2021 Water Security Program Annual report

December 2021

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Introduction

Seqwater is responsible for long-term planning, including drought response, for a reliable and sustainable water supply in South East Queensland (SEQ). This planning is outlined in the 30-year Water Security Program, "Water for Life 2017-2046" that was released in March 2017. This report can be found at:

http://www.seqwater.com.au/waterforlife

Seqwater is required to prepare and report on water security for SEQ annually. This 2021 report assesses changes in water security compared to the 2017 Water Security Program. The Water Security Program is currently under review and will be updated in 2022.

Highlights

The highlights for 2021 include:

- continued supply of a safe, reliable and high-quality bulk water supply despite the challenges presented by the COVID-19 pandemic.
- the region has been in drought response phase for much of 2021, with water grid storage levels consistently below 60% for most of the year. In accordance with the drought response plan, the Gold Coast Desalination Plant has been operating at up to full capacity.
- water savings campaigns from December 2020 to March 2021 and May 2021 to August 2021, with a further media campaign in development for release in early 2022.
- continued pre-start activities for the Western Corridor Recycled Water Scheme to prepare for full recommissioning to full capacity following the coming summer, if required.
- supply of up to 5,000 ML of purified recycled water to industrial customers, offsetting water demand from Wivenhoe Dam.
- progress on more detailed planning for regional long-term and drought contingency supply options as input to the revision of the Water Security Program, including actions to secure land and water resources to provide future water security options.
- effective engagement with the Department of Regional Development, Manufacturing and Water (DRPMW) and our SEQ Service Provider partners (City of Gold Coast, Logan City Council, Redland City Council, Unitywater and Urban Utilities) on the revision of the Water Security Program.

Water supply security situation

Seqwater regularly monitors and responds to the water security situation in SEQ. Each month Seqwater releases the Water Security Status Report. Please refer to the latest report for information about the current water security situation
https://www.seqwater.com.au/sites/default/files/2021-12/Water%20Security%20Status%20Report%20November%202021.pdf
Seqwater has responded to drought this year by:

- increasing engagement with the SEQ Service Providers and our shared understanding of drought response needs

- developing and releasing media campaigns to encourage the community to conserve water
- adaptively managing the Water Grid to balance water security and cost efficiency drivers.
- developing drought contingency water supply options and progressing planning.

Water Grid

Seqwater has continued to progress drought preparedness throughout 2021, including further collaboration and development of the Water for SEQ strategic initiatives with the SEQ Service Providers (https://www.seqwater.com.au/waterforlife).

Despite early dry season rainfall in 2021, SEQ remained in drought and subsequently the water grid storage level continued to decline as a result of below average rainfall and above average temperatures. The 60% trigger was reached again in July 2021 and reached below 55% in November 2021. Rainfall in December resulted in an increase in the water grid storage level to 63.4% (15/12/21).

Seqwater continues to closely monitor the supplies, implementing the adaptive drought response plan as detailed in the Water Security Program to respond to the situation and collaborating with the SEQ Service Providers, Government and other key stakeholders to effectively manage the drought.

Off-grid communities

In addition to the Water Grid storage being in drought response, some off-grid communities were in drought response during 2021, triggered by their local water supplies reaching low levels.

A number of off-grid communities triggered drought response in 2020 with the drought situation carrying over in to 2021. Of these communities only Dayboro required water carting to supplement supply. Dayboro exited drought response in January 2021. Drought response level exit timing varied in the Scenic Rim Regional Council area, but Urban Utilities lifted water restrictions for all Scenic Rim off-grid communities in March 2021. Jimna entered level 1 drought response in August and exited in October 2021.

The drought response plans for all off-grid communities are being updated in collaboration with the responsible SEQ Service Provider and will be included in the revised Water Security Program.

Changes to Water Security Program planning assumptions

There were no changes to the key planning assumptions for Water Security Program this year.

Demand

Demand data in this report is for the 2020/21 financial year. Reporting based on financial year is consistent with all other demand related reporting, enabling ease of comparison.

SEQ Service Providers

Water demand is influenced by many factors including weather conditions, population growth, consumption behaviour and system shocks. SEQ Service Provider water demand (urban demand) for 2020/21 reduced by 4.5% compared to the 2019/20 demands. This reduction is likely to have been driven by COVID related impacts. Analysis of consumption data received to date has indicated that while water consumption (particularly in the non-residential sector) did drop at the start of the pandemic, these sectors appear to be recovering. Our forward planning assumes that demands will return to more normal levels of growth in future years.

Figure 1 shows a historical annual water consumption growth trend of around 3% per annum since 2010/11 (excluding 2020/21). In 2020/21 water consumption dropped by 4.5% (Table 1), population was assumed to increase by around 2.1%.

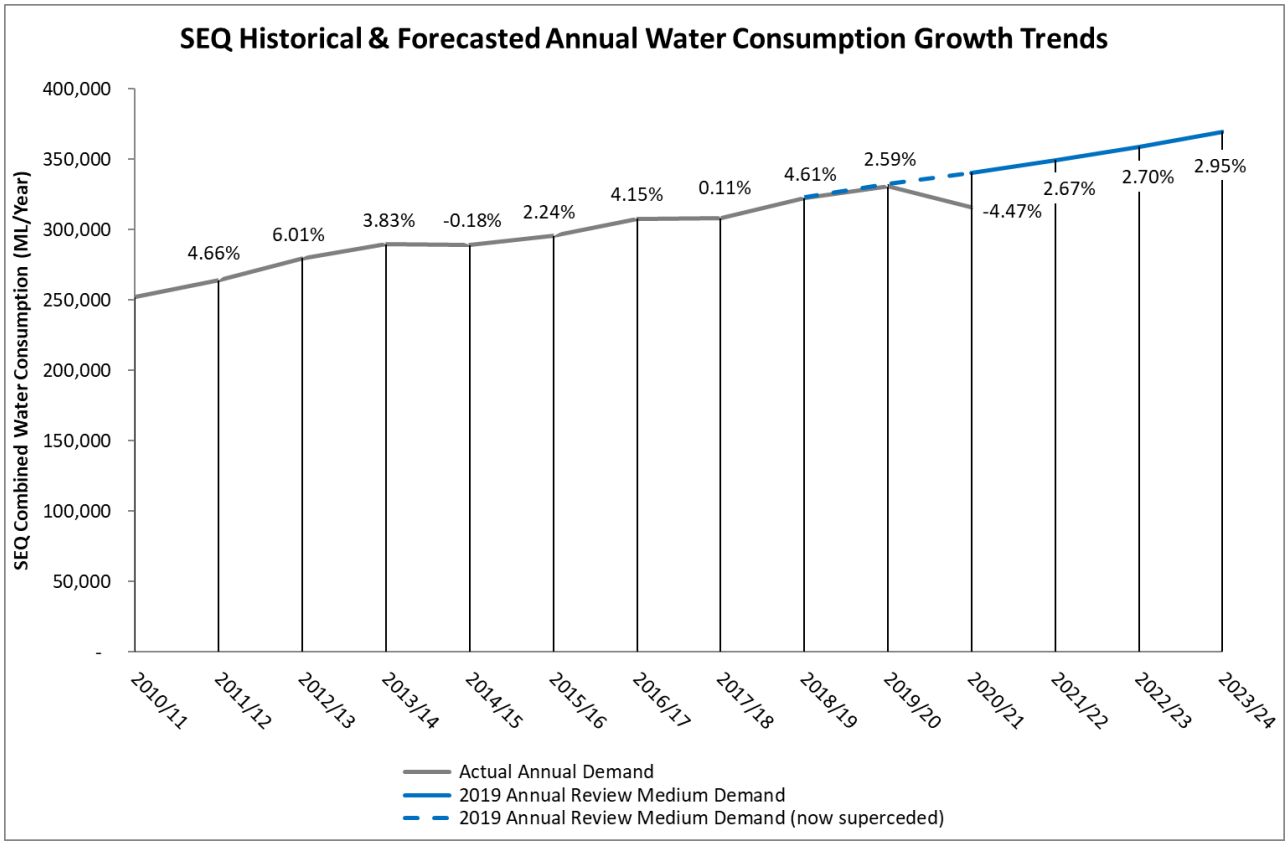

Figure 1: SEQ historical water demand and 2019 Annual Review water demand forecast (WSP2022 forecast)

Table 1. 2019/20 and 2020/21 Water supplied to SEQ Service Providers (ML/a) & (L/p/day)

Region	2019/20	2020/21	% change
SEQ Water Supplied (ML/a)	330,774	315,978	-4.5%
Total water consumption (residential and non-residential) L/p/d	269	252	-6.2%

Table 2 below illustrates consumption (megalitres per annum (ML/annum)) has reduced across all Local Government Areas (LGA), in particular Ipswich where consumption dropped by 22.2% in 2020/21 compared to 2019/20. Table 3 illustrates the same demand data in Litres per person per day (L/p/day).

Table 2. 2019/20 and 2020/21 Water supplied to SEQ Service Providers by LGA (ML/a)

Region	Water supplied (ML/annum)		% change
	2019/20	2020/21	
Brisbane	128,721	126,921	-1.40%
Gold Coast	64,447	61,606	-4.41%
Ipswich	22,194	17,276	-22.16%
Lockyer Valley	3,206	2,869	-10.51%
Logan	24,971	23,906	-4.26%
Moreton Bay	34,480	32,800	-4.87%
Noosa	6,388	5,814	-8.99%
Redland	13,736	13,550	-1.35%
Scenic Rim	2,096	1,776	-15.27%
Somerset	2,433	2,341	-3.78%
Sunshine Coast	28,102	27,118	-3.50%

Table 3. 2019/20 and 2020/21 Water supplied to SEQ Service Providers by LGA (L/p/d)

Region	Water Supplied (L/p/d)		% change
	2019/20	2020/21	
Brisbane	286	279	-2.73%
Gold Coast	292	273	-6.68%
Ipswich	277	207	-25.31%
Lockyer Valley	322	280	-13.24%
Logan	220	205	-6.57%
Moreton Bay	213	199	-6.78%
Noosa	392	353	-9.91%
Redland	246	240	-2.52%
Scenic Rim	317	259	-18.52%
Somerset	490	456	-6.97%
Sunshine Coast	264	246	-6.55%

In the current financial year (2021/22), the year-to-date annual demand growth as of November 2021 is still tracking below the average annual 3% historical growth trend. Weather conditions, drought water saving campaigns and travel restrictions imposed due to COVID are likely to have contributed to the observed below average growth.

Neighbouring Communities

Under the bulk water supply agreement with Toowoomba Regional Council up to 10,000 ML/annum can be transferred from Wivenhoe Dam to Cressbrook Dam to supplement drinking water supplies in the Toowoomba region. Table 4 shows that Toowoomba Regional Council accessed this full contract volume in 2020/21.

Table 4. 2019/20 and 2020/21 Water supplied to Toowoomba (Wivenhoe to Cressbrook transfer) (ML/a)

Customer	2019/20	2020/21	% change
Toowoomba Regional Council (ML/a)	8,990	10,000	11.2%

Power Stations

Under bulk water supply agreements Tarong and Swanbank power stations can take up to a combined total of 29,500 ML/annum. Table 5 below shows the volume of water supplied (combined total of raw and purified recycled water) to power stations in 2020/21 compared with 2019/20.

Table 5. 2019/20 and 2020/21 Actual Power Station Demands (ML/a)

Customer	2019/20	2020/21	% change
Power stations (ML/a)	14,141	17,172	21.4%

Assessment of the projected regional average demand

A review of the demand forecast was completed in late 2021, in collaboration with the SEQ Service Providers. The outcomes of this review were:

- The existing demand profile used for planning functions (2019 Annual Review Demand) has performed within an acceptable range. Actual demands for 2020/21 were 3.27% below forecast, well within the established 10% target threshold.
- Assessments of available billing data have indicated that COVID related impacts on the economy have put downward pressure on non-residential demand, however it is anticipated that many of these impacts are temporary and once travel and other restrictions have ceased non-residential demand is likely to return to pre-COVID levels.
- The shift to working from home, driven by COVID, can be seen in the available billing data where the commercial sector consumption (which includes office buildings, the second largest sector of non-residential consumption) across all SEQ reduced last year by 13% in the 6 month period June to November 2020, compared to the similar time last year. There is insufficient data to determine whether there has been a shift back to working from the office since November 2020 and it is therefore too early to determine whether working from home will result in a permanent shift of demand from the non-residential sector to the residential sector.
- Other drivers that may have contributed to the observed below forecast consumption in 2020-21 include above average rainfall and drought water saving campaigns by Seqwater and the SEQ Service Providers.
- Given the acceptable performance of the existing demand forecast and the uncertainty associated with the longevity of COVID related impacts on demand, no

changes have been made to the projected demand for water security planning purposes.

Seqwater continues to work with the SEQ Service Providers to understand longer-term demands and potential demand management options.

Off-grid community demand projection assessment

In the majority of off-grid communities over the 2020/21 financial year demands were lower than in the 2019/20 financial year. The 2020/21 demands generally fell closer to the long-term demand forecasts compared to the previous year; therefore existing demand projections remain current.

Water Supply

Seqwater has provided water as follows in 2020/21:

Table 6. Water supplied 2020/21 (ML/annum)

Sector	Total volume for 2020/21 in ML/annum
SEQ Region – total production of treated water to supply SEQ Service Providers	315,978
Subregions – total treated water supplied to each sub-region	
Northern (Moreton Bay, Sunshine Coast and Noosa council areas)	65,732
• Central (Brisbane, Ipswich, Lockyer Valley, Scenic Rim and Somerset Council areas)	151,183
• Southern (Gold Coast and Logan council areas)	85,512
• Eastern (Redland City Council area)	13,550
Bulk water grid storages - Raw water extracted for water treatment (excludes environmental, flood releases and water for irrigators)	
• Wivenhoe Dam and Brisbane River downstream of Wivenhoe (exclusive of pipelines)	138,160
• Somerset Dam	1,411
• North Pine Dam	42,118
• Hinze Dam	61,854
• Baroon Pocket Dam	24,114
• Leslie Harrison Dam	2,411
• Ewen Maddock Dam	4,236
• Cooloolabin Dam and Wappa Dam	4,860
• Sideling Creek Dam (Lake Kurwongbah)	Not applicable
• Lake Macdonald	2,967
• Little Nerang Dam	10,914

Sector	Total volume for 2020/21 in ML/annum
Climate-resilient water sources	
• Gold Coast Desalination Plant Production	19,486
• Western Corridor Recycled Water Scheme Production (PRW sent to power stations)	2,555
Other water sources	
• North Stradbroke Island (Minjerribah) – water used for water treatment (Herring Lagoon and North Stradbroke Island Bore fields, 15 Bores)**Error! Bookmark not defined.**	6,943
Off-grid communities [1] - total water produced at the water treatment plant	
• Amity Point	110
• Beaudesert	742
• Boonah-Kalbar	551
• Canungra	100
• Dayboro	188
• Dunwich	113
• Esk	247
• Jimna	6
• Kenilworth	64
• Kilcoy	1,253
• Kooralbyn	195
• Linville	10
• Lowood	3,673
• Point Lookout	282
• Rathdowney	27
Neighbouring communities – total water supplied	
• Toowoomba Regional Council	10,000
Power Stations – total water supplied	
• Total raw water intake	14,617
• Total purified recycled water intake	2,555

Note: Whilst the data used for this reporting is from the same base data source as the Resource Operations Licence/Water Licence reporting because the focus of the reporting is different, the figures will not be consistent. For example, the Resource Operations Licence/Water Licence reporting is reported by off-take/water allocation, whilst the water security reporting is based on the dam source.

[1] Treated Water Volume

Changes to the Bulk Water Supply System

Throughout 2021 Seqwater continued to deliver capital works to improve the capability of the Water Grid. Work is progressing on water security projects to support the northern sub-region including the Woombye connection which is significantly progressed and is planned to be implemented in 2022.

Climate-resilient water assets

Seqwater has two climate-resilient water supplies – the Gold Coast Desalination Plant and the Western Corridor Recycled Water Scheme. These assets are operated based on the adaptive drought response strategy in the Water Security Program, and to support operational requirements.

Desalination

The Gold Coast Desalination Plant is a key asset for the provision of water security in SEQ. The plant is used to support high water demands and the water grid when other assets are being maintained and is a critical drought water supply asset.

The Gold Coast Desalination Plant is maintained in a 'hot standby' mode to maintain the condition of its membranes and can be operational at a rate of 33% maximum capacity within 24 hours and up to the maximum production capacity of 133ML/day within 72 hours.

Desalination plants are not dependent on rainfall into catchments for source water but can be impacted by source water limitations such as exceptionally high tides or seaweed blooms that can produce high turbidity source water.

Purified recycled water

The Western Corridor Recycled Water Scheme is a scheme consisting of three advanced water treatment plants (AWTP) and over 220km of connecting pipelines between the AWTPs, industrial customers (including the power stations) and Wivenhoe Dam. This scheme has an average annual capacity to produce 59,130 ML/annum of purified recycled water once recommissioned to full capacity.

The Western Corridor Recycled Water Scheme network three AWTPs are:

- Bundamba AWTP, average production capacity of 19,710 ML/annum
- Gibson Island AWTP, average production capacity of 16,425 ML/annum
- Luggage Point, average production capacity of 22,995 ML/annum.

One treatment unit (or train) at Luggage Point AWTP is currently operational, and produces purified recycled water. This water is currently used to flush the pipeline and supply industrial customers. Seqwater is recommissioning two additional trains at Luggage Point to result in a 22,995 ML/annum capacity, both in preparation for a recommissioning of the scheme to full capacity, and to meet the full demand of existing industrial customers (Urban Utilities, CleanCo, and Stanwell).

Operation of climate-resilient water assets

Both assets have been operated in 2021 in response to drought preparedness. Gold Coast Desalination Plant has also operated to support maintenance work in other areas of the SEQ Water Grid.

Date/s	Climate-resilient water operation
November 2020 and continuing	Commenced supply of purified recycled water from existing Luggage Point AWTP to power stations. It is estimated that 20 ML/day (potentially up to 23 ML/day) of purified recycled water will be supplied to power stations.
15 September 2020 and continuing	Gold Coast Desalination Plant has been operating in drought response due to low levels in Wivenhoe Dam, having distributed 23,735 ML of water to the water grid between 15 September 2020 and 5 November 2021.

Assessment of the regional water balance

Commencing in 2017, Seqwater has continued to implement capital works and a change to the grid operating mode to allow for a greater volume of water to be transferred to the SEQ northern sub-region. While the main purpose of this was to improve the water security of Sunshine Coast region it also means that there is an overall yield increase for SEQ water supply. The Level of Service (LOS) yield modelling for the northern water supply indicated an increase in the LOS yield of 10,000 ML/annum, leading to a total of 505,000 ML/annum compared to the yield of 495,000 ML/annum specified in the 2017 Water Security Program. Both yields were inclusive of planned minor capacity augmentations identified at that time, and are well above current demand levels.

Drawdown scenarios

The region's Water Grid storage level was at 63.4% as of 15 December 2021, a small increase since its level of 54.8% (9/12/2020). Rainfall in December 2021 provided an increase in storage levels.

While Wivenhoe Dam did decline to its lowest level since the Millennium Drought, 35.9% on 7 March 2021, it has since recovered (41.2% as of 2 December 2021), and is slightly higher than the level at the time of the last annual report (39.6% at 9 December 2020). With Wivenhoe Dam representing more than half of the total water storage for the Water Grid, this makes a significant impact on the Water Grid storage level and the likelihood of triggering drought response measures. Seqwater provides access to the Water Grid storage levels and individual dam levels drawdown data at: https://www.seqwater.com.au/historic-dam-levels

Figure 2 shows recorded storage levels tracking down at a similar rate to a Millennium Drought drawdown. The design drought drawdown, which assumes the worst inflows in the stochastic dataset over a 10 year period, is also presented in Figure 2 for comparative purposes. Note, both the Millennium and design drought drawdowns were assumed to commence when storages were last full (June 2015).

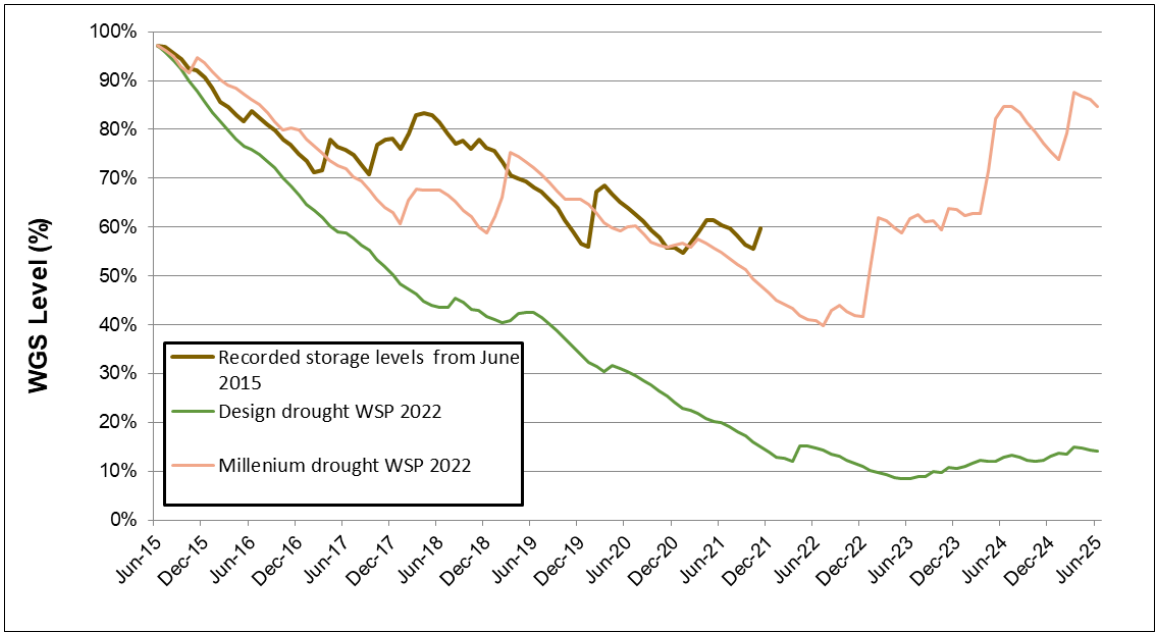

Figure 2: Design and Millennium Drought inflow draw downs and recorded water grid storage levels from June 2015

Water Security outcome statement status

All water security program actions have either been completed or are progressing as ongoing activities. Highlights for 2021 have been the increased collaboration with the SEQ Service Providers in the revision of the Water Security Program, particularly in discussions around long-term collaborative planning and drought response. Collaboration with the Department of Regional Development, Manufacturing and Water in the review of the Water Security Program has also continued.

Water Security Program review

Based on the assessment below the Water Security Program does not need to be reviewed prior to the next regulatory review in 2022.

Trigger for review	2021 Status
Change to operating full supply level (OFSL) of a water grid storage	Changes to the full supply level have not impacted water security at this time as storages are currently lower than the revised level. There may be impact post drought exit, this will be investigated further.
Significant change to drought response approach has occurred	No significant change to drought response approach has occurred in 2021. The drought response is currently being implemented in alignment with the adaptive plan.