

WIDE BAY BURNETT CONSERVATION COUNCIL INC.

Applicant

BURNETT WATER PTY LTD (ACN 097 206 614)

Respondent

AFFIDAVIT OF STEVE BURGESS

(Form 20, Order 14 rule 2)

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On 3 September 2009, I, Stephen John Burgess of 119 Doyle Road, Dagon, in the State of Queensland, affirm –

1. I have been requested by the solicitor for Wide Bay Burnett Conservation Council Inc to provide a brief report annexing the analyses that I previously provided to assist Mr Max Winders and Mr Jim Tait in preparing their reports in these proceedings. I have also been asked to annex graphs of water levels in the Paradise Dam and graphs of water inflows and releases from the dam that I prepared based on information available on the website of SunWater Ltd.

.....
Deponent

.....
Justice of the Peace / Legal Practitioner

Filed by the Applicant

Jo-Anne Bragg, Principal Solicitor
Environmental Defenders Office (Qld) Inc.
30 Hardgrave Road
West End Qld 4101

Tel: (07) 3211 4466
Fax: (07) 3211 4655
Email: edoqld@edo.org.au

2. I had previously been requested to assist Mr Max Winders who is providing an expert report on the hydrology of the Burnett River at the location of the upstream fishway and the downstream fishway prior to, and following, the construction of the Paradise Dam. Annexure “**SB-1**” to this affidavit is a copy of my two letters of instructions.
3. I understand that the reason that I am requested to prepare this affidavit is so that the respondent will be able to cross-examine me about my analyses should it wish to do so.

Expertise

4. Annexure “**SB-2**” is a copy of my curriculum vitae. In summary, I have expertise in mathematical and statistical analysis of data, including computer modelling and analysis of river hydrology.
5. I have been provided with a copy of the Guidelines for Expert Witnesses in Proceedings in the Federal Court of Australia (Version 6, 5 May 2008). I understand that my primary duty is to assist the Court in these proceedings and that I do not act for WBBCC. I have endeavoured to meet my duty to the Court to the best of my ability.

Spells analysis

6. Annexure “**SB-3**” is a copy of a ‘spells’ analysis that I prepared for periods of time during which the predicted water levels and flows at the Paradise Dam would be outside the operating conditions described for the operation of the dam’s fishway in the Resource Operations Plan for the Burnett Basin

Graphs of water levels, inflows and releases

7. Annexure “**SB-4**” are copies of graphs I prepared showing water levels, water releases and inferred water inflows from the Paradise Dam between 1 December 2005 and 28 May 2009. These graphs were prepared based on publicly reported information that I obtained from the SunWater Ltd website at URL <<http://www.sunwater.com.au>> in July 2009.

Declaration

8. I have made all the enquiries I consider desirable and appropriate and no matters of significance I regard as relevant have, to my knowledge, been withheld from the Court. The factual matters stated in this report are true, to the best of my knowledge, and the opinions stated in it are genuinely held by me. I understand my paramount duty is to assist the Court and believe I have complied with this duty to the best of my ability.

.....
Deponent

.....
Justice of the Peace / Legal Practitioner

Affirmed by)
Steve Burgess)
at this)
3rd day of September 2009)
before me:

.....
Deponent

.....
Justice of the Peace / Legal Practitioner

AFFIDAVIT – CERTIFICATE OF COMPLIANCE
(Form 20A)
(Order 14, rule 5A)

I, Jo-Anne Bragg, Solicitor, certify to the Court that the affidavit of Jo-Anne Bragg affirmed on 3 September 2009 on behalf of the applicant complies with Order 14, rule 2 of the Federal Court Rules.

Dated: ... September 2009

.....
Jo-Anne Bragg (Solicitor)

WIDE BAY BURNETT CONSERVATION COUNCIL INC

Applicant

BURNETT WATER PTY LTD (ACN 097 206 614)

Respondent

CERTIFICATE OF ANNEXURE

(Order 14, rules 2(2B) and 4)

This page and the following 1 page are the annexure marked “**SB-1**” to the affidavit of Steve John Burgess sworn before me on 3 September 2009.

.....
Justice of the Peace / Legal Practitioner

Filed by the Applicant

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Curriculum Vitae

Stephen John Burgess

Current Address "Wurraglen"
 119 Doyle Rd
 DAGUN Q 4570
 ph +61 7 5484 3749
 e: wurraglen@gmail.com

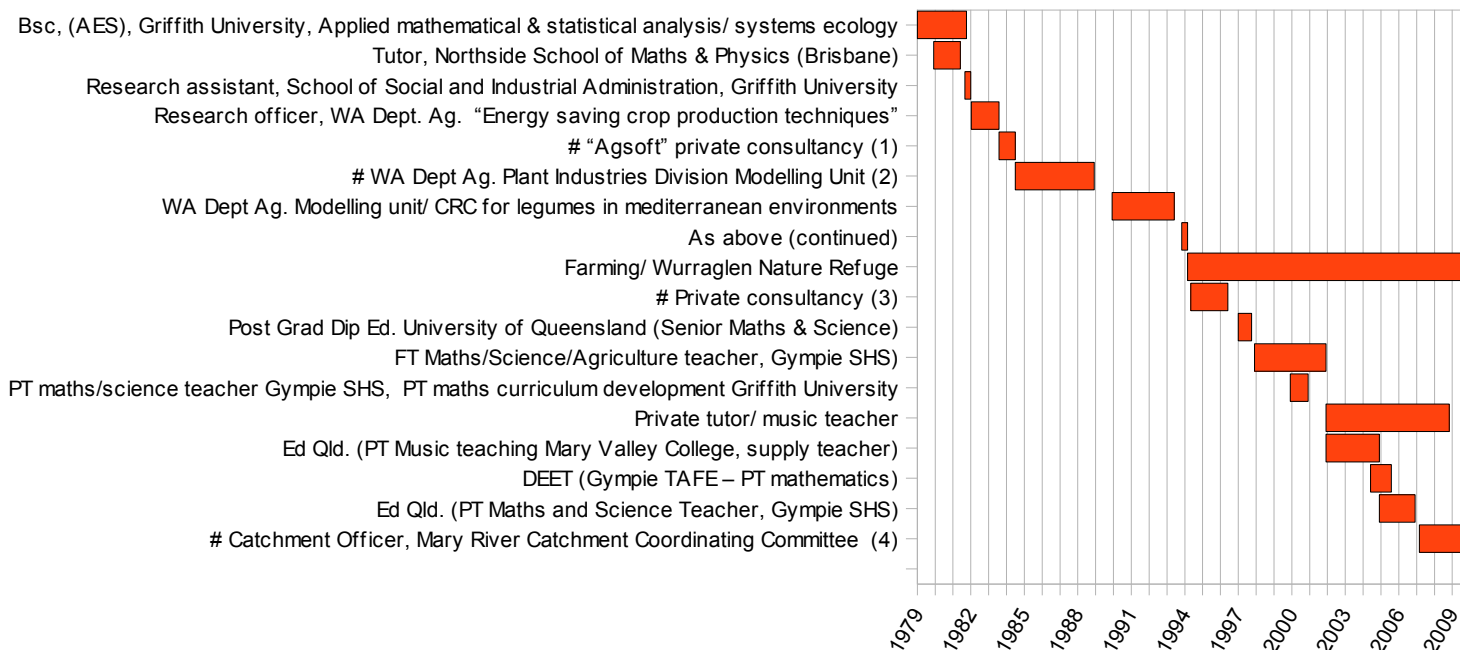
Born: Brisbane, 18/08/1961

Tax File: 486 566 096

Blue Card: 8577/1

Drivers Licence: 11 777 550

Summary of education and employment history



#Notes:

1. Work included data analysis and management, contract programming, developing crop and soil water balance software.
2. Experience included widely varied data analysis and mathematical modelling tasks, particularly water and nutrient transformations and transport in agricultural systems.
3. Clients included Cooloola Regional Development Bureau, Queensland Dairy Research Institute, WA Department of Agriculture.
4. Duties include water quality monitoring, educational programmes, analysis of water flow, quality and planning issues, hydrological and hydraulic modelling, technical representative in planning and policy issues (eg Wide Bay Water Strategy, Water Quality Improvement Plan, Water Resource Plan etc).

Current membership of formal associations

International Association for Environmental Hydrology,
 Qld College of Teachers,
 Australian Musical Examinations Board,
 Nature Refuge Landholders Association,
 SaveTheMaryRiver Coordinating Group,
 Dagun Community Group.

WIDE BAY BURNETT CONSERVATION COUNCIL INC

Applicant

BURNETT WATER PTY LTD (ACN 097 206 614)

Respondent

CERTIFICATE OF ANNEXURE

(Order 14, rules 2(2B) and 4)

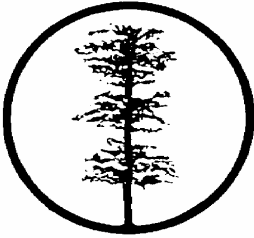
This page and the following 13 pages are the annexure marked “**SB-2**” to the affidavit of Steve John Burgess sworn before me on 3 September 2009.

.....
Justice of the Peace / Legal Practitioner

Filed by the Applicant

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26 March 2009

Mr Steve Burgess
119 Dolye Road
Dagun 4570

Email: wurraglen@gmail.com

Dear Mr Burgess,

Wide Bay Burnett Conservation Council Inc v Burnett Water Pty Ltd – Federal Court of Australia proceedings No. QUD 319 / 08

We act for the Wide Bay Burnett Conservation Council (WBBCC) in litigation in the Federal Court of Australia in relation to an alleged failure by Burnett Water Pty Ltd to construct and operate a fishway that is suitable for Australian or Queensland lungfish (*Neoceratodus forsteri*) on the Paradise Dam. This obligation is imposed by a condition of approval for the dam under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). WBBCC seeks a declaration from the Court on the legal meaning of the condition and an injunction to compel Burnett Water Pty Ltd to comply with the condition.

You are requested to assist Mr Max Winders who is providing an expert report to the Federal Court on the hydrology of the Burnett River at the location of the upstream fishway and the downstream fishway prior to, and following, the construction of the Paradise Dam. The more precise questions to be addressed in that report are later in this letter of instructions. Additional reports are being sought from other experts, including reports on lungfish passage through fishways and the significance of restricted passage on Paradise Dam for lungfish in the Burnett River, by Mr Jim Tait and a background report from Professor Jean Joss on the biology, ecology and conservation status of lungfish.

Duty to the Court

We note as a preliminary matter that your paramount duty in preparing your report is to assist the Court and you are not an advocate for WBBCC.¹ We stress that WBBCC asks you to assist Mr Winders to prepare a truly independent report that is clear and well-written and rigorously based on the best science to assist the Court to determine the issues in dispute in these proceedings.

Material included for your consideration

The following material has been included with this letter of instructions:

¹ See Guidelines for Expert Witnesses in Proceedings in the Federal Court of Australia (Version 6, 5 May 2008), available at http://www.fedcourt.gov.au/how/prac_direction.html.

- Guidelines for Expert Witnesses in Proceedings in the Federal Court of Australia (Version 6, 5 May 2008).²
- The referral of the Paradise Dam by Burnett Water Pty Ltd under the EPBC Act in 2001.
- Relevant extracts from the Paradise Dam Environmental Impact Study (EIS) in 2001.³
- Photographs of the upstream and the downstream fishway in 2006 and 2008.
- The Application and Statement of Claim in the Federal Court proceedings.
- Request for Further & Better Particulars filed by Burnett Water Pty Ltd on 12 November 2008.
- Further and Better Particulars filed by WBBCC on 19 November 2008.

During the course of litigation, we anticipate obtaining further documents from Burnett Water Pty Ltd including modelled long term daily flow data for all scenarios, (including pre-development, various designs for the Paradise Dam and no development) for the Paradise Dam site and all modelled daily water level data for the current dam design. We will provide those documents to you when they become available.

Brief history of the Paradise Dam

The Paradise Dam is a major dam with a storage capacity of 300,000 megalitres constructed on the lower Burnett River approximately 80 km southwest of Bundaberg in Queensland. The dam's name comes from its location near the site of an old mining town of Paradise but at one stage it was called the "Burnett River Dam".

Burnett Water Pty Ltd referred the Paradise Dam under the EPBC Act on 30 August 2001 and it was approved by the Federal Environment Minister under section 133 of the Act on 25 January 2002. Only two conditions were originally attached to the approval. These two conditions required the preparation of plans to mitigate impacts to a listed threatened species (the Black-breasted Quail) and listed migratory species.

The Burnett River is one of only two known endemic populations of the lungfish, which was listed as vulnerable to extinction under the EPBC Act on 6 August 2003. As a result of this listing, on 8 August 2003 the conditions of the approval for the dam were varied to attach further conditions requiring the installation of a fish transfer device, ongoing monitoring and other measures to conserve lungfish. These conditions provided as follows:

3. Burnett Water Pty Ltd must install a fish transfer device on the Burnett River Dam suitable for the lungfish. The fishway will commence when the dam becomes operational.
4. Burnett Water Pty Ltd must adhere to the environmental flow requirements specified in the *Water Resource Plan (Burnett Basin) 2000* and the *Resource Operation Plan (Burnett Basin) 2003* and the Burnett River Dam Flow Strategy for Lungfish dated 22 May 2003.
5. Prior to commencing operation of the Burnett River Dam, Burnett Water Pty Ltd must provide to the Minister a report detailing the results of baseline monitoring of the lungfish population in the vicinity of the Burnett River Dam wall.
6. Burnett Water Pty Ltd must undertake annual aquatic ecosystem monitoring at about AMDT 119 km, AMDT 201 km and at least two sites between these points and provide to the Minister five biennial summary reports. This 10-year monitoring program will include the measurement of the condition of lungfish and lungfish habitat / macrophytes. Monitoring will commence when the dam becomes operational.

² Available at http://www.fedcourt.gov.au/how/prac_direction.html.

³ The full EIS is available at http://www.sunwater.com.au/burnettwater_docs.htm#B_EIS.

7. Burnett Water Pty Ltd must conduct a review of the impacts of Burnett River Dam on the lungfish at the conclusion of the 10 year monitoring program in consultation with the Commonwealth Environment portfolio, to determine whether future monitoring is required.
8. Burnett Water Pty Ltd must make lungfish information and data from research and monitoring activities freely available for inclusion in State and Commonwealth lungfish recovery programs or programs relating to water quality in the Burnett River.
9. If aquatic ecosystem monitoring required under paragraph 4 or the review required under paragraph 5 indicates ongoing lungfish population decline at about AMTD 199 km that cannot be attributed to natural periodic fluctuations, then Burnett Water Pty Ltd will initiate appropriate recovery actions. The recovery actions cannot be inconsistent with an adopted Commonwealth Lungfish Recovery Plan.

Construction of the Paradise Dam was completed in 2005.⁴ It has a usable storage of 286,610 ML (approximately 95% of total storage capacity) and a dead storage (beneath which water cannot effectively be used) of 13,390 ML (approximately 5% of total storage capacity). Controlled discharges of water are made from the dam by sluice gates. When the water level in the dam exceeds its maximum storage, water is released from the dam via a spillway.

In an attempt to comply with condition 3 of the EPBC Act approval, Burnett Water Pty Ltd has constructed an upstream fishway and a downstream fishway. Although located in close proximity to each other, these are two separate structures with very different designs:⁵

- (a) The upstream fishway (also known as the “upstream fishlift”) consists of a 7,500 litre caged container (known as a “hopper”) into which fish are intended to be attracted by flowing water at the downstream base of the dam. The caged container is designed to be periodically lifted over the dam wall and for any fish in the container to be released on the upstream side of the dam.
- (b) The downstream fishway (also known as the “downstream fishlock”) consists of an inlet chamber on the upstream side of the dam wall in the dam reservoir and a pipe to the downstream side of the dam. Fish are intended to be attracted into the inlet chamber by flowing water. A lock or vertical gate at the entrance of the inlet chamber is designed to be periodically closed and the chamber drained to cause the fish to be transported into a pipe and released into a pool on the downstream side of the dam wall connected to the downstream river.

We anticipate obtaining detailed information from Burnett Water Pty Ltd concerning the design and actual operation of the upstream fishway and the downstream fishway and we will provide that information to you when it is available to us.

Instructions regarding the legal context of the appeal

As a preliminary matter, please note that you are not permitted to express an opinion on any question of law in your report and that Mr Winder’s report should confine itself to the relevant issues of fact within your area of expertise. However, you need to understand the legal context of the appeal to understand the relevant questions of fact that the Federal Court requires your assistance on. The legal questions are quite complex and it may be of assistance to the Court in

⁴ See http://www.sunwater.com.au/burnettwater_paradisedam.htm.

⁵ Pictures and diagrams of the upstream fishway and the downstream fishway are available at http://www.sunwater.com.au/burnettwater_environmental_fish_passage.htm

understanding a report if you set out your instructions in an introductory section to explain how you understand the relevant concepts involved in the questions of fact addressed in the body of your report.

You are instructed that the question the Federal Court must consider in the appeal is whether the design and operation of the fishway on the Paradise Dam contravenes condition 3 of the EPBC Act approval for the Paradise Dam. An offence will occur against sections 142 and 142B of the EPBC Act if the condition is contravened without any actual impact on the lungfish being proven on the balance of probabilities. An offence will occur against section 142A of the EPBC Act if the condition is contravened recklessly by Burnett Water Pty Ltd and results in a significant impact⁶ on the lungfish being proven on the balance of probabilities.

Condition 3 of the EPBC Act approval for Paradise Dam states:

Burnett Water Pty Ltd must install a fish transfer device on the Burnett River Dam suitable for the lungfish. The fishway will commence when the dam becomes operational.

Whether the upstream fishway and the downstream fishway meet the standard of being “suitable for lungfish” is an issue that is ultimately for the Court to determine. As it involves questions of the legal interpretation of the condition it is not something that you can give an opinion upon directly. We cannot ask you to simply state whether in your opinion the upstream fishway and the downstream fishway are suitable for lungfish and comply with condition 3 because that inherently involves a decision about the legal meaning of the condition. Your report and other expert reports can, however, assist the Court in resolving this ultimate issue by explaining the likelihood of lungfish passing through the upstream and the downstream fishway and any likely impacts on the lungfish population due to restricted passage.

Alleged contraventions of Condition 3

WBBCC has set out nine particulars of the conduct it alleges contravenes Condition 3 of the EPBC Act approval at paragraph 6 of the Statement of Claim provided to you. These are that Burnett Water Pty Ltd has installed and operated, is operating, and intends to continue to operate the upstream fishway and downstream fishway in a manner whereby:

- (a) The entrances to the upstream fishway and the downstream fishway are not likely to be found by lungfish attempting to move or migrate upstream or downstream of the dam wall.
- (b) The entrances to the upstream fishway and downstream fishway are too small for fully grown lungfish to enter.
- (c) The caged container in the upstream fishway is too small for fully grown lungfish.
- (d) The upstream fishway and downstream fishway do not operate continuously.

⁶ For the purposes of the EPBC Act, a significant impact has been defined by the Federal Court as “an impact that is important, notable or of consequence having regard to its context or intensity”: *Booth v Bosworth* (2001) 114 FCR 39; [2001] FCA 1453 at 64 [99] (Branson J). Cf. *Minister for the Environment and Heritage v Greentree (No 2)* (2004) 138 FCR 198; [2004] FCA 741 at [191]-[201] (Sackville J).

- (e) The downstream fishway is not suitable for lungfish to move or migrate downstream of the dam when water levels in the dam are beneath EL 62.0 m (57% of the full storage capacity of the dam) because the inlet to the downstream fishway is constructed above this height.
- (f) Lungfish are likely to be injured by the speed at which they are transported through the downstream fishway and the small dimensions of the pipes and downstream release pool.
- (g) Lungfish, particularly juveniles, are susceptible to predation while moving through the upstream fishway and the downstream fishway.
- (h) Lungfish exiting the upstream fishway or the downstream fishway are susceptible to predation at the release point.
- (i) Due to the matters raised in paragraphs 6(a)-(h), the upstream fishway and the downstream fishway are not likely (more than 50% probable) to allow any normal sized lungfish to move upstream or downstream of the dam without injury irrespective of the water level in the dam.

WBBCC has also set out particulars of why it alleges the conduct of Burnett Water Pty Ltd has, will have or is likely to have a significant impact on lungfish at paragraph 8(b) of the Statement of Claim, namely by:

- (i) Stopping, hindering, or reducing upstream and downstream movement or migration of lungfish in the Burnett River for feeding or reproduction.
- (ii) Causing a greater number of lungfish to move downstream in flood events over the dam spillway and, thereby, increasing mortality in the lungfish population due to death or injury of lungfish on the spillway.
- (iii) Unless restrained by the Court the impacts in paragraphs 8 (b) (i) and (ii) will continue during the operation of the dam for the indefinite future.

Burnett Water Pty Ltd requested further details of these particulars in a series of questions filed on 12 November 2008 and WBBCC filed a reply to those questions on 19 November 2008. The further and better particulars provided by WBBCC have been provided to you and provide further guidance on the case alleged by WBBCC.

These particulars are not intended to constrain or improperly influence your consideration of this case. The purpose of stating them in the Statement of Claim and the Further and Better Particulars is to allow Burnett Water Pty Ltd to know the case it is required to address in the proceedings and to narrow the scope of the issues in dispute and the evidence that is relevant to resolve these issues. If you disagree with these particulars or believe that further specific factual issues should be raised please inform us. It is possible for WBBCC to amend its Statement of Claim and its particulars to change the nature of the case but this should be done as soon as possible to avoid delays and unnecessary costs for both parties.

Factual questions that expert evidence is required for

The following questions are the factual issues that we consider expert evidence may assist the Court in determining the ultimate question of whether Burnett Water Pty Ltd has complied with Condition 3 of the approval for Paradise Dam:

Lungfish biology, ecology and conservation status

1. Explain the biology, ecology and conservation status of the lungfish species, including:
 - (a) The species' known distribution, populations, life history, habitat requirements, migratory behaviour and requirements (i.e. does it need to migrate and, if so, to what extent).
 - (b) The known behaviour of the lungfish relevant to the design of fish passage through the Paradise Dam.
 - (c) What demographic variables affect the natural movement or migration of lungfish, including age, sex and size?
 - (d) Does movement or migration of lungfish vary with seasons, river flow or other naturally variable factors?
 - (e) The evolutionary and ecological significance of the lungfish.
 - (f) Why the lungfish has been listed as vulnerable to extinction under the EPBC Act.
 - (g) The importance (if any) of connectivity in the lungfish population in the Burnett River and, in particular, whether there is any need for effective fish passage upstream or downstream on the Paradise Dam to provide breeding and feeding opportunities and to maintain the genetic variability and viability of the lungfish population.
 - (h) What impacts would be expected on the lungfish population in the Burnett River from the construction of the Paradise Dam without a fish transfer device, such as changes in habitat and changes in the genetic variability and viability of the lungfish population?
 - (i) Other than the Paradise Dam, what threats and impacts are faced by the lungfish population in the Burnett River?
 - (j) What other threats and impacts are faced by the lungfish species outside the population in the Burnett River?

Hydrology

2. Explain the hydrology of the Burnett River at the location of the upstream fishway and the downstream fishway prior to, and following, the construction of the Paradise Dam, including:
 - (a) What was the water flow regime, particularly periods of zero flow, at the site of the upstream fishway and the downstream fishway prior to the construction of the dam?

- (b) Review and evaluate in terms of best or sound scientific practice the hydrological modelling carried out by the respondent, Burnett Water Pty Ltd, prior to the construction of the dam particularly the modelling of:
- (i) likely water levels in the dam;
 - (ii) water releases from the dam for downstream uses, including environmental flows;
 - (iii) water releases from the dam for the operation of the upstream fishway and the downstream fishway;
 - (iv) rainfall and periods of drought in the Burnett Basin; and
 - (v) use of water by upstream water-users diverting water from the dam.
- (c) To what extent can it be expected that water levels in the dam in the future will obtain and remain above 62m AHD (57% of the dam capacity), thereby allowing the downstream fishway as currently constructed to operate?

Upstream fishway

3. What is the likelihood that lungfish⁷ will pass through the upstream fishway safely, in particular:
- (a) What is the likelihood that the upstream fishway design will allow safe lungfish passage in comparison to unrestricted passage?
 - (b) What is the likelihood that the upstream fishway will allow safe lungfish passage as actually operated by Burnett Water Pty Ltd in comparison to unrestricted passage?
 - (c) What other measures would improve upstream fish passage, including both an entirely different designed fishway and changes to the existing fishway and its operation, and to what extent would those measures improve the likelihood of safe lungfish passage upstream in comparison to unrestricted passage?⁸

Downstream fishway

4. What is the likelihood that lungfish⁹ will pass through the downstream fishway safely, in particular:
- (a) What is the likelihood that the downstream fishway design will allow safe lungfish passage in comparison to unrestricted passage?
 - (b) What is the likelihood that the downstream fishway will allow safe lungfish passage as actually operated by Burnett Water Pty Ltd in comparison to unrestricted passage?
 - (c) What other measures would improve the downstream fish passage, including both an entirely different designed fishway and changes to the existing fishway and its

⁷ Please consider all age and size classes and both male and female lungfish.

⁸ Do not assume that cost is a constraint but include estimates of the cost of different measures where possible.

⁹ Please consider all age and size classes and both male and female lungfish.

operation, and to what extent would those measures improve the likelihood of safe lungfish passage downstream in comparison to unrestricted passage?¹⁰

Significance of impacts

5. What are the impacts for the lungfish population in the Burnett River and the species generally of any restrictions in the movement of lungfish caused by the design and operation of the upstream fishway and the downstream fishway, in particular changes in the genetic variability and viability of the lungfish population?
6. Having regard to the context and intensity of the impacts, are they important, notable or of consequence for the conservation of the lungfish species?

We ask that you assist Mr Winders to address questions 2(a)-(c) in his report. The answers to these questions should, as much as possible, be based on actual evidence (e.g. data of the historic flow regime of the Burnett River at the location of the Paradise Dam).

Both the design and the operation of the fishways are relevant

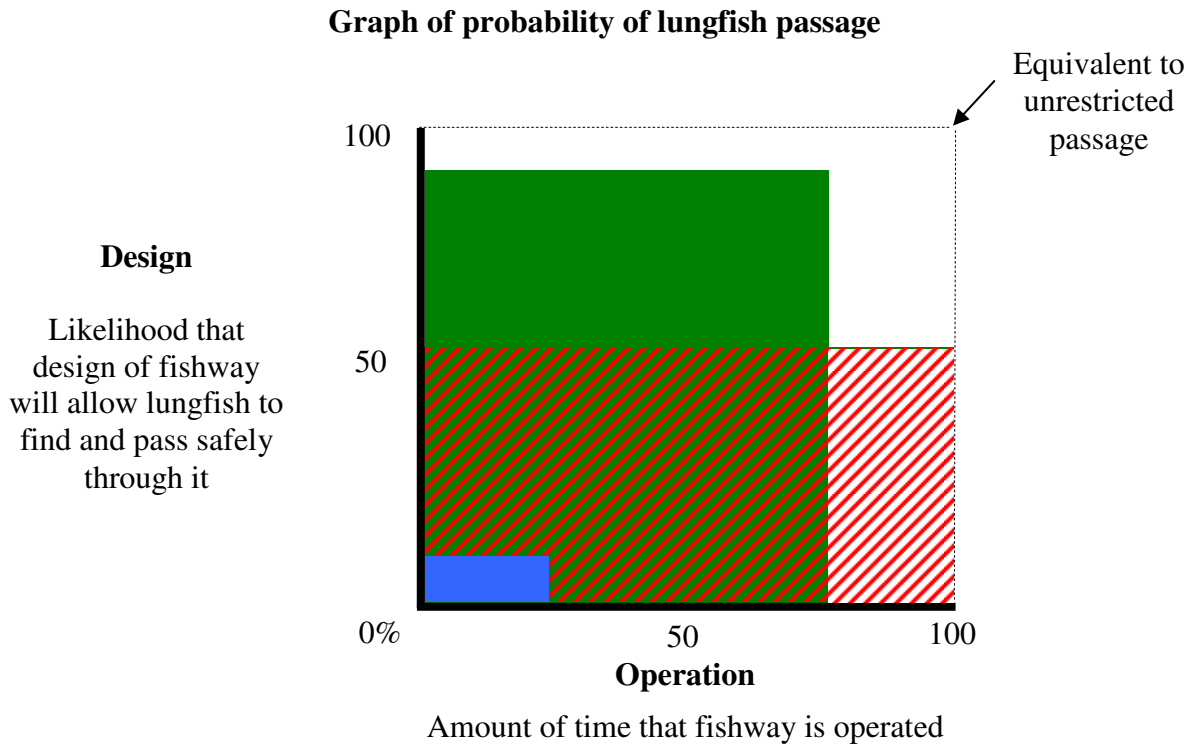
We note as further background that Condition 3 requires both the design and operation of the fishway to be considered. The design of the fishway affects the likelihood that it will allow lungfish to find and pass through it safely. The operation of the fishway affects the amount of time available and, therefore, when it is possible for lungfish to pass through it (including consideration of seasonal variation in lungfish movement).

The combined effect of the design and operation of the upstream fishway and the downstream fishway on the likelihood that lungfish will pass upstream or downstream for the dam wall may be represented graphically. The following graph considers three fictitious/hypothetical examples as follows (note that due to the different design and operation of the upstream and downstream fishways, separate consideration is required for each):

- **Hypothetical example 1:** The blue square (■) shows the area of graph for probability of 2.5% that lungfish will move or migrate through the fishway in comparison to a natural river or unobstructed passage through the dam. This supposes that there is a 10% probability that the design of the fishway will allow lungfish to find & pass safely through it & the fishway operates for 25% of the total time (1 in every 4 days).
- **Hypothetical example 2:** The red hatched square (▨) shows the area of graph for probability of 50% that lungfish will move or migrate through the fishway in comparison to a natural river or unobstructed passage through the dam. This supposes that there is a 50% probability that the design of the fishway will allow lungfish to find & pass safely through it & the fishway operates continuously (i.e. 100% of the total time).
- **Hypothetical example 3:** The green square (■) shows the area of graph for probability of 67.5% that lungfish will move or migrate through the fishway in comparison to a natural river or unobstructed passage through the dam. This supposes that there is a 90% probability that the design of the fishway will allow lungfish to find & pass safely through it & the fishway operates for 75% of the total time (3 in every 4 days).

¹⁰ Do not assume that cost is a constraint but include estimates of the cost of different measures where possible.

Note that these hypothetical examples are not based on actual data or knowledge and are intended merely to illustrate the point that it is the combined effect of the design and operation of the fishways that give the actual likelihood that lungfish will be able to pass through the fishways.



Required information

The Federal Court's *Guidelines for Expert Witnesses in Proceedings in the Federal Court of Australia* specifies the information an expert report is required to contain. This includes:

- Your qualifications;
- A statement of the questions or issues that you are asked to address;
- The factual premises upon which your report proceeds;
- The documents and other materials that you have been instructed to consider;
- All assumptions of fact that you make should be clearly and fully stated;
- If your opinion is not fully researched because you consider that insufficient data is available, or for any other reason, this must be stated with an indication that the opinion is no more than a provisional one;
- Where you believe that any statement in your report may be incomplete or inaccurate without some qualification, that qualification must be stated in the report;
- You should make it clear when a particular question or issue falls outside your expertise;

- References to any literature or other material relied upon by you to prepare the report;
- If your report refers to photographs, plans, calculations, analyses, measurements, survey reports or other extrinsic materials that are not included in the report, these must be provided to the opposite party at the same time as the exchange of expert reports;
- For any inspection, examination or experiment conducted or relied on in preparing your report, a description of what was done, who conducted it, their qualifications, and the result;
- If there is a range of opinion on the matters dealt with in your report, a summary of the range of opinion, and the reasons why you adopted a particular opinion; and
- A summary of the conclusions you reached.

As you are assisting Mr Winders to prepare his report, please consult with Mr Winders about the format and contents of information that you supply to him.

Declaration

At the conclusion of the report, the author must include the following declaration (assuming, of course, the declaration is correct to your knowledge):

I have made all the enquiries I consider desirable and appropriate and no matters of significance I regard as relevant have, to my knowledge, been withheld from the Court. The factual matters stated in this report are true, to the best of my knowledge, and the opinions stated in it are genuinely held by me. I understand my paramount duty is to assist the Court and believe I have complied with this duty to the best of my ability.

Formatting of report

We requested Mr Winders to format the report as follows:

- Address your report to the Court;
- Sign and date your report;
- Include a summary of your qualifications and experience as an appendix to your report;
- Use 12 point type and at least 2cm page margins;
- Print your report single sided and supply 5 bound copies of it, or supply a PDF version of your report for printing and binding;
- Number each paragraph of your report;¹¹
- Number all pages, including attachments and annexes, continuously from the first page to the last page (excluding any cover page to your report);

¹¹ This greatly assists references and discussion of your report in the Courtroom.

- Annex this letter of instructions to your report.

Draft of report

We request that you provide Mr Winders and EDO with a draft of your report for review before finalising it. The purpose of this is not to influence the substantive conclusions or recommendations you make but to ensure that the report is clear and addresses the required questions and issues adequately.

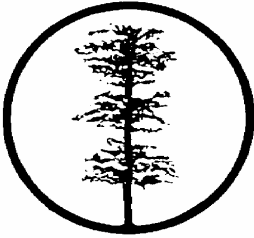
Conclusion

Thankyou for your assistance and diligence in this matter. Please contact us if you have any further questions.

Yours faithfully
Environmental Defenders Office (Qld) Inc.



Jo-Anne Bragg
Principal Solicitor



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15 June 2009

Mr Steve Burgess
119 Doyle Road
Dagun 4570

Dear Mr Burgess,

Wide Bay Burnett Conservation Council Inc v Burnett Water Pty Ltd – Federal Court of Australia proceedings No. QUD 319 / 08

We refer to your letter of instructions dated 26 March 2009.

Additional Material for your Consideration

Since our initial letter of instruction we have supplied you with some additional documentation that we thought was potentially relevant. We email you the following pleadings which we list here for a convenient record:

1. Amended Statement of Claim filed 14 April 2009
2. Defence filed 1 June 2009
3. Reply filed 15 June 2009 (to follow by email after it is filed today).

Factual Questions that Expert Evidence is Required for.

In our original letter of instructions, we requested that you assist Mr Winders as required. Mr Winders was addressing factual questions 2(a)-(c) in his report, also 3(c) and 4(c). Mr Tait will be addressing the other factual questions, including factual matter 1, Lungfish Biology, Ecology and Conservation Status which was previously assigned to Professor Jean Joss.

Instructions Regarding the Legal Context of Appeal

As included in the original letter of instructions, the experts' role is to assist on factual matters. However it is useful for you to be updated on the legal context of the case. The Amended Statement of Claim now **omits** reference to any offence against section 142A of the EPBC Act, which concerns if the condition is contravened recklessly by Burnett Water Pty Ltd and results in a significant impact on the lungfish. While that offence is omitted, we still do need Mr Winders report to cover all the factual matters previously addressed.

Dates

We have previously advised you of key dates in this matter for Mr Winders and list them for your convenience as you may assist him:

- Report due to be filed 19 June 2009;
- Burnett Water's Expert Reports due to be filed by 24 July 2009
- Experts to confer to identify or clarify any issues and to resolve or narrow any points of difference by 14 August 2009

No date has been specified by the Court for a joint expert report to be filed but we will liaise with the solicitor representing Burnett Water Pty Ltd to agree on a suitable date. We anticipate that this will be by 14 August or shortly thereafter.

Please contact us if you have any further questions.

Yours faithfully
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WIDE BAY BURNETT CONSERVATION COUNCIL INC

Applicant

BURNETT WATER PTY LTD (ACN 097 206 614)

Respondent

CERTIFICATE OF ANNEXURE

(Order 14, rules 2(2B) and 4)

This page and the following 4 pages are the annexure marked “**SB-3**” to the affidavit of Steve John Burgess sworn before me on 3 September 2009.

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Justice of the Peace / Legal Practitioner

Filed by the Applicant

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Appendix 6 –Flows Analysis Paradise Dam Reach

Spells analysis of the predicted long-term potential for operation of the fishway devices at Paradise Dam S. Burgess. 13/06/2009

A 'spells' analysis is a standard technique used in ecological studies of time-series based hydrological data. The technique used here is described in the standard text: **Stream Hydrology: An Introduction for Ecologists, 2nd Edition**, by Gordon et al., 2004. The analyses presented here were produced using the AQUAPAK software package described in that text, used under license to Sinclair Knight Mertz, the firm which produced the Environmental Impact Statement for the Paradise Dam.

The data used for the analysis is the IQQM (integrated Quantity and Quality Model) simulated data set used to formulate the operational rules for the Paradise Dam as described in the Resource Operations Plan for the Burnett Basin, June 2008. These data were obtained under license from the Queensland Department of Natural Resources and Water (now DERM). The operational levels and required flows for the fishway devices are as published in the June 2008 Resource Operations Plan for the Burnett Basin. Because there are no long term directly measured streamflow data for the Paradise damsite, these simulated data are the best available long-term data for that location, and are the data upon which the current licensed design and operation of the dam and its fishways are based.

These data represent simulated daily water levels and flows as if the weather sequence was the same as that experienced from 1890 to 1997, for a hypothetical 'no-development' scenario (the 'natural' state) and the infrastructure and water use scenario (including Paradise dam) as currently planned for in the Resource Operations Plan.

Paradise Dam IQQM simulation. Risks to fishway operation.

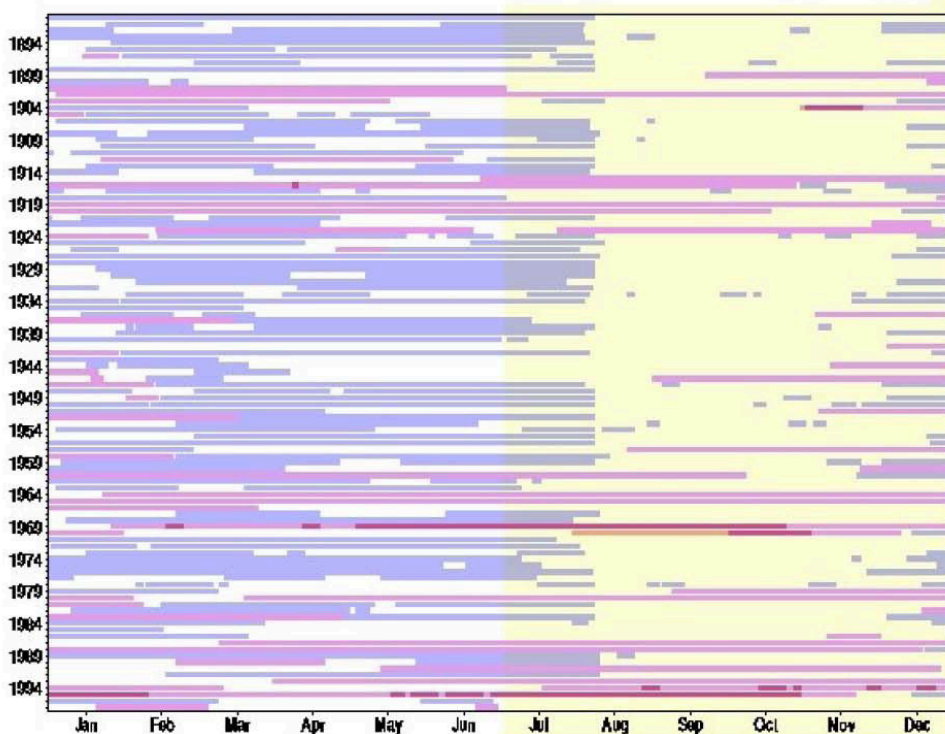


Figure 1. Spells during which the IQQM data from the Burnett Basin Water Resource Plan predict aspects of the operational range of the fishways at Paradise Dam

- Pale blue areas represent spells during which the predicted water level in the dam is above the spillway level of 67.6 m AHD, thus presenting a risk of lungfish being carried over the spillway.
- Pink areas represent spells during which the predicted water level in the dam is less than 62m AHD, thus preventing entry to the downstream fishlock.
- Brown areas represent spells when predicted releases from the dam are less than 14mL/day – during which the fishways are not expected to be operated.
- Red areas represent spells during which the two preceding conditions occur concurrently.
- Pale yellow area represents times during which lungfish would normally be moving to or from spawning sites on the Burnett River. (Brookes and Kind, 2002)

Paradise Damsite. IQQM 'natural' no-flow periods

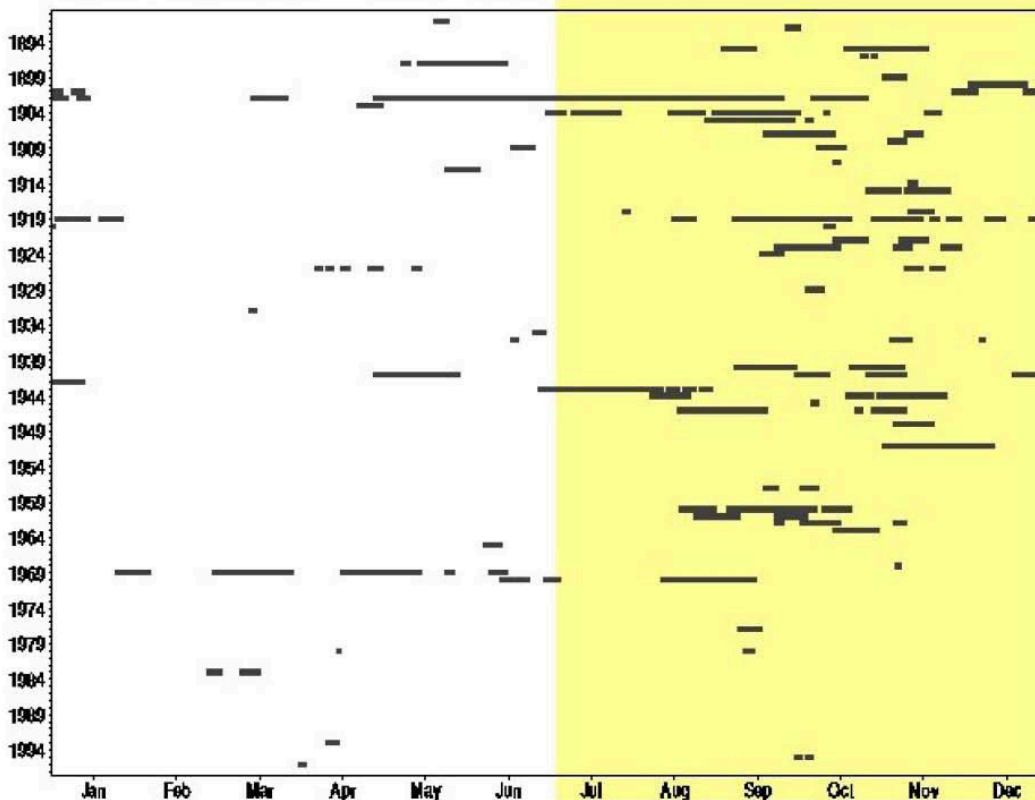


Figure 2. Spells during which the IQQM data from the Burnett Basin Water Resource Plan predicts cease-to-flow at the Paradise Dam site for the pre-development ('natural flows') scenario.

- Black areas represent cease-to-flow events, during which connectivity between pools in the vicinity of the dam wall site would be broken.
- Yellow area represents the times during which lungfish would normally be moving to or from spawning sites on the Burnett River. (Brookes and Kind, 2002)

Notes on the comparison between the 'developed' and 'natural' scenario

- There are no occasions in the 'natural' scenario where connectivity is lost for a complete spawning movement period (July to December), and only two where connectivity is not maintained for most of the spawning movement period.
- There are 9 years in the 'developed' scenario where downstream connectivity is lost for a complete spawning movement period, and 13 years where connectivity is lost for most of the spawning movement period.
- The longest spell of no downstream connectivity in the 'natural' scenario is 150 days, while the longest continuous spell of no downstream connectivity in the 'developed' scenario is 793 days.
- The most obvious feature of the analysis is that there are very significant periods of time during which lungfish are at risk of overtopping the spillway structure in the developed scenario, a risk which does not occur at all in the 'natural' scenario.
- These analyses only investigate the stated operational range of the fishway devices. They do not investigate any risks posed to lungfish by the operation of fishway devices, nor do they relate to the efficacy of the devices while they are within their stated operational range.

A spells analysis of the water levels and daily releases reported from the Paradise Dam S. Burgess. 14/06/2009

A 'spells' analysis (as described previously) was conducted on the daily data published by SunWater for the water height and volumes of water released from Paradise Dam. These two parameters govern the operational rules for the Paradise Dam fishway as described in the Resource Operations Licence for the Bundaberg Water Supply Scheme. These rules are related in turn to the conditions currently required for the upstream and downstream fish transfer devices to operate successfully.

In addition to examining the water levels and water release rates needed for the fishway to operate, this analysis also investigated periods of time during which no water at all was released from the dam. This information relates to connectivity in the river reaches downstream of the dam as well as connectivity at the dam site itself.

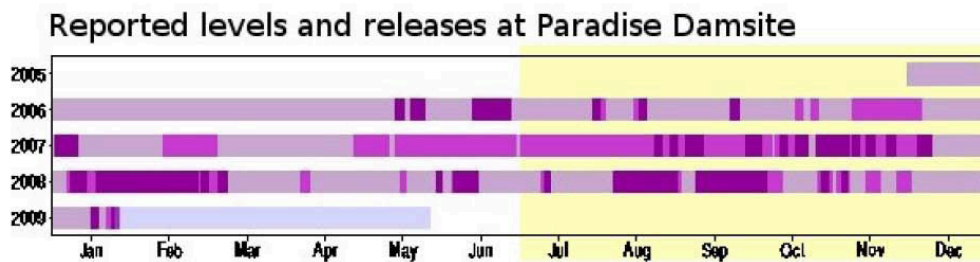


Figure 1. Spells analysis of water level and daily flow release data reported for Paradise Dam on SunwaterOnline

- Conditions met for operation of upstream and downstream fishway (water level between 62 and 67.6 m AHD, daily water release above 14 ML.)
- Water level below 62 m AHD – operation of downstream fishlock not possible, operation of 'fishway' not required by operations licence.
- Water level below 62 m AHD and daily release less than 14 ML. (Water release required for 'fishway' operation)
- Water level below 62 m AHD and a 'zero' water release reported.
- Period of time when lungfish movement to and from spawning sites normally occurs in the Burnett River (Brookes and Kind 2002)

Notes/observations:

- Data analyzed are those reported by Sunwater Online for the operation of Paradise Dam from 1/12/2005 (the start of the record for reported water level and release data) until 28/05/2009. This represents the longest data record available for both water level and daily releases at the time of analysis
- Water levels were below the elevation of the entrance to the downstream fishway for 90.35% of the record analyzed. This included for the entire duration of 3 consecutive spawning movement seasons in 2006, 2007 and 2008.
- There are 46 spells of no daily water release from the dam in the 3.5 year data record analyzed, collectively representing 18.37% of the record. The longest of these spells was 37 days. Some no-flow spells were interrupted by a single daily record of flow which broke what would have been a longer spell into two shorter spells. This frequency of no flow events equates to a frequency of about 1319 events per century
- The long-term IQQM simulations used in the Burnett Basin water resource plan to represent the 'natural' or pre-development state of the river at this location predict 169 no-flow spells (157 events per century), collectively accounting for 3.95% of the total 107.5 year simulation period. However these predictions encompass one extreme continuous no-flow event of 150 days duration, and three others longer than 37 days duration. Therefore, although the reported proportion of time for which no water was released and the frequency of these no-flow events has been significantly greater than the long term average for the 'natural' state of flow, the duration of the individual no-flow events recorded are within the range predicted for the 'natural' state of flow.
- To properly investigate how the periods of time during which no water releases were made from the dam compare to the estimated 'natural' no-flow regime for the river at that location, more detailed analysis is required. Such an analysis needs to consider the climatic conditions prevailing during the dam's operation in context with the long-term climate record.

A spells analysis comparing no-flow events reported from the Mt Lawless stream gauging station with periods of no water release from Paradise Dam

S. Burgess. 15/06/2009

A 'spells' analysis (as described previously) was conducted on the daily data published by SunWater for periods of time during which no releases were made from Paradise Dam. These periods were compared with the pattern of no-flow events recorded by the Department of Natural Resources and Water for the same period of time at the Mt Lawless stream gauging station. The Mt. Lawless station is the closest currently active station upstream of the impounded area of the Paradise Dam, in a free-flowing (non-impounded) section of the Burnett River.

Comparison of recorded 'no-flow' conditions at the Mt Lawless stream gauging station with the 'no-release' conditions at Paradise Dam

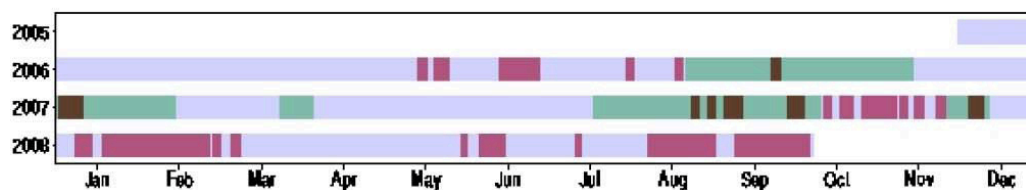


Figure 1. Spells analysis comparing periods of no-release from Paradise Dam as reported on SunwaterOnline with recorded no-flow events at the Mt Lawless gauging station.

- Common data record for both Mt Lawless and Paradise Dam
- No water released from Paradise Dam
- Zero flow recorded at Mt Lawless gauge.
- Zero flow at Mt Lawless and zero release from Paradise Dam

Notes/observations:

- The Mt. Lawless gauging station is approximately 52 km upstream from the Paradise Dam wall and in the natural state would generally experience lower flows than the reaches of the river further downstream.
- Licenced, validated data from the Mt Lawless station were sourced from the Department of Natural Resources and Water on 19/11/2008 and are used subject to the standard departmental disclaimer that applies to the use of such data.
- Analysis of the entire data record available shows that the period of time presented in this graph represents the most extreme period of no-flow events recorded at the Mt Lawless station since it commenced operation in 1975.
- The pattern and duration of no-release events from Paradise Dam during 2008 is very different to the no-flow pattern at the Mt Lawless gauge. In that year there were no cease-to-flow events at all recorded at Mt Lawless, yet there were very significant spells during which there was no water released at all from Paradise Dam.

WIDE BAY BURNETT CONSERVATION COUNCIL INC

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CERTIFICATE OF ANNEXURE

(Order 14, rules 2(2B) and 4)

This page and the following 2 pages are the annexure marked “**SB-4**” to the affidavit of Steve John Burgess sworn before me on 3 September 2009.

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Justice of the Peace / Legal Practitioner

Filed by the Applicant

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Updated graphs of daily storage and release data for Paradise Dam, as published on Sunwater Online.

S Burgess July 2009

Notes:

1. There are several missing data points in the published record of daily storage volumes. Data values for days with missing volume data were calculated from the water level measurement recorded for those days, using a volume:stage (height) relationship interpolated from the data record.
2. "Nett Inflows" were calculated as the daily increase in storage volume added to the daily release volume. On days where storage losses (eg. evaporation & seepage) are greater than true inflows, nett inflows will be negative.
3. The range of daily nett inflow volumes is an order of magnitude larger than the range of daily release volumes, making comparison on the same graph troublesome. Figures 3 and 4 show them at individually appropriate linear scales, and figure 5 compares them at the same linear scale.

Figure 1

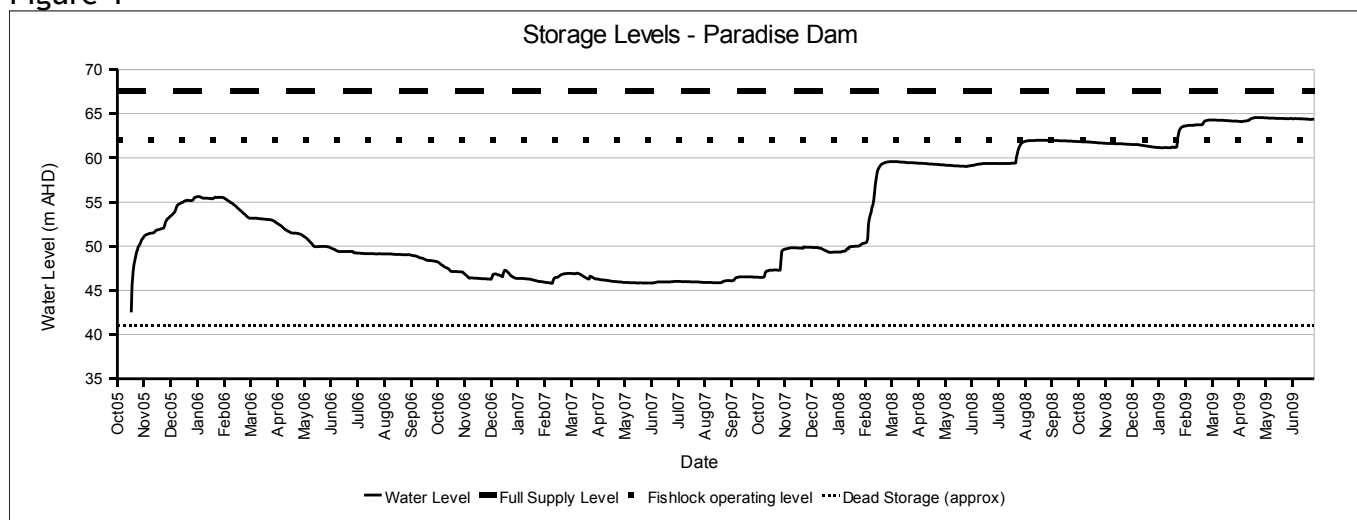


Figure 2

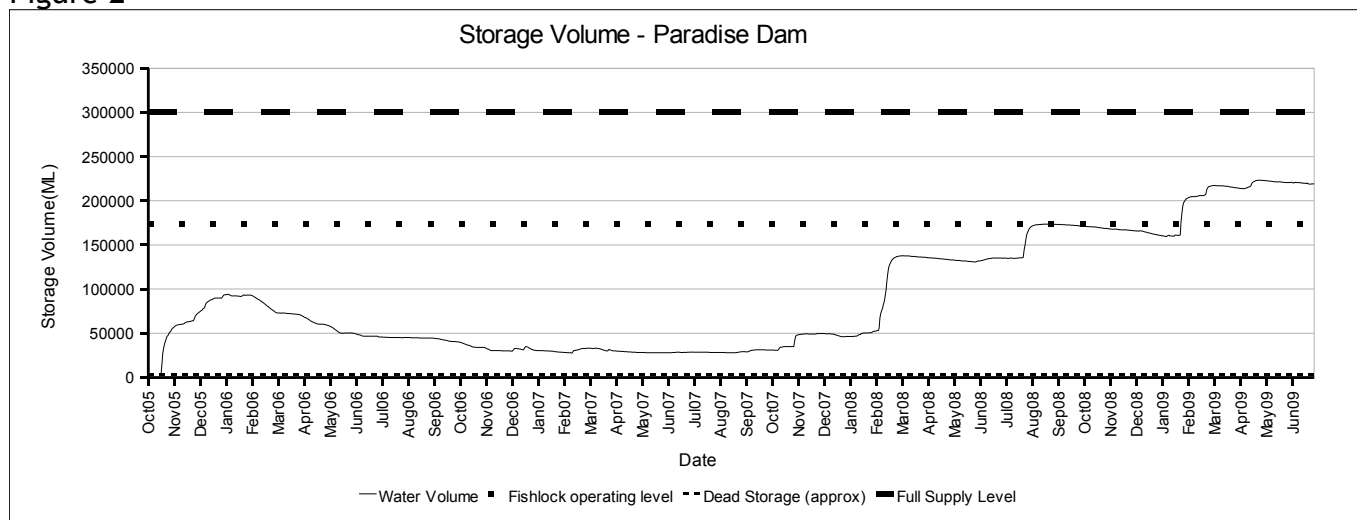


Figure 3

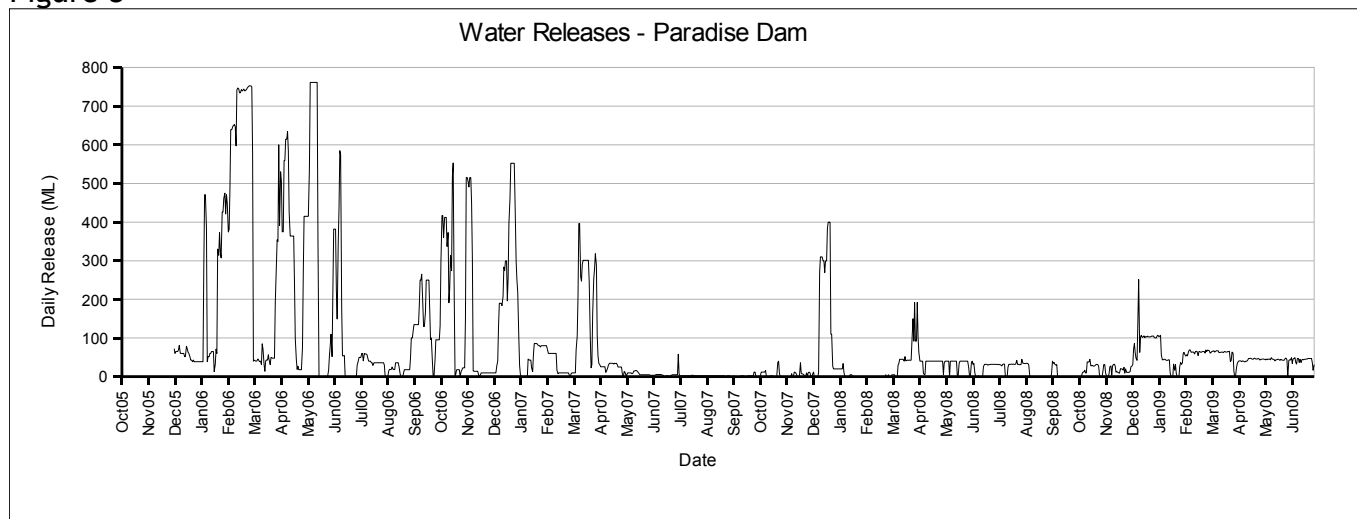


Figure 4

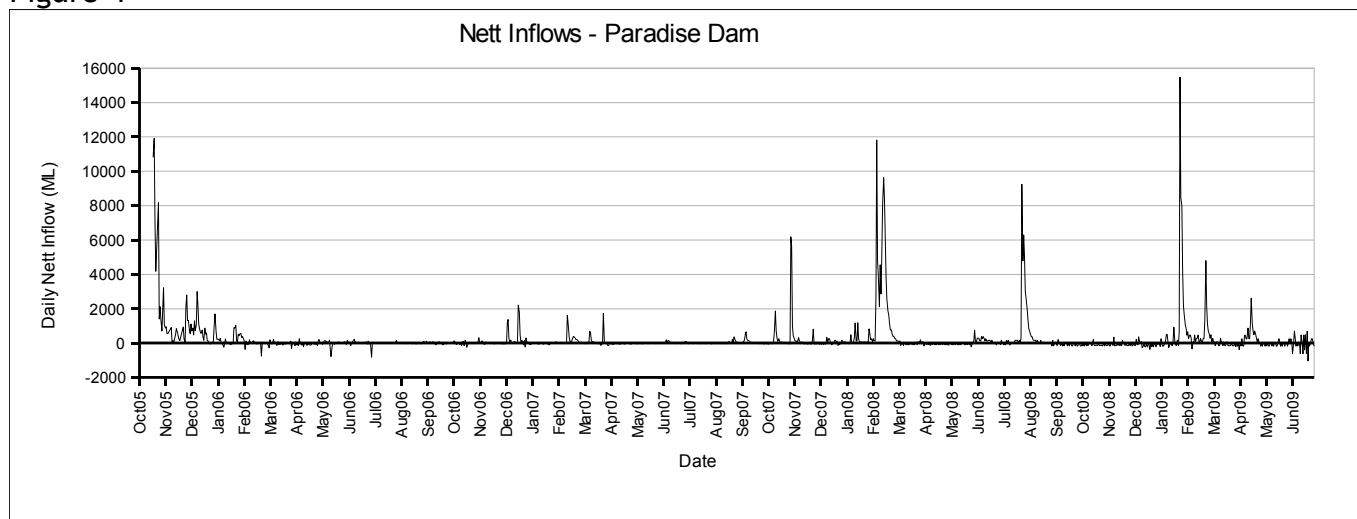


Figure 5

