



Consultation Report

North Pine Dam Optimisation Study

October 2014

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Executive Summary

The North Pine Dam Optimisation Study (NPDOS) was released for community consultation and submission 1 April 2014. This report summarises and responds to the issues raised during the community consultation meeting and through submissions.

The NPDOS was conducted to implement recommendations from the Interim and Final Reports of the Queensland Floods Commission of Inquiry. Understanding the needs of the community is crucial to presenting the Queensland Government with operational strategies for North Pine Dam and to effectively implementing the Queensland Floods Commission of Inquiry recommendations.

Community consultation was undertaken primarily through the Department of Energy and Water Supply (DEWS) website and a community consultation meeting. The website provided the necessary information and publications for members of the community to acquire knowledge about the NPDOS and to make an informed submission. An *Get Involved* survey hosted by the government's Get Involved website was also an important input into the submission process. A community consultation meeting was held where community members were able to hear about the study and discuss issues directly with DEWS, Seqwater and Department of Science, Information Technology, Innovation and the Arts experts. DEWS also released a discussion paper and used social media and advertising in the local newspaper to promote the NPDOS consultation period.

In total, 52 members of the community participated in the consultation for the NPDOS. The community consultation meeting was attended by 36 individuals, 7 submissions were received via letter and email, and there were 9 responses to the Get Involved survey by 30 June 2014. Of the 152 issues raised, 129 were directly relevant to NPDOS while 23 issues were not able to be answered or addressed by NPDOS.

The issues are grouped and discussed in this report under eight themes:

1. Dam operations
2. Dam safety
3. Water supply security
4. Bridge crossing and submergence
5. Downstream bank slumping and erosion
6. Downstream flora and Fauna
7. Infrastructure
8. Other issues

DEWS was particularly interested in the level of support for the government's preferred option of a semi-permanent (up to 20 years) lowering of the Full Supply Volume (FSV) of North Pine Dam to 90% with a concurrent lowering of the flood release level. The reasons for lowering the FSV are primarily for dam safety. However there are also secondary marginal improvements in the flood mitigation potential of the dam, more warning time for downstream residents and reductions in riverine erosion during flood events.



Of the 16 written and survey responses received, 8 supported the government's preferred option, 3 did not support this option and 5 responses were inconclusive. The three submissions which did not support the government's preferred option supported optimising the storage of water for water supply security not reducing the full supply level.

In general, the community supports the government's preferred option.

After analysing the submissions and feedback received there are three main findings that should be considered in finalising the NPDOS report:

1. Seqwater should consider strategies for minimising pulsed (night) releases to reduce downstream impacts to bank stability and aquatic fauna.
2. Seqwater should consider minimising impacts on banks stability and erosion as an objective of the flood manual as required in section 371F(c)(v) of the *Water Supply (Safety and Reliability) Act 2008*.
3. DEWS consider providing more information about the scientific investigation undertaken to look into the bank slumping and erosion in the NPDOS. This is desirable to more thoroughly explain to the community the scientific rigour that was applied during the bank slumping and erosion investigations.

What was learnt from the community consultation process include:

- The members of the community that took part in the consultation process were well informed about the nature of North Pine Dam and its role in the water supply network for SEQ.
- There is community concern that the flood operations of the dam affect bank slumping and erosion downstream of the dam.
- The flood mitigation manual for North Pine Dam should include minimising bank slumping and erosion as an objective.
- The community generally supports the increased frequency and duration of inundation of Youngs Crossing as a trade-off to reduce river erosion.
- The community supports the findings of the report, which state that the structural safety of the dam and consequently the safety of those living downstream of the dam is the paramount objective of dam flood operations.
- The community supports investigating the use of stepped ramp-down of dam releases to provide cues to fish and other fauna of dropping flows before full dewatering of habitat occurs.
- The community members that did not support lowering the FSV were concerned about the possibility of another drought impacting water supply security, particularly in light of continued population growth in the area.



Introduction

On 1 April 2014, the Queensland Premier and the Minister for Energy and Water released the North Pine Dam Optimisation Study (NPDOS) for community consultation and submission. This report summarises and responds to the issues raised during the community consultation.

The purpose of the North Pine Dam Optimisation Study (NPDOS) was to present and assess alternative operational strategies to enable the government to make informed decisions on the future operation of North Pine Dam, including whether North Pine Dam should continue to have a flood mitigation role.

The alternatives were assessed against competing objectives for dam operations, in particular balancing water supply security, dam safety, and impacts of dam operations on downstream infrastructure and environments. The optimisation of North Pine Dam is particularly challenging in that it is a gated dam designed for water supply purposes and located a short distance upstream of urban areas.

Community consultation was fundamental in enabling the government to understand the needs of the community before making a final decision on the future strategies for operating North Pine Dam.

Background

The NPDOS report implements relevant recommendations of the Queensland Floods Commission of Inquiry (QFCOI). The key purpose of the study was to identify and assess potential improvements to the operation of the existing infrastructure at North Pine Dam. QFCOI recommendation 17.3 required that the government be “presented with a wide range of options which prioritise differing objectives”. Recommendation 17.9 required consideration of whether or not North Pine Dam should be operated as a flood mitigation dam.

The QFCOI findings that supported the recommendations to establish the North Pine Dam Optimisation Study provided direction that extensive consultation be undertaken with the community and Councils. Furthermore the QFCOI Interim Report advised that any decision by the government about the strategies for the future operation of the dam follow this consultation and take into account the needs of the community.

Findings

After analysing the submissions and feedback received there are three main findings that should be considered in finalising the NPDOS report:

1. consider strategies for minimising pulsed (night) releases to reduce downstream impacts to bank stability and aquatic fauna;
2. include minimising impacts on banks stability and erosion as an objective of the flood manual as required in section 371F(c)(v) of the *Water Supply (Safety and Reliability) Act 2008*;
3. consider providing more information about the scientific investigation undertaken to look into the bank slumping and erosion in the NPDOS. This is necessary to more



thoroughly explain to the community the scientific rigour that was applied during the bank slumping and erosion investigations.

Our Approach

Community consultation was undertaken through the Department of Energy and Water Supply website, the use of social media, advertising in local newspapers, an *Get Involved* survey, and by holding a community meeting. Submissions were received both electronically and via the post. The methods used are explained below.

Dissemination of Information:

The Department of Energy and Water Supply published relevant material about the NPDOS on the official departmental website. This included the publication of the NPDOS Report as well as the accompanying discussion paper. The website included details on how to make a submission as well as details about the community meeting. Also included was a link to the *Get Involved* survey.

Community consultation meeting

The community consultation meeting was held in Warner in the Moreton Bay Regional Council Area near North Pine Dam on 27 May 2014 (Image 1).

The meeting was facilitated by an independent, external consultant. Minutes were taken at the meeting and used in the formulation of this report. 36 people attended the meeting. To inform the community about the study outcomes and to generate discussion experts from the DEWS gave detailed presentations about the NPDOS. Following the presentation the DEWS, Seqwater and the Department of Science, Information Technology, Innovation and the Arts experts were made available to answer questions about the report and the preferred option being considered by government.



Image 1: This is an image of the Community Consultation Meeting at Warner

Submissions

To ensure all members of the community were able to make a submission on NPDOS, DEWS made available facilities to receive written submission both electronically and through the post.

Get Involved Survey

The Queensland Government's *Get Involved* website hosted an online survey that allowed the community to provide feedback and comment on the report. The *Get Involved* survey was available from early May until 30 June 2014, with links from the department's website. Questions in the survey were specifically focused on receiving community feedback about the preferred option and its likely impacts. A free text comments section allowed feedback and comments to be submitted outside of the eight direct questions.

Reminders were posted on the Departments Facebook page and a reminder email was sent to those email addresses collected at the community meeting and from the optimisation study email inbox.

Discussion paper

A discussion paper was released to assist the community in understanding the study, the preferred option and key messages contained in the full report. The discussion paper



summarises the key findings of the NPDOS report, using simplified language and diagrams to discuss the concepts of the study while still maintaining the intent of the report.

The Community's Feedback

The community consultation period ran from 1 April 2014 to 30 June 2014.

The total number of respondents at 52 is small, with the community consultation meeting at Warner being attended by 36 individuals, 7 individual submissions via letter and email and 9 responses to the *Get Involved* survey. One individual provided two supplements to their original submission.

All letter and email submissions were received from Lawton, Petrie and Whiteside, which are suburbs near the dam; the majority were from individuals except for a representative submission from the North Pine Residents Association and one received from Moreton Bay Regional Council.

From the 52 responses and submissions, 152 issues were identified which have been grouped into 8 main themes including those issues directly relevant to the NPDOS Report and a group of issues described as 'other issues'. Other issues are those issues that cannot be addressed by NPDOS. Each of the themes is discussed in detail below.

Dam operations

The QFCol recommended (Recommendation 17.9) that the government consider whether North Pine Dam should be operated as a flood mitigation dam. This recommendation was made recognising that North Pine Dam was not designed to be a flood mitigation dam.

The community consultation indicated that the community has a high level of understanding of the water supply function of North Pine Dam within the regional water network. All but one submitter were aware that North Pine Dam was not a flood mitigation dam.

The *Get Involved* survey asked respondents if they supported Option 3 - the semi-permanent lowering of North Pine Dam to 90%; the majority said yes. The results of the survey generally show support for the government's preferred option; however the sample size is not large enough to provide a comprehensive statistical analysis.

Of the 16 written and survey responses received, 8 supported the government's preferred option, 3 did not support this option and 5 responses were inconclusive. The three submission which did not support the government's preferred option supported optimising the storage of water for water supply security not reducing the full supply level.

In general, the community supports the government's preferred option.

Dam Safety

In general, submitters recognised the priority of dam safety as a consideration for how North Pine Dam is operated.



The *Get Involved* survey asked respondents to indicate their support for increased inundation of Youngs Crossing as a result of the lower FSV if that lower FSV provided improved protection for dam infrastructure. Only one of the nine respondents indicated that they did not support increased inundation of Youngs Crossing in this context.

The views from written submissions demonstrate that the community supports the findings of the report in that the structural safety of the dam and consequently the safety of those living downstream of the dam is the paramount objective of dam flood operations.

Water Supply Security

The *Get Involved* survey sought to measure the level of support within the community for a semi-permanent lowering of the Full Supply Volume of North Pine Dam to 90 per cent for a maximum of 20 years.

The semi-permanent lowering of the dam to 90 per cent is the preferred option because there are minimal risks to water supply security for the bulk water supply system over the short term period of 20 years. Six of the nine survey respondents supported a semi-permanent lowering of the FSV of North Pine Dam. The three respondents that did not support lowering the FSV were concerned about the possibility of another drought impacting water supply security, particularly in light of continued population growth in the area.

Three written submissions raised the issue of water supply security. Two submitters were concerned about future droughts and the potential loss of water supply security if water supply storage is reduced for flood mitigation purposes. The NPDOS report concludes that, overall, the modelling results indicate that reductions in the FSV of North Pine Dam down to 90% FSV for 20 years will have a minimal impact on the performance of the bulk water supply system for SEQ.

DEWS has completed a review of the desired level of service (LOS) objectives; which are prescribed in Water Regulation 2002. Seqwater must now develop a detailed water security program by July 2015. The water security program will address any future infrastructure needs, demand management measures, and responses to drought conditions. The outcomes of NPDOS will be taken into consideration when Seqwater develop the water security program.

Bridge and crossing submergence

The *Get Involved* survey asked respondents about the frequency of their use of Youngs Crossing and whether they supported the preferred option to reduce the FSV of North Pine Dam. The question was asked because the NPDOS investigations revealed that the preferred option, if implemented, would result in small increases in how often and for how long Youngs Crossing was inundated and therefore not trafficable. Survey respondents supported increased inundation of Youngs Crossing as a trade-off when weighed against small improvements to dam safety, flood mitigation, increased warning time and reduction in potential river erosion. It should be noted that of the nine survey responses, two use the crossing often, six use the crossing sometimes and one rarely if ever.



Written submissions and comments made at the community consultation meeting also supported the preferred option, noting in particular that by reducing the FSV of the dam the time available for notification of downstream residents during flood events would slightly increase.

In Chapter 12 the NPDOS report considered bridge and crossing submergence during the assessment of operational options for North Pine Dam. Assessment considered impacts on bridge and crossing submergence including frequency and duration and traffic delays.

The results of the assessments show that:

- the frequency and duration of flooding for Youngs Crossing does not change significantly for lowered North Pine Dam full supply volumes down to 75%;
- lowering the dam to the existing fixed crest level of 42% FSV significantly increases the duration of dam releases, and consequently the frequency and duration of closure of Youngs Crossing; and
- without North Pine Dam the frequency of closures of Youngs Crossing would double and the duration of closures would be significantly longer.

The assessment does acknowledge that large numbers of vehicles can be impacted by submergence of road bridges with concomitant higher travel costs as a result of traffic diversions. The upgrading of North Pine River crossings is the subject of planning studies by the local government and other state government agencies and therefore NPDOS makes no recommendations about such matters.

Overall, the community supports the government's preferred option even though it will result in increased frequency and duration of the submergence of Youngs Crossing.

Downstream bank slumping and erosion

Chapter 13 of the NPDOS Report presents the results of a scientific investigation into the potential impacts of dam operations during floods on downstream bank slumping and erosion.

There is significant concern from some residents immediately downstream of the dam that the operation of the dam affects bank slumping and erosion.

Analysis of the submissions revealed that there are wide and varying views as to the cause of bank slumping and erosion. Submitters suggested the following as to what has caused or contributed to the erosion and damage to the river banks downstream of the dam:

- water being released from the dam at a velocity that breaks out of the river banks,
- changes to the flow regime allowing mangroves colonisation of the upper reaches of the river,
- “pulsing” (night time only) of flood releases in order to keep Youngs Crossing open during the day, along with the past practice of rapidly closing the gates, seen as a major factor in inducing bank slumping, and
- that the weir downstream of the dam decreases bank stability and prevents vegetation regrowth along the toe of the banks.

Other issues raised by submitters included:

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- Minimisation of erosion and bank slumping should be considered in the flood manual.
 - Loss of property and boundary migration due to erosion.
 - Silting up of the river and not having it cleared out since the 1980s.
 - The transfer of gravel and sediments along the river below the dam not matching natural river processes.
 - Concerns that the bank slumping and erosion study was desktop-based with limited site visits undertaken.
 - Bank slumping and erosion was not treated in the same proactive way as the rest of the issues covered in the report.
 - Chapter 13 of the report recognises that there is a lack of data in relation to the river and river processes. The community's preference is for a full and proper study as the correct way forward to determining future management of the dam and its surroundings.

Feedback from the community consultation meeting highlighted that pulsing of releases from the dam during drawdown after a flood event was considered an important issue. Although it was acknowledged that there is a trade-off between reducing the pulsing and the extending the time Youngs Crossing is closed to traffic, the community felt that the impact of pulsed releases on bank stability and erosion needs to be given more consideration. This issue is acknowledged in the NPDOS Report at section 4.2.7.

The current flood manual for North Pine Dam does not include a prioritised objective relating to bank slumping and erosion. However the NPDOS Report identified that this should be included in the manual to ensure compliance with minimising environmental impacts on the watercourse, as required under section 371F(c)(v) of the *Water Supply (Safety & Reliability) Act 2008*.

The scientific investigation carried out by DSITIA to inform the NPDOS Report used targeted site visits and aerial photography, and analysed the available data and information.

Based on the review of available data, it appears that the North Pine River system is insensitive to changes to the interactions between flow regimes, sediment transport, riverbank material and form, riparian vegetation and land use. In addition, the effect of the dam and release strategies relative to other human made disturbances in the systems (e.g. vegetation clearing, sand and gravel extraction) appears to be minor (NPDOS report Chapter 13). A more comprehensive study was suggested by some submitters but is not possible at this time due to limited data on the condition of or processes at work in the North Pine River prior to dam construction. Monitoring and surveys of downstream river conditions including soil types could be undertaken to provide a future reference condition.

Downstream flora and fauna

Submitters raised concerns over how to look after the waterways and associated flora and fauna. They would like to see leadership and ownership handed to people who are experts in these matters and able to give on ground support. They would also like monitoring of the wildlife downstream of the dam. It should be noted that there is an existing Pine Rivers catchment group in which members of the community can participate.



The submitters considered the weir downstream of North Pine Dam and the associated impounded water as prohibitive to the regrowth of vegetation along the toe of the riverbanks and in stream vegetation. They recognised that vegetation is vital to provide stability to the bank structure and its ability to handle flood events.

The NPDOS Report recognised the potential effect of pulse releases on erosion (Chapter 13) and fish stranding (Chapter 14). Section 14.4 of the NPDOS Report suggests that the use of stepped ramp-down of dam releases could be implemented to provide cues to fish and other fauna of dropping flows before full dewatering of habitat occurs.

Monitoring of aquatic ecosystem response to flow management is currently conducted under the Environmental Flows Assessment Program, administered by the Department of Natural Resources and Mines, and according to the environmental provisions of the *Water Resource (Moreton) Plan 2007*. Over time, the program will inform improved management responses to minimise environmental impacts.

Infrastructure

Written submissions and comments made at the community meeting questioned whether the development of water supply infrastructure has caused changes to Pine River flow regimes and the environment. Section 4.2.8 of the NPDOS report acknowledges such changes to the flow regime stating 'Such impacts have been necessary to support development in SEQ and cannot be changed significantly through dam operational changes.' The NPDOS investigations considered the implications of each operational strategy on, among other things, the submergence of road and rail bridges, bank slumping and erosion, and riparian flora and fauna

One submitter identified the bridge supports at Petrie as having contributed to significant erosion immediately downstream of the bridge. Another submitter identified that the presence of the weir downstream of the dam has prohibited regrowth of vegetation along the toe of the banks and in stream vegetation resulting in loss of bank stability. A further four comments identified the construction of the dam as fundamentally altering river flows and changing tidal regimes.

Submitters felt there was a need for more active management of the river system.

The long term impact of water supply infrastructure on flow regimes and the aquatic environment is monitored by other state agencies. Monitoring of aquatic ecosystem response to flow management is currently conducted under the Environmental Flows Assessment Program administered by the Department of Natural Resources and Mines and in accordance with the environmental provisions of the *Water Resource (Moreton) Plan 2007*.

Other Issues

Of the 152 submitted issues raised during consultation, 129 were directly relevant to study while there were 23 issues that the study was not able to answer or address.

Submitter's issues that were relevant to North Pine Dam (but were not able to be addressed by NPDOS) included:

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- flood proofing of transport infrastructure,
 - buyback of flood prone property,
 - property damage and compensation, and
 - kayaking in the river.

Some of the submissions raised valid concerns and comments relating to other projects being undertaken by both state and local government entities. It is intended to pass these comments and issues on to the relevant owner of the issue. Transport infrastructure and bridge issues will be sent to the Department of Transport and Main Roads, local government issues sent to the Local Government Association of Queensland, issues relating to possible dam infrastructure options will be considered as part of the prefeasibility study into potential future flood mitigation dam sites.

What we learnt

The results of the community consultation process for NPDOS demonstrate that the community generally support semi-permanently (up to 20 years) lowering the FSV of the dam to 90 per cent with the flood release level also lowered to 90 per cent FSV. A lower full supply level and flood release level enhances dam safety and marginally improves the flood mitigation potential of the dam and warning time for downstream residents during a flood event.

What was learnt from the community consultation process include:

- The members of the community that took part in the consultation process were well informed about the nature of North Pine Dam and its role in the water supply network for SEQ.
- There is community concern that the flood operations of the dam affect bank slumping and erosion downstream of the dam.
- The flood mitigation manual for North Pine Dam should include minimising bank slumping and erosion as an objective.
- The community supports the increased frequency and duration of inundation of Youngs Crossing as a trade-off to reduce river erosion.
- The community supports the findings of the report, which state that the structural safety of the dam and consequently the safety of those living downstream of the dam is the paramount objective of dam flood operations.
- The community supports investigating the use of stepped ramp-down of dam releases to provide cues to fish and other fauna of dropping flows before full dewatering of habitat occurs.
- The community members that did not support lowering the FSV were concerned about the possibility of another drought impacting water supply security, particularly in light of continued population growth in the area.
- The support for a minor reduction in the protection of the dam infrastructure to increase flood mitigation protection for houses and buildings is also mixed.
- The community support investigating the use of stepped ramp-down of dam releases to provide cues to fish and other fauna of dropping flows before full dewatering of habitat occurs.

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- A small number of respondents support making no changes to the operation of the dams until Alternative Urban 4 can be further investigated.



Telephone enquiries

Water: 13 QGOV (13 74 68) business hours

Energy: 13 43 87 business hours

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