



Koo Wee Rup Groundwater Management Plan

**Annual Report
2014-15**

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 of the report 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 Annual Volume)	12,915 ML
Scheduled Plan Review	A review will be undertaken in 2016
Implementation Authority	Southern Rural Water
Relevant CMA	Port Phillip & Westernport Catchment Management Authority
Report Period	1 July 2014 – 30 June 2015

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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.

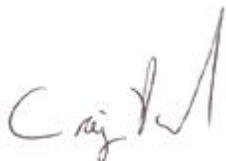
The objective of the management plan is to make sure that the water resources of the area are managed in an equitable manner so as to ensure the long-term sustainability of those resources.

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 2014-15 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 2015-16.

SRW will undertake a review of the GMP in 2016 to determine whether a groundwater management plan is still necessary or whether a local management plan would be more suitable. The review will also consider appropriateness of the existing prescriptions, particularly in relation to groundwater transfers. SRW has received feedback from licence holders that the trading zones and one year transfers do not provide sufficient flexibility for groundwater users.



CRAIG PARKER
General Manager
Groundwater & Rivers

2 Introduction

This report summarises licence information, metered usage and monitoring data collected for the period between 1 July 2014 and 30 June 2015 in accordance with the recommendations given in the Koo Wee Rup Groundwater Management Plan 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. Taking this into account, there has been no vertical limits placed on the depth of the Koo Wee Rup WSPA. 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 so as 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;
- Seek review of 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);
- Trading of existing consumptive use allocations 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 equals or exceeds 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 759.6mm (measured at Lang Lang). Lang Lang has an average rainfall of 863mm per year.

3.2 Water Levels

Groundwater levels are actively measured in forty five (45) bores, monitoring the Quaternary Sands, Westernport Group, Older Volcanics and Childers aquifers. Monitoring has been reduced from monthly to quarterly in 2011 due to rising groundwater levels, which has reduced the risk of saline intrusion.

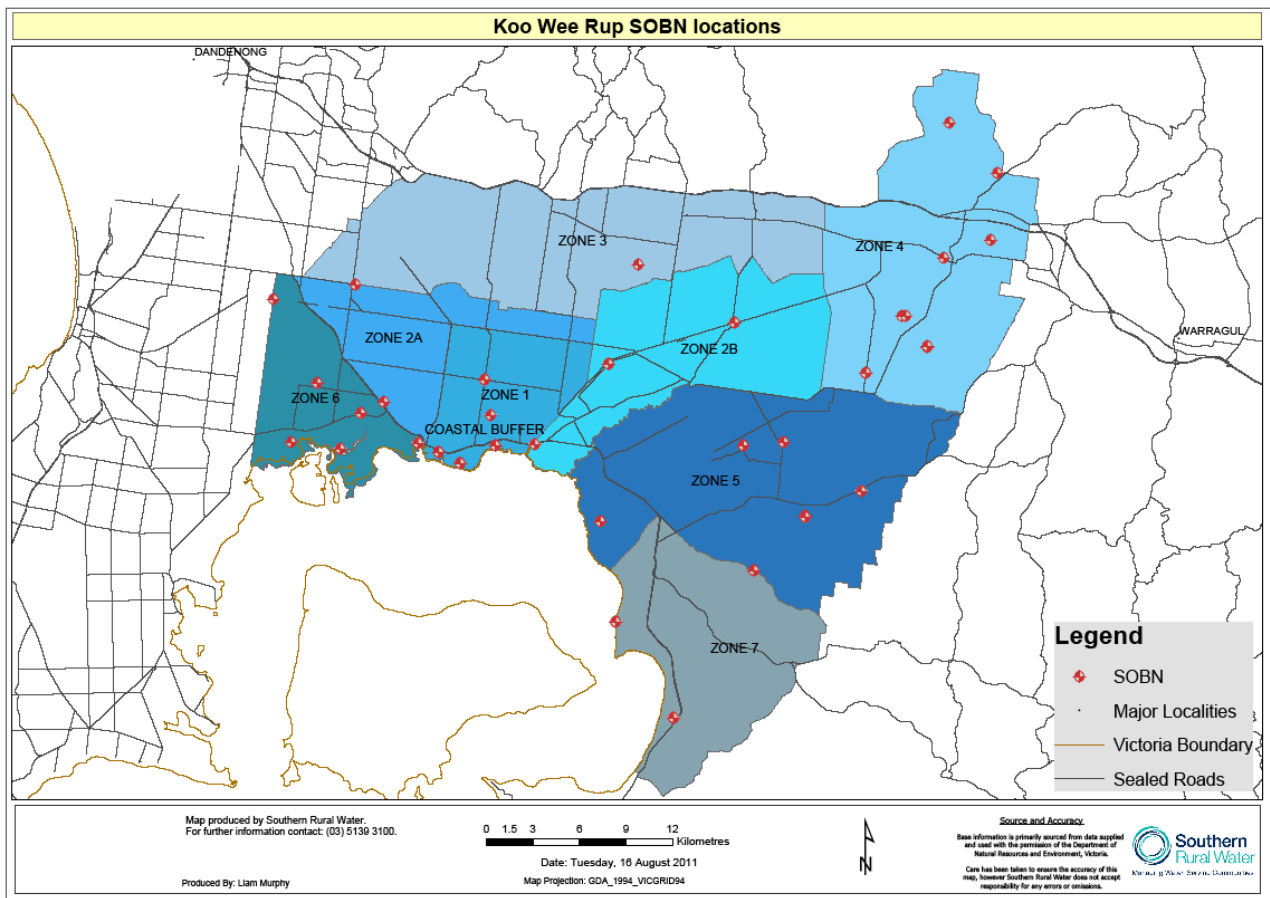


Figure 1: SOBN locations in Koo Wee Rup WSPA (see Appendix 1 for more detail).

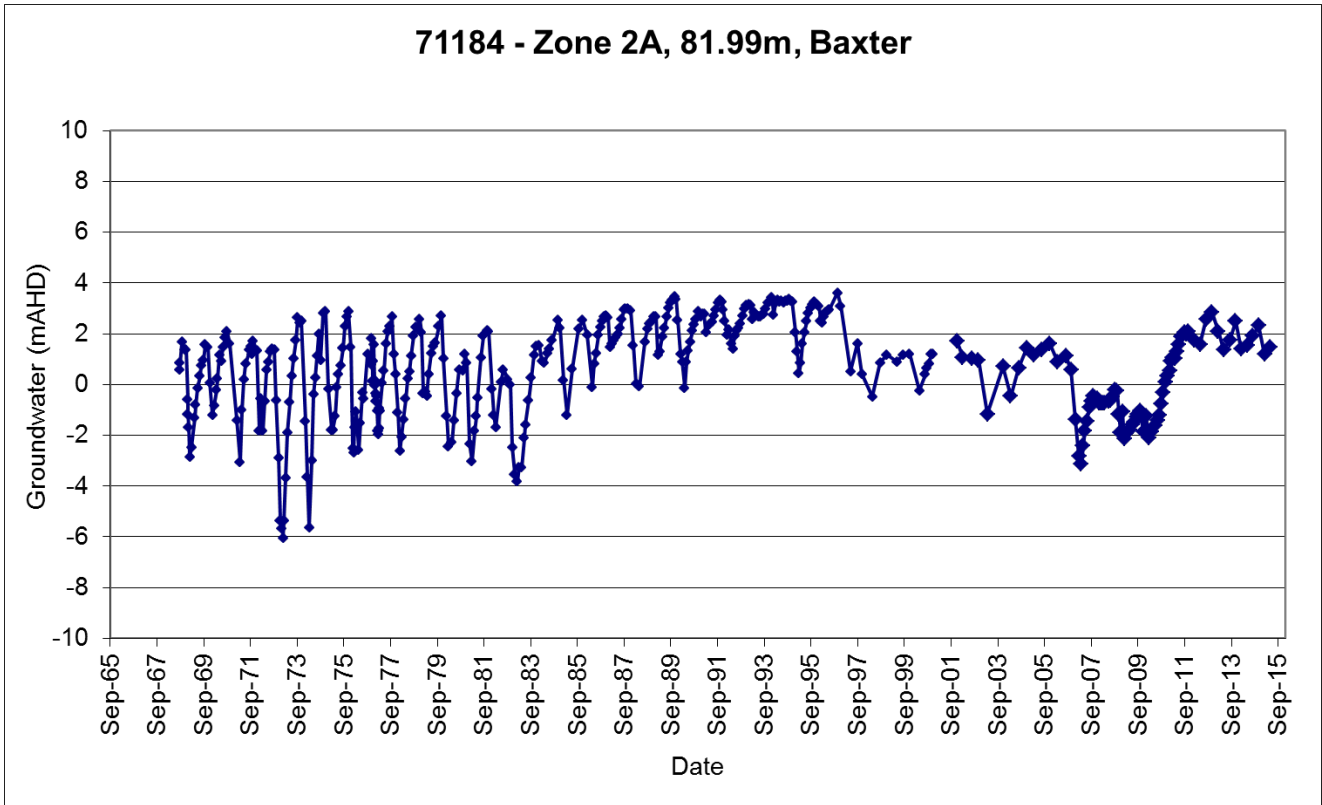


Figure 2: Example hydrograph from Zone 2A.

All hydrographs are presented in appendix 2.

The groundwater elevation data indicates:

- Long term declining water levels across the WSPA, with most bores falling by 3m or less over forty years.
- Current water levels in most bores are similar to levels seen in the 1990's.
- In the last 12 months levels have remained stable; and
- As of May 2015, a total of eleven bores had groundwater levels below sea level. Water levels in many of these bores hover around 0mAHD and may recharge to above this level over the winter.

3.3 Salinity

Salinity has been relatively stable over the past 6 years. Readings over the past 12 months have risen in some bores and fallen in others, so there is no clear trend, but most bores remain within historic ranges. Salinity in bore 91025, which is in on the coast in zone 6 has increased by over 10% during the past 12 months, so we will keep an eye on this during the next round of sampling.

Salinity will continue to be monitored and reviewed on an annual basis. Salinity monitoring was reduced from quarterly to annually in 2011 due to rising groundwater levels, which has reduced the risk of saline intrusion.

All salinity graphs are presented in appendix 3.

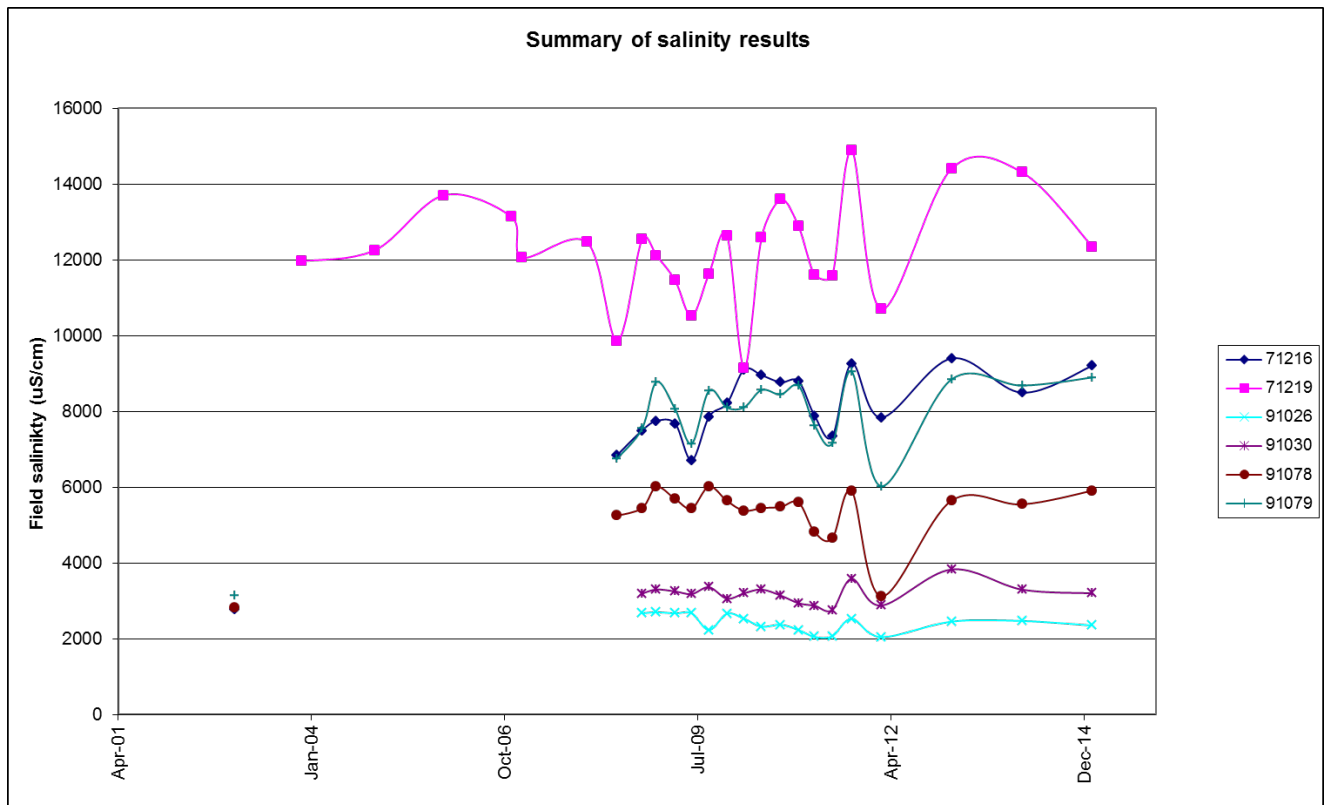


Figure 3: Graph showing salinity in KWR.

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

3.4 Water Use

The following table provides detail on water use in the 2014-15 year as compared to four previous years.

At 30 June	2011	2012	2013	2014	2015
No. of licences	371	383	369	370	364
Total allocated volume (ML)	12,018.0	12,336.2	12,624.8	12,611.8	12,597.5
No. of metered licences*	205	200	207	204	197
Total volume metered (ML)*	9,575.8	9,599.2	10,020.8	10,208.8	10,076.2
Metered volume used (ML)	1,939.4	1,924.3	3,474	3,277.2	3,698.8
Use % of allocation	16%	16%	28%	26%	29%
No. of licences with use greater than allocation	10	4	6	3	6
Permissible Consumptive Volume (PCV)	12,915.0	12,915.0	12,915.0	12,915.0	12,915.0
Use as a % of PCV	15%	15%	27%	25%	29%
No. of D&S bores ¹	1,492	1,299	1,251	1,164	1,126
D & S bores estimated use ¹	2,984	1,948.5	1,877	1,746	1,689
Estimated D & S use from licensed bores ²	742	574.5	553.5	555.0	534.0

¹Taken from the Victorian State Water Accounts

²Estimated 1.5ML per licence 2013 onwards

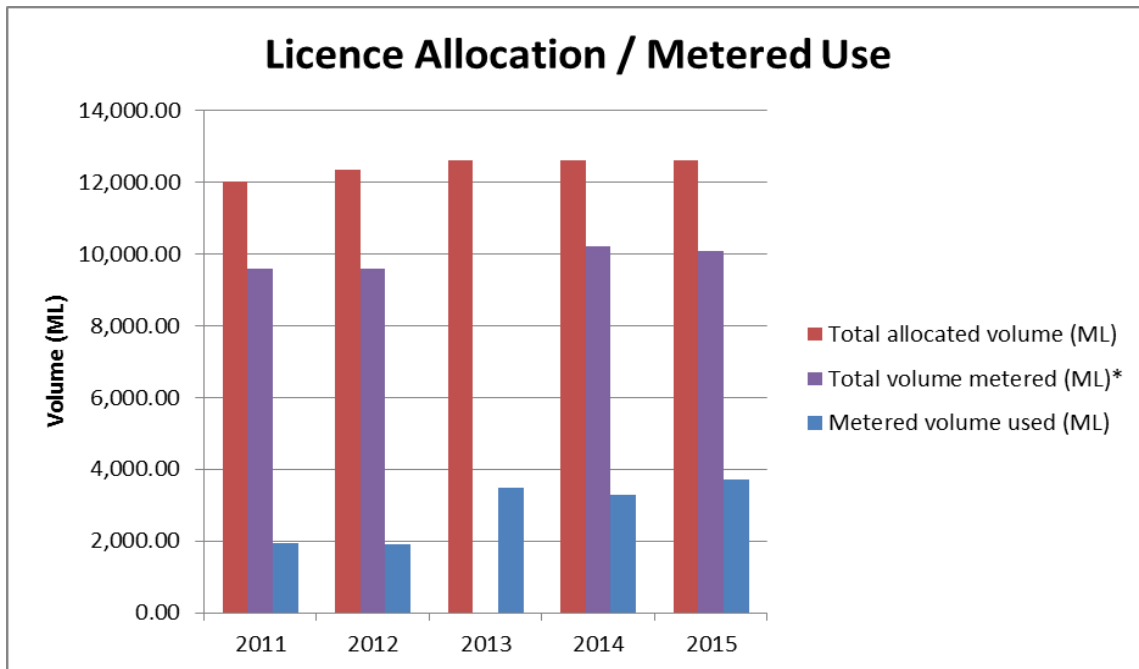


Figure 4: Licence allocation compared to metered volume and usage.

3.5 Non compliance

The following table lists the licences where water was taken in excess of licensed entitlement.

Licence No	Licence Volume	Amount taken	Amount overused	Comment
BEE020880	5	5.5	0.5	Investigation completed and licence holder has been advised to monitor usage and transfer additional volume in if needed in the future.
BEE024577	47	47.3	0.3	Investigation completed and no action was considered necessary.
BEE025660	71	298.5	227.5	This is a result of a change in property ownership and water entitlements, where the amalgamation of all existing licences was not completed prior to the end of season meter reads. The property owner holds sufficient volumes of groundwater entitlement across a number of licences within zone 2B to cover the use on this particular licence.
BEE027079	20.9	22.9	2.0	Investigation completed and licence holder has been advised to monitor usage and transfer additional volume in if needed in the future.
BEE027810	6	8.4	2.4	Investigation completed and licence holder has been advised to monitor usage and transfer additional volume in if needed in the future.
BEE028034	15.8	16.1	0.3	Investigation completed and no action was considered necessary.
Totals	165.7	398.7	233	

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 maintenance on bores that have been identified by the field service provider through the Extra Works Advice. This is bore specific.</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 level at the time of writing is specified in Schedule 1 of the Plan).</p>	<p>SRW regularly reviews the salinity monitoring program.</p>	<p>Yes</p>

4.1.2 Issues Affecting Implementation

No issues affecting implementation of monitoring prescriptions.

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 are read at least twice per year in December/January and May/June. The meter readings and usage data are recorded and stored in SRW's metering system. Usage is also recorded in the State 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 licensee's to read their meter and provide the meter reading.	Yes

4.2.2 Compliance and Exceptions

Activities under taken during the reporting period generally comply with the requirements of the Plan.

4.2.3 Issues Affecting Implementation

There are no issues to report.

4.2.4 Metering activities

	Year to 30 June 2015	Total for WSPA at 30 June 2015
Number of licences issued	2	356
Number of meters installed	2	245
Meters requiring recalibration	0	
Meters replaced	7 removed 6 replaced	

Meters read (1 – date)	Jan 2015	
Meters read (2 – date)	May/June 2015	
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
1. Temporary trade of water entitlement IS allowed within a zone or coastal sub-zone and from one zone to another zone provided that: (i) Where usage has exceeded 80% of allocation over the previous 2 years, water levels have recovered appropriately*; (ii) Transfer does not occur into coastal sub-zones**; (iii) Transfer does not occur into zones 1, 2B, 4 and 5; and (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). (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).	12 temporary transfers were processed during the reporting period in accordance with this prescription.	Yes
2. Permanent trade of Water Entitlement shall be allowed within zones and from one zone to another zone provided that: (i) Where usage has exceeded 80% of allocation over the previous 2 years, water levels have recovered appropriately*; (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. (iii) Transfer does not occur into zones 1, 2B, 4 & 5; and (iv) Transfer does not occur into coastal sub-zones.	6 permanent transfers were processed during the reporting period.	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.	0 new licences have been issued during this reporting period as prescribed	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 3 will be reduced by that licence volume.	1 license for 3ML was surrendered at the request of the licence holder	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).	Not applicable	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.	2 new entitlements were issued. PCV not affected.	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

4.3.2 Compliance and Exceptions

Activities under taken during the reporting period comply with the requirements of the Plan.

4.3.3 Issues Affecting Implementation

No issues affecting implementation.

4.4 Licensing Activities

The following table provides details of licensing activities.

Year to 30 June 2015	No.	Volume ML
New licences issued*	2	0
Additional volumes on existing licences	0	0
Licences revoked	0	0
Permanent transfers	6	69.1
Temporary transfers	12	519.6
D&S Bores notifying use	0	0

*Issued to allow for completion of trade applications

4.4.1 Issues Affecting Implementation

No issues affecting implementation.

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 so as to ensure the long-term sustainability of those resources.*

It is considered that the groundwater resources of the Koo Wee Rup WSPA are being managed sustainably.

SRW will undertake a review of the GMP in 2016 date to determine whether a groundwater management plan is still necessary or whether a local management plan would be more suitable. The review will also consider appropriateness of the existing prescriptions, particularly in relation to groundwater transfers. SRW has received feedback from licence holders that the trading zones and one year transfers do not provide sufficient flexibility for groundwater users.

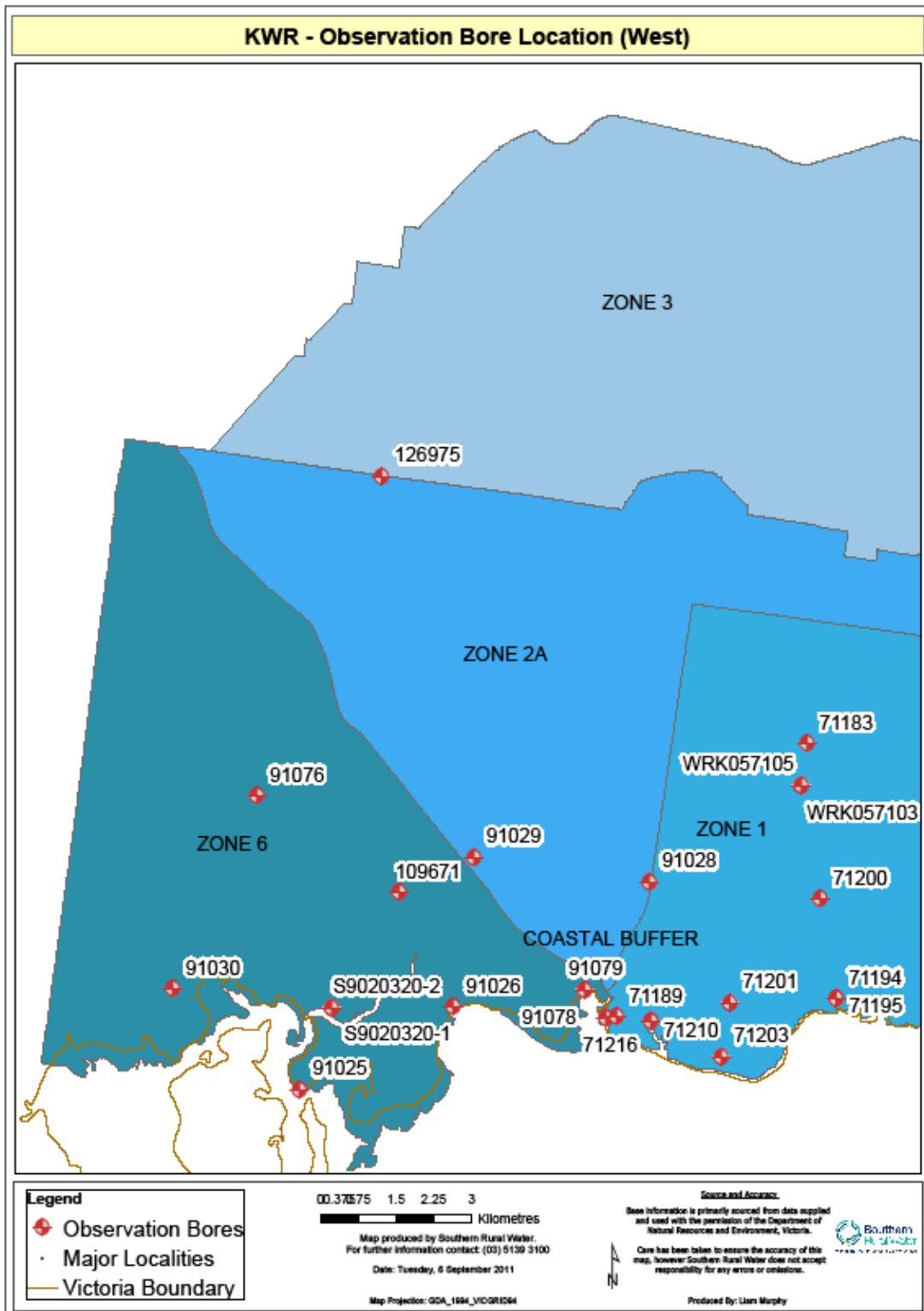
6 Appendices

6.1.1 Licence Details

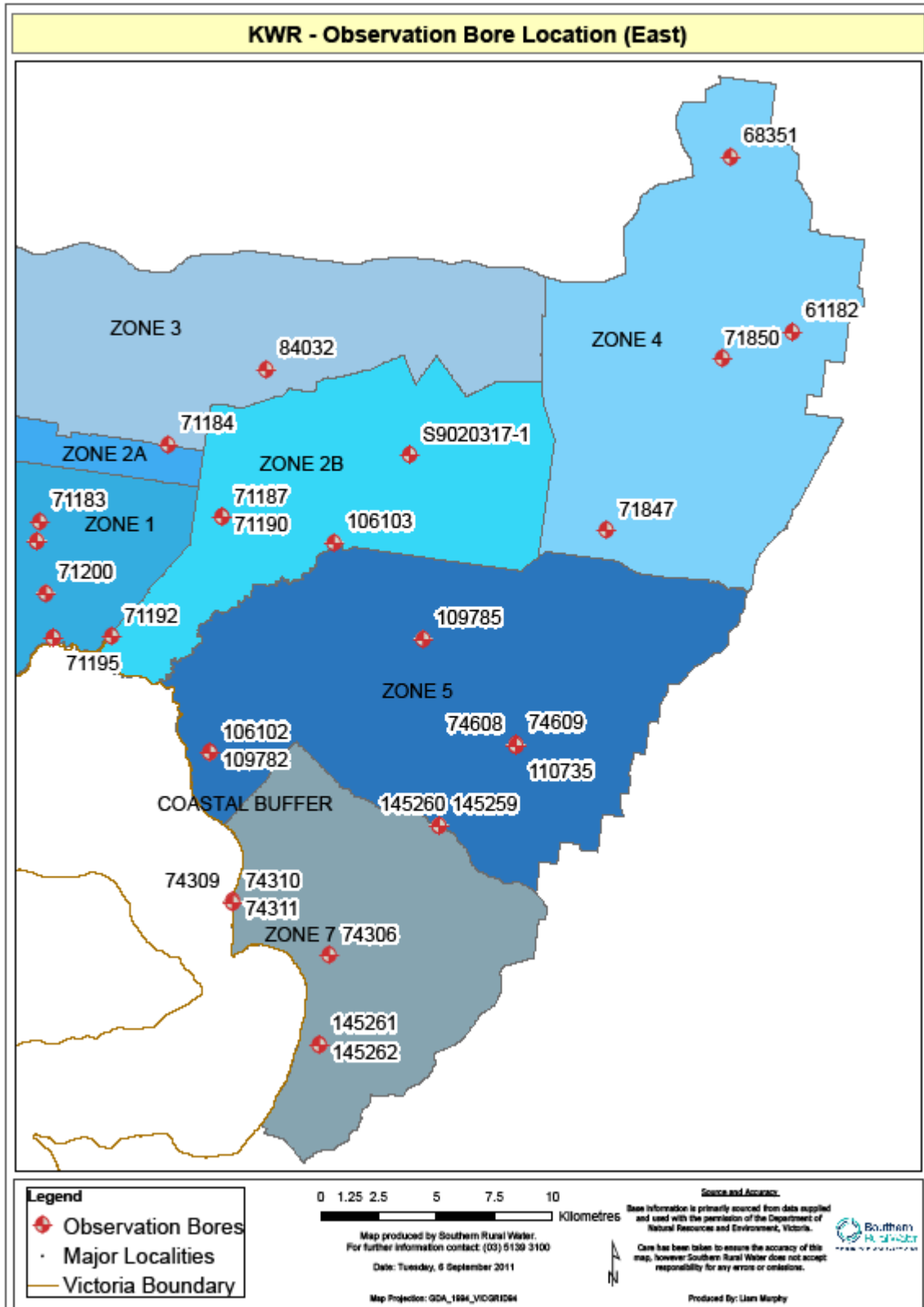
Entitlement Number	Application Type	Purpose	Previous Volume	Approved Volume
BEE022066	Surrender – at customer request	Irrigation	3.0	zero
BEE072144*	Issue	Irrigation	0	22.1
BEE072581*	Issue	Irrigation	0	30.0

*Licence issued to allow for completion of water trade application

6.1.2 Monitoring program details







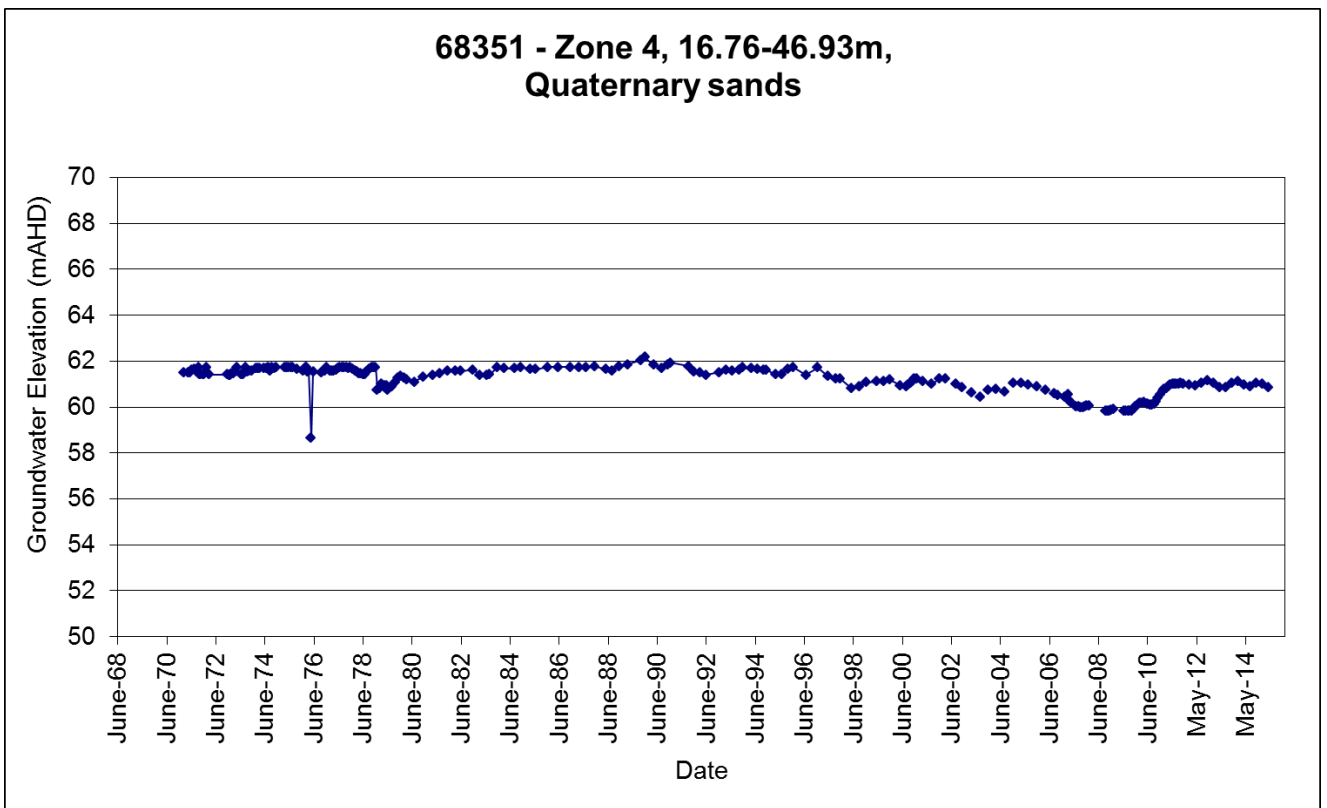
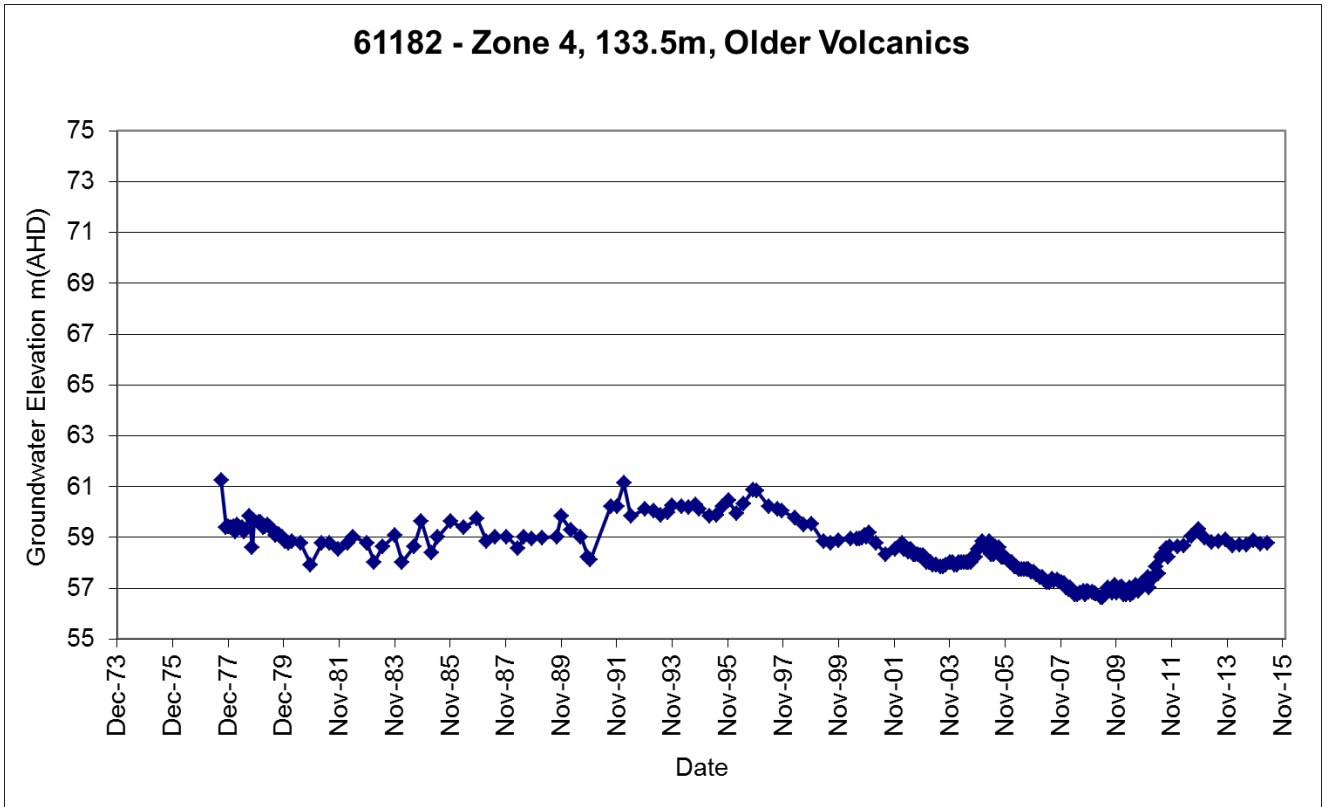
Groundwater monitoring program summary

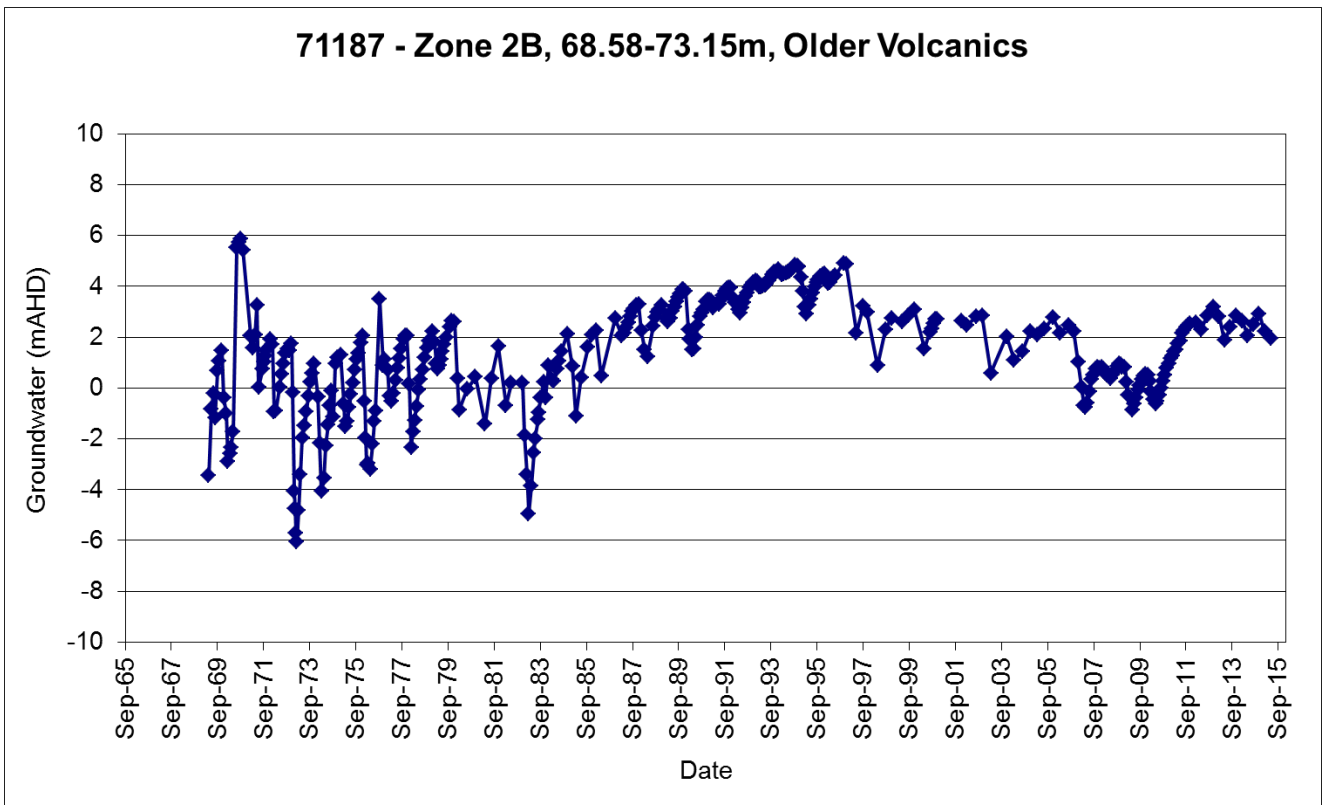
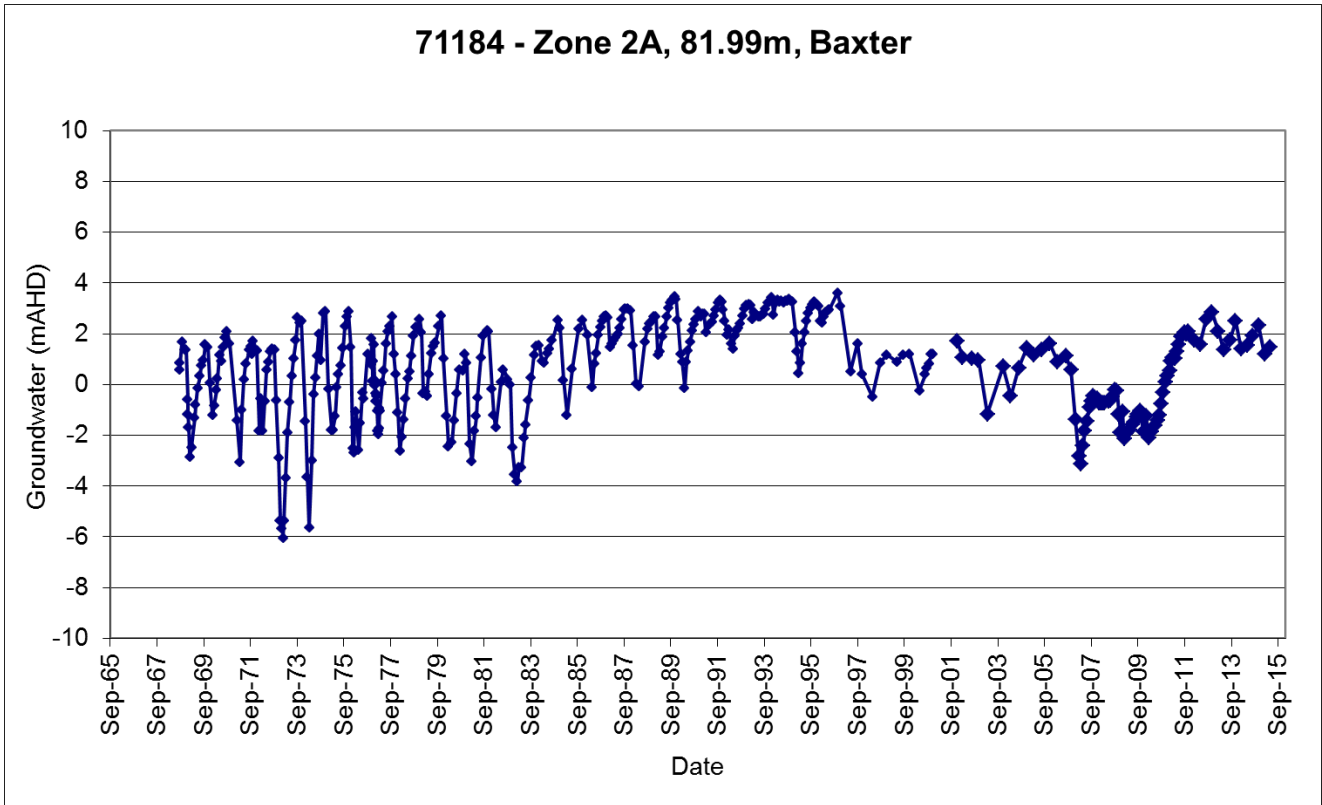
BHID	Zone	Formation	GW Level	Salinity
71216	1	Baxter	Quarterly	Annually
71219	1	Baxter	Quarterly	Annually
WRK057103	1	Older Volcanics	Quarterly	
71200	1	Sherwood	Quarterly	Annually
71201	1	Sherwood	Quarterly	
71203	1	Sherwood	Quarterly	Annually
71210	1	Sherwood	Quarterly	
71215	1	Sherwood	Quarterly	Annually
WRK057105	1	Sherwood	Quarterly	
71194	1	Baxter, Sherwood	Quarterly	Annually
71195	1	Sherwood	Quarterly	Annually
71184	2A	Baxter	Quarterly	
126975	2A	Older Volcanics	Quarterly	
91029	2A	Sherwood	Quarterly	
71190		Baxter	Quarterly	
71192	2B	Baxter, Sherwood, Volcanics	Quarterly	Annually
71187	2B	Older Volcanics	Quarterly	
WRK966214	2B	Yallock	Quarterly	
84032	3	Older Volcanics	Quarterly	
61182	4	Older Volcanics	Quarterly	
68351	4	Quaternary Sands	Quarterly	
71847	4	Yallock	Quarterly	
71850	4	Yallock	Quarterly	
74608	5	Older Volcanics	Quarterly	
BHID	Zone	Formation	GW Level	Salinity
109785	5	Older Volcanics	Quarterly	
110735	5	Quaternary Sands	Quarterly	
74609	5	Yallock	Quarterly	
91079	6	Baxter	Quarterly	Annually
WRK966216	6	Older Volcanics	Quarterly	
91025	6	Sherwood	Quarterly	Annually

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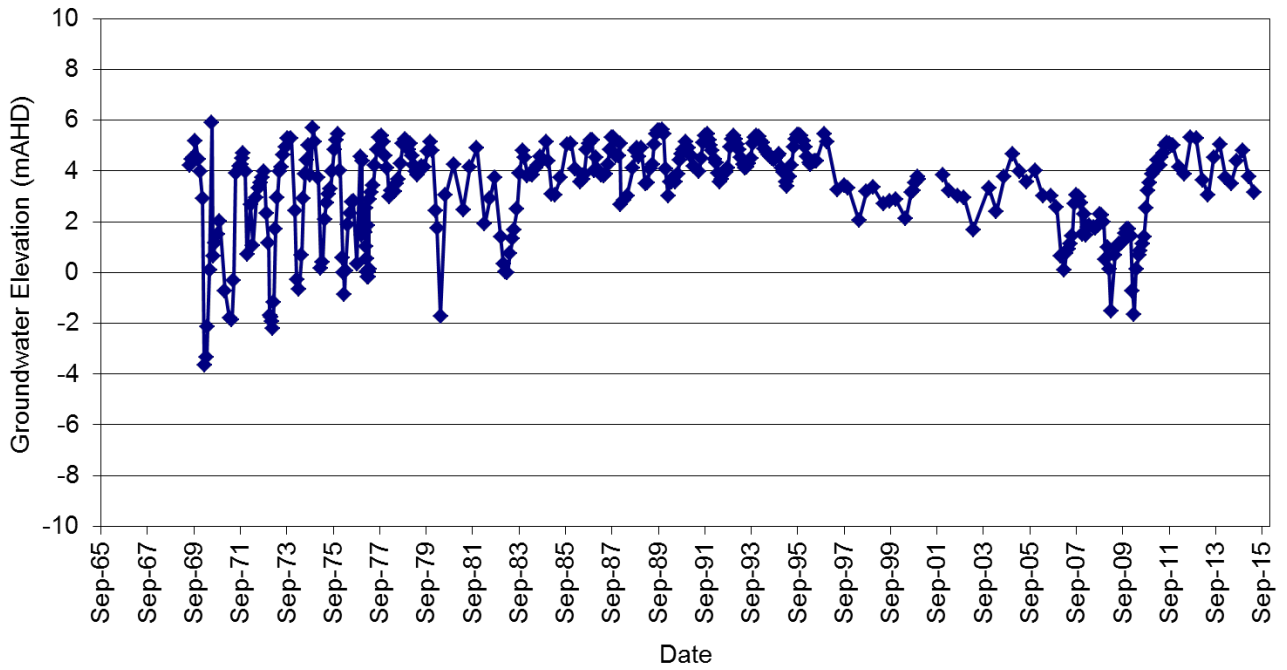
91026	6	Sherwood	Quarterly	Annually
91030	6	Sherwood	Quarterly	Annually
91078	6	Sherwood	Quarterly	Annually
WRK966215	6	Sherwood	Quarterly	
91076	6	Silurian Bedrock	Quarterly	
74311	7	Baxter	Quarterly	Annually
74306	7	Childers	Quarterly	
145260	7	Childers	Quarterly	
145262	7	Childers	Quarterly	
74309	7	Older Volcanics	Quarterly	Annually
74310	7	Sherwood	Quarterly	Annually
145259	7	Westernport	Quarterly	
145261	7	Westernport	Quarterly	Annually
106102	5(Private land)	Baxter	Quarterly	Annually
109782	5(Private land)	Childers	Quarterly	

6.1.3 Hydrographs

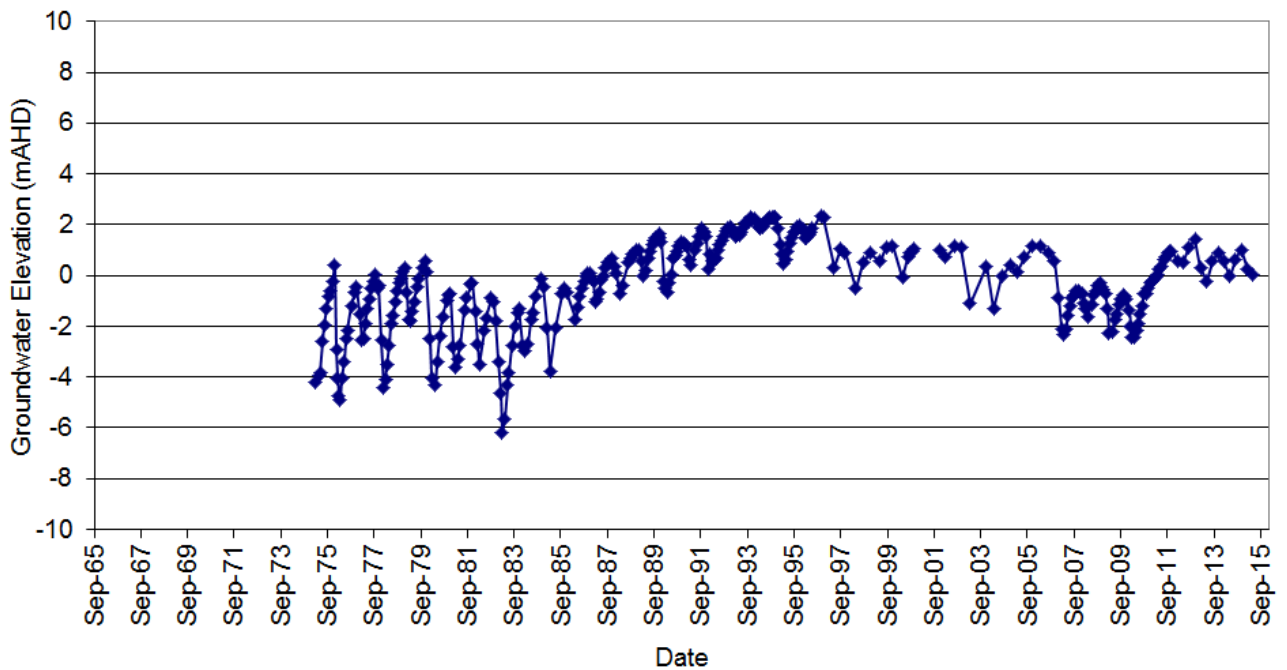


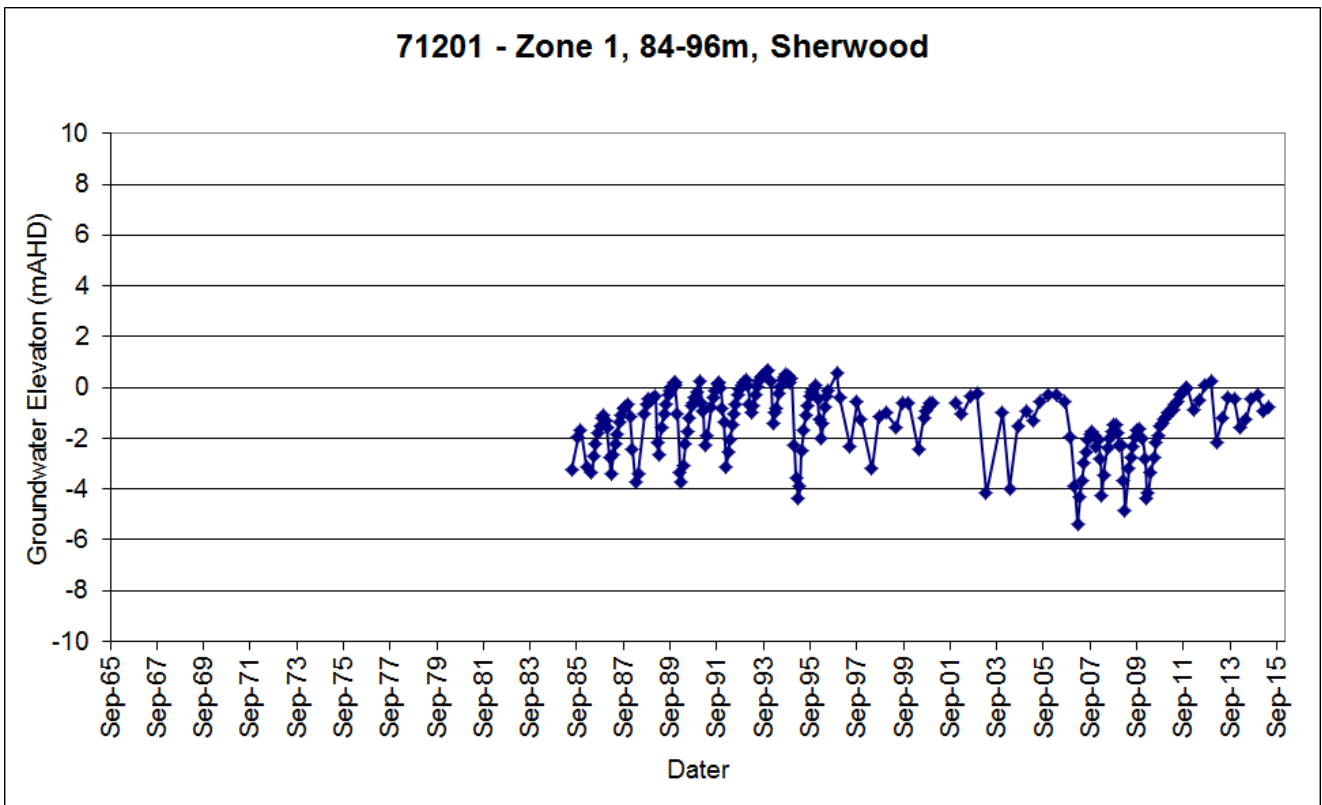
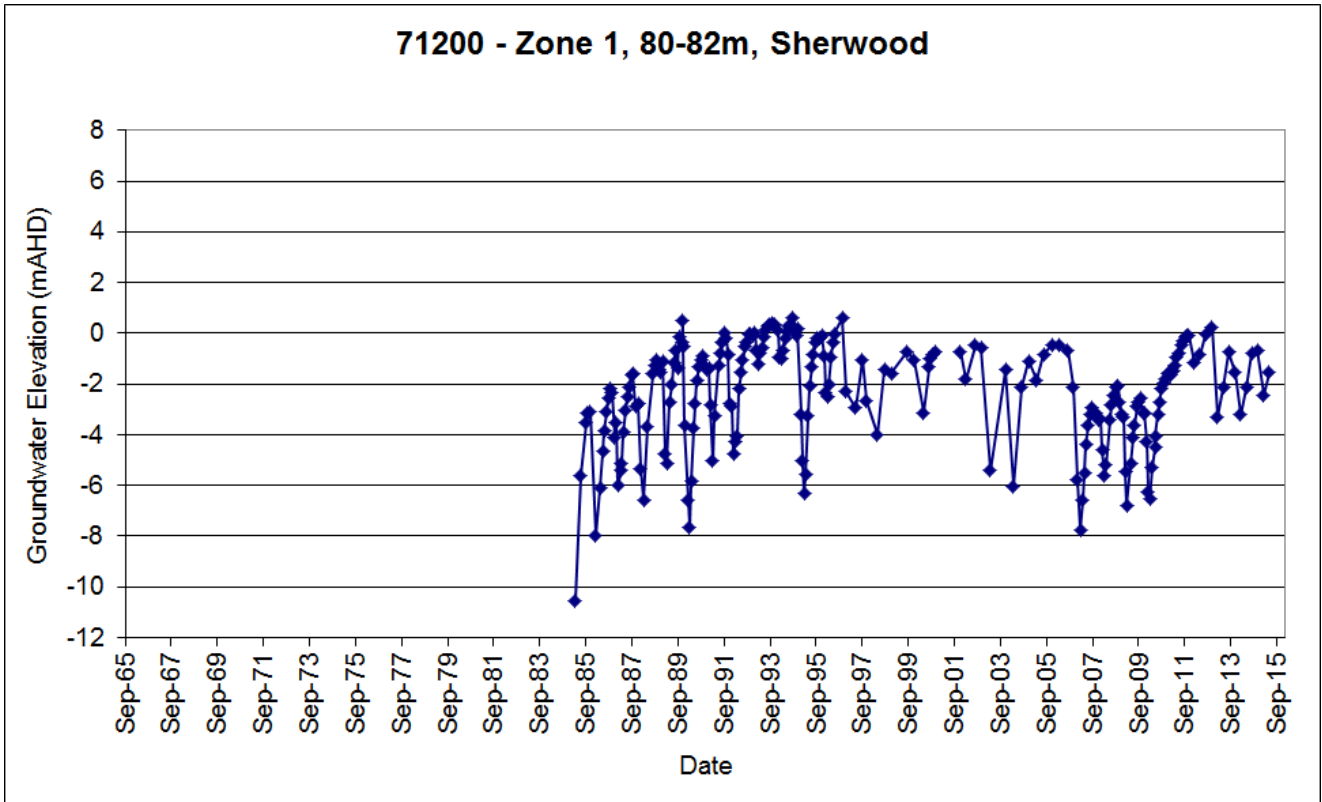


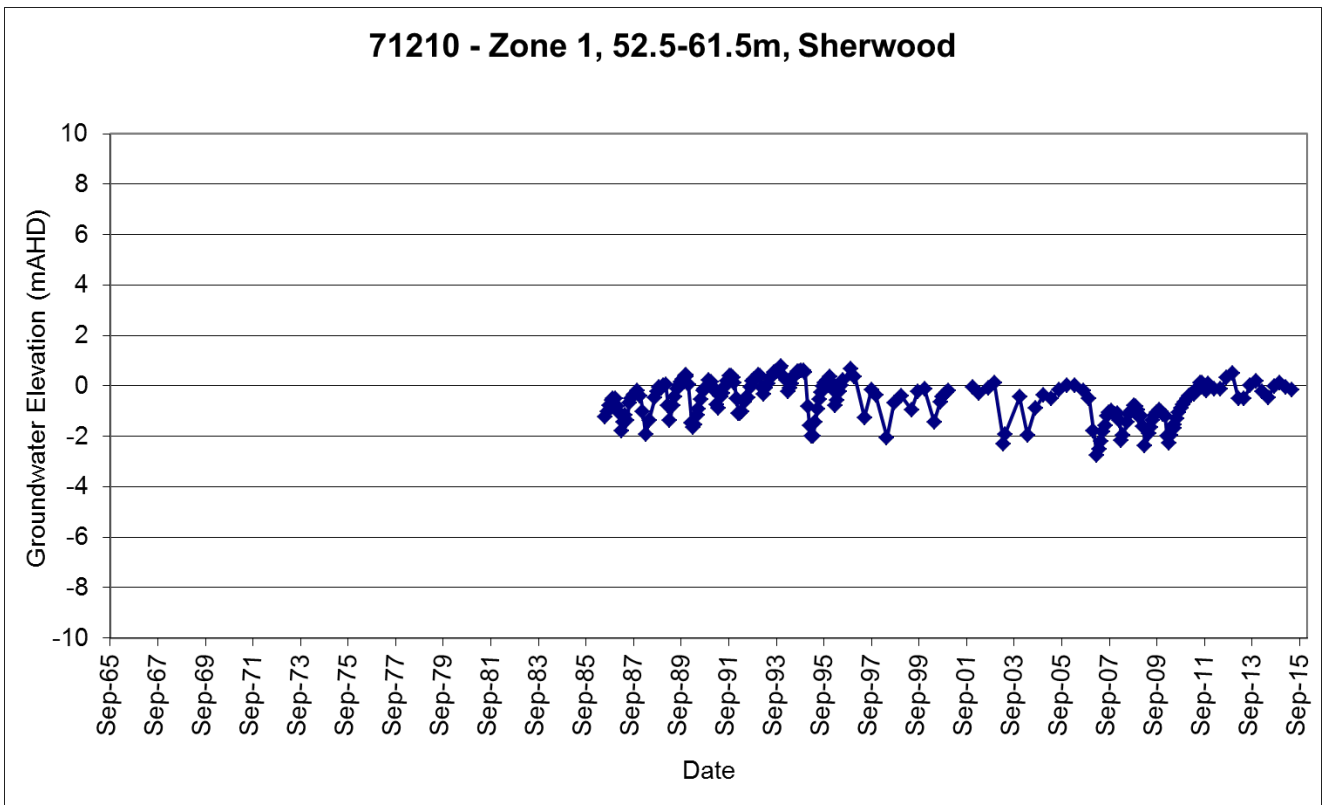
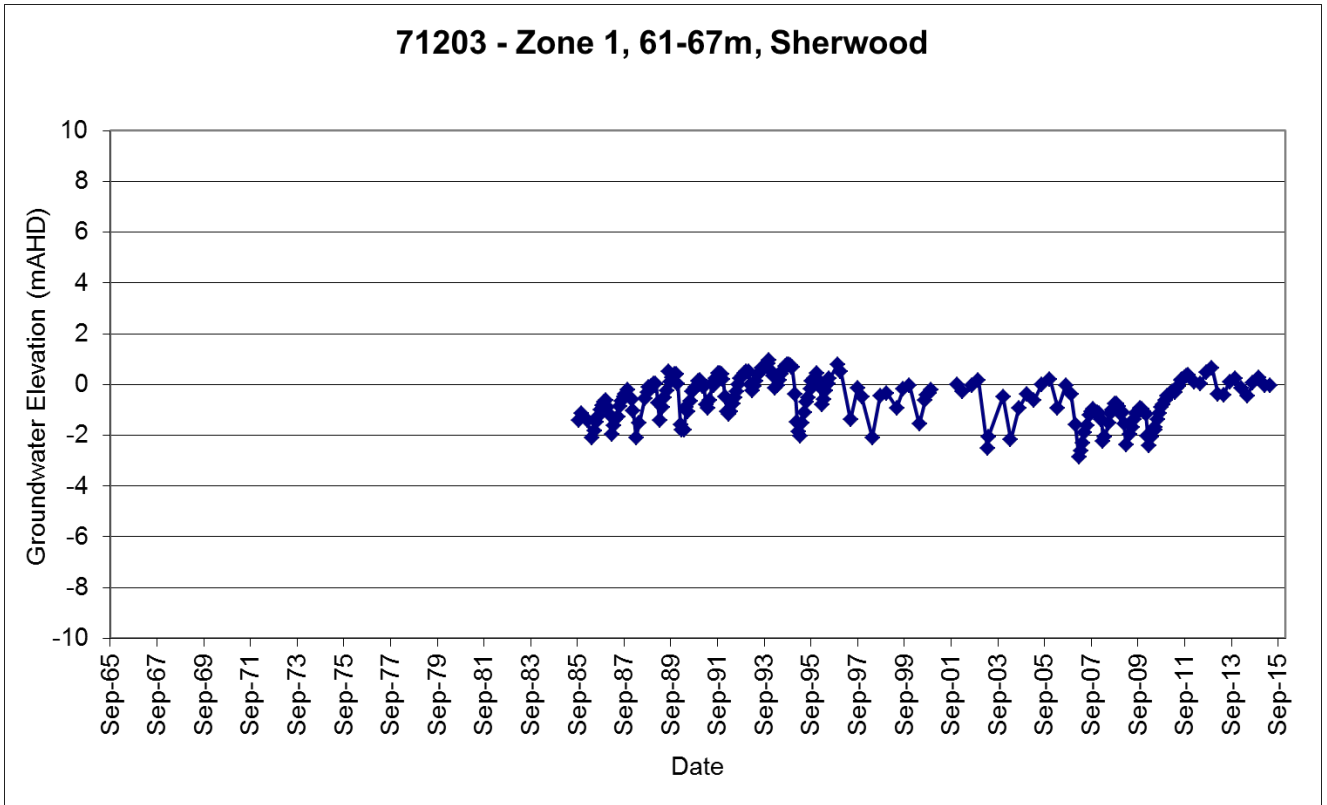
71190 - Zone2B, 40.84-49.68m, Baxter



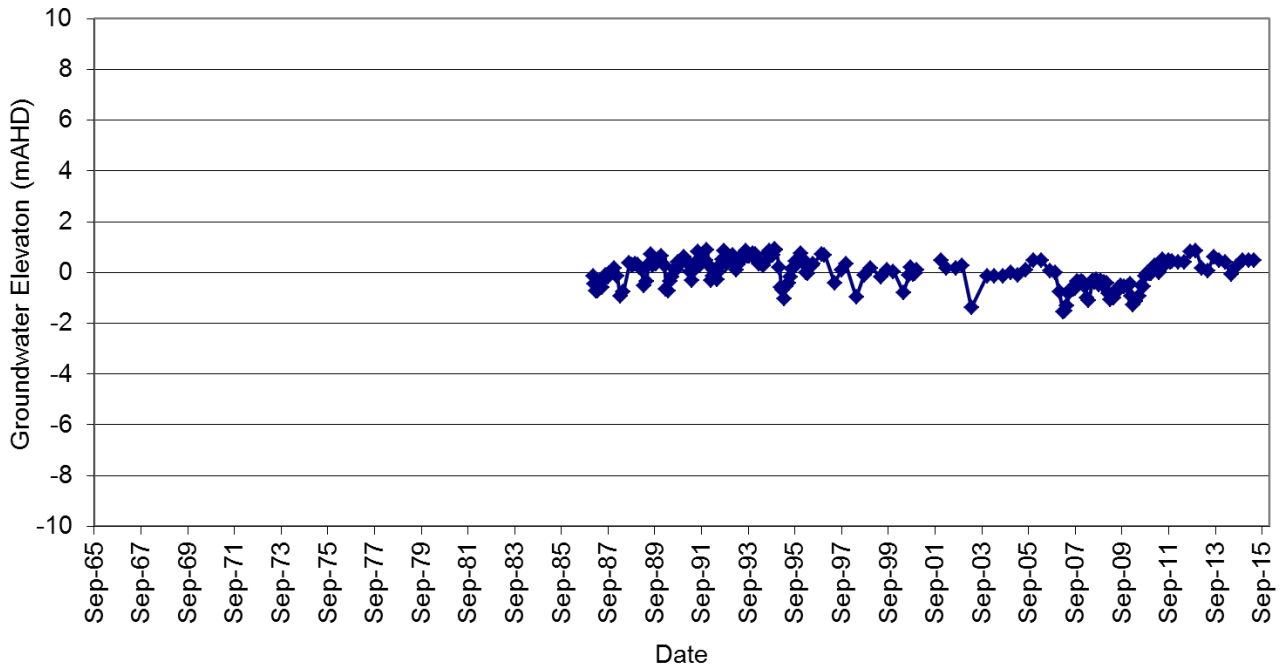
71192 - Zone 2B, 43-123m, Baxter/Sherwood/Volcanics



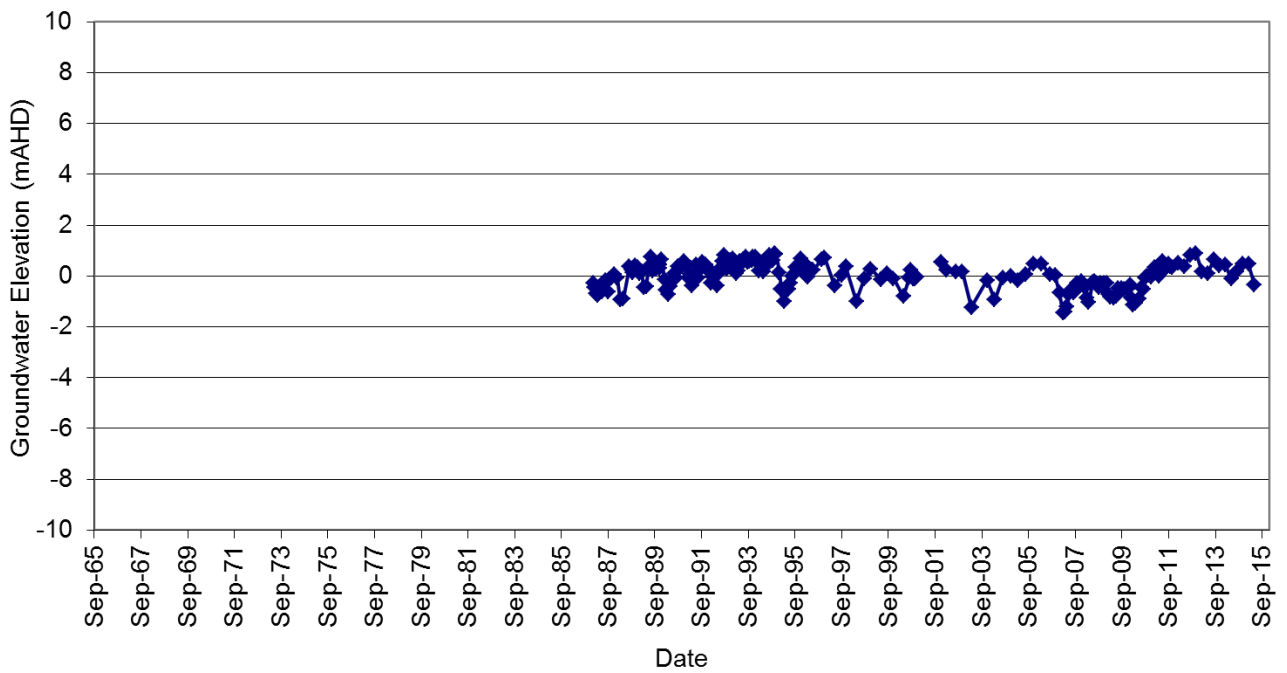


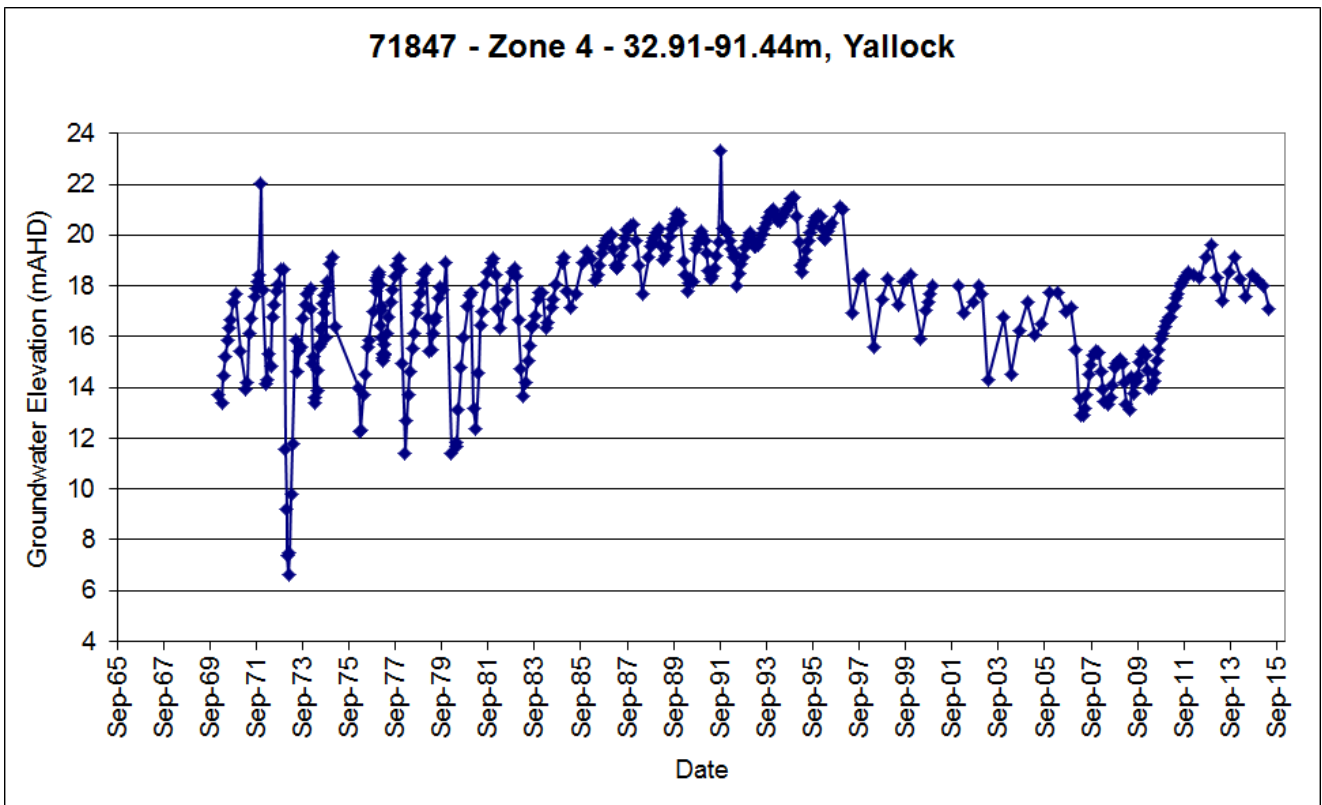
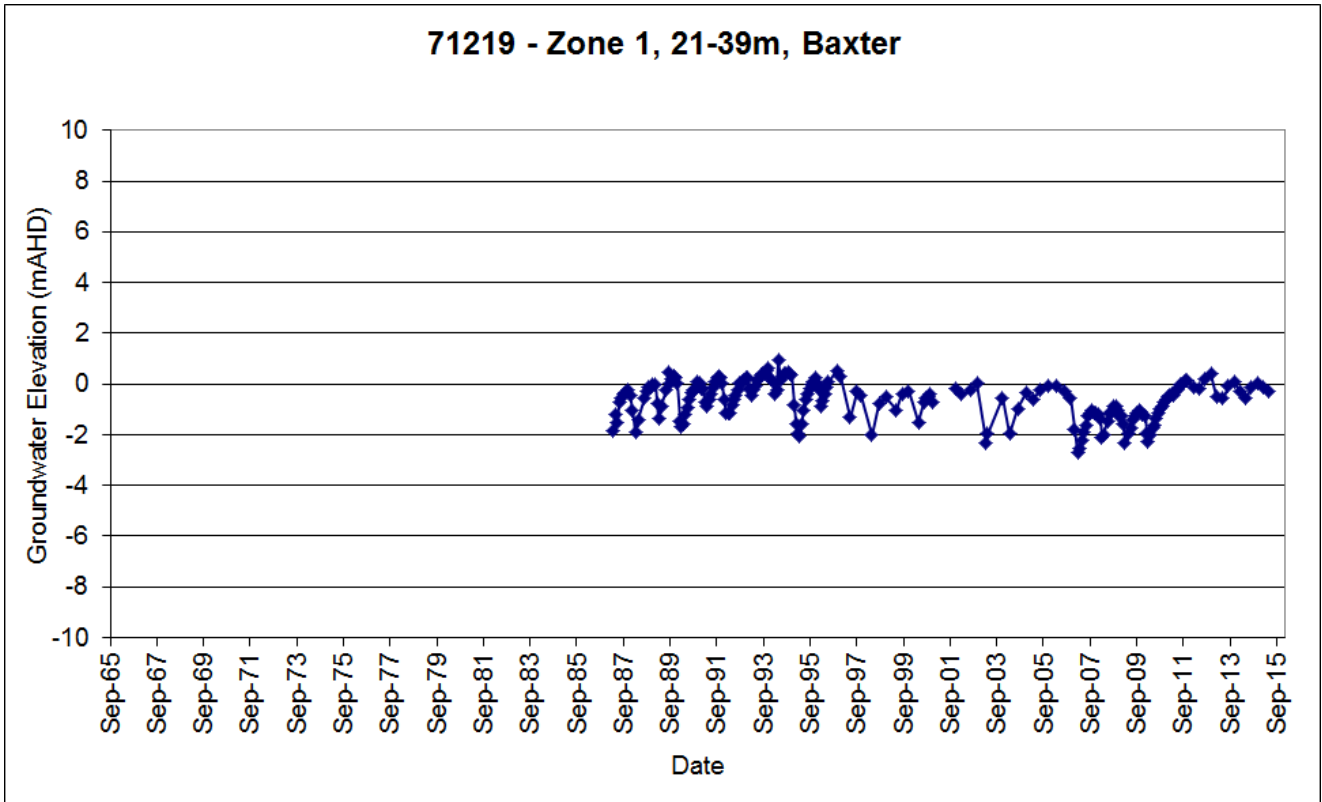


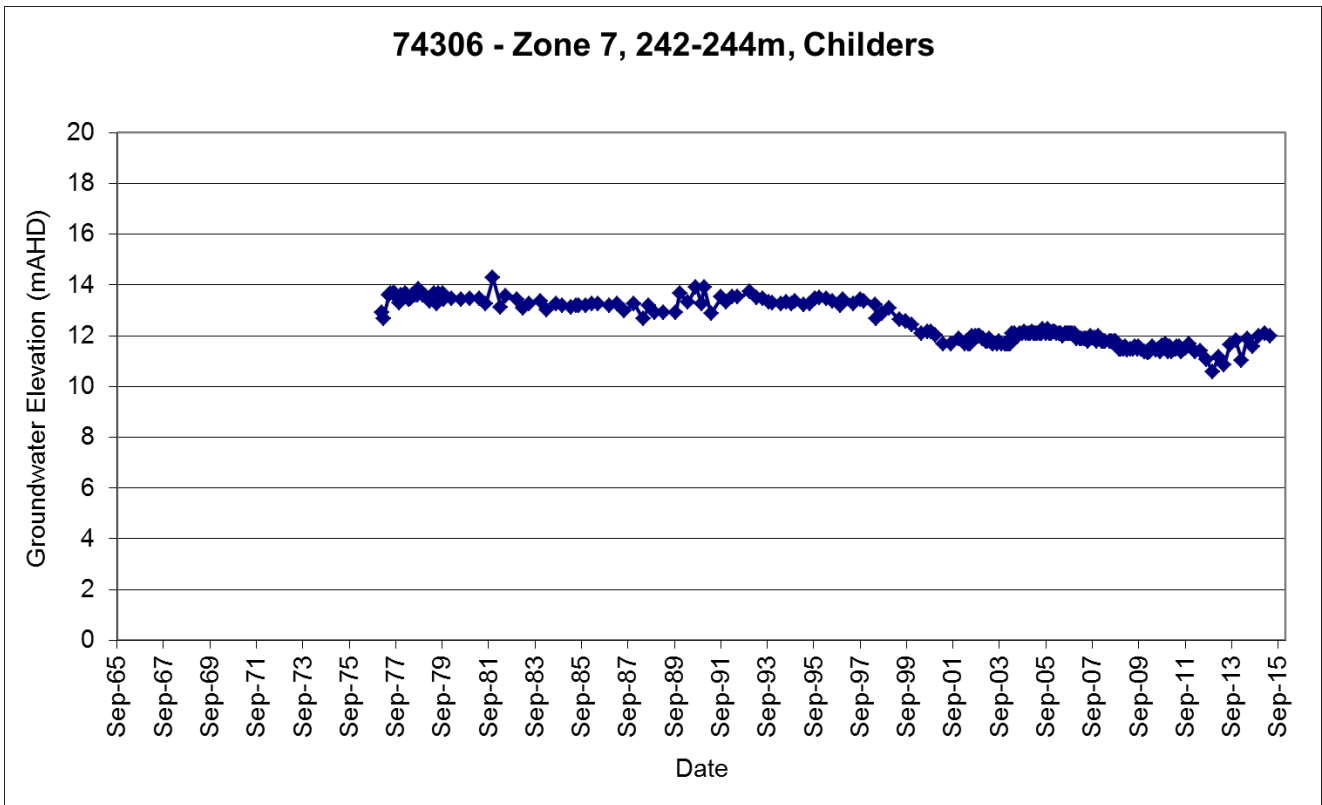
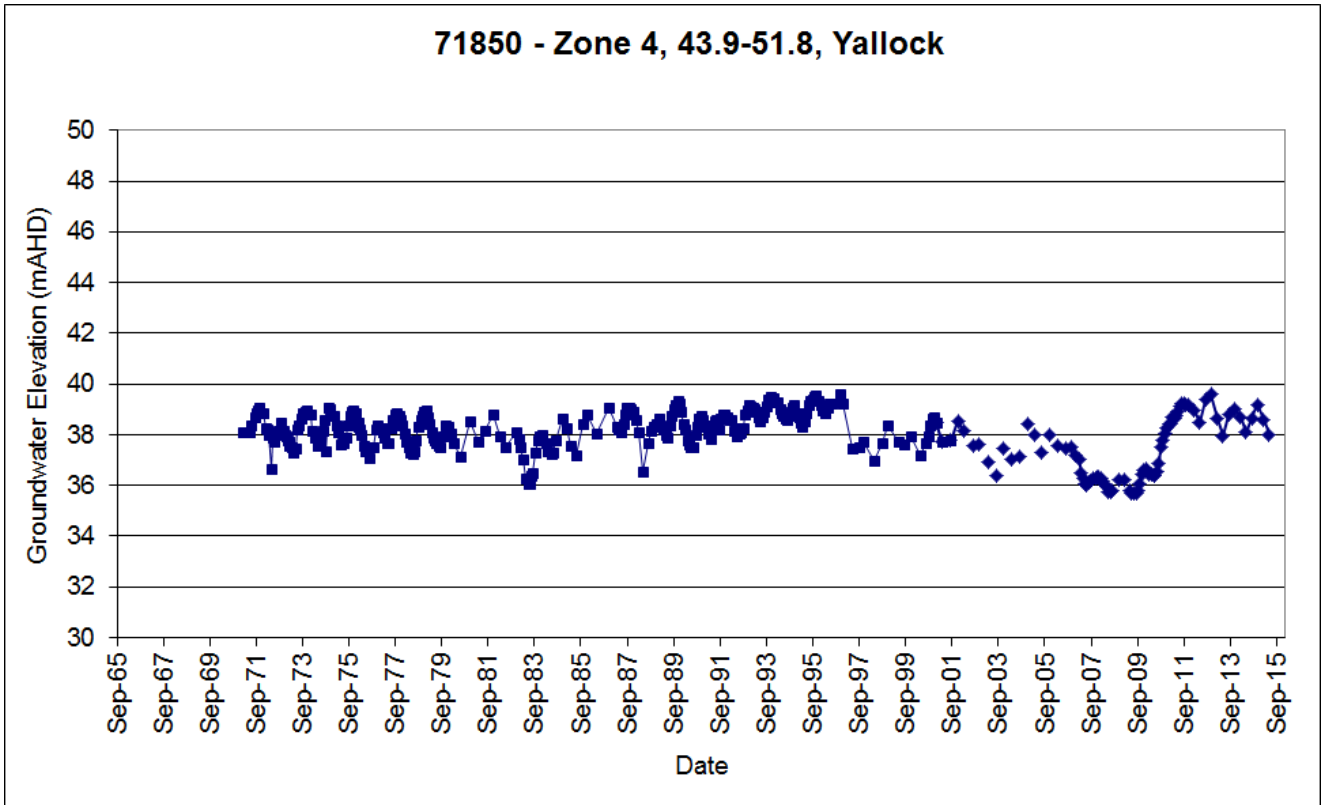
71215 - Zone 1, 68.4-74.39m, Sherwood



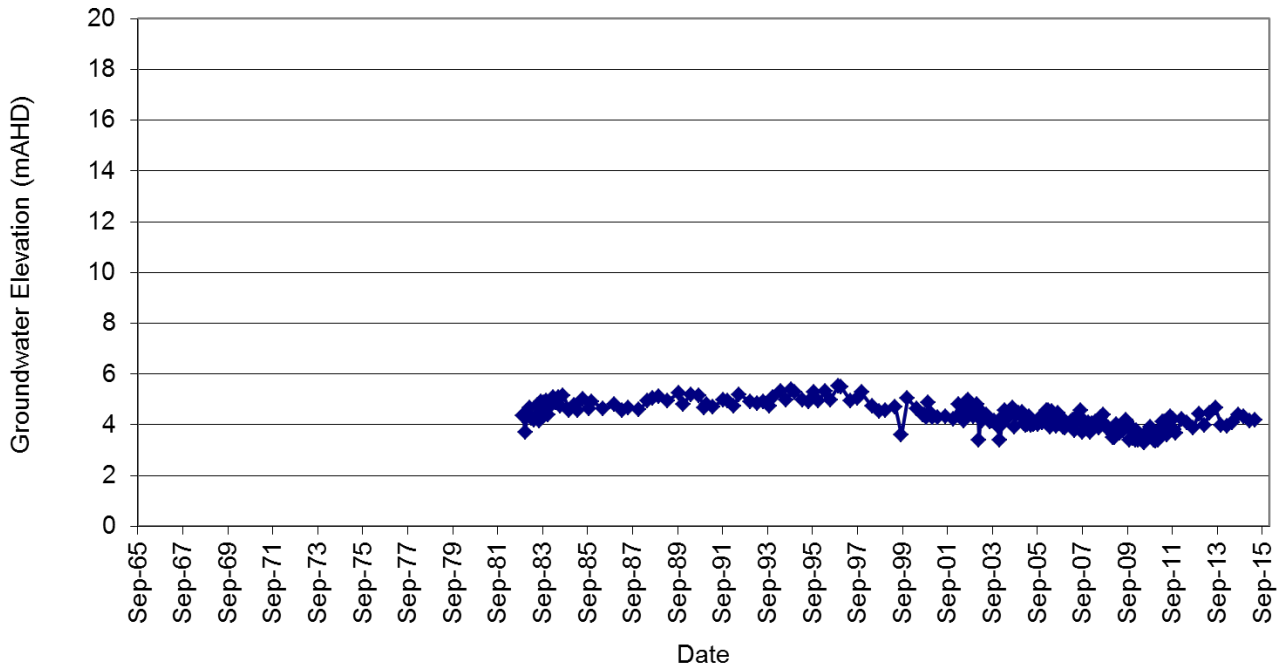
71216 - Zone 1, 27-33m, Baxter



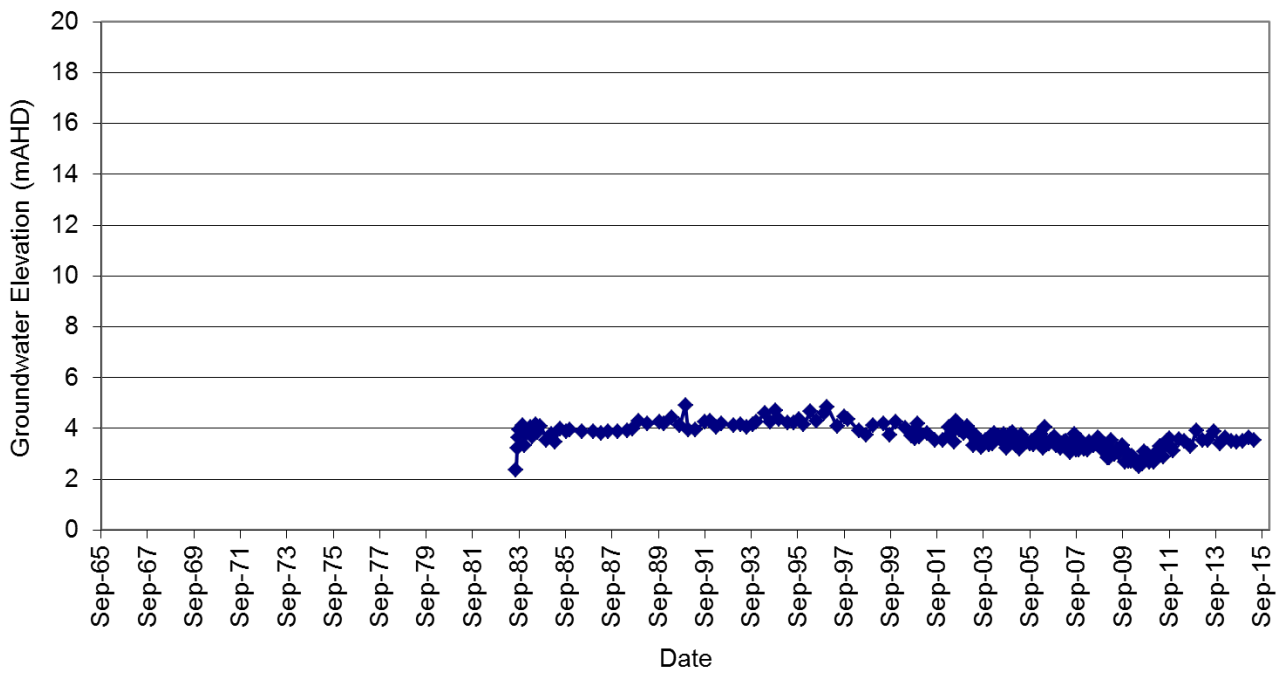


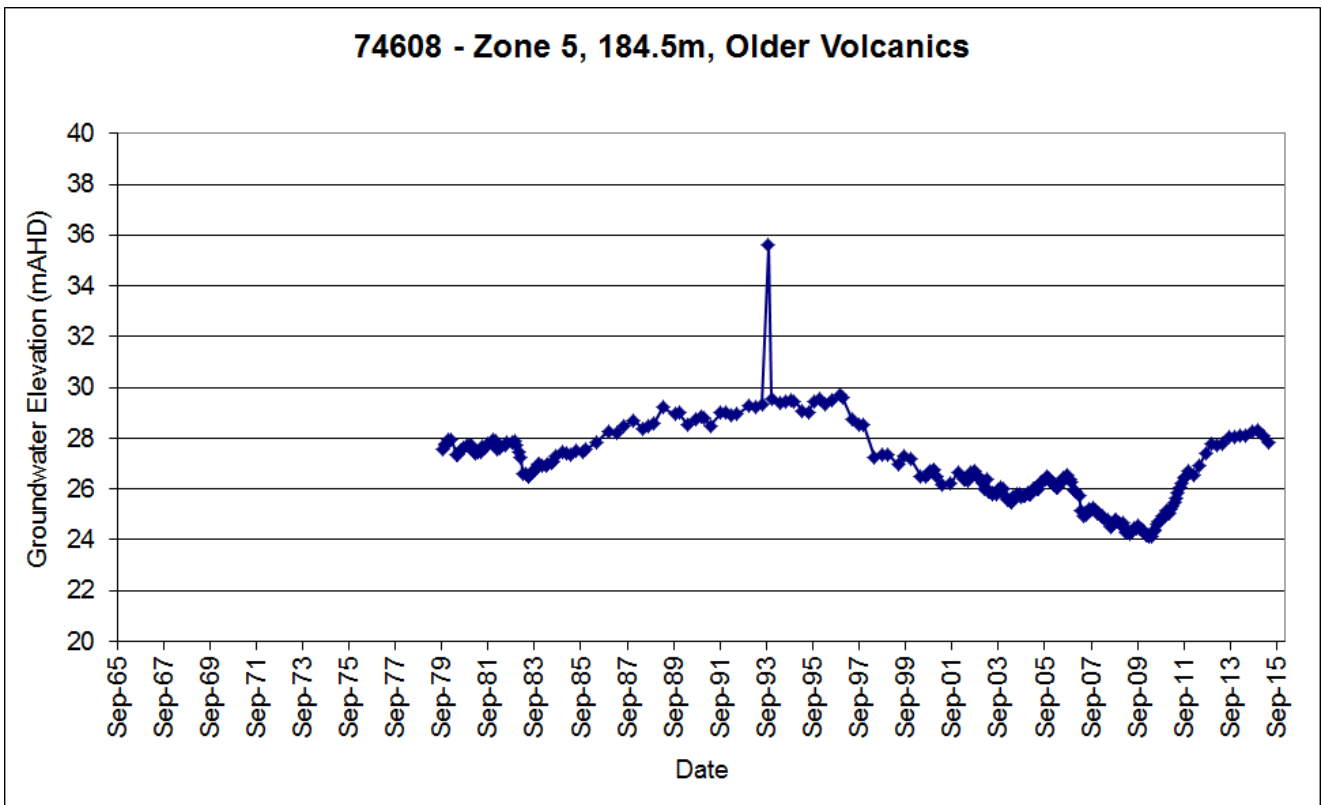
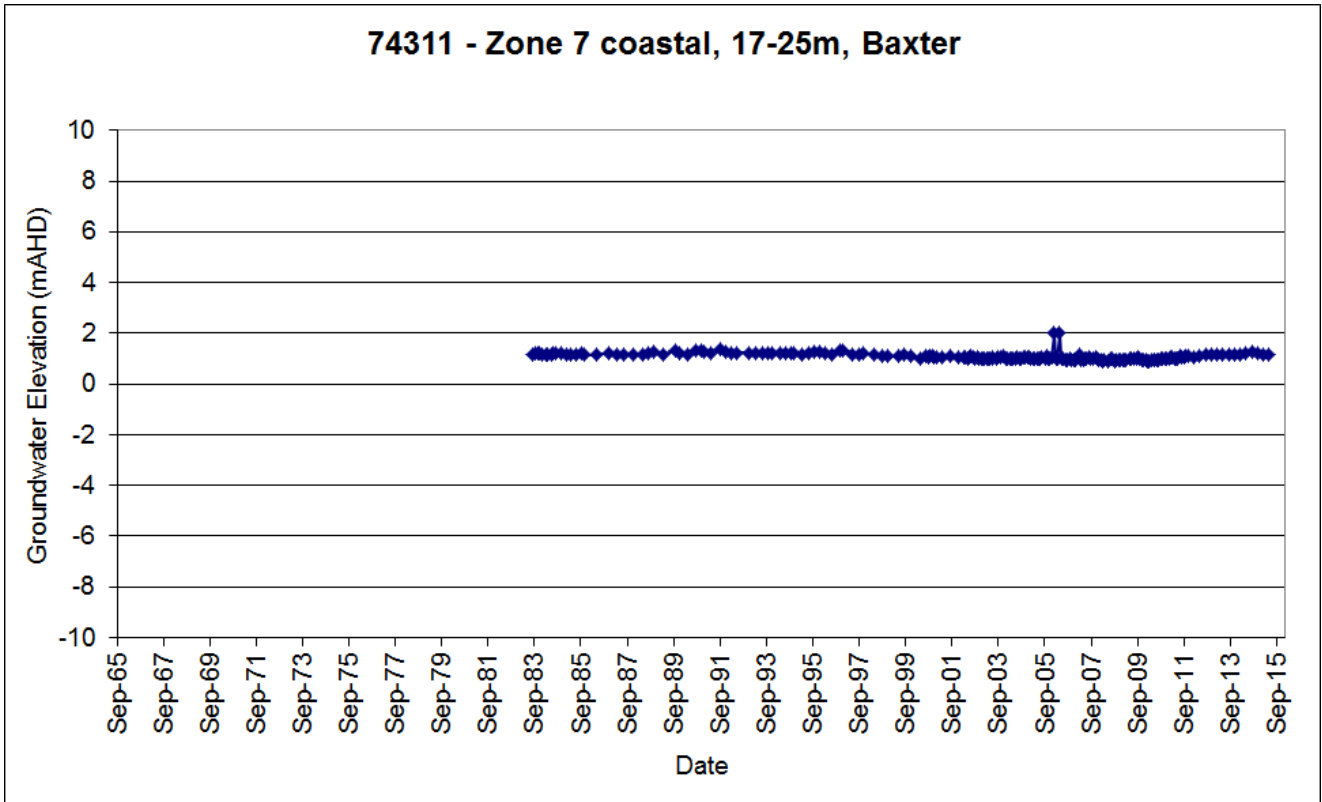


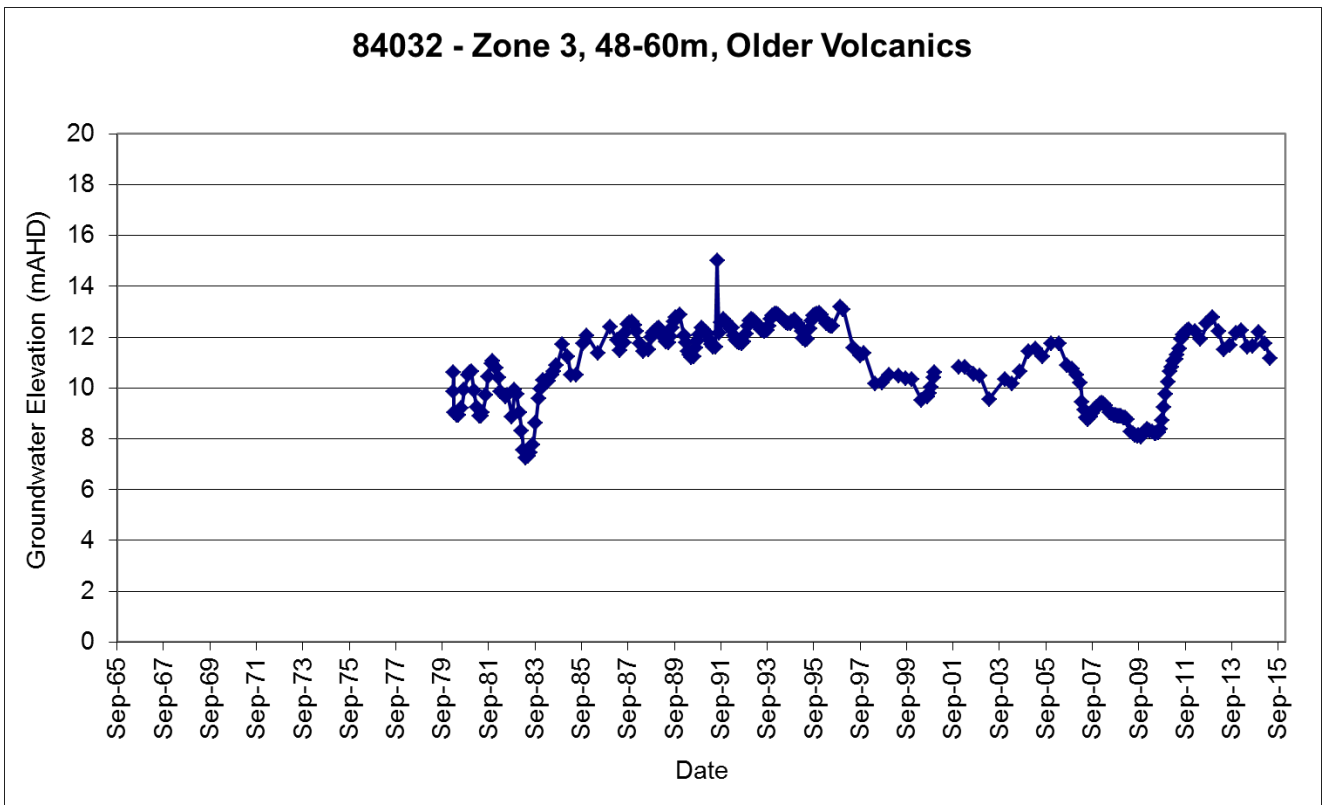
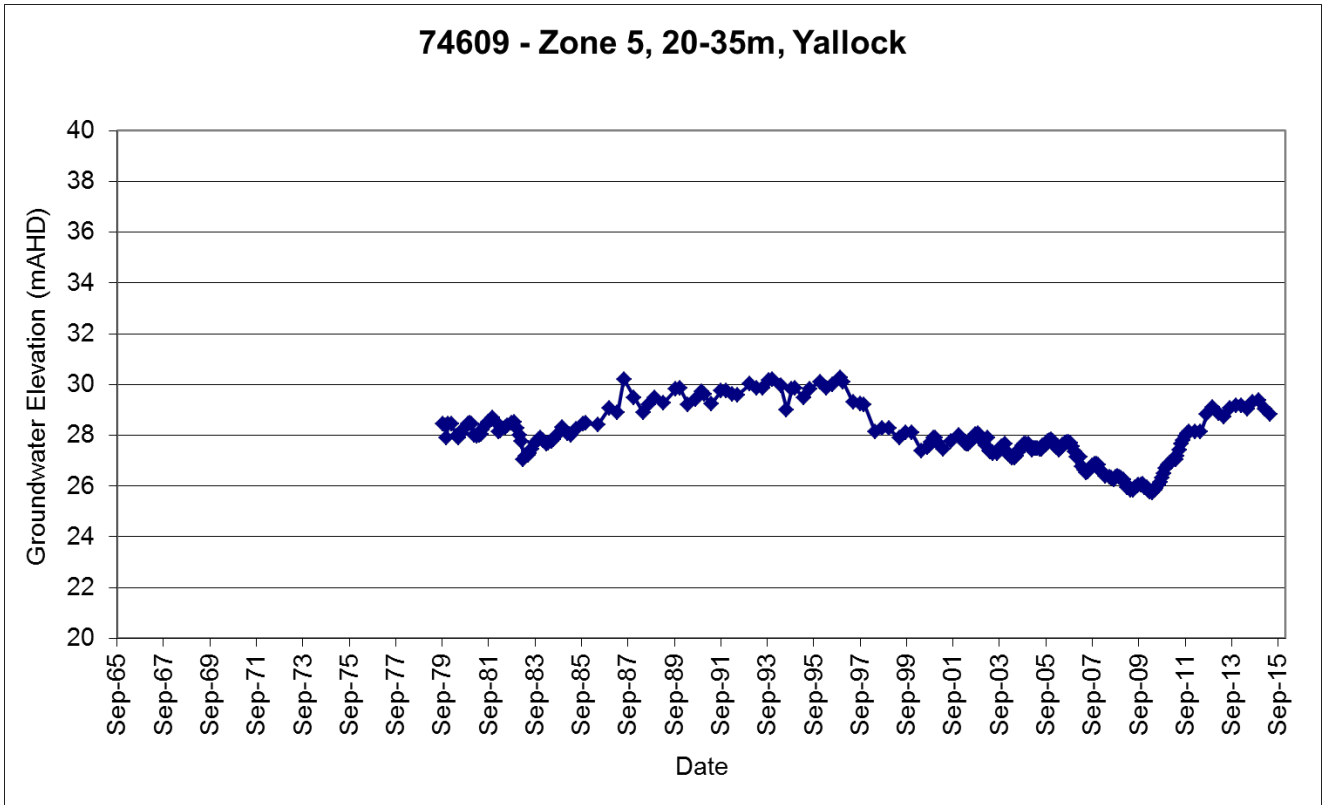
74309 - Zone 7 coastal, 97.5-118.5m, Older Volcanics



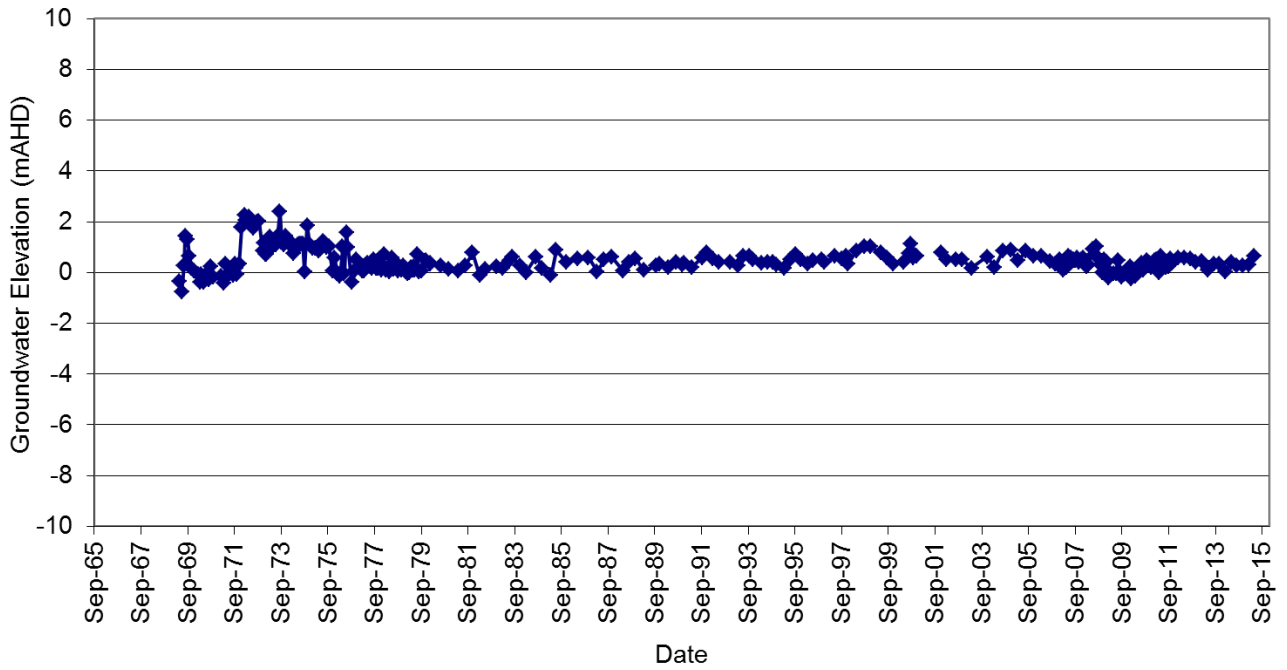
74310 - Zone 7 coastal, 84.1-87.5m, Sherwood



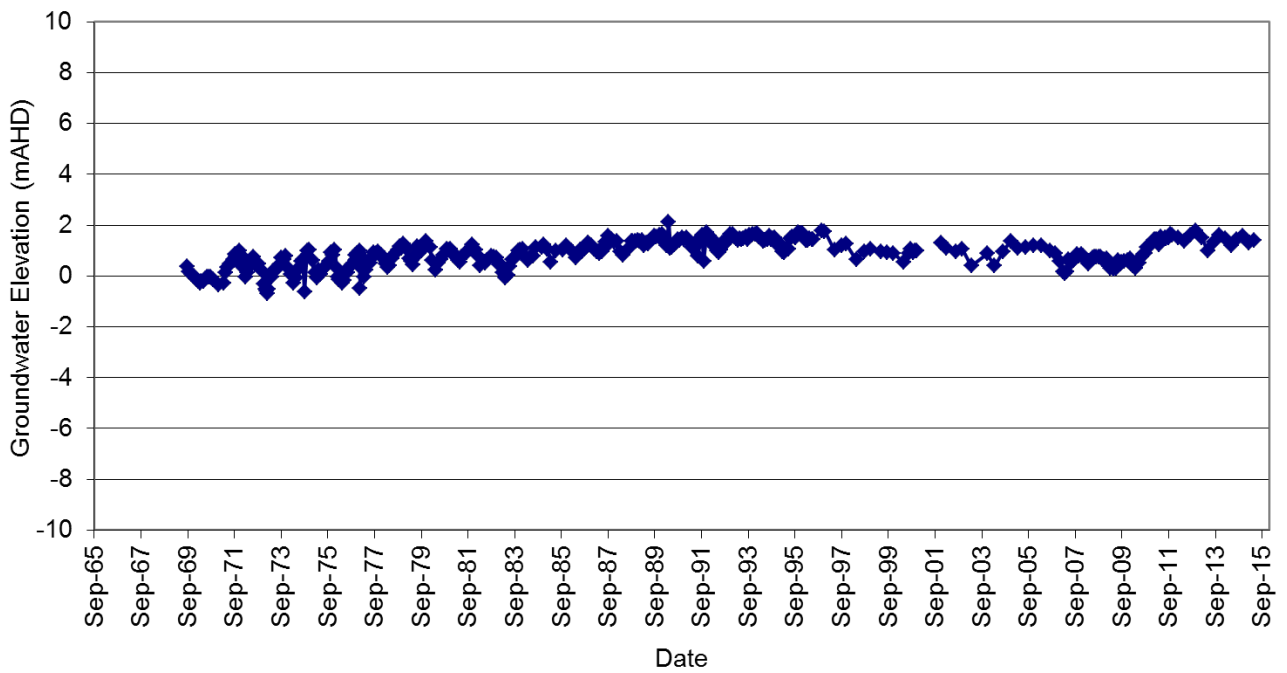




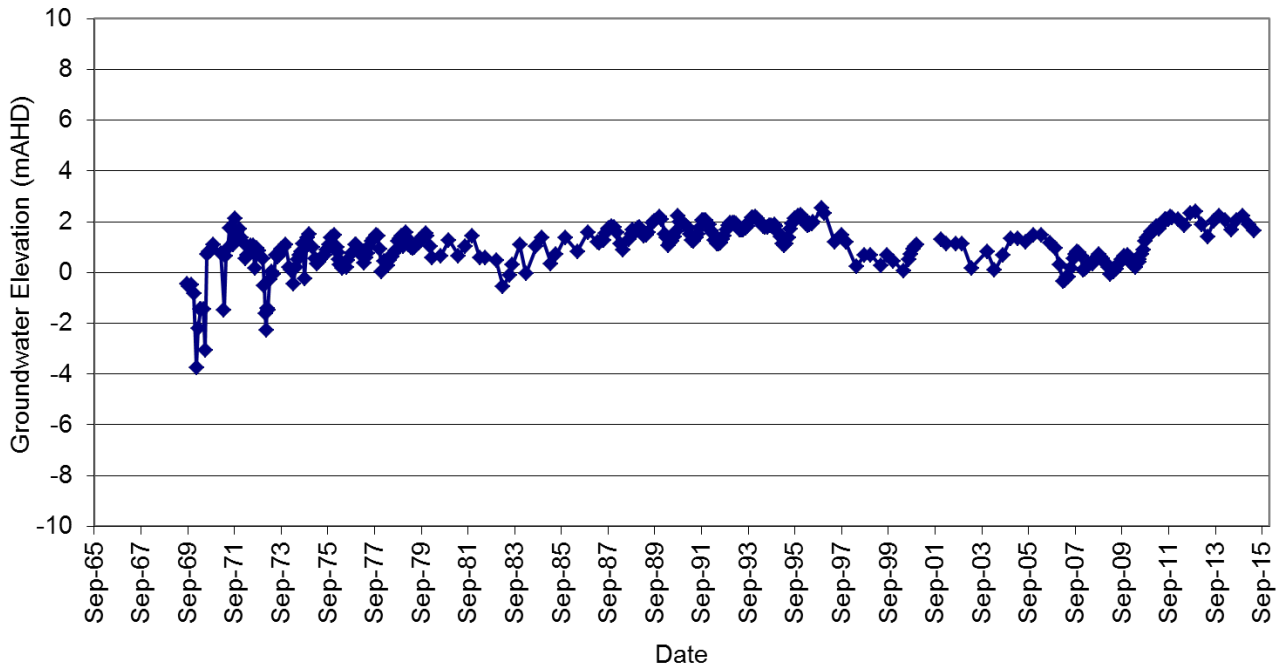
91025 - Zone 6, 19.52-51.2m, Sherwood



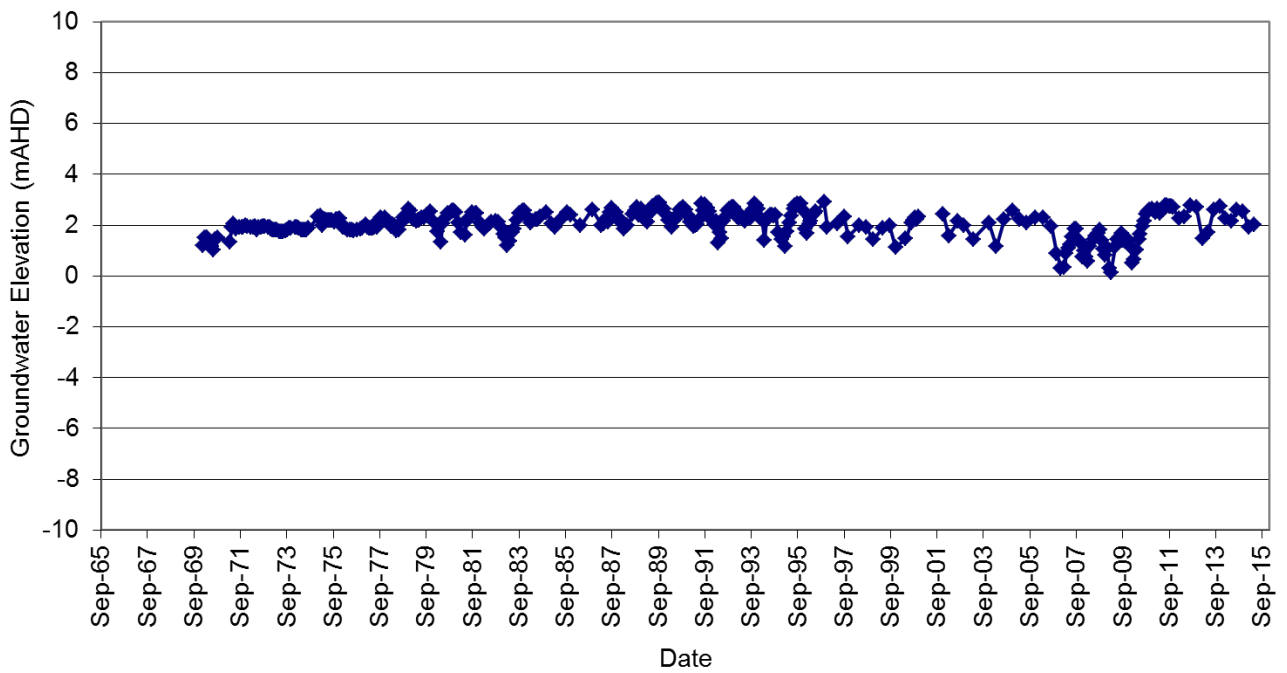
91026 - Zone 6, 28.04-93.26m, Sherwood

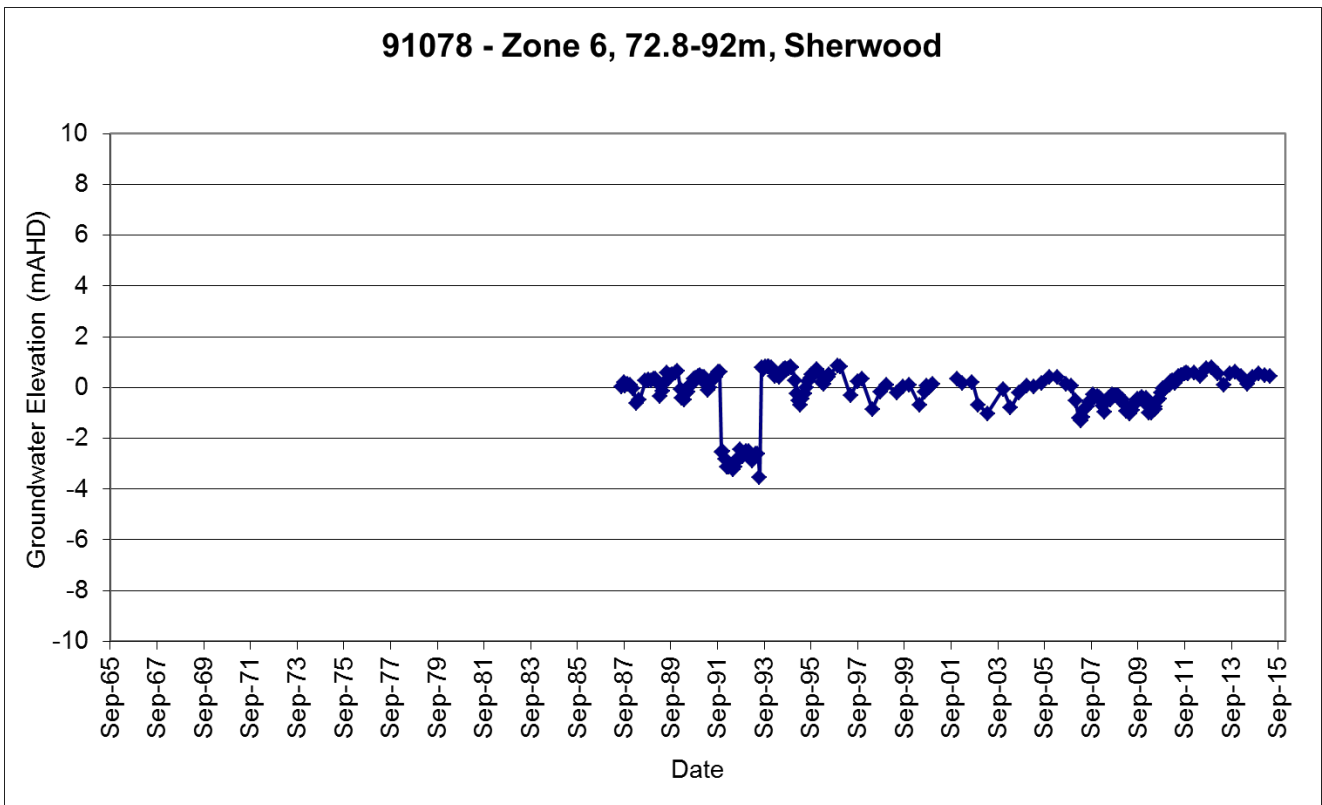
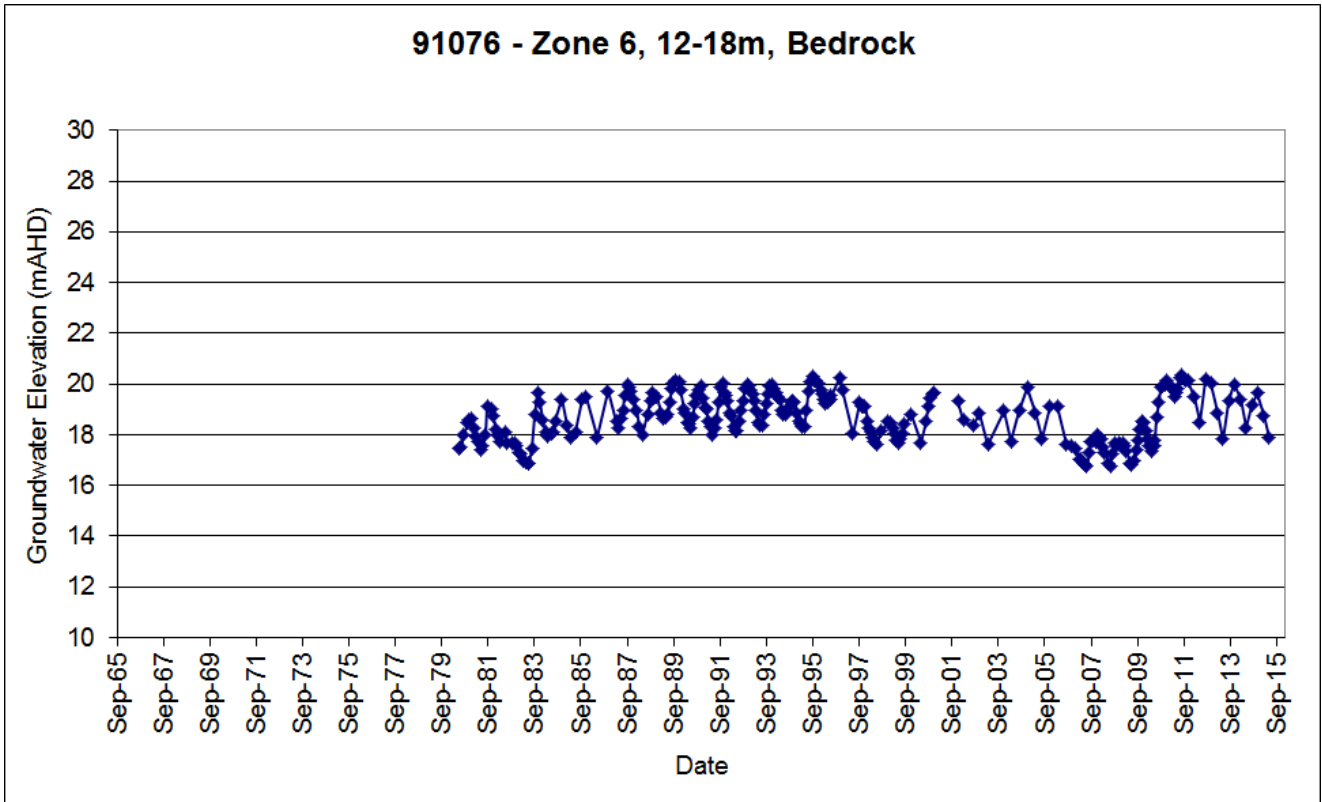


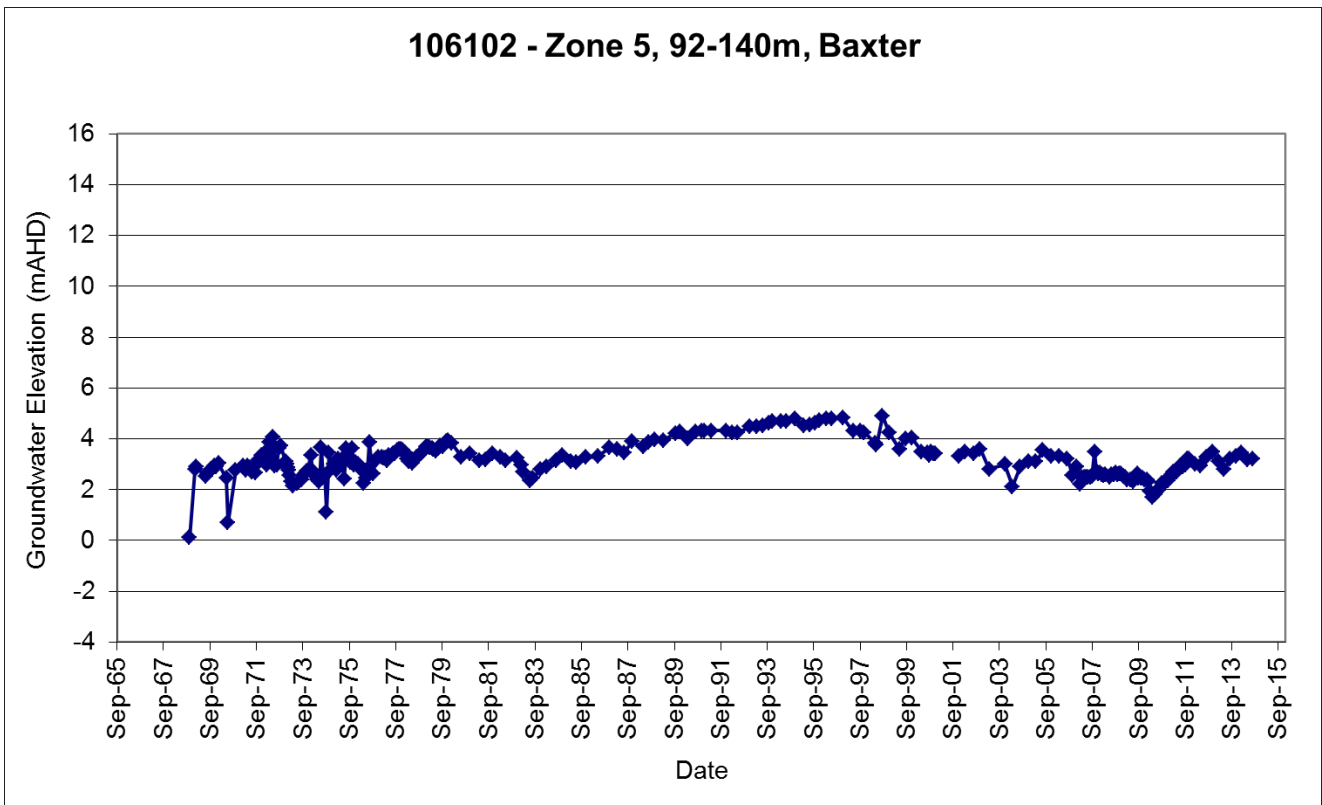
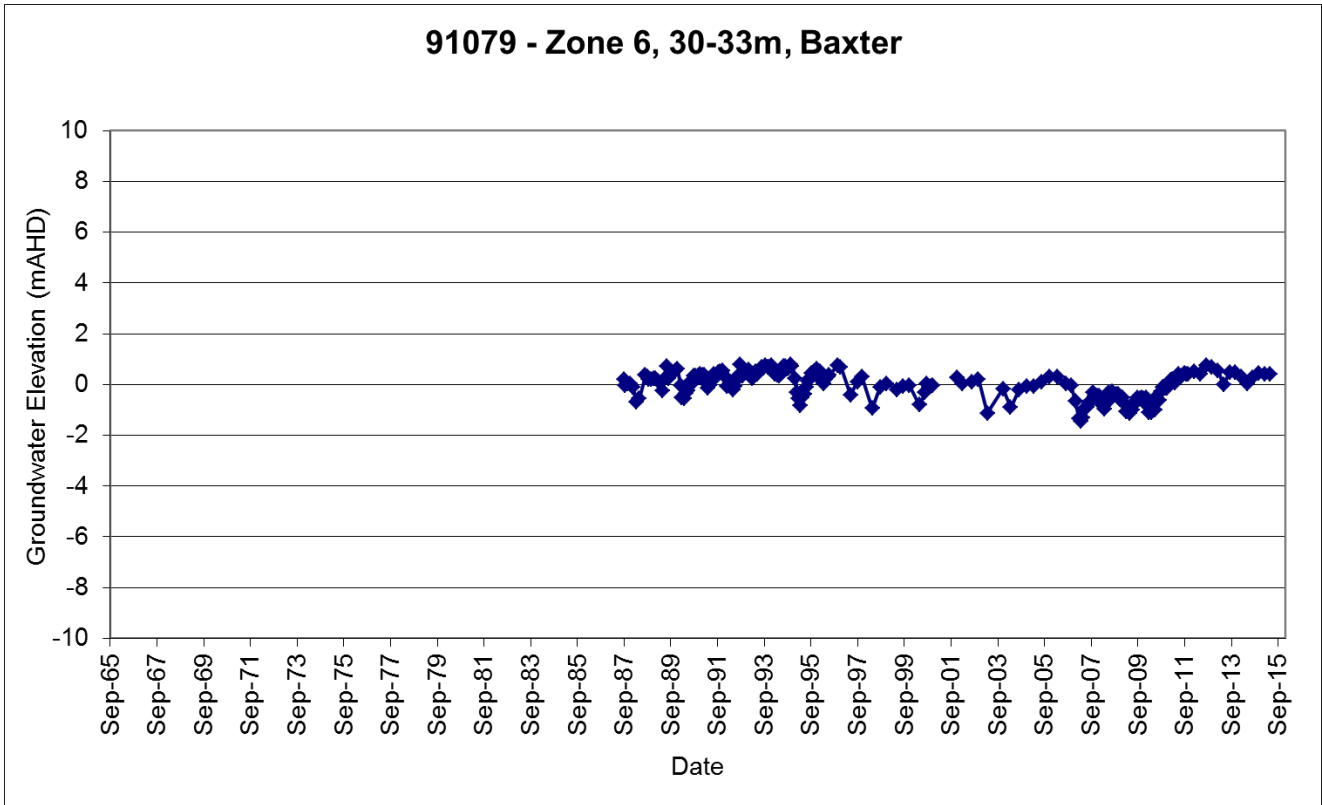
91029 - Zone 2A, 35.96-59.13m, Sherwood



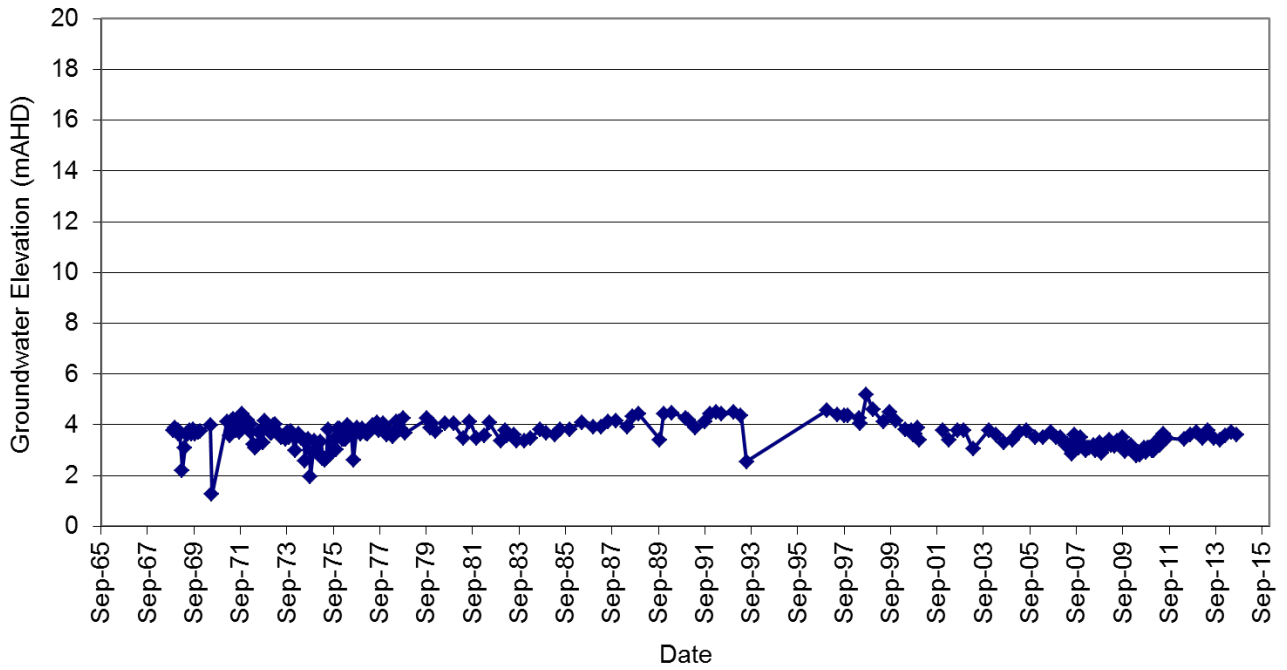
91030 - Zone 6, 22.25-50.29m, Sherwood



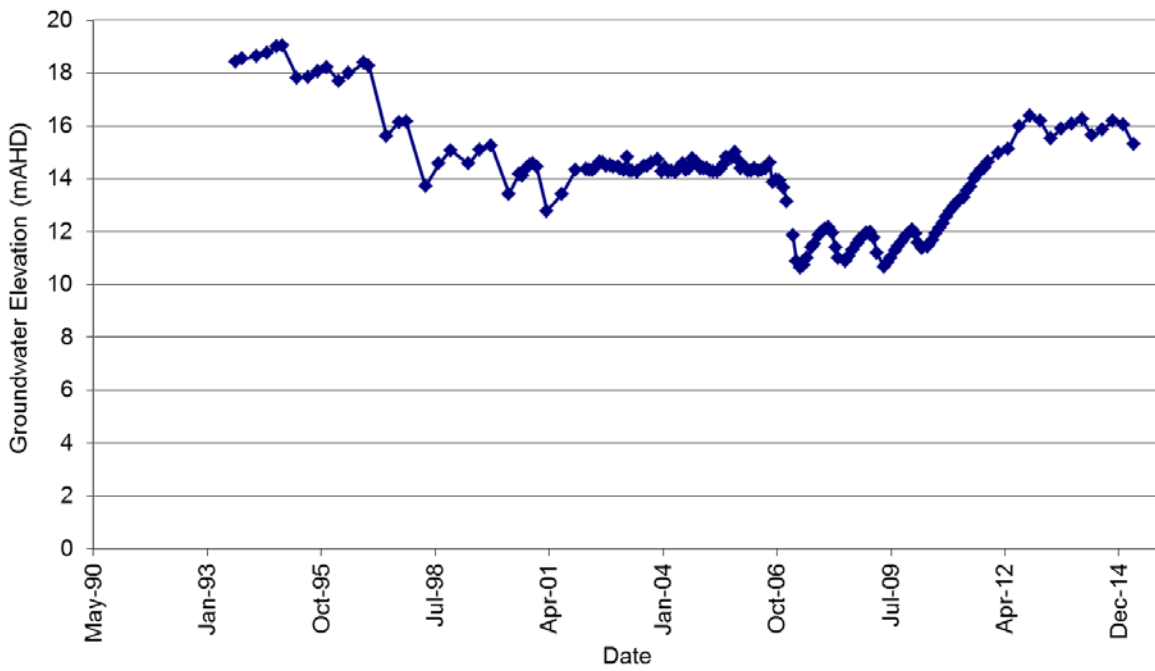




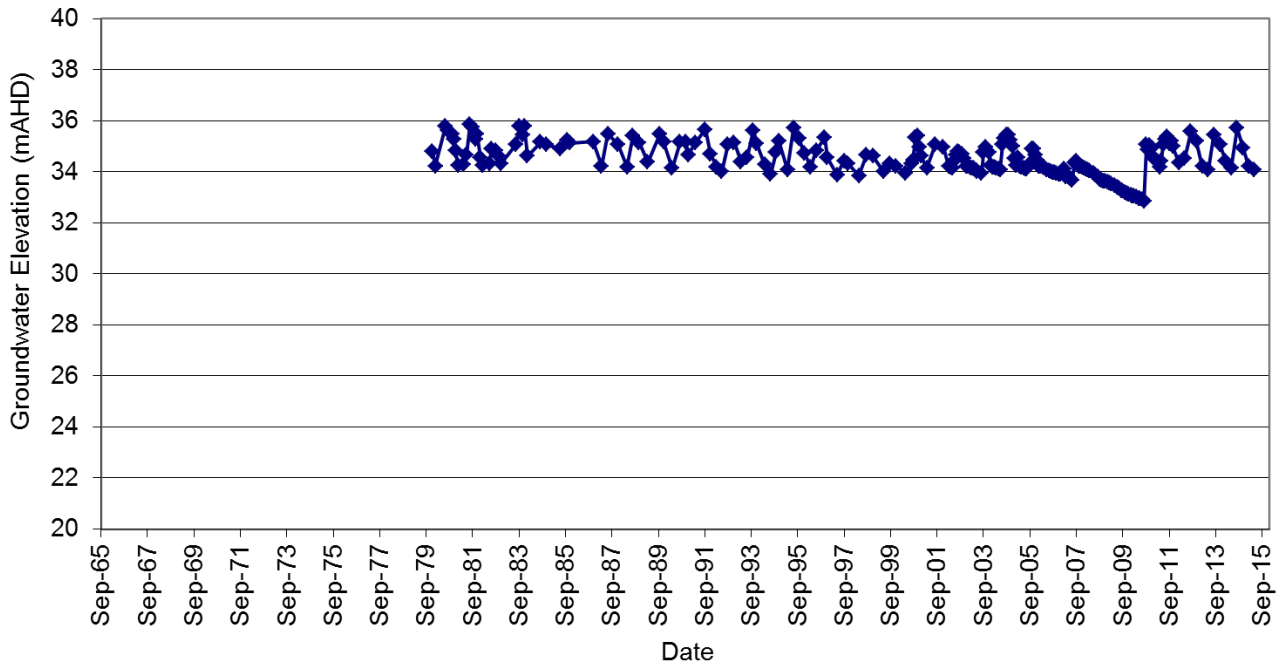
109782 - Zone 5, 208-213m, Childers



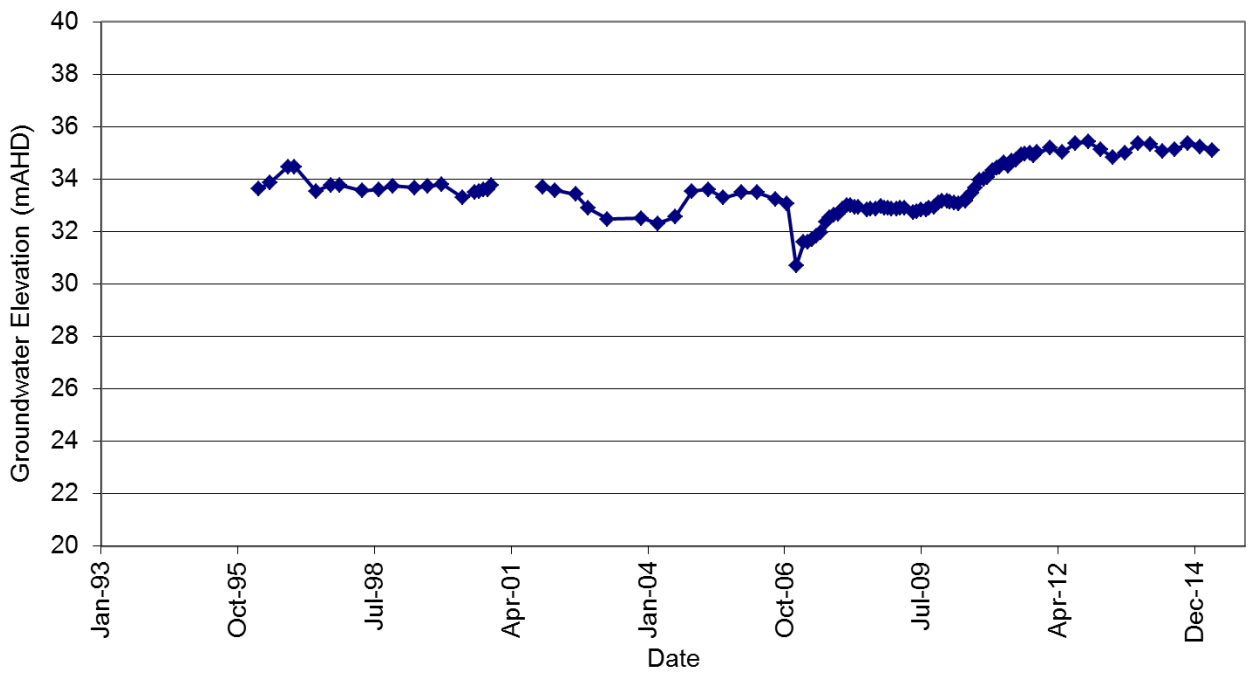
109785 - Zone 5, 106-135m, Older Volcanics

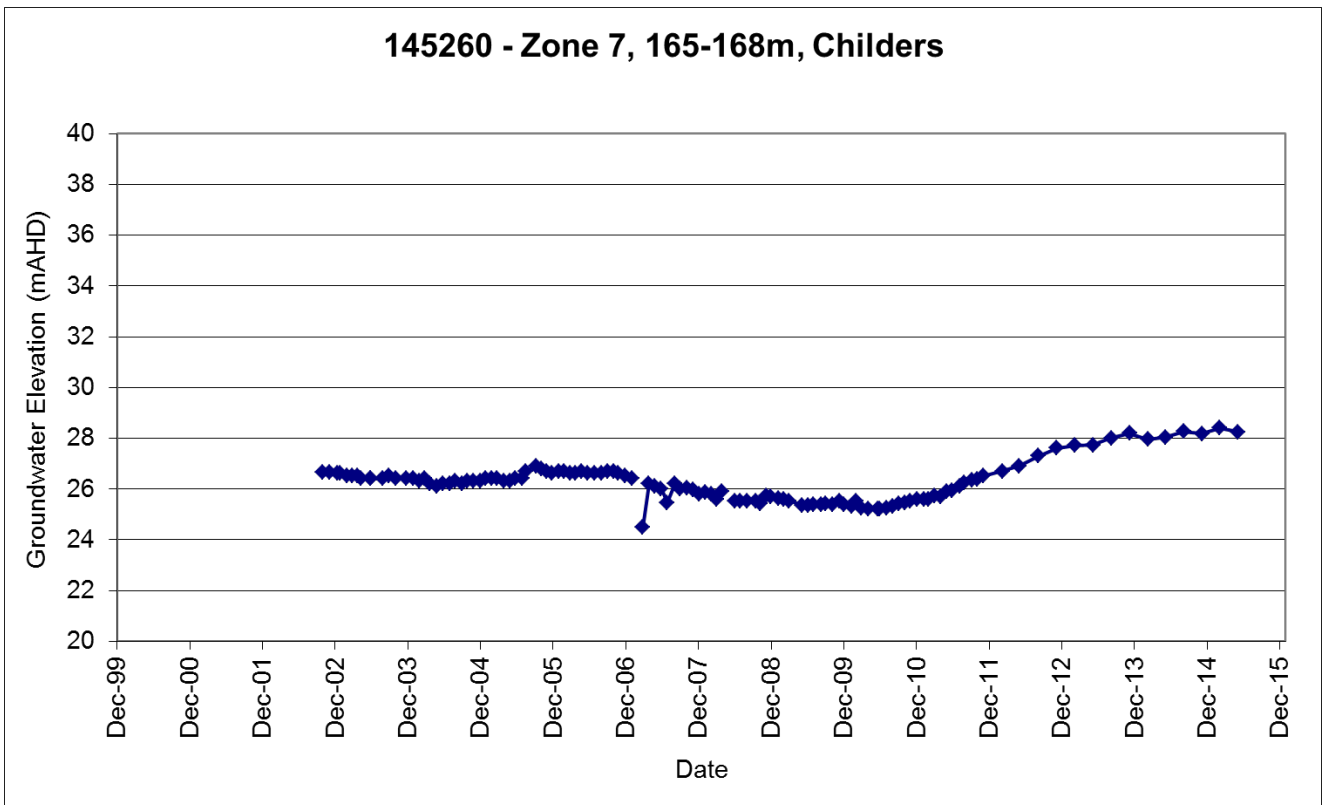
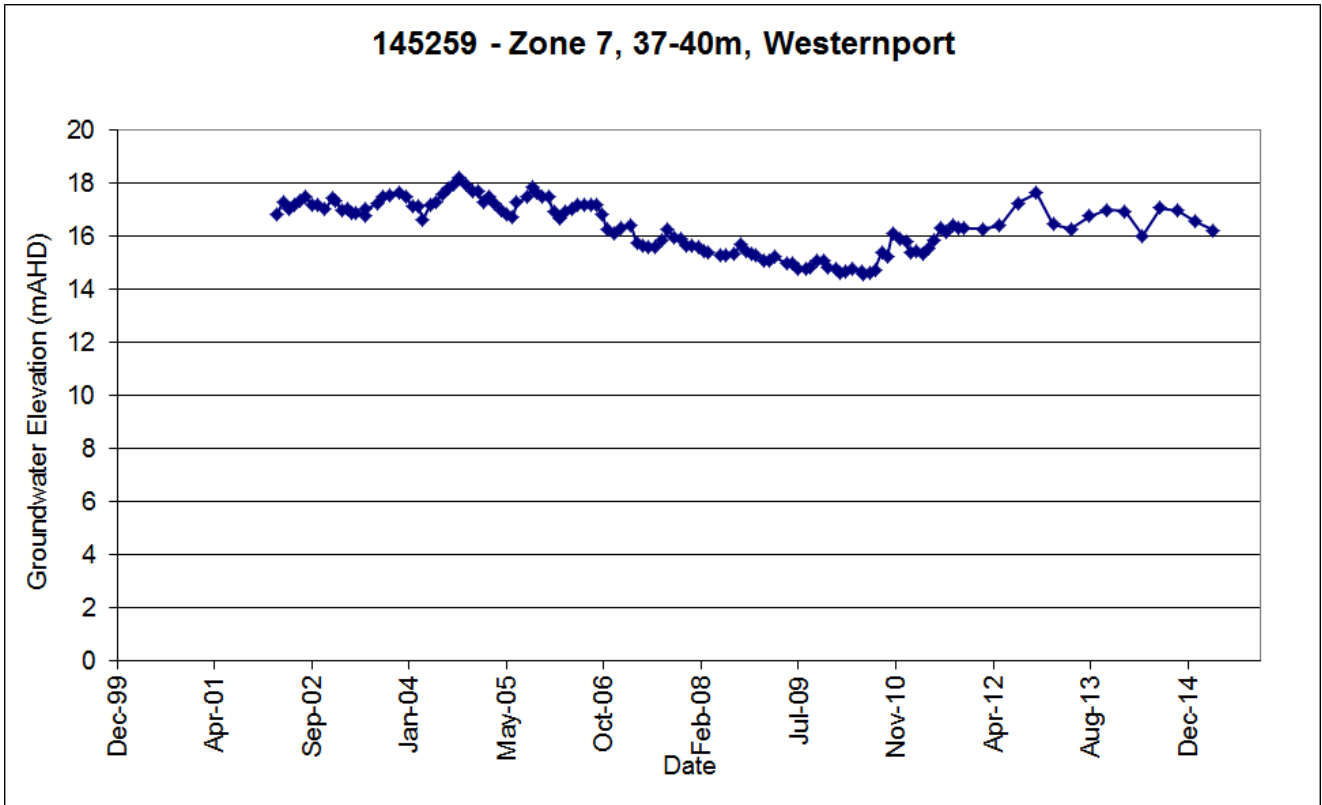


110735 - Zone 5, 46m, Quaternary sands

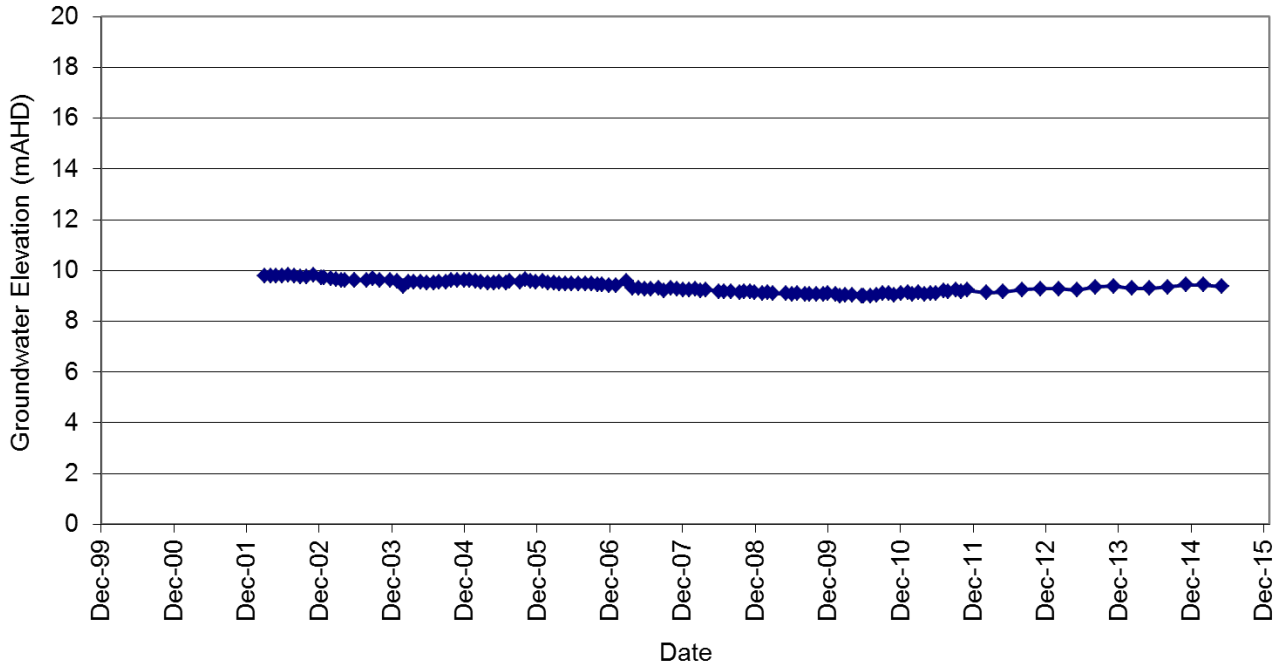


126975 - Zone 2A, 41-49m, Older Volcanics

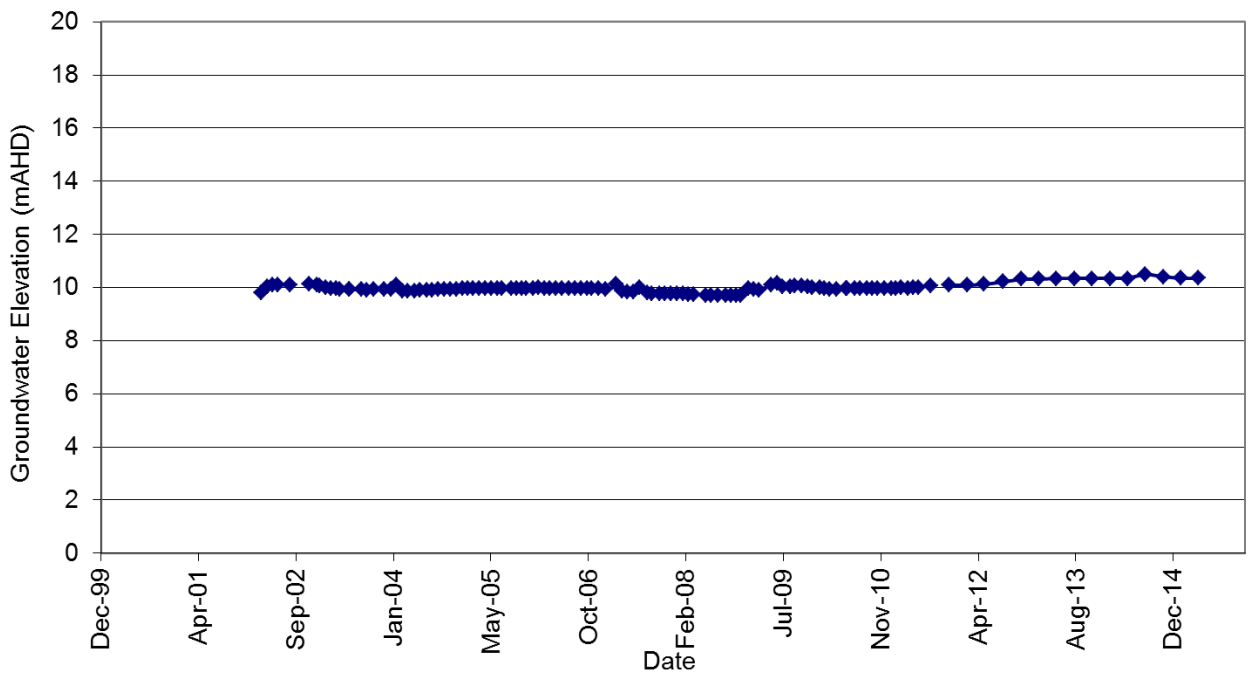


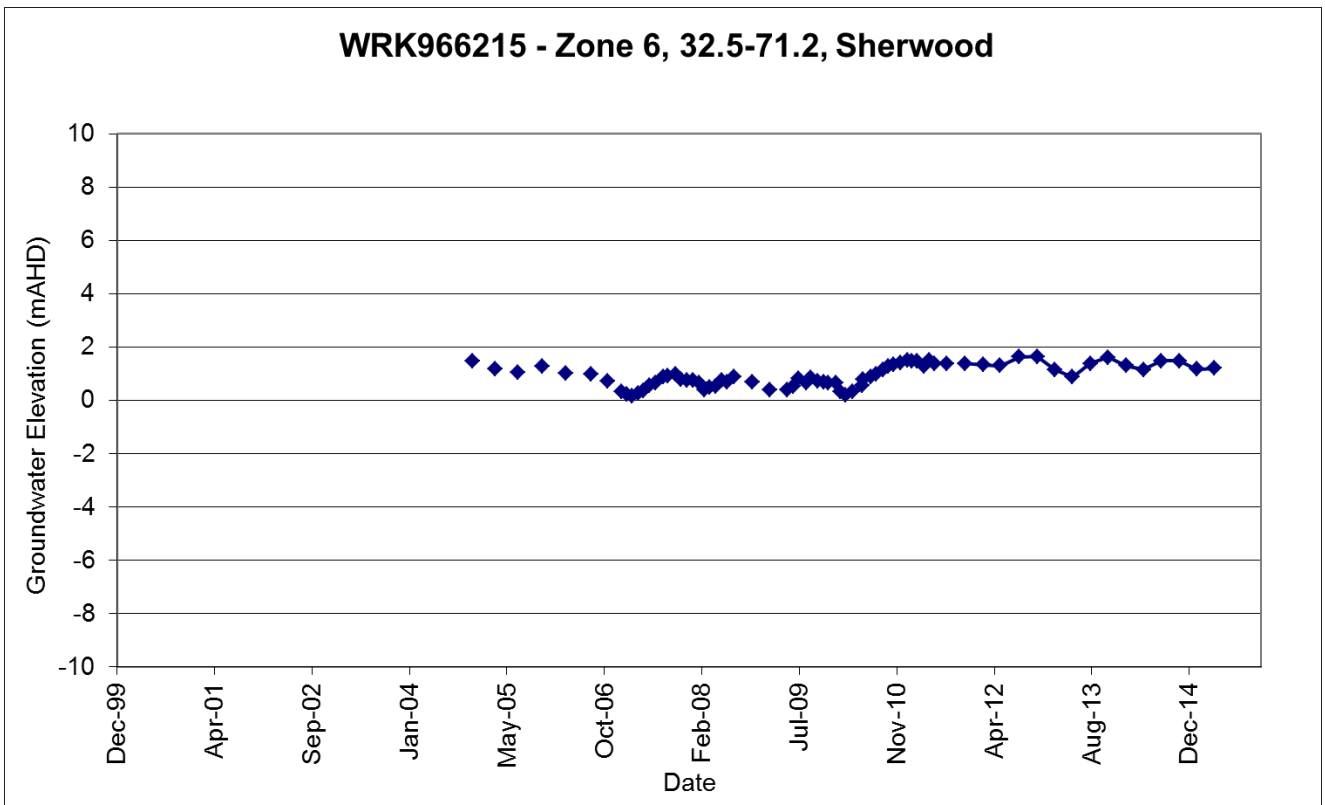
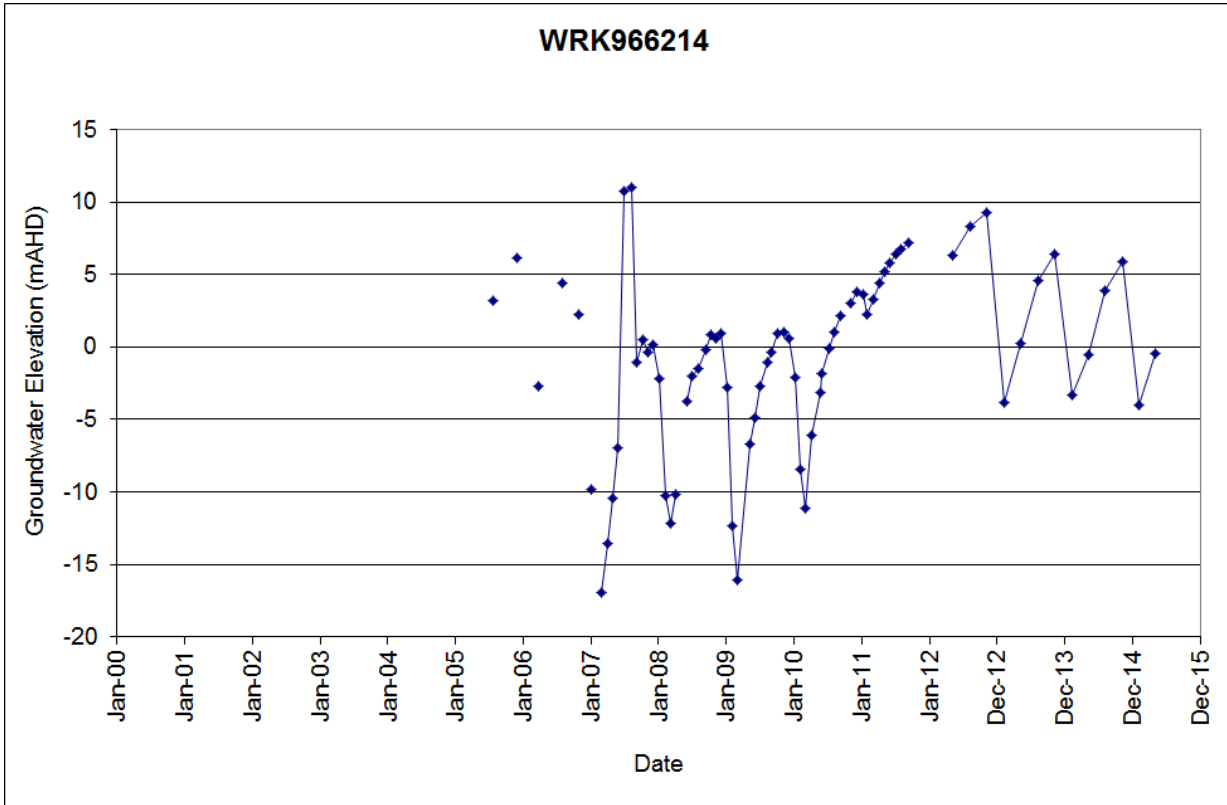


145261 - Zone 7, 67-70m, Westernport

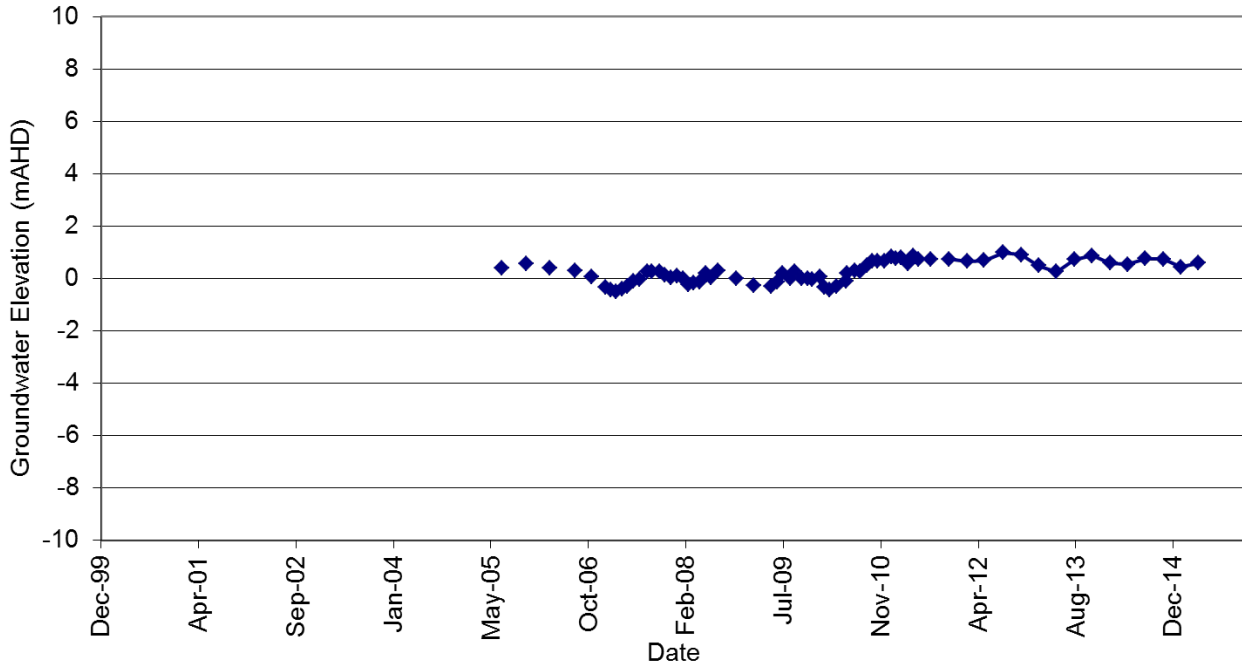


145262 - Zone 7, 205-208m, Childers

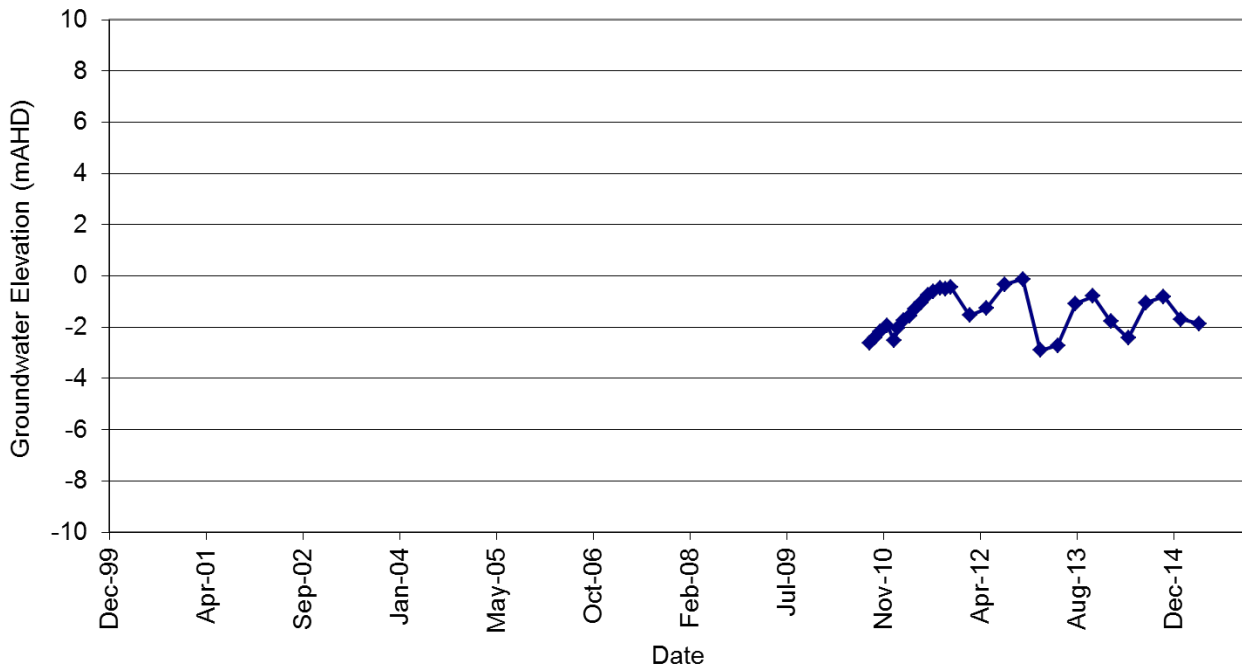


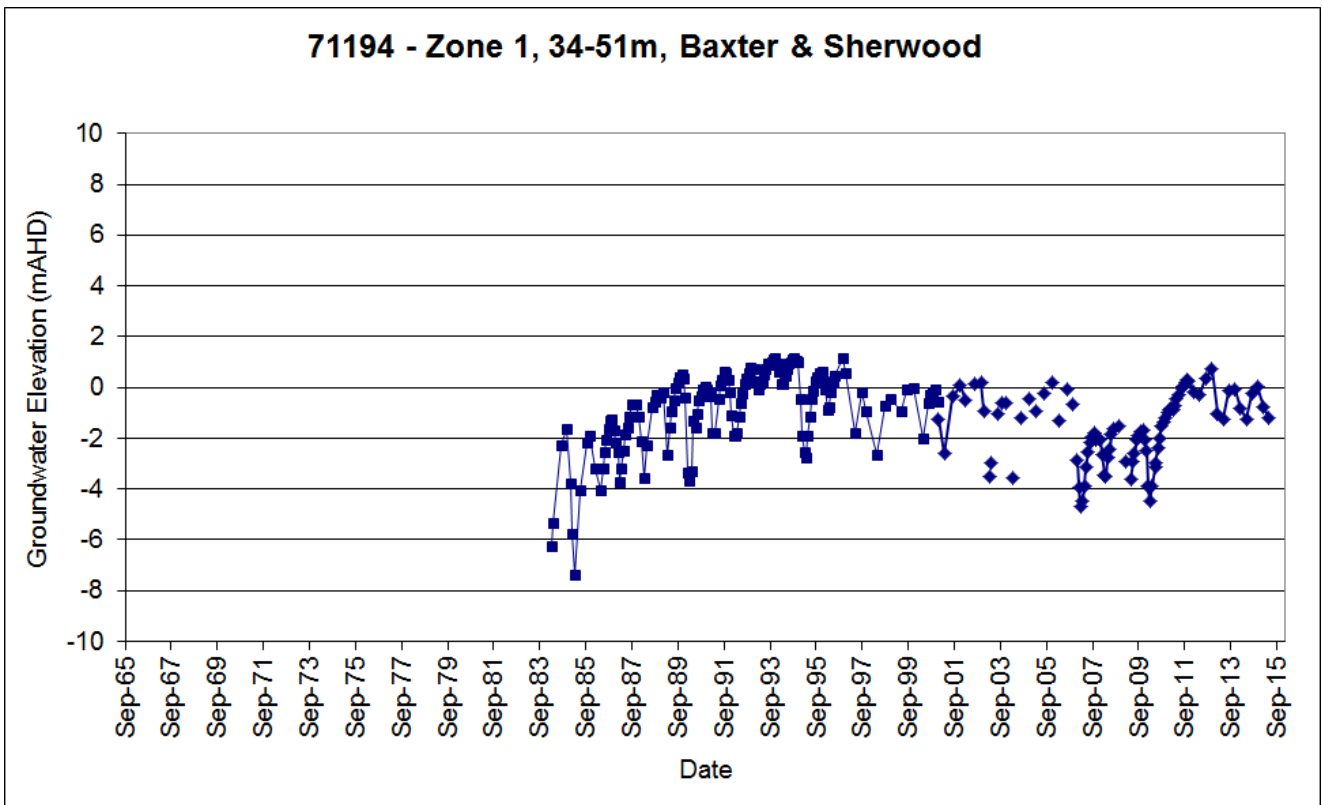
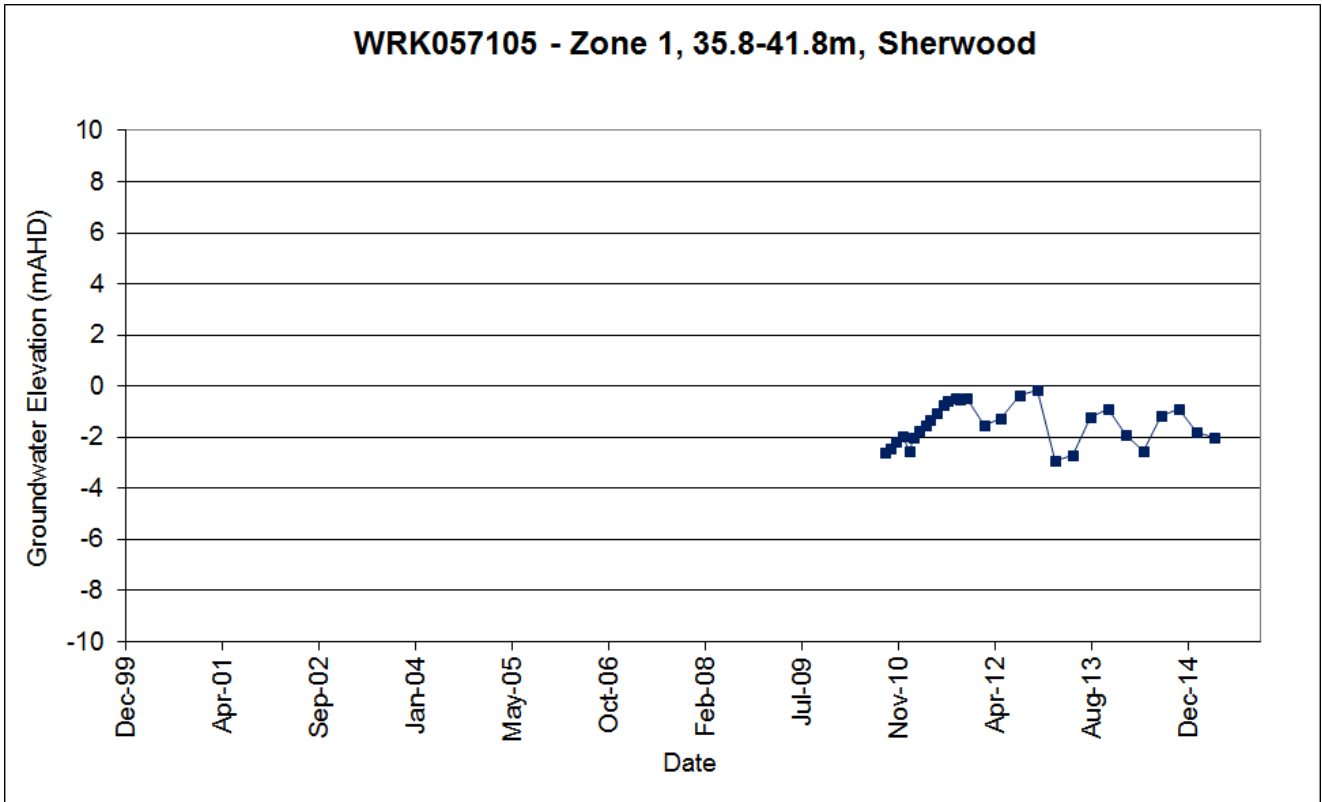


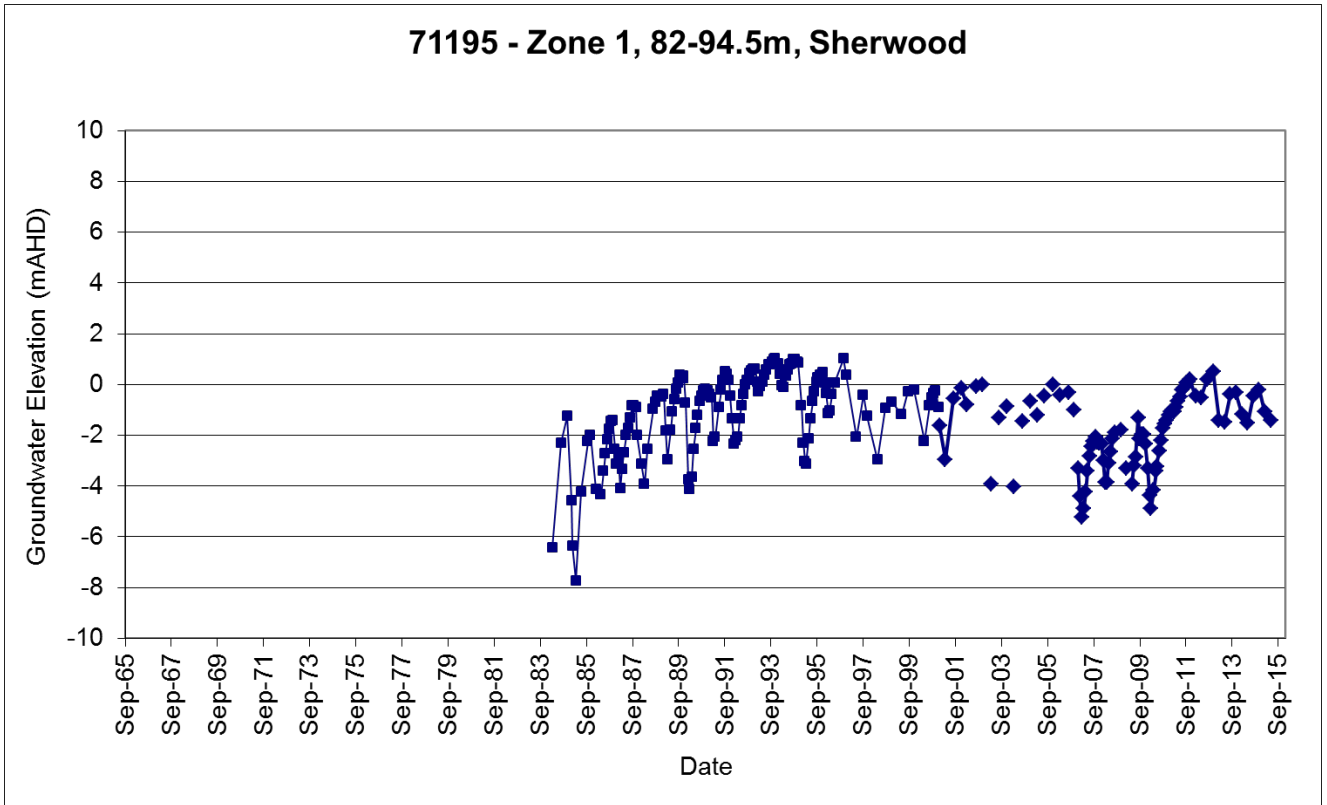
WRK966216 - Zone 6, 87.5-90m, Older Volcanics



WRK057103 Zone 7, 70-73m, Older Volcanics







6.1.4 Salinity

