INQUIRY INTO FLOODPLAIN HARVESTING

Public hearing: Monday 20 September 2021

Supplementary questions directed to Namoi Water, Mr Andrew Watson and Mr Daniel Kahl.

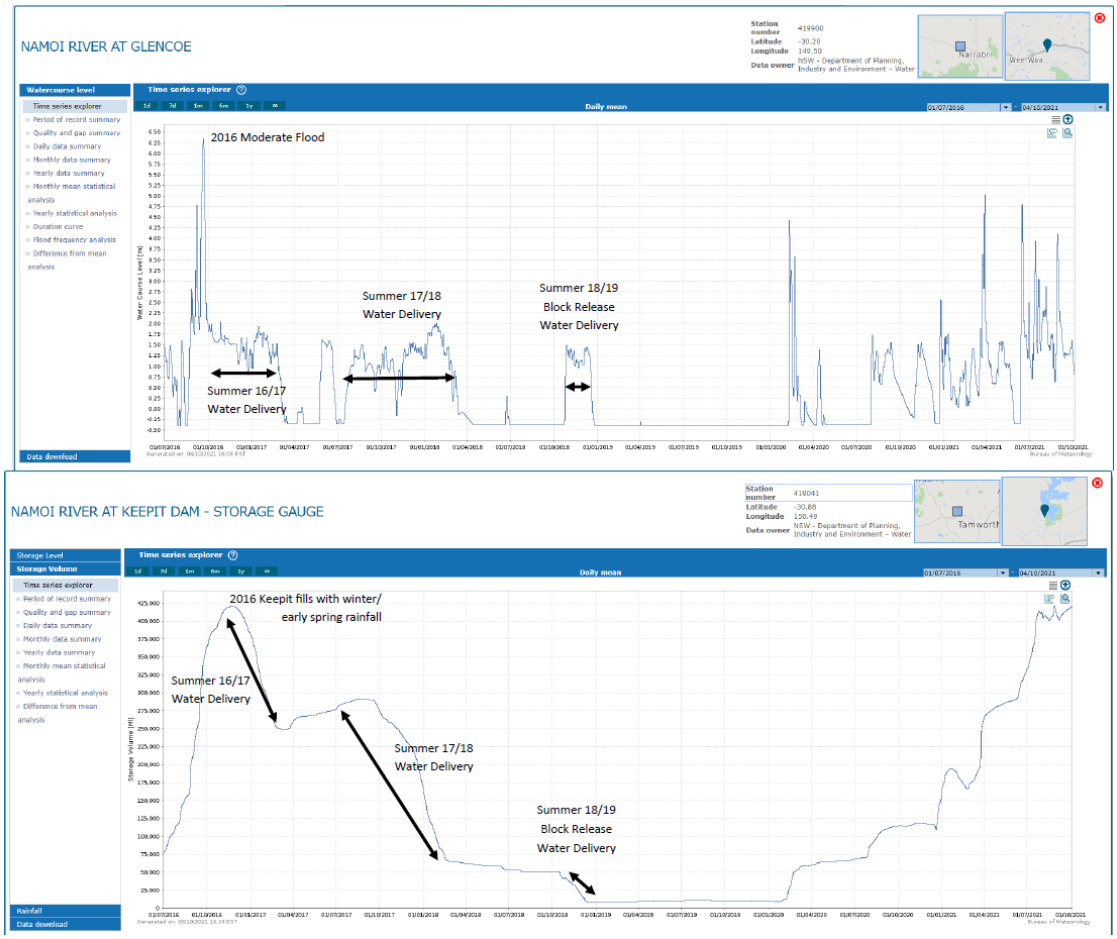
Namoi Water (no specific witness)

The Dharriwaa Elders and other have raised concerns that in 2018 the Namoi River at Walgett was dry at the same time up stream irrigator storages were full or contained water.

1. Did the filling of storages stop the flow of the Namoi River at Walgett in 2018?

Absolutely not. Any water extracted by license holders in 2018 from the Namoi River would have been metered take done only to take delivery of General Security water stored in Keepit Dam from inflows, mostly in 2016, and ordered from Keepit Dam as part of a block release conducted by WaterNSW in late 2018 (late October to late December).

Please see the below image (or for a larger copy the attached the file "Keepit vs Namoi flow 2016-2021"). These graphs compare the volume of Keepit Dam and flows at the Glencoe gauge at Wee Waa. Following a wet winter in 2016, the region entered an extremely dry period until April 2020. There is a clear correlation in these graphs of flows in the river and water being released from Keepit to meet orders by licence holders.



This is exactly how the dam should function, allowing the storing of water in wet periods to allow production in dry times. Under the Namoi Regulated River Water Sharing Plan, the water that flows into Keepit Dam is allocated to various water uses (including General Security licence holders) and then delivered. Licence holders pay for this water to be stored through their licence fees and charges as set by IPART. The water stored allows licence holders to income flowing through dry years, pay their equipment and land finance bills and provides job security for farm workers and supply businesses.

Without Keepit Dam functioning in this way, the Namoi would not have had any significant flows from 2016 until 2020. It should also be noted from these graphs that prior to and following the block release of water in 2018, the Namoi River had ceased to flow at Wee Waa as well, not just at Walgett. Not including the block release in late 2018, the entire length of the Namoi had no flow in it from April 2018 to February 2020, such is the normal function of an ephemeral river system.

a. Were the storages filled? The number of storages and how full they were filled is not something Namoi Water can answer specifically but in general terms, it is likely that many land holders and licence holder had water stored in their on farm storages during 2018. If they were filled then it was only from metered take from General Security Licences, Groundwater (bore) licences or other forms of existing watering as described in the answer to your next question.

b. What water was used? As described during the inquiry hearing, these storages are multipurpose pieces of infrastructure that hold water from a number of sources. Water held on farm in 2018 could have been sourced from;

- Water carried over and stored on farm from 2017.
- General Security water, stored in Keepit Dam from 2016 inflows and delivered in the block release in the Namoi River and stored for use throughout the rest of the summer.
- For those holding groundwater works, groundwater pumped in preparation for the summer and stored for use later in the season.
- And while storm and rain events were few and far between, it may also include tailwater and rainfall runoff from fields that were irrigated prior to rain.

2. If irrigators understood that 1994 was a cap on development, why did they then proceed to massively increase storages in the northern basin?

Would it be appropriate for any other industry to stand still and not improve the efficiency and capacity of their infrastructure for 27 years? The need to improve the size of storages and improve development on farms is driven by the need to improve the efficiency of water use and ensuring that water can be stored when it becomes available. The block release in 2018 is a prime example of one reason for this. Given the window of access was reduced in that year due to the dry conditions, licence holders need to have the capacity to store that water on farm or be restricted from accessing the water that has been allocated to them.

It should also be noted that there is a long history, before and since 1994, of government incentive and encouragement to increase and improve on farm water infrastructure. Projects have been incentivised by multiple governments to undertake on farm water infrastructure works through government funded programs and as described above, the changing nature of water access (as a result of a number of factors but including significant influence from policy and regulation set by government) has been driver in on farm development continuing.

Finally it is an important point, that simply cannot be emphasised enough, that an increase in the capacity of storages does not mean an increase in the volume of water that can be taken once all forms of water take become measured and monitored. The volume of water that can be taken is set by legislation and regulation, not by the size of storages on farms.

3. How many megalitres of water does it take to grow a hectare of cotton, on average? With due respect, Namoi Water does not see the relevance of this question. Licence holders hold a licence that allows them to access water, when it is available, for use in primary production. What crop they use that water on is their choice and will be driven by any number of factors. Namoi Water represents water users, not growers of specific crops. We also question the relevance of this question to the inquiry. This issue is a matter of access to water, how much, where and when. Any concern regarding the use of that water should be limited to broad terms such as 'will it be used for irrigating crops', not specifying particular crops and the requirements of those crops. The market will ensure the use of that water for the highest good because any licence holder that doesn't do that, within the bounds of their own unique business, will soon fail. Namoi Water would be greatly disappointed if the consideration of the matter of FPH is allowed to be caught up in politicised debate over specific crop types.

4. How regular are flood events in the Northern Basin?

Please see the below image (or for a larger copy the attached the file "Recorded Flood Peaks") showing the number and height of significant flood events based on the Glencoe gauge at Wee Waa.

Recorded Flood Peaks at Glencoe Gauge (Wee Waa)

Notes
- *Original gauge located at Glencoe river pump site approx 825m downstream of Glencoe houses*
- *Gauge posts positioned behind Glencoe houses in ~1970's and manually read*
- *Telemetric gauge installed to replace gauge posts at same site behind houses in 19??*
- *Telemetric gauge and posts relocated from site behind houses to new site approx 350m upstream beside pumps at old Collins Bridge site in 2019*

- *Table shows flood events with days at heights greater than 6.2m. This is the height required for water to begin flowing over the floodplain.*

Month	Year	Meters	Days > 6.2m	Comments
Feb	1941	6.83		Adjusted to metric and from original gauge highest of 5 peaks over 7 mths
Aug	1952	6.87	*Heights pre-1976 recorded in feet. Conversion to metric to complete data of time > 6.2m not complete.*	
Feb	1955	7.32		
Feb	1956	7.06		
Jan	1962	6.85		
Jan	1964	6.96		
Jan	1968	6.36		
Jan	1971	7.35		19 days over 6.8 joined with Gwydir.
	1974	7.45		
	1976	7.26		
May	1977	7.17	24.5	Highest of 4 peaks over 4 months (1xFeb, 1xMar, 1xApr, 1xMay)
July	1978	6.75	3	
Feb	1984	7.52	12	Highest recorded at least back to 1910. Second peak later in month 6.62m
July	1984	7.06	7.5	
Nov	1984	6.30	3.5	
June	1989	6.80	8.25	Highest of 4 peaks over 5 months. (April, May, June, August)
Aug	1990	6.79	8.75	Highest of 3 peaks over 5 months Apr x 1, Aug x 2
May	1991	6.62	4	Highest of 3 peaks over 6 months (January, May and June)
Jan	1996	5.84	-	
Feb	1997	6.96	1	
July	1998	7.39	32	Highest of 7 peaks over 5 months (June, July x 2, Aug x 2, Sep x 2)
Nov	2000	7.46	9	
Dec	2004	7.16	3.5	Pilliga scrub flood Namoi east of N'bri contained in river.
July	2005	6.28	1	Coxs creek only supply.
Jan	2010	6.27	0.5	Coxs creek and N'bri local and scrub. No Namoi.
Dec	2010	6.89	12	
Nov	2011	6.90	7	
Feb	2012	7.28	8	No major flooding upstream of N'bri
July	2012	6.24	0.5	Kaputar water followed (1day) by Pilliga Scrub Water approx 75mm rain broadly over catchment in 3days prior. Chaffey and Keepit full :- open for release. A river flood, No rain during flood.
Sept	2016	6.36	1.75	
Days access to Overland Flow (height over 6.2m)			**147.75**	
Events with 3 or more days access to Overland Flow (height over 6.2m)			**14**	

This table shows floods that have reached a height of 6.2m which is required to enter the floodplain at that point in the river. There are 30 events recorded in the period since 1941, an 80 year period. While the number of events in the last 80 years suggests that on average there is a flood event every 2.7 years it should be noted that there is a tendency for floods to occur in clusters or grouping (e.g. three events in 1984 or 5 events between January 2010 and July 2012). This emphasises the point that flooding occurs only in periods of above average rainfall. When we have a lack of rain or a generally drier period, these events do not occur and there will be long periods without an event (11 years between 1941 and 1952 or 6 years between 1956 and 1962, 1978 and 1984 and now approaching 6 years since 2016).

Since 1977 there have been 147.75 days duration of flood events higher than 6.2m, an average of 3.35 days per year of access. But these events have varied in duration from half a day to over three weeks in an event with multiple peaks (1977 or 1998 for example). The regularity of flood events in this valley is highly variable both in terms of when events occur and how long they last for meaning the impact of and access to the events is also highly variable. This data reflects only one small area of the Lower Namoi floodplain area at Wee Waa. The same variability would apply with different results in other areas within the Namoi valley and across the Northern Basin.

5. What would prevent an irrigator from wanting to take 500% of their allocation in a single flood year?

This question goes to the heart of the FPH modelling; the alternatives are to issue an annual licence to each FPH participant calculated as their proportion of the total modelled FPH take, or to issue a smaller annual licence of one fifth of that proportion of total FPH take, with the ability to carry over unused licence up to a maximum 500%.

The answer to the question above and the file "Recorded Flood Peaks" speaks to the variability of flood events occurring and their duration, which equates to access in terms of FPH take.

The second option to allow a 500% carryover better reflects the natural variability of flooding events. It allows the capture of that water to occur in the generally brief windows which flood events exist so that the accessibility to the FPH water licensed matches the volumes of the licenses more realistically. It also means if an irrigator were to take all of their '500%' FPH allocation in any one year, they would be limited to only that smaller annual licenced amount (or 1/5th of modelled FPH take) in the event of the subsequent year having floods because they would have no carryover left.

In terms of what would prevent an irrigator taking 500% in a single year, it should be noted that during flood events it is uncommon that on farm storages will be starting from empty and the fact that there has been rainfall to cause the flood event will mean the landholder will have already stored rainfall runoff along with any water from other forms of take in the storages before beginning to take FPH water. The short windows in which floods often occur may also limit an irrigators ability to take 500% in one year due simply to the duration of the event restricting their ability to take water.

6. Have you modelled the impacts of climate change in your valley?

Namoi Water has not undertaken any specific modelling of the impacts of climate change in the Namoi Valley. However, as modelling is undertaken and potential impacts understood, the Water Sharing Plans for each valley or water source have the capacity to manage the impacts of climate change. Water for irrigation use is the last to be allocated under the hierarchy of water users. If there is no rain and subsequent runoff into River storages, then there will be no allocation to General Security licences. If there is no runoff into unregulated streams and rivers, there will be no allocations to Supplementary Licences and no take from Unregulated Licences. And without rainfall the take of FPH water will not be possible due to the absence of any flood events.

a. What do those models say about the reduction in flood events due to climate change?

In the absence of specific models undertaken by Namoi Water, we have nothing to suggest there will be a reduction in flood events. However as a general comment, the potential impacts of climate change point towards more irregular and more extreme weather events. If that is to be the case, having infrastructure and accounting rules in place to ensure that FPH can occur under those conditions is extremely important.

b. What do those models say about the reduction of inflows due to climate change?

Again, the Water Sharing Plans for each water source have to ability to take into account reduced inflows and in turn provide reduced allocations or AWD's through to consumptive users if necessary in

the event inflows are not sufficient. These Watering Sharing Plans also include the need to provide end of system flows into downstream systems and help to ensure the fair distribution of water.

In answer to all parts of Question 6, whatever the impacts of climate change, the need for ensuring access to water for all stakeholders is paramount. If in fact weather events are to become more irregular and more extreme as a result of climate change then the ability to store water when it is available, both in private and public dams, should be seen as even more crucial for our ability to survive dry times with a lack of rainfall. Not just for irrigators but for town supplies, environmental water holders and high security water users. If events are to become fewer and further between but more extreme, the ability to capture that water (once the system has enough to ensure all other needs are met) is paramount to the people, businesses, towns, communities and local economies that rely on that water through dry times. It is important for all to understand that once FPH is regulated, measured and monitored, it will allow us to meet the potential impacts of climate change with a greater degree of certainty for all concerned with water, not just in the Northern Basin but across the rest of the Murray Darling Basin where FPH is an existing practise too.