

Bundaberg Water Supply Scheme (BWSS) Zoom Shed Talks Question and Answers

July 2020

Sunwater invited customers to online shed talks in June this year. This document shares the questions from growers across the three sessions and Sunwater’s responses.

If you have further questions about the scheme and the works at Paradise Dam please contact us on 3120 0270 or paradise.dam@sunwater.com.au. General customer enquiries should be directed to 13 15 89.

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Bundaberg Water Supply Scheme	
<p>1 Are the current Environmental Flow Objectives (EFO's) downstream of Paradise Dam meeting requirements and will environmental flows increase after the spillway is lowered?</p>	<p>Once the spillway is reduced and the dam is allowed to fill to the new height there is a slight improvement on all Burnett River EFO's as the spillway will again pass flows.</p> <p>With the dam water level being reduced down to 42%, but the spillway at the full supply level (FSL) we meet all the objectives except for the 5 year daily flow volume objective. This failure is due to the fact that every time we get an inflow we have to start drawing the water level down to 42% again using the outlet works which means the system isn't obtaining as many high flows. This impact is short term and is rectified as soon as the spillway is reduced.</p>
<p>2 What sort of data is being used for the capacity constraints study that Sunwater is undertaking? Will it consider that we are in a drought declared region and that water requirements will increase moving forward?</p>	<p>The study is using the design flow rates for the offtakes across the scheme and we have been fact checking individual flow rates at off takes to get a good understanding to see if users are taking the prescribed flow rates.</p> <p>We don't have telemetered meters to get real time data. Once the model is built, we can look at time of use data and see how that is changing as cropping has changed.</p> <p>The base case of the model is to identify what the scheme can pass and what we can deliver to customers. It will help us to understand current capability and that can then be used to see how the system can deliver on future demand. The model will be a tool to consider how future demand can be met.</p>
<p>3 Can the weed control that occurs in Sept/October be conducted during winter instead?</p>	<p>The weed control needs to occur when the weed is growing actively. Ideally, we should do those treatments every 10-12 weeks when the weed is active. We usually do one in September then just before Christmas and again around Easter. The chemical used for the treatment is very expensive to purchase and also has a high demand from a resource perspective, so we need to apply it at the optimal time to yield the most effective results. It can't be done in winter as the weed isn't active then so it wouldn't provide a benefit.</p>
<p>4 How often is water quality testing conducted and where are the results available?</p>	<p>Sunwater does water quality testing as per the conditions on the BWSS Resources Operations Licence (ROL). The ROL requires us to test water quality from September through to May.</p>

Question	Answer
	<p>Grab samples are taken at tail water sites and at points of water release, generally monthly. Water quality profiles are also taken in storages.</p> <p>The parameters tested include turbidity, salinity, pH, temperature and we also measure the depth of the various storages in the scheme.</p> <p>The results are provided to DNRME for historic records. We don't alter anything or act on the results, the data is collected to observe how storages react in different conditions.</p> <p>E.g. after the 2013 flood event there was increased salinity due to leaching from the substrate upstream due to a natural phenomenon that occurs after flood events.</p> <p>The data is available on the Sunwater website at: https://www.sunwater.com.au/customer/water-quality/</p>
Allocations	
<p>5 Once the Essential Works are complete and Paradise Dam is allowed to fill to the new height, what impact will that have on Announced Allocations? Will there be adjustments made at that time?</p>	<p>At the beginning of the water year on 1 July we can only calculate allocations using the reduced supply level of 42%.</p> <p>Once the Essential Works are complete and the dam can fill to the new adjusted spillway height, we will recalculate announced allocations once inflows are received.</p> <p>We are targeting December 2020 to complete the spillway lowering but there is likely to be some carry over work into 2021. We will be able to raise the storage level above 42% and to the new spillway height on completion of that carry over work. That will occur sometime in 2021, it may be early 2021, but could be mid 2021, depending on the progress of works and noting that the ability to carry out any works during the wet season is likely to be limited.</p>
<p>6 Is the rule change that quarantines the Sunwater volume just in place for the duration of the Essential Works? Is that likely to remain in place if the dam isn't returned to the original spillway height?</p>	<p>There are a number of options that we could look at, but a decision will be subject to information about the final spillway height of Paradise Dam.</p> <p>An example where storage capacity was reduced was upstream in the upper Burnett where a fabridam was removed at Claude Wharton Weir. The capacity lost there was moved to a low priority allocation and Sunwater chose to hold</p>

	Question	Answer
		<p>that allocation, with the view that in the future we may be able to restore that storage.</p> <p>We won't make a decision about that unsold water at Paradise until the future of the dam is known. We need clarity before making that decision and will engage with the Irrigator Advisory Committee (IAC) and customers when making that decision.</p>
7	How is water from Fred Haigh Dam allocated?	<p>Fred Haigh Dam is a bulk capacity share with two accounts – one for the Kolan sub-scheme and one for the Burnett River sub-scheme. As inflows come into Fred Haigh it is put against those two accounts with 85% to the Kolan sub-scheme and 15% to the Burnett River sub-scheme.</p> <p>When Kolan customers order water it only comes from the Kolan account. When Burnett customers order water it only comes from the Burnett account.</p> <p>Only once since Paradise Dam filled, for a short period during the repair works in 2013, has the Burnett sub-scheme had to draw water from the Burnett Fred Haigh account.</p> <p>The Burnett account from Fred Haig has otherwise stayed unused.</p> <p>So, if Paradise Dam was to get to a level where it can't supply allocation holders then we would look to use the Burnett account from Fred Haigh.</p>
8	Can the Burnett sub-scheme share from Fred Haigh Dam ever increase beyond 15%?	<p>The capacity of Fred Haigh Dam is 562,045 ML.</p> <p>The storage capacity of Fred Haigh Dam is split 85% to the Kolan sub-scheme and 15% to the Burnett River sub-scheme.</p> <p>When inflows are received into Fred Haigh, they are split 15/85 into the Burnett and Kolan sub-scheme accounts respectively. Once one of the accounts is full any further inflows all fully go into the other account. When the dam is spilling both accounts are full.</p> <p>There would need to be a regulatory change to amend the 15/85% split. Sunwater has no intention to make an amendment to the bulk capacity share rules for Fred Haigh Dam.</p>
9	If Sunwater's water sales had been more successful would customer water security have been lower now?	<p>If the tender had been more successful, and more water had been sold from Paradise Dam, then there would have been less water available for Sunwater to quarantine via the change to</p>

	Question	Answer
		<p>water sharing rules and there would have been a bigger risk to customers water reliability because of the reduced level of Paradise Dam.</p> <p>Under that scenario, Sunwater would have had to come up with a different way to mitigate the impact.</p> <p>The unsold amount has provided an opportunity to mitigate the reduced supply level at Paradise Dam.</p>
10	How is monthly reliability calculated? Over what time frame is that based	<p>The Burnett Basin Water Plan is underpinned by the department's Integrated Quantity and Quality Model (IQQM) with a simulation period based on over 100 years of climatic data (from 1890 to 2008) and stream flow data from the 1950's onwards. This provides DNRME with a good picture of different climatic conditions. The Water Allocation Security Objective (WASO) performance indicator is called the monthly water sharing index.</p> <p>For MP allocations in the BWSS the WASO is 90%.</p> <p>Generally, it assumes that customers want to use 1/12th of their allocation per month. A 90% reliability means that 90% of the time customers will receive the full 1/12th of their allocation each month.</p> <p>E.g. if your allocation is 120 ML, then 90 % of the time you would receive 10 ML per month.</p>
11	When Sunwater says the allocation is better under the water sharing rule change because we are sharing to fewer people, is that because the unsold Sunwater allocation has been quarantined?	<p>Yes, that's correct. Even though that water was unsold it was still an allocation that Sunwater could have sold and was shared its portion of the storage volume each year. Under the rule change the unsold water is the portion that is not going to receive a share of the storage volume anymore.</p>
12	What if we have prolonged dry conditions - what is the allocation going to look like then - say after five years of dry?	<p>The modelling that's behind the Water Plan is not forward looking, it only looks at the 118 year period they have data for. We don't forecast allocations for years into the future, but announced allocations would likely to be reduced at the start of each water year in prolonged dry conditions. This would be the case had no works occurred at Paradise Dam.</p>
13	How soon will you look to change the water sharing rules after completion of the Essential Works to lower Paradise Dam by 5.8 m.	<p>Water sharing rules generally align with a water year from 1 July - 30 June and don't usually change mid-water year.</p>

	Question	Answer
		<p>The intention is to review the rules once we know the scope of works for the full remediation of the dam and what the ultimate spillway height will be.</p> <p>Any changes to water sharing rules would be discussed in advance with the Irrigator Advisory Committee (IAC). If there was a request to consider the rules earlier, we could reconsider that in discussion with all customers.</p>
14	<p>There is still a lot of rhetoric about what Paradise Dam's condition and safety is going to be like, we don't know if the 5.8 m lowering will be the end of the lowering works. Will the water sharing rules change before the final height of the dam is known?</p>	<p>We don't think it's a good idea to change the water sharing rules all the time, however if there was strong grower interest in reviewing the rules, we would be open to hearing proposals and to working with customers to find a solution that works.</p>
15	<p>What percentage of water is used in the sub-scheme? Wouldn't the percentage of water use increase in a prolonged drought?</p>	<p>Historical usage in the Burnett sub-scheme ranges from 100,000 to 180,000 ML per year. This equates to a range of 40% to 70% of available water. The Network Service Plans provide more information and are available online¹.</p> <p>Paradise Dam created a yield of 124,000 ML of medium priority, and 20,000 ML of high priority – only around 20% of that has been sold.</p> <p>Note that the yield is not the storage volume. The yield is dependant on the frequency, volume and reliability of inflows from the catchment over time, and the storages ability (size) to retain enough volume to provide ongoing supply.</p> <p>Note that it's not just Paradise Dam that supplies the Burnett River sub-scheme, water is also provided by Ben Anderson Barrage, Ned Churchward Weir and Fred Haigh Dam.</p> <p>All the modelling through the Water Plan assumes full entitlement use (100% of the water allocated is used each year).</p>

¹ Refer to https://www.sunwater.com.au/wp-content/uploads/Home/Schemes/Bundaberg/2021_Service_and_Performance_Plan_Bundaberg_Bulk_Water_Service_Contract.pdf

	Question	Answer
16	How much far down in the dam can you go to get water out?	Paradise Dam is designed to supply water down to 4% storage capacity although Sunwater expects that supply would need to be supplemented from Fred Haig Dam once Paradise reaches 7%. Water quality from releases at low levels is also expected to be poor.
Essential Works		
17	What constitutes the Essential Works – is it just the spillway lowering and reinstatement of the crest or does it included all the other works that are deemed necessary to repair Paradise Dam, including at the apron etc?	<p>The Essential Work is just the lowering of the spillway and putting in place a concrete cap at the lowered level. This is just the first stage of the project. It is the minimum work required to reduce the risk of a dam failure prior to the next wet season.</p> <p>There are a lot of other works required at Paradise Dam and the scope of this further long-term remediation work will be developed in light of the testing and sampling work conducted this year.</p> <p>The target completion date for the long-term remediation works is indicatively around the end of 2025. This will include downstream protection works and further strengthening across the primary and secondary spillway, including post tensioned steel anchors or mass concrete buttressing.</p>
18	Is it guaranteed that the storage level will be able to go up to the new spillway level (post the 5.8 m lowering)? If the dam is found to be in worse condition might you need to keep it at 42%?	<p>Correct, that is a potential risk. If there are significant changes identified in the dam and the condition of the Roller Compacted Concrete (RCC) is worse than anticipated, then it may be prudent to keep the dam at 42%.</p> <p>The Essential Works will improve the dam against the risk of a failure to a considerable extent, but we don't know yet exactly what we will find.</p> <p>We will have a lot more visibility once the testing results are available. The full set of results is not expected to be available until December 2020.</p> <p>The initial tests will be a trial, then there will be 1-2 months of testing including extracting blocks from the secondary spillway and later from the primary spillway, sending them to a laboratory for testing, and analysis of results.</p>
19	Is the block sampling to be conducted at a lower level on the secondary spillway compared to	Yes, that is correct.

	Question	Answer
	the location of testing on the primary spillway?	
20	When the samples are analysed by the lab(s) and results are interpreted is there a process whereby Sunwater will engage with stakeholders to discuss that and how it impacts on decisions about the future of the dam, or will those decisions be made behind closed doors?	<p>The test results for the RCC will be reviewed by the project Technical Review Panel (made up of seven national and international experts, our engineering consultants, GHD, Steve Tatro and Jim Hines (Building Queensland's (BQ) independent expert) – so there will be a lot of people with expertise in RCC looking at those results and advising on the long-term engineering remediation works that are required to strengthen the dam.</p> <p>There will be ongoing engagement through the Detailed Business Case (DBC) process led by BQ.</p> <p>Test results will factor into the long-term remediation planning for the dam and so will the demand study and economic analysis.</p> <p>Consultation will occur via the Paradise Dam Industry Forum (PDIF), customers and the broader community as the options are considered.</p>
21	Where will the RCC block testing be conducted?	We are currently looking at four different laboratories - one in Brisbane and three in NSW.
22	When will the block testing occur and if results aren't that bad can you stop the lowering of the spillway?	<p>To get the blocks out we need to get a good in-situ sample that is indicative of that section of the spillway. We need to cut a fair way into the spillway to get the samples.</p> <p>The first samples will be taken from the secondary spillway, and that work has started. It will take over a month to cut through and get the blocks out as it needs to occur very carefully. Engineering experts on the Technical Review Panel have reviewed the methodology to ensure that the blocks are not disturbed as they are removed.</p> <p>That first block will be a trial for the next sample locations. It will be August or September at best before we get the blocks out of the primary spillway and we won't get full results on those samples until the end of 2020.</p> <p>This sampling work will inform the long-term remediation of the dam, but not the Essential Works that will be largely complete by December 2020.</p>

	Question	Answer
		<p>It is also important to note that while the RCC is the largest risk factor, it is one of three key dam failure risks. Risks with the foundations and scour also need to be considered and addressed when planning the remediation of the dam.</p>
23	<p>Can the dam sustain a serious flow and overflow of the spillway while the cap is off?</p>	<p>Yes, it can sustain typical flows but the Emergency Action Plan (EAP) trigger during the works is very low to ensure that the Local Disaster Management Groups (LDMG's) start considering evacuation of downstream areas in a smaller flooding event during the works. The evacuation trigger during the initial phase of the Essential Works is for a 1 in 7 year flood event, but this may change and improve slightly as lowering progresses</p> <p>Considering annual flows this is much less likely to occur during the dry season, but it is possible.</p>
24	<p>If the dam sustained an overflow event during the Essential Works would this be a risk to the dam?</p>	<p>The trigger level for downstream evacuations is for protection of the downstream community, and has been revised and will be further reviewed during the Essential Works.</p> <p>More regular flood events will be able to pass safely during the Essential Works. The dam will be monitored very closely in mid-range flood events.</p> <p>The risk of damage to the dam from larger flood events initially increased during the Essential Works, as a result of construction activities and removing the reinforced concrete crest. As lowering proceeds this risk will progressively reduce. At the completion of the Essential Works there will be a significant improvement compared to the previous dam condition.</p> <p>We are conducting the Essential Works in the dry season to appropriately manage the risk of the construction work.</p> <p>The risk of a dam failure in a significant event for the existing dam, prior to works commencing, was the driver for the Essential Works.</p>
25	<p>What can you tell us to allay our concerns about the spillway being lowered further? Will it be lowered further to meet ANCOLD guidelines and what are the implications for each metre of</p>	<p>Sunwater is conducting the Essential Works in accordance with a direction from the Dam Safety regulator to lower the spillway by approximately 5 m, we don't have a remit from the regulator to lower the spillway significantly more than that. There is a chance that the RCC lift joints are significantly worse than expected, but this is a</p>

Question	Answer
	<p>staged project and there is a lot of other strengthening work that needs to occur as part of the next stage to remediate the dam.</p> <p>The Essential Works are required to lower the risk of a dam failure before the next wet season and we are on a tight timeline to get that done by December.</p>
<p>26 As the dam level is lowered there is more land exposed in the dam – do you have to remediate that land that is exposed permanently?</p>	<p>Potentially yes, there is more work to do as part of the environmental impact assessment to understand the long term impacts for whatever the final level is, if not returned to full supply level. The extent of that is yet to be determined, but it is a consideration for the options assessment undertaken for the Detailed Business Case.</p>
<p>27 Is there a process by which alternative dam sites may be identified if Paradise Dam needs to be lowered further?</p>	<p>Yes, three working groups have been established under the PDIF:</p> <p>WG1 – is looking at the option of an alternative water product.</p> <p>WG2 – is considering the inputs required for a robust economic assessment. Bundaberg Regional Council and Adept Economics are participating in this group. The group is looking at the inputs that need to be factored into the longer term need assessment to ensure it has input from industry and is robust to ensure that government has the information that it needs to consider the water demand into the future.</p> <p>WG3 – is identifying alternate water storage options should they be required, depending on the final remediation option for Paradise Dam. It is also looking at the existing system constraints and understanding how these constraints can be overcome to foster the opportunity to open up new parcels of land for development. We need to ensure that supply is available ahead of demand.</p> <p>BQ is involved in each of the working groups and will be taking the outputs from those groups into the DBC process.</p>