

Statement of Julie Anne McLellan

I, Julie Anne McLellan, Manager, Water Resources Branch, City Planning & Sustainability Division, Brisbane City Council, of 266 George Street, Brisbane, in the State of Queensland, state on oath as follows:

1. Attachment "JAM-01" is a copy of a notice from the Queensland Floods Commission of Inquiry (**Commission**) dated 20 October 2011, requiring me to provide information to the Commission in the form of a statement (**Notice**). This statement is provided in response to the Notice.

Qualifications, Background and Responsibilities

2. My tertiary background is science based. I am an industrial chemist and I hold an Associate Degree of Applied Science in Chemistry. I am not a hydrologist or a hydraulic engineer.
3. I have had extensive experience in various Council and other roles associated with water supply and sewerage. I have been employed by Council since 1998, initially as Supervising Chemist with the Brisbane Water Division. In 2001, I became a Senior Officer (Environment and Innovation) in Brisbane Water and in the following year I took on a business management role (Manager Design and Connections) in Brisbane Water. In 2004 I transferred to the Water Supply and Sewerage Treatment section of what is now known as the Water Resources Branch (**Water Resources**) as Water Services Manager with responsibility for environmental management, in particular recycled water options and drought management.
4. I am currently the Manager of Water Resources. In 2007 I was appointed as Acting Manager of Water Resources, and in 2009 I was appointed as Manager. I have been in the role of Manager, Water Resources, from 2007 to now with the exception of ten months (September 2010 to June 2011 inclusive) when my role was as Project Director, Asset Optimisation. At that time, Water Resources was responsible for the strategic management of water supply and sewerage, waterway health, stormwater drainage, and flood management for the Brisbane local government area. Following State legislative changes which took effect from 1 July 2010, Queensland Urban Utilities was appointed as the water and wastewater services provider for a geographic area including the Brisbane local government area.
5. In my role as Manager of Water Resources, I am responsible for stormwater and drainage infrastructure, waterway health, sustainable water use and flood management. I head a multi-disciplinary team of over 40 staff and administer a Program budget in the order of

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\$165,000,000. I have led the development and implementation of a comprehensive water strategy for Brisbane with the aim of delivering a Water Smart City. Of particular relevance to the matters the subject of this statement, under my management Water Resources delivered the Lord Mayor's Taskforce on Suburban Flooding.

Steps taken in response to the Notice

6. On 12 October 2011, Council's lawyers, Clayton Utz, received a letter from the Commission asking Council to nominate a witness to provide a statement relating to the history of the Brisbane River Q100. Clayton Utz responded by letter dated 13 October 2011, advising that:
- (a) the issues which appear to be of interest have been the subject of an investigation by the Crime and Misconduct Commission (CMC), and the Commission holds a copy of the statements provided to the CMC by the relevant Council officers together with a detailed chronology attached to the CMC Report;
 - (b) in view of the complexity of the various flood studies and the multidisciplinary approach involved, it was unrealistic to expect that there would be any one person within Council who would have sufficient knowledge of the relevant flood studies spanning a period of 15 years;
 - (c) there is no one person who could give evidence relating to the history of the Brisbane River Q100, if by that the Commission means direct evidence about particular matters rather than commenting on documents;
 - (d) very few of the persons directly involved at any level remain with Council;
 - (e) doing the best it could based on its understanding of the topics the Commission wished Council to cover in the foreshadowed Requirement, Council nominated me as the officer who would provide the statement. In this regard, it was noted by Clayton Utz that I am a long-standing Council employee who has held senior management positions and that I am currently the manager of the Branch of Council most directly concerned with issues of policy relating to water and flooding issues.
7. I understand the Commission was also advised that I was not directly involved in the events which are of interest to the Commission, although I have some general familiarity with them. My general familiarity results from having been employed by Council at the of time of the intense media interest in the Brisbane River Flood Study (BRFS) issues and the CMC

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investigation, together with my subsequent move to the position of Manager of Water Resources which position was previously held by Mr Barry Ball.

8. Attachment "JAM-02" is a copy of the letter from the Commission dated 12 October 2011 and the response from Clayton Utz dated 13 October 2011.
9. The Notice was served by the Commission on the afternoon of Thursday, 20 October 2011. I received the Notice that evening. In view of the extent and detail of the information sought in the Notice (covering in excess of 150 separate questions), it was apparent to me that a very large volume of documentation dating back to 1996 (when the BRFS process commenced) would need to be identified, located and collated across a number of sections of Council in a very compressed timeframe.
10. The following morning (Friday, 21 October 2011), in order to understand and manage the logistics of compiling the volume of information sought, I sent an email to those Council officers who I believed may be able to assist in the identification and location of the Council files required to respond to the Notice. A copy of the email sent by me on 21 October 2011 is attachment "JAM-03". In addition, I sought assistance from the Knowledge & Information Officer of Council's City Projects Office (previously City Design).
11. Attachment "JAM-04" is a table listing each of the Council officers from whom I requested assistance, their current job title and the reason why I identified each of them as being persons who might have access to relevant documents or who may otherwise be able to assist in identifying and locating documents contemplated by the Notice.
12. In addition, I caused a meeting of relevant Council officers and Council's legal advisors to be convened on the afternoon of Friday, 21 October 2011. The purpose of the meeting was to:
 - (a) brief Council officers on the terms of the Notice;
 - (b) identify the Branches and individuals within Council best placed to locate and provide the material sought;
 - (c) allocate responsibility to Council officers for the provision of information to a central collection point, being Brisbane City Legal Practice; and
 - (d) provide a timeframe for the provision of information, being 12 noon, Tuesday 25 October 2011. This was a tight but unavoidable deadline in view of the extremely



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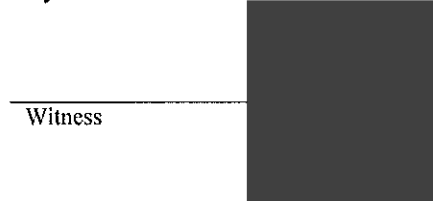
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limited period in which to collate and analyse the material and frame a response to the Notice.

13. The documents identified and collated as a consequence of the above process are extensive. The documents occupy the equivalent of 61 lever-arched folders of material. All of this material was provided to Council's lawyers, who I understand processed the documents by having them uploaded to a document management system. I am informed that duplicates and extraneous materials were removed. The remaining documents were then reviewed and narrowed to those which are responsive to the specific topics covered in the Notice. As the documents have been collated from several sources, and to assist the Commission with its review of them, the documents have been sorted and presented chronologically. The documents have also been sequentially paginated. They comprise 17 volumes and form Attachment "JAM-05" to this statement. I have been advised that this process (apart from pagination) was completed by Clayton Utz on Thursday, 27 October 2011. I have subsequently read the material contained in JAM-05 for the purpose of preparing this statement.
14. While I consider the process outlined in paragraphs 10 to 13 to be the most efficient and extensive means reasonably available to me in the short period of available time to collate the relevant material, I am unable to state whether the documentary record contained within JAM-05 is a complete record.
15. Many of the key decision-makers are no longer with Council. In view of the time which has elapsed since the relevant events and changes in Council's Administration, key senior individuals including the then Lord Mayor, Chief Executive Officer, Divisional Manager Urban Management, and Manager Waterways (now Water Resources) Urban Management Division are no longer at Council. In the time available, I have not checked with those people whether any other documents exist or may have previously existed.
16. The procurement of complex and far-reaching studies such as the BRFS necessarily involves a consultative process across the relevant Divisions, and may involve consultation with one or more of Council's Standing Committees and referral of recommendations to the Establishment and Co-ordination Committee (E&C) and Full Council.
17. In the case of the BRFS, the matter was ultimately referred to Full Council in December 2003 regarding the adoption of the Brisbane River Q100 and Defined Flood Level (DFL). Accordingly, while recommendations are made by individuals within relevant Council



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Divisions, there is no single person within Council's organisational structure who is, or who has been, charged solely with making decisions in relation to the BRFS or policies arising therefrom. Ultimately such decisions are made at the Administration level of Council.

18. As I have indicated earlier, I had no personal involvement in or knowledge of the BRFS during the period 1996 - 2003, and my statement on this issue is confined to a review of the documents that have been collated. Attachment "JAM-06" is a table of the then Council representatives who I believe, from my review of the material comprising JAM-05, were involved in:
- (a) the various Brisbane River flood study reports between 1996 and 2003; and/or
 - (b) the Council resolution in December 2003 adopting the Brisbane River Q100 and the DFL.
19. One of these employees is Mr Gavin Blakey. I am aware that Mr Blakey has prepared a separate statement on some of the issues of interest to the Commission as set out in the Notice.
20. I set out below my responses to the Notice based on the sources of information obtained as a consequence of the process set out above.

1. For the following reports:

- a) *Brisbane River Flood Study for Brisbane City Council, Sinclair Knight Merz, June 1998*
- b) *Brisbane River Flood Study: Review of Hydrological Aspects (for BCC), Monash University, (Professor Russell Mein), 9 December 1998*
- c) *Brisbane River Flood Study (Draft), City Design, June 1999*
- d) *Further Investigations for the Brisbane River Flood Study, Brisbane City Council, City Design, December 1999*
- e) *Review of Brisbane River Flood Study Report to Brisbane City Council, Independent Expert Review Panel, 3 September 2003*
- f) *Brisbane River Flood Study: Further Investigation of Flood Frequency Analysis Incorporating Dam Operations and CRC-Forge rainfall estimates - Brisbane River (Final), Sinclair Knight Merz, 18 December 2003*
- g) *Flood Modelling Services, Recalibration of the Mike 11 Hydraulic Model and Determination of the 1 in 100 AEP Flood levels, Final Report, Sinclair Knight Merz, 5 February 2004*

[provide] the following information:

- h) **How the study was conducted, including how the Brisbane City Council ('Council'):**
 - i) chose the external consultants or the section within Council that would do the work
 - ii) provided the consultants or section within Council with previous studies and other material
 - iii) provided the consultants or section within Council with data
 - iv) determined the scope of work
 - v) provided the consultants or section within Council with instructions
 - vi) determined the timeframe for the project
 - vii) determined the data to be used by the consultants or section within Council
 - viii) determined the assumptions to be made
 - ix) was otherwise involved in the study
- i) who within Council made those decisions or undertook those activities
- j) whether the chief executive officer of the Council or any Councillor or civic cabinet or the Lord Mayor (identifying which) was briefed regarding the results of the report, and if not, why not
- k) by whom the decision to give or not give briefings regarding the results was made; when and on what basis was that decision made
- l) what decision was made as to whether the results of the report would have an effect on the Q100 or planning control lines; when, by whom and on what basis was that decision made
- m) what decision was made as to whether or not to obtain a review of the report, by whom; when and on what basis was that decision made
- n) whether a decision was made that further investigations were required or not required following the report, and if so, (identifying each such report), who made that decision, what was decided; when, and on what basis.

General

21. As a result of the process mentioned above, a chronological bundle of documents has been created and is Attachment JAM-05 to this statement (**Bundle**). This Bundle is a compilation

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of the records of Council which are relevant to each of the reports mentioned in 1(a) to 1(g) of the Notice. Reference in my statement to page and volume numbers relate to the Bundle.

22. The documents which comprise the Bundle speak for themselves and to a greater or lesser degree address most of the questions set out in the Notice. For the reasons stated earlier, I am unable to provide commentary by way of direct evidence to supplement to the documentary record. The identity of the Council officers and those responsible for making decisions in relation to the matters under review are apparent from the table (Attachment JAM-06) and on the face of the documents in the Bundle.
23. As part of my preparation for this statement I have reviewed the Bundle and, by way of assistance to the Commission, have endeavoured to provide references to some of the documents in the Bundle which appear to be of relevance to the questions posed by the Notice.
24. By way of further assistance, as part of my review, I have identified a number of contemporaneous statements, chronologies and reports. These documents were prepared in 2003 and 2004 as part of and in relation to investigations conducted by the Crime and Misconduct Commission (CMC) with respect to the topics the subject of the Notice.
25. I set out below the contemporaneous statements appearing on Council files:
 - (a) Tim Quinn dated 22 July 2003 - page 3974, vol 12;
 - (b) Kerry Rea dated 24 July 2003 - page 3976, vol 12;
 - (c) David Hinchliffe, undated - page 3977, vol 12;
 - (d) Kevin Bianchi dated 16 July 2003 - page 3978, vol 12;
 - (e) Sharon Humphreys dated 16 July 2003 - page 3979, vol 12;
 - (f) Ann Bennison dated 22 July 2003 - page 3980, vol 12;
 - (g) John Campbell dated 22 July 2003 - page 3981, vol 12;
 - (h) Maureen Hayes, undated - page 3982, vol 12;
 - (i) Michael Kerry dated 16 July 2003 - page 3983, vol 12;
 - (j) Barry Ball dated 22 July 2003 - page 3985, vol 12.


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26. Mr Ball's statement (see paragraph 25(j)) is of particular significance given his role as Manager of Water Resources Branch within Urban Management Division.
27. Some of the documents which include contemporaneous chronologies relating to the period between December 1999 and mid-2003 are:
- (a) a document prepared by Mr Blakey in March 2004 titled Brisbane River Flood Studies Report, a copy of which is Attachment "JAM-07";
 - (b) the chronology appearing in the Independent Review Panel Report - page 4448, vol 13;
 - (c) a chronology appearing in a document dated 27 June 2003 and titled "Flood Levels for the Brisbane River" - page 3614, vol 11;
 - (d) a letter from Council's Chief Executive Officer to the Chairperson of the CMC dated 27 June 2003 - page 3640, vol 11; and
 - (e) an undated briefing note for Mr Tim Quinn by Mr Ball - page 3708, vol 11.
28. In March 2004 the CMC released its report "Brisbane River Flood Levels" - page 5295, vol 15.

a) *Brisbane River Flood Study for Brisbane City Council, Sinclair Knight Merz, June 1998 ("SKM (1998)")*

Choice of external consultants (h)(i)

29. A general chronology for the process of the selection of the external consultants is contained in a document titled "Flood Study Inputs Checklist" dated 6 August 1996 - page 9, vol 1 (see pages 12 - 13 of vol 1). The documents in the Bundle indicate the following:
- (a) 3 August 1996 - By advertisement in the *Courier Mail*, Council invited expressions of interest from suitably experienced organisations to carry out investigations for flood studies of the Brisbane River - page 8, vol 1;
 - (b) 6 August 1996 - Parties registering an interest were notified in writing and provided with a draft brief;
 - (c) 7 August 1996 - E&C approved the engagement of consultants to carry out the Brisbane River Flood Study - page 14, vol 1;

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- (d) 28 August 1996 - Interested parties were evaluated and a short list was selected - page 21, vol 1;
- (e) 12 September 1996 - the final draft of the tender documents for "Contract No. W 18/96/97" was prepared - page 48, vol 1;
- (f) 12 September 1996 - Short listed parties, Sinclair Knight Merz (SKM), WBM Oceanics Australia, Connell Wagner, John Wilson and Partners, and Kinhill/GHD were notified and sent tender documents - pages 31 to 35, vol 1;
- (g) 24 October 1996 - Tenders were ranked and a Memorandum was sent to the General Manager of Design Branch Department of Works recommending that SKM be invited to undertake the BRFS - page 360, vol 2;
- (h) 5 November 1996 - SKM's tender was accepted by letter from Mr Robert Carter, General Manager to SKM - page 368, vol 2.

Provision of Data, Studies and other material h(ii), (iii) and (vii)

30. The data, studies and other material provided to the consultants is, as far as I understand, listed in the "Brisbane River Flood Study Brief" - page 382, vol 2. This information appears to have been supplemented during the course of the Study from time to time as a result of interaction between Council and SKM.

Scope of work h(iv)

31. The scope of work appears to have been developed by Council during the preparation of the Brisbane River Flood Study Brief and refined during subsequent discussions with SKM culminating in the scope of works set out in SKM (1998) - page 1425, vol 6.

Instructions h(v)

32. The instructions appear to have been developed by Council during the preparation of the Brisbane River Flood Study Brief and refined during subsequent discussions with SKM culminating in the confirmation of the instructions in SKM (1998) - page 1425, vol 5.



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Timeframe h(vi)

33. It seems that, given the scope of works, Council initially considered that the consultant would require 50 weeks to complete the report. This timeframe is reflected in the letter of acceptance of the tender dated 5 November 1996 - page 368, vol 2.
34. It is my understanding that the timeframe was subsequently extended by agreement between Council and SKM until June 1998 (when SKM (1998) was delivered).

Assumptions h(viii)

35. My review indicates that the assumptions made by SKM are recorded in SKM (1998). The assumptions appear to have been developed and agreed as part of an interactive process over a period of time in correspondence and discussions between SKM and Council during the course of preparation of the report.
36. Some of the key assumptions are recorded as follows:
- (a) the water levels at that time for both dams were assumed to be Wivenhoe RL 67.0m AHD and Somerset RL 100.5m AHD (which was full supply level (FSL) and spillway level respectively);
 - (b) the design events were analysed assuming simplified operations of Wivenhoe and Somerset dams, as the "RAFTS" model could not model the complex operations associated with these dams. It was assumed that during an event all communication between Wivenhoe and Somerset would be cut - the result being that when communications are cut during a flood event, the procedure is to employ uncontrolled releases for both dams;
 - (c) no areal reduction factors were applied for the reasons set out on page 66 of Volume 1 of SKM (1998);
 - (d) as set out on Page 78 of SKM (1998), no losses (for the relevant storm event) were applied; and
 - (e) the "line of best fit" scenario was adopted rather than the Log Pearson III distribution. This assumption was referred to in a fax from SKM to Council dated 10 September 1998 - page 2011, vol 7.



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Interaction between Council and SKM h(ix)

37. The records relevant to SKM (1998) as included in the Bundle, indicate a high level of interaction between Council officers and SKM including discussions, correspondence, technical meetings and review of draft reports.

Decisions regarding SKM (1998)

Engagement (i)

38. As set out above, I am unable to supplement the documents included in the Bundle in relation to all of the decisions made regarding SKM (1998). There are specific decisions recorded in documents forming part of the Bundle, some of which are referred to below.
39. The key decision to undertake a BRFS and Wynnum Creek Study and engage external consultants appears to have been made by E&C on 7 August 1996 - page 14, vol 1.
40. The engagement, as I understand it, was between the Waterways section of Council (now Water Resources) and SKM, and decisions regarding the engagement were made by Waterways management.
41. The Bundle indicates that the day to day interaction and technical support was provided by engineers within City Design.

Briefings (j) and (k)

42. The references to briefings that I have been able to identify from the Bundle are:
- (a) an email from [REDACTED] to PWOPS [REDACTED] dated 28 August 1998 noting that he "*had a meeting with Tim Quinn on Wednesday [probably 26 August 1998] to discuss the Brisbane River Flood Study*" - page 2008, vol 7;
 - (b) a fax from [REDACTED] to [REDACTED] of SKM dated 9 October 1998 noting: "*there is still some deliberations re this. Barry Ball will be presenting to the Council mid next week*" - page 2032, vol 7;
 - (c) an email from [REDACTED] dated 13 November 1998 referring to a presentation to the Executive Management Team and E&C Strategy regarding the Brisbane River Flood Study - page 2173, vol 7.

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43. A search of Council records has not revealed any minutes of these briefings in 1998. I note from my review of the Bundle that there are several presentations which appear in the vicinity of the hard copy of the email referred to in paragraph 42(c). Those presentations are dated 26 October 1998, 6 November 1998 and 12 November 1998 - pages 2093, 2119 and 2129 in vol 7 respectively. These may be the presentations referred to in the above email but I have been unable to confirm whether that is the case.

Q100 and planning controls (l)

44. My review of the Bundle indicates that no decisions were made regarding Q100 and planning controls as a result of SKM (1998). Rather, a decision was taken to conduct a peer review of SKM (1998).

Review and further investigations (m) and (n)

45. The Bundle indicates that SKM (1998) was the subject of a peer review resulting in the following outcomes:
- (a) submissions were sought from Willing & Partners, Kinhill and PPK to conduct a review of Brisbane River Flood Management Options. Willing & Partners was selected by Council to conduct the review;
 - (b) a workshop led by Willing & Partners was held on 24 November 1998 involving a number of external consultants and Council officers from Waterways and City Design. The minutes are at page 2319 of vol 7;
 - (c) a report was produced by Willing & Partners dated 1 December 1998 entitled "Brisbane River Floodplain Management Options Report" - page 2380, vol 7;
 - (d) a hydrological review was carried out by Professor R Mein leading to a report dated 10 December 1998 - page 2454, vol 7.
46. Professor Mein's 1998 report indicated that the Q100 in SKM (1998) was likely to be an over-estimate and set out a number of further inquiries to be conducted. A decision appears to have been made by Waterways management to engage City Design to carry out, among other things, the additional work recommended by Professor Mein prior to making a decision regarding Q100 - page 2481 of vol 7, page 2548 of vol 8.


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Choice of external consultants (h)(i)

47. From my review of the Bundle, it appears the process utilised in the selection of Professor Mein to undertake Mein (1998) is relevantly evidenced in the following correspondence:
- (a) 17 November 1998 - page 2238, vol 7 - Mr Ball sent a letter to Professor Mein requesting a proposal to obtain an expert opinion on the hydrological processes used to produce SKM (1998) in determining the Q100 flow with dams;
 - (b) 23 November 1998 - page 2313, vol 7 - Professor Mein sent a fax to Council confirming he could undertake the review of hydrologic methodology and setting out his fee estimate;
 - (c) 24 November 1998 - page 2314, vol 7 - [REDACTED] of Council sent a fax to Professor Mein confirming the appointment.

Provision of Data, Studies and other material h(ii),(iii),(vii)

48. It is my understanding that the data, studies and other material provided to Professor Mein is listed in the letter to Professor Mein dated 17 November 1998, namely Volumes 1 and 2 of SKM (1998) and some summary information regarding various methodologies adopted in Brisbane River studies conducted in 1984, 1992 and 1998.
49. In addition, the Bundle indicates that Professor Mein spoke at length with Mr Scott Abby and Dr Rory Nathan of SKM - page 2453, vol 7.

Scope of work h(iv)

50. It appears that the scope of work is set out in the letter to Professor Mein dated 17 November 1998 and confirmed in Mein (1998) - page 2473, vol 7.

Instructions h(v)

51. It appears the instructions are set out in the letter to Professor Mein dated 17 November 1998 and confirmed in Mein (1998) - page 2473, vol 7 - ie. to review the design event hydrology and process for determining the Q100 flow with dams in place.

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Timeframe h(vii)

52. I did not find in my review of the Bundle any document which deals directly with the manner in which the timeframe for the work was determined, though I note Professor Mein indicated he had capacity to do the work during one week in a fax to Mr Ball dated 23 November 1998 - page 2313, vol 7.

Assumptions h(viii)

53. As this was a review, I do not understand that any assumptions were necessary.

Interaction between Council and Professor Mein h(ix)

54. A number of the interactions are set out in the documents included in the Bundle.

Decisions regarding Mein (1998)

Engagement (i)

55. The records indicate that the decision to engage Professor Mein was made by Mr B Ball, Manager Waterways, Urban Management Division.

Briefings(j) and (k)

56. I am unable to state from the Bundle what briefings may have taken place regarding Mein (1998).

Q100 and planning controls (l)

57. My review of the Bundle indicates that no decisions appear to have been made regarding Q100 and planning controls as a result of Mein (1998).

Review and further investigations(m) and (n)

58. The Bundle indicates that Mein (1998) led to further investigations being conducted by City Design.

59. Professor Mein's report indicated that the Q100 in SKM (1998) was likely to be an over-estimate and set out a number of further inquiries to be conducted. These recommendations are recorded as including:


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- (a) that an appropriate areal reduction factor be applied to the input design rainfalls used in the BRFS;
- (b) that reasonable (non-zero) design loss rates be used to estimate Q100;
- (c) that a probability analysis be conducted to determine the most suitable design values of initial storage levels for the Wivenhoe and Somerset Dams for downstream flood calculations; and
- (d) that steps be taken to resolve the apparent incompatibility between rainfall-based estimates and those from the frequency curve; this would include a sensitivity study of the influence of the nineteenth century floods on the Study outcomes.

60. The Bundle indicates that a decision was made by Waterways management to engage City Design to carry out additional work prior to making a decision regarding Q100. The further investigations to be undertaken by City Design appear to be set out in an email from L Vosper to K Morris dated 30 December 1998 - page 2481, vol 7. Although I cannot be certain it is reasonable to assume that Mr Ball was ultimately responsible for, and involved in, that decision. This observation is likely to be the case for most of the decisions which were made through the Waterways Branch (now known as Water Resources).

c) *Brisbane River Flood Study (Draft), City Design, June 1999 (City Design (June 1999))*

Choice of consultants (h)(i)

61. My review indicates the process regarding the selection of City Design to carry out the additional work recommended by Mein (1998) appears to have been as follows:

- (a) 30 December 1998 - page 2481, vol 7 - City Design was asked by Waterways (email from [REDACTED] to [REDACTED] dated 30 December 1998) to provide a cost estimate to carry out the work;
- (b) 19 January 1999 - page 2550, vol 8 - a memorandum from [REDACTED] to [REDACTED] dated 19 January 1999 provided a fee estimate to undertake the body of work set out in that memorandum, which appears to have been accepted.

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Provision of Data, Studies and other material h(ii), (iii) and (vii)

62. I assume City Design had access to all the information provided to SKM for the purpose of SKM (1998), a copy of Mein (1998), and other River and historical flood information on Council's files, records and systems.

Scope of work h(iv)

63. The scope of work appears to have developed in a series of interactions between Waterways and City Design as recorded in the Bundle culminating in City Design (June 1999). The scope of work appears to be set out in City Design (June 1999) - page 2693, vol 8.

Instructions h(v)

64. The instructions appear to have been developed in a series of interactions between Waterways and City Design as recorded in the Bundle culminating in City Design (June 1999). The instructions appear to be confirmed in City Design (June 1999) - page 2693, vol 8.

Timeframe h(vi)

65. I cannot identify how the timeframe for the work was determined, though there is no suggestion I can see that any time limit was imposed.

Assumptions h(viii)

66. The assumptions made by City Design appear to be recorded in City Design (June 1999) - page 2693, vol 8.

Interaction between Waterways and City Design h(ix)

67. The nature of the interaction is set out in the Bundle.

Decisions regarding City Design (June 1999) (i)

Engagement (i)


68. The decision to engage City Design appears to have been made by Waterways management.

Briefings (j) and (k)

69. The Bundle indicates that the following briefings appear to have been given:



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- (a) CEO briefing on 18 January 1999 - page 2548, vol 8; and
- (b) briefing to Councillor Tim Quinn and [REDACTED] on 5 May 1999 - page 2677, vol 8. There is a note that [REDACTED] would talk to the Lord Mayor. For the assistance of the Commission, I refer to the statement Mr Ball gave to the CMC on this topic (referred to in paragraph 25(j) above) and in particular to paragraphs 10 to 15 of that statement.

Q100 and planning controls (l)

70. My review of the Bundle indicates that no decisions were made regarding Q100 and planning controls as a result of the City Design (June 1999) as further investigations were required to be undertaken as recorded in City Design's "*Proposal for Further Investigations for the Brisbane River Flood Study September 1999*" - page 2814, vol 8.

Review and further investigations (m) and (n)

71. Further investigations appear to have been undertaken leading to a further report of City Design dated December 1999.

d) *Further Investigations for the Brisbane River Flood Study, Brisbane City Council, City Design, December 1999 (City Design (December 1999))*

Choice of external consultants h(i)

72. It appears that on 13 July 1999 Barry Ball and Gavin Blakey had a discussion regarding further action to be taken following City Design (June 1999). This is recorded in a memorandum of that discussion - page 2741, vol 8 - as well as the Brisbane River Flood Study Action Plan dated 27 July 1999 - page 2743, vol 8.
73. On 15 September 1999 it appears that City Design submitted to Waterways a *Proposal for Further Investigations for the Brisbane River Flood Study September 1999*" - page 2814, vol 8 - together with a fee estimate to conduct the work set out in the Proposal.

Provision of Data, Studies and other material h(ii), h(iii) and (vii)

74. From my review of the Bundle there is no suggestion that City Design did not have access to all the information available for the preparation of SKM (1998) and City Design (June 1999) and other River and historical flood information on Council's files.

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Scope of work h(iv)

75. The scope of work appears to have been developed in a series of interactions between Waterways and City Design as recorded in the Bundle and particularly in the Proposal referred to above - page 2814, vol 8 - and ultimately recorded in City Design (December 1999) - page 2895, vol 9.

Instructions h(v)

76. The instructions appear to have been developed by Council during the preparation of the report culminating in the confirmation of the instructions in City Design (December 1999) - page 2895, vol 9.

Timeframe h(vi)

77. I cannot identify how the timeframe for the work was determined, though I can see no suggestion that any time limit was imposed.

Assumptions h(viii)

78. From my review of the Bundle, the assumptions made by City Design appear to be recorded in City Design (December 1999) - page 2895, vol 9.

Interaction between Waterways and City Design h(ix)

79. To the extent interaction between Waterways and City Design was documented, my understanding is that it appears in the Bundle.

Decisions regarding City Design (December 1999) (i)

Engagement (i)

80. As set above, I am unable to supplement the documents included in the Bundle in relation to all of the decisions made regarding City Design (December 1999).
81. It appears from the Bundle that the decision to engage City Design was made by Waterways management.

Briefings, Q100 and planning controls, Review and further investigations (j), (k), (l), (m) and (n)

82. From my review of the Bundle, it appears that during the period following the completion of City Design (December 1999), Council progressed issues arising from that report through:

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- (a) implementation of Action Plans - pages 3002, 3008, 3150 of vol 9; pages 3302 and 3400 of vol 10; pages 3489, 3491, 3493, 3497, 3500, 3502, 3504, 3656, 3697 and 3700 of vol 11;
 - (b) requests for information from the Department of Natural Resources and Mines (DNR) (including data collated by the DNR) as well as access to the report being prepared by DNR relevant to rainfall and the attenuation of Wivenhoe Dam;
 - (c) discussions with the DNR, BoM and South East Queensland Water Corporation (SEQWC) regarding various issues relevant to Brisbane River flooding and the method by which the various agencies could share information in that regard.
83. In particular, the discussions referred to above appear to have included a Technical Workshop between all relevant agencies.
84. The workshop seems to have been first mentioned in April 2000 - page 3022, vol 9.
85. I understand that the workshop was arranged by Waterways, was called "Brisbane River Flood Study Technical Workshop", and was held on 6 October 2000 (Workshop).
86. The Background Paper to the Workshop dated 6 October 2000 - page 3058, vol 9 - sets out:
- (a) the purpose of the Workshop, being to bring together technical experts to assess the major components of the BRFS to ensure that the final flood study report was technically rigorous and adopted an approach and methodology that was consistent with the current practices using the latest available information;
 - (b) the work undertaken to date, including SKM 1998, the Floodplain Management Options Workshop in 1998, the hydrological review conducted by Professor Mein in December 1998 and the City Design reports of June and December 1999;
 - (c) the main outcome expected from the Workshop was confirmation that the technical analysis was the best possible judgment of the flooding characteristics of the Brisbane River or agreement by participants of amendment to the analysis. The outcomes may be to recommend acceptance of the study in its present form or that some additional analysis be undertaken. The analysis Waterways was seeking was a robust technical analysis which could be used as the foundation for updating floodplain management along the Brisbane River Corridor


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87. The attendees at the Workshop (see page 3127, vol 9) appear to have been:

- (a) Council:
 - (i) Barry Ball - Waterways;
 - (ii) Gavin Blakey - Waterways;
 - (iii) [REDACTED] - Waterways;
 - (iv) [REDACTED] - City Design;
 - (v) Ken Morris - City Design;
- (b) BoM - Peter Baddiley;
- (c) DNR - John Ruffini;
- (d) SEQWC [REDACTED];
- (e) IEAust National Committee on Water Engineering [REDACTED];
- (f) Ipswich City Council [REDACTED];
- (g) CRC for Catchment Hydrology - Professor Russell Mein

88. The documents from the Bundle relevant to the outcomes of the Workshop appear to include:

- (a) an Action Plan dated 6 October 2000 - page 3138, vol 9. In that plan:
 - (i) item 7 is: the *"Forge Study being undertaken by DNR for SEQWC"*. The *"Action"* for that item is: *"SEQWC is to advise BCC on the results of the continuous simulation study being undertaken for them by DNR for SEQWC. 1893 event to be included in the study"*;
 - (ii) the *"Notes taken during the discussion"* include comments from [REDACTED] John Ruffini as follows:
 - *1992 study - really a PMF study. Q100 not accurately determined - further work would have been required. DNR is currently undertaking a study on behalf SEQWC using the*

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forge method. Preliminary results are being assessed by SEQWC.

- *Study focussed on Wivenhoe Dam*
- *Q100 closer to 1984 BCC study than 1992 DNR study*
- *Draft is being reviewed by SEQWC*
- *SEQWC 2000 study to be finalised by December 2000*
- *consistent with Professor Mein's comments and current approach by CRC for Catchment Hydrology*
- *2/99 Flood Q80-90 in upper catchment*

(b) a handwritten note of the Workshop also appears in the Bundle - page 3144, vol 9.

89. Once again I refer to Mr Ball's statement at paragraph 25(j) above, particularly at paragraph 20 which appears to deal with aspects of the Workshop.

90. It appears that the provision of the DNR information took significantly longer than anticipated at the Workshop. It seems from my review of the Bundle that, following the Workshop, Council made numerous approaches to DNR and SEQWC for a copy of the report referred to above. For example:

- (a) 08/11/00 - page 3203, vol 10;
- (b) 14/11/00 - page 3204, vol 10;
- (c) 21/12/00 - page 3253, vol 10;
- (d) 23/01/01 - page 3329, vol 10;
- (e) 09/02/01 - page 3335, vol 10;
- (f) 16/03/01 - pages 3360 and 3361, vol 10;
- (g) 21/05/01- page 3368, vol 10;
- (h) 07/08/01 - pages 3391 and 3398, vol 10;
- (i) 25/06/01 - page 3403, vol 10;

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- (j) 24/07/01 - page 3403, vol 10;
- (k) 07/09/01 - page 3403, vol 10;
- (l) 10/09/01 - page 3403, vol 10;
- (m) 19/09/01 - page 3405, vol 10;
- (n) 19/10/01 - page 3408, vol 10; page 3157, vol 9;
- (o) 26/10/01 - page 3157, vol 9;
- (p) 02/11/01 - pages 3410 and 3411, vol 10;
- (q) 18/01/02 - page 3421, vol 10;
- (r) 12/02/02 - pages 3423 and 3428, vol 10;
- (s) 06/06/02 - page 3423, vol 10;
- (t) 04/12/02 - page 3423, vol 10;
- (u) 18/02/02 - page 3467, vol 10;
- (v) 19/12/02 - page 3468, vol 10;
- (w) 24/12/02 - page 3469, vol 10;
- (x) 17/03/03 - page 3487, vol 11;
- (y) 19/06/03 - pages 3552 and 3554, vol 11;
- (z) 24/06/03 - page 3563, vol 11;
- (aa) 27/06/03 - page 3606, vol 11;
- (bb) 27/06/03 - page 3632, vol 11;
- (cc) 27/06/03 - page 3654, vol 11;
- (dd) 30/06/03 - page 3654, vol 11;
- (ee) 01/07/03 - page 3693, vol 11;

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- (ff) 01/07/03 - pages 3694, 3695 and 3699, vol 11;
- (gg) 03/7/03 - page 3722, vol 11;
- (hh) 16/07/03- page 3889, vol 12;
- (ii) 29/07/03 - page 4030, vol 12;
- (jj) 03/11/03 - page 4755, vol 14.

91. In relation to briefings given to Councillors, the Chief Executive Officer, the E&C Committee and the Lord Mayor, the documents in the Bundle speak for themselves. However, by way of example (in addition to those documents referred to in 69 above) there were a series of briefings to the Lord Mayor and others in June and July 2003.

e) *Review of Brisbane River Flood Study Report to Brisbane City Council, Independent Expert Review Panel, 3 September 2003 (Panel (2003))*

Choice of external consultants h(i)

92. The documents that appear to be relevant to the engagement of the Independent Expert Review Panel appear in the Bundle. I have set out below some of the key documents relating to this topic:

- (a) 1 July 2003 - Action Plan and notes prepared arising out of the receipt of information from DNR which included planning for the creation of an "expert panel" - page 3700, vol 11;
- (b) 3 July 2003 - updated Action Plan - page 3712, vol 11;
- (c) 8 July 2003 - Brisbane River Flood Study Notes from Meeting 1 - page 3759, vol 11- and draft Terms of Reference - page 3769, vol 12;
- (d) 9 July 2003 - Memo of G Blakey - page 3953, vol 12;
- (e) 11 July 2003 - Project Progress Report - Brisbane River Flood Study - page 3840, vol 12;
- (f) 14 July 2003 - Brisbane River Flood Study Notes from Meeting 2 - page 3857, vol 12;
- (g) 18 July 2003 - Project progress Report - page 3899, vol 12;

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- (h) 25 July 2003 - Project Progress Report - page 3965, vol 12;
- (i) 31 July 2003 - Letter from Council to Uniquist engaging Colin Apelt as a member of the Expert Panel - page 4080, vol 12;
- (j) 31 July 2003 - Letter from Council to Monash University engaging [REDACTED] as a member of the Expert Panel - page 4141, vol 13;
- (k) 31 July 2003 - Letter from Council to RG Mein and Associates Pty Ltd engaging Russell Mein as a member of the Expert Panel - page 4146, vol 13;
- (l) 31 July 2003 - Letter from Council to Water Solutions engaging John McIntosh as a member of the Expert Panel - page 4149, vol 13.

Provision of Data, Studies and other material h(ii), (iii) and (vii)

93. The data, studies and other material that appears to have been provided to the Panel:

- (a) is referred to in the document titled "Background Information No 1 for Brisbane River flood Study Independent Expert Review Panel Meeting 31 July 2003" - page 4077, vol 12;
- (b) was supplemented during the course of the Study from time to time as a result of interaction between Council, the Panel, SKM (including draft reports), SEQwater (formerly SEQWC) and DNR; and
- (c) is referenced in the Panel (2003).

Scope of work h(iv)

94. The scope of work appears to have been developed by Council during the preparation and finalisation of the Terms of Reference, and refined during subsequent discussions with the Panel. This culminated in the Terms of Reference (the final version of which appears to have been attached to each of the letters of engagement) as set out in the Panel (2003) - page 4448, vol 13. Examples of the nature of interaction between Council and the Panel are as follows:

- (a) 31 July 2003 - Expert Review Panel Notes from Meeting 1 - page 4059, vol 12; page 4123, vol 13;
- (b) 31 July 2003 - Brisbane River Flood Study Assessment and Actions from Expert Review Panel Meeting 31 July 2003 - page 4066, vol 12; [REDACTED]

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- (c) 31 July 2003 - Presentation by K Morris to Expert Review Panel - page 4071, vol 12.

Instructions h(v)

95. The instructions appear to have been developed by Council and included in the Terms of Reference mentioned above. Instructions were also included in a document titled "Background Information No 1 for Brisbane River flood Study Independent Expert Review Panel Meeting 31 July 2003" - page 4077, vol 12. I understand that Mr Blakey's statement deals in some detail with aspects of the drafting of the Terms of Reference.

Timeframe h(vi)

96. I cannot identify how the timeframe for the work was determined.

Assumptions h(viii)

97. The assumptions made by the Panel appear to have been recorded in the Panel (2003). Based on my review of the Bundle, it appears that the assumptions were developed as part of an interactive process over a period of time during interaction between Council and the Panel.

Interaction between Council and the Panel h(ix)

98. The records relevant to this report as included in the Bundle indicate a high level of interaction between Council officers, the Panel, SKM, DNR and SEQwater including discussions, correspondence, technical meetings and review of draft reports.

Decisions regarding the Panel (2003) (i)

Engagement (i)

99. I refer to the documents set out in paragraph 92 above.
100. Given the subject matter, I assume that the engagement of the Independent Panel would have been discussed by Waterways management with the Chief Executive Officer of Council and the Lord Mayor's Office.

Briefings and Q100 and planning controls (j), (k) and (l)

101. I have reviewed the documents in the Bundle relevant to this topic which speak for themselves. However, I set out below some examples of the briefings which appear to have been provided:

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- (a) 1 September 2003 - Note to file - page 4396, vol 13;
- (b) 3 September 2003 - Agenda E&C Strategy Presentation - page 4400, vol 13;
- (c) 5 September 2003 - Memo from B Ball to the Lord Mayor and the CEO of Council re: Brisbane Flood Study - page 4493, vol 13;
- (d) 8 September 2003 - CEO Briefing Paper - page 4513, vol 13;
- (e) 8 September 2003 - E&C Strategy Results - page 4515, vol 13;
- (f) 8 September 2003 - File note of Councillor Briefing - page 4522, vol 13;
- (g) 22 September 2003 - "Notes on E&C 22 September 2003" - page 4556, vol 13;
- (h) 25 September 2003 - Note to File - page 4574, vol 13;
- (i) 13 October 2003 - E&C Strategy Presentation - page 4577, vol 14;
- (j) 13 October 2003 - CEO Briefing Paper - page 4670, vol 14;
- (k) 27 October 2003 - File note - page 4700, vol 14;
- (l) 27 October 2003 - E&C Strategy Presentation - pages 4704 and 4715, vol 14;
- (m) 31 October 2003 - Email from Gavin Blakey to B Ball and [REDACTED] - page 4740, vol 14;
- (n) 24 November 2003 - Submission to the E&C Committee - page 4812, vol 14;
- (o) 2 December 2003 - Decision of Council regarding setting of flood development levels and adoption of new flood measurement standards.

Review and further investigations (m) and (n)

102. I understand that this topic will be covered by the matters addressed by Mr Blakey in a separate statement.

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Choice of external consultants h(i)

103. My understanding is that the documents relevant to the engagement of SKM appear in the Bundle. I have set out below some of the key documents which appear to relate to this topic:
- (a) 1 July 2003 - Following a meeting between Council and SKM the previous day, a letter from SKM to Council set out the proposal to undertake further investigations to be conducted in relation to the BRFS - page 3702, vol 11;
 - (b) 8 July 2003 - Letter from SKM to Council setting out the draft scope of work - page 3792, vol 11;
 - (c) 11 July 2003 - Fax from SKM to Council including minutes of a meeting and assumptions - page 3842, vol 12.

Provision of Data, Studies and other material h(ii), (iii) and (vii)

104. It appears that the data, studies and other material provided to SKM is recorded in SKM (December 2003) - page 4918, vol 14. This information appears to have been provided during the course of the preparation of the Report from time to time as a result of interaction between Council, SKM, the Panel, SEQwater and DNR.

Scope of work h(iv)

105. From my review of the Bundle, I understand that the scope of work was developed by Council with SKM and the Panel during the work undertaken by SKM and is set out in the documents appearing at paragraphs 103(a) to 103(c) above as well as in SKM (December 2003).

Instructions h(v)

106. The instructions appear to have been developed by Council and refined during subsequent discussions with SKM and the Panel culminating in the confirmation of the instructions in SKM (December 2003). Examples of the nature of interaction between Council and SKM are as follows:

- (a) Brisbane River Flood Study Meeting Notes from Meeting 1 dated 8 July - page 3843, vol 12;

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- (b) Brisbane River Flood Study Meeting Notes from Meeting 2 dated 14 July 2003 - page 3862, vol 12;
- (c) Brisbane River Flood Study Meeting Notes from Meeting 3 dated 6 August 2003 - page 4164, vol 13.

Timeframe h(v)

107. I cannot identify how the timeframe for the work was determined, but note the following matters:
- (a) SKM had done a substantial amount of hydrologic and hydraulic modelling and other work in the course of preparing SKM (1998). I think it is reasonable to infer that much of that work was useful in preparing the further SKM report;
 - (b) DNR provided the additional information on rainfall input and dam operations which had been delivered on 27 June 2003;
 - (c) it is reasonable to infer, given the focus on this issue, that Council would want the work to be done as quickly as possible.

Assumptions h(viii)

108. It appears the assumptions made by SKM are recorded in SKM (December 2003). The assumptions appear to have been developed as part of an interactive process over a period of time during correspondence and discussions between SKM and Council during the course of preparation of the report.

109. In particular, I refer to the document mentioned in paragraph 103(c) above.

Interaction between Council and SKM h(ix)

110. The records relevant to this report as included in the Bundle indicate a high level of interaction between Council officers and SKM including discussions, correspondence, technical meetings and review of draft reports.

Decisions regarding SKM (December 2003) (i)

Engagement (i)

111. I refer to paragraphs 103(a) to 103(c) above.



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Briefings/Q100 and planning controls/Review and further investigations (j), (k), (l), (m) and (n)

112. The Independent Expert Panel (as part of the Panel (2003)) reviewed the draft SKM Reports of August 2003.
113. The key findings of the August 2003 draft SKM Reports appear to have been reflected in SKM (2003).
114. As referred to in paragraph 101(o) above, Council resolved on 2 December 2003 to adopt the findings of Panel (2003).
115. SKM (2003) (final) was not received by Council until 18 December 2003.
116. My review of the file suggests there were no decisions made in relation to the topics of "Briefings", the "Q100 and planning control" measures and the "Review and further investigations" as decisions had been made in reliance on the Panel (2003) which was ultimately adopted by Council on 2 December 2003.

g) Flood Modelling Services, Recalibration of the Mike 11 Hydraulic Model and Determination of the 1 in 100 AEP Flood levels, Final Report, Sinclair Knight Merz, 5 February 2004 (SKM (2004))

Choice of external consultants h(i)

117. I understand that the documents relevant to the engagement of the SKM appear in the Bundle. I have set out below some of the key documents relating to this topic:
- (a) 20 November 2003 - Letter from SKM to Council setting out a proposal for the recalibration of the MIKE11 Hydraulic model and the determination of the 1 in 100 AEP Flood Levels - page 4785, vol 14;
- (b) 11 December 2003 - memorandum seeking approval to engage SKM - page 4904, vol 14;
- (c) 11 December 2003 - letter from Council engaging SKM - page 4899, vol 14;
- (d) 15 December 2003 - email from G Blakey to K Morris including approval to engage SKM - page 4905, vol 14.

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Provision of Data, Studies and other material h(ii), (iii) and (vii)

118. From my review of the relevant documents in the Bundle, the data, studies and other material provided to SKM appear to be referenced in the SKM (2004) page 5125, vol 15.

Scope of work h(iv)

119. It appears the scope of work was developed by Council with SKM and set out in the letter referred to in paragraph 117(a) and SKM (2004) .

Instructions h(v)

120. The instructions appear to have been developed by Council with SKM and referred to in SKM (2004).

Timeframe h(vi)

121. I cannot identify how the timeframe for the work was determined, though I can see no suggestion that any time limit was imposed.

Assumptions h(viii)

122. It appears the assumptions made by SKM are recorded in SKM (2004).

Interaction between Council and the Panel h(ix)

123. I understand that the records relevant to this report as included in the Bundle indicate a number of the interaction between Council and SKM including discussions, correspondence and review of draft reports.

Decisions regarding SKM (2004) (i)

Engagement (i)

124. I refer to the documents set out in paragraph 117 above.

Briefings/Q100 and planning controls/Review and further investigations (j), (k), (l), (m) and (n)

125. The results of SKM (2004) relevantly provided a profile based on the recalibrated MIKE11 model for the Q100 flow of 6,000 cumecs which was the best estimate of the Panel. I understand that Mr Blakey explains, in his statement, that a decision was made to retain the

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existing DFL Profile and the reasons for that decision.

COUNCIL'S FLOOD RELATED MEASURES - 2004 ONWARDS

Background

126. During the course of the conduct of the Commission, Council has delivered large amounts of material concerning the various measures undertaken by Council relating to flood.

127. I understand that material relevantly includes:

- (i) Council's Initial Submission dated 11 March 2011;
- (ii) Council's Second Submission dated 8 April 2011;
- (iii) Statement of Colin Jensen dated 25 March 2011;
- (iv) Third Statement of Colin Jensen dated 19 April 2011;
- (v) Statement of Joseph Bannan dated 8 September 2011;
- (vi) Statement of Martin Reason dated 1 September 2011;
- (vii) Second Statement of Martin Reason dated 9 September 2011.

128. From that material, Council's records and my own knowledge, I have:

- (a) summarised below the key flood measures undertaken by Council from 2004 to date;
- (b) arranged to have prepared a chronological index of documents relevant to the key flood measures since 2004. The index identifies those documents which are in evidence before the Commission and where they appear. Copies of documents not currently in evidence before the Commission are attached to the index. The index and attached documents is Attachment "JAM-08" to this Statement.

129. In addition, Attachment "JAM-09" is a draft document titled "Brisbane City Council Floodplain Risk Management" which provides a general overview of Council's approach to flood plain risk management and categorises measures which are relevant to this issue both

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before the 2011 Flood Event and after the 2011 Flood Event. This document is a summary document prepared within Council earlier this year.

Context

130. Council's current approach to obtaining and assessing flood studies involves a number of Council officers across a number of stakeholder groups within Council including City Projects Office, Water Resources, Disaster Response and Recovery, and City Planning. The flood studies inform Council's decisions not only in relation to planning control lines but also in relation to land development, infrastructure, communication and disaster management as necessary.
131. Council's flood studies are not limited to river flooding but include creek and suburban flooding. Prior to Council's decision on 2 December 2003 (Attachment "JAM-10") to, among other things:
- (a) adopt the expert panel's best estimate of the new Q100 flow at the Brisbane Port Office gauge to be 6,000 cumecs;
 - (b) determine that the current adopted flood immunity level of 3.7m AHD at the Brisbane Port Office gauge is still the most appropriate level; and
 - (c) determine as a consequence of (a) and (b) that there is no need to change current development levels for properties adjacent to the Brisbane River;
 - (d) determine that the current "Defined Flood Level" (DFL) be set at 3.7m AHD at the Brisbane Port Office gauge,

there had been a great deal of work undertaken by Council in investigating the flows and levels of the Brisbane River. A number of studies were completed between 1996 to 2004 by both Council and external consultants engaged by Council, and that work was the subject of a peer review by an authoritative panel of Australian experts in 2003.

132. Upon completion of this body of work, Council turned its attention in particular to flooding of creeks and overland flow. Council's records indicate that on 12 November 2004, a presentation was made to Council's Policy Review Committee by Mr Blakey of Water Resources on localised flooding (ie. flooding from sources other than the Brisbane River) and the need for a flood risk management strategy. Water Resources proposed that in preparing a flood risk management strategy it was necessary for Council to collate all relevant information,

identify missing elements and required enhancements in existing studies, and prioritise actions. A copy of the presentation is Attachment "JAM-11".

Lord Mayor's Taskforce on Suburban Flooding

133. In February 2005, the Lord Mayor and Civic Cabinet established the Lord Mayor's Taskforce on Suburban Flooding (LMTSF). The LMTSF's brief was to consider all flooding issues but in particular to focus on creek and local flooding. There is often minimal or no warning for such flood events as creeks typically rise and fall within two to three hours. By contrast, Brisbane River flooding provides a "window" of up to 48 hours. This means that there is often a greater risk to life and personal safety with a creek or overland flow event in Brisbane compared to a River flood. In addition, creek and overland flood events occur more frequently than major river floods. And, as I have already noted, considerable work had been undertaken by Council on river flows and levels by this time.
134. The LMTSF's objective was to report on the strategies and options available to Council to reduce the effects of significant rain events on areas of Brisbane prone to flooding. The LMTSF met 12 times between 8 February 2005 and 24 August 2005 and developed a strategy to reduce the effects of flooding, identifying 24 major findings, with over 100 sub actions, on which to base Council's flood risk management approach and action plan for Brisbane. A copy of the LMTSF report is Attachment "JAM-12".
135. The LMTSF report was presented for adoption by Council in November 2005, and Council endorsed the implementation of the recommended key actions on 15 November 2005. A copy of Council's decision is "JAM-13". The report identified 24 key actions and sub-actions, with allocated priority levels over four areas: non-structural measures, structural measures, flood preparedness measures and flood emergency measures. Progress reports were provided regularly to the Administration from 2005 onwards. A recently prepared summary progress report (as at 31 October 2011) against these actions is Attachment "JAM-14". Water Resources is responsible for implementing the actions and significant work has been undertaken in this regard pursuant to the planned roll-out of actions extending from 2005 to 2016. Some of these actions are referred to elsewhere in this statement.
136. The implementation of the roll-out of the LMTSF report was initially monitored by way of a monthly report provided by Water Resources to the Lord Mayor and from 2008 to my Chairman, Councillor Peter Matic. In late 2010, Water Resources initiated an extensive review of Council's progress in meeting each of the recommended actions. SKM was subsequently engaged to assist Council to report on the status of Council's implementation of

the LMTSF's recommended actions. Attachment "JAM-15" are copies of Council's internal briefing note dated 14 December 2010 and the minutes referred to in that briefing note.

137. Council confirmed through the status update that 76% of the actions have been delivered (or that delivery is in progress), that 9% of the actions were under investigation, and that 15% of the actions had been closed (for instance, because the recommended actions are the responsibility of the Queensland Government or the actions have otherwise been addressed by Council). Attachment "JAM-16" is a copy of Council's status update as at 23 September 2011.
138. Council's status update report was endorsed by the LMTSF PCG on 23 September 2011. Attachment "JAM-17" is a copy of the Agenda and Minutes of Meeting of the LMTSF PCG of 23 September 2011.
139. Council has invested heavily in flood-related planning, mitigation, awareness and response initiatives both structural and non-structural measures. This investment is demonstrated by the **total flood management expenditure** across these initiatives in Council's Annual Budget as summarised below:
- (a) 2004/2005 – Flood Mitigation Activities (includes stormwater network), Flood Information and Systems and Disaster Management – \$79,785,000;
 - (b) 2005/2006 – Flood Mitigation Activities (includes stormwater network), Flood Information and Systems and Disaster Management – \$94,634,000;
 - (c) 2006/2007 – Flood Mitigation Activities (includes stormwater network), Flood Information and Systems and Disaster Management – \$99,194,000;
 - (d) 2007/2008 – Flood Mitigation Activities (includes stormwater network), Flood Information and Systems and Disaster Management – \$98,200,000;
 - (e) 2008/2009 – Flood Mitigation Activities (includes stormwater network), Flood Information and Systems and Disaster Management – \$105,672,000;
 - (f) 2009/2010 – Flood Mitigation Activities (includes stormwater network), Flood Information and Systems and Disaster Management – \$123,394,000;
 - (g) 2010/2011 – Flood Mitigation Activities (includes stormwater network), Flood Information and Systems and Disaster Management – \$137,414,000;


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- (h) 2011/2012 - Flood Mitigation Activities (includes stormwater network), Flood Information and Systems and Disaster Management - \$139,006,000 (proposed);
- (i) TOTAL – \$873,313,000.

- 140. The breakdown of these figures is provided in Attachment "JAM-18".
- 141. It is relevant to note that during the 2004 - 2010 period, Council was heavily focused on water management in the context of severe drought conditions. Dam levels fell to precariously low with levels of less than 20% of FSL. In this context water supply was a primary focus (and cost) for Council during this time. Nevertheless, Water Resources continued to fund and implement the actions recommended by the LMTSF during this period.
- 142. In summary, in addition to obtaining and assessing flood studies, Council's more recent focus has been on early warnings, provision of information (Floodwise Property Reports and Flood Flag Mapping), and raising community awareness about flash flooding and local summer storms.
- 143. In response to recent storm events (The Gap in 2008 and Breakfast-Enoggera Creek catchment in May 2009) Council developed a Disaster Management Concept of Operations as set out in paragraph 168(c) and undertook an investigation into the impacts of major infrastructure at Breakfast Creek. This investigation resulted in Council recalibrating and confirming Q100 flood levels for Breakfast-Enoggera Creek. Attachment "JAM-19" are copies of a report by Council on investigations of the flooding of major infrastructure (Clem 7) at Breakfast Creek in May 2009, and a presentation given to Council's CEO on the issues associated with this flood event.
- 144. Council continues to upgrade and maintain its stormwater network (both open and enclosed) and to maintain and rehabilitate its waterways.
- 145. As at 2005, Council had a number of waterway management plans and catchment management plans in place that typically focused on development and fill within a waterway corridor and/or water quality measures. In addition, Council had developed a number of Local Stormwater Management Plans (LSMPs) and creek flood studies that were used to inform decisions on drainage infrastructure and creek flood mapping respectively. Details of the plans and studies are provided in paragraph 153 below, and a spreadsheet of the plans and studies is attached at JAM-20.


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146. Council uses the plans and studies referred to in paragraph 145 to inform structural and non-structural flood mitigation measures.
147. Council was intent on ensuring that future work included the documentation of overland flows. Automated overland flow mapping has now been carried out for all areas of Brisbane with a contributing catchment of greater than four hectares.
148. Council launched its Flood Flag Maps in 2009. These maps depict areas that may be likely to flood from river, creek or storm tide flooding or which may be affected by overland flow path flooding. The information for each affected suburb is contained on an easy to read colour-coded map. These are available on-line or from Council's Contact Centres together with a "Flood Flag Map User Guide". Council's aim is to arm residents with knowledge of their exposure to all types of flooding.
149. A key action recommended by the LMTSF was the provision for the voluntary buy-back of properties subject to a low flood immunity, that is, a 2 year ARI which is a 50% chance of flooding in any one year. To date, the owners of more than 242 such properties have been approached and 55 properties have been purchased for an amount totalling \$24.21M.
150. Another key action was to provide early warning and intervention which is paramount for localised flood events. See in this regard paragraphs 152(k) and 164 below.
151. Council has also developed Floodwise Property Reports designed to assist residents and professionals to assess the estimated flood risk of a particular property. The Floodwise Property Reports are consistently updated with the most current information and were most recently updated to reflect the Temporary Local Planning Instrument (TLPI) adopted by Council following the 2011 Flood Event. Council will continue to update all of its flood information products as and when required.
152. Other actions undertaken as part of the LMTSF include:
- (a) City Plan Amendments - Compensatory Earthworks Planning Scheme (effective July 2006);
 - (b) Upgrades to Council's subdivision and development guidelines relating to flood-affected land and stormwater drainage (2008);
 - (c) Asset Maintenance and Management Plans (AMMP), including:


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- (i) Waterway Access AMMP (first endorsed in 2002 with 3 reviews and latest version as at December 2010);
- (ii) Enclosed Pipe AMMP (first endorsed in 2003 with 7 reviews and latest version as at September 2011);
- (iii) Hydrometrics AMMP (currently in draft form - March 2010);
- (d) Major and Minor Drainage Capital Works Programs (see Drainage Design Standards and Prioritising Relief Drainage Schemes Memorandum dated 23 October 1995);
- (e) Building certification (Building Certification Improvements Project complete);
- (f) Flood database – Council’s spatial information system was upgraded to make available to it numerous layers of data that can be used for planning and response;
- (g) Floodwise Information System – Council funded and developed *Floodwise* for the Brisbane local area. The system is web-based and provides ‘real-time’ rainfall and stream water level data and has now been adopted by some of the other South East Queensland local governments. Council has also invested in telemetry and maximum height gauges (MHG);
- (h) Creek and River Flood Data collated and available for planning and response purposes;
- (i) Early Warning Alert System (EWAS) (December 2009) - (see paragraph 164 below);
- (j) Creek Flood Alert System (Pilot) - (2009-10 Piloted in Boondall; 2010-2011 rolled out in Hemmant, East Brisbane and Rocklea and 2011-12 to be rolled out to a further 10 sites);
- (k) A rolling program of installing flashing lights on high priority flood prone roads commenced in the 2009/2010 financial year including at the following locations:

- A. Marshall Road, Rocklea;
- B. Shaw Road, Nundah;
- C. Groth Road, Zillmere;


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- D. Newman Road, Zillmere;
- E. Belsen Road, Geebung;
- F. Muriel Avenue, Moorooka (commencing 2011/2012 due for completion 2013).

(l) Education and awareness program (as referred to in paragraph 163 below).

Audit of Existing Waterway Studies

153. Council has developed a process for the review and audit of its existing waterway studies to ensure Council has access to up to date information. Attachment "JAM-20" is a spreadsheet listing Council's studies and plans and their status. The review and audit work is being undertaken as part of Council's "Maintain and Enhance Flood Models Project" (Flood Models Project). The Flood Models Project is governed by a Project Control Group (LMTSF PCG) comprised of senior Council officers from relevant sections of Council and Councillor Matic. A list of the LMTSF PCG members is Attachment "JAM-21". Council's budget for the Flood Models Project in the 2009-2012 financial years is as follows:

(a)	2009/2010	\$87,000
(b)	2010/2011	\$168,000
(c)	2011/2012	\$400,000
(d)	2012/2013	\$400,000 (proposed)
(e)	2013/2014	\$400,000 (proposed)
(f)	2014/2015	\$400,000 (proposed).

154. As part of the Flood Models Project, Water Resources commissioned City Design in late 2009 to investigate Council's existing hydrology and hydraulic studies to identify those creek studies in greatest need of revision and to develop a process for prioritising maintenance and enhancement works. On 10 March 2010, City Design provided its fee proposal for the Flood Models Project, a copy of which is Attachment "JAM-22". The purpose of the project is recorded as being to document all of Council's flood and drainage models from various sources, comment on their status and identify models which require enhancement and/or maintenance.

155. City Design (now City Projects Office) reported to Water Resources on 18 August 2010, providing a priority ranking for the upgrade and enhancement of Council's creek flood studies

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and identifying five models (Kedron Brook, Taigum Channel, Brighton Drainage, Scrubby Creek, Albany Creek) requiring review based on its prioritisation process. A copy of City Design's report dated 18 August 2010 is Attachment "JAM-23".

156. In November 2010, City Design reported on a proposed Level of Service for future flood modelling, assessed costs of undertaking flood studies and proposed a schedule of works to maintain and enhance Council's flood models. A copy of City Design's report dated 5 November 2010 is Attachment "JAM-24".
157. Attachment "JAM-25" is a schedule showing the hydraulic model upgrades on creek catchments for the next four financial years and a graph showing the number of properties that will be covered by the proposed hydraulic model upgrades. The graph indicates that on completion of this work, Council will have the most up to date information for around 80% of flood-prone properties. Planning control lines may or may not change as a consequence of this work, but the work will ensure that Council can be confident of the accuracy of its information and data.
158. The LMTSF PCG has approved the prioritisation process proposed by City Design and a four year rolling program for the updating of creek flood models.
159. In terms of Council's future work in obtaining flood studies, a preliminary draft Flood Risk Management Plan for Cabbage Tree Creek is underway. This is a pilot project which has been undertaken by Council over the last two years. The project will inform a larger project currently under development by Water Resources called the Catchment Flood Management Plan project. By this project, Water Resources proposes to investigate the potential for utilising floodplain management practices in the management of flood risk by developing catchment plans for nominated creeks. Council is yet to finalise the implementation of the creek catchment plans, and this work is still in a preliminary stage. Attachment "JAM-26" is copies of the Executive Summary of the draft Cabbage Tree Creek Pilot Study (the full document is very large) and the draft Consultancy Brief titled "Catchment Flood Management Plans".
160. Finally, in order to implement recommendations made by the Joint Flood Taskforce, including the recommendation that a comprehensive flood study be commissioned to review flood flows and levels within the Brisbane River catchment making full use of the data relating to the 2011 Flood Event, Council resolved on 2 August 2011 to ask the State Government to lead the



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implementation of those recommendations. Attachment "JAM-27" is a copy of Council's decision.

161. Currently Council is one of the stakeholders in the Wivenhoe and Somerset Dam Optimisation Study (WSDOS) which is being commissioned by the Queensland Government, local authorities, water suppliers and others. The WSDOS is to include a comprehensive flood study to review flood flows and levels within the Brisbane River catchment similar to the recommendations made in the JTF report. As noted by the LMTSF, whilst Council is the primary public agency responsible for the delivery of local flood management services to Brisbane, a number of State and Federal agencies have roles to play in relation to the management of flooding risk. Council's aim is to work collaboratively with the Queensland Government and other relevant agencies to ensure a coordinated and effective approach to obtaining a comprehensive flood study.
162. The Joint Flood Taskforce identified in its report of 8 March 2011, the need for a new flood risk management study for Brisbane. Flood risk management is a critical activity for local governments, and it is an activity which Council has been progressing since the LMTSF. Following the 2011 Flood Event, Council has been considering how best to develop the provision of flood information and flood mapping and to identify any gaps in current flood information and services. Council is not presently intending to undertake hydraulic modelling of the Brisbane River as this work is being led by the Queensland Government as outlined in paragraph 161 above. It is anticipated that WSDOS will inform Council (and other Queensland local governments) in developing an holistic and comprehensive flood risk management strategy.

Community Education and Awareness

163. Since 2004, Council has invested heavily in community awareness campaigns, including:
- (a) *Be Floodwise* campaign – Launched in September 2006 at the height of a prolonged period of drought;
 - (b) Eight FloodWise factsheets and booklets have been produced which are available free and online;
 - (c) Summer Storm Campaigns - commenced in 2006;

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- (d) Flood Flag Maps (launched in October 2009) - free of charge and on-line maps, that show the water path in each suburb for creek, tidal and river flood events. These maps show all known sources of flooding in Brisbane, including creek, river, storm tide and overland flow flooding. In 2009, a series of information sessions were held in libraries for residents in relation to Flood Flag Maps. Approximately 298,374 Flood Flag Maps have been downloaded since October 2009;
- (e) Floodwise Property Reports available on-line and free-of-charge that demonstrate the level of flooding anticipated at individual properties. Approximately 728,263 reports have been downloaded since July 2009. The FloodWise Property Report has been updated since the January 2011 Flood Event. Depending on the flood risks associated with a property, the report may include the following:
- (i) January 2011 River flood levels;
 - (ii) estimated flood levels for the 20%, 5%, 2% and 1% AEP events;
 - (iii) source of flooding including river, creek, defined overland flow or storm tide;
 - (iv) minimum and maximum ground levels;
 - (v) minimum habitable floor level for building and development; and
 - (vi) whether a property is located within a waterway corridor or is a large allotment, that is, over 1000 square metres.
- (f) Five *Living In Brisbane* Editions containing flood-related information;
- (g) In 2009, the Lord Mayor wrote 435,707 letters reminding residents to be prepared for flooding. He also wrote 68,448 letters reminding residents in at risk locations to be prepared for the summer storm season and informing them of flooding from overland flow (information now available on Flood Flag Maps);
- (h) Lord Mayor Media Releases – The Lord Mayor has issued 18 media releases since 2004 warning of flooding and urging residents to prepare for a flooding event. In October 2010, the Lord Mayor foreshadowed a repeat of the 1974 floods and urged residents in December 2010 to obtain flood insurance if needed;

- (i) the media has published numerous articles since 2004 where the Lord Mayor has warned of flooding and highlighted flood mitigation measures.

Early Warning Systems

164. EWAS provides early notifications for residents, who have registered for this service, potentially impacted by:
- (a) creek flooding; and/or
 - (b) severe storm events.
165. Information is provided via SMS, email and/or phone message to landline. This system is registration-based and free to residents of Brisbane. To date approximately 53,854 residents have registered.
166. Council uses information derived from its FloodWise software system to provide data for the Early Warning Alert Service relevant to creek flooding.
167. The FloodWise software system is a graphical display of real-time on-line information derived from data collected by telemetry that monitors creek and river water level and rainfall gauges across Brisbane. FloodWise:
- (a) records water level data at various sites across Brisbane;
 - (b) cross-references this data with road heights and levels at which communities may become flooded or isolated;
 - (c) through the website, indicates the flood status of the roads;
 - (d) as roads are threatened or become closed due to rising flood levels, SMS and email notifications are automatically issued to registered users;
 - (e) is aimed at providing threat-specific information regarding flash flooding events; and
 - (f) provides information to assist Council response operations during weather-related events.


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168. Council has developed robust Disaster Response Planning measures:

- (a) *Local Disaster Management Group (LDMG)* – Council has a LDMG that coordinated Council's response to the January 2011 disaster. The LDMG is chaired by the Lord Mayor. The LDMG has met regularly since 2004;
- (b) *Disaster Management Plan (DMP)* – Council has a Lord Mayor and District Disaster Coordinator endorsed DMP. This document is regularly reviewed and exercised;
- (c) *Disaster Management Concept of Operations* – A Disaster Management Concept of Operations was developed following the Gap Storm event in 2008. This concept created four increasing levels of response (Level 1 to Level 4) that enhanced Council's ability and capacity to respond to and recover from a significant disaster. Council believes that this concept is unique to Brisbane;
- (d) *Local Disaster Coordination Centre (LDCC)* – The LDCC has a primary location in Brisbane Square and a secondary location at Carindale. Standard Operating Procedures and a Crisis Communications Manual have been developed. In total, approximately 36 Council officers are committed per shift. Liaison officers are assigned to deal with external agencies. During the January flood event, the LDCC operated 24 hours per day but with reduced staffing between 10:00 pm - 6:00 am. At a Level 4 response (as during the recent flood event), the LDCC is significantly expanded with the establishment of a:
 - (i) *Field Operations Group (FOG)* – to manage and coordinate Council assigned and volunteered assets and resources.
 - (ii) *Disaster Intelligence Group (DIG)* – to gather, interpret and distribute information and intelligence.
 - (iii) *Incident Support Group (ISG)* – to manage administration, logistics, the call centre scripting and crisis communications.
 - (iv) *Forward Planning Group (FPG)* – to develop response and recovery plans approximately 72 hours in advance.

- (e) *Flood Information Centre (FIC)* that is activated during a flooding event.
- (f) *Disaster Management Group (DMG)* to support Council's ability to quickly respond, Council also has a full time Disaster Management Duty Officer (**DMDO**) and FIC Duty Officer. The DMG is staffed and maintained to enable out of hours response coverage;
- (g) Council officers have attended a diverse and significant amount of disaster and emergency management training both internally and externally. Courses include the Australasian Inter-Service Incident Management System (**AIIMS**), emergency planning, coordinate resources within a multi-agency response and introduction to the Queensland disaster management arrangements;
- (h) Council has conducted numerous disaster management exercises.

Specific Risk Management Documents

169. Council has a suite of Risk Management studies and plans relevant to flood risk, including those set out below:

- (a) Brisbane City Natural Disaster Risk Management Study:
 - (i) Fire Hazard Phase - March 2004;
 - (ii) Earthquake Phase - April 2004;
 - (iii) Landslip Phase - June 2004;
 - (iv) River Flood Phase - July 2005;
 - (v) Other Water Based Hazards Phase (Severe Storm, East Coast Low and Storm Tide) - September 2005.
- (b) Brisbane City Natural Disaster Risk Management Study Finalisation Package;
- (c) Threat Specific Sub-Plan for River Flood (draft) - May 2008; and
- (d) Threat Specific Sub-Plan for Storm Surge (draft) - May 2008.

170. Copies of the documents referred to in paragraphs 169(a)(iv), 169(a)(v), 169(b), 169(c) and 169(d) above are Attachment "JAM-28".

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171. I am informed that the draft Sub-Plans referred to in paragraphs 169(c) & 169(d) were incorporated into the Inundation Plan which in turn is Part 2.4 of Council's Disaster Management Plan.

Documents relating to Flood Emergency Measures & Risks

172. Council has also developed a suite of documents relating to flood emergency measures as follows:

- (a) River Flood and storm surge inundation maps;
- (b) a Dam Communications Protocol;
- (c) a Crisis Communications procedures;
- (d) a Evacuation and Human Services Plan;
- (e) Corporate Risk Management Policy;
- (f) Business continuity plans;
- (g) Council Corporate Risk Register.
- (h) Forest Lake Dam Emergency Action Plan.

Flood Models, Mapping and associated Brisbane River Flood Forecast System

173. By request, flood models are available to industry professionals. Under the current arrangements, all requests are directed to City Projects Office, Flood Management Team. The models generally provide broad scale flood information rather than information on specific properties, and are generally used and modified by experienced flood modelling professionals for specific projects


174. During a flood event, Council makes use of its "Bender" model to determine local flood height information. Mr Ken Morris, Director of Council's Flood Information Centre describes the model, its inputs and outputs in his second statement dated 3 May 2011 (at paragraph 3).

175. Council made use of the Bender modelling approach in the 2011 Flood Event to communicate with residents as follows:



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- (a) Council made property-specific information available to residents on each occasion that the Bender model and associated Brisbane River Flood Forecast System was revised by reference to revised BoM predicted River levels. It made that information available through Council's Contact Centre, usually within 20 minutes or so of receiving revised levels from BoM. A person calling the Contact Centre and specifying their address was told the predicted depth on the highest and lowest points of their property and when the peak level was forecast to occur;
- (b) Council used Bender to produce lists of streets and suburbs likely to be inundated. These lists were updated and broadcast to the public from time to time. This information was distributed by Council through various channels including social networking services, television, radio and print media, Council's website, Community Service Announcements, doorknocking of residences and premises, posters, letter box drops and pamphlets placed on cars; and
- (c) Council made use of Bender output (and of maps of flood inundation previously prepared) to publicise by reference to a map of the City, likely areas of inundation.

176. Council also prepares in advance "static" inundation maps for specific river flows. One example is the 12,000 cumecs map provided to the public prior to the peak of the flood event.

Creek and River Flood Studies

177. Council has undertaken various Creek Studies as outlined in the spreadsheet appearing as Attachment JAM-20:

- (i) Nundah Creek Study (including Zillman Waterholes Flood Mitigation Operations) - September 2004;
- (ii) Moolabin Creek and Rocky Waterholes Flood Study - February 2006;
- (iii) Toowong Creek Study - February 2006;
- (iv) Oxley Creek Flood Study - June 2008;

178. Council also has various Creek studies in progress:

- (i) Bulimba Creek Flood Study;
- (ii) Taigum Channel Flood Study;

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- (iii) Carseldine Channel Flooding Investigation;
- (iv) Albany Creek Flood Study;
- (v) Perrin Creek Flooding Investigation;
- (vi) Stable Swamp Creek.

179. Council has undertaken various River related flood studies as follows:

- (a) SKM - Recalibration of the MIKE 11 Hydraulic model and determination of the 1 in 100 AEP Flood levels 5 February 2004;
- (b) SKM - Calculation of Floods of Various return Periods on the Brisbane River (Q10, Q20, Q50 and Q2000 Events) 6 July 2004;
- (c) Brisbane Valley Flood Damage Minimisation Study 2007;
- (d) WRM Water - Brisbane River Extreme Flood Estimation Study 2007;
- (e) Brisbane River Hydraulic Model to Probable Maximum Flood (PMF) 24 June 2009 (which included the development of a 2D model).

Stormwater Infrastructure

180. In July 2010, Council commenced a de-silting program of its open and enclosed drains. This program is usually run over the course of a year. However, Council completed the project by November 2010 in preparation for the wet season. Attachment "JAM-29" is Council's internal monthly report for "2.3.2.2 Maintain and Rehabilitate Open Drainage" for November and December 2010, and January 2011.

181. This program is being carried out again now in preparation for the upcoming wet season. Attachment "JAM-30" is Council's SITREP for October 2011. The SITREP confirms that 91% of enclosed stormwater network, which was subject to river and creek flooding, has been cleaned and that 99% of work in high priority areas is complete.

182. Council has a series of documents and procedures relating to the maintenance and development of its Stormwater Infrastructure including:

- (a) Design standards for major and minor drainage systems as set by the Queensland Urban Drainage Manual (QUDM);

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- (b) Levels of service as set by Water Resources in conjunction with City Assets;
- (c) Asset Management Plan for Enclosed Stormwater Drainage Assets;
- (d) Stormwater Assets Pipe Survey CCTV - Specification & Guide;
- (e) Asset Management Plan for Bridges and Culverts;
- (f) Asset Maintenance Management Plans being developed for detention basins;
- (g) Asset Maintenance Management Plans being developed for Channels and natural watercourses;
- (h) Local Stormwater Management Plans;
- (i) Stormwater Management Code and the Waterways Code;
- (j) Stormwater Network Trunk Infrastructure Plans.

Measures since the January 2011 Flood

183. Since the January 2011 Flood Event, a number of specific initiatives have been undertaken by Council in response to flooding, including the following (which have been completed):

- (g) the report by the Joint Flood Taskforce dated 8 March 2011 (**JFTF Report**);
- (h) the report by the Flood Response Review Board released 24 May 2011 (**FRRB Report**);
- (i) Council's Flood Action Plan (**Action Plan**):
 - (i) was originally developed, and sets out the actions Council proposes to take, in response to the recommendations in the FRRB Report. The original Action Plan was released to the public on 24 June 2011;
 - (ii) was updated to take into account the findings and recommendations in the Commission's Interim Report and was released to the public on 16 August 2011; and
 - (iii) will be further updated to take into account the findings and recommendations in the Commission's Final Report proposed to be released in February 2012.

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184. In addition to City Plan and the Subdivision and Development Guidelines, the *Temporary Local Planning Instrument 01/11 - Brisbane Interim Flood Response* was endorsed by Full Council on 10 May 2011 and was effective from 16 May 2011 (TLPI). The TLPI:


- (a) applies to the land affected by the January 2011 Brisbane River flooding as well as by waterway or creek flooding;
- (b) is effective for up to 12 months and prevails over the current Brisbane City Plan 2000 when an inconsistency arises.

185. In summary, the new planning provisions introduced by the TLPI:

- (a) introduce the concept of an Interim Residential Flood Level (IRFL) which requires building levels to be increased;
- (b) allow building heights to increase in response to the IRFL;
- (c) require the location of essential services (electricity supply, telecommunications, fire services, etc) to be either higher than the IRFL or sufficiently waterproofed;
- (d) state that filling and retaining walls must not create local drainage problems or cause amenity issues; and
- (e) determine instances where resilient building materials will have to be used in developments.

186. The initiatives set out in the Action Plan are currently being progressed by Council. These initiatives relevantly include specific flood mitigations measures such as:

- (a) the investigation of the feasibility of the installation of back-flow devices for stormwater infrastructure; and
- (b) the investigation of the feasibility of levees for the Rocklea Markets.


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2. The Council's current approach, (ie as of 2011), to obtaining and assessing flood studies relevant to planning control lines, including:

- a) how it is decided whether work will be done within Council or by external consultants.**

187. Whether flood study work is done by Council itself or outsourced to external consultants ultimately depends on the need and circumstances at the time, and the type of services required. In the first instance, Council's internal service providers are Council's preferred supplier where capacity and capability exists. However external consultants may be retained to support Council service providers or to undertake a whole project where there are time constraints or where the required capabilities extend beyond what Council's internal service providers are able to provide. All expert and/or peer reviews are undertaken by external consultants or professionals, relevant to their discipline.

188. Council has procurement guidelines and requirements for the engagement and use of external consultants. Attachment "JAM-31" is a copy of Council's procurement rules which I note are currently under review. The first procedure (page 3) requires Council officers to establish the need for external professional services. Typical reasons for engaging a consultant are listed as follows:

- (i) project/work priorities cannot be met using Council staff;
- (ii) there is a need for independent and objective opinion;
- (iii) there is an emergency or urgent work requirement;
- (iv) longer term absence of permanent staff where there is a reasonable relief period (not more than 12 months eg. for maternity leave);
- (v) professional or technical skills are required and cannot be obtained internally;
- (vi) to cope with peaks in workload; and
- (vii) for special projects that are time limited and for which internal staff are not available.

189. The procurement rules set out the process to be followed for the invitation of tenders, proposals and quotations (Procedure 3, page 4) and the selection of a consultant (Procedure 4,

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page 5). Council has adopted a system of Panel Arrangements and Preferred Supplier Arrangements for the provision of professional services known as Corporate Procurement Arrangements (CPA) (Procedure 5, page 6) which allow for faster engagement of consultants as the tendering and selection process is completed in advance of the projects requiring external consultancy services.

190. In most instances, approval for consultancies with a value of more than \$10,000 is required from the Oversight of Consultancies Special Committee (OCSC). Approval is sought by way of Submission to the OCSC prior to the engagement of consultancy services. The OCSC is comprised of two Councillors, the CEO and an officer from the Strategic Procurement Office. In the event the OCSC is not able to agree on the approval or rejection of a consultancy proposal, the matter is referred to the E&C Committee for decision. Attachment JAM-31 includes a copy of the Approval Process for the OCSC and the OCSC's Charter and Processes.
191. All Council projects are managed by a project management methodology (by an adaptation of PM²) for the life of the project. Attachment "JAM-32" are copies of Council's "Project Management Procedures Overview" (with flow charts) which have been adapted by Council for the management of each phase of its projects.
192. In certain circumstances, Council may commission consultants to undertake an independent review of an existing study where Council considers independent advice or updated advice is prudent.
193. An example of such a review, although it is not a flood study, is the Lord Mayor's Taskforce Suburban Flooding Update and Review Project (LMTSF U&R) which was added to Council's 2010 FY budget to review progress of the Lord Mayor's 2005 Taskforce Report on Suburban Flooding (refer to paragraphs 136 and 137 above).
194. Attachment "JAM-33" is a memorandum dated 29 October 2010 from Water Resources to the Divisional Manager seeking approval to obtain quotations from selected consultants to provide expert technical services for co-ordinating, leading, developing and advising on technical flood risk information and the Project Management Plan for this project (refer to paragraph 193). The options available to Council in deciding whether the work would be done within Council or by external consultants are set out in the "Business Case" section of Water Resource's Submission. Those options were to seek the services of expert consultants, to redeploy other flood engineering staff, or to recruit an engineer without the required expert experience with support to be provided by Panel experts. In this particular instance, Water Resources resolved


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to (subject to the approval of the OCSC) seek the services of expert consultants from a suitable Panel on the basis that this option provided the best technical outcome and the least cost to the project.

2. The Council's current approach, (ie as of 2011), to obtaining and assessing flood studies relevant to planning control lines, including:

b) the Council's current approach to the decisions and actions described in 1(h) above

195. Question 1(h)(i) asks how Council chooses whether work will be done within Council or by external consultants. The answer to this query is set out in paragraphs 187 to 190 above.
196. Question 1(h)(ii) asks how Council provides its internal or external consultants with previous studies and other material. Council's internal and external consultants are provided with all relevant information held by Council in relation to the study to be commissioned, including previous studies and other material. The relevant area of Council commissioning the study undertakes a review of records held by that area and sources additional information as necessary from other sources within Council. Under Council's procurement rules it is mandatory that a Consultancy Brief is provided for each consultancy (Procedure 2, page 3 of Procurement Rules - Attachment JAM-31).
197. By way of example, Council provided its external consultant, Max Winders and Associates (MWA) Environmental Consultants with the following information for its recent report on backflow devices:
- (a) January 2011 Flood Map (DERM);
 - (b) iBmap stormwater network plan for Brisbane CBD;
 - (c) Western Creek LSMP Report;
 - (d) Toowong ward presentation;
 - (e) Rosalie Milton Property Counts report;
 - (f) Brisbane Flood Flag map; and
 - (g) CBD Property Counts report.
198. Question 1(h)(iii) asks how Council provides its internal or external consultants with data. Council's internal and external consultants are provided with all relevant data held by Council in the same manner as described above in relation to previous studies. Geographical

Information Systems (GIS) data and flood models are provided to external consultants by way of a User Agreement.

199. Question 1(h)(iv) asks how Council determines the scope of work. The scope of work is generally developed as part of the project mandate and may subsequently be refined in consultations between Council, any other stakeholders (for instance, the Queensland Government or other local governments), and the consultant. Under Council's procurement rules it is mandatory to include a scope in the Project Brief.
200. Question 1(h)(v) asks how instructions are provided to consultants. Instructions are provided to consultants by way of a Project Brief. Thereafter, it is usual for there to be an initial project meeting and regular update project meetings as scheduled or required. The project brief will often state the minimum number of project meetings required.
201. Question 1(h)(vi) asks how the timeframe for the project is determined. The timeframe is generally determined by Council's business needs, budget and resource availability. Under Council's procurement rules it is mandatory to specify a timetable with commencement and completion dates (Procedure 2, page 3 of Procurement Rules - JAM-31).
202. Question 1(h)(vii) asks how the data to be used is determined. The data to be used by external or internal service providers is generally determined in consultation with stakeholders following Council's review of its records. The process is an interactive one and is developed on a project by project basis.
203. Question 1(h)(viii) asks how Council determines the assumptions to be made. The assumptions to be made by the external or internal service providers are generally determined through stakeholder consultation and discussion with the service providers. The process is an interactive one and is developed on a project by project basis. (For example, in past River Flood studies an assumption as to Wivenhoe FSL would have been made: e.g. FSL or not for all design events? This would have been determined by many stakeholders e.g. DERM (then DNRM), BoM, Seqwater, BCC, other professional experts etc). These assumptions are then agreed upon and documented in the project brief.
204. Question 1(h)(ix) asks how Council is otherwise involved in studies. Council may otherwise be involved in a study as required by the particular Project Brief or project needs. For example, Council was involved in studies to inform the State Government Water Supply Strategy (not flood specifically – but other water management), the Brisbane River Hydraulic Model to PMF (2009) study for BCC (which was for disaster management purposes), the

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Fernvale and Lowood Flood Study (2009) for Somerset Regional Council, and more recently will be involved in those studies which will inform WSDOS (although still developing scope with stakeholders).

205. The detailed involvement in flood studies i.e. modelling is undertaken by council's planning and flood team in City Projects Office, however the decision and/or development of actions and/or strategies as a result of these studies is implemented by Water Resources. Ultimately issues relating to policy is one for Council resolution.


- 2. The Council's current approach, (ie as of 2011), to obtaining and assessing flood studies relevant to planning control lines, including:**
- c) the identity of the person who decides:**
 - (i) what is done with the study when it is completed**
 - (ii) who is informed about the results of the study**
 - (iii) when a study must be considered by any or all of the chief executive officer of Council, any Councillor, civic cabinet, Council or the Lord Mayor**
 - (iv) what further studies should be undertaken**
 - (v) whether any studies or work recommended by the flood study should be progressed**
 - (vi) whether the results of a flood study should be reflected in changes to the Q100 or any other planning control line**
 - (vii) whether the results of a flood study should be reflected in changes to any emergency management procedures**
 - d) how, and the basis on which, decisions falling within items 2(c) above are taken.**

206. There is generally no single Council officer who unilaterally makes decisions of the kind set out above in relation to a flood study. By way of general comment, the decision-makers of the kind identified will largely depend on the outcome and scale of the flood study.

207. By way of illustration, the Flood Models Project described in paragraph 153 above describes the process Council currently follows to undertake further creek flood studies. In short, Council uses a risk management framework to prioritise the studies to be upgraded. This is undertaken internally by Water Resources with input from City Design (City Projects Office, Planning and Flood Team). A recommendation to progress or update a new study or project is

then made to the LMTSF PCG. Once a project is considered by the LMTSF PCG, in my position as Manager Water Resources, I meet with my Chairman (Councillor Matic) to factor the project into Water Resource's budget. The CEO is briefed on projects as a matter of course either through Council's project reporting framework (PeRFORM) or as part of the budget process, and the proposed budget is considered by Full Council.

208. In general terms, if there is already budget approval for a study or project, then the findings or outcomes for the study or project is communicated to relevant Council officers, the Chairman and the CEO. If the study or project is strategic and concerns a new decision (policy or infrastructure) or has city wide implications, then relevant Council officers and the Chairman are made aware and a submission is taken to Civic Cabinet. Submissions may be considered in subsequent budget years where insufficient information is provided in support of the proposal.
209. Matters arising of an urgent nature (often raised by the public or Councillors) are considered between my Chairman and myself. A study may or may not be warranted. If further investigation is considered necessary, the work will be undertaken by my officers and/or internal or external officers at my direction, but only if I have sufficient budget. Progress reporting will be through my Chairman. If a study (or work relating to a study) is not budgeted for then there are 2 ways of securing funding:
- (a) through budget review processes (3 per annum) which include the CEO and Council's Executive Management Team (EMT). The request will have been discussed and supported by my Chairman and my Divisional Manager prior to submission; or
 - (b) if outside the budget review process, an E&C submission may be made to Civic Cabinet to approve the additional spend. This too has to be supported by my Chairman and my Divisional Manager.
210. It must be stated that for any study undertaken, Council officers (at varying levels) will determine the need for a 'study' or project. Discussions are held at the Executive level and with the Chairman (or if significant, E&C). If the 'go ahead' is given then budget bids are sought. Once budget is agreed, then the above applies. Council officers will undertake the project/study with the best information and or practice available at the time.
211. Once a study (or project) is finalised then it is ultimately a decision for Council Administration to adopt any recommendations. If recommendations involve any changes to City Plan (planning controls etc.) the study is provided to City Planning and their/Chairman and it is


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progressed to Civic Cabinet (and Full Council) by City Planning for consideration and assessment. If the study identifies the need for new/different infrastructure or communication, this is progressed (subject to approval, which may be either by way of Civic Cabinet or budget process) by Water Resources.

212. Apart from the general comments made above, I am not familiar with the precise process and steps required to effect changes to the Q100 or other planning control lines. However, the process detailed below for the adoption of the TLPI is illustrative of the number and level of decisions required.
213. In February 2011, the JFTF was established to report on how the 2011 Flood Event compares to the Q100 as presently defined, whether the Q100 as presently describes remains the best estimate of a one-in-100 year event, and what standard should be used to inform new development and redevelopment.
214. The JFTF issued its report in March 2011. It recommended that the actual 2011 Flood Event be used as the interim standard on which Council bases its planning decisions, with the condition that wherever a higher level has been set as the current Defined Floor Level (DFL), that the higher level apply pending further investigations and study. In order to implement the JFTF's recommendation, it was necessary for Council to make a request to the Minister for Local Government to create a Temporary Local Planning Instrument (TLPI). Council resolved to do this on 15 March 2011.
215. The complexity of the decision-making process involved in effecting changes to planning levels following Council's receipt of the JFTF's report are demonstrated by the following steps which were taken in adopting the TLPI:

Date	Action	Decision Maker
7 March 2011	Draft JFTF report presented to E&C Committee.	
10 March 2011	Meeting attended by Council and Queensland Government officers to discuss TLPI timeline and process.	
10 March 2011	City Planning, Water Resources and Development Assessment officers meet to discuss scope of TLPI content.	
12/13 March 2011	City Planning and Development Assessment Branches develop the TLPI content.	

14 March 2011	Presentation of draft TLPI content to Planning Guidance Committee.	
15 March 2011	Council resolved to endorse the recommendations of the Joint Flood Taskforce Report.	Full Council Divisional Manager, Manager, City Planning
16 March 2011	TLPI workshop with Queensland Government officers.	
17 March 2011	City Planning, Water Resources and Development Assessment officers hold workshop to finalise TLPI content.	
18 March 2011	Draft TLPI presented to Town Planning Sub-Committee (TPSC).	City Planning
21 March 2011	Draft TLPI presented to E&C Committee.	Divisional Manager, Manager, City Planning
24 March 2011	Proposed TLPI submission approved by E&C Committee	
29 March 2011	Councillor briefings take place prior to Full Council consideration.	Council Officers
29 March 2011	Full Council endorses TLPI.	Full Council
30 March 2011	TLPI delivered to Queensland Government.	
30 March 2011	Queensland Reconstruction Authority (QRA) briefed on draft TLPI.	
1 April 2011	Queensland Government advise of a number of modifications required to the draft TLPI.	
5 April 2011	Content workshop (Council and Building Codes Queensland (BCQ)) on TLPI flood resilience provisions.	
6 April 2011	Meeting between Council and Queensland Government to discuss proposed modifications.	
15 April 2011	TLPI presented to external Development Industry Forum.	
18 April 2011	Council responds to Queensland Government's proposed modifications.	City Planning

19 April 2011	Briefing of the Lord Mayor on the proposed TLPI.	
20 April 2011	Independent Design Advisory Panel (IDAP) briefed on Resilient Building Design requirements of TLPI.	
27 April 2011	Queensland Government provides Council with permission to adopt TLPI.	Minister for Local Government
3 May 2011	E&C Committee resolves to adopt TLPI.	Divisional Manager. Manager, City Planning
10 May 2011	Full Council endorses TLPI.	Full Council
16 May 2011	TLPI "goes live".	
31 October 2011	Council resolves to ask the Minister for Local Government for a TLPI based on preliminary content areas	Full Council. Divisional Manager Manager, City Planning

(Note: City Planning undertook the briefings, writing, consultation and negotiation on the TLPI. Water Resources supported and assisted with the content for the TLPI and continued to work in the background to finalise the DERM mapping and update the Floodwise Property Report with the January 2011 flood levels to support the TLPI.)

- 3. Whether the Council approved or determined the following technical assumptions and decisions taken by Sinclair Knight Merz ('SKM') in its carrying out the Brisbane River Flood Study between 1996 and 1998:**
- a) **use of an aeral reduction factor**
- and if the Council did so approve or determine them, by whom were they approved or determined; when and on what basis.**

216. See paragraph 36(c) above which shows that SKM did not use an areal reduction factor. I am not aware whether Council approved or determined the technical assumption.

3. Whether the Council approved or determined the following technical assumptions and decisions taken by Sinclair Knight Merz ('SKM') in its carrying out the Brisbane River Flood Study between 1996 and 1998:

b) initial dam storage

and if the Council did so approve or determine them, by whom were they approved or determined; when and on what basis.

217. See paragraphs 36(a) above which shows that the initial dam storage for Wivenhoe was FSL. I am not aware whether Council approved or determined the technical assumption.

3. Whether the Council approved or determined the following technical assumptions and decisions taken by Sinclair Knight Merz ('SKM') in its carrying out the Brisbane River Flood Study between 1996 and 1998:

c) losses from rainfall

and if the Council did so approve or determine them, by whom were they approved or determined; when and on what basis.

218. See paragraph 36(d) above which shows SKM made no allowance for losses from rainfall. I am not aware whether Council approved or determined the technical assumption.

4. Whether the decision to obtain an expert review of the 1998 SKM Brisbane River Flood Study was made before the results (or draft results) of that study were available to the Council.

219. I refer to paragraphs 45 to 47 and paragraph 55 above.

220. From my review of the Bundle it appears the decision to obtain expert review of the 1998 SKM Study was made after the results of that study were made available to Council. I refer in

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this regard to the statement of Mr Ball referred to in paragraph 25(j) above and in particular to paragraphs 5 and 6 of that statement.

5. Who made the decision that, following Professor Mein's 1998 Review Report, the flood study investigations would continue internally within the Council; when, and on what basis was that decision made.

221. See paragraphs 58 to 60 and paragraph 61 above.

6. Why City Design was chosen to continue flood study investigations following Professor Mein's 1998 Review Report.

222. See paragraphs 58 to 60 and paragraph 61 above.

7. Who decided to continue the investigations internally within the Council following the June 1999 City Design draft report; when, and on what basis.

223. See paragraphs 70 to 73 above.

8. What, if anything, was done in response to the statement on page 10 of the June 1999 City Design draft report that '... saying that the current development control level represents the 1 in 100 flood level is not valid'; when, by whom and on what basis was that decision made.

224. As set out above, the Bundle indicates that further investigations were undertaken by Council following the June 1999 City Design draft report which ultimately led to the provision of the report by the Independent Expert Review Panel in September 2003, and the resolution of Council on 2 December 2003.


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9. Why no further flood studies were initiated by the Council between the December 1999 City Design draft report and the 2003 Independent Expert Review Panel process

225. The Bundle indicates that, as set out in paragraphs 82 to 92 above, Council progressed various measures in relation to its Brisbane River Flood Study during the period mentioned above. In particular, Council continually sought information from DNR in order to progress Council's own investigations. In this regard, I refer to paragraph 89 above.

10. Whether the following are decisions made by Council, and if so when, by whom and on what basis were the following decisions made:

- a) that the flood study investigations initiated in 2003 should be conducted through an Independent Expert Review Panel process
- b) that the flood study investigations initiated in 2003 would involve SKM
- c) the timeline for the 2003 flood study investigations undertaken by SKM
- d) that SKM should submit draft reports (as opposed to final reports) to the Independent Expert Review Panel

226. See paragraphs 92 to 107 above.

11. Whether there were any discussions held with the South East Queensland Water Corporation about potential changes to dam operations during the course of the flood study investigations in 2003 and if so:

- a) what were the purpose of those discussions
- b) who was involved in them
- c) what was the outcome of them

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227. It appears from my review of the Bundle that Council had a number of discussions and interaction with SEQWC. The documents speak for themselves, however I specifically refer to the following:

- (a) 15 December 2000 - Letter from Council to SEQWC - page 3228 of vol 10;
- (b) 20 December 2000 - Letter from SEQWC to Council - page 3249 of vol 10;
- (c) 23 January 2001 - Letter from Council to SEQWC - page 3329 of vol 10;
- (d) 30 December 2002 - File Note regarding discussion between Council and SEQWC - page 3470 vol 10;
- (e) 29 May 2003 - Minutes of Meeting on Manual of Operational Protocols for Wivenhoe Dam - page 3533, vol 11;
- (f) 26 June 2003 - Memo from K Morris to P Barnes - page 3590 of vol 11.

12. Whether Council considered using a Monte Carlo approach in a flood study; if not, why not and if so; when, by whom and on what basis was any decision about using a Monte Carlo process made.

228. I understand this question will be addressed by Gavin Blakey in a separate statement from him.

13. In respect of the recommendations for further work contained in section 5.2 of the Independent Expert Review Panel report (3 September 2003):

- a) what decisions were made about what action the Council would take in response to each recommendation, and by whom;
- b) why each recommendation was or was not implemented.

229. I understand this question will be addressed by Gavin Blakey in a separate statement from him.

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14. In respect of the recommendations for further work on page 48 of the SKM December 2003 report:

- a) **what decisions were made about what action the Council would take in response to each recommendation, and by whom**
- b) **why each recommendation was or was not implemented**

230. I understand this question will be addressed by Gavin Blakey in a separate statement from him.

15. For SKM's February 2004 report, why did the Council instruct SKM to use the Independent Expert Review Panel report (3 September 2003) estimate of Q100 flow instead of the estimate determined by the SKM December 2003 report, who gave that instruction and when

231. I refer to paragraphs 117 to 125 above.

232. As far as I am aware, Council considered the best estimate of the Q100 flow was as set out in the 2003 Panel Report and adopted by Council on 2 December 2003.

16. If, as Council's Submission Two (8 April 2011) indicates at paragraph 2.4, the Council relies on the Independent Expert Review Panel report (3 September 2003) estimates of Q100 flow and height for its planning control lines, an explanation of why it has adopted that estimate instead of the estimates determined by the SKM December 2003 report or SKM February 2004 report

233. I refer to the statement of Martin Reason dated 1 September 2011 and to Council's Submission Two dated 8 April 2011.

234. The best estimate of the Q100 height at the Brisbane City gauge (as stated by the Panel) is 3.3m AHD.


235. Council has consistently adopted 3.7 m AHD at the Brisbane City gauge as the basis for planning decisions on flood-prone land. This height is referred to as the Defined Flood Level (DFL).

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236. In addition, for residential development, an extra 500mm of 'freeboard' is added to the DFL for habitable floors.
237. State Planning Policy 1/03 states that, generally, the appropriate flood event for determining a natural hazard management area (flood) is the 1% AEP (i.e. 3.3m AHD at the City Gauge).
238. Council's DFL of 3.7 m AHD at the Brisbane City Gauge is a more conservative level than that prescribed by SPP 1/03.
239. By way of example, for a residential property at the City Gauge:
- (a) 1% AEP height (as prescribed by SPP 1/03) is 3.3m;
 - (b) Council's minimum habitable floor level is 4.2m (being DFL of 3.7m plus 500mm freeboard).
240. Therefore Council's development control line for habitable floor levels at the City Gauge is 900mm greater than the Q100 and as set out in SPP1/03.


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I make this statement conscientiously believing the same to be true, and by virtue of the provisions of the Oaths Act 1867 (Qld).

Signed and declared by Julie Anne McLellan at
Brisbane
in the State of Queensland
this 4th day of November 2011

Before me:



Signature of person before whom the declaration is
made



Signature of declarant

Brenwyn Joy July, Solicitor.
Full name and qualification of person before whom the
declaration is made