assessing compatibility of dev. in NHMA – questioned loC 1.1 – 'does not result in a material increase" - this would require a significant conceptual change to the approach adopted by GCCC and likely to be subject to legal challenge based on previous legal decisions. GCCC dev. assessment process focuses on assessing the outcomes and impacts of proposed developments rather than a blanket approach that rejects dev. in that area.	•	This is a misinterpretation, as there is an alternative IoC 1.2 which gives the opportunity for the preparation of a flood assessment report to demonstrate compliance with PC 1. No amendments required.	resinior
	:	•	PC2, 2.1 – flood storage capacity through importation of fill. Only triggered if it affects > 10 cubic metres of soil. Seems to ignore adverse cumulative effects likely to result in an extensive developing area or in a particularly sensitive floodplain.	•	Propose to amend the threshold to 50m³ but provide the flexibility for local governments to use a lower threshold if appropriate for the flood characteristics of a particular locality. With this flexibility GCCC can tailor the assessment trigger to meet its specific requirements.	
	į į	•	PC - community infrastructure identifies a RFL of 1:500 ARI for "stores of valuable records" May require amendments to existing or draft planning schemes (GCCC)	•	Based on the State Archives submission (58), the RFL should be amended to 1-200 ARL	
		•	but does not apply to external areas which impact on NHMAs. Other planning codes must be developed to adequately address the interrelationships between these areas.	•	This interpretation is correct, and suitable measures to achieve this are required under Outcome 5 of the SPP.	
	Officer	•	Storm surge should be addressed under the SPP so that it is a consolidated document dealing with all major natural hazards.	•	See previous responses, No amendments required.	?
	Townsville City Council (Local Government)	•	Concerned about the adoption of the 1:100 ARI flood with little assessment of the consequences of larger or lesser floods. If the State wishes to impose this position on local governments it should undertake the necessary studies throughout the State to justify the position. Acknowledges flexibility but thinks it unreasonable that LG should have to justify their position.	•	The alternative would be for the State to all the work and justify its position to local governments which, although it would result in less work for local governments, is quite impractical. State and Commonwealth funding assistance will be provided for the necessary studies under the NDRMSP. No amendments required.	
		•	Appendix 5A Flood, PC 1 requires that "development does not compromise the safety of people". A definition for compromising safety is required.	•	The associated IoC's provide guidance in interpreting the PC.	
		•	Appendix 5A, IoC 3.2 requires that dev. should not concentrate flood flows nor pound waters. Stormwater infrastructure (pipes, open drains, detention basins) concentrate and pond waters. Clarification is required.	•	This concern should be overcome by the proposed amendment to the definition of flood to relate only to flooding associated with watercourses.	
!	it	•		•	Amend to require an emergency rescue area for specified types of community infrastructure instead of the evacuation access roads requirement which is unworkable as pointed out in other submissions.	·
,		•	Why doesn't the SPP apply to schools?	•	Because they are not considered critical infrastructure that should continue to function in the event of a natural disaster. For the same reason it is proposed to remove "nursing homes, aged care and child care facilities" from the RFL table in Appendix 7A.	
;		•	Outcome I — considers the requirement for a development commitment to have "a lower level of risk than generally applies in the vicinity" is too onerous because although a development may have the same or higher level of risk that level may still be acceptable.	•	Agree, it is proposed to remove the lower level of risk requirement from Outcome 1.	
	Director Policy and Research Local Government Association of Queensland PO Box 2230	•	Expresses concern at requirement to undertake additional studies at a cost to local government. Suggests that individual local government capacity & resource constraints need to be considered, & proposes following specific amendments & notes further amendments throughout document would be required to achieve a			¥
	Fortitude Valley QLD 4006 (Peak industry)		<ul> <li>consistent approach to the issue:</li> <li>Annex 3, A3.2 – add the underlined words " that the proposed DFE is appropriate to the circumstances of their locality including capacity and resourcing constraints"; also amend Guideline, para 7.2 – "the variation in scope should depend on the capacity and resourcing constraints of the local government.</li> </ul>	•	It is probably better to confine interpretative advice of this nature to the Guideline. Para A2.13 already says that "flood studies should be tailored to meet the needs and resources of local governments", but will also add the suggested text to Guideline para 7.2 to clarify.	

Sub No.	Submitter Details	Issues		Analysis and Recommended Response	Support for SPP Yes/No/?
		size and distribution of the population"  • Annex 3, A3.2 – Situation where a LG is seeking to improve existing level of flood protection but is unable to map the 1:100 ARI should be noted and accepted within this section.	•	This situation is covered within the expression "the circumstances of particular localities". No amendments required.	
		<ul> <li>Considers that Councils in the process of finalising their IPA schemes should not be required to do any additional work to reflect the draft SPP.</li> </ul>	•	This depends on whether or not Council had previously been advised (e.g. at Statement of Proposals stage) to map their credible natural hazards. No amendments required.	
		<ul> <li>Proposed guidelines on storm tide inundation under SCMP should be consistent with SPP and Guideline.</li> </ul>	•	Noted. No amendments required.	
		<ul> <li>Supports the limitation of the SPP to flood, bushfire and landslide, but notes that the issue of whether dam break flooding is included in the SPP requires clarification.</li> </ul>	•	Noted, it is proposed to exclude dam break from the definition of flood for the SPP.	<u> </u>
	,	<ul> <li>Suggests SPP should clarify whether it applies to self-assessable activity under the SBR such as fill associated with building works in NHMAs.</li> </ul>	•	The SPP cannot apply to any self-assessable development, as no development permit is required. Self-assessable filling associated with building work has to be addressed through the SBR. No amendments required.	
		Notes SPP will require a significant resource commitment from DES, & a program for the education, implementation & support of SPP must accompany its finalisation.	•	Noted. No amendments required.	i
	Di i	DPI supports the preparation of SPP 'in principle'.	•	Noted	Y
	Director-General Department of Primary Industries GPO Box 944	<ul> <li>DPI Forestry has a strong interest in proposed SPP. DPI Forestry is responsible for the management and protection of Crown Plantations and marketing of Crown native forests.</li> </ul>	•	Noted.	] - ;
	BRISBANE QLD 4001 (State Government)	<ul> <li>Applands initiative to prepare SPP that addresses these issues by appropriate land buffers &amp; other town planning measures.</li> </ul>	•	Noted. No amendments required.	
	Queensland Fire and Rescue Services, DES (State Government)	<ul> <li>A3.15 – suggests following material to be added under Table 2: "For site specific assessment of a particular development on a slope, if the development is downhill from the hazard, the slope effect may be taken as zero as the fir intensity will be less. On steep slopes burning heavy fuels may roll downhill, and trees may burn down, so setbacks from the hazard still need to be observed."</li> </ul>	•	Add additional material as requested.	Y
		<ul> <li>Appendix 5B, IoC 6.1 after 2000, add "and, where lot size allows, have the minimum setbacks described in 6.2".</li> </ul>	•	Amend to incorporate this requirement.	i
		<ul> <li>Appendix 5B, section 2 add "AND 2.4 Buildings and other permanent structures have the following minimum setbacks from hazardous vegetation: (a) 1.5 times the predominant mature canopy tree height in any adjoining bushfire hazard vegetation; AND (b) 5 metres from any retained vegetation strips or small areas within</li> </ul>	•	Amend IoC's as required.	
64		individual lots".			<u> </u>
	Director-General Department of Housing	<ul> <li>Supports efforts to improve planning &amp; management of NDM through measures proposed in SPP.</li> <li>Supports SPP purpose in providing consistency across the State in land use planning</li> </ul>	•	Noted.	Y
	GPO Box 690 BRISBANE QLD 4001	& improve decision-making to mitigate the adverse impacts of NH upon dev.  Supports provisions that may apply to future siting & design of housing if it involves		Noted.	
<b> </b>	(State Government)	increasing densities of residential dev. in NHMAs.  Supports approaches to bushfire and landslide.	•	Noted.	;
		Supports intention and content of Guideline.	•	Noted.	:
	General Manager, Health Services Queensland Health GPO Box 48 BRISBANE QLD 4001 (State Government)	Generally supports SPP and provide the following comments.     Jericho Shire appears in A2.1 Bushfire but not in A2.3 Landslide. Slopes in Jericho are of sufficient gradient to place people and property at risk from landslide – warrants the inclusion of Jericho Shire in A2.3.	•	Noted.  The selection of local government areas to be included for landslide purposes was based on an assessment of areas with slopes greater than 15%. Jericho Shire has virtually nil areas in this category. Jericho Shire could include appropriate measures in its scheme to address landslide as a local	Y
,	(Sizic Government)	o CQ Power maintains a Gas Fired Power Station in Barcaldine SC and has the		rather than State issue. No amendments required.  Local governments are selected based on an assessment of bushfire hazard	

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Sub No.	Submitter Details	Issues	Analysis and Recommended Response Support for SPP Yes/No/?
		capability of supplying power to the entire Central West in an emergency.  Barcaldine SC is not included in A2.1 Bushfire. Bushfire hazard to this facility could be considered of State significance warranting Barcaldine SC's inclusion in A2.1 Bushfire.	associated with physical properties of vegetation, slope and aspect. The nature of existing, proposed or possible future development is not a relevant factor. No amendments required.
		o Community based risk assessment and establishing a community's risk threshold is mentioned under section 6.35 — Queensland Health is interested in what guidance is available to communities to establish a community's risk threshold.	DES provides advice on this matter through other mechanisms (eg. the 'Red Book'). No amendments required required.
	Acting CEO Maroochy Shire Council PO Box 76 Nambour Q 4560	<ul> <li>Provides in-principle support for the draft SPP &amp; Guideline and identifies a number of technical discrepancies between the drafts and the Maroochy planning scheme measures. The key differences where amendments to the SPP are suggested are as follows:</li> </ul>	Noted, no amendments required.  Y
	(Local Government)	<ul> <li>IoC 2.1 refers to fill greater than 10 cubic metres. Maroochy planning scheme uses 50 cubic metres as the threshold for defining assessable operational works.</li> </ul>	<ul> <li>Propose that 50 cubic metres be adopted in the SPP as minimum threshold for assessment purposes but make it clear that local governments can use lower thresholds if appropriate to the flood characteristics of their area. This approach will also address the Gold Coast City Council's concern that 10m³ was too high a threshold.</li> </ul>
		<ul> <li>IoC 3.1 allows car parks and storage areas below the DFE. Maroochy requires all floors (and openings to basement car parks) to be above the 1:100 ARI with freeboard.</li> </ul>	<ul> <li>This requirement is too onerous to be applied on a State-wide basis without detailed knowledge of local conditions.</li> </ul>
		<ul> <li>IoC 4.1 and 4.2 allow public infrastructure to be flood-prone. Maroochy PS requires electrical and mechanical infrastructure to be above the 1:100 ARI flood.</li> </ul>	<ul> <li>The SPP requires infrastructure to be designed and located to exclude floodwater intrusion/infiltration and to resist hydrastatic and hydrodynamic forces associated with the DFR. This will achieve the desired outcome without being specific about locational requirements and remains the preferred approach.</li> </ul>
	;	<ul> <li>Appendix 7 - Flood level information for the 200 and 500 ARI flood events used as Recommended Flood Levels for community infrastructure is not available and would require considerable work to establish. Maroochy planning scheme uses increased freeboard requirements for community infrastructure.</li> </ul>	Amend Appendix 7 to recognise and allow this alternative approach.
	i.	<ul> <li>Appendix 5 - The use of the term development may be interpreted as the development being assessed not cumulative impacts of similar development in the balance of the catchment and on the floodplain. Suggest that all PC be redrafted such that the cumulative effects of similar development within the whole of the catchment and on the floodplain must be addressed.</li> </ul>	<ul> <li>The term "development" does refer to the particular development proposal being assessed. It can only work that way, through assessment of individual applications. The cumulative impacts are assessed under PC 2.</li> </ul>
		<ul> <li>IoC 1.1, dot point 3 does not address cumulative impact. Redraft to include.</li> <li>IoC 1.1, dot point 4 includes a note guiding compliance. The status of the note is uncertain. Suggest redraft to include the contents of the note.</li> </ul>	The cumulative impacts are addressed under PC2. No amendment is required.  Amend as suggested.
		loC 1.2 seems redundant because if 1.1 is not met then the proponent needs to demonstrate that PC 1 is satisfied in any case.	<ul> <li>IoC 1.2 aids understanding of the requirements and should be retained.</li> </ul>
		<ul> <li>PC 2 refers to hazard increase but does not identify how it is measured. For example it could be argued that a development that does not escalate the flood hazard category in A2.30 complies, while the hazard factors (A2.27) may be increased. Suggest PC 2 be redrafted to reference the factors of flood hazard rather than the flood hazard per se.</li> </ul>	<ul> <li>The factors of flood hazard are included in IoC 2.3.1 and 2.3.2. No amendment required.</li> </ul>
		<ul> <li>IoC 2.1 – requires clarification by redrafting to state that developments involving less than 10 cubic metres of earthworks are deemed to comply (if this is what was intended)</li> </ul>	Agree, see second dot point this submission above.
L		<ul> <li>IoC 2.3.3 includes a note guiding compliance. The status of the note is uncertain in</li> </ul>	Agree, redraft to include the note in the IoC.

Sub Submitter Details No.	Issues	Analysis and Recommended Response Support for SPP
	law so redraft to include the note in IoC 2.3 before the sub-paragraphs.  Bushfire  IoC 1.2.2 Development does not involve any new building work other than a minor extension (<20 square metres) to an existing building. Maroochy planning scheme excludes detached house, caretakers residence and display home including outbuildings and structures. Submitter suggests that Maroochy PS could be amended to comply but we should consider their approach.  IoC 4.1 – The SPP distinguishes between residential and non-residential lots whereas Maroochy PS does not.  Landslide  Maroochy PS includes additional requirements relating to density and form, and siting and design of buildings. Suggests that the SPP should also address these issues.	Given that much of the bushfire risk is related to detacted dwellings it seems inappropriate to exclude them from the application of the SPP and/or code. The preferred approach is for detached dwellings on existing lots to be able to be made self assessable. This is a matter for individual planning schemes, amend Appendix 5 to ensure this is feasible under the SPP.      Changes proposed by QFRS (see submission 63) will result in residential and non-residential development being treated similarly in the SPP.  These additional requirements are related to the visual amenity aspects of development on steep land and are not appropriate for inclusion in this SPP.
Under Treasurer Queensland Treasury GPO Box 611 BRISBANE QLD 4001 (State Government)	<ul> <li>SPP is an important contribution towards the State arrangements for making decisions about dev. in natural hazard prone areas and as a means of mitigating the impacts of natural disasters. Policy document is comprehensive and I congratulate you and your staff for the effort in developing SPP. Queensland Treasury has no major concerns.</li> <li>Views/comments – for improving understanding/implementation:         <ul> <li>References - somewhat complicated, often referring reader to an Annex and/or Appendix. Cross-references should be clearer and minimise need for moving from one part of the document to another and from SPP to G.</li> <li>Development applications already required to comply with guidelines &amp; processes under IPA. SPP is comprehensive &amp; may result in increased time/costs (eg. assessment time &amp; compliance).</li> </ul> </li> <li>Compare policies/guidelines developed by other States in response to 1998 changes made to Commonwealth guidelines for NDRA funding to determine whether there is scope for the requirements of the document to be streamlined.</li> <li>Para 1.1 – Purpose of the Policy – rational behind SPP not clear. Page 23 of SPPG – states 1998 changes to Commonwealth Guidelines for NDRA funding – ougoing financial assistance from Commonwealth is linked to evidence of mitigation for likely or recurring natural disasters or a commitment to develop &amp; implement such a strategy within a reasonable timeframe. SFP should refer to this requirement as well as provide any other reasons for the SPP.</li> <li>Para 6.4 – Identifying NHMA and severity of hazard (p4) – NHMA (flood) dependent on local government adopting a flood event for management of development. Possible for some local governments not to adopt a flood event &amp; avoid complying with SPP – may create inequities/inconsistencies in implementing SPP. Should be some arrangements to specify appropriate time lines for local governments to adopt flood events.</li> <li>SPPG, para 4.8 C</li></ul>	<ul> <li>Noted.</li> <li>Proposed amendments to SPP and Guideline should clarify cross-referencing. Incorporating the PC as an Annex to the SPP should also assist.</li> <li>Noted. Most larger local governments (e.g. Brisbane, Gold Coast, Maroochy) already address natural bazards in their planning schemes. The SPP is formalising and encouraging a consistent approach to dealing with natural hazards in development assessment processes. No change required.</li> <li>Noted. Queensland is leading this work. Emergency Management Australia has indicated support for the approach and that the SPP will provide a model for other States/Territories.</li> <li>Noted. DLGP requires that the SPP be kept brief and that supporting information of this nature be provided in the Guideline.</li> <li>Due to the complex nature of flood hazard and the lack of reliable Statewide information, it was not possible to set a default NHMA for flood. However, local governments will be required to adopt DFE's for flood risk management purposes when making or amending planning schemes. This effectively means that all relevant areas should be identified within 8 years. There are no other suitable mechanisms available. No amendments required.</li> <li>Noted. Wording of para 4.8 to be amended to clarify.</li> </ul>

Sub No.	Submitter Details	Issues	Analysis and Recommended Response	Support for SPP
		significant effects on Queensland, such as reductions in annual rainfall, increased risk of bushfire and increased flood risk, it may be useful to draw on this information to develop a State position on the anticipated effects of climate change so that this can be taken into consideration in fiture planning both for business and government.  O Eg. 2001 – QG released the direction statement — Queensland Greenhouse Policy Framework: A Climate of Change — detailed list of potential climate change impacts on Queensland and emphasised the vision for QLD to be able to adapt to climate change. Queensland Government Strategy, the Queensland Energy Policy — A Cleaner Energy Strategy and a vegetation management framework.  O SPPG — para 6.23 to 6.28 — Overriding Need — needs further clarification. Eg. does a developer need to undertake some formal cost-benefit analysis and if so how should the developer set about it? SPPG should provide some general details/guidelines for conducting such analysis with aim of ensuring consistency across application of SPP.	the anticipated effects of climate change is up to EPA. The SPP is not the mechanism to establish a State position on climate change impacts. No amendments required.  Noted. First reference is listed in Appendix 9. The energy strategy and vegetation management framework are not directly relevant to the SPP. No amendments required.  SPP Guideline sets out a process to determine overriding need (see paras 6.23 to 6.29). This approach has been used before to good effect in other SPPs. No amendments required.	Yes/No/?
	Director-General Department of Public Works GPO Box 2457 BRISBANE QLD 4001 (State Government)	<ul> <li>DPW supports the intent and policy direction of the SPP &amp;G.</li> <li>Capital Works Management Framework (CWMF) requires all agencies to identify and evaluate all risks pertaining to a site and at all stages of the capital works delivery process. This includes assessment of the effects of natural disasters and the inclusion in the project proposal of plans to address any risk involved. Subsequent to approval of the SPP, DWP will examine the CWMF with a view to including specific reference to the requirements of the SPP.</li> </ul>	Noted. Noted.	Y

#### Government Advisory Committee Meeting Minutes 29 July 2001

Queensland Government	Nominated Representativ	/e	Attendee
Agency			
Department of Main Roads			
Environmental Protection Agency			
Department of Premier and			
Cabinet	i		
Department of Local Government			
and Planning			
Department of Natural Resources			Russell Cuerel
and Mines			
Department of State			
Development			
Queensland Transport			
Department of Public Works			
Queensland Fire and Rescue			
Authority			
Strategic Management and			
Policy, Department of Emergency			
Services			
Disaster Mitigation Unit			
Disaster Mitigation Unit			
		•	

Agenda Item 1: Welcome

Lesley Galloway, Director Disaster Mitigation Unit, welcomed and thanked attendees and outlined the importance of developing a State Planning Policy for Land Use Planning for Natural Disaster Mitigation and Development Assessment. Lesley welcomed the involvement of State Departments with an interest in land use planning and management or development.

Discussion: There was no discussion on this agenda item

Action: No action required.

#### Agenda Item 2: Background on the State Planning Policy

Faye Smith outlined the rationale, purpose, scope, limitations, and administration of the State Planning Policy and outlined the perceived stakeholders, consultation processes, progress, next steps and timeframes. A copy of Faye's presentation is attached.

Discussion: There was no discussion on this agenda item

Action: No action required.

#### Agenda Item 3: Existing Support to Local Government

Lesley Galloway provided a context for the development of the State Planning Policy. Lesley explained changes in:

- (a) The insurance industry which link hazard risks with financial risks and place an importance on flood mapping and flood mitigation efforts
- (b) Natural Disaster Relief Arrangements (NDRA) funding (Commonwealth funding) which link receipt of Commonwealth NDRA funding to evidence of mitigation for funding eligible recurrent or predictable natural disasters

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(c) Reduced 'trigger' points for Local Governments with a small rate base to receive Queensland Government funding under NDRA if mitigation studies are in place.

Lesley explained the role and purpose of two funding programs available to Local Government:

(a) Natural Disaster Risk Management Studies Program (NDRMSP), and

(b) Regional Flood Mitigation Program (RFMP).

Lesley stated that these two programs, funded equally by the Commonwealth, Queensland, and funded Local Governments, provided resources which are available to assist Local Governments identify the natural disaster risks for their areas and to assist Local Governments fund flood mitigation capital works.

The NDRMSP provides ongoing funding to Local Governments. The Department of Emergency Services will target specific Local Governments in the next funding round to encourage them to apply for funding. Currently 89 studies have been funded under this program.

The RFMP will provide funds for the next four years.

Faye provided printed information on both these programs as well as spreadsheet information on which Local Governments have been funded under both these programs for specific studies or capital works.

**Discussion**: There was discussion about the role and charter of the Office of Community Engagement in the Department of Premier and Cabinet. Kylie Cooper stated that the charter was being developed.

Action: Attendees will read provided information on NDRMSP and RFMP prior to the focus workshop on 5 July so that they are aware of funding sources for Local Governments which will assist them identify natural Disaster Risks in their area and mitigate floods.

#### Agenda Item 4 Membership of the Government Advisory Committee

Lesley Galloway outlined the membership of the Government Advisory Committee, explaining that it involved State Government agencies with responsibility for land use planning or management, or development.

Discussion:

There was no discussion on this topic

Action:

No action required.

#### Agenda Item 5 Purpose / role of the Government Advisory Committee

Faye Smith provided attendees with a statement of the objectives and membership of the Government Advisory Committee.

Discussion:

There was no discussion on this topic.

Action:

No action required.

#### Agenda Item 6: Questions

Attendees were given the opportunity to ask questions and raise issues.

#### Discussion:

There was general discussion about:

- (a) whether or not a State Planning Policy was the best tool to achieve the outcomes desired by the Department of Emergency Services
- (b) the usefulness of a 'mapping' exercise to place the State Planning Policy in context eg existing legislation and planning policies

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- (c) the possibility of flood mitigation legislation and its links with this State Planning Policy
- (d) a review of the State Counter Disaster Organisation Act
- (e) the scope of the State Planning Policy, and
- (f) the role of State Interest Policies.

The development of a State Planning Policy was supported and it was acknowledged that other mechanisms / tools may be appropriate to ensure that the desired outcomes are achieved.

Action: Agencies to email to Faye Smith by 2 July appropriate legislation, policies etc to be 'mapped' for the development of the State Planning Policy.

#### Agenda Item 7: Next meeting

It was agreed that the next meeting will be between 1 and 3 pm on Wednesday 25 July at the Department of Emergency Services Main Building on the corner of Park and Kedron Park "Roads in the Media Room, level 2 Block e. The purpose of this meeting will be to provide comment on the Discussion Paper concerning the development of the State Planning Policy. It was explained that the document would be circulated to attendees a few days prior to that meeting so that agencies would have the opportunity to comment at the meeting.

Discussion: There was no discussion on this agenda item

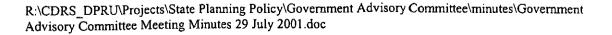
#### Action:

- 1. Faye Smith to circulate the Discussion Paper to Government Advisory Committee (GAC) representatives a few days before the next GAC meeting on 25 July 2001.
- 2. Government Advisory Committee representatives to provide comment on the Discussion Paper at the next meeting on 25 July 2001.

#### Agenda Item 8: Close

Lesley Galloway thanked participants for their input.

The meeting closed at 12.10 pm



Postal address   Executive Director, Road   Nominated representative   Postal address   Executive Director, Road   Network Management   Postal Policy Officer   Postal Polic	to attend 29/6: nvironmental Planner Wetland and Waterways mental Protection Agency fax: Cdwards rang. Said to kee uch with Russell Cuerel. be providing a response. e 2/7
Resources and Mines  Mines  Advisory Committee\members.doc	

				Manager Water Use  attend on 29/6 - permanent delegate to be appointed next week by
Department of State Development	u	PO Box 168 Brisbane Albert Street Qld 4002	Level 25 111 George St Brisbane 4000	to attend 29/6
Queensland Transport		Acting Director Service Delivery Queensland Transport GPO Box 1412 Brisbane 4001		
Department of Public Works		Manager, Capital Works Procurement Branch GPO Box 2457 Brisbane Qld 4001	Level 6A 80 George St Brisbane 4000	
Queensland Fire and Rescue Authority		QFRA Department of Emergency Services GPO Box 1425 Brisbane Qld 4001	Cnr Park and Kedron Park Roads Kedron	
Strategic Management and Policy		Director, Strategic Management and Policy Strategic and Executive Services Department of Emergency Services GPO Box 1425 Brisbane Qld 4001	Cnr Park and Kedron Park Roads Kedron	
Disaster Mitigation Unit		Director, Disaster Mitigation Unit Counter Disaster and Rescue Services Department of Emergency Services	Cnr Park and Kedron Park Roads Kedron	

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	GPO Box 1425 Brisbane Qld 4001		
Disaster Mitigation Unit	Principal Policy Officer Disaster Mitigation Unit Counter Disaster and Rescue Services Department of Emergency Services GPO Box 1425 Brisbane Qld 4001	Cnr Park and Kedron Park Roads Kedron	

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#### **Government Advisory Committee**

### State Planning Policy on Land Use Planning for Natural Disaster Mitigation and Development Assessment

Name:

Government Advisory Committee for State Planning

Policy on Land Use Planning for Natural Disaster

Mitigation and Development Assessment

Type of Committee:

Inter-agency working group comprising of Queensland

Government Departments with responsibility for

planning, land use or development

May include a representative from LGAQ from time-to-

time, as required.

**Objectives:** 

To provide strategic and practical advice to the

Department of Emergency Services at each stage of the development of the State Planning Policy and

supporting Guidelines.

To provide ongoing consistent membership to ensure

a consistent contact for involved Departments

Chair:

Director, Disaster Mitigation Unit, Counter Disaster

and Rescue Services, Department of Emergency

Services

Working Program and Timetable:

10 - 11.30 am Friday 29 July 2001

Tentative:

1 - 4 pm Wednesday 25 July to discuss Discussion

Paper

Members:

Russell Fisher

Executive Director, Road Network Management

Department of Main Roads

Michelle Walker Assistant Manager

Coastal Planning, Environmental Planning

**Environmental Protection Agency** 

#### Members (cont'd)

Principal Policy Officer
Department of the Premier and Cabinet

Senior Policy Officer
Planning Services
Department of Local Government and Planning

Manager, Strategic Planning Branch Department of State Development

Acting Director, Service Delivery Queensland Transport

Manager, Capital Works Procurement Branch Department of Public Works

Commissioner Rural Operations
Queensland Fire and Rescue Authority
Department of Emergency Services

Director, Strategic Management and Policy Strategic and Executive Services Department of Emergency Services

Director
Disaster Mitigation Unit
Counter Disaster and Rescue Services
Department of Emergency Services

Principal Policy Officer
Disaster Mitigation Unit
Counter Disaster and Rescue Services
Department of Emergency Services

To be advised Department of Natural Resources and Mines



Department of Emergency Services

## State Planning Policy

Land Use Planning for Natural Disaster Mitigation and Development

Assessment

Presentatio.

Government Advisory

Friday 29 July 2

Disaster M

### What is a State Planning Policy?

### A State Planning Policy:

- ♦ describes the position of the Queensland Government on plant and development matters of State significance, and
- ♦ is developed under the *Integrated Planning Act 1997*.

## What is the purpose of this State Planning Policy?

The purpose of this State Planning Policy is to:

- ♦ make clear the State's interest in land us planning as it relates to natural disasters
- ◆ reduce the community's vulnerability to the impacts of natural disasters,
- ◆ encourage consistency across Queensland in natural disaster mitigation management, and
- assist Local Government decision making processes concerning development applications in areas subject to natural hazards.

## Why develop this State Planning Policy?

- ◆ Queensland Government communent
  - One of the seven priorities of the Que land
     Government is safer and more supportive
     communities, including improved persona
     public safety, and
  - Funds have been dedicated over three years to fund disaster mitigation programs in the State.

- ◆ Costs of natural disasters:
  - Cost of restoration and rehabilitation has it due to:
    - population increase
    - . community having more assets, and
    - · more development in disaster prone areas.
  - In Australia, N.S.W. and Queensland accounted for:
    - . 66 per cent* of total disaster costs, and
    - . 53 per cent* of the total number of disasters.
      - * (figures are for 1967 1999)

- The average annual cost of natural disasters in Queensland was \$239.2 m between 1.7.8 1999.

Intangible costs are estimated to be at least equivalent to, but most likely substantially more than, direct and indirect costs (BTE Report 1 2001).

Commonwealth Natural Disaster Relies
 Arrangements funding

- Costs are increasing
- Guidelines link ongoing financial assistance to evidence of mitigation (from July 1998)
- If evidence of mitigation is not apparent, the Queensland Government faces the risk of meeting recovery and rescue costs throughout Queensland without Commonwealth assistance
- Local Governments are the primary beneficiaries of NDRA funding.

## What is the scope of the State Planning Policy?

The State Planning Policy will:

- ♦ Address natural disaster risk manages issues in land use planning and development assessment, and
- ◆ Apply State-wide
- ◆ Affect Local Government and State Government.

# How does the State Planning Policy fit with disaster management?

Disaster Management 'Mantra'

- Prevention
- Preparedness
- Response
- Recovery

PPRR

The State Planning Policy will focus on the two P's:

- Prevention and
- Preparedness.

# What are the limitations on the State Planning Policy?

The State Planning Policy:

◆ Will address natural hazards (geohands) but not technological hazards, and make provision for dealing with flooding caused by a dam break.

The State Planning Policy cannot.

♠ Resolve directly issues associated established urban areas and existing development, or

◆ Direct Local Governments to adopt specification methods.

## How is a State Planning Policy administered?

The Department of Local Government and Planning:

- ◆ Is responsible for administering State Plan Policies, and
- ◆ Will ensure advice from DES about interpreting the State Planning Policy is integrated with Loca Governments' planning schemes in a way that is balanced with other relevant planning considerations.

The Department of Emergency Services will be available to provide advice to L. Governments and State Government interpreting the State Planning Policy in particular situations.

# Who are the key stakeholders?

- Local communities
- ◆ Local Governments
- Property developers and owners
- **♦** Insurance industry
- ◆ Commonwealth and State Government agence
- ◆ LGAQ & Aboriginal and Islander Co-ordinating Councils
- Consultants and advisors (planning & development)

- ◆ Various industries e.g. tourism, farming and mining
- Not-for-profit charitable and volunta, organisations
- Professional bodies
- **♦** Tertiary institutions
- **♦** Conservation groups
- ◆ Other groups.

# What is the consultation process?

- ◆ Steering Committee (DES and DLOS)
- ◆ Government Advisory Group*
- ◆ Targetted focus workshop*
- ◆ First public consultation ('Preparation phase)
- Second public consultation ('Consultation phase)
- Written submissions during first and second consultation phases
- ◆ Targetted consultations*
- ◆ Requested consultations.*
- * Additional to requirements of *IPA 1997*

## Focus Workshop 5 July 2001

- To define which natural disaster mitigation issues can be investigated under a State Planning Policy
- To identify key planning and management issured
   relation to each natural hazard
- To identify common ground and planning solutions dealing with each natural hazard
- To develop a range of options for moving forward on identified issues
- To arrive at a preferred direction for progressing the development of a State Planning Policy
- To identify stakeholders
- To identify preferred communication methods.

# What is the role of the Government Advisory Committee?

- ◆ Provide strategic and practical agrice and input to Department of Emerge Services at each stage of the development of the State Planning Poleg:
  - Discussion Paper
  - **♦** Draft State Planning Policy
  - **◆** Draft supporting Guidelines.

# What progress has been made?

- ◆ A Business Case has been approved by the Executive Director, CDRS to engage a town planning a sultancy
- ◆ Monies have been committed to engage a town-sing consultancy
- ◆ A draft Intention to Prepare a State Planning Policy been developed
- ◆ An internal communication strategy has been developed and is being implemented
- ◆ Discussions have been held with other government departments which have / are preparing State Planning Policies

- ◆ Meetings with Department of Local Government and Planning occur as required
- ◆ A Steering Committee has been established met
- ◆ A Government Advisory Committee has been established and met
- ◆ Targetted briefings have occurred
- ◆ Research is underway
- ◆ A Focus Workshop is planned for 5 July 2001.

## What are the next steps?

- ◆ Focus workshop on 5 July
- ◆ Develop a Discussion Paper and finalise apply of the Intention to Prepare document
- ◆ Undertake the first public consultation phase
- ◆ Develop a proposed State Planning Policy, supporting guidelines and explanatory notes
- ◆ Undertake the second public consultation phase
- ◆ Finalise the State Planning Policy and supporting guidelines
- ◆ Undertake targetted consultations as required
- ◆ Handover documentation to Department of Local Government and Planning.

(Ministerial/Cabinet processes & publishing processes are planned at most stages)

### What is the timeframe?

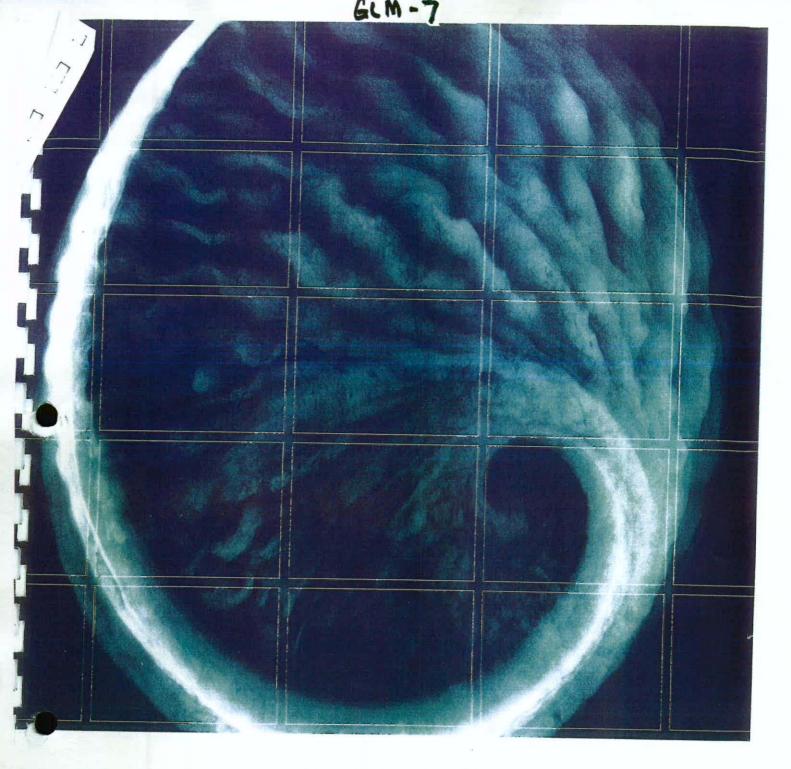
The development and finalisation of the State Planning Policy, supporting guidelies and explanatory notes are expected to take to three years.

## Who can 1 contact?

Director, Disaster Mitigation Unit Counter Disaster and Rescue Services Department of Emergency Services

Principal Policy Officer
Disaster Mitigation Unit
Department of Emergency Services

Questions?



## State Planning Policy for Natural Disaster Mitigation

Consultation Stage Report

Department of Emergency Services

March 2003

8020919

www.erm.com



Department of Emergency Services

#### State Planning Policy for Natural Disaster Mitigation Consultation Stage Report

March 2003

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Reference: 8020919RP1

For and on behalf of	
Environmental Resources Management	
Australia	
Approved by: Sandy Vigar	
Signed:	
Position: Director	
Date: /0/3/03	

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APPENDIX D SUMMARY OF ISSUES DURING CONSULTATION STAGE

#### 1.1 CONSULTATION OVERVIEW AND CONTEXT

This report summarises the outcomes of the Consultation Stage for the Draft State Planning Policy (SPP) for Natural Disaster Mitigation and associated Guideline undertaken over the period 19 October 2002 to 13 December 2002. The report has been prepared by Environmental Resources Management Australia (ERM) on behalf of the Queensland Department of Emergency Services (DES). This report continues on from ERM report State Planning Policy for Land Use Planning for Natural Disaster Mitigation and Development Assessment, Preparation Stage Consultation Report.

The Consultation Stage of the preparation process of the Draft SPP and Guideline was undertaken in accordance with the requirements of the Integrated Planning Act 1997 (IPA). Section 2.4.3 of IPA states that: "The process stated in Schedule 4 must be followed in making or amending a State Planning Policy.

The process involves the following three stages -

- Preparation stage
- Consultation stage
- Adoption stage".

To comply with the requirements of IPA, the Consultation Stage involves publishing a notice in a newspaper circulating generally in the State. The notice is required to state the name, purpose and general effect of the policy, contact details for further information and copies of the policy, and details regarding the duration of the consultation period and how written submissions can be made.

The consultation process adopted for each stage of the preparation of the Draft SPP and Guideline has exceeded the minimum requirements of IPA. It incorporated extensive face-to-face consultation activities at the commencement of the process, throughout the Preparation Stage and again during the Consultation Stage. The purpose of implementing a wider consultation process was to ensure that the Draft SPP and Guideline were complete, practical and user-friendly.

The latest phase of consultation has been critical to the development of the Draft SPP and Guideline, with stakeholders providing detailed feedback on the format, content and structure of a draft SPP and Guideline. This phase has also enabled a considerable level of information dissemination and education about the Draft SPP and Guideline to likely users.

#### 2.1 OVERVIEW

Consultation workshops were held in locations across Queensland during November and December 2002 (refer to section 2.5) and were attended by representatives from Federal, State and Local Governments, business and development industry, Local Government bodies, community groups, environmental/conservation groups, professional organisations, academia and the general community. The workshops were open to interested persons.

DES advertised the opportunity to participate in the consultation process for the SPP in two ways (see Appendix A). First, the Public Notice for Consultation Period for Draft State Planning Policy and Guideline was published in newspapers circulating throughout Queensland and the draft Policy and Guideline was on public display from 19 October 2002 to 13 December 2002 ie. for more than the required 40 business days. The Public Notice invited persons with relevant interests to attend the regional workshops, detailing times, dates and locations of the intended workshops and relevant contact details. Secondly, DES issued letters of invitation to key stakeholders, taken largely from the stakeholder database established during the previous rounds of consultation. The Draft SPP and Guideline were distributed to stakeholders prior to the workshops to facilitate the opportunity for feedback and maximise workshop participation.

#### 2.2 DRAFT STATE PLANNING POLICY AND GUIDELINES

The Draft SPP and Guideline were prepared over the period January to August 2002, in accordance with statutory requirements and on the basis of the outcomes of consultation feedback received during earlier activities. The SPP and Guideline were drafted in consultation with experts in various fields, including considerable input from the Queensland Department Of Natural Resources and Mines (NR&M) and DES including Queensland Fire and Rescue Service (QFRS). Research also drew on inter-state and national information sources, including NSW bushfire strategies, national disaster risk management guidelines and national flood risk management guidelines.

The Draft SPP represents the intended statutory document. It is a concise policy document that outlines the requirements with regard to land use planning for natural disaster mitigation in areas to which the SPP applies, should the SPP be approved. The supporting Guideline will have legal status as 'extrinsic material' under the Statutory Instruments Act 1992. The Guideline

is intended to provide technical support and advice for the interpretation and implementation of the SPP.

#### 2.3 INFORMATION DOCUMENTS AND DISTRIBUTION

During the SPP Consultation Stage, copies of the Draft SPP and Guideline and copies of workshop summaries were widely distributed among stakeholder groups, and copies of these and earlier documents, including the Discussion Paper have been made readily available to all interested persons. A stakeholder database was established following the initial consultation workshop held in July 2001 and has been maintained and updated with the further identification of interested parties. Copies of documents have been distributed to all parties on the database to maximise continued participation in the preparation process. Stakeholder representatives were also requested to nominate any groups that may have been omitted throughout the stakeholder identification process to ensure the widest dissemination of information was achieved.

A project-specific website was established as a link from the DES home page and this has been maintained and updated throughout the duration of the process. The website contains links to an electronic copy of the Draft SPP and Guideline and the Department's SPP email contact.

#### 2.4 Workshops

15 workshops and one presentation were held during the Consultation Stage and are summarised in *Table 2.1* and *Appendix B*. Approximately 340 people attended the workshops and a further 12 attended the presentation to the Government Advisory Committee (GAC). The workshop format differed from the two-stage format implemented in the first round of consultations to address the differing purpose and objectives of the Consultation Stage which were the dissemination of information and explanation of the format, content and intended implementation of the Draft SPP and Guideline.

The workshop format was designed to inform and update participants on activities undertaken since the previous consultations, then to provide a detailed examination of the structure and content of the Draft SPP and Guideline. Considerable opportunity for discussion and questions was provided throughout the workshops, which were run in an open and interactive format, to encourage participants to ask questions and discuss issues as they were raised. Some case examples were included in discussions to ensure participants obtained a general understanding of the way in which the SPP would be implemented.

Table 2.1 SUMMARY OF WORKSHOP LOCATIONS AND PARTICIPANTS

Location	Venue	Date	Time	Attendees
Toowoomba	Mercure Hotel	7 November	10:00am - 1pm	■ State Government – 9
		1	•	<ul> <li>Local Government – 8</li> </ul>
				Industry – 4
	1		l"	■ Community – 1
				Government bodies - 3
		1		TOTAL – 25 Attendees
Brisbane #1	Virginia	8 November	9:30am - 12:30pm	■ Federal Government – 1
	Palms Motel	) November	7.50ant - X2.50pm	State Government – 18
i				Local Government – 10
		1		■ Industry –8
f				TOTAL - 37 Attendees
Gold Coast	Mercure	11	9:30am – 12:30pm	State Government – 3
Gora Coast	Hotel, Surfers	November	7.50am - 12.50pm	Local Government – 4
	Paradise	November		Industry – 2
	Taradise			Community – 9
				Academia – 1
				TOTAL - 19 Attendees
D J. l	Ocalita Hatal	10	70.00 1.00	· <del> </del>
Bundaberg	Quality Hotel	12	10:30am - 1:30pm	• State Government – 6
	Burnett	November		Local Government – 16
	Riverside	ļ	İ	• Industry – 2
		1		• Community – 2
	ļ <u>.</u>			TOTAL – 26 Attendees
Brisbane #2	Virginia	18	9:30am – 12:30pm	Federal Government – 1
	Palms Motel	November		State Government – 18
		ĺ		■ Local Government – 9
	İ			<ul><li>Industry – 7</li></ul>
	1			■ Community – 2
				<ul> <li>Academia – 3</li> </ul>
				TOTAL – 40 Attendees
Townsville	Summit Hotel	20	9:30am 12:30pm	_= State-Government - 10
		November		<ul> <li>Local Government – 17</li> </ul>
				<ul> <li>Industry – 5</li> </ul>
				■ Community – 2
				<ul> <li>Academia – 1</li> </ul>
				TOTAL – 35 Attendees
Cairns #1	Palms	21	9:30am – 12:30pm	■ State Government – 14
	Southside	November	•	<ul> <li>Local Government – 7</li> </ul>
	Hotel			<ul> <li>Industry – 3</li> </ul>
				Community – 1
				<ul> <li>Academia – 2</li> </ul>
				TOTAL – 27 Attendees
Cairns #2	Palms	21	1:30pm - 3:30pm	State Government – 2
	Southside	November	•	<ul> <li>Local Government – 7</li> </ul>
	Hotel	1		■ Industry – 4
				Academia – 1
				TOTAL – 14 Attendees
SunshineCoast	Millwell Road	22	9:30am - 12:30pm	State Government – 7
Janorda (COust	Community	November	i i i i i i i i i i i i i i i i i i i	<ul> <li>Local Government – 11</li> </ul>
ļ	Centre	, to tollioer		Community – 3
. <b>i</b>	Centre	i		TOTAL – 21 Attendees
Doolsh	Contro Poi-t	25	9:00am 12 am	·····
Rockhampton	Centre Point	November	9:00am – 12pm	Diate Government - 12
#1	Motel	Movember		■ Local Government – 13
ł		:		Industry – 3
				TOTAL - 28 Attendees

Centre Point	25	2pm – 5pm	<ul> <li>State Government – 5</li> </ul>
Motel	November		<ul> <li>Local Government – 9</li> </ul>
	]		■ Industry – 1
			• Community – 2
			TOTAL – 17 Attendees
Shamrock	26	10:30am - 1pm	■ State Government – 9
Hotel	November	•	<ul> <li>Local Government – 12</li> </ul>
			<ul> <li>Community – 3</li> </ul>
		1	TOTAL - 24 Attendees
Club Hotel	28	10:15am - 1pm	State Government – 4
Motel	November	•	<ul> <li>Local Government – 5</li> </ul>
			TOTAL – 9Attendees
Теггасе	2 December	10am – 1pm	■ State Government – 8
Gardens		·	<ul> <li>Local Government – 5</li> </ul>
Function			<ul> <li>Community – 1</li> </ul>
Centre .			TOTAL – 14 Attendees
SES Airport	4 December	10am – 1pm	■ State Government – 3
Complex			<ul> <li>Local Government – 3</li> </ul>
Training			■ Industry – 1
Room			TOTAL - 7 Attendees
DES Building,	19	- "	State Government - 11
Kedron	December		<ul> <li>Industry – 1</li> </ul>
			TOTAL - 12 Attendees
TOTAL ATTENDANCE			Approximately 350.
	Shamrock Hotel  Club Hotel Motel  Terrace Gardens Function Centre SES Airport Complex Training Room DES Building, Kedron	Shamrock Hotel  Club Hotel Motel  Club Hotel Motel  Terrace Gardens Function Centre  SES Airport Complex Training Room  DES Building, Kedron  November  26 November  2 December 4 December  December	Motel  Shamrock Hotel  November  10:30am - 1pm  November  Club Hotel November  Terrace Gardens Function Centre  SES Airport Complex Training Room  DES Building, Kedron  November  10:30am - 1pm  10:15am - 1pm  10am - 1pm  10am - 1pm

#### 2.5 SUBMISSIONS

Copies of the Draft SPP and Guideline were distributed to key stakeholders, distributed at workshops and available on the DES website. The Draft SPP and Guideline were accompanied by an Explanatory Statement that set out the requirements for written submissions including postal and email addresses.

Stakeholders attending workshops were encouraged to prepare submissions and details regarding final dates, contacts and web address were emphasised during the workshop sessions. 68 submissions were received during the consultation period (see *Appendix C*) as follows:

- Commonwealth Government Agencies 4;
- State Government Agencies 25;
- Local Government (including LGAQ) 16;
- Private Individuals and Organisations 16;
- Consultants and Academics 4 (including the Planning Institute of Australia Queensland Division).

Of the 68 submissions, only four were opposed to the introduction of SPP1/03.

Of these, two were private individuals with concerns about particular properties, one was a private individual who opposed the SPP on legal/philosophical grounds including the submitter's view that the IPA under which the SPP was prepared is invalid, and one from Burdekin Shire which supports the objectives of SPP1/03 but opposes the SPP itself because (inter alia) it shifts the responsibility for hazard mitigation issues from State to local government without a concomitant transfer of resources.

#### CONSULTATION OUTCOMES

#### 3.1 OVERVIEW

3

The implementation of a comprehensive and detailed consultation process from the outset of SPP preparation has enabled the drafting of a focussed SPP through the early identification of issues, concerns and opportunities associated with natural disaster mitigation.

The continuation of the extensive consultation throughout the statutory consultation period has facilitated the dissemination of information to and education of practitioners likely to be implementing the SPP and Guideline. This has benefits for more efficient implementation of the Policy by reducing the likelihood of confusion and complications when the SPP commences.

#### 3.2 LEVEL OF RESPONSE

Total attendance at the various workshops was approximately 350.

Attendance at the workshops was not evenly spread across stakeholder groups, with government representatives comprising 78% of participants. Of the 266 government representatives, 2 were from Federal Government agencies, 128 from State Government and 136 were from Local Government. Representatives from industry groups, conservation and environmental groups, academia, and the general community represented the remaining 22%. There was a relatively low level of representation from academia, environmental and conservation groups, developers, the business community and the general public.

68 submissions were lodged during the formal consultation period from 19 October to 13 December 2002.

#### 3.3 MAIOR THEMES

The primary objective of the consultation workshops was to educate potential users of the SPP and Guidelines as to how the documents will be implemented and to obtain feedback relating to the practicality and

appropriateness of the contents of the documents to achieve the desire outcomes.

There was a high level of interest in the Draft SPP and many questions related to implementation of the SPP, technical issues, cross referencing and general issues associated with obtaining an understanding of the Draft SPP. There was a strong level of support for the Draft SPP and the way in which it had been prepared, with recognition of the efforts to maintain flexibility whilst establishing a solid framework from which to enable effective provisions and planning tools to be developed. Although there was strong support for the proposed SPP overall, a number of particular issues were raised. These are discussed in further detail below.

#### 3.3.1 Recurrent Themes

: ]

During the consultation in relation to the Draft SPP and Guideline, several recurrent themes emerged.

The concept of the Natural Hazard Management Area (NHMA) was subject to much discussion, given its central role in the implementation of the Draft SPP. In particular, triggers, inclusions and thresholds for items contained in Annex 1 of the Draft SPP and the review of NHMAs by local authorities were examined in detail.

Concepts including acceptable/unacceptable risk and development commitment, particularly as they apply to Outcome 2, were questioned in relation to determining clear definitions, site specific issues and measuring risk.

The reasoning for the specific exclusion of storm tide inundation, cyclones and earthquakes was also questioned in particular local government areas.

The relationship of the Draft SPP with IPA and the opportunity for developing model codes were discussed widely and, in discussions relating to development assessment, the role of DES as a referral agency was commonly queried throughout the State.

As in the first round of consultation, how the SPP will deal with climate change was of interest and the degree to which the SPP should deal with this issue was debated.

Also, comments and queries relating to insurance, liability and compensation were frequently raised throughout the State, particularly by local government representatives.

A brief overview of the principal views/comments commonly raised by participants in relation to the four key components of the Draft SPP and Guideline - flooding, bushfire and landslide and community infrastructure – are outlined as follows:

- Flooding This hazard is dealt with differently than bushfire and landslide, in that a default Natural Hazard Management Area (NHMA) Flood is not proposed to be established from the commencement of the SPP. Concerns were raised about the potential timing of the adoption of a NHMA in some local government areas as the SPP, through IPA, has the potential to allow a local government several years to determine their NHMA (Flood) at the time of preparation of the next planning scheme. Issues associated with definitions were raised, particularly in relation to the definition of floodplain, the appropriate use of terms (DFE, PMF, 1:100ARI, AEP) and the inclusion of dam break in the flooding definition.
- Bushfire Given that the default NHMA for bushfires relies on mapping undertaken by the QFRS, concerns were raised as to the accuracy of this data at the local government area level. The need for and assistance with 'ground-truthing' was raised as well as the compatibility of current practices and techniques used in particular local government areas. The linkages between bushfire provisions in the Draft SPP and existing legislation and regulations (such as the Standard Building Regulation) were discussed and questioned.
- Landslide With the basic default NHMA set at all land of 15% slope or greater, concerns were raised that the issues of off-site impacts (uphill or downhill impacts) were not sufficiently required to be addressed. Concerns regarding the work/resources involved in determining these areas (such as geological studies and mapping) were raised. Examples of local government areas for possible inclusion and exclusion were identified in relation to landslides.
- Community Infrastructure Queries raised in relation to community infrastructure were largely focussed on the application of the triggers in Annex 1(b) of the Draft SPP and the recommended flood levels in Appendix 7 of the Guideline. The implementation of the proposed performance criteria and compatibility indicators was queried and several suggestions were made in relation to the application of the SPP to public records and electricity infrastructure.

#### 3.3.2 Specific Issues

Appendix D summarises the key issues, comments and concerns which were raised during the consultation period, at both the workshops and contained within written submissions.

#### 4.1 KEY FINDINGS

Key findings arising from the Consultation Stage include the following.

- There is strong support for the draft State Planning Policy for Natural Disaster Mitigation and associated Guideline (64 of the 68 submissions, more than 340 or the 350 workshop attendees).
- There is widespread acceptance of and support for the structure, format
  and content of the draft State Planning Policy and Guideline, in
  particular the use of Natural Hazard Management Areas, Outcomes and
  suggested Performance Criteria and Compatibility Indicators.
- There is strong support for the flexible approach adopted by the draft State Planning Policy in allowing local governments to adapt the Policy to suit local conditions.
- The State Planning Policy should ensure strong linkages with existing legislation and regulations, minimising confusion and overlap.
- Comments and queries raised were largely related to implementation of the SPP, technical terms, timing issues and definitions.

#### 4.2 SUGGESTED CHANGES AND ASSOCIATED RECOMMENDATIONS

Participants in the consultation workshops and the written submissions identified various suggestions for the modification and improvement of the Draft SPP and Guideline. *Table 4.1* summarises key issues raised, and provides a recommendation as to how to respond to each issue raised.

Table 4.1: Suggested Changes and Key Recommendations

Issue	Suggested Change	Recommendation
Definition of flood – dam break which is not further addressed in SPP and needs to clarify that flooding does not include local drainage problems.	Suggest that dam break be removed from SPP and that the SPP only address watercourse flooding.	Amend the definition of flood to address these matters.
Default NHMA for flooding	Default NHMA for flooding could be the 'flood of record' (the largest flood since records began in the LGA) or the 1:100 AEP flood.	Insufficient data available in many areas of the State. Retain the approach in the Draft SPP and Guideline.
Definition of flooding and related concepts	Comments were made as to appropriateness of terms/concepts used ie: PMF, DFE, 1:100 ARI and several suggestions as to more appropriate terms.	Use Annual Exceedence Probability (AEP) instead of ARL

Storm tide inundation	Include storm tide inundation.	Do not include storm tide inundation on the basis of potential duplication and conflict with SCMP.
NHMA (Landslide)	Diagram and text in Appendix 8 are contradictory - amend to ensure consistency	Amend as necessary to achieve consistency.
NHMA (Bushfire)	Amend Appendix 5A Bushfire, Indicator of Compatibility 6.1 by including the setback requirement for residential buildings as they apply to non-residential buildings under IC 6.2	the Guideline to incorporate suggestions.
,	Amend A3.15 to include the following material under Table 2: "For site specific assessment of a particular development on a slope, if the development is downhill from the hazard, the slope effect may be taken as zero as the fir intensity will be less. On steep slopes burning heavy fuels may roll downhill, and trees may burn down, so setbacks from the hazard still need to be observed."	
	In Appendix 5B, section 2 add "AND 2.4 Buildings and other permanent structures have the following minimum setbacks from hazardous vegetation: (a) 1.5 times the predominant mature canopy tree height in any adjoining bushfire hazard vegetation; AND (b) 5 metres from any retained vegetation strips or small areas within individual lots".	
Insufficient explanation/ information	Comments were made that the SPP does not provide adequate information in relation to: - determining unacceptable risk - vegetation values	Amend the SPP and Guideline to provide additional information on interpreting "unacceptable risk", and clarify the relationship between the SPP and other instruments/ values such as conservation and amenity.
Development Commitment	Amend definition to exclude exempt development and development only assessable against the SBR.	Review and amend the definition of "development commitment".
Outcome 1	Remove reference to lower level of risk	Amend as proposed.
Earthquakes	Include earthquakes in SPP	Do not cover earthquakes - it is adequately covered by existing regulations and standards.
Community Infrastructure	Definition of works should be amended to reflect that contained in Electrical Safety Act 2002.	Amend as proposed
·	Remove reference to electricity infrastructure within SPP	Retain reference to electricity infrastructure.
Climate Change	Definition within SPP does not reflect that of Convention on Climate Change	Review definition.
	Amend para 4.8 Climate Change, p23 of Guideline-states 'there is currently no State position on the anticipated effects of CC'. This may be misinterpreted to infer that QG has not given any consideration to the issue. It should be recognised that research by the QG on this issue has been ongoing for a number of years and the Government has implemented a number of policy initiatives in response to addressing the potential impacts of CC identified by the research.	Amend para 4.8 to clarify.
	Given that the predicted changes resulting from CC are likely to have significant effects on QLD, such as reductions in annual rainfall, increased risk of bushfire and increased flood risk, it may be useful to draw on this information to develop a State position on the anticipated effects of CC so that this can be taken into consideration in future planning both for business and government.	No amendment proposed. This is acknowledged and it is agreed that it would be desirable. However, establishing a State position on anticipated effects of climate change is up to EPA.

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Consideration of environmental values	Clarify the relationship between the SPP and other values.	Incorporate amendments clarifying that the SPP does not support hazard mitigation works that would result in unacceptable impacts on environmental or amenity values, and that the correct balance between these competing requirements can only be determined on a locality or site-specific basis.
Development Thresholds	Clarify the development thresholds in Annex 1(a) of the SPP.	Review and amend the thresholds in Annex 1(a).

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Public Notification and Workshop Invitations

#### **Public Notice for Consultation Period** for Draft State Planning Policy and Guideline

The Honourable Nita Cunningham MP, Minister for Local Government and Planning, and the Honourable Mike Reynolds AM MP, Minister for Emergency Services and Minister Assisting the Premier in North Queensland, have prepared the State Planning Policy and Guideline for Natural Disaster Mitigation (SPP).

Subject of the Policy

The proposed SPP addresses the mitigation of flood, bushfire and landslide through land use planning and development assessment. The purpose of the policy is to ensure that flood, bushfire and landslide hazards are adequately considered when making decisions about certain development.

Area to which the Policy would apply

It is intended that the proposed SPP will apply throughout

The Government is calling for submissions

Submissions must be made in writing, signed by each person making the submission, and include each submitter's name and address. The grounds of the submission must be stated as well as the facts and circumstances relied on to support the grounds. Submissions are to be addressed to:

Attention: State Planning Policy

Acting Director

Disaster Mitigation Unit

Counter Disaster and Rescue Services Department of Emergency Services

GPO Roy 1425

BRISBANE OLD 4001

e-mail: sppconsultation@emergency.qld.gov.au

The closing date for submissions is Friday, 13 December 2002.

The submissions will be given to the Minister for Local Government and Planning and the Minister for Emergency Services and Minister Assisting the Premier in North Queensland.

After considering the submissions, the Ministers will decide
whether to adopt the proposed SPP as notified, adopt it with modifications, or not adopt the proposed SPP.

The Department of Emergency Services will hold consultation workshops on the draft Policy and Guideline at:

Toowoomba

10.00 a.m. - 1.00 p.m. Thursday, 7 November.

Brisbane*

9.30 a.m. - 12.30 p.m. Friday, 8 November,

9.30 a.m. - 12.30 p.m.

Monday, 18 November.

9.30 a.m. - 12.30 p.m.

Gold Coast*

Monday, 11 November. 10.30 a.m. - 1.30 p.m.

Bundaberg

Tuesday, 12 November.

Townsville*

9.00 a.m. - 12.00 p.m.

Wednesday, 20 November.

Cairas*

9.00 a.m. - 12.00 p.m.

Sunshine Coast*

Thursday, 21 November. 9.30 a.m. - 12.30 p.m.

Rockhampton'

Friday, 22 November.

9.00 a.m. - 12.00 p.m.

Mackay '

Monday, 25 November.

10.30 a.m. - 1.30 p.m. Tuesday, 26 November.

Roma

10.30 a.m. - 1.30 p.m. Thursday, 28 November.

Mount Isa

10.00 a.m. - 1.00 p.m.

Monday, 2 December.

Longreach

10.00 a.m. - 1.00 p.m. Wednesday, 4 December.

an additional afternoon workshop will be held at these locations if morning sessions are overbooked.

To register to attend a workshop and/or obtain a copy of the draft State Planning Policy and Guideline for Natural Disaster Mitigation, please telephone of 3247 8977. Alternatively a copy of the draft document can be found at the Department of Emergency Services' website www.emergency.qld.gov.au/publications/spp



Ph: 07 3247 8977 Our Ref: CDS 4899

21 October 2002

Counter Disaster and Rescue Services

Department of Emergency Services

- «delTitle» «delFirstName» «delLastName»
- «delPosition»
- «OrgName»
- «OrgPostAddress»
- «OrgSuburb» «OrgState» «OrgPCode»

Dear «delTitle» «delLastName»

I am pleased to invite you to participate in public consultation on the draft State Planning Policy and Guideline for Natural Disaster Mitigation (SPP).

The draft SPP sets out the State's interest in ensuring that the natural hazards of flood, bushfire and landslide are adequately considered when making decisions about development. The SPP, if adopted, will have effect when development applications are assessed, planning schemes are made or amended, and when land is designated for community infrastructure. The SPP aims to minimise the potential adverse impacts of flood, bushfire and landslide on people, property, economic activity and the environment. The purpose of the Guideline is to provide information and advice on interpreting and implementing the SPP.

This is the second and final public consultation phase for the development of the SPP as required under Sehedule 4 of the Integrated Planning Act 1997. The first phase concerning the Queensland Government's intent to prepare a SPP was held between September and November 2001. The second phase of consultation is about the draft SPP and Guideline. A copy of the draft SPP and Guideline is enclosed. Additional copies can be accessed from the Department's website - www.emergency.gld.gov.au/publications/spp.

You are invited to lodge a written submission about the draft SPP and Guideline to:

Attention: State Planning Policy
Acting Director
Disaster Mitigation Unit
Counter Disaster and Rescue Services
Department of Emergency Services
GPO Box 1425
Brisbane QLD 4001.

Alternatively, submissions may be emailed to sppconsultation@emergency.qld.gov.au.

#### **Disaster Mitigation Unit**

Emergency Services Complex Cnr Kedron Park Road & Park Road Kedron Qld 4031

GPO Box 1425 Brisbane Queensland 4001 Australia

Telephone +61 7 3247 8481 Facsimile +61 7 3247 8480 Website www.emergency.qid.gov.au Written submissions, signed by each person making the submission and containing the name and address of submitters, must be received by Friday 13 December 2002. The grounds of the submission must be stated as well as the facts and circumstances relied on to support the grounds.

As with the initial public consultation phase, regional workshops are being held. To facilitate booking and catering arrangements, and to assist with preparation and resources for the workshops, the attached nomination form needs to be received no later than 1 November 2002 if you wish to attend a workshop.

Forms should be returned to:

Attention: State Planning Policy

**Acting Director** 

**Disaster Mitigation Unit** 

Counter Disaster and Rescue Services Department of Emergency Services

**GPO Box 1425** 

BRISBANE QLD 4001. Telephone: 3247 8977 Facsimile: 3109 5060

The locations, dates and times for regional workshops are:

Toowoomba	Th 7 Nov, 10 am - 1 pm	Sunshine Coast*	Fri 22 Nov, 9.30 am -12.30 pm
Brisbane*	Fri 8 Nov, 9.30 am - 12.30 pm	Rockhampton*	Mon 25 Nov, 9.00 am - 12.00 pm
	Mon 18 Nov, 9.30 am - 12.30 pm		·
Gold Coast*	Mon 11 Nov, 9.30 am - 12.30 pm	Mackay*	Tues 26 Nov, 10.30 am – 1.30 pm
Bundaberg	Tue 12 Nov, 10.30 am - 1.30 pm	Roma	Thurs 28 Nov, 10.30 am - 1.30 pm
Townsville*	Wed 20 Nov, 9.00 am - 12:00 pm	Mt Isa	Mon 2 Dec, 10.00 am + 1.00 pm
Cairns*	Thurs.21 Nov. 9.00 am - 12.00 pm	Longreach	Wed 4 Dec, 10.00 am - 1.00 pm

An afternoon workshop will also be held if the morning session is overbooked.

Following this second consultation stage, the Minister for Emergency Services and the Minister for Local Government and Planning will consider all submissions and the outcomes of consultations. The Ministers will decide whether to adopt the proposed SPP as notified, adopt the proposed SPP with modifications, or not adopt the proposed SPP.

The Department of Natural Resources and Mines (DNRM) intends to undertake a one-hour public consultation process on the State Flood Risk Management Policy Discussion Paper following the SPP workshops. The Discussion Paper will be available at the end of October 2002. If you or your nominee wish to attend the DNRM workshop, please complete the attached nomination form accordingly. Any enquiries concerning the DNRM's State Flood Risk Management Policy Discussion Paper and consultation process, should be directed to Mr Russell Cuerel at the DNRM on

I encourage you to participate in the public consultation process for the State Planning Policy and Guideline for Natural Disaster Mitigation.

Yours sincerely

Appendix B

Workshop Summaries

## DRAFT STATE PLANNING POLICY FOR NATURAL DISASTER MITIGATION REGIONAL CONSULTATION WORKSHOPS 2002

Time/Date:

10:00am - 1:00pm 7 November 2002

Location:

Toowoomba (Mercure [Burke & Wills] Hotel)

Overview Comments: Overall, the tone of the meeting was positive. A number of participants had been involved in earlier consultation for the SPP.

PARTICIPANTS

Attendees (27): State Government -

(Department

(Crows

Russell Cuerel (DNRM)

#### WORKSHOP PROGRAM AND SUMMARY OF QUESTIONS AND ANSWERS

- (1) Introduction, Overview and Presentation on SPP
- (2) Question and Answer

ISSUE	DETAILS	ANSWER PROVIDED
Terminology	Comment was made that the term "landslide" predetermines or presupposes the instability of land. It was suggested that the term could be replaced by "potential landslide" or "potentially unstable land"	Consider in the finalisation of the SPP.
Timing of SPP and planning schemes	If the SPP is not adopted before a planning scheme is finalised and therefore default mechanisms apply to LGA, and then funding is received under the Natural Disaster Risk Management Studies Program and hazard studies are	<ul> <li>The new Natural Hazard Management Area/s would apply as soon as the Local Government had resolved to adopt it.</li> <li>While it would be desirable to amend the planning scheme as soon as possible, amendments could be undertaken at a later</li> </ul>

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completed prior to the next planning scheme being prepared, would the current planning scheme need to be amended or would the new "adopted area" change	time.
automatically?  How do Councils that are currently well advanced in preparing planning schemes obtain sign off that the scheme complies with SPP without having to wait until next round of amendments?	Councils could specifically request that the Minister assess this as part of the 'sign off' process. Otherwise, it would be included in the next amendment or formal review of the scheme.
With no specified timeframes for preparing a flood study and no default mechanism, Local Governments may 'ignore' the responsibility of preparing flood studies until absolutely necessary – this could be up to 8 years.	Local Governments will be encouraged to undertake studies as soon as possible. However, this situation could occur as the SPP is not applicable for in relation to flood hazard for development assessment until Local Governments adopt a defined flood event (DFE) for the particular locality.
Bushfire  • Hazard areas are not static and risk can vary between seasons. Is there a specified method to determine risk?	Bushfire hazard does vary with the season. The hazard assessment approach is based on slope, aspect and vegetation and results in a hazard classification that is relevant regardless of seasonal conditions.
Why were some LGAs excluded from the draft SPP for bushfire and who determined this?	Exclusions were based on advice from the QFRS. Areas are proposed to be excluded on the basis that the level of hazard is not considered to be of state significance. Local Governments in excluded areas may choose to implement the SPP as it relates to bushfire.
Landslides  • How was it determined that some LGAs would be excluded from the draft SPP for landslide?	The assessment of landslide hazard was based on slope of land with a review by the Department of Natural Resources and Mines of other factors that may influence landslide.
·     .	Landslide hazard mapping needs to be done at a local level to

be a dramatic change over small areas?	achieve accurate outcomes. Hazard assessments for specific sites may be necessary to determine the suitability of specific development proposals.
Councils may take on liability by identifying haz areas	It is expected that Councils should be researching hazards as part of planning scheme preparation as it is a core matter in the preparation of planning schemes. Hazard maps could include a disclaimer.
In some cases eg. powerlines, roads, rail etc, ir may need to be placed in hazard prone areas.	• This is recognised and provided for in the SPP, in the statement "wherever practicable" and in the performance criteria of Appendix 7 of the Guideline.
The importance of protection of human life and p safety should be more strongly emphasised in the the document	public  • Consider during the finalisation of the SPP  e front of
Will there be a second draft of the SPP placed or notification?	No. The Integrated Planning Act 1997 describes the public consultation process for developing a SPP. The next step is for the Minister to consider the submissions and the and decide whether or not to adopt the SPP or to adopt the SPP with amendments.
Was native title taken into consideration?	No. It was not an issued considered specifically relevant to land use planning for natural disaster mitigation.
ted to SPP. The creating problems in dealing with natural hazards	
	<ul> <li>Councils may take on liability by identifying haz areas</li> <li>In some cases eg. powerlines, roads, rail etc, in may need to be placed in hazard prone areas.</li> <li>The importance of protection of human life and safety should be more strongly emphasised in the the document</li> <li>Will there be a second draft of the SPP placed or notification?</li> <li>Was native title taken into consideration?</li> </ul>

# DRAFT STATE PLANNING POLICY FOR NATURAL DISASTER MITIGATION REGIONAL CONSULTATION WORKSHOPS 2002

Time/Date:

9:30am - 12:30pm 8 November 2002

Location:

Brisbane #1 (Virginia Palms Hotel)

Overview Comments: Overall, the tone of the meeting was positive. Several participants had been involved in earlier consultation on the SPP.

**PARTICIPANTS** 

**Facilitators** 

WORKSHOP A ROGICENT AND SUMMERS OF QUESTIONS AND ANSWERS

- (1) Introduction, Overview and Presentation on SPP
- (2) Question and Answer

Flooding

• Where will flooding provisions apply?

• Flood velocity measurements and mapping are useful in better understanding flood damage rather than just maximum flood

, Russell Cuerel (DNRM)

- ANSWER PROVIDED
- Flooding is the only hazard which applies across the State without any LGA exemptions, provisions also apply for community infrastructure.
  - The importance of velocity mapping is acknowledged, as is the limited resources of some local governments to complete basic

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	inundation levels. The SPP should impose a gre requirement for local governments to undertake mapping.	ater flood assessments. Velocity mapping is a realistic expectation for larger local governments.
Bushfire	<ul> <li>Management of fuel loads is as important as the bushfire control. The SPP should nominate manameasures to be imposed as development approva</li> <li>The SPP guideline refers to 5000litres of availab water. Ipswich City Council requires 10,000 little be more appropriate as it offers a more realistic time.</li> </ul>	from bushfire is acknowledged. The SPP seeks to achieve appropriate development that reduces exposure to bushfire.  comment noted and will be considered in the finalisation of the SPP.
Compatibility of Development	<ul> <li>Would the SPP apply to a vacant lot within a dithat has an existing flood problem?</li> <li>The example of Russell Island in Redland Shire relation to flooding and it was suggested that the to carefully consider "development commitment result in unacceptable development,</li> </ul>	specifically consider existing development commitments. It would be necessary for the assessment manager to determine if the proposal has an unacceptable level of risk.
Development Assessment	<ul> <li>What is the applicability of the SPP to land that or designated for future industry?</li> <li>Is it proposed that the Department of Emerg (DES) be a referral agency for applications?</li> </ul>	commitment, however Strategic Plan designations are not considered by the SPP to be a development commitment.
Compensation	<ul> <li>Will the State give consideration to legislative support the implementation of the SPP not being compensation?</li> </ul>	re changes to • Exemption exists under the Integrated Planning Art 1997 c

Liability	Where Local Governments have gone through the assessment and hazard mapping processes included within the SPP and guideline, will they be exempt from liability?	Each local government should seek independent legal advice on this issue. The SPP does not provide an exemption from liability.
	What is the liability for events that occur beyond the expected levels/nominated levels of hazard?	• The SPP is about a defined level of hazard. The end result is that local governments need to do their homework to ensure that assessments are accurate and that they know where the nominated levels of hazard are in their area. Natural Hazard Management Areas are defined in the Glossary where it is stated that they may not reflect the full extent of an area affected by hazard.
Funding/ Resources	<ul> <li>Is there a possibility for the State Government to commission universities to undertake hazard studies and mapping on behalf of the State?</li> </ul>	<ul> <li>Comment was noted, however the Natural Disaster Risk         Management Studies Program funding is available to all Local         governments and other eligible groups.</li> </ul>
Document Changes	SPP Annex 1- 1.1 (b) should read "throughout" and not "anywhere" in Queensland.	Suggestions to be considered in the finalisation of the SPP
	There is a need to clarify exemption and inclusion of the LGAs for bushfire and landslide hazard and the effect on community infrastructure decisions.	
Other	Nomination of Natural Hazard Management Areas on maps will cause concern to residents and result in property devaluation.	The issue is about risk management. The reverse would be an accusation of not releasing available information about possible hazards.
	not related to SPP.  uld encourage or facilitate the resumption of properties or development d areas.	This is not within the ambit of the SPP.

## DRAFE STATE PLANNING POLICY FOR NATURAL DISASTER MICIGATION REGIONAL CONSULTATION WORKSHOPS 2002

Time/Date:

9:30am - 12:30pm 11 November 2002

Location:

Gold Coast (Mercure Hotel, Surfers Paradise)

Overview Comments: Overall, the tone of the meeting indicated a high level of interest with a number of concerns about the potential implementation of SPP and its focus. One participant had been involved in the earlier SPP consultation process in 2001. PARTICIPANTS

WORKSHOP PROGRAM AND SUMMARY OF QUESTIONS AND ANSWERS

Russell Cuerel (DNRM)

- (1) Introduction, Overview and Presentation on SPP
- (2) Onestion and Answer

(2) Question and ISSUE	DETAILS	
Guidelines	Is the guideline regulatory?	Yes, the guideline has legal status as 'extrinsic material' and its role is to support the deef GDB.
Timing of SPP and planning schemes	With a March 2003 deadline, how can planning schemes address the SPP when it is not finalised? Will the Minis sign off on State interests if these issues are not addresse.	The most desirable outcome will be to reflect the SPP into

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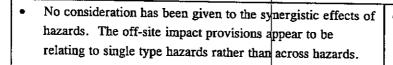
		of the SPP is impracticable because an excessive amount of work would be required to amend an advanced draft planning scheme, the SPP would be used in development assessments alongside the planning scheme until the latter is reviewed/amended.
		<ul> <li>In many cases the 'whole-of-Government' input to planning scheme preparation has identified the need for specific actions to address natural hazards and natural disaster mitigation. In such cases, these actions should be a pre-requisite for the Minister's 'sign off'.</li> </ul>
Flooding	With no specified timeframes for preparing a flood study and no default mechanism, local governments may 'ignore' the responsibility of preparing flood studies until absolutely necessary. This could be up to 8 years.	<ul> <li>Local Governments will be encouraged to undertake studies as soon as possible. However, this situation could occur as the SPP is not applicable for in relation to flood hazard for development assessment until Local Governments adopt a defined flood event (DFE) for the particular locality.</li> </ul>
·	Why has the SPP not identified a default Natural Hazard Management Area (NHMA) for flooding?	Due to limitations in data accuracy and availability across the State and differences in local conditions, it is not feasible to define a standard level. Identification of an appropriate defined flood event (DFE) requires specific consideration of local conditions.
	In areas with lower hazard, would it be reasonable for a	This would have to be determined in consultation with the State; however, the SPP makes provision for this in Appendix 2 of the Guideline.
	Local Government to use local knowledge rather than undertake formal flood studies?	Consideration will be given to including the definition contained in Appendix 2 of the Guideline in the SPP.
	Is there a definition for floodplain management study?	When making and amending planning schemes, consideration would have to be had for urban areas and areas of potential development.
	It is recognised that there may be different defined flood	Defined flood events should be determined for these areas. Local

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	events (DFEs) for different areas within a Local Government Area – what if there is no data available for certain areas?	Governments could consider applying for funding through the Natural Disaster Risk Management Studies Program.
Bushfire	Bushfire hazard assessments do not seem to require the consideration of medium/high hazard areas that form the default for natural hazard management areas (bushfire).	The methodology set out in Appendix 3 of SPP Guideline was developed by QFRS and includes all relevant considerations.
Landslides	Does the SPP apply to developments requiring the vast clearing of land which will result in increased runoff and increased possibility of landslides?	<ul> <li>Yes. The proposed SPP would apply if the proposed development were in a natural hazard management area (landslide). The preparation of planning schemes should include the development of strategies to prevent increasing the extent or severity of a hazard.</li> </ul>
•	Could LG adopt a higher/different level to 15% or greater?	Yes this would require a technical study to demonstrate that it is appropriate.
	Have studies determined how many properties are affected by landslides? Are we bringing in a policy that does not apply to many properties?	The intent of the SPP is to minimise potential impacts of landslide hazard. This requires identification of potentially affected areas.
Climate Change	Are building regulations standard throughout the State?  Predictions of climate change suggest that strong winds may get stronger - will regulations be raised?	<ul> <li>Regulations are standard through the Building Code of Australia and the Standard Building Regulation. Raising of standards may be investigated but is not part of the SPP process.</li> </ul>
Compatibility of Development	What is compatible?	• Compatibility is determined by Performance Criteria provided in Appendix 5 and 7 of the Guideline and is discussed on page 29.
Development Assessment	<ul> <li>Will the SPP result in some development becoming impact assessable?</li> </ul>	**************************************
Funding/ Resources	Will Local Governments be resourced to undertake what is required in the draft SPP?	The Department of Emergency Services has requested that LG consider these issues for over two years. Funding is available through the Natural Disaster Risk Management Studies Program.

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Natural Environment	Vegetation removal can occur for bushfire safety purposes. This can result in loss of conservation values. The SPP does not reinforce the need for the protection of the natural environment. Outcome 2 should be amended to include reference to the natural environment and a should be added regarding the criteria/principles relating to natural environment/protection of biodiversity values. Comments were made by another stakeholder that ecological sustainability is covered in the Integrated Planning Act and therefore this is a consideration anyway.	The draft SPP seeks to achieve a consistent approach to the consideration of community safety and to minimise costs through (a) a staged approach; (b) inclusion of default natural hazard management areas for bushfire and landslide; (c) exclusion of areas of the State for bushfire and landslide where they are assessed to be low hazard; and (d) matching the required hazard studies to the level of risk.  A State Planning Policy is a single issue Policy developed within the framework of the Integrated Planning Act 1997 which seeks to achieve ecological sustainability.  Suggestions will be considered in the finalisation of the SPP.
Other	<ul> <li>Does the Position Statement have power?</li> <li>There should not be exceptions to Outcome 1.</li> <li>The SPP should be more oriented to guiding development.</li> </ul>	<ul> <li>Yes. It forms part of the SPP.</li> <li>The comment is noted and will be considered in the finalisation of the SPP.</li> <li>The purpose of the proposed SPP is to minimise the adverse impacts of natural hazards on people, property, economic activity and the environment by ensuring that natural hazards are adequately considered when making decisions about development. The SPP seeks to guide development by specifying areas and development that require investigation in relation to natural hazards.</li> </ul>



The comment is noted and will be considered in the finalisation of the SPP.

### DRAFIS FATIE PLANNING POLICY FOR NATURAL DISASTER MITERATION REGIONAL CONSULTATION WORKSHOPS 2002

Time/Date:

10:30am - 1:30pm 12 November 2002

Location:

Bundaberg (Quality Hotel Burnett Riverside)

Overview Comments: Overall, tone of the meeting was positive, other than one who expressed concerns about the SPP in relation to a personal development/flooding issue. Approximately half of the participants had been involved in the consultation process to date.

**PARTICIPANTS** 

Russell Cuerel

## Workshop Program and Summary of Questions and Answers

- (1) Introduction, Overview and Presentation on SPP
- (2) Question and Answer

ISSUE

	DETAILS
Flooding	<ul> <li>An individual raised specific concerns about the SPP conveying powers to local governments to prevent future development happening in designated hazard areas. The concerns primarily related to a specific parcel of land and the effect of the SPP on its development and specific drainage and resumption matters.</li> </ul>

#### ANSWER PROVIDED

The SPP team discussed the issues with the person concerned before, during and after the presentation and outlined the intent of the SPP and its role. The individual requested that her formal submission be forwarded to the Minister for Natural Resources and Mines for consideration and this has been done.

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Bushfire	Bundaberg is proposed to be exempted from the SPP, but has a number of large areas that are prone to bushfire.	<ul> <li>Bundaberg may adopt or implement the SPP provisions for bushfires them or make a submission requesting that the SPP areas be modified to include the City in the bushfire controls.</li> </ul>
	Is the default bushfire mapping the most recent mapping?  Recent discussions and "groundtruthing" of some areas has identified some inconsistencies between the maps and actual conditions.	<ul> <li>Draft SPP maps are based on the most recent QRFS maps which are understood to have been recently revised and updated. Local Governments are encouraged to "groundtruth" these maps or undertake their own bushfire hazard risk studies. The Rural Fire Service can assist Local Governments in "groundtruthing".</li> </ul>
	A formal review of the maps should be undertaken in the near future and regularly thereafter, to ensure that maps are constantly being updated and are always current	• Comment noted.
Development Assessment	• Is there a link between the SPP and the designation of Bushfire Prone Areas under the Standard Building Regulation?	• This will be considered further in the finalisation of the SPP. The Natural Hazard Management Area (bushfire) could reflect the Bushfire Prone Area.
	Will the SPP prevent development from impacting upon downstream land?	The SPP includes the intention of encouraging local governments to develop schemes that prevent damage/impacts upon external land.
Funding/ Resources	What kinds of studies/projects have received recent funding	<ul> <li>There is a list of recent funding available. Generally, all-hazard assessments are undertaken first, followed by more specific detailed studies of specific hazards if required.</li> </ul>
Community Infrastructure	What associated health institutions are included in community infrastructure eg. community health centres, child care centres?	<ul> <li>Applicable community infrastructure is defined in Annex 1 Part (b).</li> <li>Community health centres and child care centres are not community infrastructure required during and immediately following a natural hazard event. Consideration will be given in Appendix 4 in the Guideline to Recommended Flood Levels.</li> </ul>

# DRAFESTATE PEANNING POLICY FOR NATURAL DISASTER METIGATION REGIONAL CONSULTATION WORKSHOPS 2002

Time/Date:

9:30am - 12:30pm 18 November 2002

Location:

Brisbane #2 (Virginia Palms Hotel)

Overview Comments: Overall, the tone of the meeting was positive. Several participants had been involved in the earlier SPP consultation.

**PARTICIPANTS** 

(DES) Russell Cuerel (DNRM)

### WORKSHOP PROGRAM AND SUMMARY OF QUESTIONS AND ANSWERS

- (1) Introduction, Overview and Presentation on SPP
- (2) Question and Answer

ISSUE	DETAILS	Answer Provided
Flood	Could advice be provided as to how to determine if you are in a flood prone area (ie: in a valley/lowest point etc) in a similar way to Appendix 8?	Consider in finalisation of SPP.
	Consider using defined watercourses to describe flood areas.	Consider in finalisation of SPP.

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	<ul> <li>Dam Breaks/spillway – why are these not considered further. There are state wide studies available regarding dam break.</li> <li>The SPP could include a gradation for degree public safety (eg: in relation to flooding, medium and high risk could be defined by 1:100 ARI and low risk by 1:100 – 1:1000 ARI)</li> </ul>	<ul> <li>Reference to dam break to be deleted from SPP.</li> <li>Consider in finalisation of SPP.</li> </ul>
Bushfire	<ul> <li>Provide further detail on "groundtruthing".</li> <li>Consider appropriateness of Figure 1, Appendix 3.</li> </ul>	<ul> <li>Remote sensing data was used during preparation of maps. Groundtruthing ensures that maps suitably reflect local conditions. Consider further explanation in Guideline.</li> <li>Discuss with QFRS and consider in finalisation of SPP.</li> </ul>
Natural Hazard Planning	Are there comparable schemes/measures used in other parts of Australia?	Yes, some include flood management documents in Victoria/NSW, bushfire management strategies in NSW. The SPP is the only document that considers the various hazards in one policy document.
Insurance	<ul> <li>The insurance industry may refuse to insure property/people in natural hazard management areas.</li> </ul>	Documenting the level of hazard does not change the level of hazard.  Natural hazards are a core matter that should be addressed in planning schemes. Planning measures should be put in place to protect people and property
Terminology	Acceptable/unacceptable – can these terms be standardised? Communities would consider these terms differently for different hazards.	The Disaster Risk Management Guidelines prepared by the DES provides information on determining acceptable/unacceptable risk and indicates these meanings are not meant to be standardised. Refer to book for further information.
Other	Does setting arbitrary limits create a false sense of security?	<ul> <li>The approach adopted by the SPP is that natural hazard management areas require further consideration in relation to natural hazards. They are not identified as areas that are safe or not safe and there will be residual risk. By improving the level of knowledge, communities will become better educated about hazards.</li> </ul>

## DRAFI STATE PLANNING POLICY FOR NATURAL DISASEER MINIGATION REGIONAL CONSULTATION WORKSHOPS 2002

Time/Date:

9:30am - 12:30pm 21 November 2002

Location:

Cairns #1 - morning session ( Palms Southside Hotel)

Overview Comments: Overall, the tone of the meeting was positive. 4 participants had been involved in the SPP consultation process in 2001

(DES), Russell Cuerel (DNRM)

WORKSHUP PROGRAM AND SUMMARY OF QUESTIONS AND ANSWERS

- (1) Introduction, Overview and Presentation on SPP
- (2) Question and Answer

ISSUE	DETAILS		
Flooding	How can local conditions be taken into ac determining a defined flood event (DFE)?  (1:50 Year ARI) DFE be adopted?	count when Can Q50	1:100 Year ARI (Average Recurrent Interval) is intended to be the starting point, to be supported by supplementary assessments to determine local variations and appropriate levels. Other levels could be adopted providing that detailed assessments and corresponding justification for the level can be provided.
Bushfire  010165 - State Plann	<ul> <li>Can uses such as farm forestry occur in the they would, by definition, be creating fire</li> <li>Draft SPP provisions place a strong relianting Policy Regional Workshops</li> </ul>	risk?	<ul> <li>Such uses could be facilitated and managed by the development of appropriate planning scheme code.</li> <li>Use of the QFRS mapping is intended as an interim step until Councils</li> </ul>

So su fir Pr	QFRS mapping and on-going revisions of the will happen if mapping is not updated by Q Some of the mapping is inaccurate eg. cropsuch as caneland are nominated as medium fire areas, which is excessive and restrictive. The Standard Building Regulation has specific provisions relating to bushfire design of structure and the ability for Local Governments to noming the ability for Local Governments to noming the property of the Standard Building Regulation has specific provisions relating to bushfire design of structure and the standard Building Regulation has specific provisions relating to bushfire design of structure and the standard Building Regulation has specific provisions relating to bushfire design of structure and make the Bushfire Natural Management Areas (NHMAs) and the Standard Building Regulation has specific provisions relating to bushfire design of structure and the standard Building Regulation has specific provisions relating to bushfire design of structure and the standard Building Regulation has specific provisions relating to bushfire design of structure and the standard Building Regulation has specific provisions relating to bushfire design of structure and the standard Building Regulation has specific provisions relating to bushfire design of structure and the standard Building Regulation has specific provisions relating to bushfire design of structure and the standard Building Regulation has specific provisions relating to bushfire design of structure and the standard Building Regulation has specific provisions relating to bushfire design of structure and the standard Building Regulation has specific provisions relating to bushfire design of structure and the standard Building Regulation has specific provisions and the standard Building Regulation has specific provisions and the standard Building Regulation has specific provisions and the standard Building Regulation has specific provisions and the standard Building Regulation has specific provisions and the standard Building Regulation has sp	OFRS?  pping areas  n or high risk  ve.  cific  cuctures and  nate Bushfire  his	•	undertake their own comprehensive assessments. The Rural Fire Service has offered to assist Local Governments in the "groundtruthing" of the maps.  It makes sense for the SPP and Standard Building Regulation to have the same triggers and areas. Adopting a NHMA would not make the
prothe the Pr rea	provisions relating to bushfire design of structure of structure design of structure d	ructures and nate Bushfire his I Hazard	•	same triggers and areas. Adopting a NHMA would not make the
Bu a I als Bu	Building Regulation Bushfire Prone Areas to Local Government adopted a NHMA would be become the applicable area for the Star Building Regulation provisions?	the same. If uld this then		Standard Building Regulation apply to the same areas, it would have to be the subject as a separate Council decision. Potential linking of the SPP and the Standard Building Regulation will be considered further in the finalisation of the SPP.
пат	What is the basis of the 15% slope as the desatural hazard management area and what p cientific evidence was this based upon?	lefined process/		It is an investigation area that is likely to pick up most of the areas subject to landslide hazard. The draft SPP and Guideline recognises there will be land steeper than 15% that is stable and less than 15% which is unstable. Appendix 4 of the Guideline identifies a number of issues which should be considered in a geological stability study.
rat ris	The SPP should incorporate a statement about a statement about the potential sisk trade-off decisions where grounds exist evelopment occur despite the risks.	al to make	•	This process should be undertaken as part of the planning scheme review and development process outlined in Appendix 5 point 2.
dev	Vill Councils be liable if they have approve evelopment which is subsequently damaged azard event?	ed ed by a	•	The SPP is a forward-looking document ie. it does not affect existing or approved development.

SPP document	<ul> <li>The SPP should be linked with the State Coastal         Management Plan and the Building Code of Australia.</li> <li>The SPP indicates that the trigger for the application of</li> </ul>	<ul> <li>Links and cross-references will be included in the SPP by way of footnotes and formal references.</li> </ul>
	the CDD is increased and it is a group	<ul> <li>The SPP has not quantified a threshold as this was thought to be a decision better made by Local Governments, but this position can be reviewed in the finalisation of the SPP.</li> </ul>
Community Infrastructure	The SPP has nominated State-controlled roads as being network infrastructure and hence subject to the community infrastructure provisions, yet many local roads are equally important and are not covered by the same provisions	<ul> <li>The community infrastructure provisions do not cover local roads, because of the definition of "community infrastructure" in the Integrated Planning Act 1997.</li> </ul>
Other	<ul> <li>Has the SPP consultation process has included representatives of the insurance industry?</li> <li>In determining the level of hazard, the assumption is that the hazards are time-dependent, but hazard regimes change. Planning based on current hazard regimes may result in gross underestimates of future hazard risks. Hazard risks should be reviewed regularly and appropriate changes made to the natural hazard management areas.</li> </ul>	Yes, insurance industry representatives have been involved in all stages of SPP consultation.

### DRAFT STATE PEANNING POLICYTOR NATURAL DISASPER MERICATION REGIONAL CONSULTATION WORKSHOPS 2002 Time/Date: 9:30am - 12:30pm 20 November 2002 Location: Townsville (Summit Hotel) Overview Comments: Overall, the tone of the meeting was positive. 6 participants had attended the 2001 SPP consultation process. **PARTICIPANTS** Attendees (35): State Government conditional on the basis that the Integrated Planning Act [IPA] is not a valid legal enactment and that his attendance in no way denoted his recognition of IPA or its subsidiary policies as valid legal entities). (DES), (DES), Russell Cuerel (DNRM) WORKSHOP PROGRAM AND SUMMARY OF QUESTIONS AND ANSWERS (1) Introduction, Overview and Presentation on SPP (2) Question and Answer ISSUE DETAILS ANSWER PROVIDED Flood Is the 1:100 Year ARI (Q100) to be used as the flooding The 1:100 Year ARI is a starting point for investigation. A different

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benchmark across the State?

Does flood mapping have to be undertaken for all

Environmental Resources Management Australia

defined flood event may be adopted provided that there is justification

No. Mapping of streams and waterways should only need to be undertaken for those areas that are or may be developed. Balance

for such a level.

· · · · · · · · · · · · · · · · · · ·		
	<ul> <li>Will the SPP affect existing development eg. Giru</li> <li>township and cane mill flood regularly.</li> <li>What will be the actual level for trigger land level or</li> <li>applications.</li> <li>Existing and from expansions with</li></ul>	nen be assessed as required, in relation to development uture development commitments would remain although ill need to consider the Outcomes of the SPP. Il management areas defined flood events would apply to a floor levels as the Building Code controls the actual ill sof development.
	The Recommended Flood Levels for access in Appendix     are unachievable and unrealistic.	•
Bushfire	the Bushfire maps? Will the maps be provided to Councils?  Why are some Local Governments excluded from the Bushfire provisions of the SPP?  Who will be responsible for the enforcement of the SPP?  maps and a revaliable in both Local Governments bushfire hazard bushfire provisions of the SPP?	ments have been involved in the groundtruthing of the view of maps has recently been completed. Mapping is oth soft and hard formats directly from the QFRS. ments have been excluded based on an assessment of d undertaken by the QFRS. ments will continue to have the responsibility to enforce pprovals.
Landslides	Local Government Area are not of a sufficient detail to to develop and	alt investigation trigger. Local Governments will need adopt measures in planning schemes to assess and able development.
Liability	Will Local Governments that are excluded from the SPP for bushfire and/or landslide be eligible for future Federal Government funding if assessments and Local Government funding if assessments and	ments have been excluded from the draft SPP based on of hazard assessed to exist. Federal funding requires ments to mitigate likely or recurring events. This d not be affected by the introduction of the SPP.
State Coastal Management Plan	<ul> <li>How is storm surge being addressed by the SPP? To         comprehensively address natural hazards, the SPP</li> <li>Storm surge is         (SCMP). The</li> </ul>	dealt with by the State Coastal Management Plan Environmental Protection Agency is developing address storm surge and these will be released

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	may create  The State Count NA	tly with the SPP. Duplication of the provisions in the SPP confusion and cross-referencing is to be used. It is drafted on the assumption that other legislation and including the SCMP) are lawful.
Planning Schemes	planning schemes currently being planning s	be necessary to directly incorporate the SPP into the chemes currently being prepared, although the principles of
SPP document	me SFF at	e core matters and should be incorporated.  specific suggestions during the finalisation of the SPP.

	Outcome 2, Further explanation is needed of what is 'acceptable' and 'unacceptable' risk.	
Other	<ul> <li>Is the Department of Emergency Services (DES) intended to become a referral agency for the SPP?</li> <li>Are model codes/templates likely to be produced for the SPP?</li> </ul>	<ul> <li>No, DES is not intended to become a required referral agency, although individual application may be referred to DES for advice during the assessment process.</li> <li>Appendices 5 and 7 have methodologies which are useful to develop codes. Consideration will be given to a table in the Guideline to assist with development of codes.</li> </ul>

# DRAFE STATE PLANNING POLICYFOR NATURAL DISASTER METICATION REGIONAL CONSULTATION WORKSHOPS 2002

Time/Date:

1:30pm - 3:30pm 21 November 2002

Location:

Cairns #2 - ( Palms Southside Hotel)

Overview Comments: Overall, the tone of the meeting was positive. 3 participants had been involved in the SPP consultation process in 2001.

**PARTICIPANTS** 

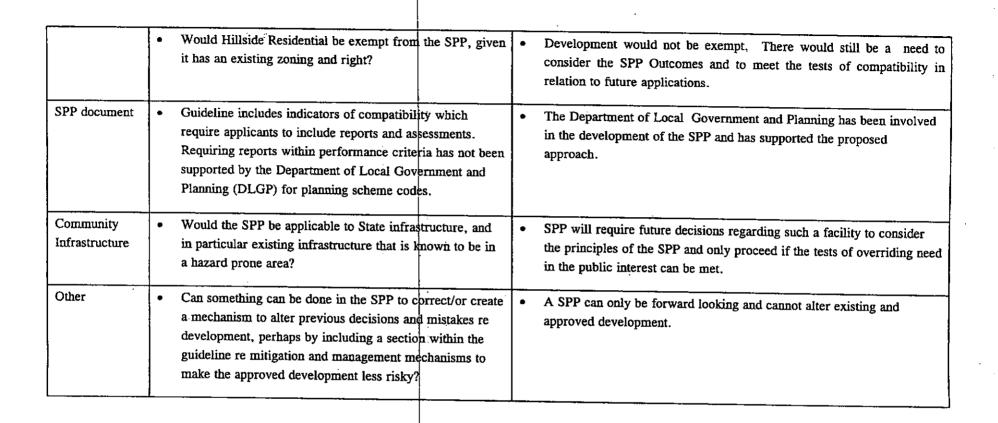
, Russell Cuerel (DNRM)

### WORKSHOP PROGRAM AND SUMMARY OF QUESTIONS AND ANSWERS

- (1) Introduction, Overview and Presentation on SPP
- (2) Question and Answer

Issue	DETAILS	ANSWER PROVIDED
Flooding	Does the SPP consider or make an assumption about sealevel rise?	<ul> <li>The Draft SPP does not include a specific assumption about sea-level rise, but indicates that the issue should be considered in the consideration of natural hazard management areas.</li> </ul>
Bushfire	Who assesses applicants' bushfire assessments/ management plans as no or few people in Councils have the skills? Is DES going to be a referral agency?	<ul> <li>DES is not intended to be a referral agency, but assessments of specific issues such as bushfire plans could perhaps be sent to QFRS for advice during the assessment process.</li> </ul>
Landslides	How steep the 15% is in real terms?	<ul> <li>Approximately 1 in 6. This does not, however, prevent development occurring over this point, but requires an assessment of the suitability and stability of the land.</li> </ul>

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### DRAIT STATE PEANNING POLICY FOR NATURAL DISASTER MUTICATION REGIONAL CONSULTATION WORKSHOPS 2002

Time/Date:

9:30am - 12:30pm 22 November 2002

Location:

Sunshine Coast (Millwell Road Commuity Centre)

Overview Comments: Overall, there was a high level of interest and a number of constructive suggestions made. Several participants had been involved in the

**PARTICIPANTS** 

Russell Cuerel (DNRM)

## WORKSHOP PROGRAM AND SUMMARY OF QUESTIONS AND ANSWERS

- (1) Introduction, Overview and Presentation on SPP
- (2) Question and Answer

Issue	DETAILS		
Timing of SPP and planning schemes		of g	The Integrated Planning Act 1997 sets out the process for making a planning scheme. Natural hazards are a core matter that a Local Government must address as part of preparing a planning scheme. Planning schemes that are currently being prepared will need to address the issues as agreed between the Local and State Governments.
Flooding  8010165 - State Planning	• The natural hazard management area (fl	ood) is	

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	areas identified during large storm/flooding events that are higher than the DFE. How do you deal with this?	been defined for the management of a hazard but may not reflect the full extent of the area that may be affected by the hazard" ie. there is residual risk. The SPP allows Local Governments to adopt a higher level of protection for their community. Local Governments can use different DFE levels in different ocalities within the local government area. The SPP provides guidance on the approach to be used.
Bushfire	by QFRS and is more accurate.	Noted  Comment noted for consideration during finalisation of the SPP.
Natural Hazard Management Areas (NHMAs)	clearly identity the areas to which the SPP	Natural hazard management areas (NHMAs) are to be used for this purpose.  Local Governments are to specifically identify NHMAs according to local conditions and are encouraged to undertake natural hazard studies.
Role of the SPP	It has been identified what an SPP can and cannot do. It appears that the 'cannot' components will nullify the SPP. Significant	A SPP is developed within the framework of the Integrated Planning Act 1997 and has constraints and opportunities. A SPP cannot affect past land use lecisions. Its role is to influence future decisions. The SPP should be used in onjunction with other complementary mitigation strategies.
Agricultural land	Would it be appropriate for Local	This is a matter for each Local Government to consider.

Funding	<ul> <li>Are there any provisions for the Government to share costs? It appears to be the responsibility of Local Government to implement State Government policies.</li> <li>The Natural Disaster Risk Management Studies Program gives a 2/3 subsidy the applicant (usually a Local Government) for studies. 1/3 is provided by State and 1/3 by the Commonwealth.</li> <li>The SPP provides a system for progressively introducing requirements and hadefault for bushfire and landslide for Day 1 implementation.</li> <li>Natural hazard constraints are a core matter to be addressed in the preparation planning schemes whether or not there is a SPP.</li> </ul>
Vegetation Removal	<ul> <li>Will the SPP link with Department of Natural     Resources and Mines requirements for vegetation removal?</li> </ul> Comments noted and will be considered in the finalisation of the SPP?
Planning Schemes	<ul> <li>Will model codes be developed?</li> <li>Performance criteria and indicators of compatibility are provided to assist in the preparation of planning schemes and for development assessment. Further guidance is being prepared in the finalisation of the SPP.</li> <li>Not in the first instance but once the maps are integrated into planning schemes will require a planning scheme amendment</li> </ul>
Development Assessment	<ul> <li>Development assessment provisions allow for consideration of conditions on one parcel of land. What about the effects on adjacent parcels of land?</li> <li>The SPP recognises and provides for the consideration of cumulative and off si impacts and these are included in Development Assessment Outcomes and the requirements to meet the objectives of the Outcomes.</li> </ul>
General	The Department of Emergency Services is to     be commended for its initiative in developing     a SPP for Natural Disaster Mitigation.      Noted

### Drafe State Planning Policy for Natural Disaster Medication Regional Consultation Workshops 2002

Time/Date:

9.00am - 12pm 25 November 2002

Location:

Rockhampton #1 (Centre Point Motel)

Overview Comments: Overall, the tone of the meeting was positive. A number of participants had been involved in earlier consultation for the SPP.

**PARTICIPANTS** 

Russell Cuerel (DNRM)

#### WORKSHOP PROGRAM AND SUMMARY OF QUESTIONS AND ANSWERS

- (1) Introduction, Overview and Presentation on SPP
- (2) Question and Answer

ISSUE	DETAILS	ANSWER PROVIDED
Definition of a Natural Disaster.	<ul> <li>How is a Natural Disaster defined for the purpose of the draft SPP?</li> <li>What level of Natural Disaster is the draft SPP intended to apply to?</li> </ul>	<ul> <li>Natural Disaster is defined in the SPP as "a natural hazard event which severely disrupts the fabric of a community and requires the intervention of various levels of government to return the community to normality"</li> <li>The draft SPP proposes that land use planning be used to mitigate the impacts of future natural disasters by identifying "natural hazard management areas" and applying appropriate planning criteria to ensure proper consideration of the consequences of development.</li> </ul>

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Community Infrastructure	Why are schools excluded from Annex 1(b)?	<ul> <li>Schools are included in categories of development in natural hazard management areas in Annex 1(a). Annex 1(b) is intended to identify community infrastructure that should keep functioning during and immediately after a natural hazard event.</li> </ul>
Community Infrastructure	<ul> <li>In relation to flooding, does consideration of the specified community infrastructure have to take into account issues other than continued operation of the infrastructure during a hazard event?</li> </ul>	<ul> <li>In a natural hazard management area, one must consider the imp acts identified in point 4 of Annex 1(a) on flood flows by changing the flood characteristics of the area.</li> </ul>
Natural Hazard Management Areas (Bushfire)	Is there a link between the adoption of Natural Hazard Management Area (Bushfire) and the adoption of bushfire-prone areas for the Standard Building Regulation?	It would be up to the Local Government but the same background studies could be used for both.
Natural Hazard Management Areas (Bushfire)	How would a Local Government go about undertaking a Natural Hazard Assessment study?	A methodology is provided in Appendix 3 of the Guideline.
Natural Hazard Management Areas (Bushfire)	The aspect diagram on Page 60 appears to be more applicable to southern areas rather than northern areas of the State.	This will be referred to QFRS for further consideration.
Natural Hazard Management Areas (Landslide)	Why is the 15% slope used?	• It is an investigation area that is likely to pick up most of the areas subject to landslide hazard. The draft SPP and Guideline recognises there will be land steeper than 15% that is stable and less than 15% which is unstable. Appendix 4 of the Guideline identifies a number of issues which should be considered in a geological stability study.
Natural Hazard Management Areas	Does the Natural Hazard Management Area (Landslide) include land likely to be affected by a landslide such as downslope areas that might	• It is preferable that a geological stability be undertaken and that the Natural Hazard Management Area (Landslide) takes this into account.

(Landslide)	be less than 15% slope?	
Natural Hazard Management Areas (Landslide)	Rockfall should be explicitly included in the definition of landslide	To be considered further in finalisation of the SPP.
Natural Hazard Management Areas (Flood)	Was consideration given to graduated flood management studies rather than just 1:100 year ARI?	In the undertaking of flood hazard assessments for an area this could be considered.
Natural Hazard Management Areas (Flood)	Could a Defined Flood Event (DFE) of less than 1:100 year ARI be used on the basis of historical evidence rather than a flood study that would be beyond the financial resources of the local government?	• It is important to consider probability and consequences of a greater flood event. Funding is available to assist local governments to undertake studies to identify a DFE. This funding is the Natural Disaster Risk Management Studies Program funding where 2/3 of the studies money is provided by the Commonwealth and the Queensland Government and 1/3 is provided by the successful applicant. This issue can be negotiated on a case by case basis with the State Government
Natural Hazard Management Areas (Flood)	Will the impacts outside of the Local Government Area (LGA) boundary be considered?	Yes. Need to consider impacts of development regardless of LGA boundaries.
Natural Hazard Management Areas and Land Values	Could the designation of Natural Hazard     Management Areas affect land values?	<ul> <li>Designation would not change the level of hazard affecting an area. The purpose of the draft SPP is to ensure that planning properly takes into account natural hazards.</li> </ul>
Development Commitment	How do you determine if a Development     Commitment were a "development clearly     consistent with the relevant zone (or equivalent)     in a planning scheme"?	• If proposed purpose is a permitted purpose or if it is included within the Intent of Zone provisions or similar, then it would apply.
Development Commitment	Would the draft SPP apply to a Multiple     Dwelling development in a Multiple Dwelling	• If it requires a development application, then the sections of Outcomes 1 and 2 relating to Development Commitments would apply.

	Zone?	
Development Commitment Exceptions (Outcome 1)	Would permitting development with a lower level of risk than development generally in the area put more people at risk in natural hazard management areas?	<ul> <li>The SPP needs to recognise development commitments. Under Outcome 2, the level of risk needs to be lower than that which generally applies to development in the vicinity. This would raise the standard in existing hazard prone areas. The issue will be considered further in the finalisation of the SPP.</li> </ul>
Model Codes	Is consideration being given to developing     Model Codes for local governments to use?	<ul> <li>Appendices 5 and 7 have methodologies which are useful to develop codes.</li> <li>Consideration will be given to a table in the Guideline to assist with development of codes.</li> </ul>

Community Infrastructure	In relation to Community Infrastructure proposals, would it be appropriate to have the Department of Emergency Services as a advice agency?	It is not proposed to have any referral or concurrence agencies specified in relation to the draft SPP but an assessment manager could seek input from any agency as an advice agency.
Timing	Where a Local Government is currently preparing a planning scheme, should a code in relation to natural hazard management be included or should the Local Government wait for finalisation of the SPP?	• The Department of Emergency Services has been commenting at Statement of Proposals stage that the issue should be addressed in planning schemes. Inclusion of a code is one way of dealing with this and is recommended. Until commencement of the SPP, the way in which the issue is to be addressed is a matter for agreement between the Local and State Government on a planning scheme by planning scheme basis.

# DRAFT STATE PLANNING POLICY FOR NATURAL DISASTER MELICATION REGIONAL CONSULTATION WORKSHOPS 2002

Time/Date:

10.30am - 1pm 26 November 2002

Location:

Mackay (Shamrock Hotel)

Overview Comments: Overall, the tone of the meeting was positive. Several attendees had been involved in previous consultation for the SPP.

**PARTICIPANTS** 

Facilitators:

Russell Cuerel (DNRM)

### WORKSHOP PROGRAM AND SUMMARY OF QUESTIONS AND ANSWERS

- (1) Introduction, Overview and Presentation on SPP
- (2) Question and Answer

ISSUE	DETAILS	ANSWER PROVIDED
Cyclones	Flooding occurs with cyclones so cyclones should be included in the SPP	The SPP address flooding consequences of cyclones in the sections relating to floods
Landslide	Acid sulfate soils should be included in considerations	Acid sulfate soils are covered in their own SPP
Unacceptable Level of Risk	Should be defined clearly. Thresholds could be included so that what is an unacceptable level of risk is quantified and arguments/ debates do not ensue over interpretation	The proposed approach is discussed in draft SPP and Guideline. It will be considered further in finalisation of SPP. Suggestions to strengthen the approach are welcomed
Insurance	Flood insurance is expensive	SPP and identification of Natural Hazard

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		Management Areas would not change the level of hazard in an area but would provide the information so that people are aware of it
Outcome 1	Is overriding need in the public interest interpreted as in the same way as other SPPS?	• Yes
Outcome 1	Would this apply to Material Change of Use applications?	• Yes
Natural Hazard Management Areas (Flood)	Protection of properties against flooding should be given priority over protection of mangroves	Comment noted. Planning Schemes must comply with all relevant legislation, including environmental legislation
Community Infrastructure	The proposed inclusion of State-controlled roads should be widened to include Local Roads where they are important to the network	To be considered further in the finalisation of the SPP
Community Infrastructure	<ul> <li>Provisions in Appendix 7 relating to access should be clarified and Recommended Flood Levels (RFLs) for access reconsidered as it is important to keep the facility above the RFL but it is not practical to maintain access above this level. The SPP could consider alternative access other than roads eg. helicopter. Consider how far access referred to goes ie. is it immediate local access, access to the catchment, etc?</li> </ul>	To be considered further in the finalisation of the SPP
Community Infrastructure	There is a need to consider accessibility to community infrastructure. The proposed community infrastructure may not be in a natural hazard management area (NHMA) but may not be accessible	Community infrastructure provisions are proposed to apply throughout the Local Government Area, not just in NHMAs. The aim is to site the infrastructure appropriately taking into account natural hazards.

(3) Issues raised not related to SPP.

Storm surge guidelines should be prepared by EPA in a timely fashion so it can be used in relation to the SPP for Natural Disaster Mitigation. Flood infrastructure needs to maintained and operated properly after being constructed.

## DRAFTSTATE PLANNING POLICY FOR NATURAL DISASTER METIGATION REGIONAL CONSULTATION WORKSHOPS 2002

Time/Date:

10.15am - 1pm 27 November 2002

Location:

Roma (Club Hotel Motel)

Overview Comments: Overall, the tone of the meeting was positive.

**PARTICIPANTS** 

Facilitators:

, Russell Cuerel (Department of Natural Resources and Mines)

#### WORKSHOP PROGRAM AND SUMMARY OF QUESTIONS AND ANSWERS

- (1) Introduction, Overview and Presentation on SPP
- (2) Question and Answer

ISSUE		DETAILS		Answer Provided
Flood	•	If a State-controlled road is to be developed would Annex 1, Part (a) apply if it changed the natural flows or characteristics of floodwater in a natural hazard management area (NHMA)?		State-controlled roads are listed in Annex 1, Part (b) as a community infrastructure.  If the development of a State-controlled road is within a NHMA and involves works outlined in Annex 1, Part (a), then Outcomes 1, 2 and 3 apply to the community infrastructure proposal. This process is illustrated in Figure 1 on Page 18 of the Guideline.
Flood	•	Why is there no default for flood?	•	The SPP has set defaults for bushfire and landslide as it is possible to apply consistent investigation criteria across the State. Due to the complex nature of flood hazard and the lack of State-wide information, it is not possible to set a default for flood. Flood hazard needs to be locally defined. The natural hazard management area (NHMA) (flood) is the Defined Flood Event (DFE) adopted by a Local Government. If a Local Government has not defined the NHMA (flood) (ie adopted a DFE), then the SPP does not apply for development assessment purposes. Over time, it is encouraged that local assessment and mapping of flood hazard areas be addressed in planning schemes

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		with planning strategies and measures to mitigate the impacts of flood hazard.
Flood	<ul> <li>The recommended flood levels and note about evacuation access in Appendix 7 was questioned in relation to a road through a town (eg. road from Charleville to the Airport has a dip, which in 1990 flood caused a problem).</li> </ul>	<ul> <li>The SPP recognises that there are circumstances when community infrastructure needs to be located in a particular area. Outcome 3 emphases 'wherever practicable' when locating and designing community infrastructure. Each Local Government and infrastructure provider should look at the consequences when locating community infrastructure, for example an airport, and determine evacuation routes and minimise the adverse impacts.</li> </ul>
Flood	What about a subdivision on a hill in a flood prone area?	The Assessment Manager would need to assess the consequences of locating a subdivision and determine evacuation routes. The development would need to meet Outcome 1 and, if a development commitment, also meet Outcome 2.
Flood	<ul> <li>Where a development proposal is in a flood plain with only access by a bridge, can the bridge be upgraded?</li> </ul>	The SPP deals with development and not external infrastructure. The applicant would need to demonstrate that the development has demand for that infrastructure.
Community Infrastructure	<ul> <li>What about community infrastructure that is a private development?</li> </ul>	• The types of community infrastructure to which the SPP applies are listed in Part (b), Annex 1 of the SPP. However, the proposed development could trigger Part (a), Annex 1 of the SPP, if it involves these actions or activities.
Development	Annex 1, Part (a) refers to increasing the number of people in a natural hazard management area (NHMA). Is this an increase of one person or 20 dwellings?	• If the development is an existing development commitment, it would need to meet Outcome 2. If a dwelling is within a NHMA then it would need to be compatible with the nature of the natural hazard by meeting the performance criteria set out in Appendix 5 of the Guideline.
Development	Will the SPP stop all types of development that are subject to hazard?	Development in hazard areas such as flood plains may not be appropriate if it cannot meet the SPP Outcomes. Decisions about planning and development, have to be considered in relation to the SPP Outcomes and performance criteria.
Insurance	If a NHMA is defined, insurance companies may not provide insurance.	A hazard exists whether or not the NHMA is defined. Providing information on natural hazards enables more informed decisions.

# DRAFT STATE PLANNING POLICY FOR NATURAL DISASTER MITLIGATION REGIONAL CONSULTATION WORKSHOPS 2002

Time/Date:

10am - 1pm 2 December 2002

Location:

Mount Isa (Terrace Gardens Function Centre)

Overview Comments: Overall, the tone of the meeting was positive. 4 attendees had been involved in previous consultation for the draft SPP.

**PARTICIPANTS** 

Attendees (14): State Government -

Russell Cuerel (DNRM)

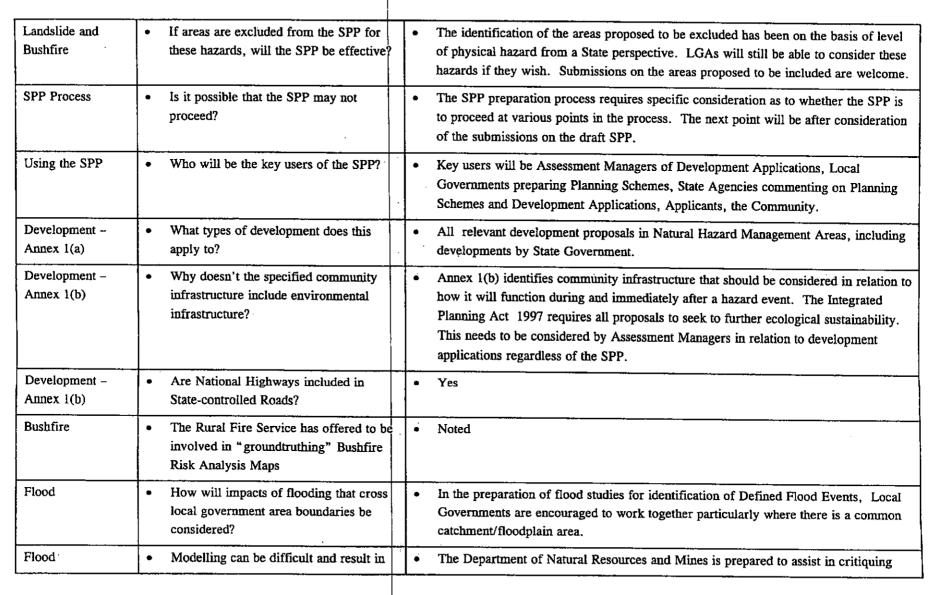
#### WORKSHOP PROGRAM AND SUMMARY OF QUESTIONS AND ANSWERS

- (1) Introduction, Overview and Presentation on SPP
- (2) Question and Answer

Issue	DETAILS	Answer Provided
Storm surge	In the Gulf of Carpentaria, the impacts of storm surge are more sudden and the consequences greater than overland flow flooding.	• Storm surge would be required to be considered as part of flood hazard assessment under draft SPP. Guidelines will be prepared by the EPA under the State Coastal Management Plan (SCMP) and there are opportunities for involvement. There will be cross referencing between the draft SPP and the SCMP Guidelines
Costs	How is the issue of costs of studies being addressed?	<ul> <li>Local Governments are encouraged to apply for funding under the Natural Disaster Risk Management Studies Program.</li> <li>SPP timing allows for studies to be undertaken over several years. There are defaults which may be put in place from Day 1 for bushfire and landslide and flooding is addressed when a Local Government adopts a Defined Flood Event.</li> <li>Areas of the State of relatively lower physical hazard for bushfire and landslide are proposed to be excluded from requirement to consider development applications under the SPP for these issues.</li> </ul>

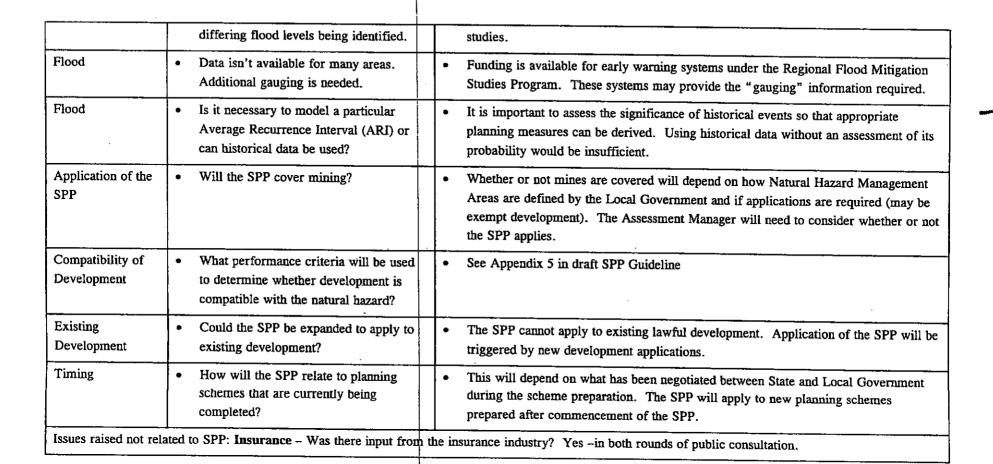
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Environmental Resources Management Australia



8010165 - State Planning Policy Regional Workshops

Environmental Resources Management Australia



# DRAFT STATE READING POLICY FOR NATURAL DISASTER METERATION REGIONAL CONSULTATION WORKSHOPS 2002

Time/Date:

10am - 1pm 4 December 2002

Location:

Longreach (SES Airport Complex Training Room)

Overview Comments: Overall, the tone of the meeting was positive.

**PARTICIPANTS** 

Russell Cuerel (Department of Natural Resources and Mines)

# WORKSHOP PROGRAM AND SUMMARY OF QUESTIONS AND ANSWERS

- (1) Introduction, Overview and Presentation on SPP
- (2) Question and Answer

Issue	DETAILS	ANSWER PROVIDED				
Community Infrastructure	<ul> <li>In Annex 1, Part (b) what is the definitio of State- controlled roads?</li> </ul>	The Department of Main Roads designates State-controlled roads. From a State point of view, State-controlled roads provide key transportation links important for communities. Some State-controlled roads and some local roads can be important evacuation routes.				
	<ul> <li>Under the Integrated Planning Act, can Local Governments exclude State- controlled roads?</li> </ul>	<ul> <li>State-controlled roads are exempt from planning schemes and designated and constructed by Department of Main Roads in consultation with Local Governments. The SPP applies to community infrastructure including State- controlled roads. The designator would need to go through the steps outlined in the SPP.</li> </ul>				
Bushfire	<ul> <li>Why are areas of the State proposed to b excluded from the SPP for bushfire?</li> </ul>	<ul> <li>Areas proposed to be excluded from the SPP have been assessed as having a low level of bushfire hazard by the Queensland Fire and Rescue Service. Local Governments that are excluded from the SPP can still be proactive in addressing bushfire and landslide hazards in their areas.</li> </ul>				

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Flood	•	What happens if a Local Government approves development and it is then flooded?	•	Local Governments should seek their own legal liability advice. Understanding flood hazards enables effective planning and is a public safety issue.
Timing	•	Is there any time frame for hazard assessment studies?	•	Local Governments are encouraged to undertake hazard assessment studies as soon as possible. Studies will be required to be undertaken in conjunction with the preparation of the next planning scheme after the adoption of the SPP.
Development	•	Could the SPP be used to prevent development?		Yes. The SPP sets a broad approach for development assessment in determining compatibility and/or minimising adverse impacts from natural hazards. Local governments can refuse a proposed development if it does not meet the SPP Outcomes. In a legal situation, the SPP would be taken into account and the Court would consider whether the development achieves the Outcomes of the SPP.
Drought	•	Why is drought not included in the SPP	?	Drought is outside the scope of land use planning and development assessment and is tackled through other mechanisms. It is a chronic event rather than a sudden event and not likely to be mitigated by land use planning and development assessment.

Appendix C

Submissions

# Stage 2 - submissions

ID	Title	First Name	Last Name	Position	OrgName	DATE OF SUB	RECEIVED
1	Ms					22/10/2002	25/10/2002
2	Mr	•				28/10/2002	31/10/2002
3	Mr	-		Acting Clerk of the Parliament	Legislative Assembly Offices	5/11/2002	13/11/2002
4	Mr			Chief Executive Officer	Country Energy	11/11/2002	13/11/2002
5	Dr			Manager-Risk Modelling Project	Geoscience Australia	20/11/2002	20/11/2002
6	Mr	Gary	White	President - Queensland Division	Planning Institute of Australia	12/12/2002	17/12/2002
7	Mr			Manager, Preservation Services	Queensland State Archives	22/11/2002	22/11/2002
8	Mr			Director, Civil Operations	Beaudesert Shire Council	20/11/2002	25/11/2002
9	Mrs					25/11/2002	25/11/2002
10	Mr	Peter	Borrows	Chief Executive Officer	SEQ Water	21/11/2002	25/11/2002
11	Mr	-		Chief Executive Officer	Kingaroy Shire Council	28/11/2002	29/11/2002
12	Mr	Ian	Whitehead	Director Facilities Development and Management	Sport and Recreation Queensland	27/11/2002	29/11/2002
13	Mr	-		A/Director-General	Department of Tourism, Racing and Fair Trading	18/11/2002	27/11/2002
14	Mr	• 1		Program Manager Property Services	Queensland Police Service	27/11/2002	28/11/2002
15	Mr		-			21/11/2002	4/12/2002
16	Ms			Director Regional Services	Department of Primary Industries	29/11/2002	3/12/2002
17	Mr			Chief Executive Officer	Stanthorpe Shire Council	29/11/2002	2/12/2002

ID	Title	First Name	Last Name	Position	OrgName	DATE OF SUB	RECEIVED
18	Mr					28/11/2002	2/12/2002
19	Mr	•		Chief Executive Officer	Winton Shire Council	25/11/2002	2/12/2002
20	Mr	Allan	Best	Principal Project Officer	Arts Queensland	6/12/2002	6/12/2002
21	Mr		-	District Director North Coast Hinterland	Department of Main Roads	29/11/2002	6/12/2002
22	Mr		-	Manager, Planning & Stategy	Caboolture Shire Council	6/12/2002	10/12/2002
23	Mr	-	_			5/12/2002	10/12/2002
24	Mr	Peter	Byrne	Chief Executive Officer	Bundaberg City Council	6/12/2002	10/12/2002
25	Mr			Acting General Manager	Cairns International Airport (Cairns Port Authority)	5/12/2002	11/12/2002
26	Mr	-		Director-General	Department of Industrial Relations	6/12/2002	10/12/2002
27	Mr			General Manager Network Asset Management	Energex Limited	6/12/2002	10/12/2002
28	Mr	P	Hennessey	General Manager Planning and Policy	Redland Shire Council	10/12/2002	12/12/2002
29	Mr		-	Principal	Sargent Consulting	10/12/2002	12/12/2002
30	Mr			Director Assets and Development	Pine Rivers Shire Council	11/12/2002	12/12/2002
31	Mr			Chair	Bay Islands Development Association Inc.	12/12/2002	12/12/2002
32	Mr		-	Planning Officer	Thuringowa City Council	12/12/2002	12/12/2002
33	Mr	Jim	Davidson	Regional Director Queensland Branch	Bureau of Meteorology	12/12/2002	12/12/2002
34	Mr	John	Adams	Planning Manager	Ipswich City Council	12/12/2002	12/12/2002
35	Mr	-	-	Director-General	Environmental Protection Agency	18/12/2002	2/01/2003

Monday, 17 March 2003 Page 2 of 4

	ID Title	First N	ame Last Nam	e Position	OrgName	DATE OF SU	IB RECEIVED
3	JO MI			Director-General	Department of Main Roads	12/12/200	
	37 Ms	-	i	Senior Advisor (Land Use Planning)	Queensland Transport	13/12/200	2 13/12/2002
. ,	38 Mr		-	Reader Faculty of Science and Engineering	James Cook University	12/12/200	2 13/12/2002
***	39 Mr			Senior Advisor Air Services Unit	Queensland Transport	13/12/2002	2 13/12/2002
. 1	40 Ms			Manager Strategic Planning	Toowoomba City Council	13/12/2002	13/12/2002
1	41 Mr			Secretary	Ipswich Rivers Improvement Trust	12/12/2002	13/12/2002
	42 Mr		-	President	North Queensland River Trusts Association	9/12/2002	13/12/2002
3	43 Mr			Chief Executive Officer	Sarina Shire Council	11/12/2002	13/12/2002
-	44 Mr	•	-	Secretary	Sunshine Coast Rural Land Holders Association	11/12/2002	13/12/2002
1	45 Mr	•	-	Assistant Commissioner North Coast Region	Queensland Police Service	11/12/2002	13/12/2002
1 -	46 Mr			Principal Policy Officer Forest Policy Unit	Department of Primary Industries - Forestry	10/12/2002	13/12/2002
5	47 Mr		-	Secretary	Department of Environment and Heritage	10/12/2002	13/12/2002
(	48 Mr			Director-General	Emergency Management Australia	13/12/2002	13/12/2002
	49 Mr	Russell	Cuerel	Senior Policy Officer Water Use	Department of Natural Resources and Mines	12/12/2002	12/12/2002
-	50 Ms	-	-		Gold Coast and Hinterland Environmental Council	13/12/2002	3/12/2002
	51 Ms		S	Charles and the same of the sa	Freehills Solicitors	13/12/2002	3/12/2002
	52 Mr	-	N	Manager I	Mc Kean Family Trust No. 2	13/12/2002 1	3/12/2002
	53 Mr		C	hief Executive Officer	Cairns City Council	10/12/2002 1	5/12/2002

. 4	ID	Title	First Name	Last Name	Position	OrgName	DATE OF SUB	RECEIVED	
	54	Inspector			District Office	Disaster District Co- ordinator	18/11/2002	16/12/2002	
	55	Mr			Manager City Planning Urban Management Division	Brisbane City Council	13/12/2002	13/12/2002	
	56	Dr			Principal Project Officer Infrastructure Projects and I and Management	Department of State Development	16/12/2002	16/12/2002	
	57	Mr			Chief Executive Officer	State Disaster Mitigation Committee	13/12/2002	16/12/2002	
	58	Ms			Director and State Archivist	Queensland State Archives	12/12/2002	16/12/2002	
	59	Mr			Member	Planning Institute of Australia	17/12/2002	17/12/2002	
	60	Ms			Strategic Planning Officer	Townsville City Council	18/12/2002	18/12/2002	
	61	Mr	-		Director Policy and Research	Local Government Association of Queensland	16/12/2002	17/12/2002	
	62	Dr			Director-General	Department of Primary Industries	12/12/2002	17/12/2002	100
	64	Ms		-	Director-General	Department of Housing	17/12/2002	19/12/2002	
-	65	Dr			General Manager, Health Services	Queensland Health	19/12/2002	24/12/2002	0 0
	66	Mr			Acting Chief Executive Officer	Maroochy Shire Council	19/12/2002	23/12/2002	
	67	Mr			Under Treasurer and Under Secretary	Queensland Treasury	23/12/2002	8/01/2003	
	68	Mr			Director-General	Department of Public Works	13/01/2003	16/01/2003	

6 Hensman Park Court OXENFORD QLD. 4210 AUSTRALIA

Fax (07) 5573 4557 Home Phone (07) 5573 4557

October 22, 2002

Acting Director
Disaster Mitigation Unit
Counter Disaster & Rescue Services
Department of Emergency Services
GPO Box 1425
BRISBANE QLD. 4001

Attention: State Planning Policy

Dear Sir/Madam,

I wish to make the following submission, for the proposed SPP which is to address the mitigation of flood, bushfire, landslide through land use planning and development and to ensure adequate consideration is given in decision making processes etc.

My family and I reside at Oxenford on the Gold Coast we have lived here since the 1980's.

Our home is located in close proximity to an area (floodplain) this site houses the commercial movie studios and the theme parks at Oxenford. Extensive filling (thousands of tons) of this floodplain took place and this enabled this floodplain to have developments built on this site over the years. (movie studios/theme parks).

Common sense dictates, that the loss of this flood storage area (from extensive filling) has the potential to inflict adverse ramifications from flooding on the local area and its residents. I believe local residents concerns were raised with Council at the time of this intensive filling, regarding potential serious impacts a flood would have on the surrounding region and its residents.

In fact I believe concerns were raised within Council about the very same things. I believe at the time that this major filling of the floodplain was taking place, Council requested that the Shire Engineer compile a report on the concerns. (Closing the gate after the horse as bolted I would have thought).

Council in more recent times received a report re the possible flooding in the surrounding areas from this floodplain. An article about this report in a local newspaper referred to this floodplain site as 'underwater world' (or words to that effect), not 'movieworld'.

I believe the flood height mentioned in the report could be as high as 8 metres. What are the serious impacts from possible flooding levels at 8 metres, to local surrounding areas and their residents?

Given the current 'insurance climate' should a flood occur, would it be reasonable for the insurance companies to view the filling and development of a floodplain (reducing the storage area) as contributing to and exacerbating the damage to local residents homes etc., from flooding?

Land use - floods, until we can harness mother nature and can control the uncertainty of her intentions for us, Governments of all persuasions cannot continue to permit the filling of flood areas and then proceed to permit a full onslaught of developments on these precarious and unpredictable sites.

Land use - bushfires, I was born nearly 60 years ago in a place called Leura in NSW, my parents and family were no strangers to bush fires. I now live on the side of a mountain in a forested area at Oxenford. Its fair to say that our home is surrounded not only by homes but forested mountains (hills). A number of the streets in our area (cul-de-sacs) have only one entry/exit. The Oxenford area is designated as residential (future urban). Homes on forested slopes and ridge tops usually find themselves in the path of any potential bush fire. Forested mountains (hills) are not conducive to building homes/units etc on especially if 'cut and fill' is needed. If 'all' the trees and scrubland is removed back to bare earth, one creates the possibility of landslip. if there are 'natural water courses' through these mountains (hills), this too may very well magnify any potential landslip problems. (Thredbo I believe would be a good example).

Land use - landslip, as previously explained I live on the side of a mountain. A large area of the estate has had 'all' the trees removed (a moon scape) from the slopes etc., and homes have been built by 'cut and filling' the slopes, the fill in many cases is approximately 5-10 metres high and the houses sit on top of this fill. There are I believe three (3) natural water courses down through this estate. As one council officer aware of the area made comment, his comment was along the lines of 'another Thredbo waiting to happen'. Its my understanding that many of the homes in the area have major cracks in their homes I believe in one home the palm of ones hand fits into one of the cracks.

The other concern one has re landslip, is that local residents homes are on one side of the mountain and a 'quarry' is on the other side. Over a number of years local residents have been contacting the 'quarry' and 'council' raising concerns re the effects local residents are experiencing from the various blasts from this quarry. Such as 'earthquake like effects', 'drinking glasses on drip trays of sinks falling into the bowl', 'glass in windows and doors shaking like a babies rattle', 'a sewing machine cabinet with a machine and overlocker in same, moving', 'paper on top of a cabinet shooting off the cabinet' etc.

Representatives from the quarry assure local residents they are blasting in accordance to the Standards. Unlike the local residents at the coalface, the people who are

the authors of these Standards do not usually 'live' in the areas where these Standards come into play.

Its not unreasonable to suggest that its the local residents who are the experts, those residents who live on or near the other side of this 'quarry' and are the recipients of the adverse impacts from blasting. How does one set a Standard on scaring the living daylights out of someone from blasts? What of the impact on a persons health, from this unexpected blasting, especially if their health is frail? Lets not forget the potential adverse impacts on local residents properties?

The current Standards may be perceived as appropriate, especially if you do not live in close proximity to the blasting, however, for the residents who are at the coalface, (live on the same hill and possibly the same rock shelf that the blasting is being carried out) the blasting needs to be reassessed and limited to ensure that local residents are not the recipients of these unwanted adverse environmental impacts.

When my family and I moved to Oxenford from Sydney it was like stepping back in time to a bygone day. Since then, we have watched with alarm at times the metamorphose of the Gold Coast and surrounding areas trying to grow into a city.

One should not develop and use floodplains, for its not a matter of 'if' mother nature will send us a flood its only a matter of 'when'.

Where there is the potential for 'bush fires', ensure that any approval for land use and building has the appropriate tools and measures in place to ensure potential damage to life and limb, property is minimised. Ensure the ease of entry and exit to properties in potential bush fire areas. Clearing of all trees and bushes around the buildings over a large area.

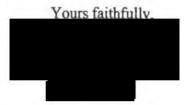
 No doubt there are already many measures in place within councils planning documents which are meant to prevent such things as building on slopes of a certain degree (angle).

Planning policies can be implemented, however, I truly believe that in fairness and equity to all members of the public, planning, land use, development decisions/approvals/consents should not be bought or sold and whilst ever any land use and planning assessment and decisions are made and kept behind closed doors planning policies are not worth the paper they are written on:

Flood, bushfires, landslip, all most certainly a 'hazard' for the members of the public who may find themselves in one or all of these hazardous paths. One would have thought given the devastation any one of the above can have on ones life, it would go without saying that not to 'adequately' consider and assess 'all' the potential ramifications on the public would be perceived as tantamount to negligence.

I have not been educated ('expert') in floods, bushfires, landslip, my experiences are from being at the coalface myself or knowing someone who has been involved in any or all of the above hazards. I do feel that in my local area, there is the potential for all three of the above hazards given the right conditions to present themselves possibly, at varying times in the future. Local residents have already experienced bush fires.

I thank you for this opportunity to make this submission.



200 28/10/200

Attention:

State Planning Policy

Acting Director

Disaster Mitigation Unit

Counter Disaster and Rescue Services Department of Emergency Services

G.P.O Box 1425

BRISBANE QLD 4001



### In reference 9-1

I believe that the 100 year standard is unreasonable. If in one's lifetime it doesn't occur then a system of total control exists therefore contrary to the concept of the constitution.

In reference A23.2

What measures would be put in place to protect people from action from councils unfairly taking land.

At the moment the State Ombudsman and Land Court is available once councils can designate any area under this proposed policy they become masters not servants also contrary to the concept of the constitution.

In reference to our case

Surely if councils agree to development in the past and they themselves own the holding ponds shouldn't they be the ones held responsible for the flooding they caused due to lack of maintenance of the open drain leading into the Sunwater open pipe which Sunwater placed a grid over and has caused the grid to completely block the exit of run off water.

Please refer to our on going case since October 1999 with the Bundaberg City Council by speaking to the Ombudsman, Rodney Metcalfe, and our reference number is ART.3423.

Our family has owned this parcel of land for 56 years knowledge of land levels and water run off gives our case together with the engineers report credence. We will enclose a copy of the report if you require it.

We therefore request your committee not to place such power into the hands of councils if this proposed SPP was now in place we would have been discriminated against without prejudice.

SIGNED:

DATED:

28/10/2002

164 MCCARTHY ST BUNDABURG 4670

OUR REF: 00-150



JD & KE FINNIS

# REPORT ON PROPOSED RESUMPTION BY BUNDABERG CITY COUNCIL

CHARDS ROAD, BUNDABERG

## BUNDABERG

PO Box 712 29 Woongarra Street Bundaberg Qld 4670 Ph: (07) 4152 9822

Fax: (07) 4152 4114 Email: lsabundy@ledserg.com.au

#### SUNSHINE COAST

PO Box 1256 Level 1, 25 Bulcock Street Caloundra Qld 4551 Ph: (07) 5492 8840

Fax: (07) 5492 8826
Email: lsasuncoast@ledserg.com.au

#### BRISBANE

PO Box 351 17 Henry Street Spring Hill Qld 4004 Ph: (07) 3835 1078 Fax: (07) 3835 1079

Email: lsabrisbane@ledserg.com.au

www.ledserg.com.au

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3.0	DESIGN OPTIONS	3
3.1	SYSTEM CAPACITY	3
3.2	BUNDABERG CITY COUNCIL DESIGN	4
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4.0	POSSIBLE UPGRADE	7
5.0	CONCLUSION	3

# **APPENDICES**

APPENDIX A - Easement Location - SK1 (Bundaberg City Council)

APPENDIX B - Alternative Drainage Proposal

APPENDIX C - Photographs

# 1.0 INTRODUCTION

Leddy Sergiacomi and Associates Pty Ltd have been commissioned to comment on the implications of drainage works near Chards Road in South Bundaberg as outlined by Bundaberg City Council in their report – "Drainage Report McCarthy Street and Chards Road" – June 2002. The recommendation of this report includes the acquisition of  $1020\text{m}^2$  of land from the southern area of Lot 10 on RP54207, Parish of Kalkie currently owned by JD & KE Finnis. The land acquisition is proposed in the form of a drainage easement as detailed on Council's Plan SK1 (refer Appendix A).

# 2.0 BACKGROUND

Council's present drainage system in the Chards Road area consists of a 1350 RC pipe in the western side of Chards Road which discharges into a concrete lined drain at a location approximately mid way along the frontage of Lot 10 (Finnis property). The piped system accepts flows from another 1350 R.C Pipe which exists adjacent to the southern boundary of the Finnis site and drains the existing retention system from St Mary's School, Carinya Place subdivision and McCarthy Grove subdivision. An open drain and a 600 RC pipe provides an outlet system for the retention basins upstream. This drain infrastructure is located within the Sunwater Channel Reserve. The 1350 RC pipe inlet structure consists of a concrete endwall and wingwalls with a metal grate fixed to the endwall preventing public access through the culvert from Chards Road to the Sunwater Reserve. A blockage occurred at this grate in a recent storm event and caused flooding in the immediate and upstream areas. It has been suggested that the blockage was caused by sugar cane debris from the surrounding cane farms.

# 3.0 DESIGN OPTIONS

#### 3.1 SYSTEM CAPACITY

The following factors limit the current system capacity at the Chards Road drain and Sunwater drainage pipe:

- Blockages occur due to cane debris accumulating on the inlet grate;
- Single 1350 RCP from Sunwater Reserve is lateral line to major flow along Chards Road 1350 RCP which has a higher flow and thus limits the capacity of the Sunwater 1350 RCP; and
- 1350 RCP capacity along Chards Road is far less than concrete open drain capacity.



# KINGAROY SHIRE COUNCIL

Gen Enq: (07) 4162 6200 Facsimile: (07) 4162 4806 Email: info@kingaroy.qld.gov.au

All Communications to be addressed to The Chief Executive Officer

PO Box 336 KINGAROY Q 461( www.kingaroy.qld.gov.au

28 November 2002

Acting Director
Disaster Mitigation Unit
Counter Disaster and Rescue Services
Department of Emergency Services
GPO Box 1425
BRISBANE QLD 4001

Attn: State Planning Policy

DECEIVED 2 9 NOV 2002

Dear Sir/Madam

# Submission - Draft SPP for Natural Disaster Mitigation

Please find below Council's submission on the Draft SPP Natural Disaster Mitigation.

**S. 6.12** of the SPP states "An existing development commitment that is not compatible with the nature of the natural hazard is consistent with Outcome 1 provided it would have a lower level of risk than generally applies in the locality".

It is considered this position is erroneous, as it does not take into account existing use rights (pre-approved developments which are not subject to new regulation) and otherwise may still result in development in hazardous areas.

**S. 6.14** of the policy states "Development achieves Outcome 2 when it is brought as near as practicable to the level required to comply with the performance criteria for compatibility with Outcome 1, and the development would not result in unacceptable levels of risk to people or property".

The phrase "as near as practicable to the level required" is disputed as it may still result in development subject to significant levels of risk.

Our Ref: BS15/43-DG:bt 3 5 PP 6 Wivenhoe, Somerset Worth Ene Dance Quality of Water. Quality of Water. Quality of Water. Quality of Water.

Acting Director Disaster Mitigation Unit Counter Disaster and Rescue Services Department of Emergency Services GPO Box 1425 BRISBANE QLD 4001



Dear Mr

Draft Planning Policy and Guideline on Natural Disaster Mitigation

I refer to your letter dated 28 October 2002 requesting a submission on the above.

SEQWater is the owner and operator of Wivenhoe, Somerset and North Pine Dams that are part of the water supply for South East Queensland.

Wivenhoe and Somerset are also flood mitigation dams for the areas of Esk Shire Ipswich and Brisbane City, and SEQWater operate these dams in accordance with a Flood Mitigation Procedures Manual gazetted by the Department of Natural Resources and Mines. Therefore SEQWater's interest is in the operation of these dams and flood risk management.

SEQWater also own 40,000 hectares of land surrounding these dams and has a close association with Rural Fire Services for combating bushfires in the area. Appendix 3 of the Guideline document on Hazard Assessment – Bushfire was found to be very informative.

While the draft paper is of interest to SEQWater, it does not seem to impact on our responsibility and thank you for seeking our feedback. However SEQWater does undertake and keep up to date hydrological and flood studies related to these dams. This information is available to Local Government and State Emergency Organisations for Counter Disaster Plans.

I trust the above is sufficient but if you require more information please contact the Corporation's Operations Manager,

Yours sincerely

PETER BORROWS

Chief Executive Officer

South East Queensland Water Corporation Limited | Head Office: Level 3, 240 Margaret St Brisbane, Queensland 4000 | Ph: 07 3229 3399 | Fax: 07 3229 7926 | www.seqwater.com

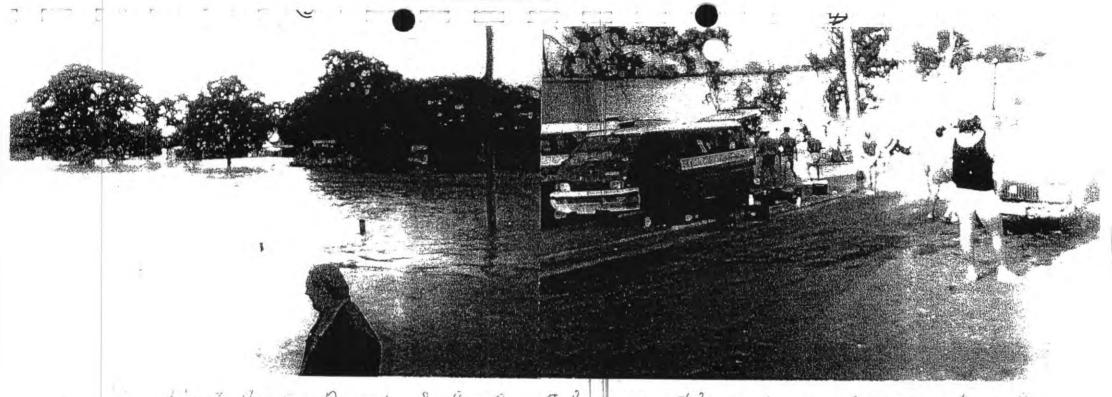
Wivenhoe Dam 'Lake Wivenhoe' Insbane Valley Highway na Fernyale Queenstand 4306 Phone: 07 5427 8100 Fax. 07 5426 1097 Somerset Dam 'Lake Somerset' Somerset Dam Township Queensland 4312 Phone: 07 5426 0188 Fax: 07 5426 0107 North Pine Dam 'Lake Samsonvale' Forgan Road, Joyner Queensland 4500 Phone: 07 3882 1422 Fax: 07 3882 1759 All correspondence to:

Chief Executive Officer PO BOX 236 Albert Street Brisbane Queensland 4002



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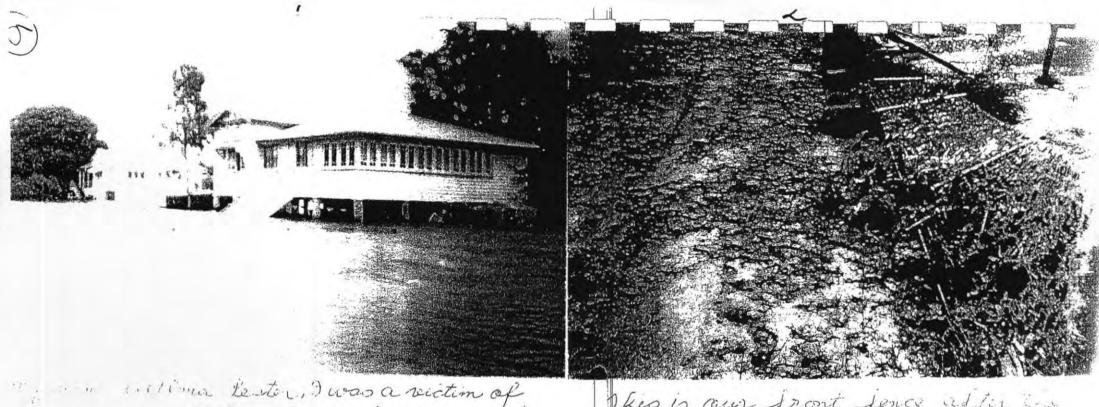
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Mrs Alma Lester
Jellicoe Street
Rockhampton Qld 4700

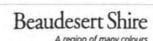
Plone y. Signed

When Contacting Council please ask for

Mr C Lawson 07 5540 5165 Tel:

CL:JR Ref-

20/03/07 866700



A region of many colours

20 November, 2002

Disaster Mitigation Unit Counter Disaster and Rescue Services Dept of Emergency Services **GPO Box 1425 BRISBANE QLD 4001** 

Attention:

Dear Sir.

## Re: Draft State Planning Policy for Natural Disaster Mitigation

I refer to your letter dated 21 October, 2002 requesting Council's comments in relation to the Draft State Planning Policy for Natural Disaster Mitigation.

At its meeting held on 19 November, 2002, Council resolved to advise you that it generally supported the introduction of a State Planning Policy for Natural Disaster Mitigation but with the following caveats:

- Council seeks advice as to whether a verbal definition of a hazard risk management area would be sufficient to trigger the SPP or whether an area must be defined spatially;
- Council seeks advice as to the basis of the default 15% slope as the default for 2. triggering the SPP;
- Council seeks advice on whether a uniform average Recurrence Interval must 3. be chosen for the Defined Flood Event:
- Council seeks advice on what justification, if any, Council would need to have a 4. DFE of ARI lower than the default 100 years; and
- Council seeks confirmation that funding will be available for Councils needing to 5. undertake studies to define natural hazard management areas.

Yours faithfully,

DIRECTOR CIVIL OPERATIONS

JAWORDIDESIGNIT79\Corresp-CLawson\CTTDF-CLIVEmergServieSPPNatOts\Mildou

From:

To:

Consultation, SPP

Date:

11/22/02 3:04pm

Subject:

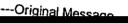
Re: FW: Consultancy Workshop 18 November - Brisbane - File Ref: QSA 02/379



Please record it as a submission and when the official one arrives we should combine them and consider them as one submission.

>>> SPP Consultation 11/19/02 03:32pm >>>

Unless you advise otherwise, I will print this off and attach to the official submission when it arrives. regards



ruesuay, 19 November 2002 10:22 AM

To: SPP Consultation Cc: QSA Records

Subject: Consultancy Workshop 18 November - Brisbane - File Ref: QSA



Thank you for an interesting and enjoyable Consultancy Workshop yesterday.

On looking further at the Draft SPP for Natural Disaster Mitigation I would make the comment that the list-of-community infrastructure in Annex 1-Part-(b)-should-be expanded to include: "storage areas for public records under the Public Records Act 2002"

The Act states that "a public authority is responsible for ensuring the safe custody and preservation of records in its possession."

Queensland Government Information Standard 40 Recordkeeping supports the Act and the Queensland Government Information Architecture Best Practice Guide for Recordkeeping states that "public authorities should develop, implement and monitor ...disaster preparedness and recovery strategies and processes."

We will send an official submission in this regard shortly.

Regards,

Manager, Preservation Services Queensland State Archives

435 Compton Road

PO Box 1397

RUNCORN QLD 4113

SUNNYBANK HILLS QLD 4109

Australia

Australia

Telephone:

URL: http://www.archives.gld.gov.au

From:

To:

Date:

11/18/02 7:46am

Subject:

today's briefing session re SPP Natural Disaster Mitigation

Dear

I regret I am unable to attend today's workshop on the SPP Natural Disaster Mitigation.

PIA has been impressed with the commitment to consultation with your SPP.

My next step is to obtain comments from senior members of the profession in the response to the Draft guideline as we will be preparing a response to your Draft. I note there is a specific inclusion relating to climate change and we will support this strongly as I have just concluded the research components of our first stage of our climate change and planning project. The findings from our research are that there is a need for further research into climate change and that many other disciplines are expecting planning will come up with some answers. We have also established that no other agencies are currently working on this aspect of climate change.

If we have any queries at this stage I will contact you directly.

Good luck with today's workshop. Regards

Policy & CPD Coordinator PIA Old

Phone

fax

6)

We note that climate change has been addressed in a limited way that reflects the current position of the State Government. PIA notes that this is an emerging topic and we are currently concluding the initial and scoping stages of a major project on climate change and potential adaptation strategies through planning. This stage of our project "Sustainable Regional and Urban communities adapting to Climate Change" has been funded through EPA, Sustainable Industries and the Australian Greenhouse Office. Several of your Departmental officers have been present at the progress briefings for this project. To date our study has established the following

- · There are no currently available planning tools to address climate change
- Other disciplines, notably science based disciplines, have an expectation that planning will do something relating to adaptation strategies and climate change
- The current information available on climate change does not lend itself to integration into either plan administration or plan preparation
- Planners have recognised that this is a critically important area of their professional development
- No other programs or research undertaking focusing on adaptation through planning were identified.

It is anticipated that the outcomes from this project would be in a form suitable for incorporation into or at least reference to this SPP and guidelines. The project has been designed so that a series of issues papers and planning tools would be developed and promoted through a State and perhaps national level consultation and awareness program.

We would welcome the opportunity how we could development a partnership for the research phases of this project.

PIA supports this SPP and guideline and congratulate the Department on thoroughness in consultation. PIA strongly urges the Department to ensure that the requirements of this SPP will not frustrate the efforts of local government in the timely preparation and approval of planning schemes.

Yours truly,

Gary White President

Planning Institute
Australia



PO Box 223 Brisbane, Albert Street QLD 4002

Queensland

Telephone: (07) 3289 1792 Facsimile: (07) 3289 1793 Email: qld@planning.org.au Web: www.planning.org.au

A.B.N. 71 852 748 056

Acting Director
Disaster Mitigation Unit
Counter Disaster and Rescue Services
Department of Emergency Services
GPO Box 1425
BRISBANE QLD 4001

Re: State Planning Policy

12 December, 2002

Dear

1) -> 5PP tran for consideration

19/12/02

The Planning Institute of Australia, Queensland Division, (PIA) has taken part in several of the workshops and briefings during the development of the draft State Planning Policy for Natural Disaster Mitigation (SPP). During this process we have noted the thoroughness of your consultation and program and the work that sits behind this. PIA congratulates the Department and your consultants for a thorough program.

The SPP and supporting guidelines have addressed the major natural hazards that are amenable to clear spatial definition. We commend the structure of the document as it provides a clear relationship between the proposed Outcomes and development approval processes as well as the requirements for plan preparation.

In many areas of the State there is a lack of reliable spatial data relating to natural hazards. Therefore many shires and cities that are currently in the process of preparing planning schemes will be required to carry out additional studies in order to satisfy the requirements of this Draft SPP.

It must be recognised that significant resources will be required to accurately map flood, bushfire and landslide hazards. This will be a major cost impact on local government, and must be addressed by State Government as part of implementing the policy.

There are concerns that as many councils are currently well progressed in the preparation of their planning schemes and the additional work required by this Draft SPP will mean that planning scheme preparation will be delayed. It is not responsible for the State government to insist on compliance with the March 2003 deadline for planning schemes if all the requirements of this Draft SPP are also to be addressed.

The requirements created by this SPP are supported as good planning, however it should be recognised that this additional expectation of planning schemes adds further weight to suggestions that an extension to the March 2003 deadline for planning schemes is required.

such as storm tide inundation. Although storm tide is dealt with by the State Coastal Management Plan - Queenslands Coastal Policy 2001 (SCMP)," I feel there is a great opportunity to produce a comprehensive and overarching natural hazard State Planning Policy via inclusion of storm tide. The logic behind the separation of storm tide from other natural hazards appears to lie with a geographical division between the coastal zone and the rest of the continent, I suppose the question could be put; is the focus on building a policy for natural hazard mitigation or policies for geographical zones? Could you cater for both and simply include storm tide policy in both documents? Hazards don't confine themselves to zones and it would also be nice to see storm tide inundation expanded to encompass other cyclone related hazards such as flooding, severe winds and wave action.

It would be unfortunate if the opportunity was not taken to rectify this shortcoming at this point in time.

All the best

Risk Modelling Unit
Minerals and Geohazards Division
Geoscience Australia
ABN: 80 091 799 039
GPO Box 378, Canberra, ACT 2601
Telephone

Telephone | Facsimile

GA Website: www.ga.gov.au

-<mark>----</mark>Original Message---<u>--</u>

Sent: Friday, 8 November 2002 5:06

To: Subject: spp

Hi

It was lovely to meet you today and have a brief conversation. Thank you for introducing yourself.

I was wondering if you could write a submission about the storm surge issue if you and Geoscience Australia feel strongly about it. We need submissions before 13 December.

if you wish to discuss further, you can reach me on

Cheers.

From:

Sent:

-Sunday, 24-November 2002-5:02-PM-

To:

Cc:

[agso.gov.au];

Subject:

Fwd: RE: spp



InterScan_SafeSta

mp.bxt

This is from

from Geoscience Australia. I think this should

be

treated as a SPP submission. Cheers.

----Original Message----

Date: 11/20/2002 08:03 am +1000 (Wednesday)

From:

Subject: RE: spp

It was also good to meet with you. Congratulations on what seems to be a fine draft of the SPP on Natural Disaster Mitigation, the presentation was also run in an efficient and informative way. There are a number of minor points that I would like to make concerning the content of the Policy itself and also a recommendation of a more strategic nature. Comments are as follows:

- 4.6 One of the main concerns of climate change, especially for states like QLD, will be coastal erosion caused by sea level rise.
- 4.7 You have only mentioned "rapid onset" natural hazards, what about "slow onset" natural hazards such as acid sulfate soils, sea level rise, salinisation etc. You should perhaps outline why you aren't addressing these.
- A2.43 ".... changes in flood behaviour, roles and responsibilities of....." should also include "the elements at risk."

The review process for updating hazard and risk assessments (I believe this is every 7 years for flood) should include a review of the historic data, the number of elements at risk and their vulnerability since the last assessment.

Appendix 4:

Estimates for landsliding of 15 and 7 degrees should be referenced.

Reference to the following documents should be made:

1999: Granger, K., Jones, J., Leiba and M., Scott, G. (1999). Community Risk in Cairns: A Multi-Hazatd Risk Assessment. AGSO-Australian Geological Survey Organisation. CD and Brochure.

2001: Hayne, M. and Gordon, D. (2001). Regional landslide hazard estimation, a GIS/decision tree analysis: Southeast Queensland, Australia. Proceedings of the Fourteenth Southeast Asian Geotechnical Conference. Hong Kong 10-14 December 2001.

2001: Granger, K., Hayne, M., Scott, G., Jones, J., Leiba, M. and Midellman, M. (2001). Natural Hazards and the risks they pose to South-East Queensland. K. Granger and M. Hayne (eds). AGSO-Geoscience Australia. AGSO Cat. No 37282. CD and Brochure.

These references are directly relevant to Queensland and represent some of the first truly quantifiable landslide risk estimations.

Reference should also be made to the "Australian Landslide Database" at www.ga.gov.au

On a side issue; it is disappointing that the SPP does not include natural hazards

(5)

From: Sent: Sunday, 24 November 2002 4:54 PM To: Cc: Subject: -wo: HE: THIM: SPP InterScan_SafeSta mp.txt This is from treated . Geoscience Australia. I think it should be as a submission for the SPP. Cheers. ----Original Message----Date: 11/21/2002 08:36 am +1000 From: (Thursday) To: Subject: KE: TRIM: spp rurther comment on the landslide work in the SPP. The issue of using shadow angles to determine the runout distance of debris flows also needs to be addresses. (who worked for GA) estimated a shadow angle on 14 degrees for the Cairns region (distal portion of debris flow). This work can be found in the "Community risk in Cairns, a multi hazard risk assessment" report (I sent this reference last email). has also been produced in the report: 1999: M. Leiba, Baynes, F. and Scott, G. 1999. Quantitative landslide risk assessment of Cairns. Australian Geological Survey Organisation. AGSO Record 1999/36 Thanks Risk Modelling Unit Minerals and Geohazards Division Geoscience Australia ABN: 80 091 799 039 GPO Box 378, Camberra Telephone +61 ^vacsimile A Website: www.ya.gov.au ----Original Message----From: [mailto] Sent: Friday, 8 November Subject: TRIM: spp It was lovely to meet you today and have a brief conversation. I was wondering if you could write a submission about the storm surge issue if you and Thank you for Geoscience Australia feel strongly about it. We need submissions before 13 December. if you wish to discuss further, you can reach me on Cheers.

4



#### 11 November 2002

Attention: State Planning Policy
Acting Director
Disaster Mitigation Unit
Counter Disaster and Rescue Services
Department of Emergency Services
GPO Box 1425
Brisbane OLD 4001



#### Dear Sir

Thank you for your letter dated 21 October 2002 inviting Country Energy to participate in public consultation on the draft State Planning Policy and Guideline for Natural Disaster Mitigation (SPP).

Country Energy commends the Queensland Government for initiating the preparation of the Guideline to ensure that natural hazards of flood, bushfire and landslide are adequately considered when making land use planning decisions. We are aware of the need to mitigate the adverse impacts of natural hazards and have recently enhanced our plans and operational procedures in relation to bush fire risk management.

Country Energy is committed to continually improving our network to allow the better management of risks associated with electricity, providing a safer and more reliable service for our customers.

I am confident the SPP will assist in creating a consistent approach to land use planning for natural hazards and provide policy support for the Queensland Government when dealing with those hazards.

Although Country Energy will not be participating in the public consultation phase we will be closely monitoring development and progress of the Guideline.

Yours sincerely

Managing Director

www.countryenergy.com.au
ABN 37 428 185 226
Craig Murray- Managing Director
Cnr Littlebourne Sts & Hampden Park Road, KELSO NSW 2795
PO Box 172 BATHURST NSW 2795 Telephone 02 6582 8697Facsimile 02 6582 8695



# LEGISLATIVE ASSEMBLY OFFICES

(3)

Correspondence to be addressed The Clerk of the Parliament Parliament House Alice and George Sts Brisbane, 4000 OLD Australia

Your Ref.:

Our Ref.:

Tel.:(07)

3406 7137

5 November 2002

Attention: State Planning Policy
Acting Director
Disaster Mitigation Unit
Counter Disaster and Rescue Services
Department of Emergency Services
GPO Box 1425
BRISBANE QLD 4001



Dear Sir

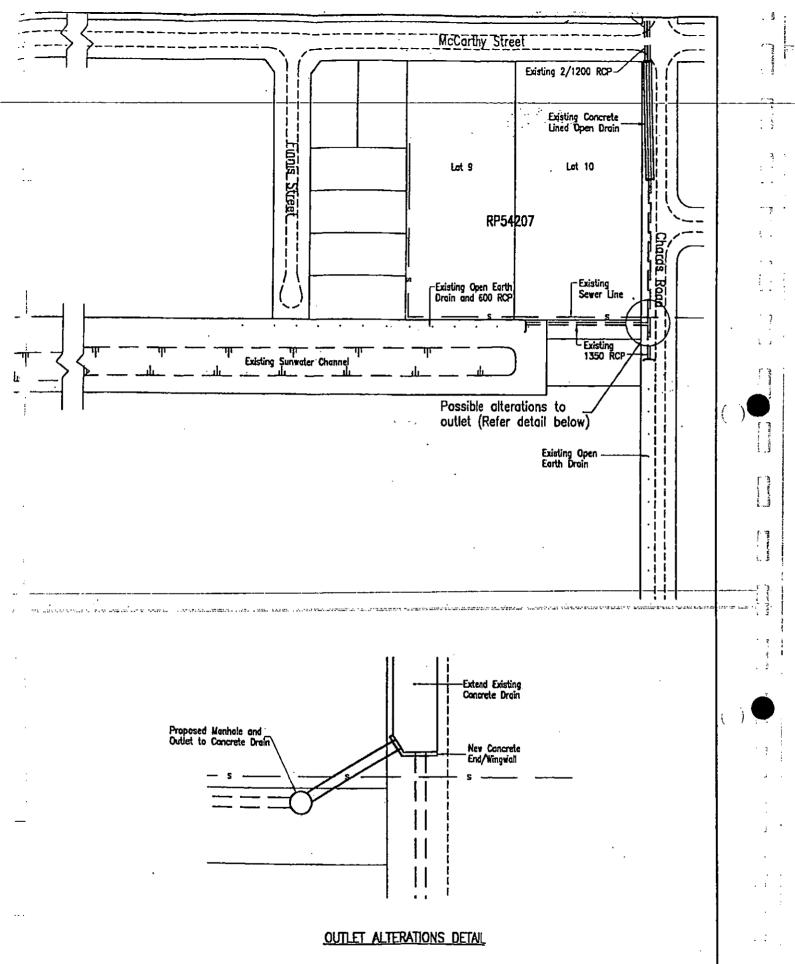
### Re: State Planning Policy and Guideline for Natural Disaster Mitigation

I write with regard to your correspondence 21 October 2002 inviting participation in public consultation on the draft State Planning Policy and Guideline for Natural Disaster Mitigation (SPP).

The Parliamentary Service notes the importance of such documentation in minimising the risk to people and property and appreciates being given the opportunity to contribute to the SPP guidelines. However, due to the nature of the Parliament House site, it is unlikely that the Service could make a significant contribution to developing the policy and guidelines.

Yours faithfully



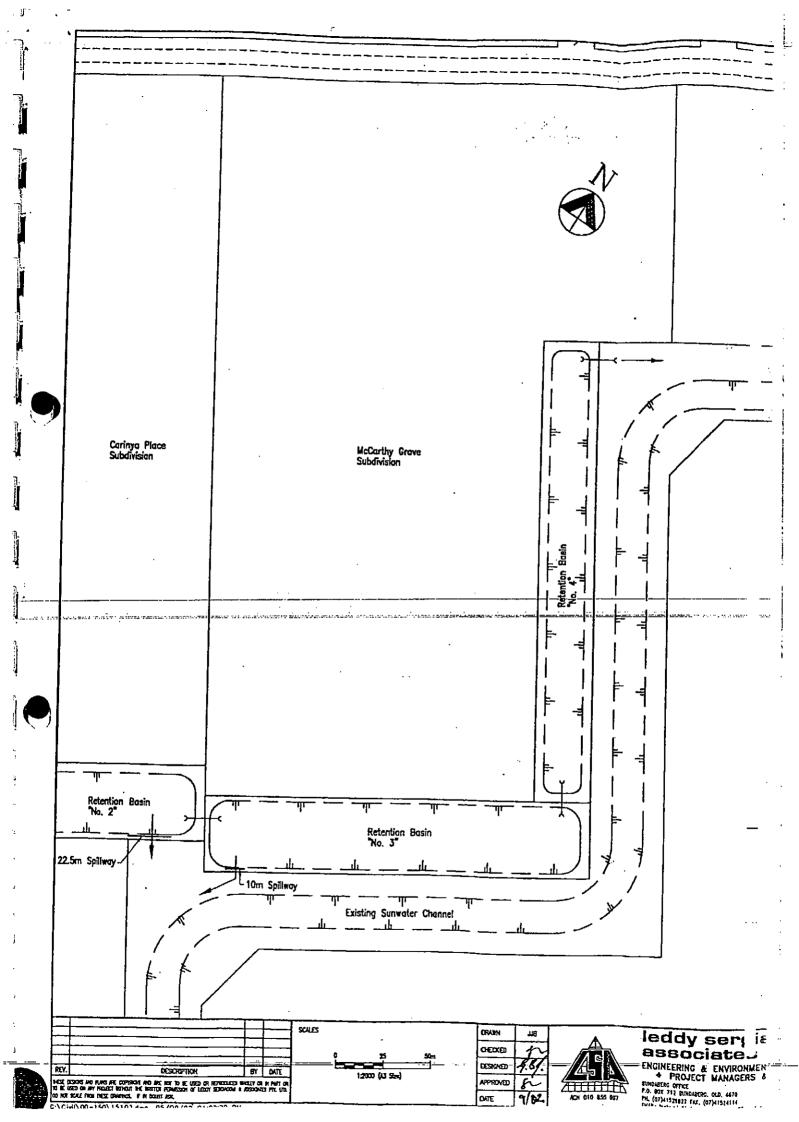


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ISBANE & SUKSHINE COASI



Our ref:

ART.3423

on the

QUEENSLAND ombudsman

23 October 2002



Dear Mr & Mrs

I refer to our meeting at the Bundaberg City Council Chambers on 15 October 2002 when you outlined certain problems you have experienced regarding the proposed resumption of land by the Council and specifically, problems associated with drainage in the area.

As I promised I would do, I subsequently raised your complaint with the Mayor and with the Chief Executive Officer. The report by engineering consultant, Leddy Sergiacomi & Associates Pty Ltd had been received (that day) by the Chief Executive Officer from your solicitors. It is proposed that this report be examined by Council's engineers and that the two reports be referred to the Council's Works Committee for consideration. I asked the Chief Executive Officer that, if necessary, a meeting take place between the engineering representatives of the parties with a view to ascertaining if agreement can be reached in relation to drainage in the area, thus proposed). I have now written to the Council formally conveying this aspect.

As the matter is still under investigation by the Council, it is not proposed that this office intervene further at this time. However, if in due course you remain dissatisfied writing direct to our office.

Thank you for referring your complaint to this office for consideration.

Yours faithfully







# NITA CUNNINGHAM, M.L.A. MEMBER for BUNDABERG

4 February 2000

Cnr. McCarthy's and Chards Roads BUNDABERG. Q. 4670

Dear Mrs.

I have made representations on your behalf to the Hon. T. Mackenroth, Minister for Communication and Information, Local Government and Planning, and Minister for Sport, in relation to the flooding caused by the recent heavy rains in Bundaberg, and attach a copy of the response I have received from that office, for your information.

Also please find enclosed your video of the flooding on you property.

Please be assured of my assistance at all times wherever possible.

Yours sincerely

NITA CUNNI<del>NGHA</del>M MLA STATE MEMBER FOR BUNDABERG



## Hon. Terry Mackenroth MP



MINISTER-FOR-COMMUNICATION AND INFORMATION, LOCAL GOVERNMENT AND PLANNING, AND MINISTER FOR SPORT

MIN/31386.00-LAA/2411

-3 FEB 2000

Ms N Cunningham MP Member for Bundaberg PO Box 935 BUNDABERG QLD 4670

Dear Ms Cunningham

Thank you for your letter of 10 January 2000 regarding a complaint made to you by Mrs K Finnis.

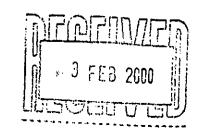
Officers of my Department have discussed Bundaberg City Council. I am informed the flooding experienced by Mrs Finnis and otherswas a result of a combination of extreme rainfall and blockages to the stormwater system-for the area-caused by sugar cane trash. Council is currently considering appropriate measures to

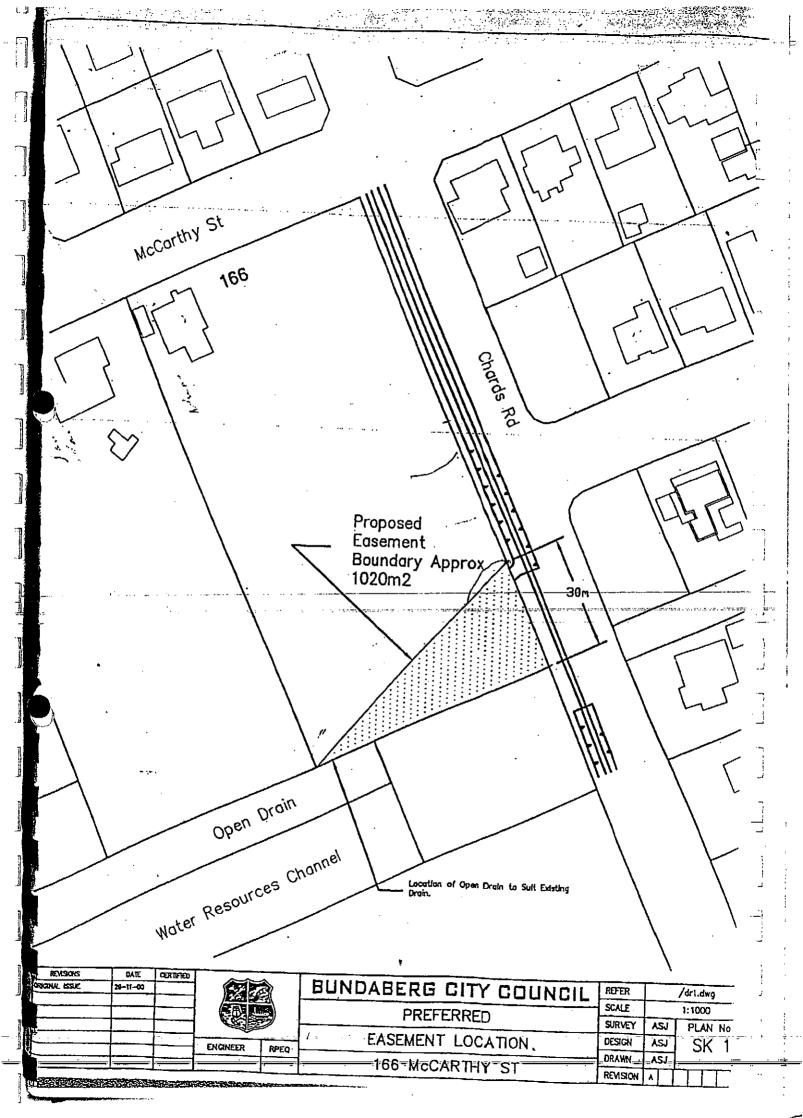
With regard to concerns regarding a recent subdivision approval in the area, I understand conditions attached to the approval required the construction of sufficient stormwater detention basins to ensure the subdivision does not exacerbate any flooding.

I trust this information is helpful. Please find enclosed video tape as supplied.

Yours sincerely







#### 5.0 CONCLUSION

Our assessment of the existing drainage problems indicate that Council's proposed relief drainage works would improve the flood immunity of the area, however the need for land acquisition over the Finnis property is questioned given that flood immunity of a similar standard can be provided using suitable catchment management practices as outlined.

If any additional trunk drainage works were deemed necessary (given the Sunwater Reserve security issue) a small overflow facility could be considered. Such a device could include a small culvert adjacent to the existing 1350 RC pipe or a drain parallel to the rear boundary of the Finnis property with a suitable radius curve to deflect flows into the Chards Road drain. The drain would result in a significant reduction in any resumption requirements.

It is also recommended that the future access for subdivision of the Finnis property in Chards Road requires 2/1350 RC pipe culverts, as a lesser structure would cause unacceptably high water levels in the proposed concrete Chards Road drain.

### 4.0 POSSIBLE UPGRADE

- 4.1 The capacity of the alternative system could be further increased should an increased flood immunity or blockage factor be considered necessary by undertaking the following works:
  - Installation of a second RC pipe of sufficiently small size to prevent access to the Sunwater channel; or
  - Construction of a bypass channel concrete lined drain of lesser width than proposed by Council.

It is considered that either option would require only minor works to prevent access at the Sunwater Reserve boundary.

# 1eddy sergiacomi & associates pty. Itd.

The proposed alternative design results in a Q20 water level at the inlet of the Sunwater 1350 RCP of RL 21.68m. Natural surface levels are approximately 21.90m in this area.

#### 3.3 ALTERNATIVE DESIGN

The major defect in the existing drainage system (ie the blockage of the Sunwater 1350 RCP) can be addressed by low cost measures with no resumption requirements, ie:

(a) Prevention of cane debris entering detention basin system by installation of suitably designed trash racks adjacent to spillways at basin 2 and 3.

Our site investigation of the upper catchment reveals that the only route where substantial quantities of cane trash could enter the system would be via the spillways in the retention basin system. To this end, the relevant cane debris could be prevented from entering the retention basins by the provisions of such trash racks. Historical flooding in the area since the installation of the retention basins indicate that only in extreme rainfall events is any flow from the cane areas directed into the retention area.

(b) Modifications to grate at inlet to Sunwater 1350 RC pipe.

It is suggested that the vertical grate could be modified by removing some of the vertical bars in the lower and upper areas of the grate. This would reduce the possibility of debris build up if any were to occur whilst maintaining the security issue associated with the grate.

- (c) The capacity of the Sunwater 1350 RCP can be increased by improvements to operating conditions by Bundaberg City Council's extension of concrete drain in Chards Road and directing the outlet of the 1350 RCP at an oblique angle to the drain flow.
- (d) The future access for subdivision of the Finnis property requires 2/1350 RC pipe culverts, as a lesser structure causes unacceptably high water levels in the new concrete Chards Road drain.

#### 3.2 BUNDABERG CITY COUNCIL DESIGN

Council's proposed design of relief drainage in the area includes the following:

- Remove the existing 1350 RC pipe in Chards Road and replace same with a concrete open drain. A section of the 1350 RC pipe is proposed to be retained to provide access to the future Finnis subdivision.
- From discussions with Council officers, it is understood that Council intends to extend the existing concrete drain profile in Chards Road south to the southern Finnis boundary.
- Extend a concrete drain through the proposed easement within Finnis's property to the Sunwater channel reserve.

In general, Council's proposal provides for a complete blockage of the current 1350 pipe system from the Sunwater Reserve and Council's intention is to remove this culvert when construction of the concrete drain is complete. Also, it appears that the —length-of-resumption (30m) along Chards Road, has been influenced by achieving a satisfactory entry angle for stormwater from the Sunwater drainage path into the Chards Road drain.

The following approaches to development commitments are suggested:

<u>Approved Development</u> – the SPP could only be applied to a requested change to an existing approval or a request to extend the currency period of an approval.

<u>Self-Assessable Development</u> – the SPP must be incorporated into the Planning Scheme codes. Development not consistent with any provision of the code triggers code assessment and the assessment manager then assesses the merits of the particular proposal.

<u>Exempt Development</u> – provisions of the Planning Scheme cannot be applied to exempt development. "Exempt" status would indicate the local government considers the land use to be compatible with the nature of the hazard.

<u>Development clearly consistent with the intent of the zone</u> – provisions for Self-Assessable or Exempt Development apply, as discussed above.

<u>Subdivision in accordance with the provisions of the Planning Scheme</u> – must be made assessable against the provisions of the SPP.

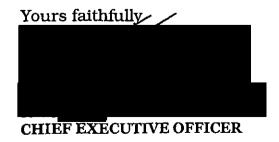
<u>Development consistent with a designation for Community Infrastructure</u> – must be consistent with Outcome 2 of the SPP.

#### <u>Appendix 5 - Performance Criteria</u>

B – Bushfire - Indicators of compatibility section 1 – It should be recognised that bushfire risk can be effectively reduced from Medium to Low via appropriate on-site management, especially of vegetation around the activity.

Include a clause: "or It can be demonstrated the site can be managed to maintain bushfire risk to a LOW hazard level.

**1.22** - 20% increase in gross floor area is arbitrary – a limit to extensions to a building is not relevant to bushfire and flood risk and should not be defined. Any increase in gross floor area in a landslip hazard area should be assessed on its merits and a report be prepared by a Registered Professional Engineer of Queensland if relevant.



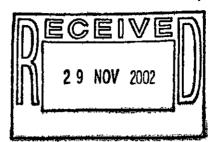




Our Reference: S02/878

Sport and Recreation Queensland

Team Leader, State Planning Policy Department of Emergency Services Counter Disaster and Rescue Services GPO Box 1425 BRISBANE QLD 4001



Dear

In response to a recent meeting held on 12 November 2002 with and of the Facilities Planning Section, the following comments are offered on the draft State Planning Policy for Natural Disaster Mitigation on behalf of Sport and Recreation Queensland.

As you are aware from the above meeting, Table 1 in clause 6.37 is a cause of concern due to the implication that *all* recreation and open space areas may be appropriate land uses across a floodplain at *all* levels of severity of hazard. This table, in conjunction with clause 7.10, may lead some local governments to allocate recreation to floodable areas in the majority of cases. It is important that the majority of open space that is available for recreation and sport, is used *primarily* for this purpose, rather than as drainage areas or floodways, with recreation and sport as a secondary use.

It is understood that the role and focus of the draft State Planning Policy (SPP) is mitigating exposure to, and risk of, natural hazards of flood, bushfire and landslide. However, in promoting just one perspective of land use planning (risk management), other relevant factors may be overlooked. To address Sport and Recreation Queensland's concern regarding Table 1, it is suggested that an additional note be included at the bottom of the table that states:

Not all forms of recreation or open space should be located in areas at risk. Appropriate land assessment and planning should be carried out.

In relation to clause 7.10, while it is accepted that some (but not all) recreation activities can occur on flood prone land, it is part of the planning process to assess the landscape and identify appropriate land for different types of activities. Flood prone land presents a number of constraints and is unsuitable for a range of activities and infrastructure development.

For example, retention basins could accommodate an open field for informal or formal active recreation. However, there would be significant design considerations such as: speed of flooding, access and escape points for users, design of inlet and outlet points, duration of storage, water quality issues, speed of drying or firming of the field. Further, there are significant costs incurred in the provision of infrastructure associated with the activity, such as change rooms, clubhouses and lights.

In addition, competitive use is constrained by the uncertain availability of such a field. This is unlikely to be a good solution in high and frequent rainfall areas. An amendment of clause 7.10, which includes a recommendation to undertake assessment of the suitability of the land for the proposed purposes is suggested.

If you require further information in regards to this matter, please contact Principal Recreation Planning Officer, Sport and Recreation Queensland on telephone number

Yours sincerely

Jan Whitehead Director

Facilities Development and Management

**Sport and Recreation Queensland** 

27 November 2002

DEPARTMENT OF EMERGENCY SERVICES

1 9 NOV 2002

EXECUTIVE SERVICES



Contact Officer Telephone Mark Jones 3239 3581

06 021048

Department of Tourism, Racing and Fair Trading

incorporating Liquor Licensing

Director-General
Department of Emergency Services
GPO Box 1425
BRISBANE QLD 4001

Dear

Thank you for your letter dated 21 October 2002 regarding the draft State Planning (Policy and Guideline for Natural Disaster Mitigation (SPP).

As previously advised in my letter of 31 October (copy attached), the SPP is a significant natural disaster mitigation measure that will complement the development of a Tourism Industry Crisis Management Plan (TCMP). The TCMP is being developed under the auspices of the Growing Tourism Strategy and will better prepare both government and industry to reduce or respond to the impacts of shocks on the tourism industry.

Development of the Plan has and will continue to be progressed in a consistent and complementary manner to the SPP. I would also reiterate the importance for the SPP to continue to take into account the impact natural disasters have on tourism generally.

I look forward to our agencies continuing to work collaboratively to ensure these initiatives are progressed in a complementary manner.

Please contact , Director, Growing Tourism Unit on telephone if you require further information about the TCMP.

Yours sincerely

A/Director-General

lacing and Fair orading representative on the Old Tropicist Cyclone Cooldinating Councilles.

27/11/02

Level 26 111 George Street Brisbane Queensland 4000 GPO Box 1141 Brisbane Queensland 4001

Telephone +61 7 +61 7 3239 3633 Facsimile +61 7 +61 7 3239 0824 Email david.williams@dtrft.qld.gov.au Website www.dtrft.qld.gov.au ABN 29 597 409 596 Director-General
Department of Emergency Services
GPO Box 1425
BRISBANE QLD 4001

Dear

As a result of a recent meeting of the Chief Executive Officers' Employment, Economic Development and Infrastructure Committee, I wish to confirm the involvement of this Department in disaster and crisis management activities, particularly as they relate to fourism.

As you would be aware, the impacts of September 11, coupled with the collapse of Ansett Airlines shortly thereafter, had significant ramifications for the Queensland tourism industry and the economy as a whole. It is in this context that both the Government's *Immediate Response Group* and its *Industry Consultative Group* subsequently identified the need for agencies and industry to work together to develop a Tourism Crisis Management Plan (TCMP) to learn from recent experiences.

The TCMP is being developed under the auspices of the Growing Tourism Strategy and will better prepare both government and industry to reduce or respond to the impacts of shocks on the tourism industry. In line with the State Counter Disaster Plan, the TCMP is adopting a comprehensive approach, and will consider *prevention*, *preparedness*, *response* and *recovery* issues.

Development of the Plan has and will continue to be progressed in a manner which is consistent with the range of initiatives being undertaken by the State Disaster Mitigation Committee. I would also highlight the Importance for the State Planning Policy for natural disaster mitigation to continue to take into account the impact natural disasters have on tourism generally.

Director of the Growing Tourism Unit, represents tourism on the Queensland Tropical Cyclone Coordination Committee (co-chaired by Department of Emergency Services and Bureau of Meteorology) and in that capacity, she has presented the Plan profile and early draft Plan to the Committee.

You are welcome to contact on telephone on telephone if further information on the TCMP is required.

I look forward to our agencies continuing to work collaboratively to ensure these initiatives are progressed in a complementary manner.

Yours sincerely

# SIGNED BY DIRECTOR-GENERAL

Director-General <u>3/1/01</u>のレ

Level 26 111 George Street Brisbane Queensland 4000 GPO Box 1141 Brisbane Queensland 4001 Telephone +61 7 +61 7 3239 3633 __ Facsimile +61 7 +61 7 3239 0824 Email david williams@dtrft.qld.gov.au Website www.dtrft.qld.gov.au ARN 29 597 409 596

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Commissioner, Queensland Ambi	ulance Service
Commissioner, Queensland Fire a	and Rescue Service
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#### QUEENSLAND POLICE SERVICE



Property and Facilities Branch 200 Roma Street, Brisbane Q 4000 GPO Box 1440, Brisbane, Q 4001

DEGELVED 1 2 8 NOV 2002

TELEPHONE (07) 3364 3702 FACSIMILE (07) 3364 4673

BY: ____

Our Ref:

Natural Disaster

Mitigation Policy2

Your Ref:

Tony Crompton

27 November 2002

Acting Director Disaster Mitigation Unit Counter Disaster and Rescue Services Department of Emergency Services GPO Box 1425 BRISBANE QLD 4001

Attention: State Planning Policy



## DRAFT STATE PLANNING POLICY INCLUDING GUIDELINE - NATURAL DISASTER MITIGATION

Reference is made to your correspondence of 21 October 2002 seeking Queensland Police Service comment on the second draft State Planning Policy and associated guideline.

Comments provided in response to the first round consultation are still valid and the Service remains particularly concerned with wording contained in Appendix 7 that promotes design solutions catering to a 1:200 year flood event for police facilities.

It is considered that Appendix 7 performance criteria should also provide confirmation to the reader that there will be numerous circumstances where it will not be possible to achieve this standard. I would therefore recommend that this appendix be modified to reinforce information already contained in Outcome 1 of the SPP, namely "...except where: there is an overriding need for the development in the public interest and no other site is suitable and reasonably available for the proposal;".

The Service would take this opportunity to thank Department of Emergency Services for its invitation to be involved in the preparation of the State Planning Policy.

Yours faithfully



Program Manager (Property Services)
PROPERTY AND FACILITIES BRANCH

C/- James Cook University Post Office James Cook Dr Townsville Qld 4811

21/11/02

Attention: State Planning Policy
Acting Director
Disaster Mitigation Unit
Counter Disaster and Rescue Services
Department of Emergency Services
GPO Box 1425
BRISBANE QLD 4001

re: public notice posted at page 86 of the Townsville Bulletin newspaper on 19 October 2002, and, related public meeting held at the Summit Motel at Townsville on 20 November 2002.

To the Acting Director and whomever else it may concern

By way of my signature at the end of this submission, I maintain the conditional appearance made by me in the process-of the purported development of a State Planning Policy and Guideline for Natural Disaster Mitigation (herein referred to as the "SPP", and, the "G", respectively)-at the above mentioned meeting held at Townsville on 20 November 2002. There are at least three separate matters upon which I rely in the making of my conditional appearance, which are as follows:

- 1. (a) The so-called Integrated Planning Act 1997 (Qld); is an aberration that attempts to subvert the principles and objectives of Ecologically Sustainable Development (ESD)-which permeate, almost, if not absolutely, each and every other relevant provision of law, relating to the environment, and made at the Local, State, Federal and International levels; does not fit, nor accord, with the wider framework of environment related legislation at the said levels; and; as such; is voidable, if not, absolutely null and void; and; accordingly, and with all due respect to, the institution of the Parliament of Queensland, and, the Honourable past and present members thereof; it is my strong conviction that, having overlooked or otherwise not accounted for this most undesirable state of affairs, and despite the lack of any other obvious defect on the face of the IPA instrument or in the process of the making thereof, the Parliament has made, no more than, an invalid attempt to enact the said Integrated Planning Act 1997 (herein referred to as the IPA); and;
  - (b) The matter raised at the meeting at Townsville on 20 November 2002 by the Mayor of the Burdekin Shire Council Councillor ie, to the general effect that the State government appears to be using the processes in IPA to devolve, the bulk of the State's responsibilities, and impracticable volumes of work related to same (with no corresponding increases in funding), to the Local Government sector; and; the nature of the IPA itself, in that, the IPA, and related processes set in motion, unlawfully or otherwise, have the effect of allowing all and sundry to make copious development applications, which basically and inevitably must be approved in one form or anotherie. the IPA and related processes, in accordance with the objectives of the Act itself, promote uninhibited development in the unrealistic pursuit of constant and unchecked economic development with little if any real control or restriction of the simplistic broader agenda to generally engage in further development wherever any opportunity (admirable, sustainable, or not) may arise; consequently ensure that IPA, and the processes purportedly put in place thereunder, are far from being examples of ESD, and, are unsustainable, in the long term, whether that be from a social, an economic, orfor that matter-a direct physical environmental, aspect.

- 2. (a) After the close of the above mentioned meeting I discussed some of the issues with another who participated in the proceedings, and that person indicated to me, that, the person who conducted the meeting, and who, I add, did state during the meeting that it would be herself that "signed off on the thing"-apparently in reference to the SPP&G, was merely a private consultant; and; afterwards I spoke to the said person-ie. the convener of the meeting-and asked for her name, and, she gave me her card, which identified her as one Sandy Vigar BRTP MBA MSc(Env Mgt) LGTP (Q) FPIA Director of Environmental Resources Management Australia (note: due to the fact that I arrived at the meeting late and had not caught the details of the convener's name and position, etc, I was not previously aware of these matters); and;
  - (b) It would seem then, that, the process being carried out is ultra vires; in that; in accordance with the provisions of Part 4 of Chapter 1 of the IPA, it is the Minister who is to conduct all processes relating to the formation of State Planning Policies under the IPA; and; while I might accept, that, in accordance with the relevant case law, an employee of the Department-being one who could have been validly appointed as the Minister's delegate (under the IPA for the purposes of carrying out the formation of such policies on the Minister's behalf)-might be able to rely upon, the so-called Defacto Public Official Doctrine, or similarly, some version of the so-called Carltona Principles, to validly act on behalf of the Minister to prepare such policies, even if that officer was not validly appointed as the Ministers delegate so to do; I do not accept, that, it is lawful and valid for a private consultant, who is not directly in the full time employ of the relevant department of the government, to conduct, any process, on the Minister's behalf-as part of some one off contract struck by the Minister or another for such purposes, and, if such a process (of so using a private consultant) were to be employed, it would, at the least, be one where, the public submitters are, deprived of their right to have the ear of the Minister directly, and therefore, deprived of natural justice (re: the fair hearing rule and the absence of bias rule), in that, the process purportedly prescribed in schedule 4 of the IPA requires that submissions about proposed State Planning Policies be given directly to the Minister, for the Ministers consideration (see, eg. section 5 of Part 2 of Schedule 4 of the IPA), and, does not allow for those submissions to be first screened by some private consultant, who presumably will then deprive the Minister of a full viewing of-and thereby a full opportunity to give consideration to the entire contents of, each and every submission made (as is required by the legislation)¹.
- 3. (a) Section 2.4.3 of the IPA purports to establish a process for the making of State Planning Policies, and, while section 2.4.4 of the IPA provides that substantial compliance with the requirements of that process-as set out in schedule 4 of IPA-is all that is required for a policy to be validly made, the latter section only does so conditionally-ie. on the conditions that any non-compliance has not;

adversely affected the awareness of the public of the <u>existence and</u> the <u>nature of</u> the <u>proposed policy</u> [re: clause (a) of section 2.4.4] (underline added for emphasis); and, or, or;

<u>restricted</u> the <u>opportunity</u> of the public under schedule 4 to make submissions on the <u>proposed policy</u> [re: clause (b) of section 2.4.4] (underline added for emphasis); and;

Page 2

¹ In such circumstances, as those apparent and described herein, private citizen Sandy Vigar and her privately operated consultancy Environmental Resources Management Australia, become the 'principal' submitter which, basically, secures the bulk of the Minister's consideration while being allowed to exclude others altogether from the real process of the Minister's consideration.

- 5. At the meeting held at Townsville on 20 November 2002 Mayor Woods of the Burdekin Shire Council made a comment regarding the *Indicators of compatibility* in the table at page 66 of the DSPPIG, and, the discussion that followed-especially comments made by the representative of the Environmental Protection Agency (herein the EP Agency)³-appeared misleading, in that, despite the use of the word "OR" in the table as continued at the top of page 67, and, in light of the relevant rules and maxims of statutory interpretation (re: the contextual approach to statutory interpretation, and, eg. the maxims, *Ejudem generis*, and, *noscitur a sociis...etc*), the provisions of the table in 1.2 at page 67, that allow for a development proposal to *otherwise* comply, do not necessarily allow that the said proposal is not required, in any event, to substantially comply with the indicators of compatibility at 1.1 in page 66.
- 6. There is no definition of what a "comprehensive assessment" [referred to at 1.3 in the table at page 76 of the DSPPIG] is, and, although some of the participants at the meeting expressed dissatisfaction when this matter was raised, it is an important issue to be considered, if the matter is to be set out in a statutory instrument, because, in the absence of a definition, some definition will still have to be applied, and, that in itself, could lead to, disputes and subsequent litigation, or the need to avoid same by applying to judicial authorities for declarations as to what is the appropriate definition-which must then be applied.
- 7. At the meeting a matter was raised with respect to the words "concentration of flood flows or ponding of floodwaters" used in 3.2 of the table at page 68 of the DSPPIG, and, there is some concern, that, the suggested changes to be made thereto-to protect development proponents and authorities called on to approve development applications from the possibility that the wording might restrict their ability to carry out or approve human constructed drainage works and the like, are themselves, of concern, because, the amendments proposed may simply provide all and sundry with a loophole which could then be exploited to allow development to interfere with all and any natural watercourse, aquifer or other water body.
- 8. It seems to me then that, the proposed SPP and G are likely to be no more than another mere policy with no real control on development-and as such might not even meet the commonwealth requirements discussed above, and, the only effective way to deal with Natural Disaster Mitigation is on a regional basis by way of the development of Regional Coastal management Plans developed pursuant to the provisions of the Coastal Protection and Management Act 1995 (Qld)

Page 5

³ Please note, that, as the purported statutory instrument published in the gazette, which purports to rename the Queensland Department of Environment as the EP Agency, would be, if validly made, an example of subordinate legislation, and, that instrument was not tabled in the Parliament as required by the provisions of the Statutory Instruments Act (Qld), then, in accordance with the provisions of that Act, the said instrument is to be taken to have never been made, and, therefore, the EP Agency is, at this time, no more than an unincorporated private body, funded by the government, but one that has no power or jurisdiction, nor any other authority, to act as, or on behalf of, the government of Queensland.

9. I say with all due respect, that, it also appears to be of some considerable concern that, if suggestions made⁴ by one Brian Bailey at the meeting held at Townsville on 20 November 2002 were to be accepted and acted on, and changes made according thereto, then, matters relating to, development applications, and disaster mitigation funding, might simply be decided, upon the basis of relatively irrelevant considerations-ie. the mere convenience of making calculations in the field, rather than, more relevant considerations, say, eg. likely changes in whether patterns due to greenhouse gas emissions and the associated global warming effect.

#### Conclusion and other final statements

Needless to say then, that, I would not support the proposed SPP, and, nor would I support the associated G, and, clearly, I am opposed to the details of the proposals to date, not the least of all the process purportedly employed, which-it seems-has been completely ad hoc and absolutely ultra vires.

I respectfully and tentatively make the statement, that, if I were the Minister concerned, I would; call in the process purportedly performed to date, and, declare it to be ad hoc, null, and void; and; refrain, absolutely, from utilising the processes purportedly put in place under the provisions of the IPA, in favour of more admirable and validly made legislative provisions such as those set out in the Coastal Protection and Management Act 1995 (CPMA).

I suggest that the matters of Disaster Mitigation are yet another set of issues that relate to proceedings I have initiated in the Planning and Environment Court at Townsville in the case of William "Billy" Peter Tait v Townsville City Council & Ors No. D311/00, which is, despite having been, for the time being and due to the lack of available resources, stalled in a quagmire of procedural defects and related ultra vires orders purportedly made⁵, an ongoing proceeding relating to the planning processes of the CPMA.

I advise, that, I am not one who has been formally admitted to practice at the Bar, and, therefore, I can not, and do not purport to, give legal advice; and; it follows then, that, if anyone acts on anything that I have stated herein, then, they do so at their own risk, and, I shall not be responsible for anything said or done on the basis of my opinions-expressed herein.

This is not a request for legal representation. I shall represent myself, at all times, and in all circumstances. I shall, act on my own behalf, and represent myself, at all times, and in all circumstances; however; I also intend to represent the interests of, the wider community, and the public generally, where-at my own discretion-I see fit so to do.

This submission, is made without prejudice to my interests, and, shall not act as a waiver of any right or privilege I, have, had, or might otherwise have had. I shall not incur any liability, nor-for that matter-shall I incur any other responsibility, in the making of this submission.

#### Page 6

⁵ Including, of course, the aberrant failures of the registrar of the Court of Appeal (of the Supreme Court of Queensland) to file relevant appeals to that Court-seeking to have the defects in D311/00 in the Planning and Environment Court below corrected, which the said registrar has engaged in, purportedly on the basis of the false pretence that some prohibitive and purportedly "prescribed filing fee" is required-when it would be reasonable to expect that the said registrar would know full well that there are no such fees required.

⁴ To the effect, that, the Burdekin area, due to the nature of the catchment-ie. with floodplains either side of the river which are relatively broad and of little elevation, practitioners in the field use a 1 in 50 year flood event, merely for convenience in calculations, because, in performing their calculations, for the Council, the results which are arrived at-through the use of a 1 in 100 year event-become somewhat meaningless, and, the said practitioners have simply adopted a practice of adding 150mm "freeboard" to their final results (using the 1 in 50 year event) on the basis, that, work done in the Bohle River area (which, given the apparent uniqueness of the Burdekin River catchment, seems to be, not reasonably transferable data, and, of little, if any, weight so as to justify it being used to extrapolate upon-in the case of the Burdekin area) indicates that-in that other area-150mm equates to another 50 years in the calculations [or something to that effect].

Please respond to this submission, by giving your serious consideration to the contents of this submission, and also, by sending a written response, to me, which, acknowledges your receipt of this submission, and outlines whatever other action you propose to take in response to this submission.

Thanks for that.

Yours



- cc. Hon Minister for Local Government and Planning Nita Cunningham MP
- cc. Hon Minister for Emergency Services and Minister Assisting the Premier in North Queensland Mike Reynolds AM MP

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This is a pio forms submission made to you with respect to the above mentioned matter. I apploping for not making a more detailed considered submission but find in the current circumstance that I have little choice to do otherwise established right of the individual to the freedoms of communication about matters political, and, association and; the ptatutorily prescribed and customary commonly requirement, for the principles and dejectives of Ecologically Commonwealth Jovernment of Australia and various consociates thereof [including, so-called private job network page! (PTD.)

member organisations, the thing which unlawfully goes under the protected name "lentrelish", community based associations and even the Oncensland Police Service, have utilised State and Federal government funds to develop systems that achieve no real proposes of any worthy merit, but which are, deliberately or through sheer incompetence for more likely a mixture of besth), designed to brustrate and among the ander resourced and under privileged with gross abuses of their statute bosed rights and privileges, and basic human rights they are entitled to as australian citizens (or indust global citizeno-ey. ocerseas visitoro entitled to recieve welfare assistance when wisiting australia). The abhorrent practices to which I refer victude unlawful involuntary coercive treatment and unlawful diarionination made against individuals, such as myself, on the basis of their political activity or political convictions, opinionas For example, the above mentioned thing, which has no real power or cuttority to act as a delegate of the Secretary of the Department of Sucial Security and thereby make decisions pursuant to the social security law, has bun permitted by the government to inlawfully according information, and utilise vast amounts of government resources for the purposes of attempting to impersonate government Officers, misinterpretation and subsequent ultra vers repapplication of the social security law In doing so The thing koo unlawfully, depended some individuals of the

uns and assistance vegare entitled to water that law and theatired many more with similar treatment for in the pursuit of a corpsign of widespread and well involuntary coercion, designed to force those viderdust into unlimited contracts and place convictions about their as called obligations under the law, and thereby, have them perform all manner of minial warthless and relatively improductive tasks (eg. valesly goody for. an unreasonable minimum number of jobs per period, attend cet poorly structured training course as that ? reported can tree an attendance love and such range act of the focusament without producing any quality arrive, participate in programo [which own to include conjunter proprior and attack] designed - not for the purposes developed to the participants but for the purposes of unlawfully delivering medical treatment to the participants without consent [ y. rocial work experiences ossessment of behaviour markeration of thought processed) that, ultimately, deprive them of the time and resources that try are establed to what utilise to, engage in ordinary community life, and the development of their com and the public true interest generally, by, of practice their freedom of communication about matter political and ther associated bredom of association, participating in actuities designed to faster garaine public participation in the chaision making processes of government and atter wise to enhance and promote democratic processis and (Jage

grandly socialising and interacting with other measures of the wider community as wantly walnut utyers in a free fair and democratic society. The relatively few persons such as night was object to the current abuses and attingst to assert their logal right which they are entitled to bey law one quickly tied up in the quagners of slow, infficient pant ) upon working, bias and ineffective review procedure which are currently in grenation purportedly pursuant to the provisions of the social security law and atter instruct Indeed, it sums that at least one purportely independent review leady - ie the Social Security Greek Inibund - has, descended into the arena with the meraly meddling thing, good of up with it against applicant to which the SSAT has a statutory fediciony duty to tract justly and fairly, and, absolutely it acros - fails to seen recognize the body which is organist to make decisions under the social security law-is the said Secretary of the Department of social security legal districts that 9 have with respect to these systematic always entered the costs jurisdiction of the Federallow, of liestratio some 15 months for most) age but going yet to find a final rasolution (is one which is reasonable fair and risk to humbals of unlawful advise decisions the "thing" purports to have made against me under page 4

responsible and representative systems of government, and

the social security low over the soot couple of years Needless to say that the tall taken on my time and. available reasers in having to litigate in the craving forumo (ay SAIS MAI, Jadual Court, Jedural Magistratio Gourt has been outstanted and not only landway from , opportunity to maningfully participate in publically notified opportunite for pop public participation in the decision making processes of government butabo, has also post one pur personally in a very precasion set of living and so, being of very limited time and resources with

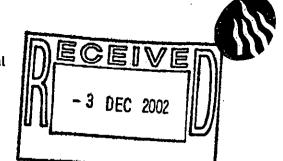
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too which to meaningfully contribute submissions with respect to your matter, mainly because of the circumstances referred to above and associated matters, I make the Collowing general submission and sincisty suggest that you great me - and any relevant atter - an indefinite extension of time in which to make further more detailed occlimissions (ie. once some change in the above vartions circumstances of abuse con be justly effected)

General Sulmission There are statutorely precrubed and customary common low requirements which and by way of an openiore juris to that offer fevrelenced by the many statistic relevant and evidence of an extensive state dractic (to implement ouch statistic low) - for the principles and objectives of statistic low) - for the principles and objectives of acologically sustainable agreement to be adverted to acologically sustainable agree (275.)

in all development activity wierer they be property pages including the making of legislation I request an entersion of tion is which to make further, Trov-delailed Ochmores This is not a reject for light representation I shall represent fourthfield myself order on my own liebalf at all times have I also intend to represent the public intends when appropriate Theraberesión is made without projective to my interest and is not a waver of any right or privilege I have haf or night atturned back had. It have an part al I resource believy my right to, withdraw any part of this sellension or to add to it in any way at such time Please suspond to this sellenianon by sending four written surpoise and your written sucknowledgment of your recept of this letter of submissions, to me at the above given addition as as on as to practicable Nortes for that. yours

Office of the Director-General



Queensland

Department of Primary Industries

Enquiries: Sandra Baxendell Telephone: +61 7 4688 1296

29th November 2002

State Planning Policy

**Acting Director** 

**Disaster Mitigation Unit** 

Counter Disaster and Rescue Services

Department of Emergency Services

**GPO Box 1425** 

Brisbane QLD, 4001

**Dear Acting Director** 

Subject

Submission to the State Planning Policy, Natural Disaster

Officers from within this Department have perused documents supplied, and attended consultation meetings

This proposed planning policy may impact on DPI Forestry operations, and I have received advice from Forestry that the business group shall submit, if necessary, a response direct to your office

Other then forestry staff my staff shall not be submitting a response

Yours sincerely

Director, Regional Services (South)

Department of Primary Industries celebrating 2002 Year of the Outback

203 Tor Street PO Box 102

Toowoomba Queensland 4350

Facsimile Email Mobile Website

+61 7 4688 1184 Sandra.baxendell@dpi.qld.gov.au 0427 379 174

www.dpi.qfd.gov.au Call Centre RecFind ---

00/RecFind (SB:AM) Principal Forest Officer

C/ PO Beerburrum 4517

Your Reference

If telephoning or calling, please ask for:

Our Reference

JD:RT (Doc 41804)



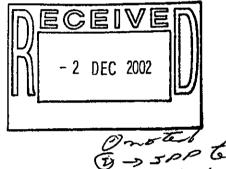
File No. 116 & 505/14

29 November 2002

Acting Director
Disaster Mitigation Unit
Counter Disaster and Rescue Services
Department of Emergency Services
GPO Box 1425
Brisbane Qld 4001

Attention: State Planning Policy

Dear Sir,



(D-) SPP ton ;

Proposed State Planning Policy for Natural Disaster Mitigation.

Thank you for the opportunity to comment on the proposed State Planning Policy.

At its meeting of 26 November 2002 Council considered the implications of the proposed policy and wishes to make the following points:

- Stanthorpe Shire should not be included as a Shire where the State Planning Policy applies
  for landslide. It is submitted that although the Shire contains slopes in excess of 15%, the
  landslide risk factors are small. There have been no known incidences of landslide in
  recent history in the Shire. There is no evidence of instability. The geology of the Shire
  mitigates against landslide.
- 2. There is a need for an agreed explicit approach to fire break creation and maintenance between the Department of Emergency Services and the Department of Natural Resources and Mines. It is noted that proposed clearing activities constituting essential management including establishing or maintaining a fire break sufficient to protect a building or property boundary or paddock is not assessable under Schedule 8 of IPA. The planning scheme can control such clearing. In a response to Council's Draft IPA Scheme, Department of Natural Resources and Mines have stated, "Any clearing of vegetation for fire breaks should limit the clearing of any vegetation mapped as "endangered" remnant vegetation on the Regional Ecosystem Map."

Council considers that the State Planning Policy should clarify the various State Agency responses to clearing for firebreaks. The Rural Fire Brigade in Stanthorpe are of the opinion that some strategic, permanently maintained firebreaks are necessary to limit the progress of wildfires across the countryside. These firebreaks are positioned in response to the usual progress of fires and are not necessarily located to protect individual properties, buildings or paddocks. In some cases, these firebreaks involve the clearing of "endangered" remnant vegetation.

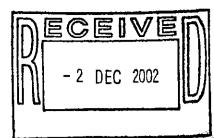
Please contact Council's Shire Planner, Jeanette Davis on 46815535 should you wish to clarify any of the issues raised.

Yours faithfully

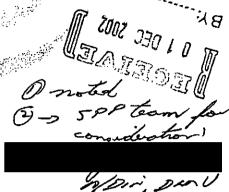


### Winton Shire Council

BH:DM 60:140 25th November 2002



Acting Director – Disaster Mitigation Unit Counter Disaster and Rescue Service Department of Emergency Services G P O Box 1425 BRISBANE QLD 4001 Attention: State Planning Policy



Dear

Re: Draft State Planning Policy and Guidelines for Natural Disaster Mitigation

I refer to the above and your letter dated 21 October 2002 and advise that this matter was considered at the Movember Ordinary monthly meeting of Council.

Council will be sending representatives to one of the public meetings and will provide comment through that process. Council has also requested that I specifically write and note that drought has been excluded from the policy.

Council can certainly understand the reasoning behind the exclusion of drought.

However, Council also notes that through our lown mitigation analysis drought was considered to be a real matter of concern, due to the secondary risks to community and public safety. Specifically, droughts affect our unsealed roads and due to the lack of water, these can not be maintained. Roads with large areas of building are a real hazard, particularly with large and growing numbers of visitors to the region with limited experience on timescaled roads.

Other than this, Council was satisfied with the approach taken, the designated areas of risk and appreciates the opportunity to comment on the draft.

Yours faithfully



Chief Executive Officer



All Communications to:

The C.E.O., P.O. Box 288, WINTON QLD 4735 AUSTRALIA

Telephone: (07) 4657 1188 Facsimile: (07) 4657 1342

Attention - State Planning Policy
Acting Director

Disaster Mitigation Unit
Counter Disaster & Rescue Services
GPO Box I425
Brisbane QLD 400I

Dear Sir,

Flood & cyclonic conditions usually occur during king tides & some rain is governed by moon phases. When Mackay is covered by a 6.7 metre tide, there is not much room for safety in a lot of areas. When tropical downpours occur as well, Mackay will be in trouble with water intrusion (floods) as it is a flood plain. After the 1918 cyclone the city fathers deemed that no building shall take place east of Juliet St. & has NO protein from a tidal wave nearly a century later. An early warning of evacuation is the only option.

In a lot of areas this will cover sewer inlets flooding the Sewerage Treatme Plants (STP's) causing raw sewage to pollute the Barrier Reef Lagoon. On 17/11/00 this happened in my yard where flood waters entered the sewerage system for 6 to 7 hour & flooded two low blocked houses, but the Council has done something about it after 17 years of whinging. When this area was a cane farm it had 5 water furrows, now only one.

Pioneer River - Although we have a levee bank on the southern bank of the River to protect the city from flood waters; there are flood gates towards the mouth, that an left open to nuture mangroves. On I7/II/OO (I recorded 416 mm of rain) there was a lot of flooding in SE Mackay & damaged property & this is contrary to the SPP in your draft. Who should be held responsible? — insurance will not cover this unless you have flooding insurance (which costs an arm and a leg). These groups are very vocal & do not give a damn about human life or infrastructure, but should be held responsible for compensation

on the northern bank, very little has been done to prevent erosion & floodwaters between 1934 & 1958 twelve hectares of land has been lost to the river plus the tow ) ship of Foulden. The Government wanted to build a new road to complement Malcomson St. This street was a suburban street & not designed for its present use as a main road, it is a traffic hazard. This proposed road would have acted as a levee bank from floodwaters but was opposed by the vocal few, who got their way. They are building a new Mater Hospital & this road would have provided an expressway. In 1958 North Mackay was covered by one metre of water & most of this water will discharge into the STP's which could damage or kill off the Great Barrier Reef - we will not get a second chance to repair the Reef. We will be igger swells & waves on to the coast which will be a disaster for Mackay. We are using the Barrier Reef Lagoon as a repository for our sewage - it has to stop sooner than later. After nearly 45 years North Mackay is still unprotected from floodwaters, from the Pioneer River/ Barnes Creek. The Pioneer River has changed course towards the north & if this trend continues, it will break into Barnes Creek - there is nothing to stop it. The Cremone area could be described as a pimple on the

Pioneer River's backside, dividing floodwaters around it. It becomes an island now with larger tides. The River has also silted up very badly due to tidal flow. I am unaware what the tidal flow is in the River, but in Vines Creek on the Harbour Road, the flood tide is less than 3 hours & this will cause sediment to be deposited when the tide ebbs for more than 92 hours.

North Mackay is still untested from floodwaters from Janes Creek/Gooseponds as the holding ponds of Greenfields & Glenfields have been raised & sealed. Four fishways have been built to improve fishing & together with other subdivisions & huge buildings will increase the flow in this area. Vern Veith (Sunfish) wrote in a magazine "our native fish are poor swimmers & jumpers unlike their Northern hemisphere counterparts! A fish kill has already occurred in this area on I2/I2/OI after a 92mm downpour.

There are other areas around Mackay requiring levee banks, Andegrove, south of Mc Cready Creek - salt water entered here during cyclonic weather & it was wrecked as a cane farm & was substituted to Seaforth. Also the Shoal Point area especially the black sandy areas will present a lot of problems with water, it is situated on a large lifer. Before this area was levelled the farmers had to pump out the hollows via a centrifugal pump attached to the power take-off of a tractor to dry it out before harvesting and/or planting. The water was pumped to the mangroves.

North of the River, there are huge areas of acid sulphate soils that have already been built on, & during wet seasons the foundations will become unstable & may require a rebuild. I have a barbecue in my back yard which has tilted due to acid sulphate soil. Roads will break up forming bog holes when this type of soil is present.

Landslides - Over the last few years there has been a lot of houses built on hill-sides & if the house pad has not been properly constructed, a land slide will occur. The block of land should have a master drain to divert the water away from the house pad & the roadway should be contoured so it does not wash out after the first downpour. It will be a more expensive exercise, but if it is done properly, it will be less repair in the long run.

Fires - Bushfires in hilly country is particularly dangerous because a fire will draw up a hill & can travel at a very rapid rate & the steep terrain will make it very dangerous to control. The fire department would require better equipment to handle this type of terrain such as four wheel drives, six wheel would be a better option & better still would be on tracks but these would be more expensive & track machines would require a semi or a heavy trailer to transport it to the scene of the fire. The resident could do a lot to fire proof his property by keeping fuel to a minimum by mechanical means or by livestock. Burning off is another option but this will enrage the greenies but safety should be the only option. I was caught in a cane fire burning the shirt off my back but my ears were still "hot" for a week afterwards. Mackay is allowing multi story buildings & the Fire Brigade should be upgraded accordingly. With green cane harvesting this will become a very serious problem on a hot dry day, even a spark from the blade of

( U ,

a cane harvestor's basecutters could ignite the trash which could cause a lot damage to adjoining properties & countryside. I have seen a few harvestors destroyed by fire fortunately they were harvesting burnt cane. The fire was put out by the Fire Bridage, but the harvestor had to be replaced. It should be made compulsory to have a fire broaround your residence, otherwise the insurance company can refuse to cover you; we were told by the SGIO Insurance that they were not our fairy Codmother & we had to pay for damage ourselves.

Duplications - I know this is outside yourguideline, but it is a serious problem in Mackay with Taxis, Police, mail etc. Surely we do want a tradegy to occur then some thing will be done; you have to take the Mackay City Council to court before they will act. I got my street name changed making a request on 8/IO/99 & it was approved on 28/6/00 & signposted on 2/8/00, but in the meantime I had to go to the Ombudsman on 25/5/00. I was treated like a bad smell, by the Council.

I was born on 18/12/32 & spent my entire life in the Mackay area except for nearly three years in Brisbane when I damaged my hip by falling off a bicycle. I was brought up on cape firstly at Habana & then @ Cotherstone, now called Mt. Pleasant. I spent seasons at Farleigh Mill as a Cane Inspector & manually measured cane farms from Mackavi to Elaroo including the northern beaches area & Seaforth as well as OL - 72 (6ssa) for the Land Department. We did the initial survey to get an idea what was suitable for cane growing @ OL - 72. Later we used aerial Photoes and plotted out with a computor under the DOS system & later with the Windows system. I was involved in the resous of residents from the township of Fouldem in the 1958 flood, & made a report for Mr. Shaw, manager Farleigh Mill later a member for Dawson. The report was him to calculate what assistance was required to shift the entire township. I also go for boat rides (was called fishin @ Constant Creek Eiroc/Blacks Beach & Markey and the shift the entire township. I also go for boat rides (was called fishin @ Constant Creek Eiroc/Blacks Beach & Markey and the shift the shi

@ Constant Creek, Eimeo/Blacks Beach & Harbour, but keep away from Reliance Greek & Pioneer River because of the STP's & some fish I have caught here have sores on them.

I hope you do not adopt the model operating in NSW. Nearly 50 years ago, while holidaying in Sydney, I took a bus to Camberra & there were numerous animals burnt to death in fenced paddocks (sheep, cattle & horses) by bushfires & now they are still it but now it is humans. I hope our Premier is right that we are the SMART state.

Yours faithfully,

4

From:

Sent:

Friday, 6 December 2002 3:28 PM

To:

Subject:

Fwd: SPP on Natural Disaster Mitigation

Response from Arts Qld. Cheers.

----Original Message----

Date: 12/06/2002 02:53 pm +1000 (Friday)

From:

To:

Subject: SPP on Natural Disaster Mitigation

Hi

Arts Qld has reviewed the Consultation Draft SPP and Guideline and has noted the amendments in respect of cultural facilities, etc. Arts Qld does not intend making a further submission at this time.

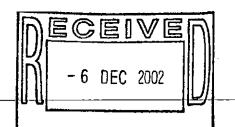
Regards

Principal Project Officer Capital Asset Management Unit

Arts Queensland

Phone: +61 7 3224 5684 Fax: +61 7 3235 4001

Email: allan.best@arts.qld.gov.au





0 5 DEC 2002

Department of Main Roads

29 November 2002

Acting Director
Disaster Mitigation Unit
Counter Disaster and Rescue Services
Department of Emergency Services
GOP Box 1425
Brisbane OLD 4001

Dear Sir

State Planning Policy (SPP) - Natural Disaster Mitigation

I refer to the State Planning Policy workshop held at the Maroochy Community Centre on the 22 November 2002.

Main Roads North Coast-Hinterland District would like to thankyou for the opportunity to make a formal submission on the SPP - Natural Disaster Mitigation but in this instance the department has no comment to make.

Yours sincerely

District Director
North Coast-Hinterland

North Coast-Hinterland District 50 River Road PO Box 183 Gympie Queensland 4570 ABN 57 836 727 711 Our Ref 417-5-39 Rnk2041 Your Ref CDS 4899 Enquiries 5482 0333 Telephone +61 7 54820333 Facsimile +61 7 54820370



# Caboolture Shire Councille.

6 December 2002

Enquiries: Direct Phone: Theo Riethmuller

Direct Fax:

(07) 54 200 298 (07) 54 200 355

Our Ref:

621/17/5 (TR:ct)

Your Ref:

CDS 4899

Attention: State Planning Policy
A/Director Disaster Management Unit
Counter Disaster and Rescue Services
Department of Emergency Services
GPO Box 1425
BRISBANE QLD 4001

Dear Sir

#### Re: Draft State Planning Policy and Guideline for Natural Disaster Mitigation

Thank you for the opportunity to participate in the public consultation on the abovementioned draft State Planning Policy (SPP).

Council at its meeting of 3 December 2002 resolved to make the following submission regarding the proposed SPP to the Department of Emergency Services:

- 1. Council supports the proposed State Planning Policy (SPP) and Guideline, however it recognises the significant amount of further study it requires to adequately implement the policy.
- 2. There is a lack of existing spatial data relating to natural hazards affecting the Shire. Therefore, a number of detailed studies will need to be carried out by Council in order to satisfy the requirements of the proposed SPP. This will be a major cost impact on local government, including Caboolture.

  Shire Council, and this must be addressed by State Government as part of implementing the policy.
- 3. As Council is currently well progressed in the preparation of its proposed IPA planning scheme, it will not be possible to satisfy the requirements of the proposed SPP within the timeframes envisaged. It must be recognised that significant resources will be required to accurately map flood, bushfire and landslide hazards and this timing, availability of resources and Council's advanced progress of scheme preparation should be considered during any review of proposed IPA schemes by State agencies (in particular the Department of Emergency Services).

Should further information be required concerning this matter please contact Council's Planning & Strategy Unit as above referenced.

Yours faithfully

MANAGER PLANNING AND STRATEGY

As Christmas is fast approaching, we would like to take this opportunity to advise you that Council will be closing over the Christmas period from 4.30pm on Tuesday, 24 December 2002 and will re-open at 8.30am on Thursday, 2 January 2003.

Councillors and staff wish to extend to you compliments of the season.

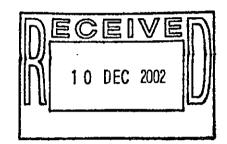
Warwick Willmott

## Geological and Resource Planning Advice

179 Victoria Avenue Chelmer Qld 4068 Telephone: 07 3379 6485 Email: willmott@powerup.com.au ABN: 98 596 261 753

5 December 2002

Attention: State Planning Policy
Acting Director
Disaster Mitigation Unit
Counter Disaster and Rescue Services
Department of Emergency Services
GPO Box 1425
BRISBANE OLD 4001



Dear Sir/Madam

### Comments on State Planning Policy for Natural Disaster Mitigation

Thank you for forwarding a copy of the above draft document and the opportunity to provide comments on the proposed Policy. I will confine my comments to landslides, being hazards with which I am familiar.

In general, given the lack of readily available information on the extent of areas of landslide risk through out the State, the approach taken by the draft Policy to ensure landslide risk is considered in planning schemes and development assessment is supported.

However, it would seem that some refinement is needed as to how a 'natural hazard management area (landslide)' is referred to and shown on planning schemes. It is noted that Outcome 4 of the SPP requires natural hazard management areas to be identified in planning schemes. Whether this means describing such areas in writing only, or actually mapping them is not clear. If mapping is required, it would seem necessary for all local governments listed in the SPP to at least prepare slope maps for the whole of their areas showing slopes over 15% (to comply with A3.3(c)). As all landscapes contain an intricate mosaic of flat, sloping and steep land, these maps would be very intricate, and not very useful unless prepared at a detailed scale, which would be quite onerous for many Local Governments, particularly in the time frames envisaged.

Similarly, if a Local Government has had a geological stability survey undertaken (see A3.3(a)), it is again likely to result in a complex mosaic of stable and potentially unstable zones, which would be difficult to depict on planning scheme maps in meaningful detail.

Thus it should be clarified that planning schemes need only describe what constitutes a natural hazard management area (landslide), but with reference to other maps where available.

Thus such an area would for example be defined as "all land with slope over 15%" or "Zones B, C and D shown on the maps of the landslide risk study of the Shire by XYZ Consultants".

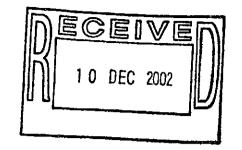
At a more general level, it is noted that as land clearing is now classified as development, all applications for clearing on land over 15% slope, even for rural purposes, will apparently be subject to the SPP. This could generate considerable work for Local Governments in assessing proposals, possibly with consultants' reports needed in each case, and would overlap assessment of rural clearing proposals for vegetation protection under the *Vegetation Management Act 1999*. Possibly some thought needs to be given to rationalising assessment of clearing proposals under both the Act and the SPP.

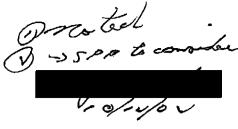
I trust these comments prove useful, and wish you well with the Policy.

Yours sincerely



Bundaberg City Council





346:AWF:ES

All enquiries to

6th December 2002

Attention: State Planning Policy **Acting Director Disaster Mitigation Unit** Counter Disaster & Rescue Services Department of Emergency Services **GPO Box 1425 BRISBANE QLD 4001** 

CC Local Government Assoc of Qld Inc PO Box 2230, FORTITUDE VALLEY BC QLD 4006

Attention:

Dear Sir / Madam

RE: Submission On Draft State Planning Policy Natural Disaster Mitigation - Bundaberg City Council

Bundaberg-City-Council-is-generally-supportive-of-the-State-Planning-Policy-for-Natural Disaster Mitigation. It is however surprising that the Policy does not cover earthquake issues. Whilst it is recognised that the Standard Building Regulation specifies construction standards for buildings with respect to earthquake loadings, it is considered that other pieces of infrastructure in particular trunk water supply infrastructure may have significant roles following earthquake events, yet no standards or guidelines exist for the planning of such.

Bundaberg City is one region in Queensland specifically affected by earthquake and some guidance from the state through the planning policy as to how Councils in the region should be addressing this issue is considered appropriate.

If you wish further to discuss this matter please contact Council's Manager Planning and Development, h on 4

Yours faithfully

Chief Executive Officer

All communications to be addressed to the Chief Executive Officer

T;\Eida\TOWNPLAN\DEPT EMERGENCY SERVICES 06

Postal Address: Street Address: Website:

P.O. Box 538, Bundaberg, Qld., 4670 188-190 Bourbong-Street-Bundaberg, 4670-----

A.B.N. 45 538 587 15 Telephone: (07) 4153 999 (07) 4153 922

F-mail:

www.bundabergcity.qld.gov.au ceo@bundaberg.qld.gov.au

Facsimile: (07) 4152 915

(25)

E500068

CAIRNS PORT AUTHORITY

DECEIVED

1 1 DEC 2002

5 December 2002

Acting Director Disaster Mitigation Unit Counter Disaster and Rescue Services GPO Box 1425 BRISBANE QLD 4001

Dear

DRAFT STATE PLANNING POLICY AND GUIDELINE FOR NATURAL DISASTER MITIGATION

Thank you for your letter of 21 October 2002 concerning the above.

Cairns Port Authority does not wish to lodge a submission on the draft SPP, however we would appreciate a copy of the document when it is released.

Yours sincerely

# A/g General Manager - Airport

Сору

Frank Spannenburg

Kim Kelleher

Enquiries

Kim Kelleher 4052 9770

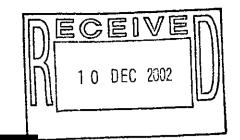
Our Ref

**JM**tg

GASHAREMIRPORTNew Structure GMAW or M. Counter Disaster and Rescue Services - Droft SPP. doc

Cairns Port Authority ... shaping the future

Cnr. Grafton and Hartley Sts, PO Box 594, Cairns Qld. 4870 Australia Telephone: (07) 4052 3888 Facsimile: (07) 4052 1493 Int.Tel: 61-7- 4052 3888 Int.Fax: 61-7-4052 1493 Email:marketing@cairnsport.com.au Website: www.cairnsport.com.au



Acting Director
Disaster Mitigation Unit
Department of Emergency Services
GPO Box 1425
BRISBANE QLD 4001



Department of industrial Relations

2 -> 500 tran for consideration

Dear Mr

Thank you for the opportunity to comment on the draft State Planning Policy and Guideline for Natural Disaster ('the SPP').

On 1 October 2002, a new legislative regime for electrical safety in Queensland commenced – the *Electrical Safety Act 2002* (the Act). The Act is directed at eliminating the human cost to individuals, families and the community of the death, injury and destruction that can be caused by electricity. It does this by introducing a legislative framework that imposes electrical safety obligations on a wide range of persons to ensure electrical safety and provides ways to discharge those obligations.

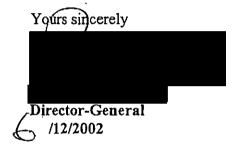
Electricity entities have an obligation to ensure that their 'works' are electrically safe and operated in a way that is electrically safe. Works of an electricity entity means the electrical equipment—and—electric—line—associated—equipment;—controlled—or—operated—by the entity to generate, transform, transmit or supply electricity. Clearly this definition is specifically concerned with electrical equipment. Conversely, 'operating works' under the Electricity Act 1994, cited in Annex 1b of the SPP, also includes non-electrical equipment such as fuel stocks, operated by generation, transmission or distribution entities.

An electricity entity, as defined in the *Electricity Safety Act 2002*, encompasses generation, transmission and distribution entities, and also special approval holders (refer Part 7 of the *Electricity Act 1994*) and QR. Given the commencement of the *Electrical Safety Act 2002* subsequent to initial drafting of the SPP, it is recommended the definition of the types of electricity related community infrastructure be reviewed.

As part of discharging their obligation, electricity entities' works must be able to perform under the service conditions and the physical environment in which the works operate. There are no specific provisions for development and planning applications. However, the *Electrical Safety Act 2002* contains requirements for works, such as clearance distances for exposed conductive parts and overhead electric lines, which seek to control hazards which can potentially result in fire. In this respect, there appears to be no conflict between the intent of the *Electrical Safety Act 2002* and the SPP.

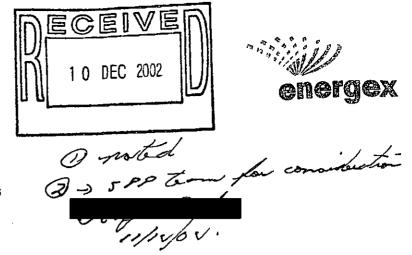
Block B Neville Bonner Building 75 William Street Brisbane Queensland 4000 Australia GPO Box 69 Brisbane Queensland 4001 Australia Telephone +617 3225 2000 Website www.dir.qld.gov.au Technical requirements for the design, building and maintenance of electric lines and works are also regulated by the *Electricity Act 1994*, administered by Treasury Department, who may wish to provide comment on the alignment of the SPP with their legislation. Similarly electricity entities, such as Energex, Ergon Energy, Country Energy and Powerlink, will be best placed to provide information on the processes adopted for developing and planning electricity infrastructure. They may also provide useful input into the practicalities of complying with an applicant's roles and responsibilities, and more importantly outcomes one to three required by the SPP.

Should you have any queries regarding the information provided, please do not hesitate to contact principal Policy Officer on who will be pleased to assist.



6 December 2002

Acting Director
Disaster Mitigation Unit
Counter Disaster and Rescue Services
Department of Emergency Services
GPO Box 1425
Brisbane QLD 4001



Dear Sir

## Response to Draft State Planning Policy

Under the Electricity Act 1994, Gas Act 1965 and associated Acts, ENERGEX is required to deliver a safe and reliable energy supply to all customers in a manner which supports the economic, social and environmental wellbeing of the community.

To meet this commitment, ENERGEX invests an average of \$250 million per annum on new capital projects in substations and distribution network systems. This investment is necessary to ensure the reliability of supply and cater-for-future growth-within the south-east-Queensland area.

The Integrated Planning Act 1997 (IPA) treats infrastructure as a core matter and electrical infrastructure in particular as essential community infrastructure.

To enable ENERGEX to continue to provide electrical infrastructure in a cost effective and efficient manner, appropriate consideration of this essential infrastructure needs to be built into the planning system and its supporting implements.

To this end, ENERGEX requests you consider comments made in response the draft State Planning Policy – Natural Disaster Mitigation.



Enquiries
Neil Andersen
Telephone
(07) 3407 4857
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(07) 3407 4144
Email
neilandersen
@energex.com.au

Corporate Office 150 Charlotte Street Brisbane Qld 4000 GPO Box 1461 Brisbane Qld 4001 Telephone (07) 3407 40 Facsimile (07) 3407 460 www.energex.com.au

ENERGEX Limited ABN 40 078 849 055 In relation to the draft State Planning Policy and its impacts upon ENERGEX operations the following comments are submitted:

 ENERGEX is a supply entity under the Electricity Act 1994. It has statutory obligations in relation to the efficient and economic supply of power.

Due to its obligations and requirements under its Act, ENERGEX must "follow" and support development patterns, it does not "lead" development or provide infrastructure in advance to need. (As a general rule – development is already in place when electricity is provided).

Similar to other items of network infrastructure such as roads and railways, electricity infrastructure must connect to an existing network. At times this will require electricity assets being constructed in areas restricted by this SPP. However, unlike roads, the SPP makes neither specific exemption nor recognition of this aspect of an electricity network.

A further consideration is that of the requirements of electricity engineering/design, which dictates the location of substations in relation to electricity load assessment, and the location of powerlines/networks.

The cumulative effect of the previous points is such that sites for substations are determined by a range of factors beyond ENERGEX control. Due to this issue, ENERGEX sees the application of the SPP provisions to substations as not reflective of the development process causing the need for substations and an unnecessary cost to the community.

development for the purposes of IPA. These aspects include:

- operational work for a public sector entity (see operating work Electricity Act 1994) – schedule 8, part 3, item 17,
- addition of transformers within an existing substation, and
- (proposed) electricity distribution lines up to 66kv.

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ENERGEX requires removal of reference to electricity infrastructure from the SPP.

- 2. Section 5, item 5.8 appears to raise a conflict with the provisions identified under Appendix 7, part A.
  - Section 5, item 5.8 makes reference to the States position in relation to an appropriate flood level indicator as being the 1:100 ARI
  - Appendix 7, part A, in regards to Power Stations, Major Switch Yards, and Substations refers to an acceptable solution of 1:500 ARI.

ENERGEX submits that the 1:100 ARI is the State's position and should be applied throughout Appendix 7 (in reference to electricity infrastructure).

As general comments, ENERGEX points out that there appear to be internal inconstancies within the document, specifically conflict between the intents of various outcomes and their associated performance criteria and acceptable solutions.

- 3. Section 2, part 8, item 8.3 appears to conflict with elements such as section 2, part 6, item 6.47.
  - Item 8.3 directs assessment managers not to approve development applications that are unable to achieve outcomes 1 to 3
  - item 6.47 recognises the situation where a development application should proceed even though it does not meet the requirements of outcome 3.
- 4. Appendix 5, table A, item 4.1 infrastructure is designed to exclude floodwater intrusion conflicts with table A, item 2.1 development does not detrimentally affect flood storage capacity or flood conveyance characteristics.

Thank you for the opportunity to address ENERGEX interests as part consultation process involving this draft State Planning Policy.

Yours sincerely

General Manager Network Asset Management

CC

Office of Energy for information

For consistency, it is suggested that this hazard be removed from this SPP as was done with earthquake and strong winds.

4

The Introduction of a default natural hazard management area for flood hazard is practical due to the lack of reliable statewide flood data. Council has adopted a 100 year ARI flood event which is consistent with the SPP but Council also requires a minimum development floor level of 300mm above the 100 year ARI flood event.

The methodology used by Council for landslide is consistent with the SPP and the bushfire mapping methodology has been conducted in consultation with the Queensland Fire and Rescue Service.

There is also the matter of portraying a 'false sense of security' for properties that fail outside of the natural hazard management areas, particularly for flood and landside hazards. Further reference is made to this in Issue 8.

# Issue 2 - Development Outcomes and Development Assessment

There is a need for clarification for self-assessable activity under the Standard Building Regulation 1993 (SBR), such as fill associated with building works, in natural hazard management areas if it should be exempt from the SPP. Planning should take precedence over the SBR.

It is strongly supported that community infrastructure should be located and designed to function effectively during and immediately after natural hazard events. Performance criteria as included in the Guideline will provide useful assistance in determining if community infrastructure development is compatible with the nature of the hazard.

## Issue 3 - Making and Amending Planning Schemes

The work to date on the proposed Redland Shire planning scheme has identified natural hazard issues (as addressed by the draft SPP) and is consistent with the criteria set out in the SPP (Annex 3) for determining natural hazard management areas.

#### Issue 4 - Cost Implications

There are no additional costs associated with implementing the SPP as Redland Shire Council is already adopting standards for mapping that are consistent with the SPP. However, landowners of properties that are identified as being within a natural hazard management area may have other associated costs such as increased insurance premiums.

## Issue 5 - Relationship between the SPP and other Disaster Mitigation Programs

Eligibility for ongoing financial assistance from the Commonwealth for restoration of public assets will be supported by the proposed inclusion of natural hazard management areas within the new planning scheme.

# Issue 6 - Relationship between the SPP and the State Coastal Management Plan for Storm Tide Hezard

The development of guidelines for stormtide hazard by the Environmental Protection Agency will need to be consistent with the SPP. Council is keen to participate in discussions on this matter and in setting the adopted immunity level for planning purposes.

# Issue 7 - Compensation Claims arising from the SPP

The use of performance based assessment measures aimed at ensuring the safety of persons and property should support the making or amending of planning schemes that reduce the risk to persons or property from natural processes, and therefore limit/reduce compensation payable by the local government in accordance with IPA.

# Issue 8 - Implications of showing Natural Hazard Information for Local Governments

Redland Shire Council is currently producing a series of overlay maps, that identifies various natural hazard areas, as part of the new IPA planning scheme process. The detail of this mapping is reliant on the material available to Council and will therefore be reviewed in association with work being done with the Shire in the hazard assessment study.

With regard to natural hazards, local governments such as Redland Shire have a responsibility to the community to advise, to the best of its ability, on natural hazards. It may be appropriate to include a disclaimer on natural hazard management areas relating to the accuracy of the information provided and stating that the areas identified are not the full extent of area prone to natural hazard. Planning authorities adopt a level of risk that is acceptable to communities when assessing the ratio of risk to loss/cost.

# Issue 9 - Roles and Responsibilities of Local Government under the SPP

Guidance on refusing development applications that are unable to achieve outcomes as specified in the SPP is useful and will be given considerable weight in the development assessment process.

It is not clear in the SPP whether the State Government will have a referral role in the development assessment process under IPA where development is within a natural hazard management area.

#### Summary

After a few minor clarifications are made, the SPP will provide a consistent, State-wide policy context for planning and development decisions. The increased consistency provided by the SPP should mean greater certainty about what constraints and development requirements should apply to particular development proposals. The SPP should act to reduce the pressures on Local Government to consider inappropriate forms of development in hazard prone areas.

Should you require any further information in relation to this submission, please contact

— Strategic Planning Advisor on telephone

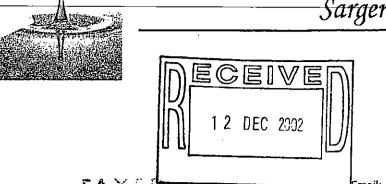
Fours sincerely

MAQ

Genéral Manager Planning and Policy

GACH TABE TO . MOY & XE





Sargent Consulting

ABN 74 424 370 508

11 Redwood Place THE GAP Queensland 4061 Tel: 0419 311160 Fax 07 35110440

Email: dmsargent@tpg.com.au

10 December 2002

The Acting Director
Disaster Mitigation Unit
Counter Disaster and Rescue Services
Department of Emergency Services
GPO Box 1425
BRISBANE QLD 4001

क्षातिकात्रीका प्रकार संस्था करते । संस्था स्थाप संस्था स्थाप स्थाप स्थाप स्थाप स्थाप स्थाप स्थाप स्थाप स्थाप स

Dear Sir

### Draft State Planning Policy — Natural Disaster Mitigation

Having attended one of the Brisbane workshops on the draft SPP and Guideline on Natural Disaster Mitigation, I should like to submit the following suggestions and comments.

As a consultant operating in the fields of flood risk management and more recently also in broader natural disaster risk management, I welcome the draft SPP and congratulate you on its production.

My first comment is in respect of the interim or default designations of **Natural Hazard Management Areas.** I support the default designations in respect of bushfire and landslide, but note that no such default position is included in respect of flood. I suggest that a default position could be introduced by means of an interim Designated Flood Event (DFE) based on the "flood of record", that is the largest flood since records began at that particular locality.

Introduction of this requirement would prevent undue development in the period until a detailed flood assessment becomes available. An example in which this would have been beneficial is Charleville. I am familiar with flooding in Charleville having been Project Manager for the *Western Queensland Towns Flood Study* which looked at flooding and flood mitigation in six towns including Charleville following the April 1990 flood. I was involved more recently, in a review role, in respect of a further detailed flood study subsequent to the 1997 event. During the period between these floods, and since, further development has been allowed in the floodplain (below the

1990 level) with no stipulation of minimum floor height. Putting aside the issue of Murweh Shire Council's duty of care in this regard, if there had been a requirement for a Natural Hazard Management Area (Flood) based on an interim DFE of the 1990 flood extent, such development would have been prevented or at least substantially curtailed. Not only has this continuing development increased the community flood risk, it has also made it more difficult to mitigate future floods.

It could be argued that using the flood of record may set too high a standard, but in most cases the flood of record will be lower than the 100 year flood. Even in the minority of cases where it is greater, it provides greater long term protection and the DFE could be subsequently reduced.

I request that you give this proposal due consideration.

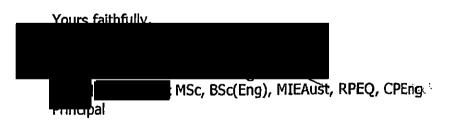
My other comment is in respect of the definition of **floodplain** contained in the Glossary of both the draft SPP and the accompanying Guideline.

The extent of a river's floodplain is the result of the hydraulic and geomorphic processes to which it has been subjected. This includes both current and past climatic conditions. The definition you have given based on the PMF (current climate) is that for flood prone or flood liable land. These are not necessarily the same.

Where a river has not yet been subjected to its PMF, the floodplain would not have developed to the full extent of the PMF, and conversely where the floodplain is the result of previous wetter climates as in many currently arid regions, the floodplain may extend beyond the current PMF extent.

I suggest you differentiate between these terms.

Thank you for considering my suggestions, and I hope that the draft SPP is adopted in the near future.





# Division of Assets & Development



### Pine Rivers Shire Council

220 Gympie Road Strathpine Old 4500 PO Box 5070 Strathpine Qld 4500

07 3480 6555 07 3881 3204

Contact:

Phone:

3480.6600

Our Ref:

116/5-1; 500/102 NJ:SC

Your Ref:

CDS 4899

Date:

11 December, 2002

1 2 DEC 2002

Mr.

**Acting Director Disaster Mitigation Unit** Counter Disaster and Rescue Services Department of Emergency Services **GPO Box 1425** 

BRISBANE, QLD, 4001

Dear

Re:

Draft State Planning Policy - Comments from Pine Rivers Shire Council

Further to the State Planning Policy Workshop held on 18 November, 2002 and your request for public submissions on the draft State Planning Policy, the following comments and suggestions are... provided in respect of the Guideline document.

#### 1. Appendix 2: Undertaking Natural Hazard Assessment - Flood:

- (a) Section A2.1 refers to 'Dam Break'. Whilst it is agreed that dam break can result in a flood. some clarification is required here. In undertaking the recent Natural Disaster Risk Management Study, Council was requested by Department of Emergency Services to exclude dam break as this was deemed not to be a natural disaster.
- (b) It is necessary to distinguish here and in Appendix 7 between criteria that relate to Flood Plain Management and Stormwater Management. Most Councils have design standards for stormwater usually based upon the Queensland Urban Drainage Manual. Stormwater flooding can relate to surcharge from pipe or open channel drainage and not necessarily where a defined watercourse exists or previously existed.

#### 2. Appendix 3: Undertaking Natural Hazard Assessment - Bushfire:

- (a) In Table 1 there is no reference to dry sclerophyll forest. There are substantial areas of this forest type within Pine Rivers and other Local Government areas. The difficulty here could be that there appears to be a number of ways of describing vegetation types.
- (b) Figure 1 Compass degree ranges for each aspect category: This may need further consideration to fully reflect conditions applying throughout Queensland. It seems that 'aspect' in relation to bushfire refers to exposure to sun or shading and to meteorological effects such as hot drying wind etc. More than one diagram may be required to properly reflect Queensland conditions.

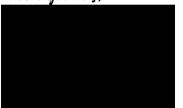
(c) The document whilst providing guidance in hazard assessment does not consider techniques for bushfire risk assessment. It is appreciated that hazard assessment is a planning issue whereas risk assessment is a management issue. Consideration might be given as to whether any expansion or discussion is warranted in this regard.

#### 3. Appendix 8: Calculating Slope from a Topographic Map:

The diagram and the text are contradictory as the diagram shows a line which is at an angle to the contours and item 2 of the text refers to a line perpendicular. Whilst it is possible to measure a slope between any two points regardless of their relationship with the contours, the diagram and the text need to be consistent and made clearer.

Thank you for the opportunity to provide comments on the Policy and Guideline.

Yours sincerely,



Director Assets & Development.



# Bay Islands Development Association Inc.

A 655 member non-profit advocacy organization representing landholders and residents of Russell, Karragarra, Lamb and Macleay Islands PO Box 3133 Sunnybank South Q 4109 Ph/Fax 07 33455308 Email: black-stump@ihug.com.au

sppconsultation@emergency.qld.gov.au

# Comments to the to the proposed State Planning Policy for Natural Disaster Mitigation

By reprinting the text and commenting on this policy and guideline by boxed comments this association as the largest landholder membership of Residential A land association in Australia wishes to make its comments loud and clear. A copy of this is being sent to the two Ministers and Premier as the comments show that 9000 existing owners of Bay island land would be affected by this policy as they are in an area of high and medium bushfire risk.

But before doing so the Association prefaces its comments by three paragraphs in italics.

The Association has already had two meetings with Hon Mike Reynolds Emergency Services Minister and has tried unsuccessfully to remove a Redland Shire Council Vegetation Protection Order off 14303 Bay Island allotments. Since then the Southern Moreton Bay Island's Local—Area Plan Planning Study was released showing 6600 Residential A-lots about 80 per cent of Russell Island's residential land designated as a Major Bush Fire Hazard. This includes over 30 per cent of the available vacant residential A land stock in South East Queensland. Furthermore, the Council was proposing that 513 Residential A lots would be resumed for the purpose of bushfire management. This is despite a State Cabinet decision of May 2000 that owner's rights of Residential A land would be protected by legislation.

Because of Council's VPO impact that has made the islands particularly Russell Island a veritable tinderbox and its threat to resume 513 residential lots, the Association has requested that the Minister declare all Residential A land except those lots that are endangered remnants of biodiverse significance under the State Vegetation Management Act to be able to be cleared immediately. The Association to the time of writing had have had no response. Any Local Law to restrict clearing on a Residential A lot is a repugnant law and a very dangerous one if fire strikes a bay community.

Perhaps the State Planning Policy needs to accept a few basic tenets to protect an owners right to clear vegetation from the basic of all land use tenures ie Residential A land, and not to create obstacles that make this a nightmare and make clearing of this veritable tinderbox more and more difficult.

#### **Boxed comments**

2. APPLICATION OF THE POLICY

2.2 The SPP applies to development involving:

• the actions or activities described in Part (a) of Annex 1; and

The SPP applies to IPA assessable development. The Bay Islands have 14303 assessable Residential A lots of which about 9000 are in a Medium or High bushfire hazard area mainly because of a RSC VPO and RSC policy that favours conservation preventing development (ie the "preventers" versus the owners that want to develop ie the "doers"). All lots are assessable under the RSC town plan by a fairly repugnant amendment (The 14th Amendment) some years ago. So we have a major headache here immediately. Are we going to allow development or are we going to prevent development by now using an SPP.

The SPP essentially applied to regard to Bay Island Res A lots in a NHMA of Medium and High Bushfire Hazard say the following.

Under 6.3 Outcome 1, the draft SPP would apply to assessable development and in bushfire NHMAs the SPP applies to where development increases the number of people living, working, or congregating in those areas (e.g. residential development, etc.) or involves removal of vegetation on vacant Residential A lots with no building approval etc. if it is compatible with the natural hazard except where there is an overriding need for development in the public interest (Increased risk to people is a significant consideration when determining overriding need) and no other site is suitable and reasonably available or the development proposal is a development commitment and it would have a lower risk than generally applies to development in the vicinity. Under 6.8 Development within NHMAs areas is compatible with the nature of the natural hazard when it complies with the relevant performance criteria in the SPP Guideline. The development application should demonstrate that the development proposal complies with the performance criteria. And what is the performance criteria? It can be what is mentioned later in this submission but it can be an alternative criteria that's supported by sufficient reporting.

In other words if the performance criteria was not met, then a development manager would have to refuse assessable and the poor bay island landholder in such an area of risk who would not possibly be able to demonstrate an overriding need for development in the public interest as increased risk to people is a significant consideration when determining overriding need. Potentially 9000 lots would be affected on the Bay Islands or a significant number of people to make the SPP absolutely unworkable.

So let us now get on to the performance criteria in bold and the indicators of compatibility in normal below to see if these 9000 landholders can apply the criteria in Appendix 5 of the guidelines.

#### General

1. Development does not compromise the safety of people or property from bushfire. Development is compatible when 1.1 A site-specific bushfire hazard assessment demonstrates that the development will not be in an area of High or Medium bushfire hazard OR 1.2 The development will: 1.2.1 not result in a material increase in the number of people living, working or congregating in the area; or 1.2.2 not involve any new building work other than a minor extension (<20 m 2 Gross Floor Area) to an existing building. OR 1.3 The development complies with performance criteria 6-8 below (as applicable to the particular development).

Here by the courtesy of Redland Shire Council and the inability of State Officials to meet with the Association to have VPOs removed from Residential A land (Read the DLGP recent correspondence), Res A lots are unbelievably allowed to remain in NHMAs. The poor landholder cannot get development approval to build because he can't live in his house as he will increase the island's population. And a resident who wants to build an extension can only build a pov one. This shows that this criteria is also totally unworkable.

### Development in High and Medium severity bushfire hazard areas

7. Development that materially intensifies the use of High bushfire hazard areas incorporates effective siting, design and management measures to minimise bushfire hazard. Development is compatible when: 7.1 The development does not materially increase the number of people living, working or congregating in the area or involve the storage or manufacture of flammable, explosive or noxious materials in bulk within the High bushfire hazard area. OR 7.2 A comprehensive Bushfire Management Plan is submitted and the development complies with the Bushfire Management Plan, to the satisfaction of the assessment manager.

As for above The poor landholder cannot get development approval to build because he can't live in his house as he will increase the island's population or store lawnmowing petrol that he uses for cutting 3 metre fire breaks allowed under the VPO. As he can't do these two things he will have to submit a comprehensive Bushfire Management Plan and if the development complies with the Bushfire Management Plan, to the satisfaction of the assessment manager then he may get the go ahead. Again the SPP is totally unworkable.

So the alternative is simple and it is a sure way to prevent repugnant laws occurring.

Firstly with the SPP there must be retrospective legislation to amend the IPA to allow clearing on all Res A land. Then people in communities can be able to build and force 20 metre fuel free zones around their properties like those golden years before VPOs came in and certain people started to forget that fire is a good servant but a bad master.

Secondly the RSC Amendment 14 to the Redland Town Plan should be removed and no Residential A land made assessable under any Queensland Town Plan and therefore restricted by IPA policies. Repugnant legislation will always fail under common law.

Thirdly there needs to be a lot more thought put into the SPP.

Fourthly there needs to be a measure whereby one Director General local government is accountable and should have the powers to invite community consultation on an ongoing basis.

Fifthly the Minister for Emergengy Services should immediately order the clearing of Bay Island Land that is of any bushfire risk and blow to what Redland Shire Council is doing.

Yours faithfully



From:

Sent:

Thursday, 12 December 2002 12:03 PM SPP Consultation

To:

Cc:

Subject:

Draft State Planning Policy (natural disaster mitigation) Submission





naturalhazardssub InterScan SafeSta mission.doc mp.txt

File: A72B; PDJ; PDJ

Dear Sir / Madam

Please find attached the submission from Thuringowa City Council on the Draft State Planning Policy.

Regards

Planning Services Thuringowa City Council

<<naturalhazardssubmission.doc>>



Attention: State Planning Policy
Acting Director
Disaster Mitigation Unit
Counter Disaster and Rescue Services
Department of Emergency Services
GPO Box 1425
BRISBANE OLD 4001

12th December, 2002

Dear Sir / Madam

This submission is made in response to the proposed State Planning Policy (SPP) (Natural Disaster Mitigation) draft document.

It is considered that Thuringowa City Council has identified, and where practicable, mapped areas potentially affected by natural hazards as part of the new IPA Planning Scheme, which will be undergoing public consultation shortly. The combination of the development assessment tables and codes in the draft IPA planning scheme will ensure that all relevant development is assessed against specific development standards for natural disaster mitigation.

In general, the concept of a SPP for these issues is commendable and supported in principle.

One matter that raised debate was the decision to include the 1 in 100 year ARI event as the Defined Flood Event (DFE) in the document. The option was given to Local Authorities (LA) to specify a lower DFE provided substantiating documentation could be provided for the lower DFE.

In Thuringowa since 1991, the 1 in 50 year ARI event has been used as the benchmark for developable land with habitable floor levels to be 450mm above the 1 in 50 year ARI flood level. It is considered that this "buffer" or "freeboard" sufficiently ensures that habitable levels for residential homes would be not less than the 1 in 100 year ARI DFE.

Checking the 1993 report, modeled differences between the 1 in 50 year and 1 in 100 year ARI flood levels along the Bohle River varies between 0.08m and 0.46m. Differences in the river reach south of Dalrymple Road, are between 0.09m and 0.43m. Comparing differences between the 1 in 20 and 1 in 50 year ARI events for the 1993 and 2001 reports would indicate that the 2001 report would support similar level differences between the 1 in 50 and 1 in 100 year

- 4.6 The Queensland...... to the effects of climate change. <u>Projected</u> changes <u>are likely to</u> include reductions ......These changes <u>would</u> have significant impacts
- 4.8 There is currently no State position on the <u>projected</u> effects of climate change. Information ....
- 3. In Appendix 5 reference is made to the need to consider the impact of developments on "flood warning times". It may be worth considering including a reference to consulting the Bureau of Meteorology here if there is a flood warning system in place?
- 4. The definition of PMF given is the flood that "could conceivably occur" whereas the Institution of Engineers, Australia (IE Aust) use "could reasonably occur". Also, the IE Aust refer to the flood from the PMP as the "PMP Design Flood", not the PMF. There needs to be consistency with nationally agreed definitions.
- 5. A2.20 indicates that Bureau of Meteorology data is also available from DNRM. It is important that users are aware that this may not be the most up to date source of data and that the Bureau, as the National Meteorological Service should be the primary source of meteorological data and information. Also, the phrase "hydrologic models where BoM operates a flood warning system" would be improved by the wording "possible hydrologic models or flood forecasting studies where BoM operates a flood warning system".
- 6. The definition of "flood" includes dam break, yet Appendix 2 of the Guideline includes nothing about dam break studies. There should be (at least) some reference here to the document on dam safety in A9.4.
- Reference to the Emergency Management Australia Flood Warning Guide should be included in A9.4 (Appendix 9 of the Guideline) even though it is somewhat peripheral to the core purpose of this Guideline. While there is mention in various places of flood warning and emergency response action, it would be useful to emphasise the need for all flood mitigation strategies (not just land use planning which is the subject of this document) to be integrated. Including the EMA Guide, and making some reference to it earlier in the document perhaps under a heading "An Integrated Approach" would add value to the draft SPP.
- 8. The Bureau would also suggest that it (as an organisation) be included in A2.44 (along with CSIRO, QCCA and DNRM) as a source of climate change information.

Yours sincerely

Jim Davidson Regional Director (Queensland) Bureau of Meteorology GPO Box 413 Brisbane Qld 4001

13 December 2002

Please find attached a comment on the Draft State

From:

Sent:

Thursday, 12 December 2002 12:34 PM

To:

Subject:

SPP Consultation SPP for Natural Disaster Mitigation







DraftSPPDisasterMit ATT13829.txt lgation.doc...

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Planning Policy including

Guidelines for Natural Disaster Mitigation.

1

ARI events. CoT could therefore justify maintaining the 1 in 50 year ARI event as its DFE using strategic thinking and visionary standards established over a decade ago.

One issue that may need some further consideration is the matter requiring at least one road to a nominated infrastructure use (see Table A in Appendix 7 of the guideline) to be passable for the emergency evacuation for all floods up to the nominated Recommended Flood Level (RFL) in the table. All roads are generally passable in a 1 in 10+ year ARI event. There may be some difficulty for LA's to achieve the designated access standard. The extent of the road system to be passable is vague and without any defined limit.

Calculation on slope from a topographic map (refer to Appendix 8 of guideline, p78) needs to be calculated perpendicular to the contours not parallel to the grid lines. Otherwise calculated slopes will not be accurate (eg. in the case of example shown). The actual distance on perpendicular alignment is 1.4cm. Slope calculation is then  $1.4 \times 25000/100 = 350m$ , so slope is  $20/350 \times 100 = 5.7\%$  or a 20% difference to the 4.7% shown.

I trust these comments are of assistance and Council awaits your decision on the proposed adoption of the SPP.

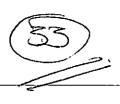
Regards

Planning Officer
Planning Services
Thuringowa City Council

PO Box 86

Honngowa Gentral 61-0-4845

Drainage Engineer Infrastructure Services Thunngowa City Council PO Box 86 Thuringowa Central QLD 4817



Attention: State Planning Policy
Acting Director
Disaster Mitigation Unit
Counter Disaster and Rescue Services
Department of Emergency Services
GPO Box 1425
Brisbane Qld 4001

Dear Sir

I refer to your letter to provide the planning Policy and Guideline for Natural Disaster Mitigation.

has asked that I respond to this request as the Bureau's Regional Director for Queensland. The opportunity to provide feedback on the draft policy is appreciated.

Overall, the draft policy is seen to be a significant advance in regard to natural disaster mitigation in the area of land use planning and development in Queensland.

With respect to the policy approach for dealing with floods, the Bureau considers that the policy should include some requirements for floodprone areas above the Defined Flood Event. As a minimum, it is suggested that the policy should require consideration of public safety (risk to people, evacuation routes etc) in areas up to say at least the "500 year" or "1000 year" flood level. The policy might, in addition, require consideration of unacceptable modifications to flood behaviour or increases to flood levels that may also impact adversely on the DFE or lesser floods. In its current form, the existing draft policy may unintentionally lead to potentially more serious flood disasters for floods exceeding the DFE.

Again in relation to floods, it is suggested also that the use of Average Recurrence Interval—(ARI) terminology is not consistent with a risk management approach and should be replaced, or at least used in conjunction with, the use of Annual Exceedance Probability (AEP) terminology. The use of ARI has shown to be quite misunderstood and is easily misinterpreted. Further, it is suggested that the Policy or Guideline should include some explanation of the probability of various AEP events occurring over a design or planning timescale (e.g. the chance of a 1% AEP (100 year ARI) event occurring within the next 50 or 100 year period).

More specific editorial comments are as follows:

1. The definition of Climate Change in the Glossary (in both the Policy and Guidelines) does not agree with the Framework Convention on Climate Change international definition, which is:

Climate change: a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.

2. The following changes to the text on "Climate change" (Page 23) are also recommended:

Attention: State Planning Policy Acting Director Disaster Mitigation Unit Counter Disaster and Rescue Services

> Queensland Regional Office Bureau of Meteorology GPO Box 413, Brisbane, Queensland 4001

> > 12 December 2002

Attention: State Planning Policy
Acting Director
Disaster Mitigation Unit
Counter Disaster and rescue Services
Department of Emergency Services
GOP Box 1425
Brisbane Qld 4001

Dear Sir,

## Draft State Planning policy and Guideline for Natural Disaster Mitigation

I refer to your three letters CDS 4899 of 21 October 2002 to the Director of Meteorology, the Regional Director for Queensland and the Deputy Regional Director for Queensland. This is collective Bureau response and includes comments from Head Office staff in Melbourne, together with comments from the Queensland Regional Office of the Bureau.

As a general comment the Bureau believes that the title of the document is misleading. It implies a comprehensive policy on all aspects of natural disaster mitigation whereas the document itself focuses only on development options from a planning policy perspective and not on other measures for natural disaster mitigation such as early warning systems. It is considered important that the restricted scope of the document is adequately reflected in the title and reinforced in the early part of the document.

#### More specific editorial comments:

1. The definition of Climate Change in the Glossary (in both Policy and Guidelines) differs from the international definition of the Framework Convention on Climate Change, which is

Climate Change: a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.

- 2. The following changes to the text on "Climate change" (page 23) are also recommended:
  - 4.6 The Queensland ..... to the effects of climate change. <u>Projected</u> changes <u>are likely to</u> include reductions ..... These changes <u>would</u> have significant impacts .....
  - 4.8 There is currently no State position on the projected effects on climate change.
- 3. In Appendix 5 reference is made to the need to consider the impact of developments on "flood warning times". It may be worth considering including a reference to consulting the Bureau of Meteorology here if there is a flood warning system in place.

- 4. The definition of PMF given is the flood that "could conceivably occur" whereas the Institution of Engineers, Australia (IE Aust) use "could reasonably occur". Also, the IE Aust refer to the flood from the PMP as the "PMP Design Flood", not the PMF. There needs to be consistency with nationally agreed definitions.
- 5. A2.20 indicates that Bureau of Meteorology data is also available from DNRM. It is important that users are aware that this may not be the most up to date source of data and that the Bureau of Meteorology, as the National Meteorological Service should be the primary source of meteorological data and information.
- 6. The definition of "flood" includes dam break, yet Appendix 2 of the Guidelines includes nothing about dam break studies. There should be at least some reference here to the document on dam safety in A9.4.
- 7. Reference to Emergency Management Australia Flood Warning Guide should be included in A9.4 (Appendix 9 of the Guideline) even though it is somewhat peripheral to the core purpose of this Guideline. While there is mention in various places of flood warning and emergency response action, it would be useful to emphasise the need for all flood mitigation strategies (not just land use planning which is the subject of this document) to be integrated. Including the EMA Guide, and making some reference to it earlier in the document perhaps under a heading "An Integrated Approach" would add value to the draft SPP.
- 8. The Bureau would also suggest that it be included as an organization in A2.44, along with CSIRO, OCCA, and DNRM, as a source of climate change information.

Yours faithfully,

Deputy Regional Director (Qld)

(J4)

From:

Sent:

Thursday, 12 December 2002 2:19 PM SPP Consultation

To:

Subject:

Draft State Planning Policy including Guidelines for Natural Disasters Mitigation





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Please find attached the submission from Ipswich City Council

relation to the Draft State Planning Policy including Guidelines for Natural Disasters Mitigation.

A hard copy of the submission will be forwarded with today's mail.

Regards

Senior Planner

Ipswich City Council

Ph:

Fax:

E-mail:

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Thank-you

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11 December 2002

Dear Sir

### Re: Draft State Planning Policy including Guidelines for Natural Disasters Mitigation

The Council of the City of Ipswich offers the following comments as a submission in relation to the Draft State Planning Policy (SPP) including Guidelines for Natural Disasters Mitigation.

#### **GENERAL/OVERVIEW:**

It is pleasing to see that the Departments have taken on the concerns raised by Council and other submitters in the preparation of the Draft SPP, in particular that:-

- (a) there is State Government financial and in kind support in the preparation of detailed hazard studies:
- (b) the scope of the SPP is limited to flooding, land-slippage and bushfires,
- (c) there is recognition of the differences in planning for greenfield sites, compared to infill or committed development (including zoned land); and
- (d) a degree of flexibility is included in the implementation approach to the SPP.

#### **SPECIFIC ISSUES:**

The following specific issues are raised in relation to the proposed SPP:

#### 1. Bushfires:

The guidelines which support the draft SPP recommend that properties located within the medium to high hazard areas on the Bushfire Risk Analysis maps have, amongst other development standards, a requirement for a water reserve of 5,000L dedicated for fire fighting purposes. It is considered that this water reserve is insufficient and that the minimum water reserve should be 10,000L.

Director
Disaster Mitigation Unit
Counter Disaster and Rescue Services
Department of Emergency Services
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- 2. The draft SPP refers to two forms of flooding terminology:-
  - (a) 1:100 year Average Recurrence Interval (ARI) flood event; and
  - (b) 1% Annual Exceedence Probability (AEP).

The draft SPP states that "Average Recurrence Interval (ARI)" is a statistical estimate of the average period in years between the occurrences of a flood of a given size or larger (eg. floods with a discharge as big or larger than the 100 year ARI flood event will occur on average once every 100 years). The ARI of a flood event gives no indication of when a flood of that size will occur next."

The draft SPP further states that the "Annual Exceedence Probability (AEP)" is the probability that a particular flood event would exceed a specified flood height within any one year.

It is considered that using the term 'year' in relation to a defined flood event is likely to continue to cause confusion in the community about when such an event may occur. It would be preferred if the flooding terminology simply referred to a probability measure (eg 1:100 or 1%) rather than a specific reference to years.

3. Consideration should be given to amending IPA (eg Section 5.4.2 of Part 4 Compensation) to ensure that a local government is not liable for compensation for loss of yield (or otherwise) as a result of incorporation of the provisions of the SPP.

Yours faithfully

John Adams
PLANNING MANAGER



Enquiries Telephone Shannon McGuire (07) 3227 6877 cds 4899

Your reference Our reference

BNE9950 vol 2

18 December 2002

Director-General
Department of Emergency Services
GPO Box 1425
BRISBANE QLD 4001

**Environmental Protection Agency** 

Incorporating the

Queensland Parks and Wildlife Service

DEPARTMENT OF EMERGENCY SERVICES

n 2 JAN 2003

EXECUTIVE SERVICES

Dear Michael

#### Draft State Planning Policy and Guideline for Natural Disaster Mitigation

Thank you for the opportunity to provide comment on the final draft version of the State Planning Policy for Natural Disaster Mitigation (SPP), and Guideline for Natural Disaster Mitigation.

Attached herewith, are comments from the Environmental Protection Agency. I trust that these comments are of value to you. If you require further information regarding these comments, please do not hesitate to contact Shannon McGuire on telephone 3227 6877.

Yours sincerely

Director-General