



Water entitlement market prices
Murray–Darling Basin
(September quarter 2016)

Report prepared for Australian Government Department of Agriculture and Water Resources

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1. Introduction

This September 2016 quarter water entitlement market prices report has been prepared by Marsden Jacob Associates (Marsden Jacob) for the Australian Government Department of Agriculture and Water Resources.

A water access entitlement is a perpetual or ongoing entitlement to exclusive access to a share of water from a specified consumptive pool, as defined in the relevant water plan.

The report includes:

- southern Murray–Darling Basin (MDB) market activity and price information, by region and entitlement type (Section 2)
- northern MDB market activity and price information, by region and entitlement type (Section 3)
- a list of catchments and water sources (Appendix A)
- a list of data outliers removed from the trade data (Appendix B).

1.1 Regions, entitlements and key statistics

The entitlement price report is broadly split into the southern and the northern MDB, as detailed in Table 1 and Table 2. Interactive maps showing the location of these trading regions are available on the [Murray–Darling Basin Authority's website](#). The water sources included in each of the regions are listed in Appendix A.

Table 1: Regions and entitlement types, southern MDB

Region	Entitlement type
SA Murray	Class 3a
Vic. Murray above Barmah Choke	High reliability
Vic. Murray above Barmah Choke	Low reliability
Vic. Murray below Barmah Choke	High reliability
Vic. Murray below Barmah Choke	Low reliability
Goulburn	High reliability
Goulburn	Low reliability
Campaspe	High reliability
Loddon	High reliability
NSW Murray	General security
NSW Murray	High security
NSW Murray Irrigation Limited	General security

Water entitlement market prices: Murray–Darling Basin (September quarter 2016)

Region	Entitlement type
Murrumbidgee	General security
Murrumbidgee	High security
Lower Darling	General security
Lower Darling	High security

Table 2: Regions and entitlement types, northern MDB

Region	Entitlement type
Macquarie	General security
Namoi	General security
Gwydir	General security
NSW Border Rivers	General security
Barwon–Darling	Unregulated
Lachlan	General security
Condamine–Balonne (St George)	Supplemented
Condamine–Balonne (Upper Condamine and Lower Balonne)	Unsupplemented
Central Condamine Alluvium Groundwater (1, 2, 3 and 4)	Groundwater (sub areas 1, 2, 3 and 4)
Upper Condamine Alluvium Groundwater (Dalrymple Creek)	Groundwater
Upper Condamine Alluvium Groundwater (Oakey Creek)	Groundwater
Qld Border Rivers	Supplemented
Qld Border Rivers	Unsupplemented
Lower Balonne	Overland flow

As requested by the department, for each of the regions and water entitlement categories Marsden Jacob reports a range of measures, subject to data availability and the number of trades:

- volume weighted average price (VWAP)
- median price
- mean price
- mode price
- 25th and 75th percentile prices
- price quintiles

- trade volume
- number of trades
- water trading exchange prices.

1.2 Data sources

The data sources for this report are:

- National Water Market Register data, up to 31 December 2013
- state government water registers and websites
- water exchange and broker noticeboard prices.

1.3 Notes

Entitlement prices in the state government water registers can lag the exchange date of contracts or water sale agreements by periods of days to several months. This means the entitlement prices shown in the monthly and quarterly VWAPs may not reflect all exchanges during the month.

Entitlement prices that do not appear to reflect arm's-length transactions have been excluded in the data cleaning process (see Appendix B). Removing these values reduces price distortions in the reporting. This means prices in this report may differ from prices shown in registers where these transactions have not been removed.

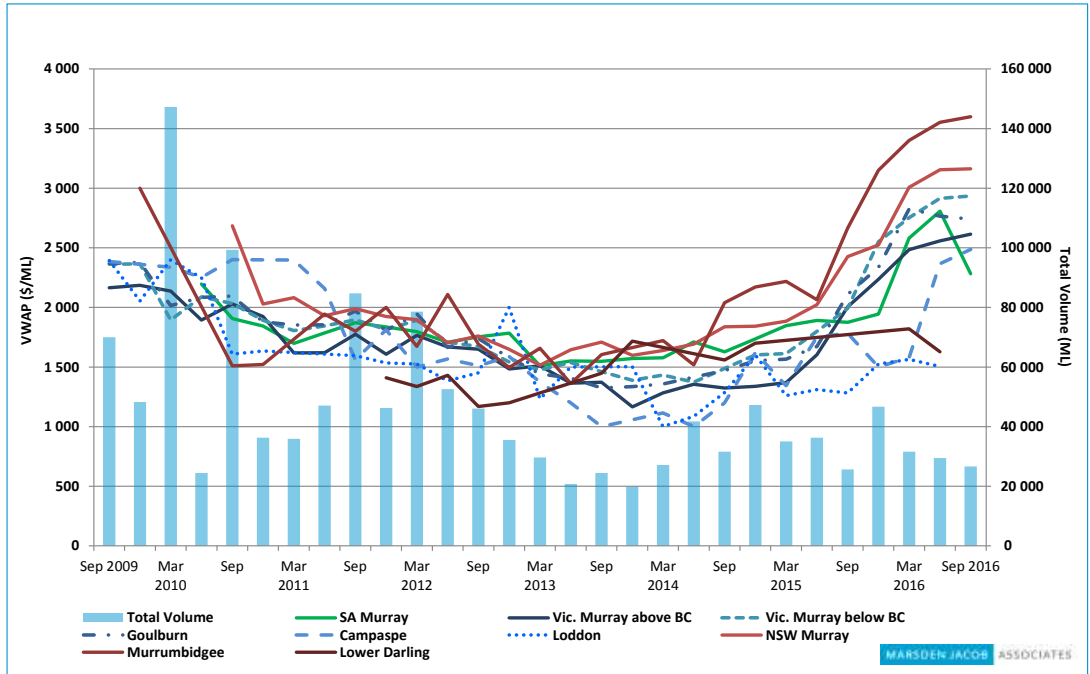
Marsden Jacob uses a two-stage process to clean the data:

1. Removing prices that may not be genuine; for example, removing transactions where the price was reported to be null (\$0 per ML)
2. Reviewing and potentially removing transactions outside two standard deviations from the average price of water entitlements by region (or trading zone) and by water product.

Marsden Jacob does not necessarily remove all trades that fall outside two standard deviations, as some of them reflect arm's-length trades. If trades that fall outside two standard deviations are retained in the regional dataset, this is noted in the region- and entitlement-specific reports.

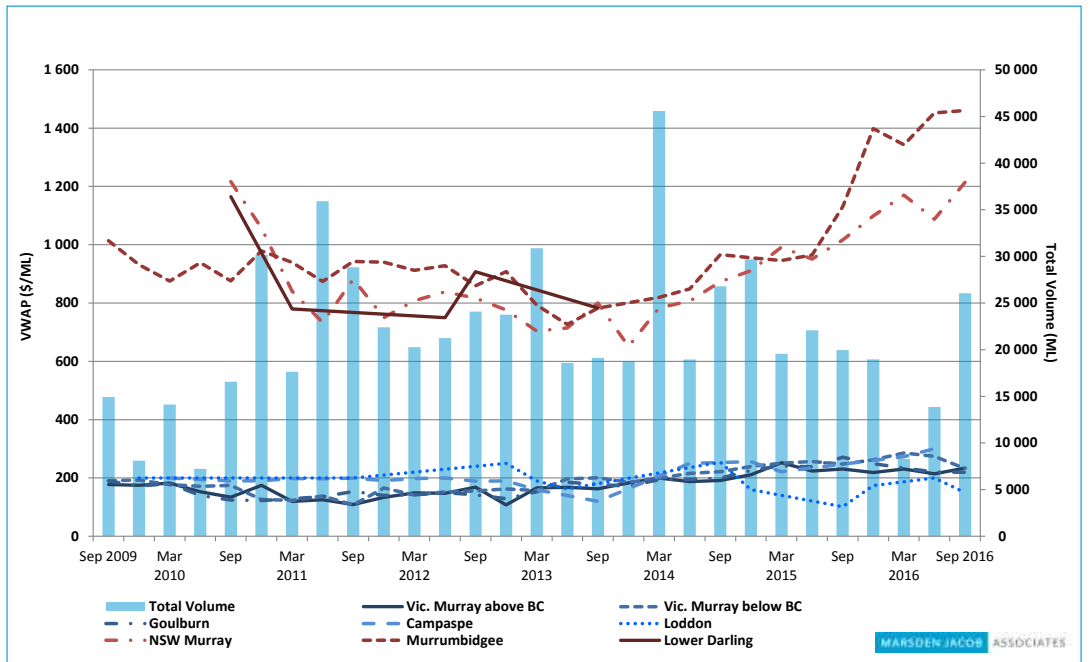
2. Southern Murray–Darling Basin

Figure 1 Price correlations in the southern MDB, high security, high reliability, Class 3a, September 2009 to September 2016



Source: Marsden Jacob analysis, 2016.

Figure 2 Price correlations in the southern MDB, general security, low reliability, September 2009 to September 2016



Note: Where possible, zero values have been interpolated in these charts, so they differ slightly from the region- and entitlement-specific charts.

Source: Marsden Jacob analysis, 2016.

2.1 South Australian Murray: Class 3a

Figure 3 Entitlement market prices and volumes, SA Murray, Class 3a, September 2009 to September 2016

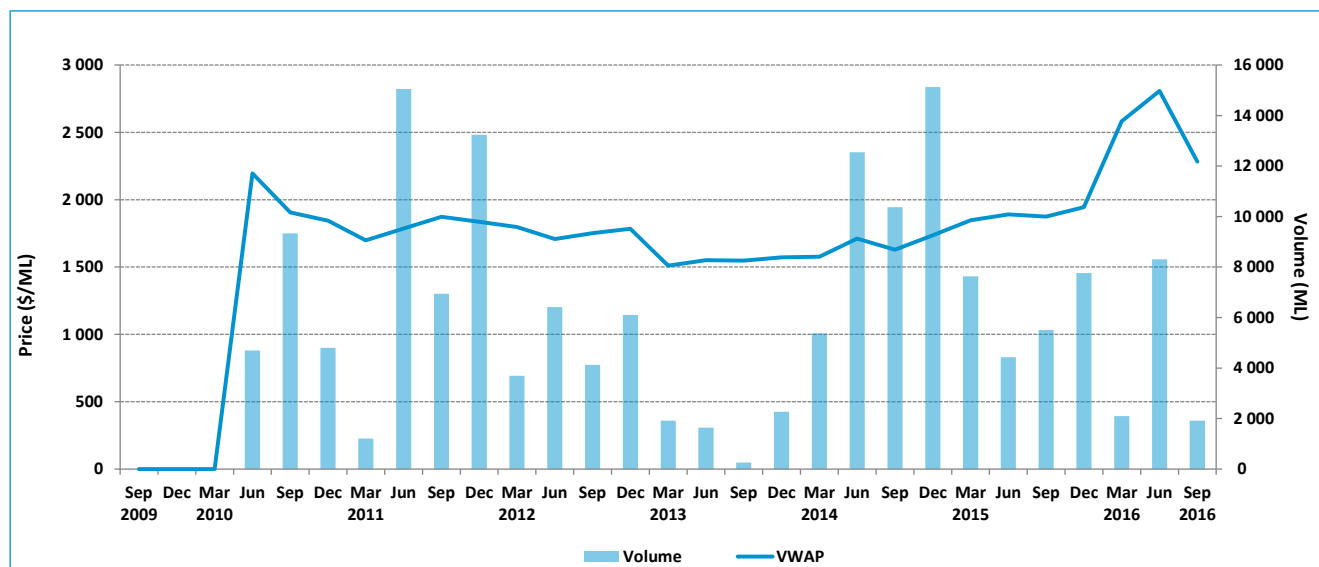
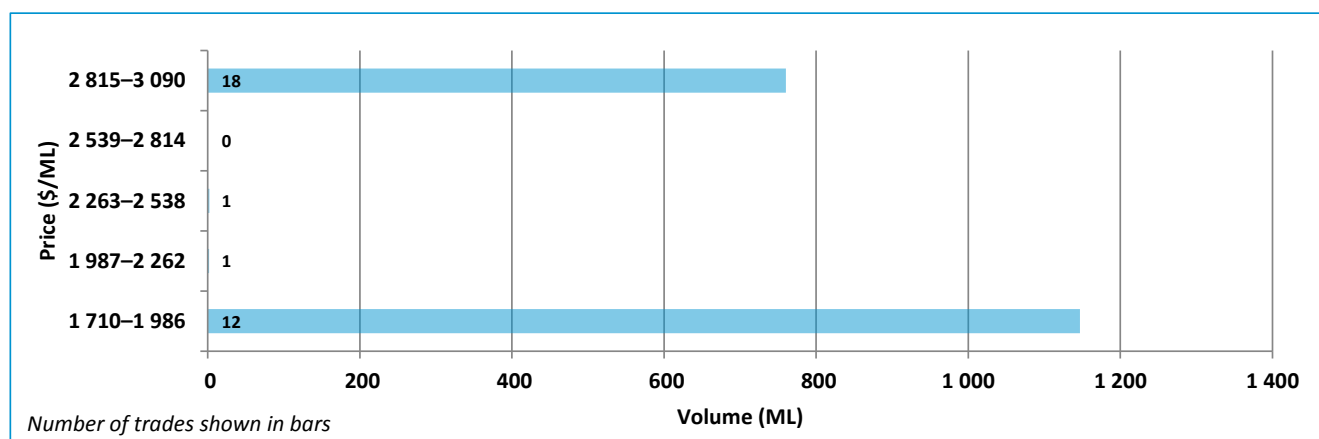


Table 3 Entitlement market prices and volumes, SA Murray, Class 3a

Volume weighted average price (\$/ML)		September quarter (\$/ML)					September quarter volume (ML)	September quarter no. of trades	Broker buy/sell range (\$/ML)	
September 2016	September quarter	YTD	25th percentile	75th percentile	Median	Mean	Mode			
2 029	2 283	2 283	1 875	3 000	2 900	2 514	1 875	1 911	32	2 600-3 000

Figure 4 Entitlement market price range, SA Murray, Class 3a, by volume, September quarter 2016



Data sources: [H2OX](#), [National Water Exchange](#), [SA Water Register](#), [Waterfind](#).

2.2 Victorian Murray above Barmah Choke: high reliability

Figure 5 Entitlement market prices and volumes, Vic. Murray above Barmah Choke, high reliability, September 2009 to September 2016

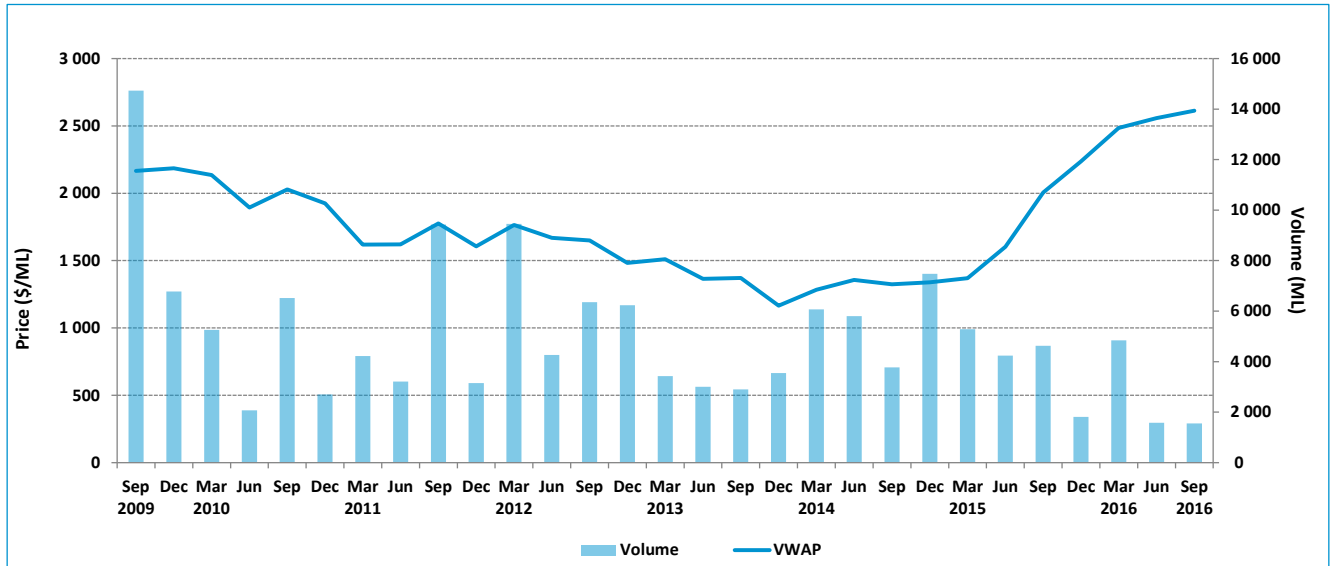
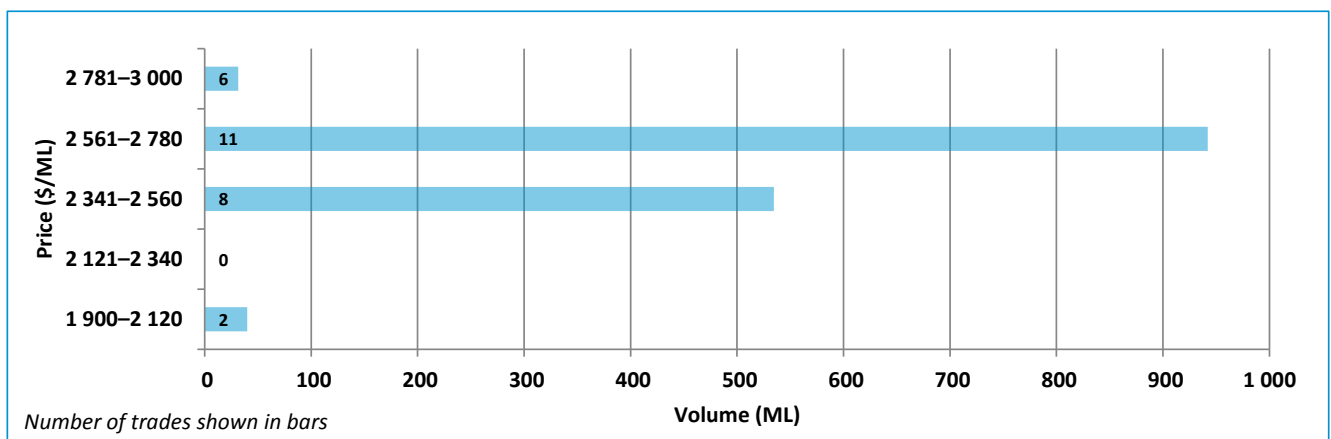


Table 4 Entitlement market prices and volumes, Vic. Murray above Barmah Choke, high reliability

Volume weighted average price (\$/ML)		September quarter (\$/ML)					September quarter volume (ML)	September quarter no. of trades	Broker buy/sell range (\$/ML)	
September 2016	September quarter	YTD	25th percentile	75th percentile	Median	Mean	Mode			
2 561	2 614	2 614	2 500	2 700	2 650	2 615	2 500	1 548	27	2 400-2 650

Figure 6 Entitlement market price range, Vic. Murray above Barmah Choke, high reliability, by volume, September quarter 2016



Data sources: [H2OX](#), [National Water Exchange](#), [Victorian Water Register](#), [Waterfind](#).

2.3 Victorian Murray above Barmah Choke: low reliability

Figure 7 Entitlement market prices and volumes, Vic. Murray above Barmah Choke, low reliability, September 2009 to September 2016

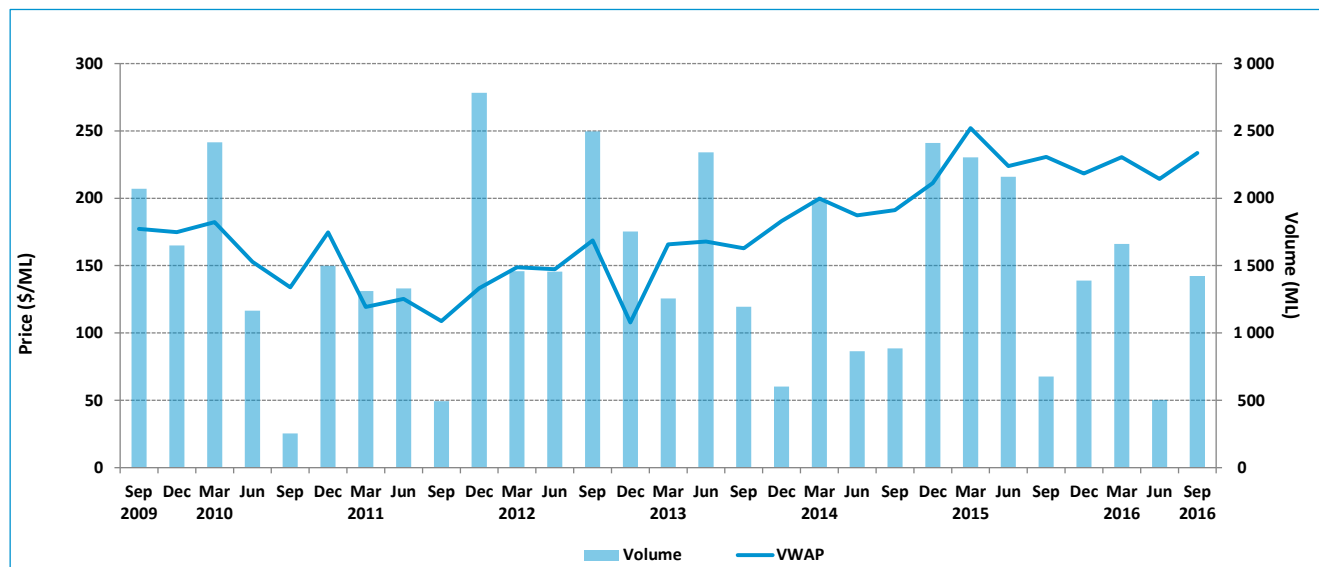
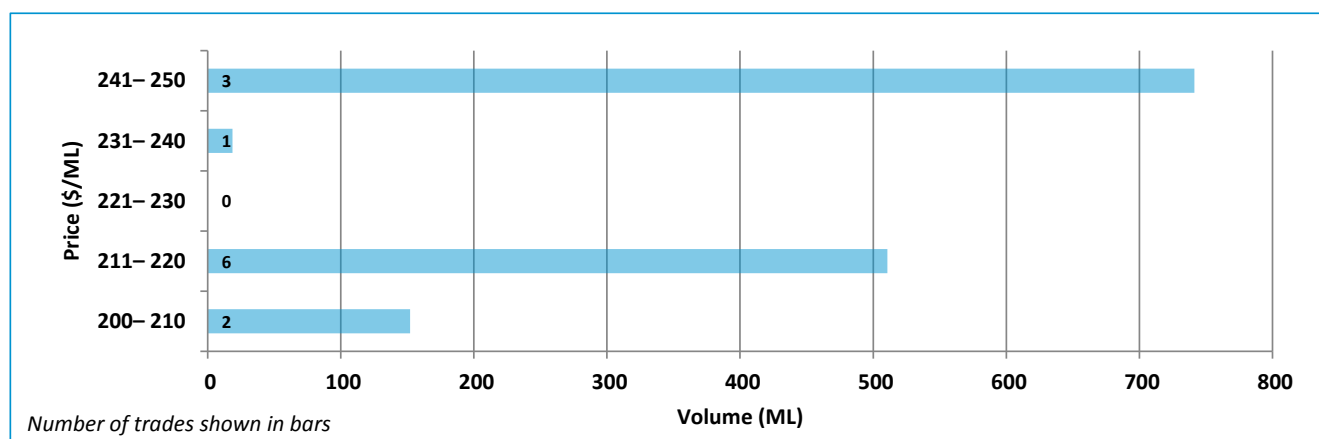


Table 5 Entitlement market prices and volumes, Vic. Murray above Barmah Choke, low reliability

Volume weighted average price (\$/ML)		September quarter (\$/ML)					September quarter volume (ML)	September quarter no. of trades	Broker buy/sell range (\$/ML)	
September 2016	September quarter	YTD	25th percentile	75th percentile	Median	Mean	Mode			
241	234	234	219	239	220	225	220	1 423	12	225-250

Figure 8 Entitlement market price range, Vic. Murray above Barmah Choke, low reliability, by volume, September quarter 2016



Data sources: [H2OX](#), [National Water Exchange](#), [Victorian Water Register](#), [Waterfind](#).

2.4 Victorian Murray below Barmah Choke: high reliability

Figure 9 Entitlement market prices and volumes, Vic. Murray below Barmah Choke, high reliability, September 2009 to September 2016

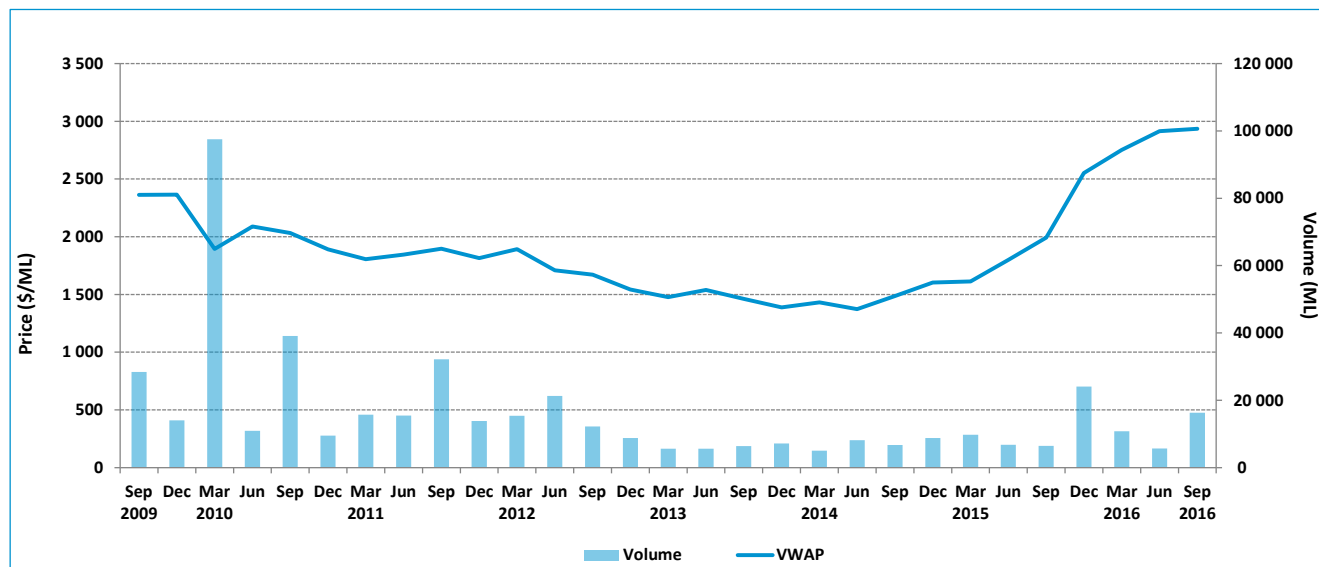
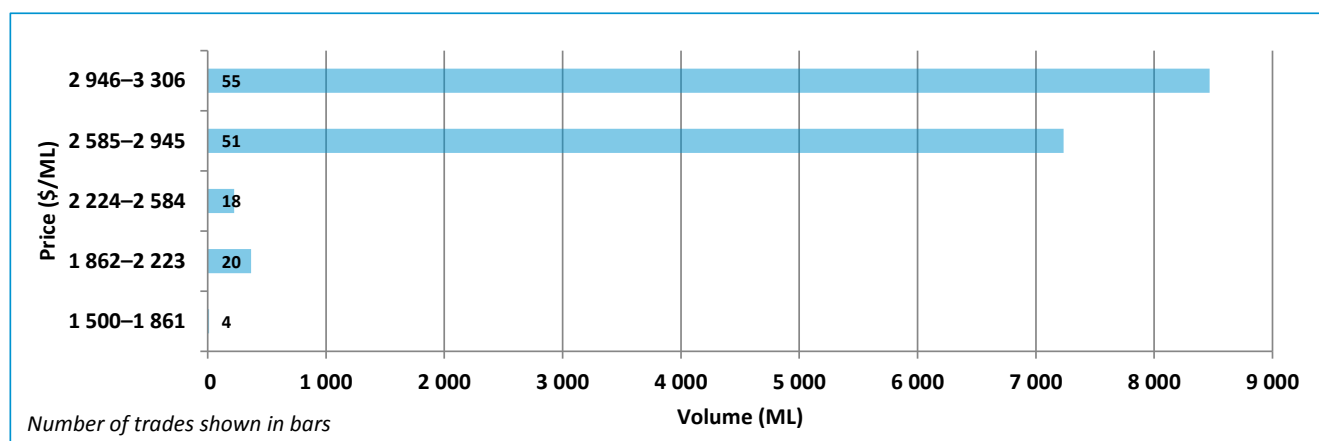


Table 6 Entitlement market prices and volumes, Vic. Murray below Barmah Choke, high reliability

Volume weighted average price (\$/ML)		September quarter (\$/ML)					September quarter volume (ML)	September quarter no. of trades	Broker buy/sell range (\$/ML)	
September 2016	September quarter	YTD	25th percentile	75th percentile	Median	Mean	Mode			
2 968	2 935	2 935	2 500	3 000	2 850	2 712	3 000	16 304	148	2 700–3 000

Figure 10: Entitlement market price range, Vic. Murray below Barmah Choke, high reliability, by volume, September quarter 2016



Data sources: [H2OX](#), [National Water Exchange](#), [Victorian Water Register](#), [Waterfind](#).

2.5 Victorian Murray below Barmah Choke: low reliability

Figure 11 Entitlement market prices and volumes, Vic. Murray below Barmah Choke, low reliability, September 2009 to September 2016

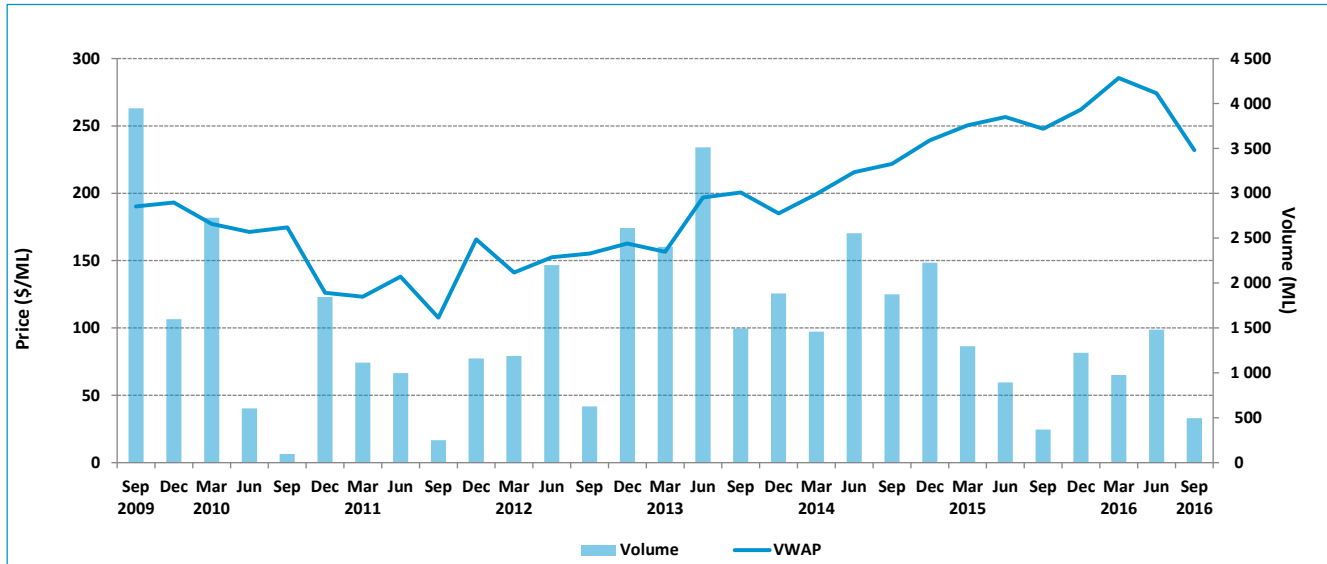
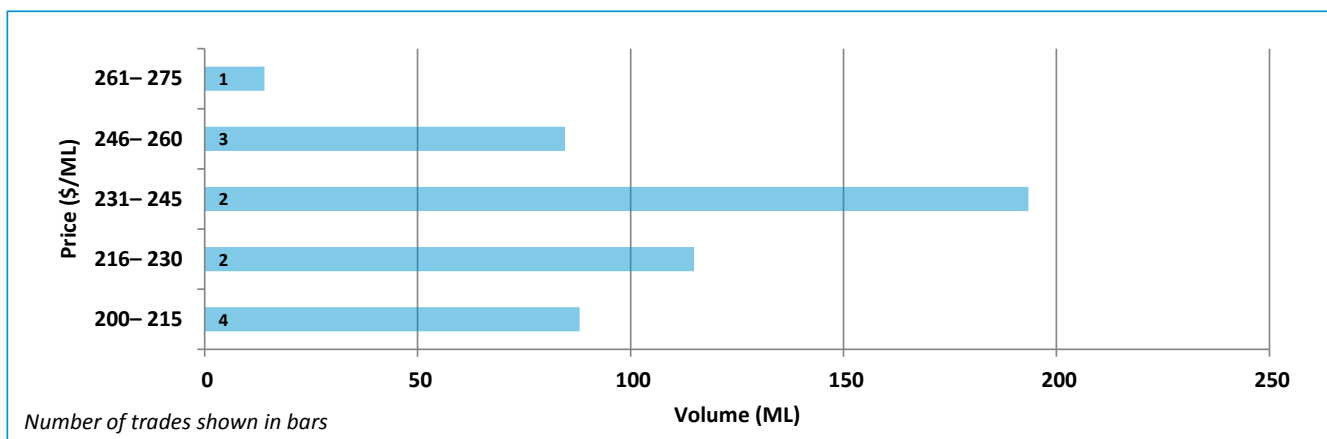


Table 7 Entitlement market prices and volumes, Vic. Murray below Barmah Choke, low reliability

Volume weighted average price (\$/ML)		September quarter (\$/ML)					September quarter volume (ML)	September quarter no. of trades	Broker buy/sell range (\$/ML)	
September 2016	September quarter	YTD	25th percentile	75th percentile	Median	Mean	Mode			
231	232	232	200	250	233	230	200	495	12	240-250

Figure 12 Entitlement market price range, Vic. Murray below Barmah Choke, low reliability, by volume, September quarter 2016



Data sources: [H2OX](#), [National Water Exchange](#), [Victorian Water Register](#), [Waterfind](#).

2.6 Goulburn: high reliability

Figure 13 Entitlement market prices and volumes, Goulburn, high reliability, September 2009 to September 2016

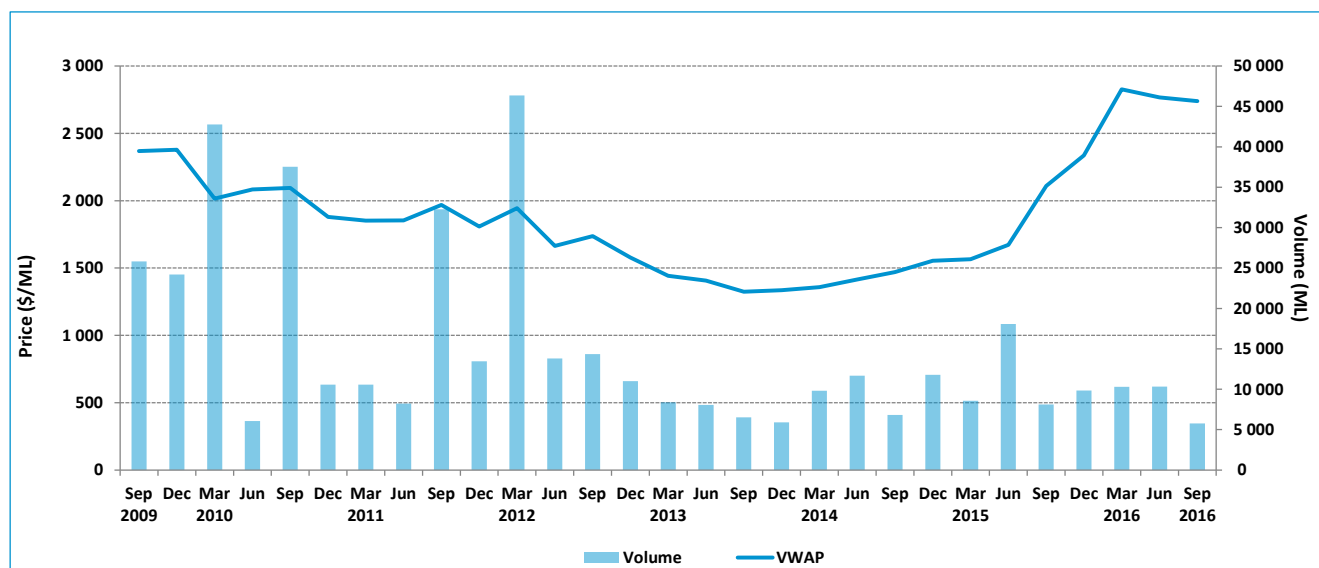
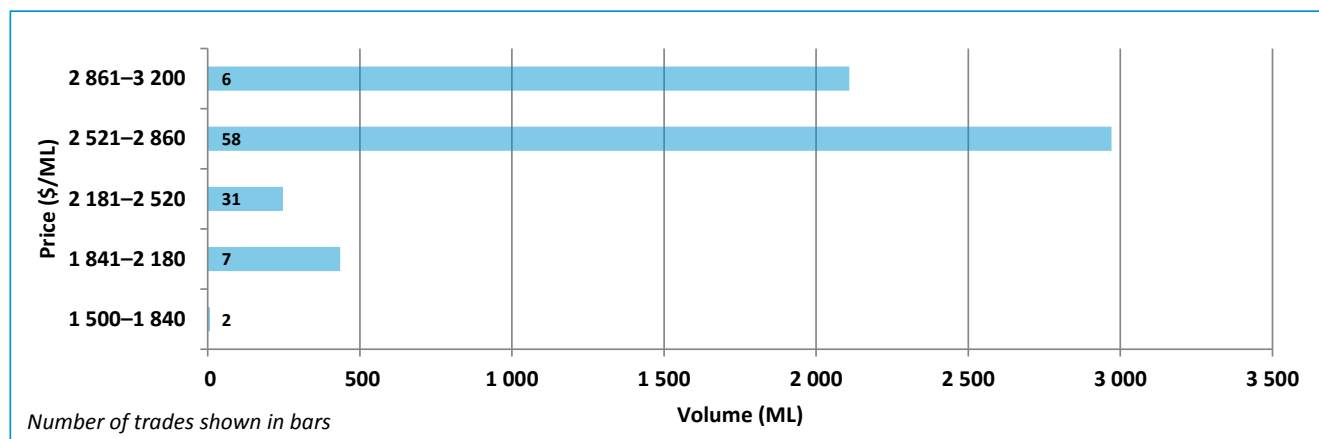


Table 8 Entitlement market prices and volumes, Goulburn, high reliability

Volume weighted average price (\$/ML)		September quarter (\$/ML)					September quarter volume (ML)	September quarter no. of trades	Broker buy/sell range (\$/ML)	
September 2016	September quarter	YTD	25th percentile	75th percentile	Median	Mean	Mode			
2 926	2 740	2 740	2 500	2 750	2 600	2 562	2 500	5 771	104	2 700-3 000

Figure 14 Entitlement market price range, Goulburn, high reliability, by volume, September quarter 2016



Data sources: [H2OX](#), [National Water Exchange](#), [Victorian Water Register](#), [Waterfind](#).

2.7 Goulburn: low reliability

Figure 15 Entitlement market prices and volumes, Goulburn, low reliability, September 2009 to September 2016

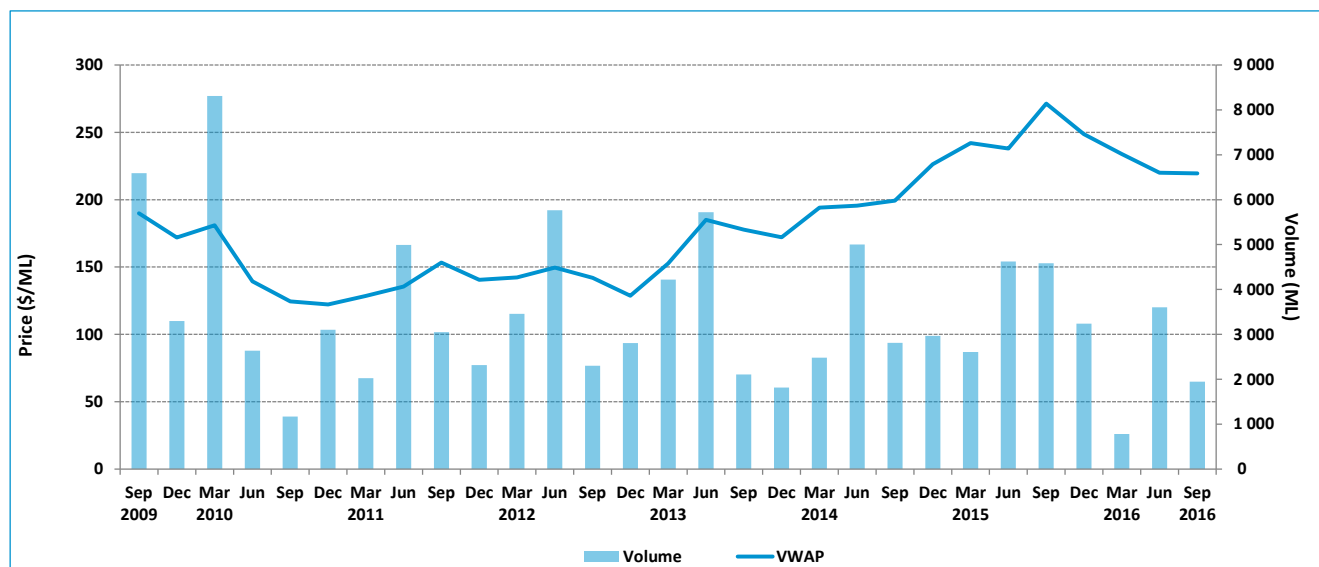
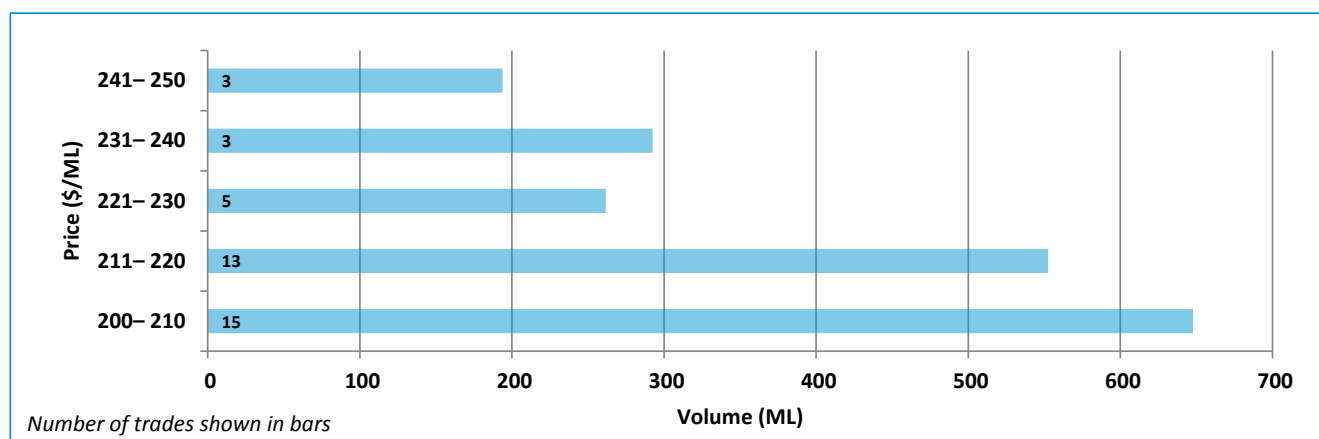


Table 9 Entitlement market prices and volumes, Goulburn, low reliability

Volume weighted average price (\$/ML)		September quarter (\$/ML)						September quarter volume (ML)	September quarter no. of trades	Broker buy/sell range (\$/ML)
September 2016	September quarter	YTD	25th percentile	75th percentile	Median	Mean	Mode			
222	219	219	200	225	220	219	220	1 948	39	230-250

Figure 16 Entitlement market price range, Goulburn, low reliability, by volume, September quarter 2016



Data sources: [H2OX](#), [National Water Exchange](#), [Victorian Water Register](#), [Waterfind](#).

2.8 Campaspe: high reliability

Figure 17 Entitlement market prices and volumes, Campaspe, high reliability, September 2009 to September 2016

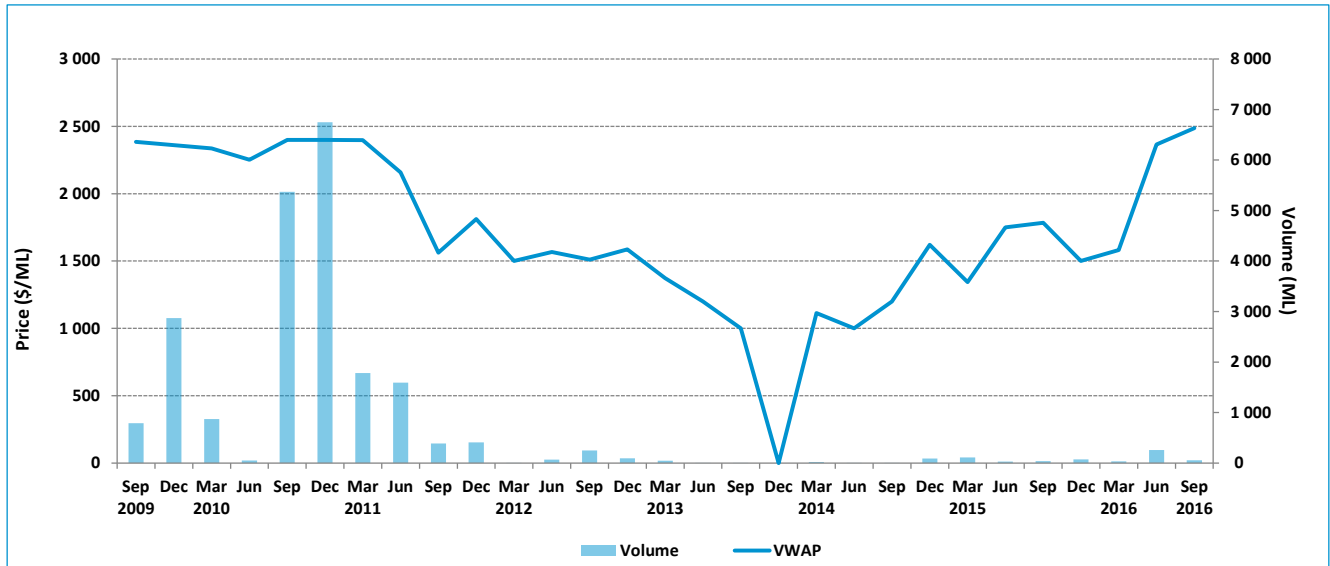
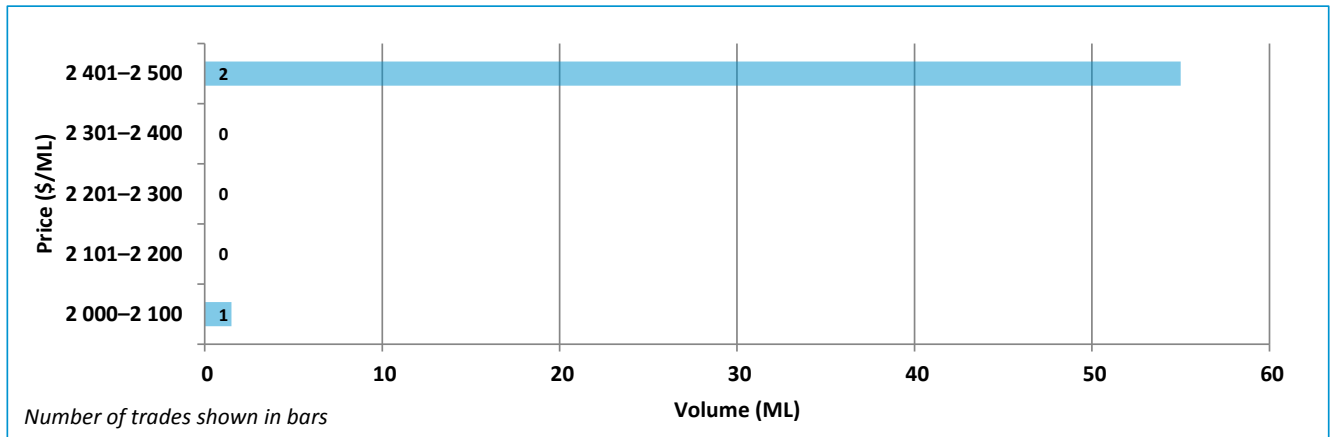


Table 10 Entitlement market prices and volumes, Campaspe, high reliability

Volume weighted average price (\$/ML)		September quarter (\$/ML)					September quarter volume (ML)	September quarter no. of trades	Broker buy/sell range (\$/ML)	
September 2016	September quarter	YTD	25th percentile	75th percentile	Median	Mean	Mode			
–	2 487	2 487	2 250	2 500	2 500	2 333	2 500	57	3	2 500-2 800

Figure 18 Entitlement market price range, Campaspe, high reliability, by volume, September quarter 2016



Data sources: [H2OX](#), [National Water Exchange](#), [Victorian Water Register](#), [Waterfind](#).

2.9 Loddon: high reliability

Figure 19 Entitlement market prices and volumes, Loddon, high reliability, September 2009 to September 2016

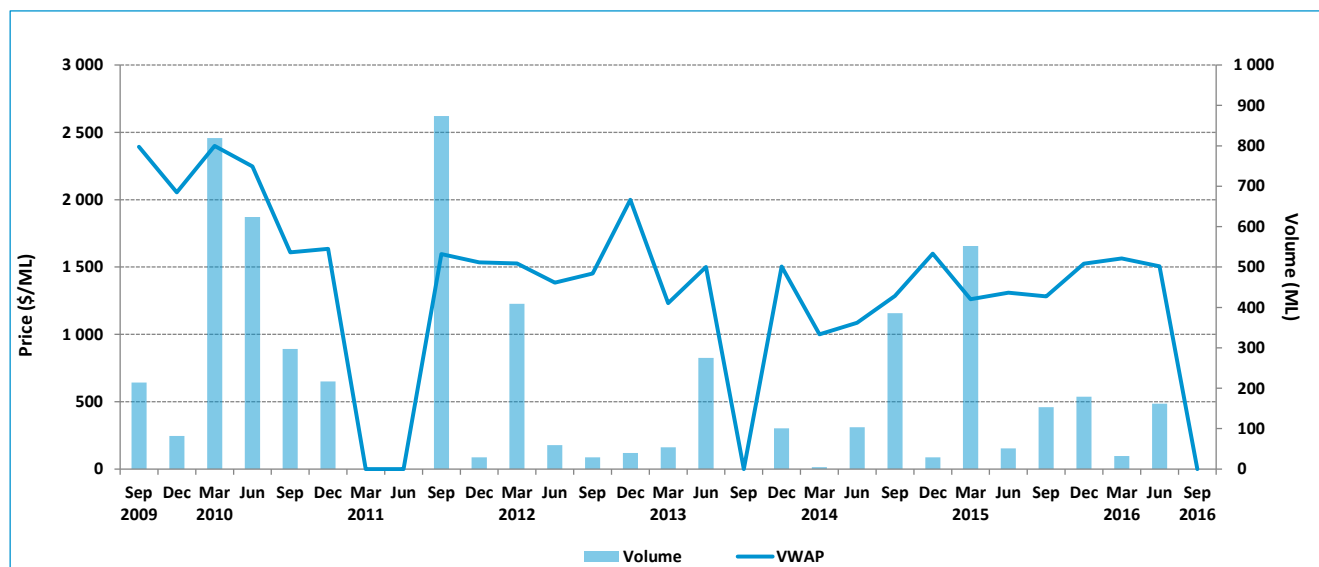


Table 11: Entitlement market prices and volumes, Loddon, high reliability

Volume weighted average price (\$/ML)		September quarter (\$/ML)					September quarter volume (ML)	September quarter no. of trades	Broker buy/sell range (\$/ML)
September 2016	September quarter	YTD percentile	25th percentile	75th percentile	Median	Mean	Mode		
-	-	-	-	-	-	-	-	-	- No listing

Data sources: [H2OX](#), [National Water Exchange](#), [Victorian Water Register](#), [Waterfind](#).

2.10 New South Wales Murray: general security

Figure 20 Entitlement market prices and volumes, NSW Murray, general security, September 2009 to September 2016

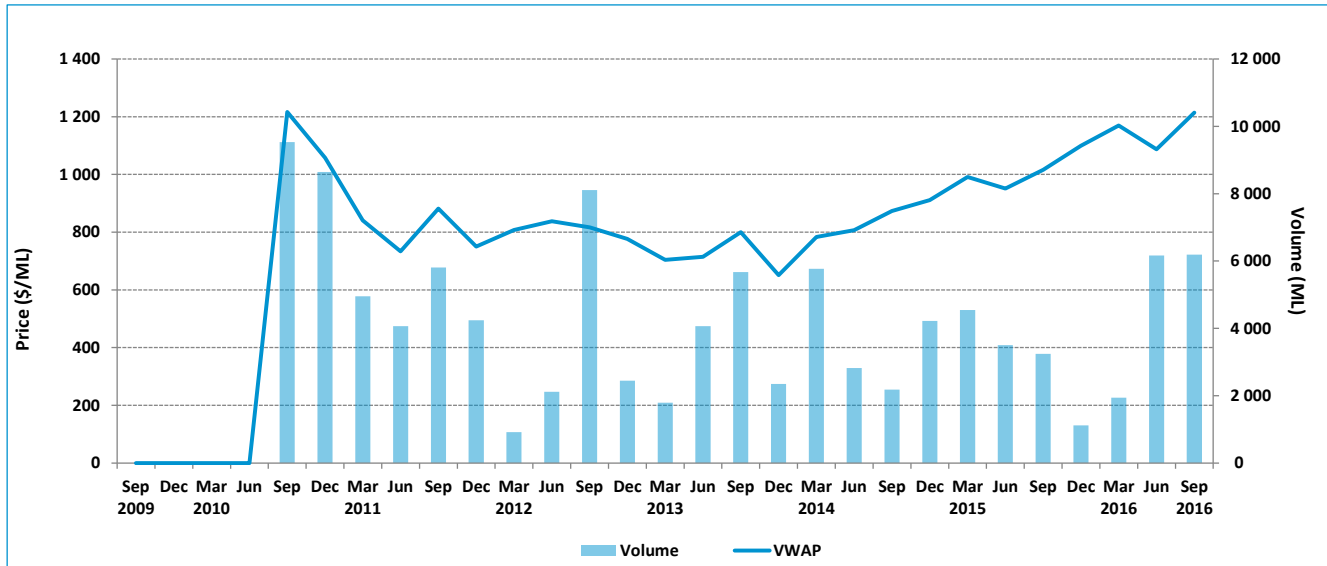
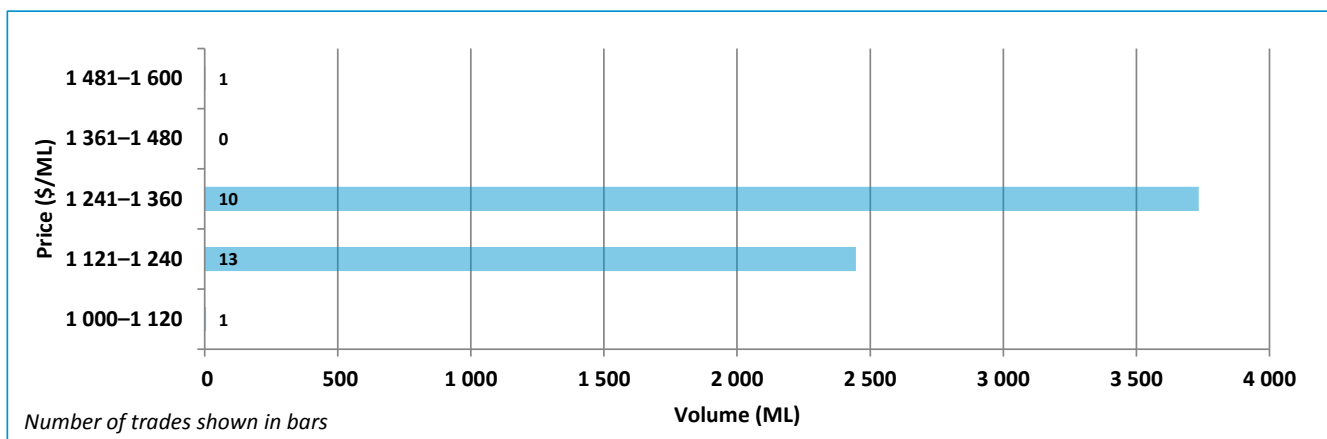


Table 12: Entitlement market prices and volumes, NSW Murray, general security

Volume weighted average price (\$/ML)		September quarter (\$/ML)					September quarter volume (ML)	September quarter no. of trades	Broker buy/sell range (\$/ML)	
September 2016	September quarter	YTD	25th percentile	75th percentile	Median	Mean	Mode			
1 200	1 214	1 214	1 175	1 250	1 213	1 219	1 250	6 189	25	1 100-1 300

Figure 21 Entitlement market price range, NSW Murray, general security, by volume, September quarter 2016



Data sources: [H2OX](#), [National Water Exchange](#), [Waterfind](#), [NSW Water Register](#).

2.11 New South Wales Murray: high security

Figure 22 Entitlement market prices and volumes, NSW Murray, high security, September 2009 to September 2016

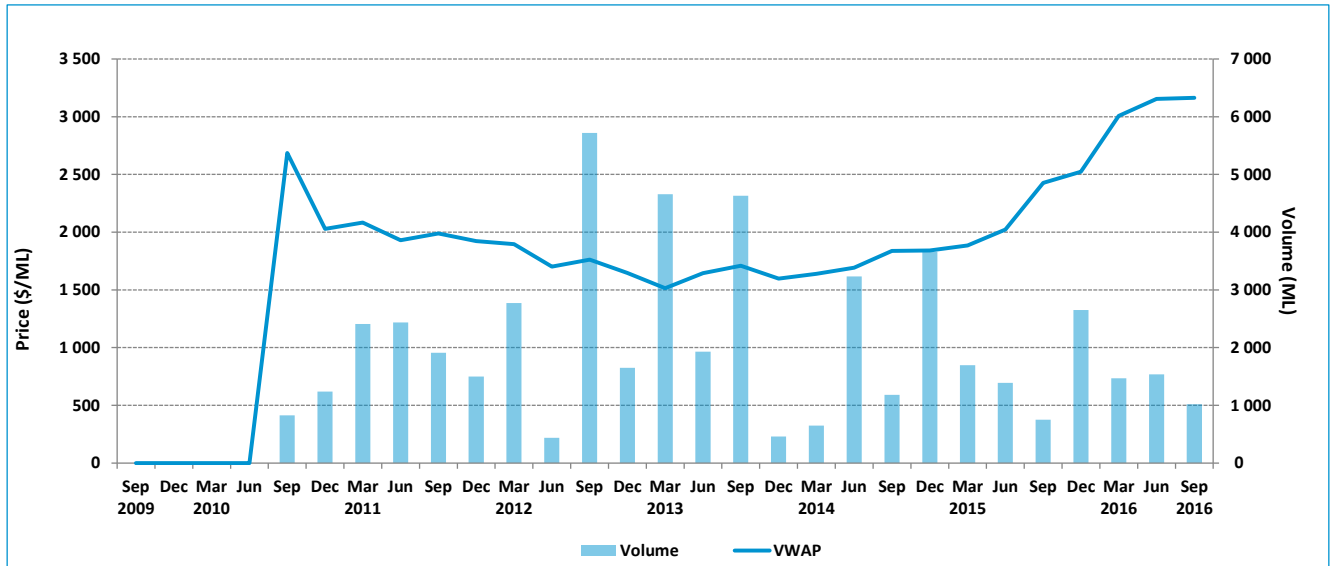
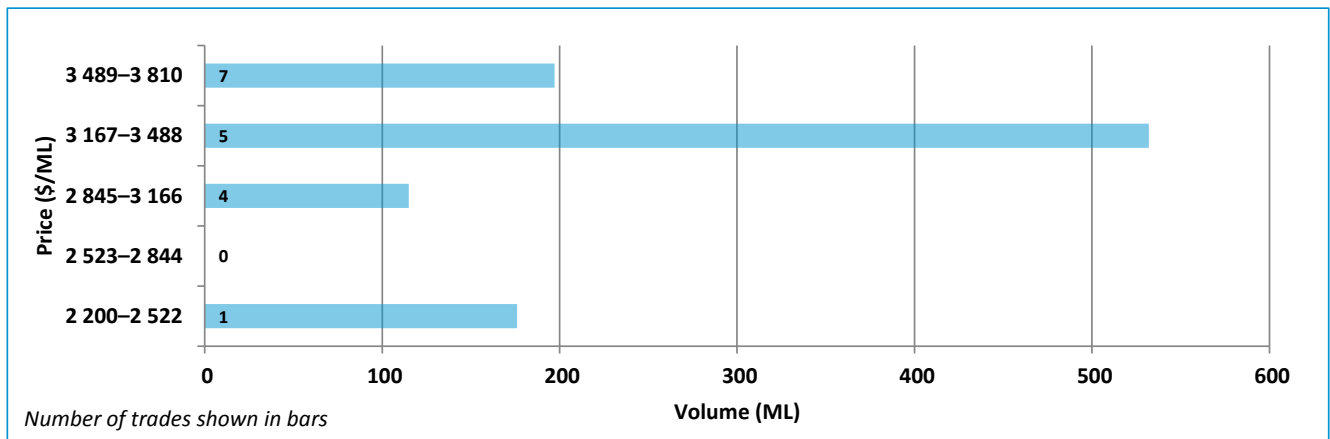


Table 13 Entitlement market prices and volumes, NSW Murray, high security

Volume weighted average price (\$/ML)		September quarter (\$/ML)					September quarter volume (ML)	September quarter no. of trades	Broker buy/sell range (\$/ML)
September 2016	September quarter	YTD	25th percentile	75th percentile	Median	Mean	Mode		
3 370	3 163	3 163	3 120	3 600	3 356	3 313	3 600	1 020	17 3 100-3 400

Figure 23 Entitlement market price range, NSW Murray, high security, by volume, September quarter 2016



Data sources: [H2OX](#), [National Water Exchange](#), [Waterfind](#), [NSW Water Register](#).

2.12 New South Wales Murray Irrigation Limited

Figure 24 Entitlement market prices and volumes, NSW Murray Irrigation Limited, general security, September 2009 to September 2016

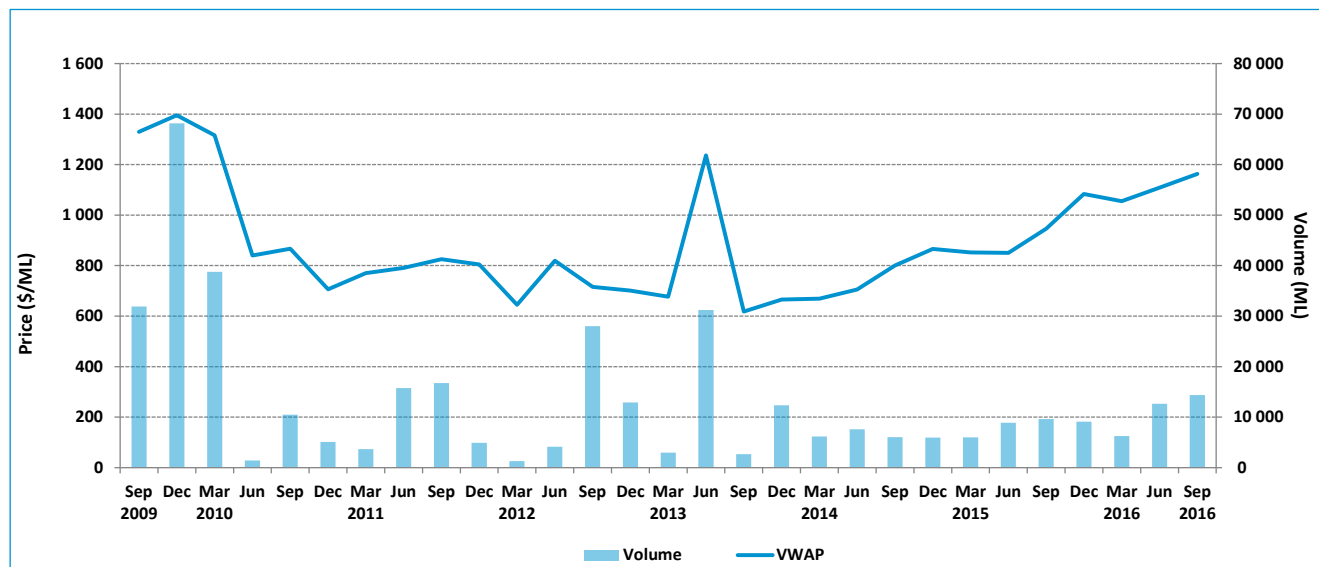
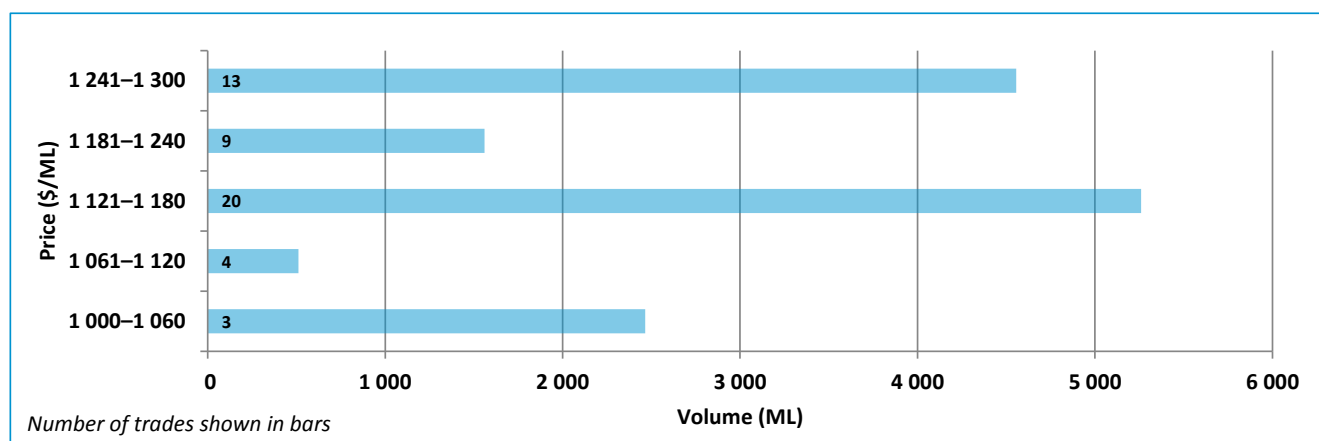


Table 14 Entitlement market prices and volumes, NSW Murray Irrigation Limited, general security

Volume weighted average price (\$/ML)		September quarter (\$/ML)					September quarter volume (ML)	September quarter no. of trades	Broker buy/sell range (\$/ML)	
September 2016	September quarter	YTD	25th percentile	75th percentile	Median	Mean	Mode			
1 225	1 163	1 163	1 150	1 250	1 175	1 177	1 150	14 353	49	1 100-1 300

Figure 25: Entitlement market price range, NSW Murray Irrigation Limited, general security, by volume, September quarter 2016



Data source: [Murray Irrigation Limited](#).

2.13 Murrumbidgee: general security

Figure 26 Entitlement market prices and volumes, Murrumbidgee, general security, September 2009 to September 2016

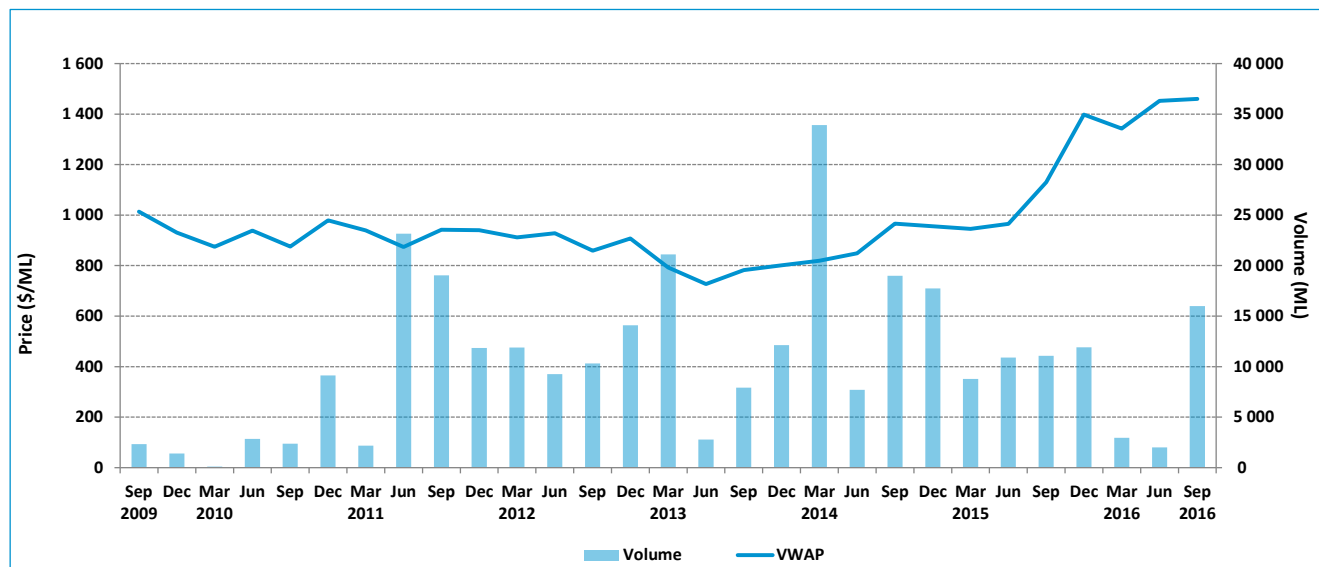
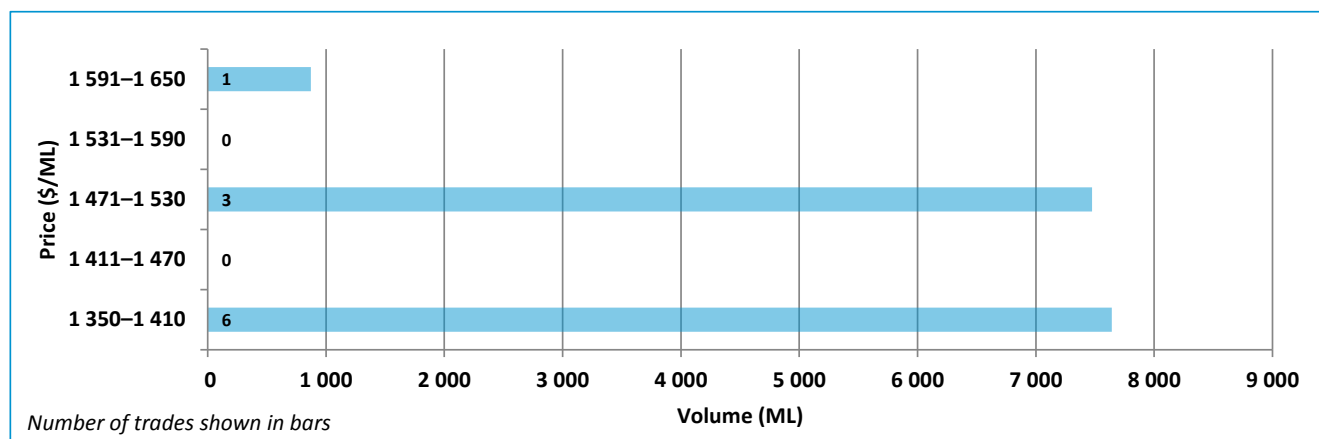


Table 15 Entitlement market prices and volumes, Murrumbidgee, general security

Volume weighted average price (\$/ML)		September quarter (\$/ML)					September quarter volume (ML)	September quarter no. of trades	Broker buy/sell range (\$/ML)	
September 2016	September quarter	YTD	25th percentile	75th percentile	Median	Mean	Mode			
–	1 460	1 460	1 400	1 500	1 400	1 450	1 400	15 989	10	1 350-1 500

Figure 27 Entitlement market price range, Murrumbidgee, general security, by volume, September quarter 2016



Data sources: [H2OX](#), [National Water Exchange](#), [Waterfind](#), [NSW Water Register](#).

2.14 Murrumbidgee: high security

Figure 28 Entitlement market prices and volumes, Murrumbidgee, high security, September 2009 to September 2016

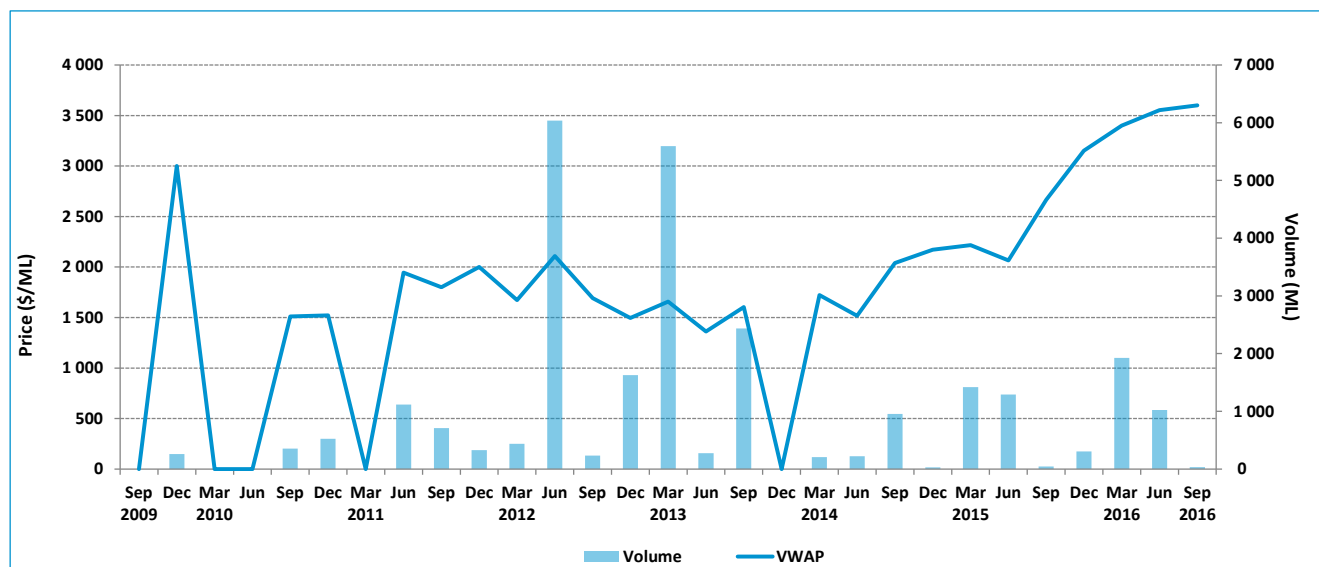
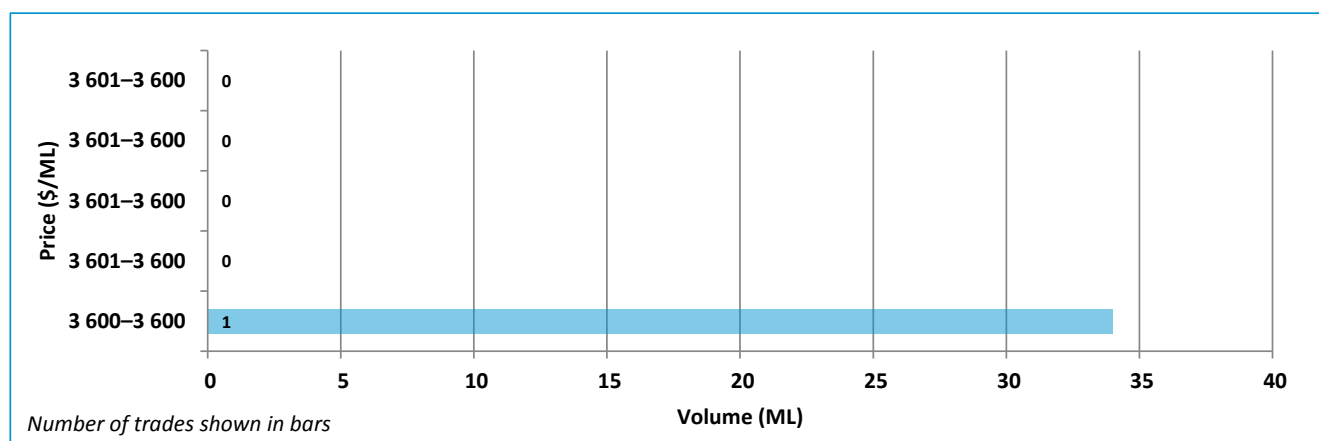


Table 16 Entitlement market prices and volumes, Murrumbidgee, high security

Volume weighted average price (\$/ML)		September quarter (\$/ML)					September quarter volume (ML)	September quarter no. of trades	Broker buy/sell range (\$/ML)
September 2016	September quarter	YTD	25th percentile	75th percentile	Median	Mean	Mode		
–	3 600	3 600	3 600	3 600	3 600	3 600	3 600	34	1 3 400-3 600

Figure 29 Entitlement market price range, Murrumbidgee, high security, by volume, September quarter 2016



Data sources: [H2OX](#), [National Water Exchange](#), [Waterfind](#), [NSW Water Register](#).

2.15 Lower Darling: general security

Figure 30 Entitlement market prices and volumes, Lower Darling, general security, September 2009 to September 2016

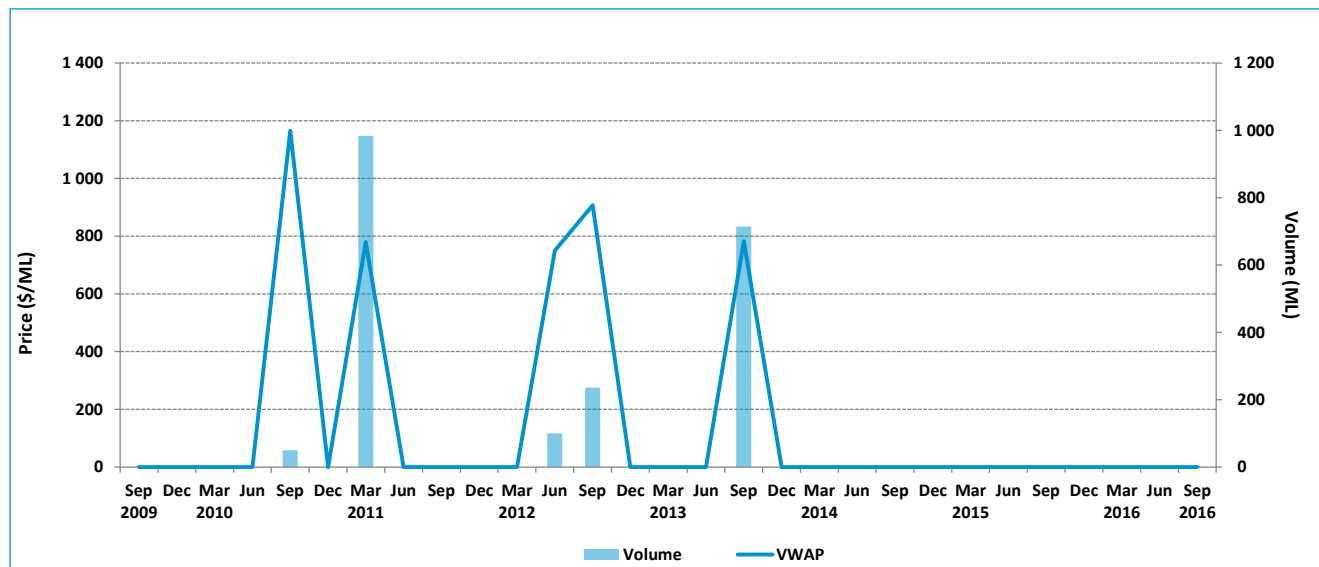


Table 17 Entitlement market prices and volumes, Lower Darling, general security

Volume weighted average price (\$/ML)			September quarter (\$/ML)					September quarter	September quarter	Broker buy/sell range (\$/ML)
September 2016	September quarter	YTD	25th percentile	75th percentile	Median	Mean	Mode	volume (ML)	no. of trades	
-	-	-	-	-	-	-	-	-	-	No listings

Data sources: [H2OX](#), [National Water Exchange](#), [Waterfind](#), [NSW Water Register](#).

2.16 Lower Darling: high security

Figure 31 Entitlement market prices and volumes, Lower Darling, high security, September 2009 to September 2016

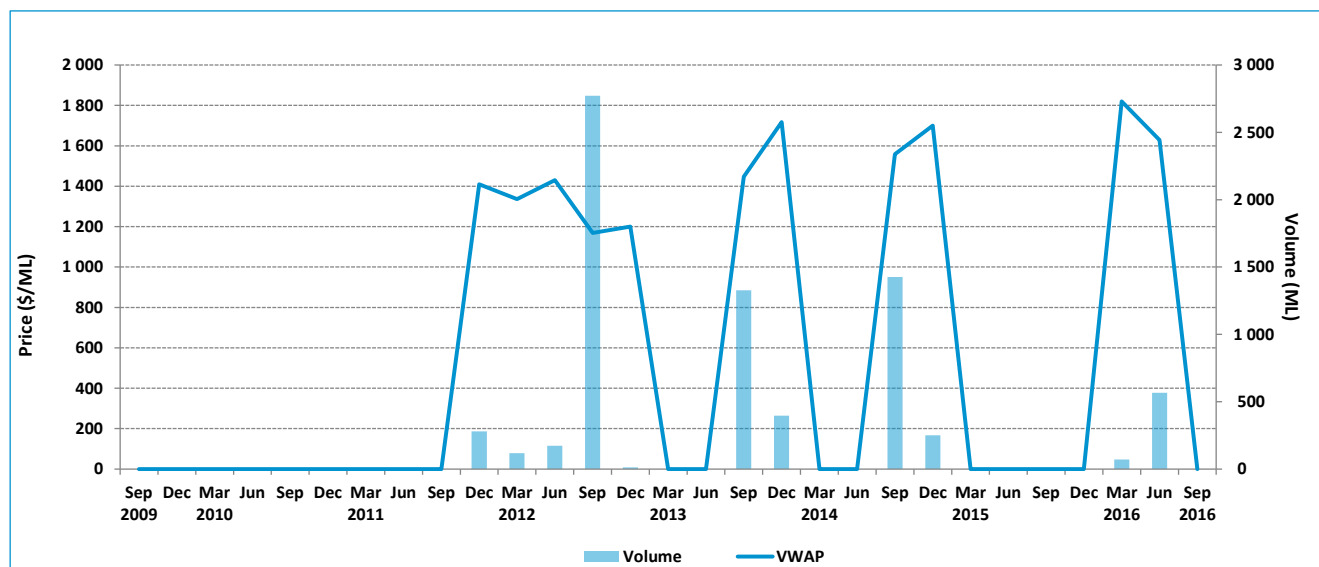


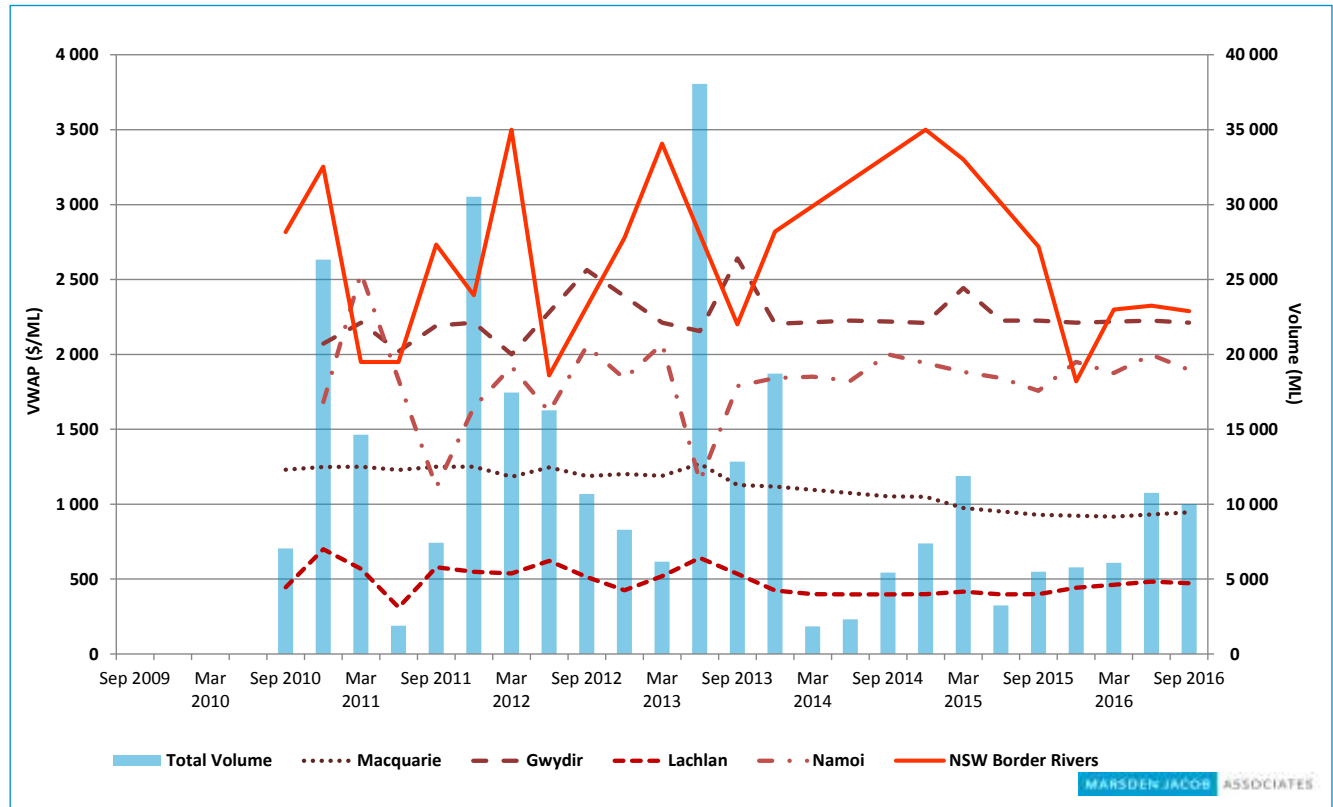
Table 18: Entitlement market prices and volumes, Lower Darling, high security

Volume weighted average price (\$/ML)		September quarter (\$/ML)					September quarter volume (ML)	September quarter no. of trades	Broker buy/sell range (\$/ML)
September 2016	September quarter	YTD	25th percentile	75th percentile	Median	Mean	Mode		
-	-	-	-	-	-	-	-	-	- No listings

Data sources: [H2OX](#), [National Water Exchange](#), [Waterfind](#), [NSW Water Register](#).

3. Northern Murray–Darling Basin

Figure 32 Price correlations in the northern MDB, general security, September 2010 to September 2016



Note: Zero values have been interpolated in this chart, so it differs from the region- and entitlement-specific charts.

Source: Marsden Jacob analysis, 2016

3.1 Macquarie: general security

Figure 33 Entitlement market prices and volumes, Macquarie, general security, September 2009 to September 2016

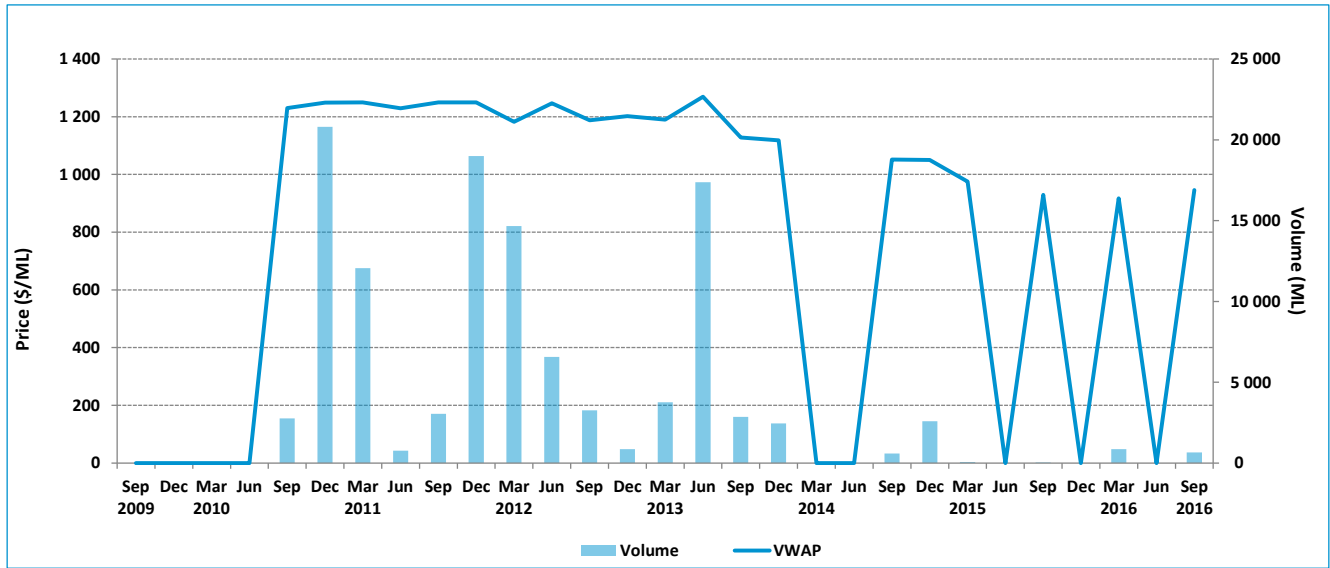
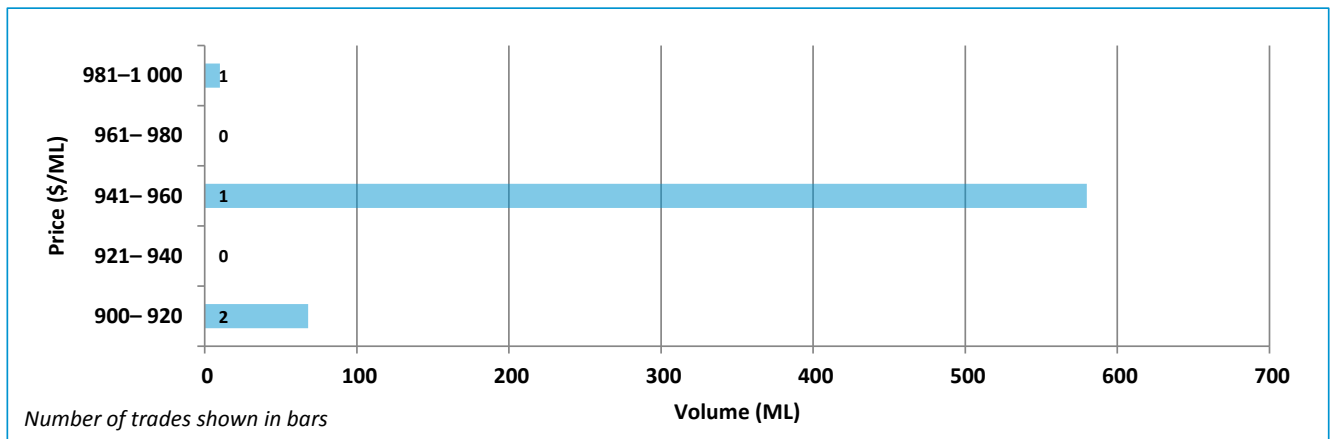


Table 19: Entitlement market prices and volumes, Macquarie, general security

Volume weighted average price (\$/ML)		September quarter (\$/ML)						September quarter volume (ML)	September quarter no. of trades	Broker buy/sell range (\$/ML)
September 2016	September quarter	YTD	25th percentile	75th percentile	Median	Mean	Mode			
950	946	946	900	963	925	938	900	658	4	1 000-1 250

Figure 34: Entitlement market price range, Namoi, general security, by volume, September quarter 2016



Data sources: [NSW Water Register](#), [Waterfind](#).

3.2 Namoi: general security

Figure 35 Entitlement market prices and volumes, Namoi, general security, September 2009 to September 2016

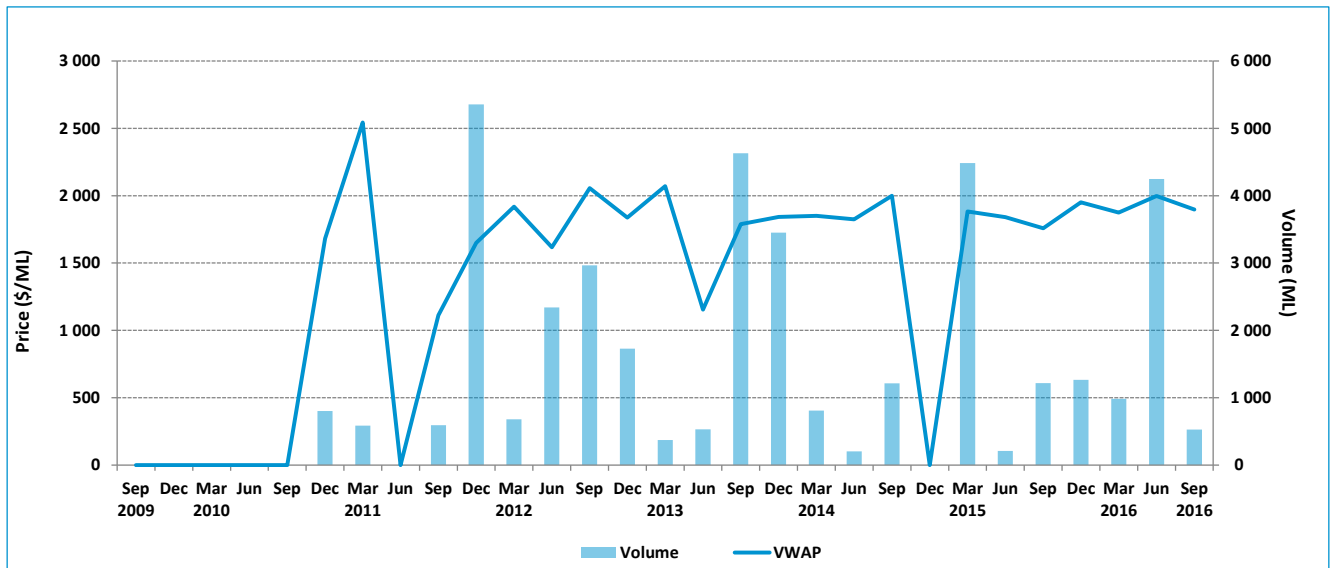
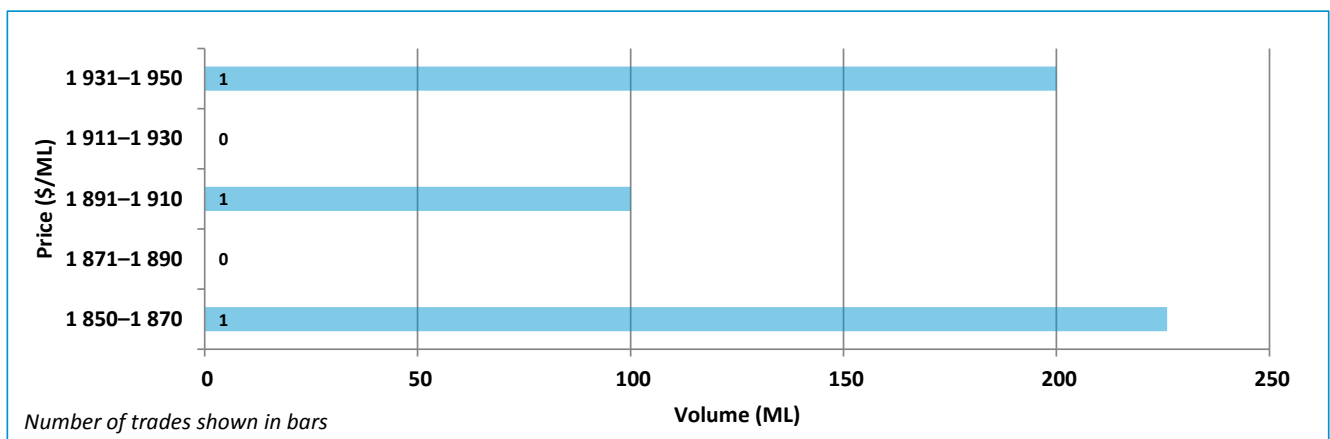


Table 20: Entitlement market prices and volumes, Namoi, general security

Volume weighted average price (\$/ML)		September quarter (\$/ML)					September quarter volume (ML)	September quarter no. of trades	Broker buy/sell range (\$/ML)	
September 2016	September quarter	YTD	25th percentile	75th percentile	Median	Mean	Mode			
–	1 898	1 898	1 875	1 925	1 900	1 900	–	526	3	1 850-2 000

Figure 36: Entitlement market price range, Namoi, general security, by volume, September quarter 2016



Data sources: [NSW Water Register](#), [Waterfind](#).

3.3 Gwydir: general security

Figure 37 Entitlement market prices and volumes, Gwydir, general security, September 2009 to September 2016

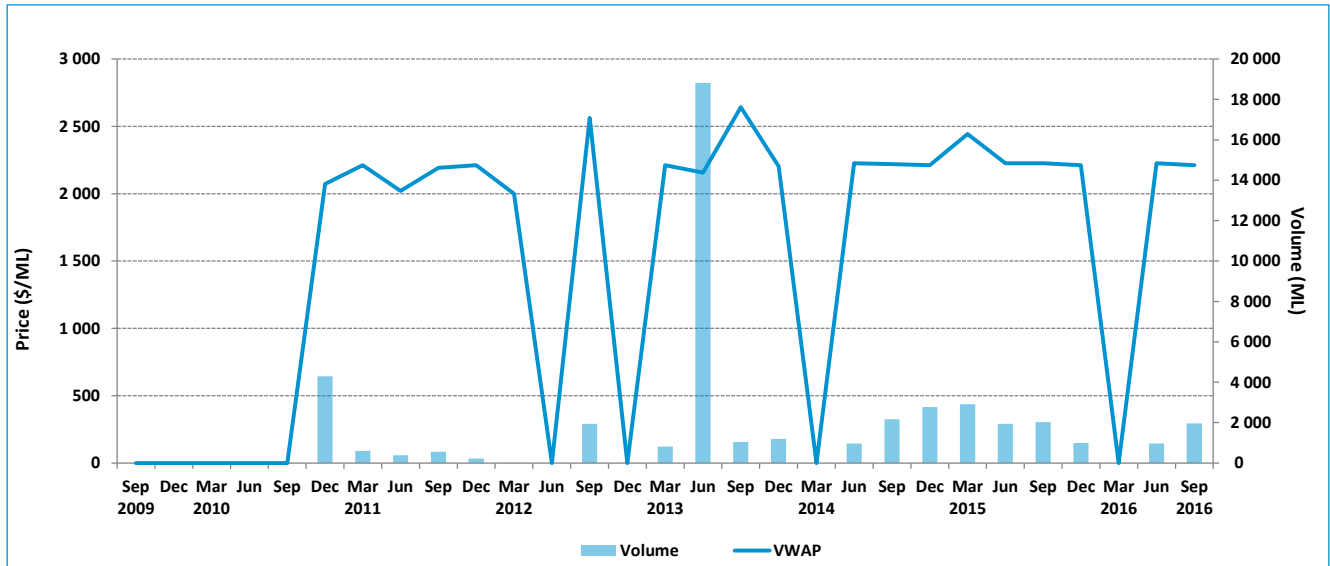
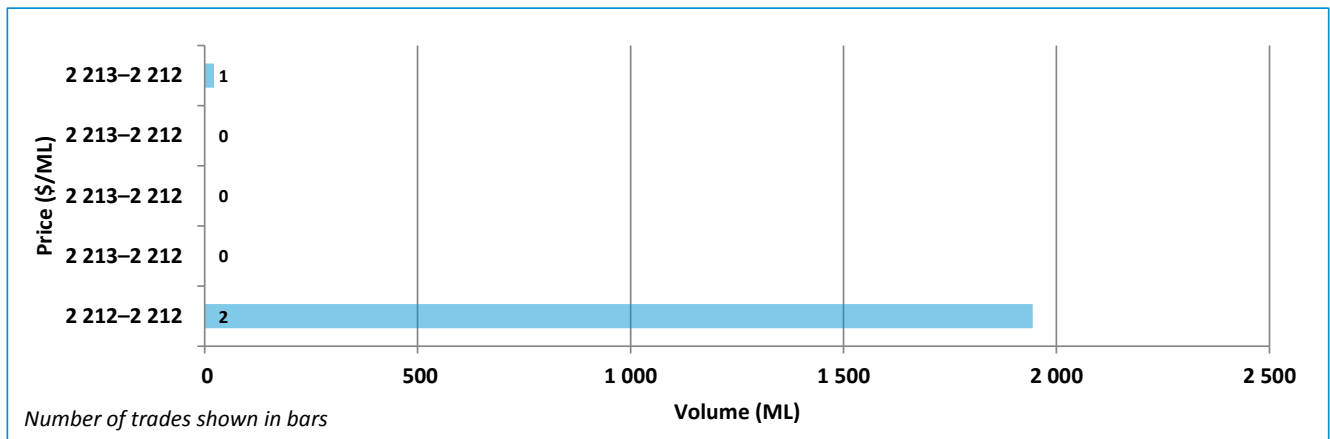


Table 21 Entitlement market prices and volumes, Gwydir, general security

Volume weighted average price (\$/ML)		September quarter (\$/ML)						September quarter volume (ML)	September quarter no. of trades	Broker buy/sell range (\$/ML)
September 2016	September quarter	YTD	25th percentile	75th percentile	Median	Mean	Mode			
2 212	2 212	2 212	2 212	2 212	2 212	2 212	2 212	1 966	3 2 100-2 300	

Figure 38 Entitlement market price range, Gwydir, general security, by volume, September quarter 2016



Data sources: [NSW Water Register](#), [Waterfind](#).

3.4 New South Wales Border Rivers: general security

Figure 39 Entitlement market prices and volumes, NSW Border Rivers, general security, September 2009 to September 2016

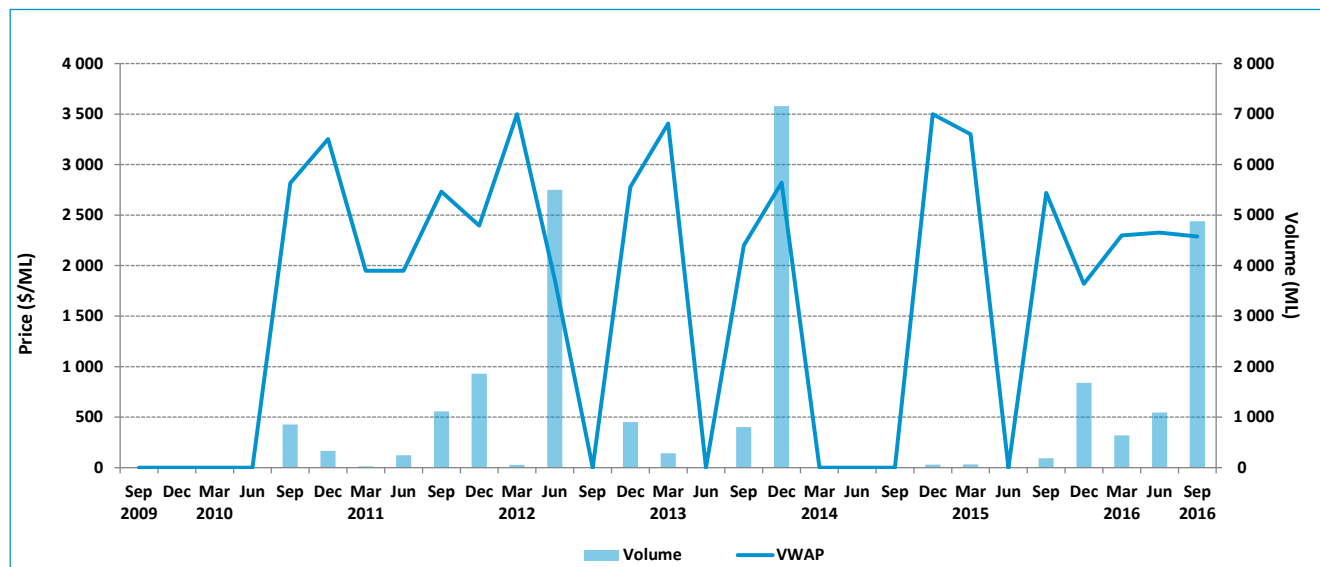
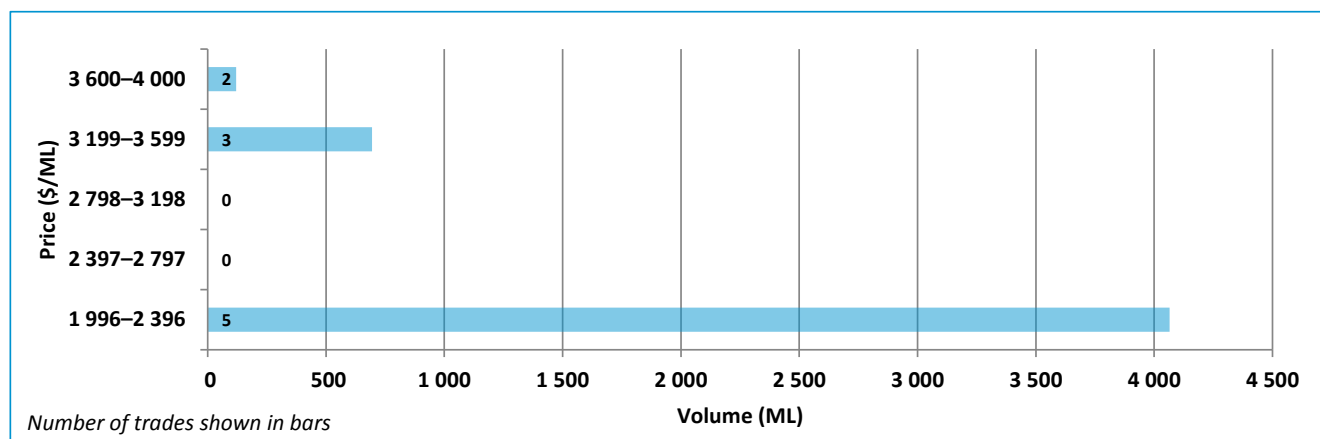


Table 22 Entitlement market prices and volumes, NSW Border Rivers, general security

Volume weighted average price (\$/ML)		September quarter (\$/ML)					September quarter volume (ML)	September quarter no. of trades	Broker buy/sell range (\$/ML)	
September 2016	September quarter	YTD	25th percentile	75th percentile	Median	Mean	Mode			
–	2 289	2 289	2 100	3 500	2 737	2 867	1 996	4 880	10	No Listings

Figure 40 Entitlement market price range, NSW Border Rivers, general security, by volume, September quarter 2016



Data sources: [NSW Water Register](#), [Waterfind](#).

3.5 Barwon–Darling: unregulated

Figure 41 Entitlement market prices and volumes, Barwon–Darling, unregulated, September 2009 to September 2016

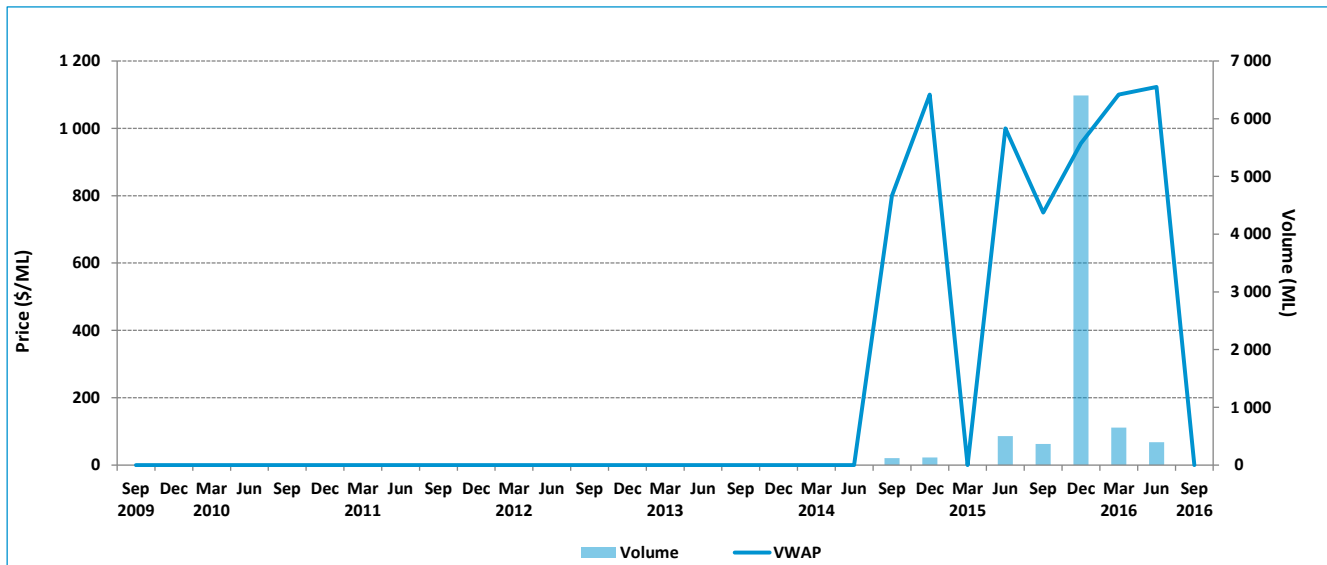


Table 23 Entitlement market prices and volumes, Barwon–Darling, unregulated

Volume weighted average price (\$/ML)		September quarter (\$/ML)					September quarter volume (ML)	September quarter no. of trades	Broker buy/sell range (\$/ML)
September 2016	September quarter	YTD	25th percentile	75th percentile	Median	Mean	Mode		
-	-	-	-	-	-	-	-	-	1 000-1 300

Data sources: [NSW Water Register](#), [Waterfind](#).

3.6 Lachlan: General security

Figure 42 Entitlement market prices and volumes, Lachlan, general security, September 2009 to September 2016

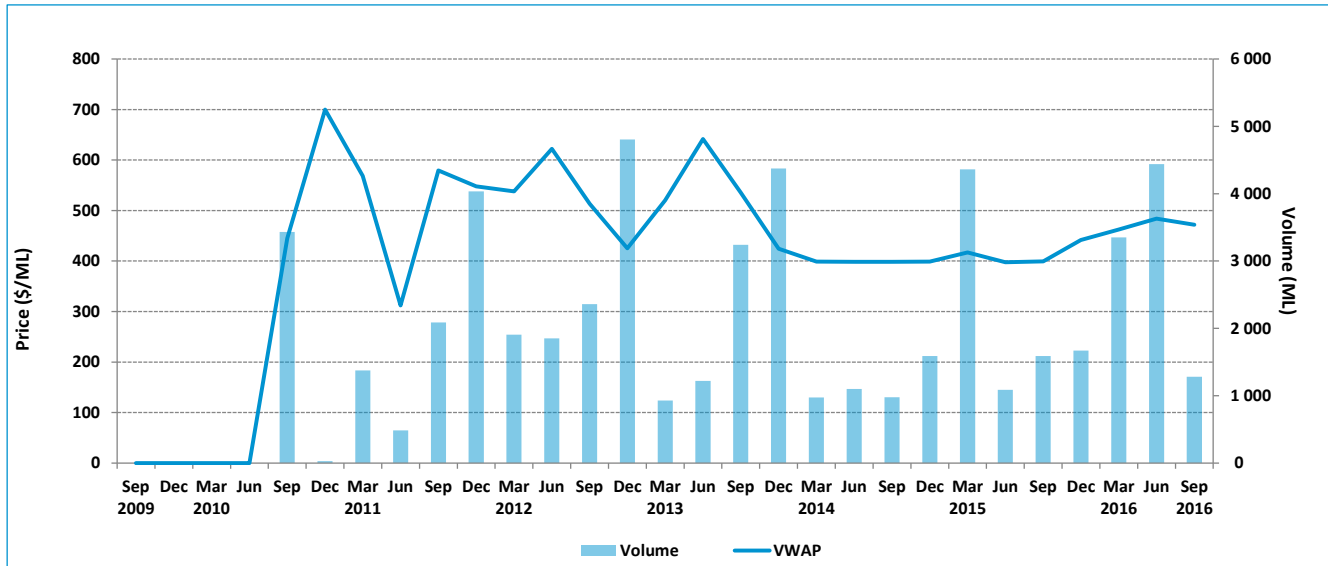
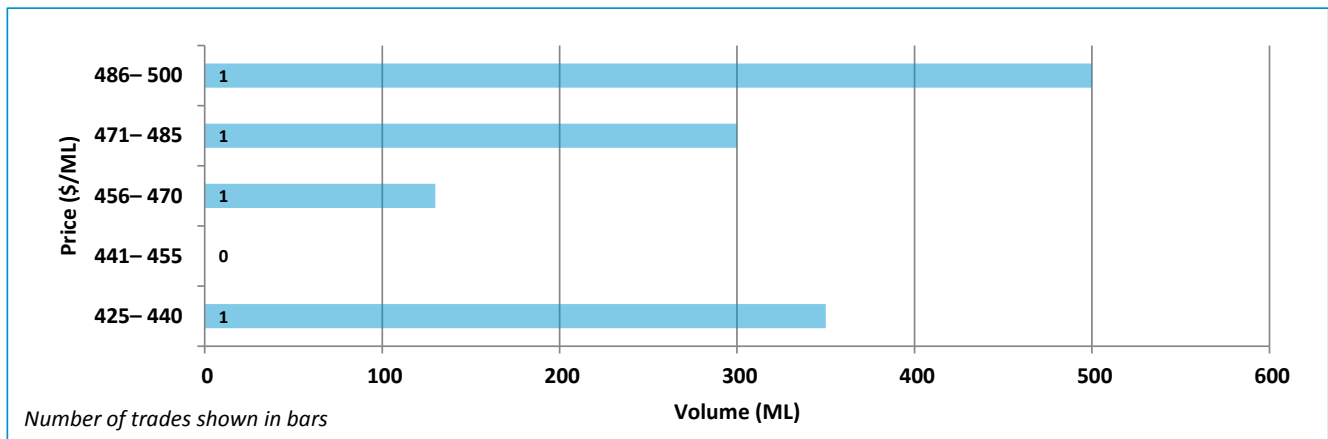


Table 24 Entitlement market prices and volumes, Lachlan, general security

Volume weighted average price (\$/ML)		September quarter (\$/ML)					September quarter volume (ML)	September quarter no. of trades	Broker buy/sell range (\$/ML)	
September 2016	September quarter	YTD	25th percentile	75th percentile	Median	Mean	Mode			
500	472	472	451	489	473	468	–	1 280	4	450-525

Figure 43 Entitlement market price range, Lachlan, general security, by volume, September quarter 2016



Data sources: [NSW Water Register](#), [Waterfind](#).

3.7 Queensland

The markets in Queensland are very thin. Only limited trading of entitlements occurs.

Queensland does not maintain a publicly available trade register. Information on entitlement trades is provided on an aggregated monthly basis.

Table 25 Entitlement market prices and volumes, Queensland

Resource operation plan	Water supply scheme / water management area	Type of entitlement	Volume weighted average price (\$/ML)			September quarter volume (ML)	September quarter no. of trades
			September 2016	September quarter	YTD \$/ML		
Qld Border Rivers	Border Rivers/ Macintyre Brook	Supplemented	–	–	–	–	–
Qld Border Rivers	Border Rivers	Unsupplemented	–	–	–	–	–
Condamine–Balonne	St George / Upper Condamine	Supplemented	–	–	–	–	–
Condamine–Balonne	Condamine–Balonne / Lower Balonne / Upper Condamine	Unsupplemented	–	–	–	–	–
Condamine–Balonne	Central Condamine Alluvium Groundwater (1, 2, 3 and 4)	Alluvium groundwater	–	–	–	–	–
Condamine–Balonne	Upper Condamine Alluvium Groundwater (Dalrymple Creek)	Alluvium groundwater	–	–	–	–	–
Condamine–Balonne	Upper Condamine Alluvium Groundwater (Oakey Creek)	Alluvium groundwater	–	–	–	–	–
Condamine–Balonne	Lower Balonne	Overland flow	–	–	–	–	–

Data source: [Queensland Business and Industry Portal and Queensland Government website.](#)

Appendix A: Regions and water sources

Table A1 Water sources (southern MDB)

Region	Water source
SA Murray	River Murray Prescribed Water Course (Class 3a)
Vic. Murray above Barmah Choke	6 Vic. Murray Dart to Barmah
Vic. Murray below Barmah Choke	7 Vic. Murray Barmah to SA 6B Lower Broken Creek
Goulburn	1A Greater Goulburn 1B Boort 3 Lower Goulburn
Campaspe	4A Campaspe Eppalock to WWC 4C Lower Campaspe
Loddon	5A Loddon–Coliban Channel to Lower Weir Pool (now 5A Loddon – CC/Tull to LWP) 5B Bullarook
NSW Murray	New South Wales Murray Regulated River Water Source
Murrumbidgee	Murrumbidgee Regulated River Water Source
Lower Darling	Lower Darling Regulated River Water Source

Table A2 Water sources (northern MDB)

Region	Water source
Macquarie	Macquarie and Cudgegong Regulated Rivers Water Source
Namoi	Lower Namoi Regulated River Water Source Upper Namoi Regulated River Water Source
Gwydir	Gwydir Regulated River Water Source
NSW Border Rivers	Border Rivers Regulated River Water Source
Barwon–Darling	Barwon–Darling Unregulated River Water Source
Lachlan	Lachlan Regulated River Water Source

Appendix B: Outliers removed

Table B1 shows outliers removed from the trade data in the September 2016 quarter.

Table B1 Outliers removed from trade data

Date	Catchment	Product name	Volume (ML)	Price (\$)	Price per ML (\$/ML)
8/07/2016	Goulburn	High Reliability	6.6	\$2,500	\$378.79
28/07/2016	Goulburn	Low Reliability	15.8	\$4,740	\$300.00
18/07/2016	Murrumbidgee	General Security	972.0	\$680,400	\$700.00
19/07/2016	Murrumbidgee	General Security	147.0	\$125,000	\$850.34
19/07/2016	Murrumbidgee	General Security	440.0	\$374,999	\$852.27
13/07/2016	Namoi	General Security	162.0	\$880,000	\$5,432.10
14/07/2016	NSW_Border_Rivers	General Security	24,665.0	\$7,633,078	\$309.47
14/07/2016	NSW_Border_Rivers	General Security	1,860.0	\$1,425,002	\$766.13
24/07/2016	SA_Murray	Class 3a	0.5	\$750	\$1,500.00
12/07/2016	Vic_Murray_BelowBC	Low Reliability	37.4	\$5,610	\$150.00
1/07/2016	NSW_Murray	General Security	66.0	\$1	\$0.02
1/07/2016	NSW_Murray	General Security	59.0	\$1	\$0.02
1/07/2016	NSW_Murray	General Security	61.0	\$1	\$0.02
1/07/2016	NSW_Murray	General Security	61.0	\$1	\$0.02
1/07/2016	NSW_Murray	General Security	61.0	\$1	\$0.02
1/07/2016	NSW_Murray	General Security	61.0	\$1	\$0.02
1/07/2016	NSW_Murray	General Security	8.0	\$1	\$0.13
4/07/2016	NSW_Murray	General Security	5.0	\$1	\$0.20
5/07/2016	NSW_Murray	High Security	15.0	\$1	\$0.07
21/07/2016	NSW_Murray	General Security	72.0	\$1	\$0.01
21/07/2016	NSW_Murray	General Security	63.0	\$1	\$0.02
21/07/2016	NSW_Murray	General Security	63.0	\$1	\$0.02
21/07/2016	NSW_Murray	NOT_ALLOC	3.0	\$1	\$0.33
21/07/2016	NSW_Murray	NOT_ALLOC	3.0	\$1	\$0.33
25/07/2016	NSW_Murray	General Security	12.0	\$1	\$0.08

Water entitlement market prices: Murray–Darling Basin (September quarter 2016)

Date	Catchment	Product name	Volume (ML)	Price (\$)	Price per ML (\$/ML)
22/07/2016	Vic_Murray_BelowBC	High Reliability	55.5	\$1	\$0.02
1/08/2016	Broken	High Reliability	2.0	\$10,000.00	\$5,000.00
10/08/2016	Goulburn	High Reliability	5.0	\$7,500.00	\$1,500.00
29/08/2016	Goulburn ^a	Low Reliability	8.6	\$1,548.00	\$180.00
2/09/2016	Goulburn	Low Reliability	27.8	\$2,780.00	\$100.00
2/09/2016	Goulburn	Low Reliability	38.1	\$3,810.00	\$100.00
13/09/2016	Goulburn	Low Reliability	12.0	\$1,380.00	\$115.00
5/08/2016	Goulburn	Low Reliability	37.4	\$11,220.00	\$300.00
13/09/2016	Loddon	High Reliability	99.0	\$249,999.75	\$2,525.25
13/09/2016	Loddon	Low Reliability	99.0	\$249,999.75	\$2,525.25
26/08/2016	Loddon ^a	High Reliability	1.0	\$2,300.00	\$2,300.00
5/09/2016	Murrumbidgee	General Security	1,400.0	\$1,050,000.00	\$750.00
1/09/2016	NSW_Border_Rivers	General Security	9,946.0	\$5,260,339.94	\$528.89
1/09/2016	NSW_Border_Rivers	General Security	930.0	\$525,003.60	\$564.52
5/09/2016	NSW_Murray	General Security	3.0	\$6,000.00	\$2,000.00
13/09/2016	NSW_Murray	General Security	32.0	\$1,200.00	\$37.50
11/08/2016	NSW_Murray	High Security	432.0	\$138,240.00	\$320.00
11/08/2016	NSW_Murray	High Security	432.0	\$138,240.00	\$320.00
12/08/2016	SA_Murray	Class 3a	121.0	\$206,910.00	\$1,710.00
2/08/2016	SA_Murray	Class 3a	4.0	\$14,210.00	\$3,552.50
9/09/2016	Vic_Murray_AboveBC	High Reliability	207.7	\$172,391.00	\$830.00
24/08/2016	Vic_Murray_BelowBC	High Reliability	3.0	\$2,799.99	\$933.33
1/08/2016	Vic_Murray_BelowBC	Low Reliability	0.5	\$150.00	\$300.00
29/08/2016	Goulburn	High Reliability	2.0	\$21.10	\$10.55
24/08/2016	NSW_Murray	General Security	11.0	\$0.99	\$0.09
11/08/2016	NSW_Murray	High Security	55.0	\$1.10	\$0.02
11/08/2016	NSW_Murray	High Security	55.0	\$1.10	\$0.02
9/09/2016	Vic_Murray_AboveBC	Low Reliability	160.3	\$99.39	\$0.62
7/09/2016	Vic_Murray_BelowBC	High Reliability	2.0	\$3,000.00	\$1,500.00

Water entitlement market prices: Murray–Darling Basin (September quarter 2016)

Date	Catchment	Product name	Volume (ML)	Price (\$)	Price per ML (\$/ML)
9/09/2016	NSW_Murray	High Security	164.0	\$1.64	\$0.01
9/09/2016	NSW_Murray	High Security	176.0	\$1.76	\$0.01
9/09/2016	NSW_Murray	General Security	1.0	\$1.00	\$1.00

BC = Barmah Choke.

a Trades are within the bounds of two standard deviations for the catchment, but have been excluded.