QUEENSLAND FLOODS
COMMISSION OF INQUIRY

STATEMENT OF DARREN BRADLEY MOOR

I, **DARREN BRADLEY MOOR** of the Department of Environment and Resource Management, 209 Bolsover St Rockhampton, solemnly and sincerely affirm and declare:

Requirement from Queensland Floods Commission of Inquiry

1. I have seen a copy of a letter dated 25 October 2011, which is attachment **DBM-01**, from the Commissioner, Queensland Floods Commission of Inquiry to me requiring a written statement under oath or affirmation, and which details the topics my statement should cover.

Role

2. I am currently acting in the role of Regional Services Director, Central West Region, Department of Environment and Resource Management and have been acting in this role since 26 September 2011. Prior to this I was the Regional Manager Land Services in the Central West Region.

3. In March 2011 the Non-Commercial Assets Unit was transferred from the Water Services business group in the Central West Region to the Land Services business group. At that time I was the Regional Manager responsible for Land Services and consequently assumed responsibility for the management of non-commercial assets (NCAs).

Item 1: The Department of Environment and Resource Management's ('DERM') ownership of non-commercial water assets, including abandoned dams in Queensland

4. Following the corporatisation of SunWater in 2000, the State retained the ownership and responsibility for the maintenance of 37 water-related NCAs. Through machinery of government changes the Department of Environment and Resource Management (DERM) was also given responsibility for the management of some abandoned dams that were the legacy of previous mining tenements. A number of these NCAs were subsequently decommissioned or transferred to other owners.

5. The current NCA portfolio administered by DERM comprises 24 assets: 10 dams, 12 weirs, 1 pipeline and a system of levees on the lower Mary River near Maryborough. This portfolio has not changed since the commencement of the 2010/2011 wet season.

6. These assets are listed at attachment **DBM-02 NCA List.**

7. These assets are shown on the map at attachment **DBM-03 NCA Map.**

Item 2: Whether any non-commercial water assets owned or managed by DERM were affected by flooding in the 2010/2011 wet season

8. By design all NCAs were affected to some extent by the widespread heavy rainfall which occurred throughout Queensland during the 2010/2011 wet season. In all cases these assets experienced an increase in water levels and responded as expected, as set out in the following paragraphs.

9. In the case of the 10 dams, these NCAs experienced a rise in water levels and this resulted in water being released via the spillway. I am not aware of any adverse impacts caused to these NCAs as a result of the 2010/2011 wet season. To my knowledge, any upstream impacts were contained within the flood margins and downstream impacts were not attributed to by the performance of the structures. There was no significant structural damage noted for any of these NCAs however, some minor maintenance repairs were required eg. scours, track erosion, undermining and loss of material.

10. In relation to weirs, in general, these NCAs became submerged during periods of high flow. All weirs functioned and operated as expected during the 2010/2011 wet season. There was no significant structural damage noted for any of the weirs.

11. In relation to the system of levees on the lower Mary River near Maryborough, due to the high flow in the Mary River during the 2010/2011 wet season, the levee system was affected. Please refer to my response to Item 3 for further details.

Item 3: Whether flooding at any non-commercial water asset increases the level of flooding at any nearby property, and if so, details of that effect

12. The only reported impact of flooding, during the 2010/2011 wet season, that was associated with any of the NCAs was at the Mary River Levees. The Mary River Levee System is a network of earthen embankments, approximately 19 kilometres in overall length, and was constructed by the Queensland Water Resources Commission in the 1980's. The levees are designed to provide a degree of immunity to saltwater intrusion onto 32 properties downstream from the Mary River and Tinana Creek barrages.

13. Mr [redacted], a property owner adjacent to the Mary River, advised DERM, on 25 January 2011, that water from the Mary River flooded his canefields on 20 January 2011. Mr [redacted] advised that water had flowed across the flats on the northern side of Kent Street, crossed the street and had entered his fields. Mr [redacted] said that this coincided with high spring tides, however, he had not seen the water enter the fields at this time of year in previous years. Refer to **DBM-04** File Notes of Conversations with Mr [redacted].

14. DERM inspected the area on 27 January 2011. This inspection aligns with Mr [redacted]'s account of events in relation to inundation to his property however, the report did not find that the inundation was caused by a malfunction of the Mary River Levee System. The inspection also revealed that there was no damage to the levee. The resulting internal staff report recommended ongoing monitoring of the levees in future as it was considered that the inundation was a result of "king tides" coinciding with higher than usual flooding in both the Mary River and Tinana Creek. Refer **DBM-05 Mary River Levees Site Visit Report**

Item 4: whether any non-commercial water assets pose a risk to life or property when affected by flooding, and if so, details of those risks

15. There are five NCAs managed by DERM, referred to as "referable dams". These are regulated by the Office of the Water Supply Regulator (OWSR) of DERM under the *Water Supply (Safety and Reliability) Act* 2008 (WSA). Referable dams are defined in Chapter 4 part 1 of the WSA however; in general a referable dam is a dam that would, in the event of failure, put a population of two or more people at risk.

16. The five referable dams in DERM's NCAs portfolio are:

- Ibis Dam;
- Crooks Dam;
- Wyndham Dam;
- Copperfield Dam; and
- Corella Dam.

17. These dams are managed in accordance with the "Dam Safety Condition Schedule" (for each structure) that has been issued by the director, Dam Safety (Water Supply), DERM under section 497 (7) of the *Water Act 2000.* Copies of the Information Notice Applying Safety Conditions and the Dam Safety Condition Schedules for each referable dam are attached. Refer attachments **DBM-06 Dam Safety Conditions.** Since 2008, the regulation of referable dams was transferred from the *Water Act 2000* to the WSA.

18. Referable dams, in cases where a dam is failure impact assessed under the WSA are categorised with a failure impact rating with either a Category 1 failure impact rating or a Category 2 failure impact rating. For a category 1 failure impact rating, 2 or more persons and not more than 100 persons would be at risk in the event of a dam failure and for a category 2 failure impact rating, more than 100 persons would be at risk in the event of a dam failure. Under the WSA, population at risk (PAR) means the number of persons, calculated under the failure impact assessment guidelines, whose safety will be at risk if the dam, or the proposed dam after its construction, fails.

19. An engineering study finalised in September 2010, commissioned by DERM and undertaken by Sunwater, revealed that the flood capacity of Ibis Dam is lower than previously calculated and the spillway does not comply with current safety standards for passing very large flows. Ibis Dam has been assessed as only

capable of safely handling 7% of the Acceptable Flood Capacity and has a Population at Risk (PAR), in Irvinebank of 75 persons during high flow events. Ibis Dam has a PAR of 32 persons for a 'Sunny Day Failure', which is a planning scenario that assesses the consequences of the sudden failure of a dam, for example, due to an earthquake.

20. Ibis Dam is a category 1 referable dam under the WSA.

21. Crooks Dam is a category 1 referable dam under the WSA with a PAR, if the dam was to fail, of up to 18 people.

22. Wyndham Dam is a category 1 referable dam under the WSA with a PAR, if the dam was to fail, of up to 18 people.

23. Copperfield Dam is a category 1 referable dam under the WSA with a PAR, if the dam was to fail, of up to 15 people.

24. Corella Dam is a category 1 referable dam under the WSA with a PAR, if the dam was to fail, of up to 10 people.

Item 5: if any non-commercial water asset does increase flood levels nearby or does pose a risk to life or property when affected by flooding, steps taken by DERM in the past, and plans for the future , to address those risks in terms of:

a. **Flood preparedness - before**
b. **emergency management - during**
c. **structural change to those assets -after**

25. As part of routine maintenance, all NCAs are subject to planned inspection programs. The frequency of these inspections increases during the wet season in recognition of the increased flows during this time. Referable dams are inspected on a weekly basis. A summary of the issues noted and the inspection reports are attached. Refer **DBM-07 2010/11 Wet Season Impact on NCA Register and supporting documentation**.

Ibis Dam

26. As part of a dam safety review conducted by SunWater, during 2009, concerns were identified with the upgrade of the dam that was undertaken in 1996/97. This led to further investigation by SunWater in June 2010, which revealed the original structure was a concrete-encased rock filled structure rather than a mass concrete structure, as had been assumed up to that time. Consequently, DERM, as manager of the dam, was required to re-evaluate the safety of the dam. Refer **DBM-08**.

27. The engineering study prepared by Sunwater in 2010 revealed that the flood capacity of the dam is lower than previously calculated and the spillway does not comply with current safety standards for passing very large flows. The dam has been assessed as only capable of safely handling 7% of the Acceptable Flood

Capacity for the Population at Risk (PAR) in Irvinebank (75 people). Refer **DBM-09.**

28. The OWSR has assessed the dam as being in the very high risk category and advised that the dam needs to be upgraded or decommissioned by 1 October 2012.

29. During 2010 DERM installed an automated gauging station to monitor the water level in the dam. This information is available, via a satellite link, and allows the Emergency Action Plan Officer (EAPO) to check the water level without going to the dam site. Refer **DBM-10.**

30. In 2010, DERM reviewed the Emergency Action Plan (EAP) for Ibis Dam and issued the revised version on 5 October 2010. After receiving feedback from the Local Disaster Management Group, this plan was amended and reissued on 16 December 2010. Refer attachments **DBM-11** and **DBM-12.**

31. As part of the preparation for the 2010/2011 wet season, DERM held a training session for EAPOs from Ibis Dam, Crooks and Wyndham Dams, Copperfield Dam and Corella Dam, in Atherton during November 2010. This also included a training scenario in Irvinebank. Refer attachment **DBM-13.**

32. On 25 December 2010, ex-tropical cyclone Tasha produced about 75mm of rainfall in the Ibis Dam catchment. 50mm of this fell in one event commencing about 8:30am. The predetermined level for triggering the Ibis Dam EAP is 826.1 metres AHD. The EAP for Ibis Dam was activated on 25 December 2010 because this trigger level was reached. Refer attachment **DBM-14.**

33. As tropical cyclone Yasi approached the North Queensland coast, on 2 February 2011, DERM recommended to the Local Disaster Management Group that a pre-emptive voluntary evacuation occur. Consequently the Local Disaster Management Group issued an emergency alert, via Emergency Management Queensland, later the same day. Refer attachments **DBM-15.**

34. DERM met with the OWSR on 27 May 2011 and discussed the proposed actions to reduce the risks associated with Ibis Dam. Notes for the meeting are attached, refer **DBM-16.**

35. The OWSR issued an Information Notice on 19 September 2011 that amended the Safety Conditions for Ibis Dam. Several amendments were included. However, the most significant was the inclusion of a condition requiring the owner to either upgrade or decommission the dam by 1 October 2012. Refer attachment **DBM-17.**

36. Following the 2010/2011 wet season DERM reviewed the operating requirements for Ibis Dam and altered them to reduce the associated risks. These changes are:

- The water level has been lowered by six metres (ie. six meters below the spillway);
- The blank flange on the main outlet works has been removed to increase the capacity to release water from the dam in the event of a major inflow; and

- Any inflows that raise the water level above the revised level will be released via the outlet works. Refer attachment **DBM-18.**

37. The revised operating conditions lower the risks associated with a Sunny Day Failure. However, have minimal impact on the PAR during a major flood event.

38. In addition, the automated gauging station at Ibis Dam has been upgraded to measure the water level upstream and downstream of the dam. Further upgrades are currently being implemented and include an automated warning system that will notify the Emergency Action Plan Officer in Irvinebank of potential problems. The satellite contact will be replaced with access via the 3G network as the primary system. However, the satellite system will remain as a back-up system. Refer attachment **DBM-19.**

39. DERM held a community information session in Irvinebank on 25 July 2011 to advise the residents of the revised operating conditions. At the meeting the community did not accept the need to reduce the water level and strongly objected to the proposed action. Consequently DERM agreed to engage an independent engineer to review the proposed strategy.

40. DERM engaged AECOM to undertake the independent review of the stability, structural integrity and spillway capacity of Ibis Dam. AECOM was also asked to provide advice on whether there was additional safety benefit in lowering the water a further three metres (to a total of six metres).

41. The report by AECOM:

- Confirmed the departments concerns with the stability, structural integrity and spillway capacity of the Ibis Dam;
- Noted that SunWater (who identified the concerns with the dam) has drawn appropriate conclusions; and
- Endorses a nominal six meter reduction in the operating level as this will have a significant impact on reducing the PAR from a Sunny Day Failure.

A copy of the report is attached; refer **DBM-20.**

42. DERM and AECOM held another community information session in Irvinebank on 24 August 2011. At the meeting DERM confirmed that it would lower the water level in Ibis Dam a further three meters to six meters below the spillway and any further inflows (above the new operating level) will be released via the outlet works. The community remains unconvinced of the safety concerns and the need for action.

43. DERM commenced the second stage water release from Ibis Dam on 13 September 2011 and completed this release on 5 October 2011. The water level in Ibis Dam is six metres below the spillway as at Friday 28 October 2011.

44. In accordance with the recommendations of Queensland Flood Commission of Inquiry and a request from the Local Disaster Management Group, a warning

system consisting of a series of sirens, is currently being installed in Irvinebank and will be in place by 1 December 2011.

45. In accordance with the of Flood Commission of Inquiry recommendations, DERM has reviewed the EAP for Ibis Dam. A draft copy was provided to the District Disaster Management Coordinator and the Mareeba Police Superintendent on 13 October 2011 for review. Any comments will be considered prior to releasing the revised EAP in November 2011.

46. DERM intends to test the revised EAP, in a scenario event, in Irvinebank during the first week of December 2011.

47. DERM is preparing a submission, seeking a decision on the future management of Ibis Dam, for consideration by the Cabinet Budget Review Committee (CBRC).

48. I have had considerable communication regarding the risks posed by Ibis Dam. My emails relating to reducing these risks are attached. Refer **DBM-21.**

49. Other relating documentation for Ibis Dam is also attached. Refer attachments **DBM-22.**

Crooks Dam and Wyndham Dam

50. Crooks Dam and Wyndham Dam are located adjacent to each other, with Crooks Dam located immediately downstream of Wyndham Dam. Because of their close proximity these dams act as a homogenous structure and are reported together in this section.

51. Remedial works were undertaken on Crooks Dam and Wyndham Dam during 2008, 2009 and 2010. Following this work, GHD was engaged to undertake a Failure Impact Assessment. These reports were finalised in October 2010 and are attached. Refer attachment **DBM-23 Report for Crooks Dam Failure Impact Assessment** (incorporating Wyndham Dam).

52. The EAP for Crooks and Wyndham Dams was reviewed in 2010 and Revision 6 was issued in October 2010. Refer attachment **DBM-24 EAP Crooks and Wyndham Dams Revision 6.**

53. The EAP for Crooks and Wyndham Dams was again reviewed in February 2011 following the 2010/2011 wet season and revision 9 was issued in February 2011. Refer attachment **DBM-25 EAP Crooks Dam Revision 9.**

54. In line with the Queensland Flood Commission of Inquiry's recommendations, DERM reviewed the EAP for Crooks and Wyndham Dams in October 2011. Draft copies were provided to the District Disaster Management Coordinator and the Police Superintendent on 17 October 2011 for review. Any comments will be considered prior to releasing the revised EAP in November 2011.

55. The Crooks Dam Standing Operating Procedures Revision 2 was issued in June 2010. This was reviewed, following the 2010/2011 wet season, and revision 3

was issued in February 2011. Refer attachment **DBM-26 SOP Crooks Dam Revision 2** and **DBM-27 SOP Crooks Dam Revision 3.**

56. Other relating documentation for Crooks Dam and Wyndham Dam is attached. Refer attachments **DBM-28.**

Copperfield Dam

57. GHD was engaged to the review the Failure Impact Assessment for Copperfield Dam. The report, Copperfield Dam Failure Impact Assessment Review was finalised in May 2010 and was accepted by the OWSR on 6 April 2011. Refer attachment **DBM-29** and **DBM-30.**

58. The Copperfield Gorge Dam Standing Operating Procedures Revision 4 was issued in August 2010. This has since been amended and revision 5 was issued in March 2011. Refer attachments **DBM-31** and **DBM-32**.

59. GHD was engaged by DERM, in 2010, to undertake a comprehensive inspection of Copperfield Dam in accordance with the Queensland Dam Safety Management Guidelines (DERM 2002). The inspection included an evaluation of the surveillance data and all dam safety related documentation including the Operating and Maintenance Manual, Standing Operating Procedures, EAP, Data Book and the most recent dam safety review. The report for Copperfield Dam Comprehensive Inspection was finalised in February 2011 and is attached. Refer attachment **DBM-33.**

60. The EAP for Copperfield Dam was reviewed in 2010 and Revision 5 was issued in May 2010. Refer attachment **DBM-34.**

61. In accordance with the of Flood Commission of Inquiry recommendations, DERM has reviewed the Emergency Action Plan for Copperfield Dam. A draft copy was provided to the CEO of Etheridge Shire Council on 17 October 2011 for review. Any comments will be considered prior to releasing the revised EAP in November 2011.

62. Other relating documentation for Copperfield Dam is attached. Refer attachments **DBM-35**.

Corella Dam

63. The EAP for Corella Dam was reviewed in 2010 and Revision 8 was issued in October 2010. Refer attachment **DBM-36.**

64. The Corella Dam Standing Operating Procedures Revision 3 was issued in June 2010. This was reviewed, following the wet season, and revision 4 was issued in February 2011. Refer attachment **DBM-37** and **DBM-38.**

65. In accordance with the of Flood Commission of Inquiry recommendations, DERM has reviewed the Emergency Action Plan for Corella Dam. A draft copy was provided to the CEO of Cloncurry Regional Council on 17 October 2011 for

review. Any comments will be considered prior to releasing the EAP in November 2011.

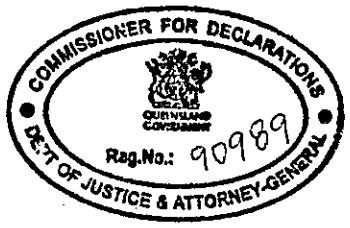
66. Other relating documentation for Corella Dam is attached. Refer attachments **DBM-39.**

I make this solemn declaration conscientiously believing the same to be true, and by virtue of the provisions of the *Oaths Act 1867.*

Signed [redacted]
Darren Bradley Moor

Taken and declared before me, at Rockhampton this 2nd day of November 2011

[redacted]
~~Solicitor/Barrister/Justice of the~~ ~~Peace~~/Commissioner for Declarations



Due to the large number, and size, of the annexures to this statement, it is only possible to publish those annexures specifically referenced in the Commission’s Final Report.

These annexures are:

DBM-1

Attachment DBM-1 is in its original form as provided to the Commission, with redactions as made by the party. No additional redactions were made by the Commission to this document.

Our ref: Doc 1758260

25 October 2011

Assistant Crown Solicitor
Crown Law
GPO Box 5221
BRISBANE QLD 4001

Dear

Department of Environment and Resource Management – Abandoned Mines

Please find enclosed a Requirement to Provide a Statement to the Commission addressed to Acting Regional Services Director, Central West Region, Operations and Environmental Regulation, in the Department of Environment and Resource Management (DERM). The Requirement relates to three principal matters, namely:

(a) DERM's ownership of non-commercial water assets, including abandoned mines in Queensland;
(b) DERM's understanding of the effect, if any, of flooding at its non-commercial water asset sites during the 2010/2011 wet season; and
(c) any action taken by DERM in the past, or planned to be taken in the future, to minimise risks posed by flooding at its non-commercial water asset sites.

The material is returnable to the Commission no later than 4 pm, Tuesday, 1 November 2011.

If you require further information or assistance, please contact on telephone

We thank you for your assistance.

Yours sincerely

Executive Director

Encl.

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Our ref: Doc 1757471

25 October 2011

Acting Regional Services Director
Central West Region
Regional Service Delivery
Operations and Environmental Regulation
32-36 Wood Street
Mackay QLD 4740

REQUIREMENT TO PROVIDE STATEMENT TO COMMISSION OF INQUIRY

I, Justice Catherine E Holmes, Commissioner of Inquiry, pursuant to section 5(1)(d) of the *Commissions of Inquiry Act 1950* (Qld), require to provide a written statement, under oath or affirmation, to the Queensland Floods Commission of Inquiry, in which the said gives an account of:

1. the Department of Environment and Resource Management's ('DERM') ownership of non-commercial water assets, including abandoned dams in Queensland

2. whether any non-commercial water assets owned or managed by DERM were affected by flooding in the 2010/2011 wet season

3. whether flooding at any non-commercial water asset increases the level of flooding at any nearby property, and if so, details of that effect

4. whether any non-commercial water assets pose a risk to life or property when affected by flooding, and if so, details of those risks

5. if any non-commercial water asset does increase flood levels nearby or does pose a risk to life or property when affected by flooding, steps taken by DERM in the past, and plans for the future, to address those risks in terms of:

    a. flood preparedness

    b. emergency management

    c. structural change to those assets.

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In addressing these matters, Mr Moor is to:

- provide all information in his possession and identify the source or sources of that information;
- make commentary and provide opinions he is qualified to give as to the appropriateness of particular actions or decisions and the basis of that commentary or opinion.

Mr Moor may also address other topics relevant to the Terms of Reference of the Commission in the statement, if he wishes.

The statement is to be provided to the Queensland Floods Commission of Inquiry by 4pm, Tuesday 1 November 2011.

The statement can be provided by post, email or by arranging delivery to the Commission by emailing info@floodcommission.qld.gov.au.

Commissioner
Justice C E Holmes