

Koo Wee Rup WSPA Groundwater Management Plan

**Annual Report
2018-19**

Foreword

This report is submitted to the Minister for Water, Port Phillip & Westernport Catchment Management Authority and Melbourne Water in accordance with s32C *Water Act 1989*. A copy of this report is available for inspection at the offices of the Authority, and notice of report availability will be published as required by s32D of the *Water Act 1989*.

The purpose of this report is to detail Authority activities administering and enforcing the management plan and provide information that is required to be reported under the Plan.

Area Summary

Area	Koo Wee Rup Water Supply Protection Area
Segment	Groundwater
Area Declared	January 2002
Plan Approved	4 August 2010
Allocation Limit (Permissible Consumptive Volume)	12,915 ML
Scheduled Plan Review	A review commenced in 2017 and remains underway
Responsible Authority	Southern Rural Water
Relevant CMA	Port Phillip & Westernport Catchment Management Authority
Report Period	1 July 2018 – 30 June 2019

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1 Executive Summary

The Koo Wee Rup Groundwater Management Plan (GMP) was prepared under Division 3 Part 3 of the *Water Act 1989* for the Koo Wee Rup Water Supply Protection Area (WSPA) and relates to the groundwater resources of the protection area. The Koo Wee Rup GMP was approved by the Minister for Water in August 2010.

The objective of the management plan is to make sure that the water resources of the area are managed in an equitable manner and to ensure the long-term sustainability of those resources.

Southern Rural Water (SRW) is the authority responsible for managing and administering the plan, which includes the preparation of an annual report to demonstrate compliance. The annual report summarises licence information, metered usage and monitoring data collected for the reporting period in accordance with the recommendations given in the Koo Wee Rup GMP.

The Koo Wee Rup GMP Annual Report for 2018-19 demonstrates that SRW has complied with the requirements of the plan.

Monitoring and metering indicate no significant changes in the condition of the resource or water usage patterns; therefore it is considered that the groundwater resources of the Koo Wee Rup WSPA are being managed sustainably. No changes are proposed for the monitoring strategy in 2019-20.

The GMP requires that a review is undertaken of the plan after 5 years. SRW is currently reviewing the Koo Wee Rup GMP. A survey of groundwater licence holders was completed in 2019 and this has confirmed that some customers believe that there should be greater flexibility in trade rules. Further technical work is proposed in order to assess the impacts of more trade and potentially higher levels of groundwater use.



HUGH CHRISTIE
Manager Groundwater & Rivers

2 Introduction

This report summarises licence information, metered usage and monitoring data collected for the period between 1 July 2018 and 30 June 2019 in accordance with the requirements of the Koo Wee Rup GMP.

The Koo Wee Rup WSPA is separated into 8 zones and comprises the groundwater resource, mainly in the Westernport sequence (Baxter, Sherwood and Yallock formations). The Westernport sequence is generally considered a single aquifer system, as there is a hydraulic connection between each individual formation. However basaltic clay of the Older Volcanics is considered to form a semi-confining layer between the Westernport sequence and the underlying Older Volcanics/Childers formations.

Groundwater within the Koo Wee Rup WSPA is used for irrigation, dairy, industrial, and stock and domestic purposes.

The Koo Wee Rup GMP identifies SRW as the authority responsible for managing and administering the plan.

The objective of the management plan, as set out in the *Water Act 1989*, is to make sure that the water resources of the area are managed in an equitable manner and to ensure the long-term sustainability of those resources.

The plan requires SRW to:

- Coordinate groundwater level monitoring and metering programs;
- Review monitoring and metering data;
- Administer groundwater licensing within the prescriptions of the plan;
- Review and report annually to the Minister administering the *Water Act 1989* on the implementation of the plan;
- Periodically review the plan and if, in its opinion, amendments are necessary or desirable, make recommendations to the Minister accordingly.

The success of the Koo Wee Rup GMP is measured through a number of licensing, metering and monitoring objectives. These include:

- All consumptive use to be metered and recorded in line with both State Government and Corporation metering policies;
- Groundwater usage is to be maintained within licence volumes;
- Water levels and water quality (salinity) is to be monitored to maintain acceptable levels and to ensure the long term sustainable use of the aquifer(s);
- Transfers of existing licences occurs in accordance with all relevant provisions of the *Water Act 1989* and/or any supplementary rules adopted for the Koo Wee Rup WSPA;
- No new groundwater licences will be issued if the total of all groundwater licence entitlements would exceed the PCV declared for the Koo Wee Rup WSPA, unless allowed for by prescriptions 7 & 8.

Further information can be obtained from the Koo Wee Rup WSPA Groundwater Management Plan. A copy can be found on Southern Rural Water's website: www.srw.com.au.

3 Key Observations

3.1 Rainfall

Rainfall during the reporting period was 731.9mm (measured at Lang Lang). Lang Lang has an average rainfall of 859mm per year.

3.2 Water Levels

Groundwater levels are measured monthly in twenty eight (28) bores, monitoring the Quaternary Sands, Westernport Group, Older Volcanics and Childers aquifers.

The location of observation bores in the area are shown below in Figure 1. Hydrograph for bore 71187 is shown in Figure 2. All hydrographs are presented in appendix 2.

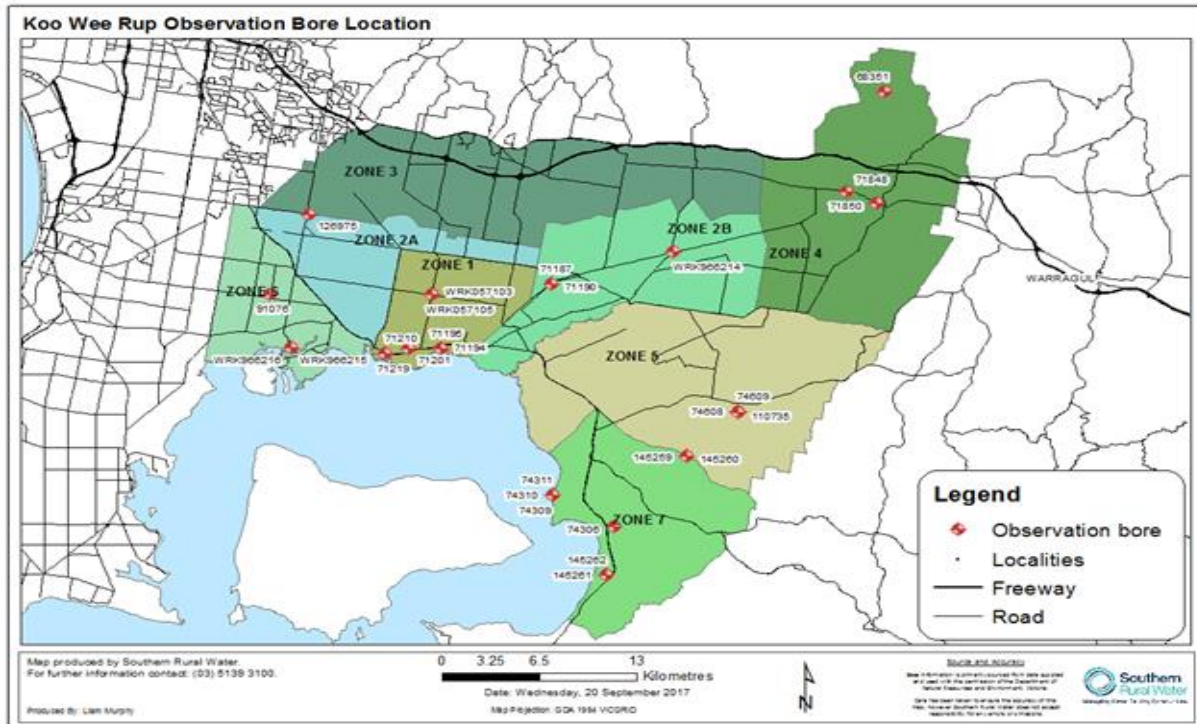


Figure 1: SOBN locations in Koo Wee Rup WSPA.

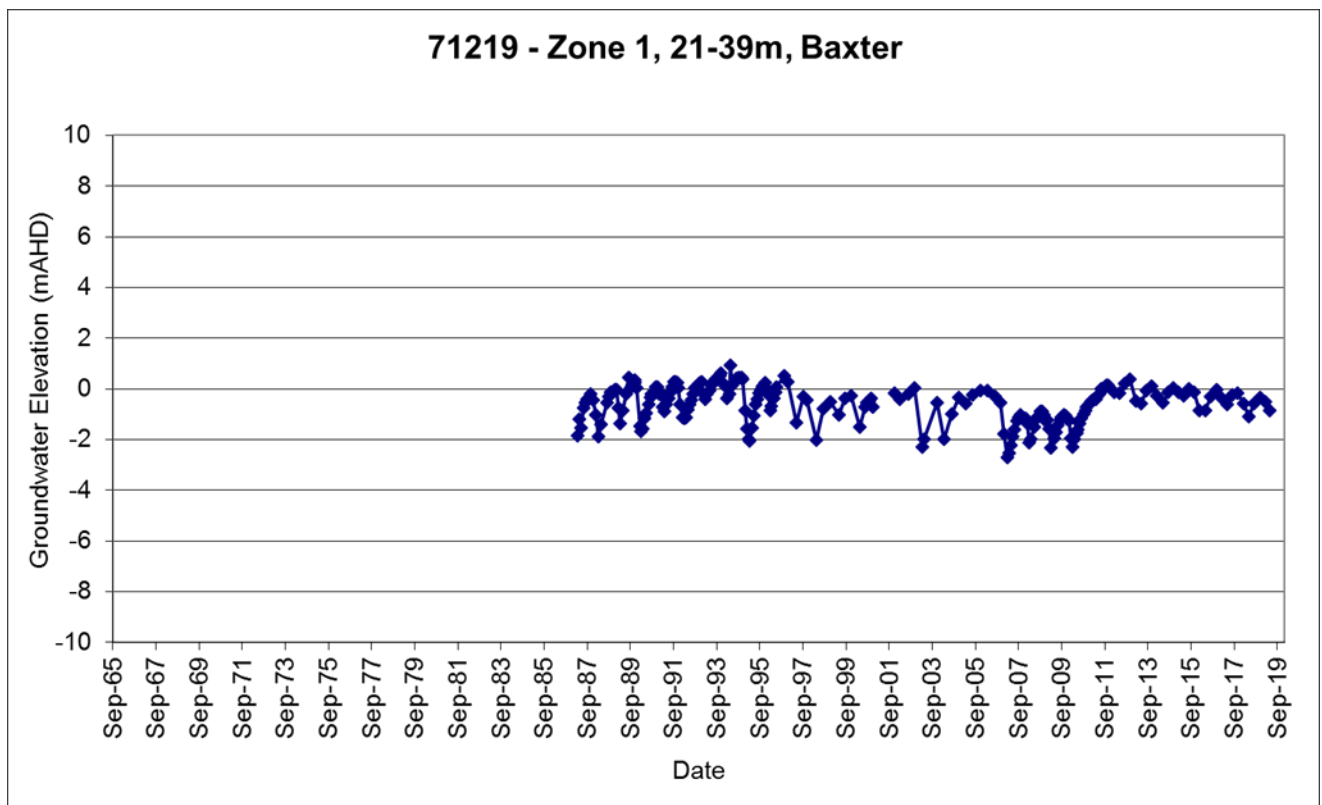


Figure 2: Example hydrograph from Zone 2B.

The groundwater elevation data indicates:

- Groundwater level trends over the last 30 years in all aquifers are generally stable across the majority of the WSPA, including the coastal zone
- Current water levels in many bores are similar to levels seen in the 1990's.

- 2018/19 was a relatively dry year, with near average usage volumes, and seasonal groundwater levels have declined in several bores as a result.
- There are isolated locations where hydrographs show a modest longer term declining trend, in Zone 7 (SOBN bores 74306 and 145259) and in Zone 1 (WRK057103/5). These declines are likely to represent the impact of local pumping.

3.3 Salinity

One of the key drivers for monitoring salinity in the plan was the potential of saline intrusion into the aquifer, as well as broader resource management issues.

This monitoring has shown that salinity has been relatively stable over the past 10 years and most bores remain within historic ranges. Refer figure 3 for summary results.

The exceptions to this are:

- Salinity in Bore 71194, which is on the coast in zone 1, has varied considerably over the period of record, which correlates to periods of high rainfall is high and low usage, and vice versa.
- Salinity in Bore 74311, which is on the coast in zone 7, has decreased since monitoring began in 2008.
- Bore 71219 (appendix 3) has much higher levels of salinity than the other monitored bores, although these levels are stable. This is likely to be due to a remnant pocket of saline water in the aquifer, or because the impermeable clays and mudstones that separate the aquifer from the sea are thinner in this area.

Salinity will continue to be monitored and reviewed on an annual basis.

All salinity graphs are presented in appendix 3.

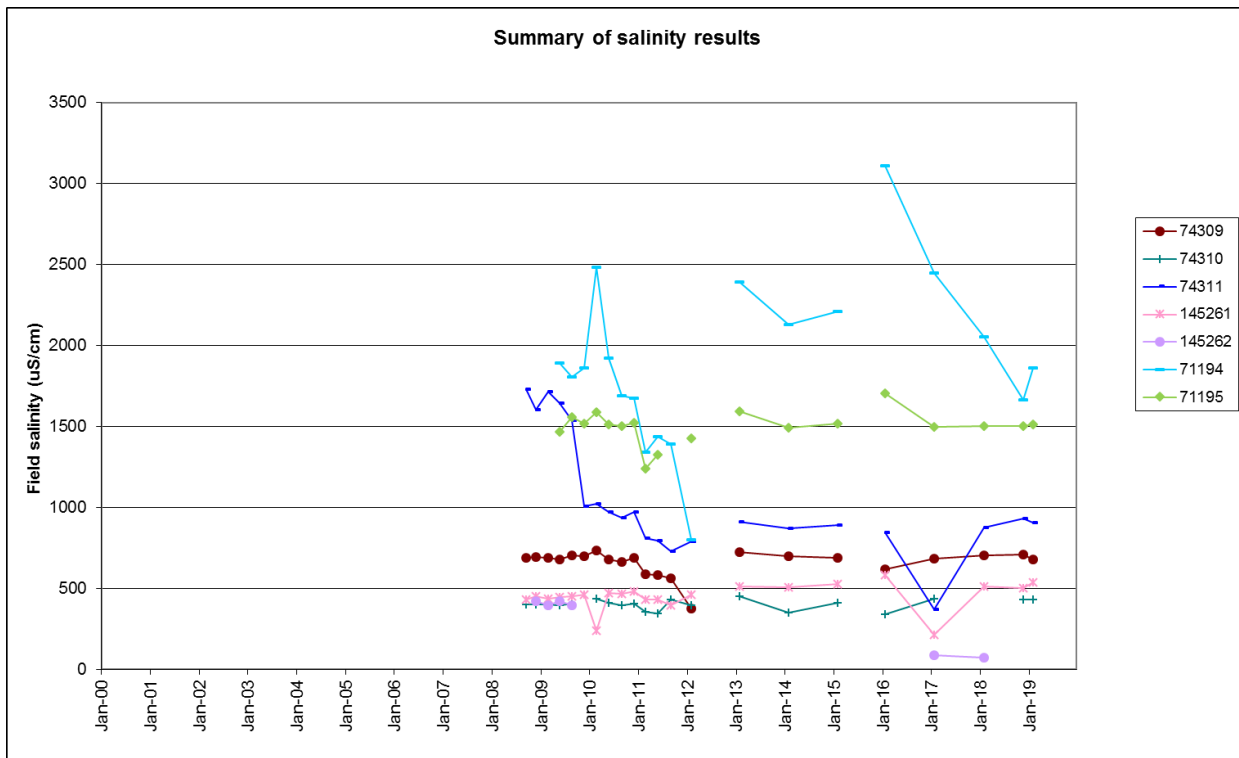


Figure 3: Graph showing salinity in KWR.

EC (electrical conductivity) units are microSiemens per centimeter (uS/cm)

3.4 Water Use

The following table provides detail on water use in the 2018-19 year as compared to the four previous years. The total number of licences has decreased over the 5 years predominantly due to customers amalgamating multiple licences held into one licence and also due to surrendering of licences (no licences were surrendered in 2018-19). The total number of metered licences has also decreased due to changes in licence use from irrigation back to stock and domestic use only or licences becoming inactive.

At 30 June	2015	2016	2017	2018	2019
No. of licences	364	352	344	346	340
Total entitlement volume (ML)	12,597.5	12,579.6	12,577.2	12,575.0	12,575.0
No. of metered licences	197	193	173	162	156
Total entitlement volume metered (ML)	10,076.2	10,314.3	9,561.1	9,412.7	9,547.4
Metered volume used (ML)	3,698.8	4,347.8	3,503.3	3,451.1	3,963.5
Use % of allocation	29%	35%	28%	28%	32%
No. of licences with use greater than entitlement	6	2	1	2	0
Permissible Consumptive Volume (PCV)	12,915	12,915	12,915	12,915	12,915
Use as a % of PCV	29%	34%	27%	27%	31%
No. of D&S bores ¹	1,126	1,125	1,061	996	996
D & S bores estimated use ¹	1,689	1,688	2,402	1,494	1494
Estimated D & S use from licensed bores ²	534	528	516	519	510

¹Taken from the Victorian State Water Accounts

²Estimated 1.5ML per licence 2013 onwards

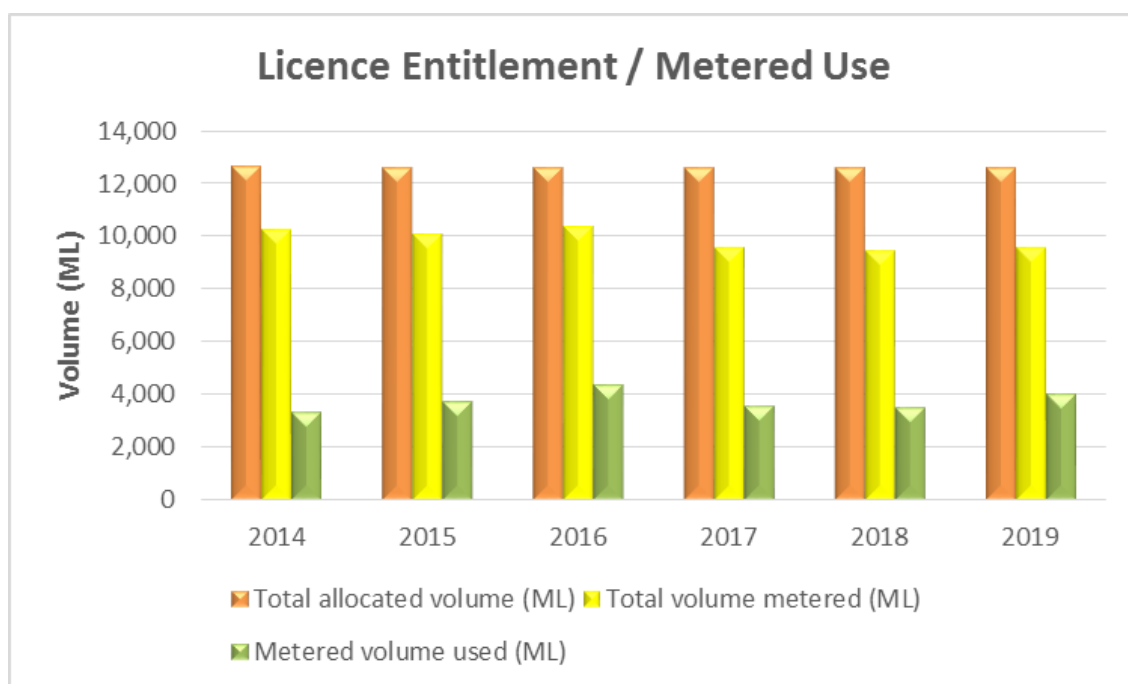


Figure 4: Licence entitlement compared to metered volume and usage.

3.5 Non compliance

No compliance issues were identified in the Koo Wee Rup GWMU during 2018-19.

SRW investigates all compliance issues and considers several factors such as the seriousness of the breach and impact on the resource and other users, prior to deciding on the most appropriate action. The action taken by SRW can include the use of direction notices, warning letters and prosecution.

4 Plan Implementation

4.1 Monitoring

4.1.1 Prescriptions

The following table details the requirements of the management plan in relation to monitoring.

Plan Requirement:	Activity / Reference	Complies
<p>13. The Department must ensure that monitoring bores are properly maintained and replaced if necessary; and</p> <p>14. The Department and the Corporation must ensure that data collected from monitoring bores are entered into the State's groundwater management system (or equivalent), within 30 days of them being received.</p>	<p>The monitoring bores are owned and managed by the Department of Environment, Land, Water and Planning (DELWP).</p> <p>All bores have minor maintenance carried out annually which includes site clearance, rust removal, painting, and ensuring the bore is secure and safe.</p> <p>The DELWP carries out additional maintenance on bores that have been identified as requiring attention under the annual program</p>	<p>Yes</p> <p>Yes</p>
<p>15. The Department and the Corporation must ensure that water level monitoring and investigations are carried out at appropriate locations throughout the Protection Area to:</p> <p>i. assess annual and long term impact on water levels from groundwater pumping;</p> <p>ii. monitor regional and local seasonal drawdown;</p> <p>iii. examine interaction between groundwater and surface water;</p> <p>iv. provide information for future resource assessments; and</p> <p>v. monitor the impacts of groundwater pumping generally across the Protection Area and in areas of high intensity groundwater pumping.</p>	<p>SRW works closely with the DELWP to ensure that the monitoring program meets the requirements of the Plan.</p> <p>If SRW identifies bores of greater interest, monitoring may be undertaken in addition to the DELWP's monitoring program.</p> <p>SRW regularly reviews the groundwater level monitoring program and data.</p>	<p>Yes</p>
<p>16. The Corporation shall review the groundwater level monitoring program as the established trigger level is approached (the trigger level at the time of writing is specified in Schedule 1 but may be reviewed and amended by the Corporation, as necessary).</p>	<p>SRW regularly reviews the groundwater level monitoring program. Monitoring program is presented in the Appendices.</p>	<p>Yes</p>
<p>17. The Corporation must ensure that water quality monitoring is carried out at appropriate locations throughout the Protection Area to provide information that allows assessment of changes in the groundwater salinity.</p>	<p>SRW regularly reviews the salinity monitoring program and data. Salinity monitoring program is presented in the Appendices.</p>	<p>Yes</p>
<p>18. The Corporation shall review the groundwater quality monitoring program as the established trigger level is approached (the trigger</p>	<p>SRW regularly reviews the salinity monitoring program.</p>	<p>Yes</p>

level at the time of writing is specified in Schedule 1 of the Plan).		
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4.2 Metering

4.2.1 Prescriptions

The following table details the requirements of the management plan in relation to metering.

Prescription	Activity	Complies
10. All meters will comply with State metering policy and the Corporation's metering policy	SRW has completed a Metering Action Plan that outlines how our metering fleet will comply with the required metering standards. Meters comply with the current requirements.	Yes
11. The Corporation must: i. ensure all meters within the Protection Area are read twice per year – in or around January and June; ii. determine the volume of water extracted from the bore since the flow meter was last read; and iii. within 30 days after a meter is read, record the amount of water used on a database.	All meters were manually read twice however a project was commenced installing Automated Meter Reading (AMR) technology on all metered bores. This will provide access to daily meter readings. Meter readings and usage data were recorded and stored in SRW's metering system. Usage is also recorded in the Victorian Water Register.	Yes
12. The Corporation may request the Licensee to read a meter and to provide the Corporation with the meter reading: i. the Licensee must comply with the request; and ii. for the purposes of this clause, the Corporation must provide a phone number, email address, pre-paid mail or similar method for the licensee to lodge the meter read.	SRW did not request any licensees to read their meter and provide the meter reading.	Yes

4.2.2 Metering activities

Meters are installed on active licences greater than 10ML. Some licences may require multiple meters to properly account for water usage

As highlighted in section 3.4 the total number of metered licences has decreased in the area due to changes in licence use from irrigation back to stock and domestic use only or licences becoming inactive.

	Year to 30 June 2019	Total for WSPA at 30 June 2019
Number of licences issued (see section 4.4 for details)	0	346
Number of meters installed	0	197
Meters requiring maintenance	19	59
Meters replaced	1 removed 1 replaced	
Meters read (1 – date)	Jan/Feb 2019	
Meters read (2 – date)	Jun 2019	
Number of estimated readings	0	

4.3 Restrictions on Licensing and Licence Transfers

4.3.1 Prescriptions

The following table details the requirements of the management plan in relation to licensing

Plan Requirement:	Activity/Reference	Complies
<p>1. Temporary trade of water entitlement is allowed within a zone or coastal sub-zone and from one zone to another zone provided that:</p> <p>(i) Where usage has exceeded 80% of allocation over the previous 2 years, water levels have recovered appropriately*;</p> <p>(ii) Transfer does not occur into coastal sub-zones**;</p> <p>(iii) Transfer does not occur into zones 1, 2B, 4 and 5; and</p> <p>(iv) A temporary trade shall expire no later than 30th June in the financial year in which it is approved (ie 1 July to 30 June).</p> <p>(v) At the request of both trading parties, the temporary transfer may commence on 1 July if it is approved prior to 30 June (ie transfer entitlements can start in the new irrigation season rather than having to commence in the middle of an irrigation season).</p>	<p>21 temporary transfers were processed during the reporting period in accordance with this prescription.</p>	Yes
<p>2. Permanent trade of Water Entitlement shall be allowed within zones and from one zone to another zone provided that:</p> <p>(i) Where usage has exceeded 80% of allocation over the previous 2 years, water levels have recovered appropriately*;</p> <p>(ii) Review of groundwater monitoring data indicates that the transfer is unlikely to have significant adverse impacts and seasonal water level recovery in the target zone is acceptable.</p> <p>(iii) Transfer does not occur into zones 1, 2B, 4 & 5; and</p> <p>(iv) Transfer does not occur into coastal sub-zones.</p>	<p>4 permanent transfer was processed during the reporting period.</p>	Yes

3. All groundwater licenses in the WSPA will be migrated to the State Water Register within six months of Ministerial approval of this Management Plan.	All licences are located in the Water Register.	Yes
4. No new groundwater licenses shall be issued, except as described in Prescriptions 7 and 8.	1 new licence was issued to enable temporary trade to be processed	Yes
5. The total licence entitlement/allocation shall not exceed 12,915 ML (PCV Gazette G28 11 July 2011), or any volume adjusted in accordance with Prescriptions 6 to 8.	Total entitlement volume is less than PCV.	Yes
6. If a groundwater licence is surrendered, revoked or not renewed the total entitlement in Prescription 5 will be reduced by that licence volume.	0 licences were surrendered.	Yes
7. The Corporation may issue a licence which may lead to the total groundwater licence entitlement in Prescription 5 being exceeded to overcome an administrative oversight or other anomaly, provided it does not exceed the PCV (12,915ML at time of writing).	The one new licences issued did not increase the overall total entitlement volume for the GMU	Yes
8. The Corporation may issue or amend a groundwater licence in accordance with any State-wide policy. The volume in Prescription 5 and the PCV (by application to the Minister) will be adjusted.	Nothing to report	Yes
9. The Corporation must report the details of any licence referred to in Prescriptions 6 to 8 in the annual report.	Refer to appendices for details	Yes

4.4 Licensing Activities

The following table provides details of licensing activities. As highlighted in section 3.4 there has been a reduction in the number of licences over the past 5 years predominantly due to customers amalgamating multiple licences held into one licence

Year to 30 June 2019	No.	Volume ML
New licences issued*	0	0
New licences issued#	1	0
Additional volumes on existing licences	0	0
Licences revoked	0	0
Permanent transfer	4	112.2
Temporary transfers	21	802
D&S Bores notifying use	0	0

*Issued as a result of a split licence

Issued with zero entitlement to enable trade to occur

4.4.1 Compliance and Exceptions

Activities undertaken during the reporting period comply with the requirements of the Plan.

4.4.2 Issues Affecting Implementation

Nil

5 Conclusions

The objective of the management plan, as set out in the Water Act 1989, is to make sure that the water resources of the area are managed in an equitable manner and to ensure the long-term sustainability of those resources.

The evidence provided demonstrates that the groundwater resources of the Koo Wee Rup WSPA are being managed sustainably.

The GMP requires that a review is undertaken of the plan after 5 years. SRW is currently reviewing the Koo Wee Rup Groundwater Management Plan. A survey of groundwater licence holders was completed in 2019 and this has confirmed that some customers believe that there should be greater amount of flexibility in trade rules. Further technical work is proposed in order to assess the impacts of more trade and potentially higher levels of groundwater use.

Appendices

5.1.1 Licence Details

Water Trade details for the 2018-19 season can be found at:

<http://waterregister.vic.gov.au/water-trading/take-and-use-licence-trading>

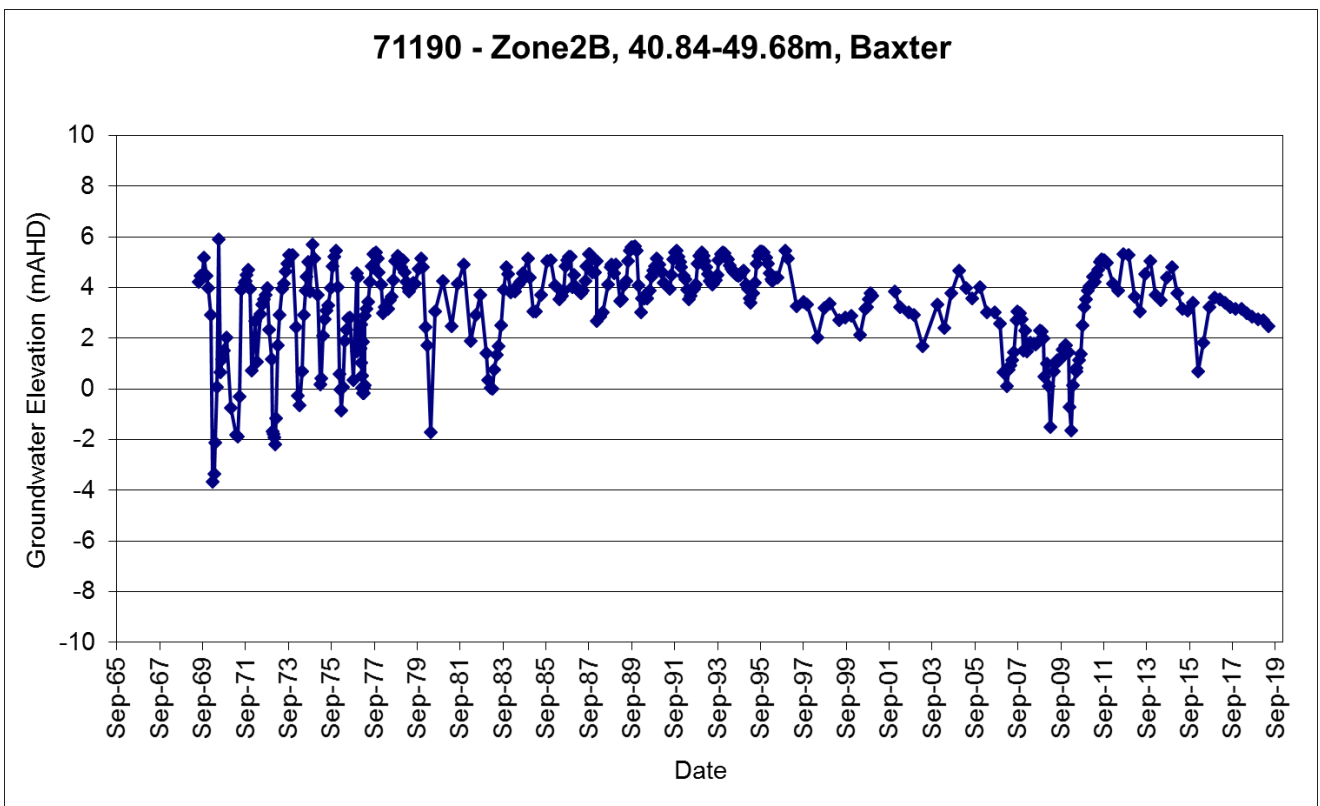
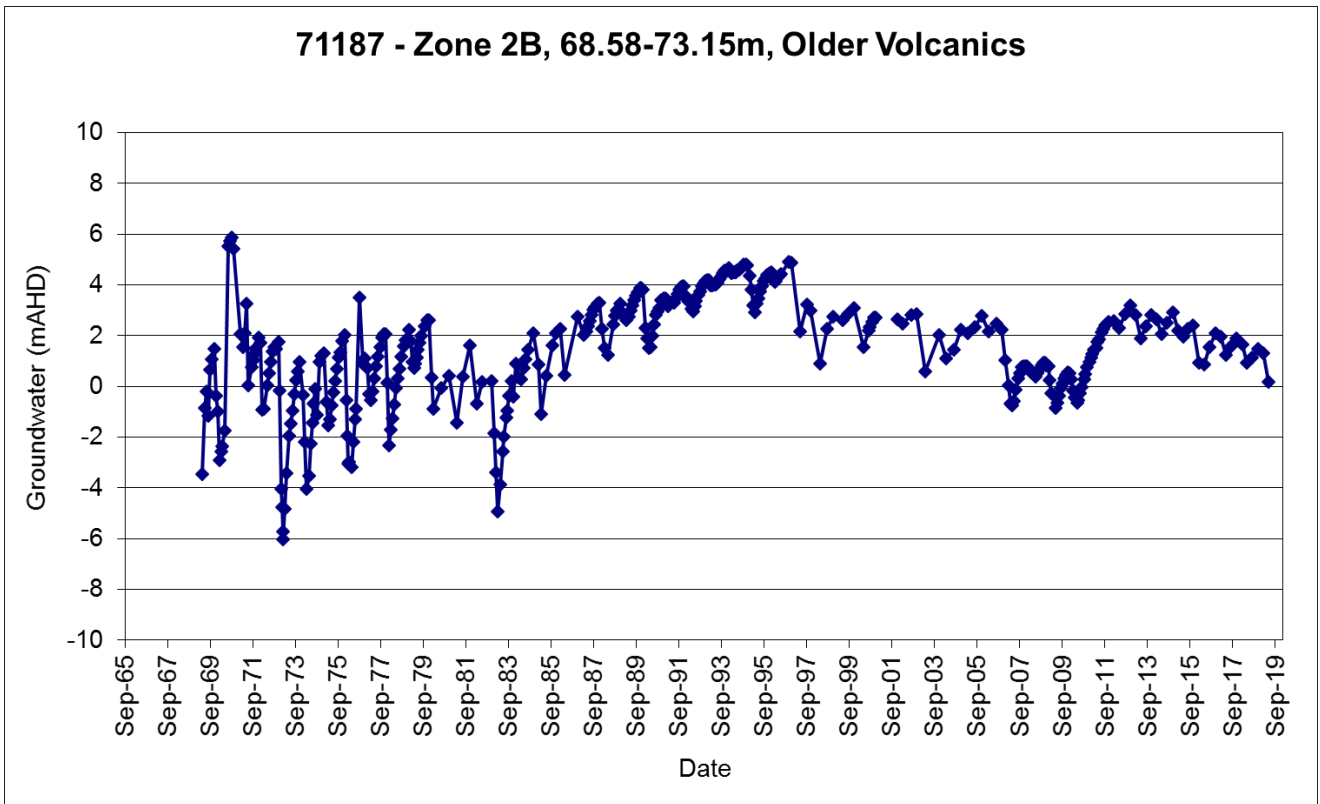
5.1.2 Monitoring program details

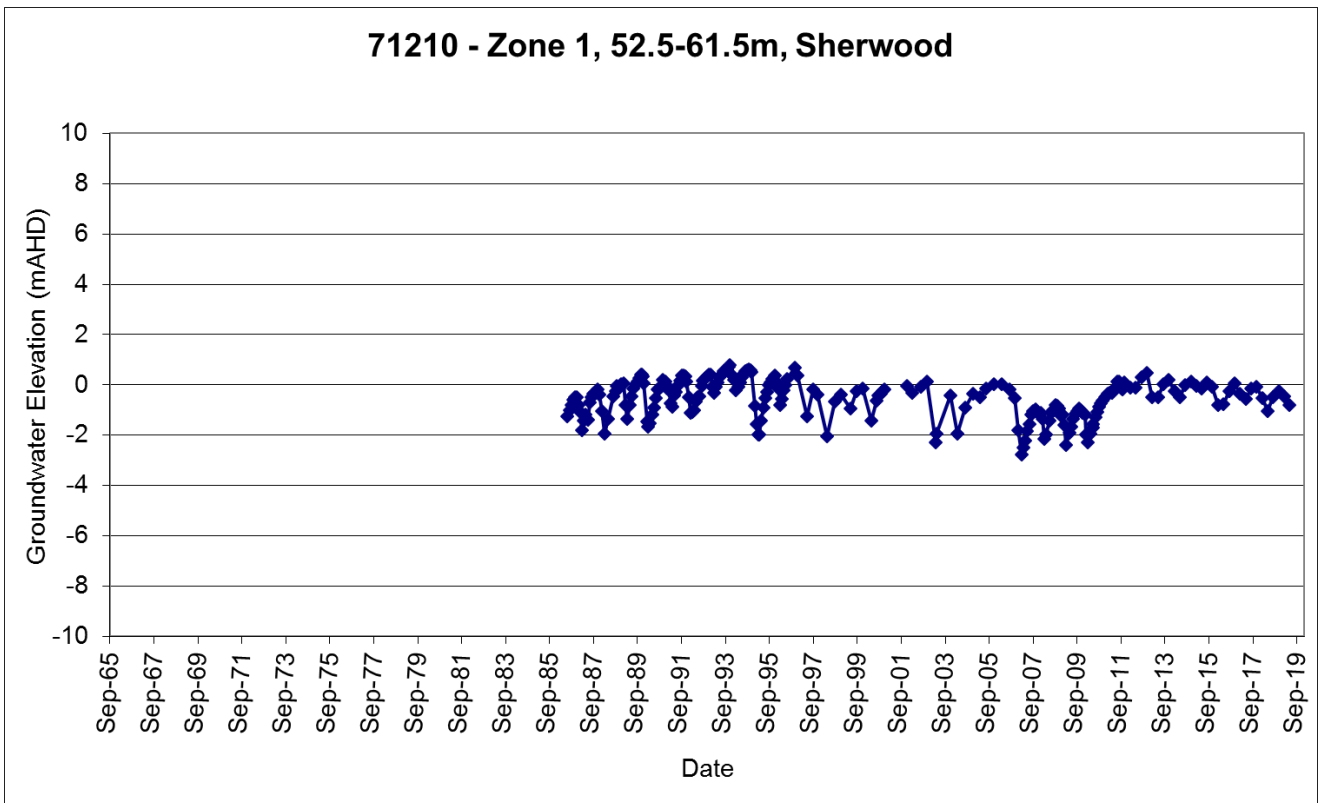
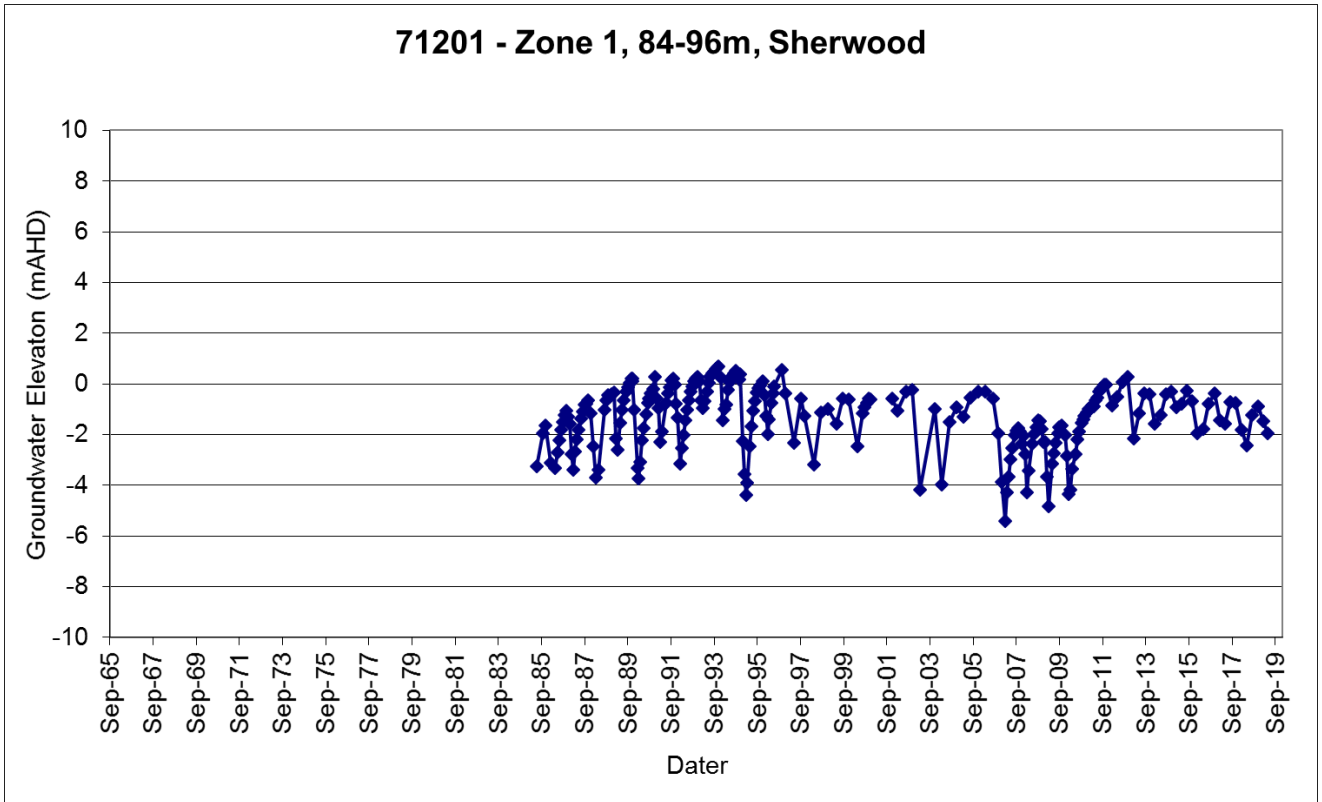
Groundwater monitoring program summary

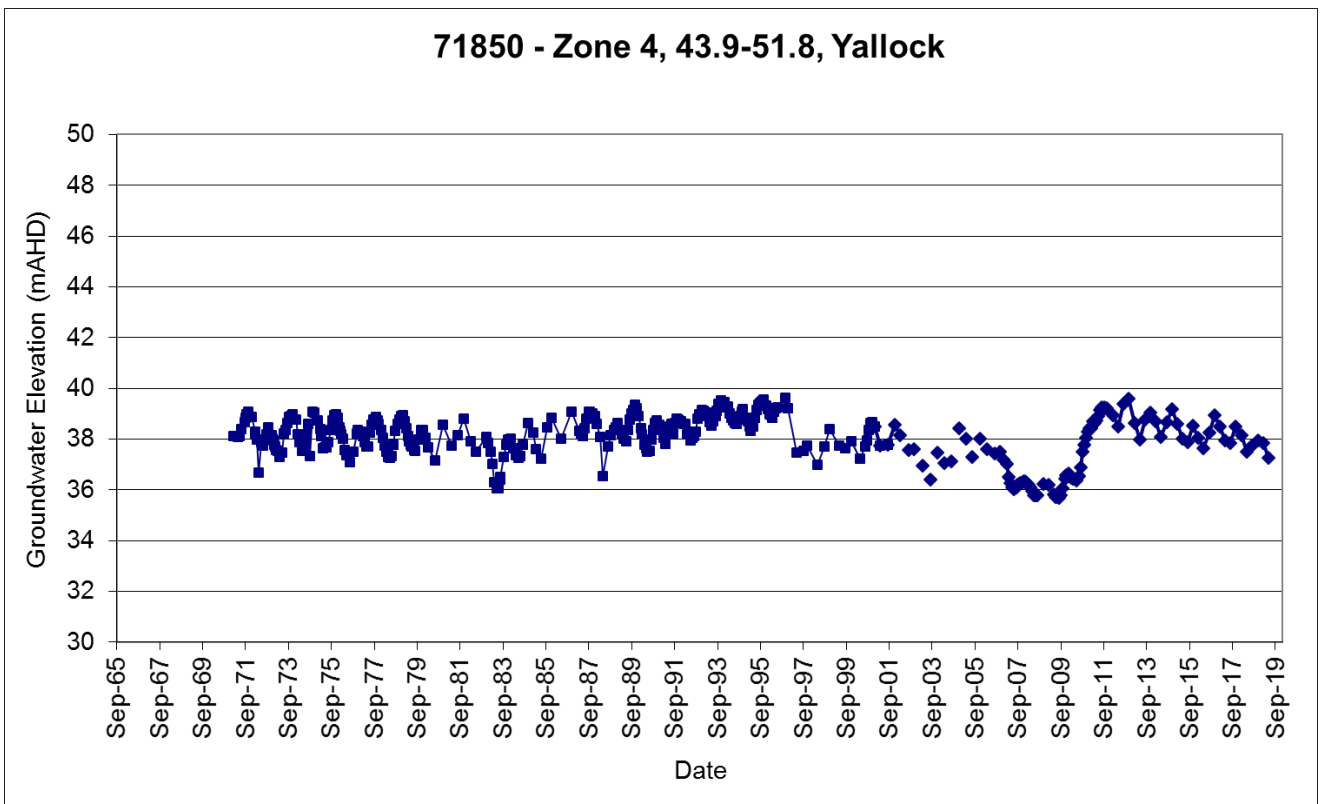
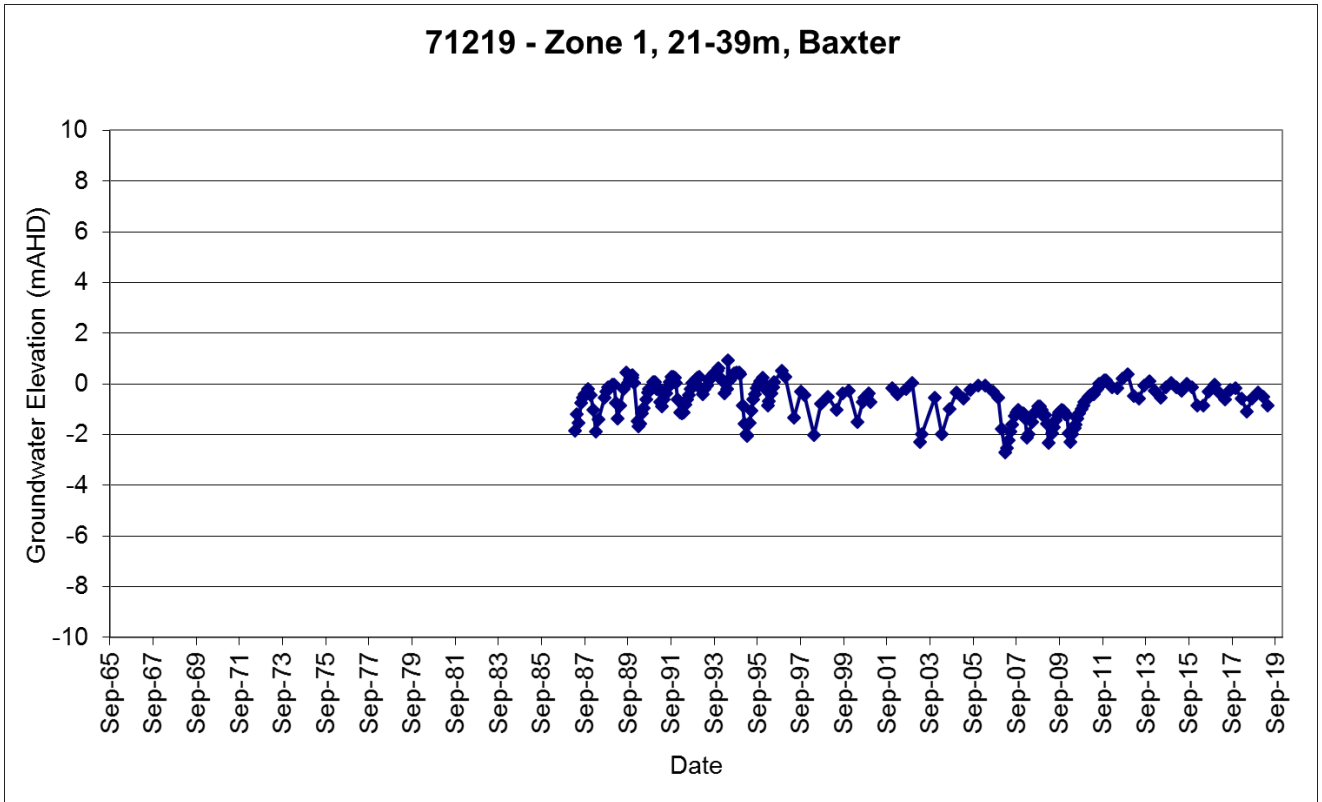
BHID	Zone	Formation	GW Level	Salinity
71194	1	Baxter, Sherwood	Quarterly	Annual
71195	1	Sherwood	Quarterly	Annual
71201	1	Sherwood	Quarterly	
71210	1	Sherwood	Quarterly	
71219	1	Baxter	Quarterly	Annual
WRK057103	1	Older Volcanics	Quarterly	
WRK057105	1	Sherwood	Quarterly	
68351	4	Quaternary Sands	Quarterly	
71848	4	Yallock	Quarterly	
71850	4	Yallock	Quarterly	
74608	5	Older Volcanics	Quarterly	
74609	5	Yallock	Quarterly	
110735	5	Quaternary Sands	Quarterly	
91076	6	Silurian Bedrock	Quarterly	
74306	7	Childers	Quarterly	
74309	7	Older Volcanics	Quarterly	Annual
74310	7	Sherwood	Quarterly	Annual
74311	7	Baxter	Quarterly	Annual
145259	7	Westernport	Quarterly	
145260	7	Childers	Quarterly	
145261	7	Westernport	Quarterly	Annual

145262	7	Childers	Quarterly	Annual
126975	2A	Older Volcanics	Quarterly	
71187	2B	Older Volcanics	Quarterly	
71190	2B	Baxter	Quarterly	
WRK966214	2B	Yallock	Quarterly	
WRK966215	6	Sherwood	Quarterly	
WRK966216	6	Older Volcanics	Quarterly	

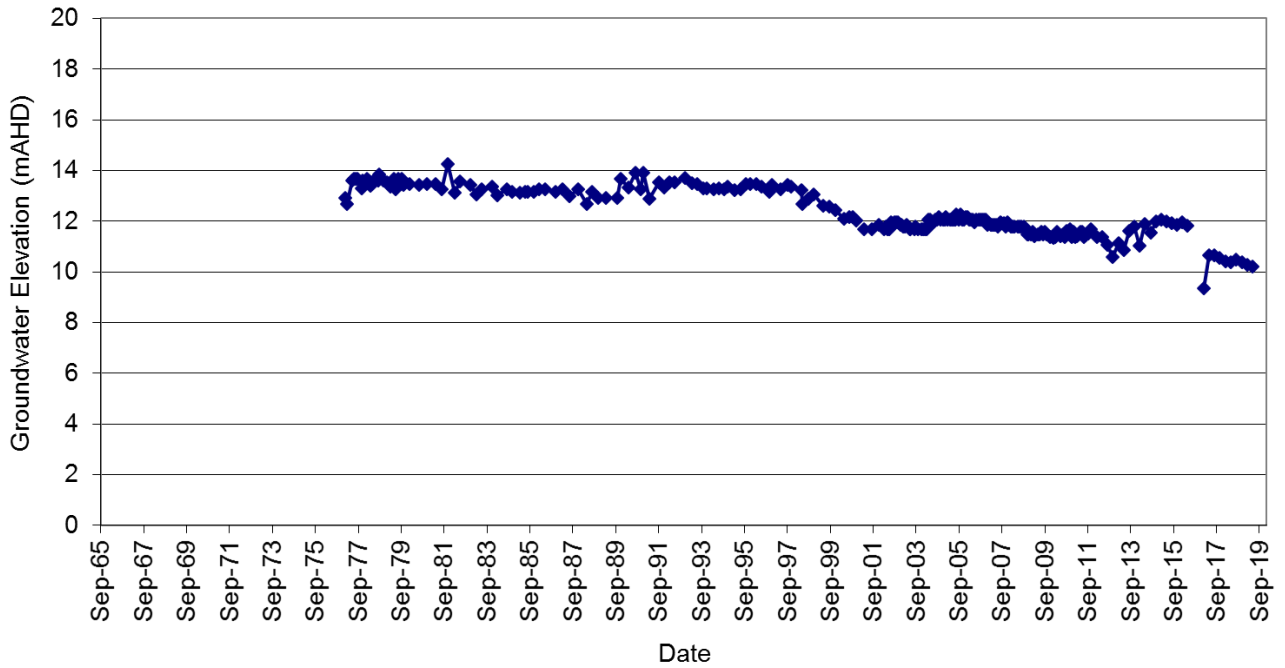
5.1.3 Hydrographs



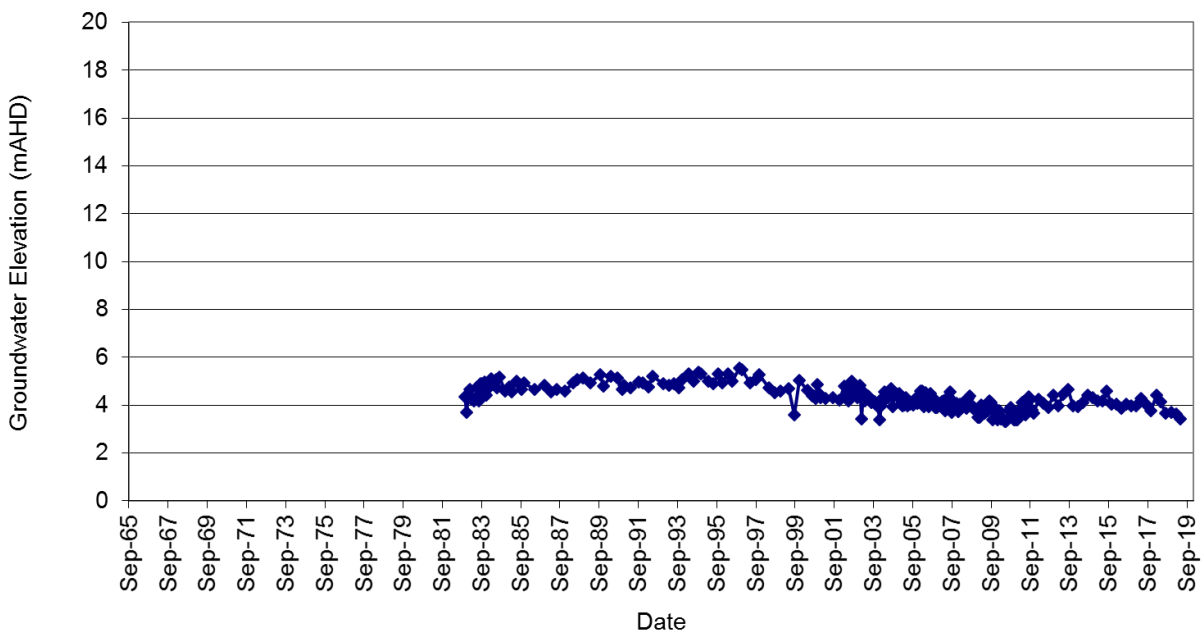




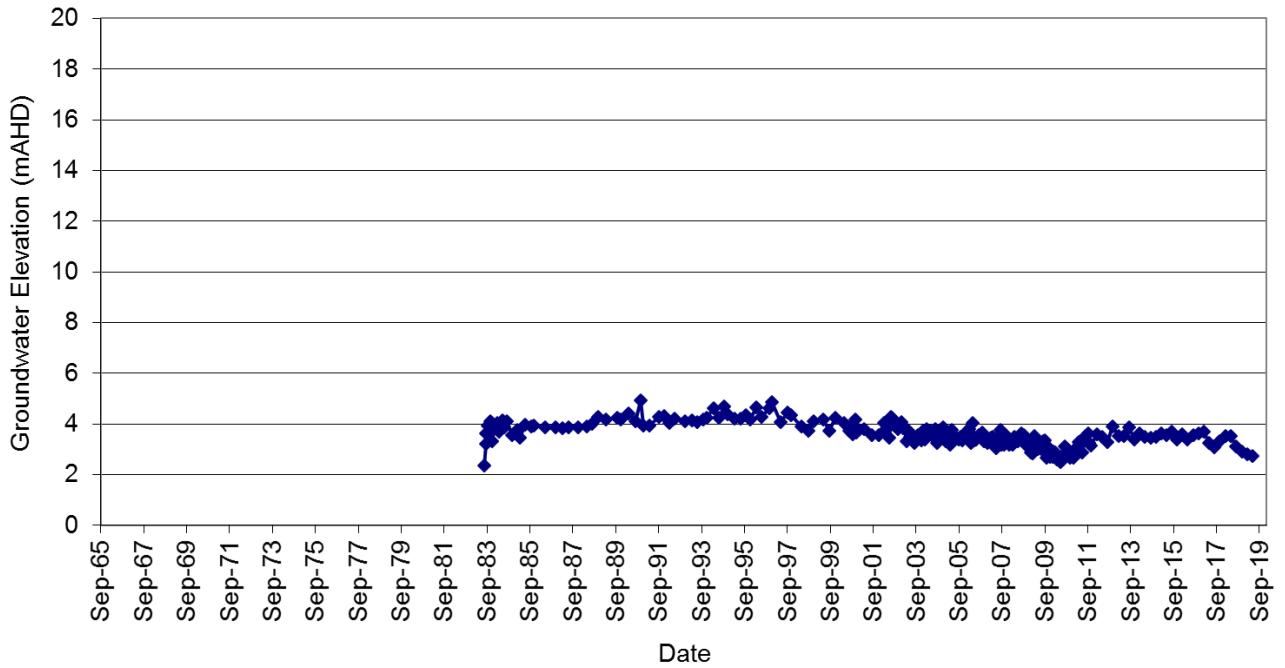
74306 - Zone 7, 242-244m, Childers



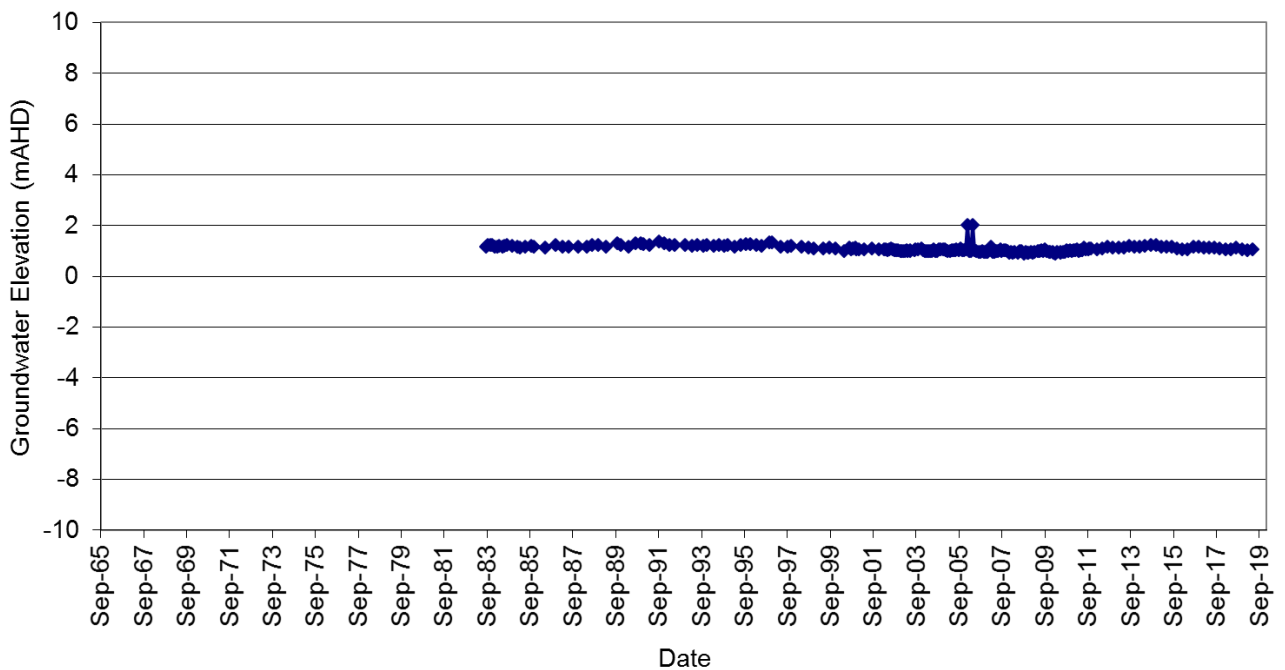
74309 - Zone 7 coastal, 97.5-118.5m, Older Volcanics

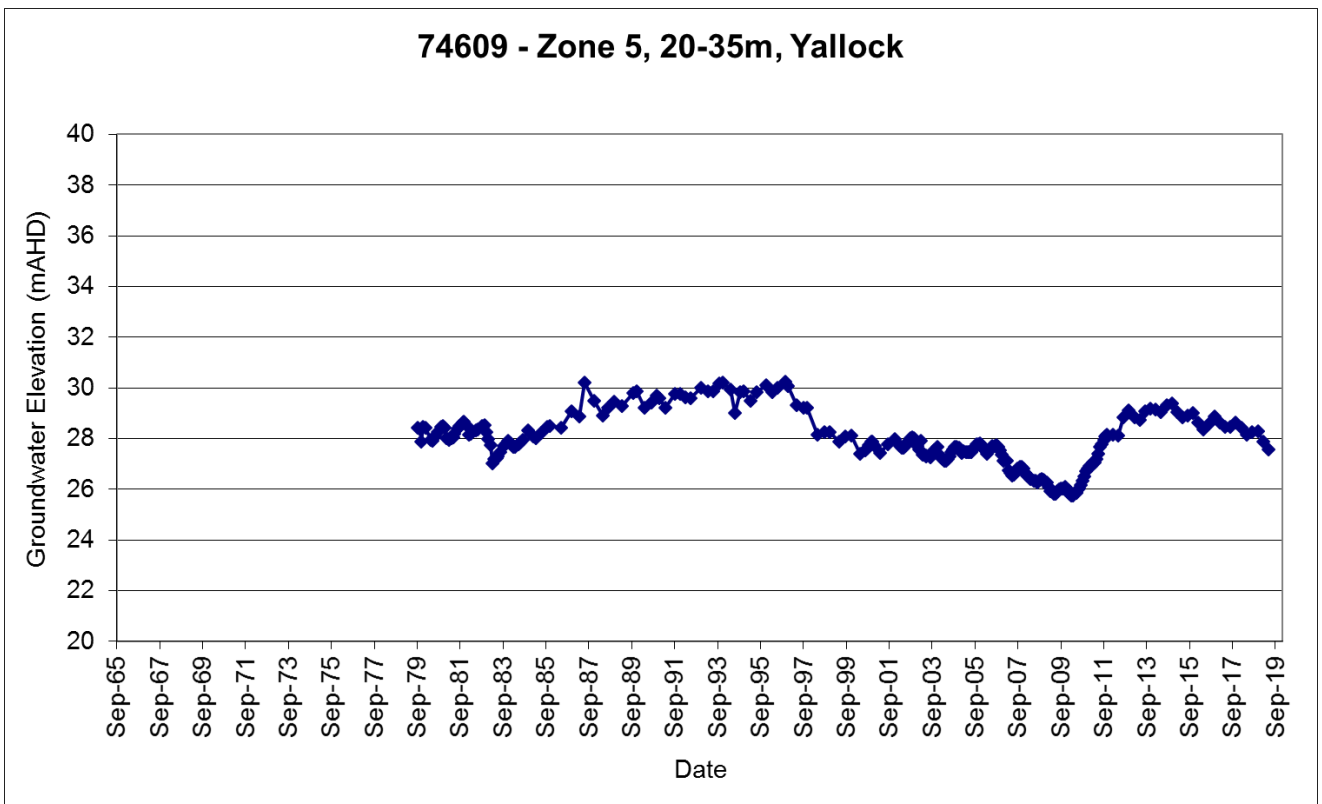
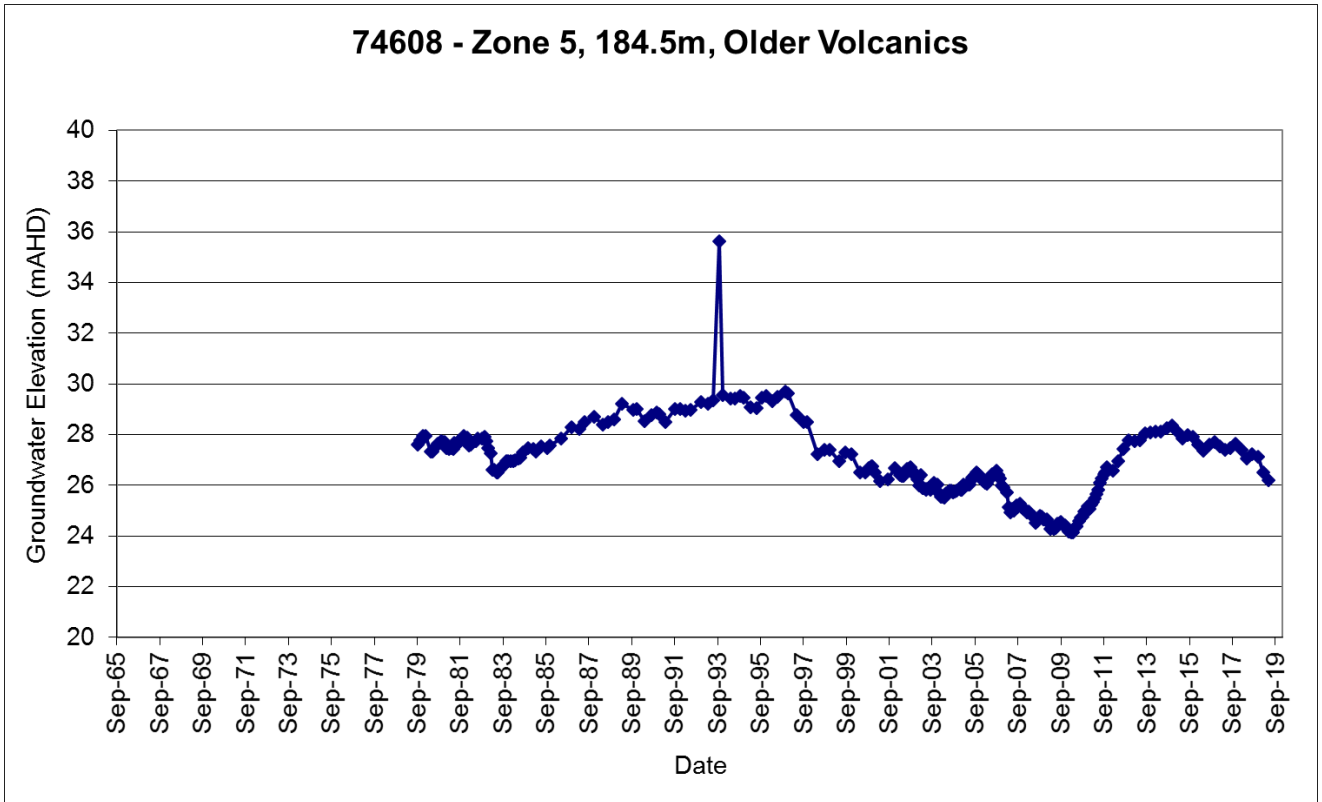


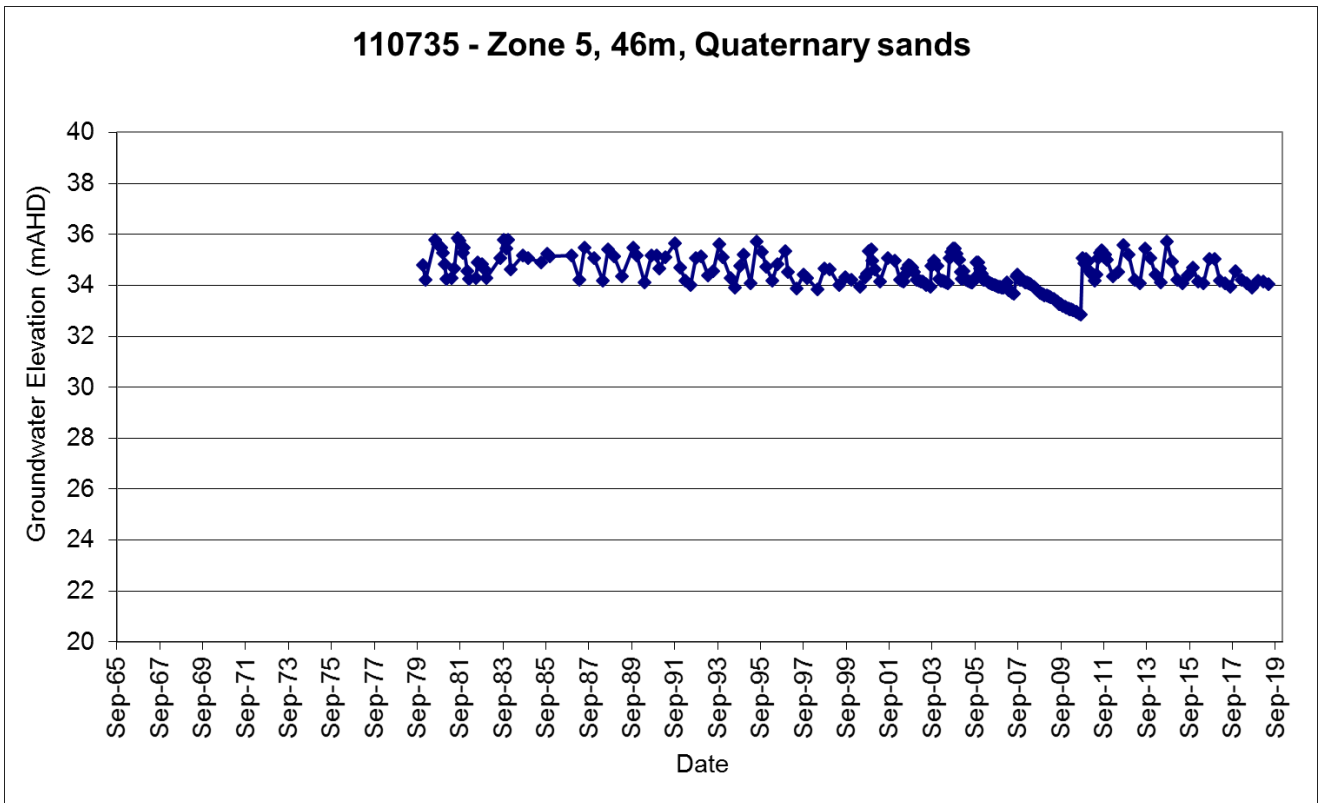
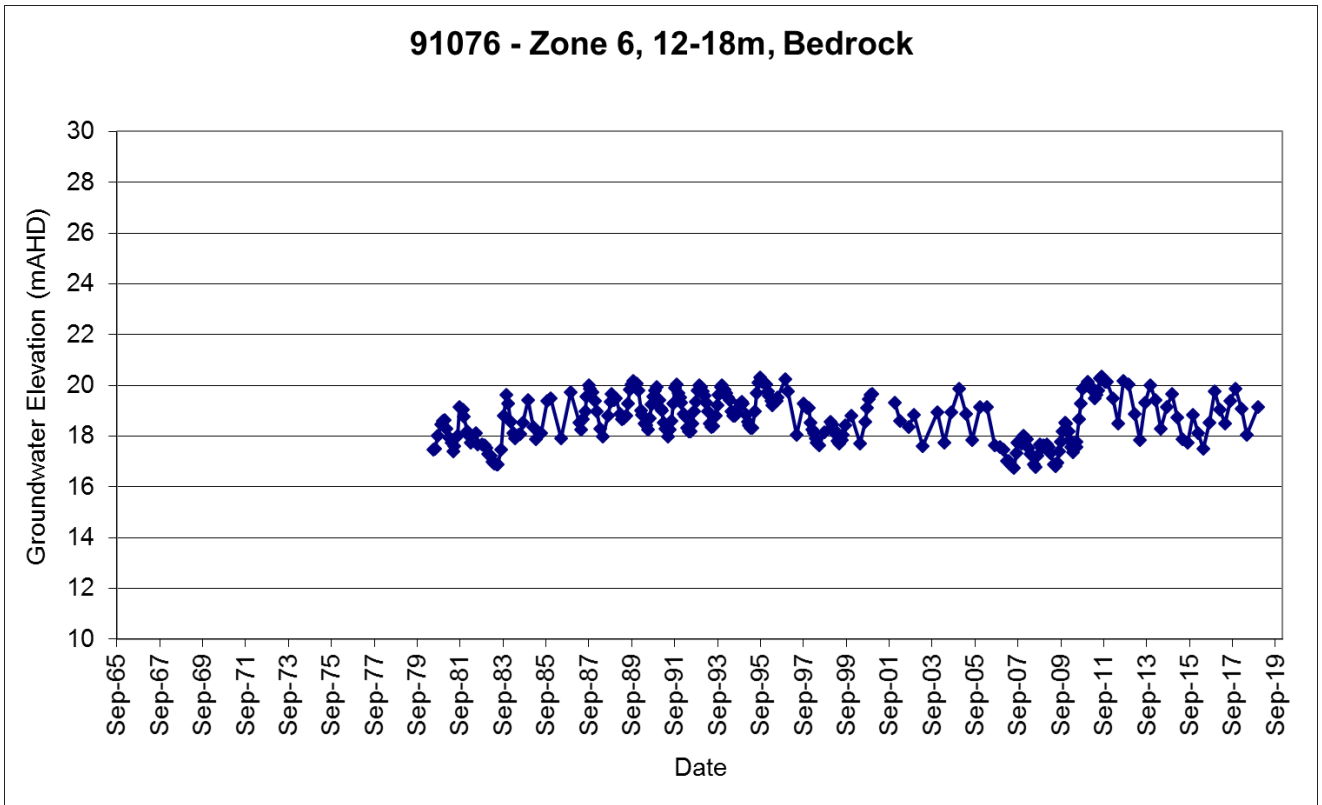
74310 - Zone 7 coastal, 84.1-87.5m, Sherwood

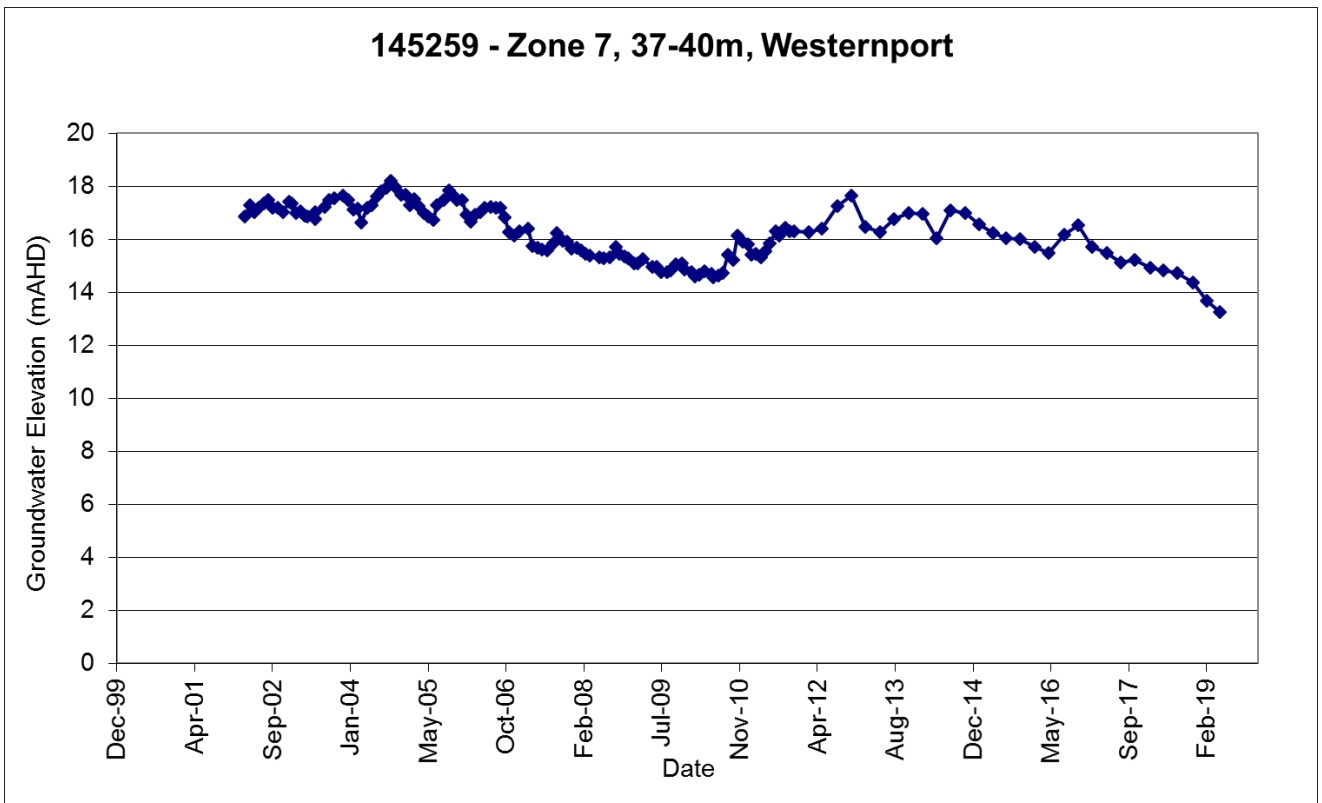
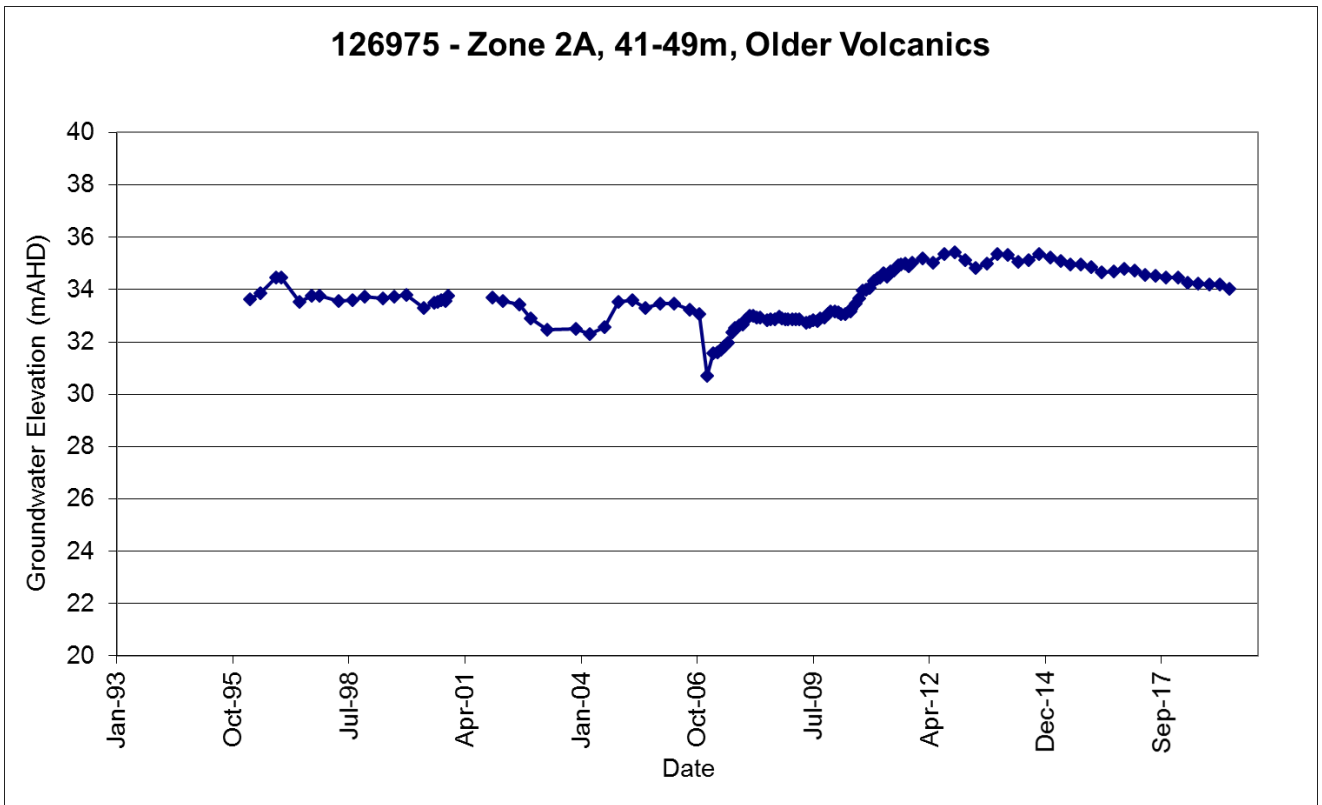


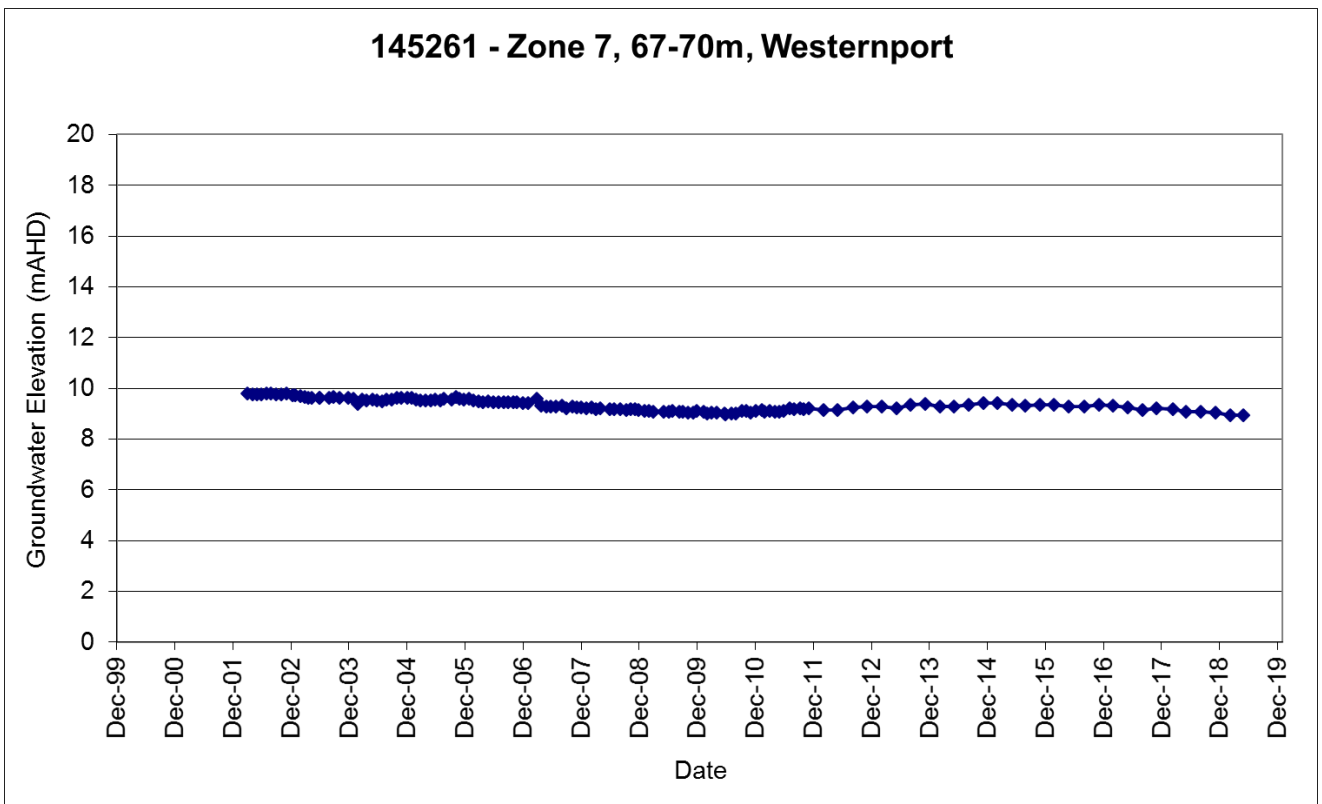
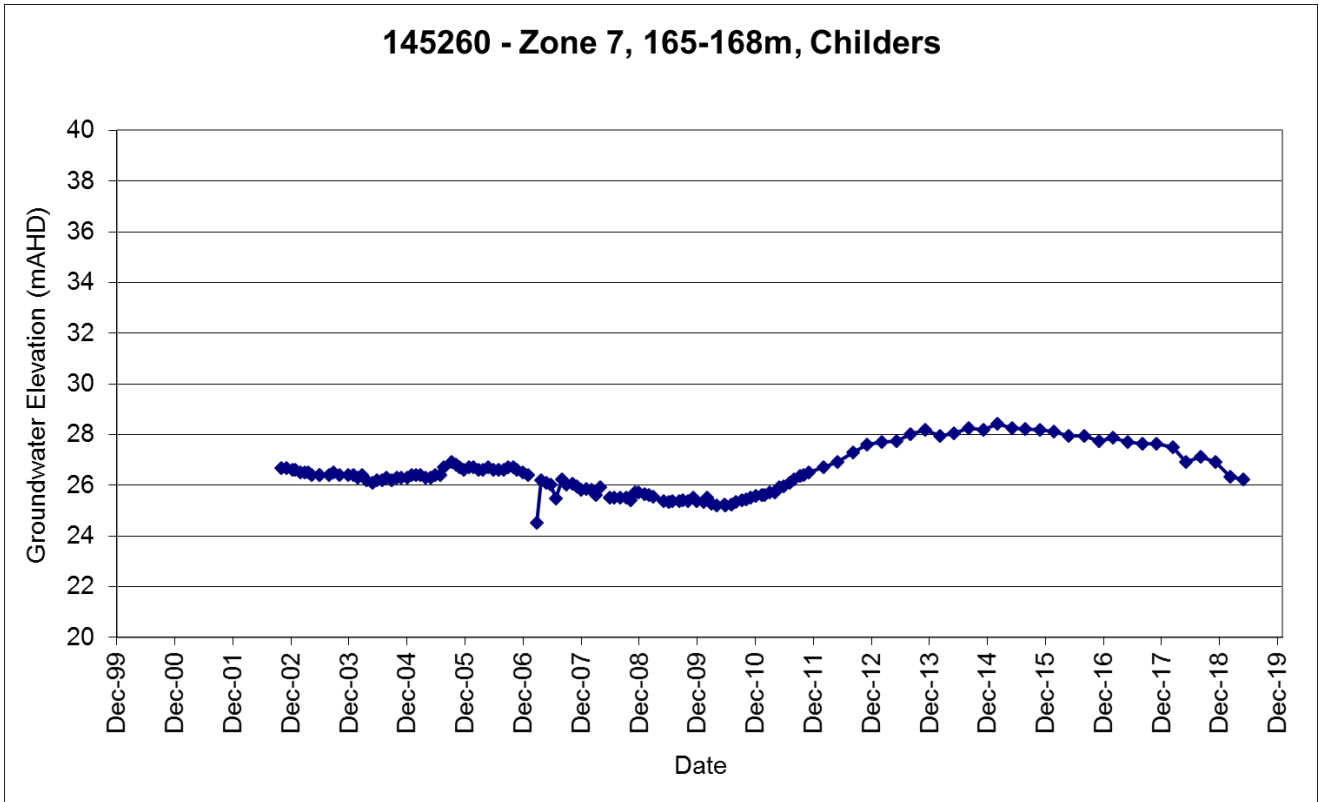
74311 - Zone 7 coastal, 17-25m, Baxter



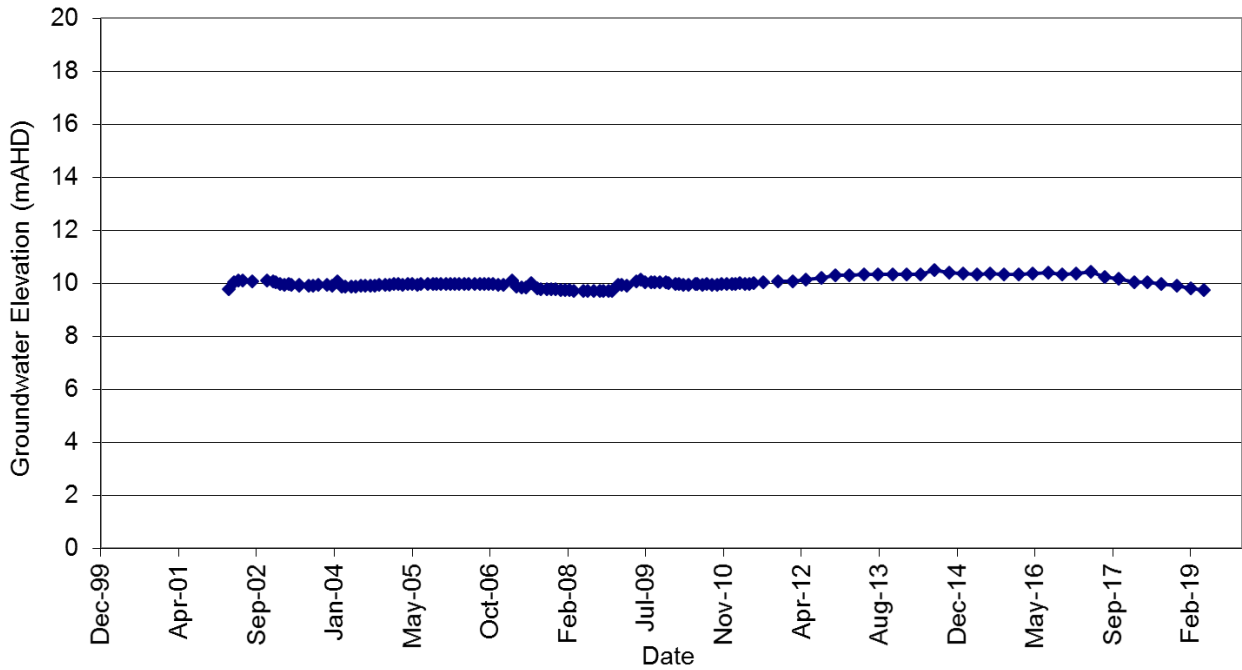




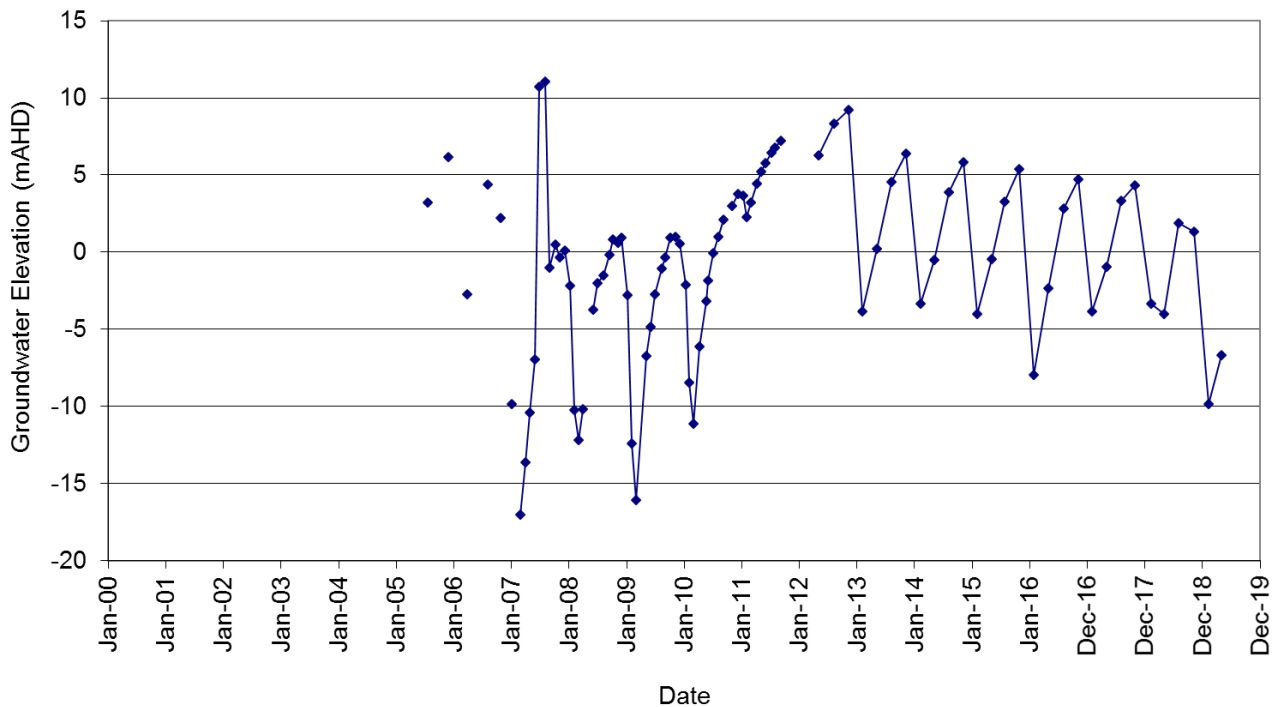


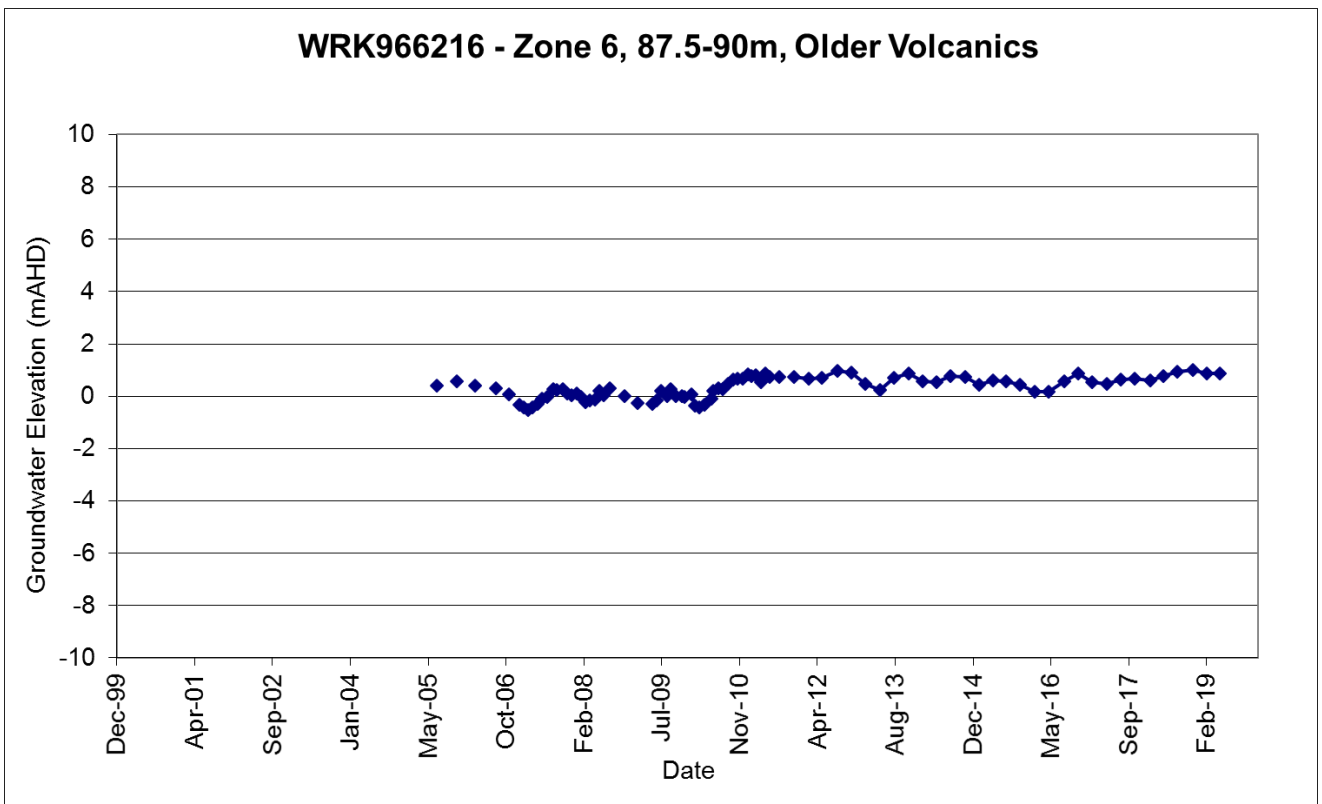
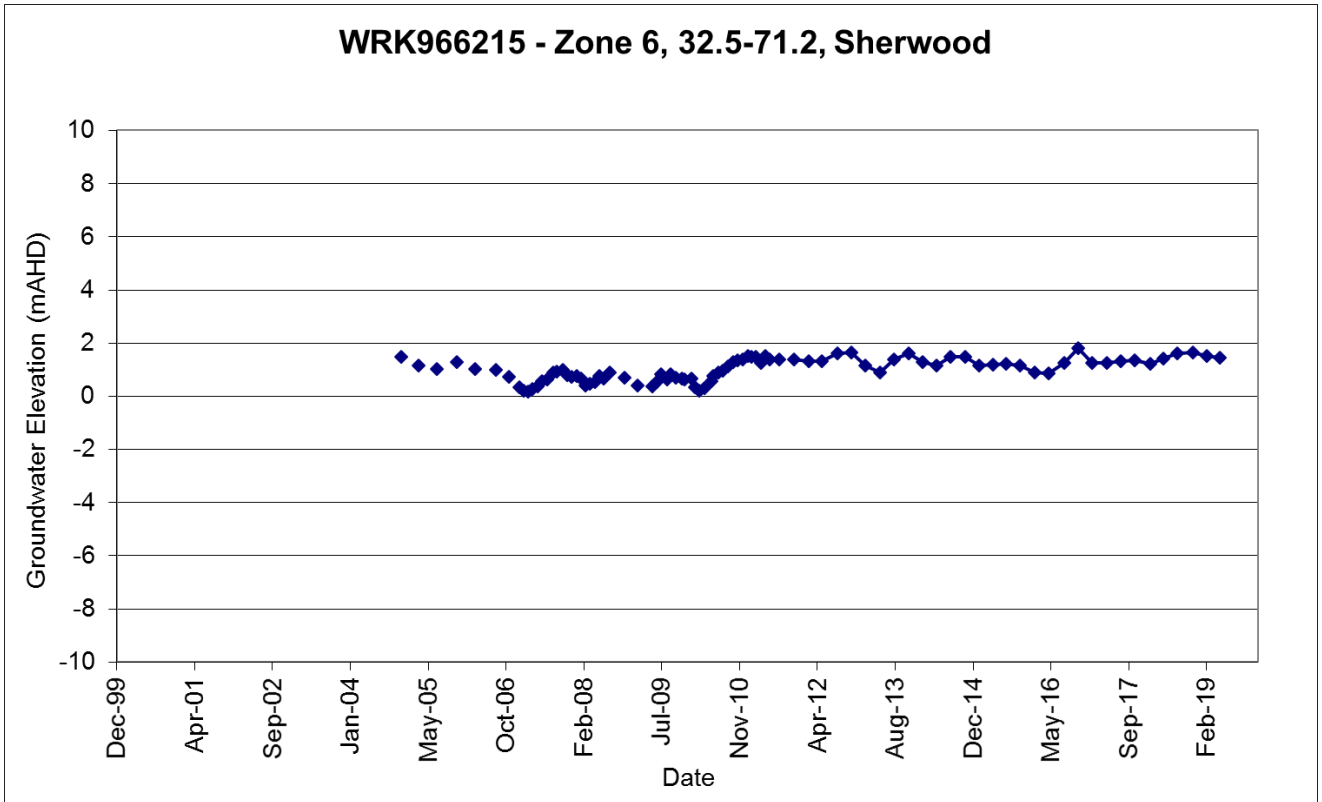


145262 - Zone 7, 205-208m, Childers

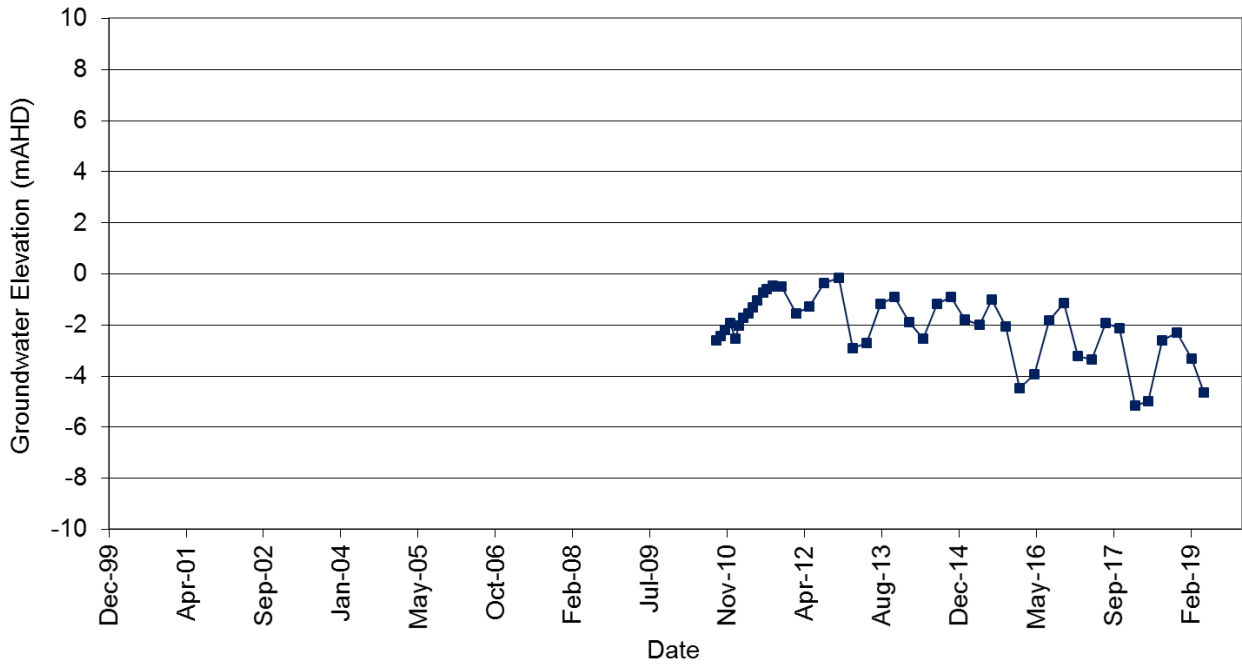


WRK966214

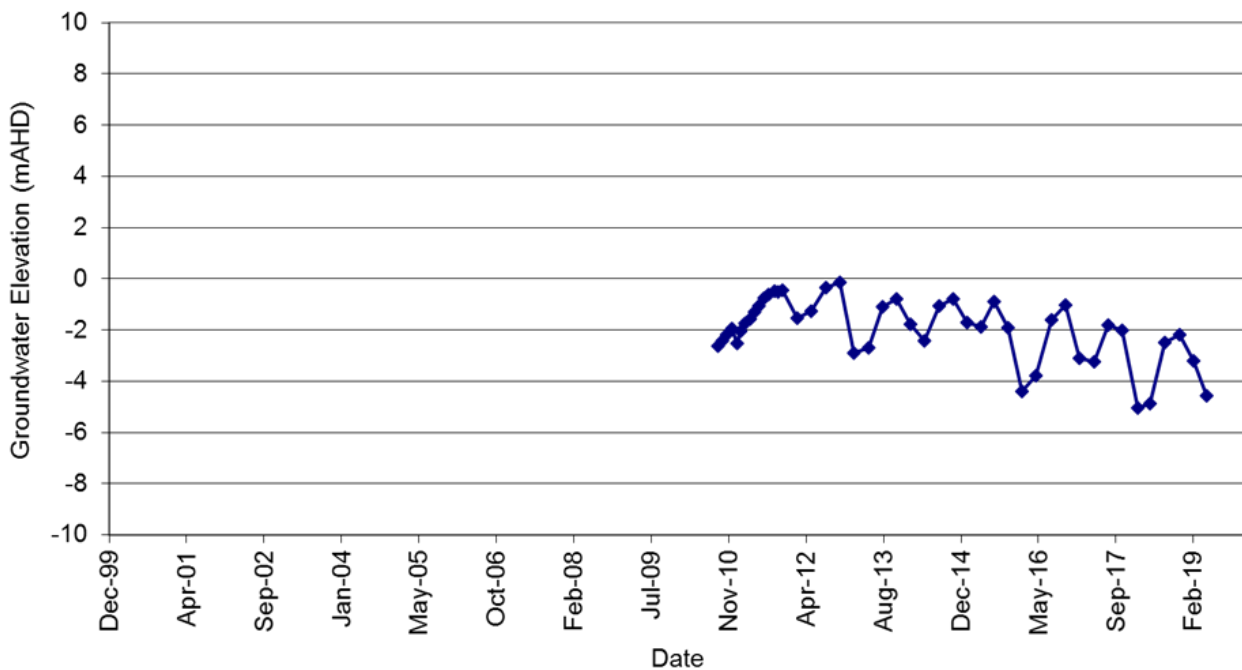




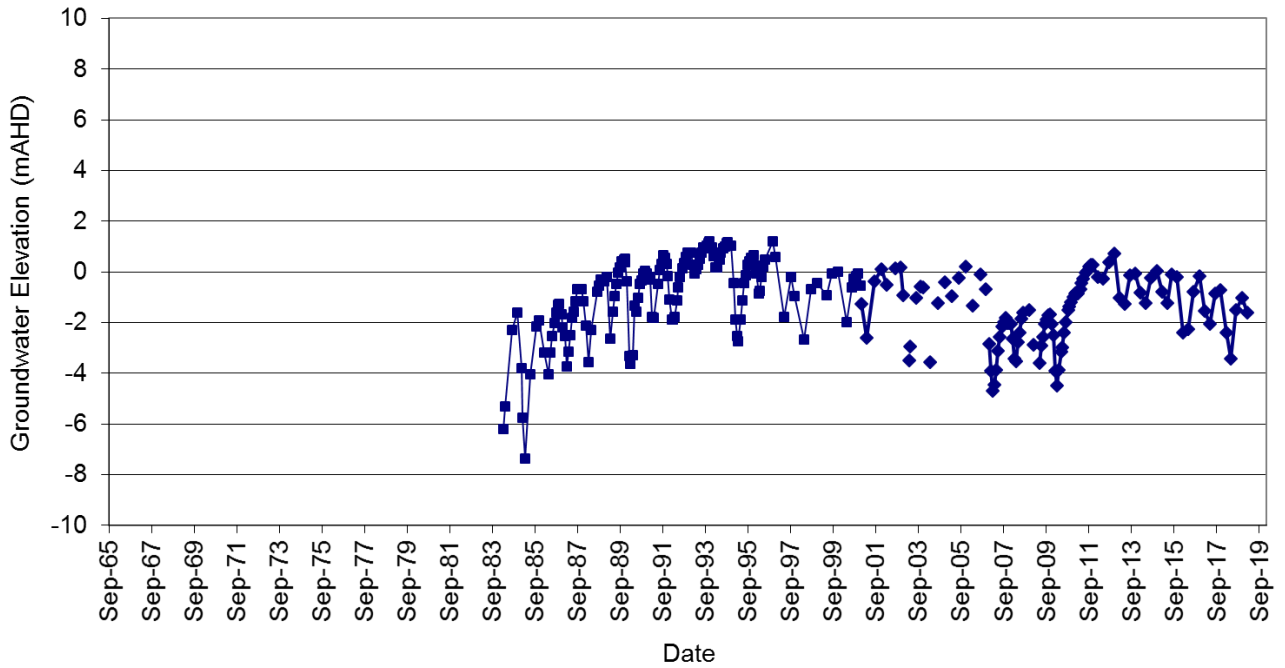
WRK057105 - Zone 1, 35.8-41.8m, Sherwood



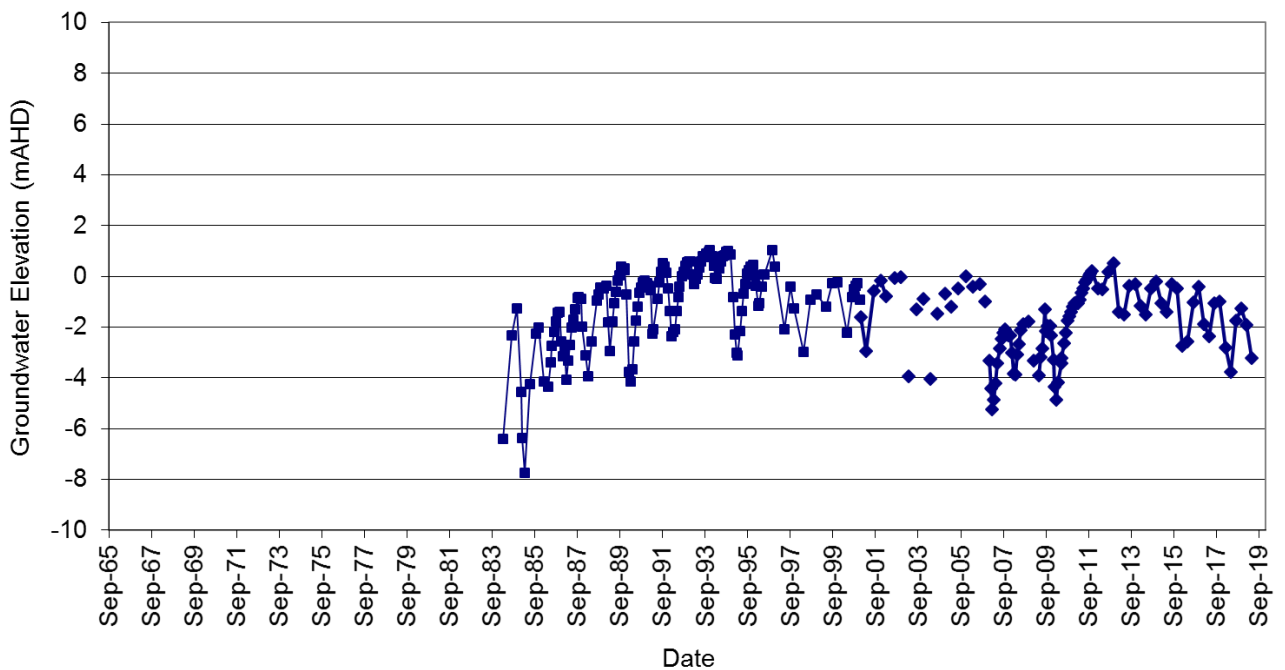
WRK057103 Zone 1, 70-73m, Older Volcanics

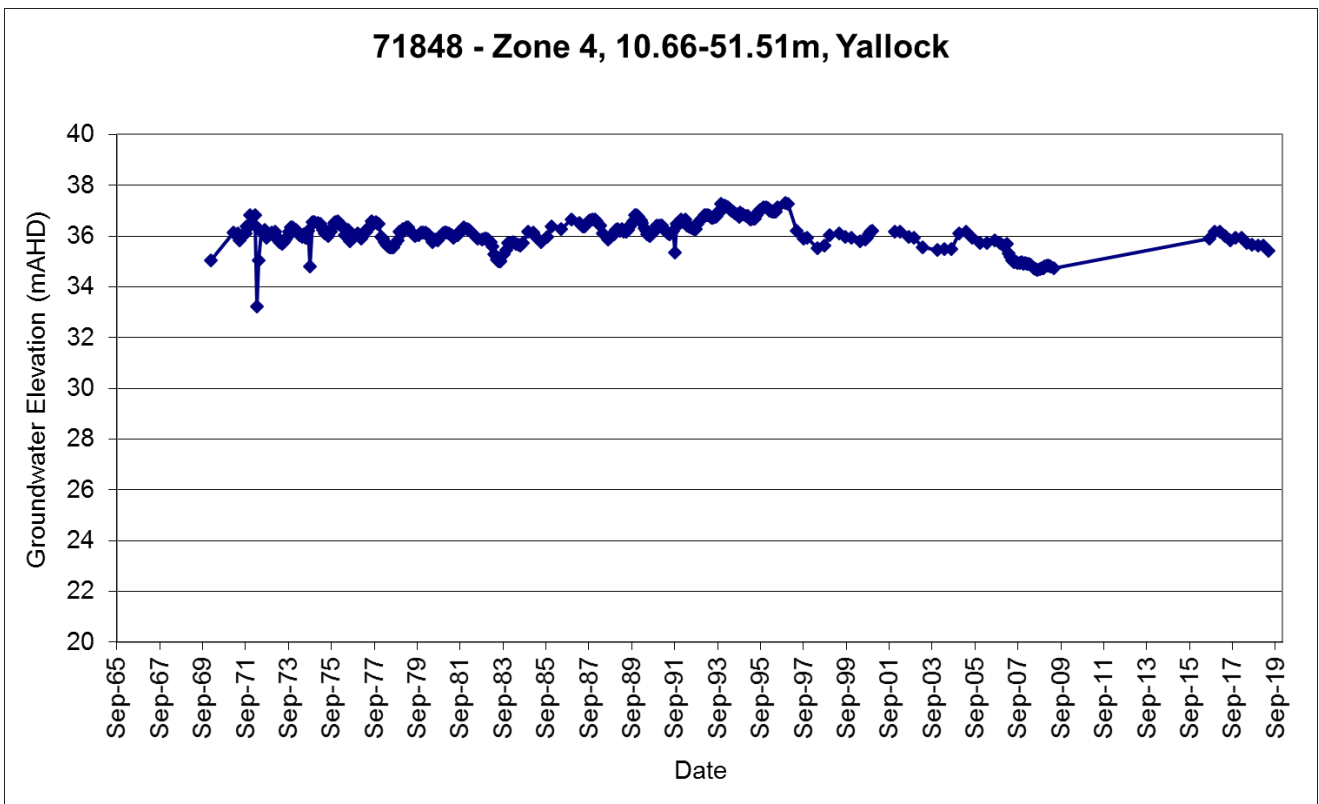
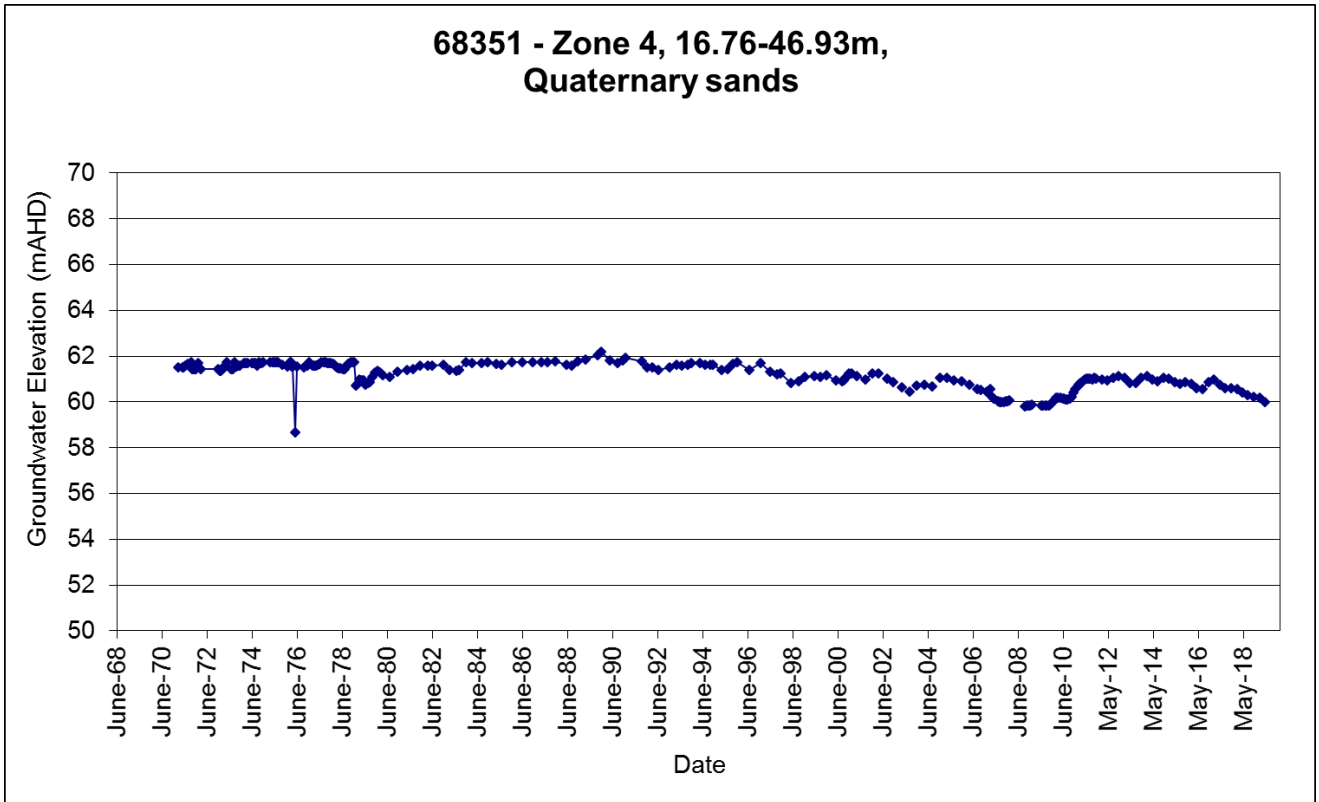


71194 - Zone 1, 34-51m, Baxter & Sherwood



71195 - Zone 1, 82-94.5m, Sherwood





5.1.4 Salinity

