

ACE: Ace

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	31/7/1980	Don Munro	2.0m		On s/w side of lake approx. 500m (direct) from gate entering reserve or 650m along track (very poorly defined). Datum is at the base of and lake side of north western most Euc. Sp. which is one of six in a conspicuous grove at this location.
HT 300	10/4/2000	John Bullock & Assoc.	3.909m	321.720m	AMG E 757860 N 6344590
HT 300	23/11/2005	B Hugessen		321.720m	GDA94 E 758029 N 6344741

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	31/7/1980	Don Munro	2m	14.0m & 16° from CALM datum
2 (B)	31/7/1980	Don Munro		80.0m & 16° from CALM datum

**Gauge Maintenance:**

Date	By Whom	Details
10/4/2000	Alan Clarke	The 2m mark on gauge 1 read 1.999 when surveyed to the CALM datum. The lake was flooded gauge two would have been under 1m of water. Gauge 1 wood board was in good condition but the depth plate has faded and difficult to read. The CALM datum was surrounded by water and loose in the ground. The CALM datum height was 2m. The depth of the lake on April 10 was 2m. A DOLA BM was installed, 150m further back up the slope on dry land, and surveyed to the CALM datum and gauge.

**ALB1: Albany 26385****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM	13/5/1981	Don Munro	2.00m		3.00m to S/E side of track at a point 210.0m along track from entry point 'B'
HO 294	6/4/2000	John Bullock & Assoc.	2.465m	104.09m	AMG E 605900 N 6148430 MGA E 606041 N 6148594
ALB1BM	16/09/2008	Yvonne Winchcombe			WGS 84 Z 50H E 606041 N 6148594
ALB1 BM HO294	23/5/2015	Yvonne Winchcombe			WGS 84 Z 50H E 606043 N 6148597

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	13/5/1981	Don Munro	2m	28.0m and 310° from CALM datum
2 (B)	13/5/1981	Don Munro	1m	50.0m and 310° from CALM datum
3 (C)			1m	
ALB1A	16/09/2008	Yvonne Winchcombe	2m	WGS 84 Z 50H E 606013 N 6148619
ALB1C	16/09/2008	Yvonne Winchcombe	1m	WGS 84 Z 50H E 605890 N 6148782
ALB1D 1m	4/4/2011	Alan Clarke	1m	WGS 84 Z 50H E 606047 N 6148793
ALB1B	8/11/2011	Yvonne Winchcombe	2m	WGS 84 Z 50H E 605995 N 6148633
ALB1 A2	23/5/2015	Yvonne Winchcombe	2m	WGS 84 Z 50H E 606012 N 6148621
ALB1 D1	24/5/2015	Yvonne Winchcombe	1m	WGS 84 Z 50H E 606049 N 6148791
ALB1 E2	26/4/2018	Alan Clarke	2m	WGS 84 Z 50H E 605782 N 6148763

**Gauge Maintenance:**

Date	By Whom	Details
6/4/2000	Alan Clarke	The 1m mark on gauge 1 read 1.005 and on gauge 2 read 1.005 when surveyed to the CALM datum. Gauge 1 in good condition, gauge 2 just readable. A DOLA BM was installed and surveyed to the CALM datum and gauges.
7/4/2001	Alan Clarke, Katherine Sorokine	While looking for a temporary depth marker, placed by Sue Elscott in November 2000, from on top of the vehicle I noticed a depth gauge in the middle of the wetland close to the open water area. The lake was completely dry at this time. The Munro map does not show this 3 <sup>rd</sup> gauge. On inspection the 1m gauge, by its construction and materials, is most likely one of ours. We proceeded to level from the DOLA benchmark ENE to the dropper used for the Nov. 2000 depth and out to the 1m gauge in the middle of the wetland. We levelled back to the dropper and on to the benchmark to close. The misclose was 2mm. The 1m mark on gauge 3 is reading 1.014m (adjusted. ie first run out 1.015, 2 <sup>nd</sup> run back 1.013m). Lake height for the top of the dropper is 0.939m (adjusted). The string marking the Nov. 2000 water depth is 0.445 below the top of the dropper. Lake depth for November 2000 was 0.494m. The depth plate on gauge 3 was faded and rusting so it was replaced with a plastic plate at the same height (1.014m). Gauge 3 is in the open water section in the middle of the lake on the same line as the benchmark and gauges 1 and 2. Access is easiest by walking 100m further east along the track from the benchmark and out through the lower sedge and back towards the NW to the middle of the lake.
20/3/2007	Alan Clarke, Yvonne Winchcombe	Removed 'FW' sign and attached an 'A' to 2m gauge. Attached a 'C' to 1m gauge in open water beyond the tall Baumea. According to the map directions Gauge B is located in the tall Baumea. An extensive search failed to locate the gauge.
4/4/2011	Alan Clarke, Yvonne Winchcombe	Installed new 1m gauge D (needs 'D') at end of Baumea thicket (easier to access than 1m gauge C). GPS 50 H 0606047, 6148793. Surveyed from BM out to new gauge angle and back to BM. There was a 6mm misclose so adjusted difference by half to 3mm. Final height of new gauge D = 1m +/- 3mm.
26/4/2018	Alan Clarke,	Depth at D 0.86m @ 1135hrs. Gauge C 0.85 @ 1510hrs. Installed a new 2m gauge E with a 3m SS

	Laurent Marsol	angle at wpt ALB1E, Z50 E 605782, N 6148763, which is approx. 50m west of the depth loggers on the north side of an 'island' of tall Baumea. Installed a 2m SS angle and alloy post with camera BP#22 facing the new gauge E. The lake height was transferred using the still water conditions because a level survey was impractical at this site.
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**ALB2: Albany 27157****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	17/3/1980	Don Munro	2.0m		On fence line approx. 97.0m S/E of point where drain and fence intersect
HO 295	6/4/2000	John Bullock & Assoc.	2.534m	75.232m	AMG E 618770 N 6147330 MGA E 618826 N 6147490
ALB2BM	16/09/2008	Yvonne Winchcombe			WGS 84 Z 50H E 618826 N 6147490
ALB2 2m Datum	5/4/2011	Alan Clarke	2.0m		WGS 84 Z 50H E 618815 N 6147500 (F&W Benchmark)

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	17/3/1980	Don Munro	2m	In drain 2.5m off firebreak (track). 72.0m & 268° from CALM datum.
2 (B)	17/3/1980	Don Munro	1m	At end of drain, approx. 130m S/S/E of Gauge 1
ALB2A	16/09/2008	Yvonne Winchcombe	2m	WGS 84 Z 50H E 618751 N 6147493
CHEYB	11/08/2010	Alan Clarke	1m	WGS 84 Z 50H E 618786 N 6147381
ALB2 A2	11/4/2014	Yvonne Winchcombe	2m	WGS 84 Z 50H E 618751 N 6147494
ALB2 B1	11/4/2014	Yvonne Winchcombe	1m	WGS 84 Z 50H E 618787 N 6147383
ALB2 C1	22/5/2013	Yvonne Winchcombe	1m	WGS 84 Z 50H E 618776 N 6147180

**Gauge Maintenance:**

Date	By Whom	Details
April 2000	Alan Clarke	The 1m mark on gauge 1 read 0.969 and on gauge 2 read 1.022 when surveyed to the CALM datum. The CALM datum and both gauges were in good condition. A DOLA BM was installed and surveyed to the CALM datum and gauges.
5/4/2011	Alan Clarke, Yvonne Winchcombe	Installed 'B' onto gauge – left at current height. Discrepancy of 0.028m between 2m CALM/DEC datum and 1m gauge B. IE, 1m mark on gauge B is actually Lake Height 1.028m. GPS of 1m gauge B: 50 H 0618787, 6147384. 2m mark at A read 1.960m to the CALM datum. Surveyed between 2m mark at A and 1m mark at B. The difference was 1.069m. Dry at 2m gauge, replaced old gauge plate on 2m gauge with plastic gauge board and added a '2' and 'A'. From survey, adjusted gauge board up 0.04m to equal CALM/DEC Datum 2m. GPS of 2m gauge A: 50 H 0618751, 6147494. GPS of CALM/DEC Datum: 50 H 0618815, 6147500 Surveyed DOLA BM to CALM/DEC 2m datum. CALM Datum is 7mm higher than BM lake height.
22/5/2013	Alan Clarke, Yvonne Winchcombe	Installed 1m Gauge C at 50 H 0618776 / 6147180
28/4/2018	Alan Clarke, Laurent Marsol	Gauge A2 read 0.82m. Gauge B 1m read 0.835m. Depth plate at b has popped off board, but still in place. Needs a new depth plate. Installed part depth plate above 1m mark on gauge C by fixing a 2m SS angle to the gauge C Star Iron!!! Gauge C now reads up to 1.6m. Gauge C read 0.83m. Installed a green alloy 2m post and fixed to the tall plastic camera post. Installed camera BP#16 to view gauge C.

**ALTH: Altham**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM	29/7/1980	Don Munro	1.0m		1.0m south of fence line and approx. 8.0m above normal max. high water mark and 6.0 out from ridge.
HD 228	9/4/2000	John Bullock & Assoc.	2.426m	281.582m	AMG E 634420 N 6302400 MGA94 Z 50 E 634560 N 6302590
AlthBM	18/09/2008	Alan Clarke			WGS 84 Z 50H E 634562 N 6302593

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	29/7/1980	Don Munro	2m	100.0m and 310° from CALM datum
AlthA	18/09/2008	Alan Clarke	2m	WGS 84 Z 50H E 634473 N 6302658

**Gauge Maintenance:**

Date	By Whom	Details
9/4/2000	Alan Clarke	The 1m mark on gauge read 0.997 when surveyed to the CALM datum. Replaced the old gauge plates with plastic depth plates and secured the gauge wood board with an angle iron. . A DOLA BM was installed and surveyed to the CALM datum and gauge. <b>The BM was connected to AHD.</b> Lake depth on April 9 was 0.31.
28/3/2007	Alan Clarke	Installed an 'A' at the top of the 2m depth plate and fixed the bottom of the 1m plate with two wood screws.

**ANDE: Anderson**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM	13/5/1981	Don Munro	2.0m		14.0m S/E of boat ramp track & 9.0m below mallee line. Also 1.5m S/E of lone Melaleuca
HO 285	2/6/1998	Scanlan Surveys	2.908m	226.473m	AMG 84 E 588673 N 6217155
ANDEBM	17/9/2008	Yvonne Winchcombe			WGS 84 Z 50H E 588666 N 6217158
ANDE BM HO285	7/4/2016	Yvonne Winchcombe			WGS 84 Z 50H E 588666 N 6217159
ANDE DM2	7/4/2016	Yvonne Winchcombe	2.0m		WGS 84 Z 50H E 588671 N 6217167 (Don Munro 2m Datum)

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	13/5/1981	Don Munro	3m	5.0m & 310° from datum (REMOVED 2/6/1998)
2 (B)	13/5/1981	Don Munro	2m	35.0m & 100° from datum
3 (C)	13/5/1981	Don Munro	1m	270.0m & 84° from datum (Removed 21/3/2007)
1 (D)	2/6/1998	Alan Clarke	3m	Replaces 1 (A) in same location
4 (E)	5/5/2009	Alan Clarke	1m	WGS 84 Z 50H E 588751 N 6217127
ANDEB	17/09/2008	Yvonne Winchcombe	2m	WGS 84 Z 50H E 588694 N 6217163
ANDED	17/09/2008	Yvonne Winchcombe	3m	WGS 84 Z 50H E 588668 N 6217172
ANDEE2	5/05/2009	Alan Clarke	2m	WGS 84 Z 50H E 588751 N 6217127
ANDE D3	7/4/2016	Yvonne Winchcombe	3m	WGS 84 Z 50H E 588667 N 6217169

**Gauge Maintenance:**

Date	By Whom	Details
2/6/1998	Alan Clarke, Grant Pearson	The gauge 1 depth plate had been damaged by high-powered rifle fire and the old galvanised angle iron had been bent over. The 2m mark on gauge 2 read 1.999 and the 1m mark on gauge 3 read 1.010 when surveyed to the CALM datum. A new 3m gauge using a galvanised angle iron and a stainless steel depth plate replaced gauge 1. The gauge height was levelled in from the secure CALM datum. The final level for the 3m mark on the new gauge 1 was 3.000. The gauge 2 depth plate had been damaged by high-powered rifle fire and the old galvanised angle iron was loose in the ground. A new 2m gauge was installed using a galvanised angle iron and a stainless steel depth plate. The gauge height was levelled in from the secure CALM datum. The final level for the 2m mark on the new gauge 2 was 1.996. The gauge 3 wood post was loose in the soft mud and the depth plate was badly rusted. A new 1m gauge using a galvanised angle iron and a stainless steel depth plate replaced gauge 3. The gauge height was levelled in from the secure CALM datum. The final level for the 1m mark on the new gauge 3 was 0.993. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. Work carried out on June 2.
4/6/1998	Alan Clarke, Grant Pearson	Finished off final level run of all gauges previously disrupted by nightfall. Attached float to gauge 2. Work carried out on June 4.
15/2/2002	Alan Clarke, Mike Scanlan	Replaced the worn stainless steel 2m depth plate on gauge 2 with a plastic depth plate at the same level. The 1m gauge 3 galvanised angle was rusted, but sturdy the paint had completely worn of the stainless steel depth plate. A new plastic depth plate was fixed to the old stainless plate. The depth at this gauge was 0.35m.
21/3/2007	Alan Clarke, Yvonne Winchcombe	Removed the 1m gauge C from the centre of the lake because it was badly rusted and a skiing hazard. Attached a 'B' to the 2m gauge. Replaced the stainless steel depth plate, which had sustained bullet holes with a 6mm plastic depth plate and attached a 'D' to 3m gauge.
5/5/2009	Alan Clarke, Yvonne Winchcombe	Installed new 2m gauge E using two stainless steel angles and a 6mm plastic depth plate. Surveyed gauge E in from Gauge B. GPS location of gauge E UTM E 0588751, N 6217127. Lake depth 51cm below 1m mark on 2m gauge E. Depth = 0.49m. Lake height of dropper is 1.500m.

**ANGO: Angove**

**Datum Details:**

<b>ID</b>	<b>Date</b>	<b>By Whom</b>	<b>Lake Height</b>	<b>AHD Height</b>	<b>Location (See sketch diagram for details)</b>
CALM	14/5/1981	Don Munro	3.0m		13.0m & 215° from southern corner leg of windmill stand
HO 293	5/4/2000	John Bullock & Assoc.	2.646m	2.190m	AMG E 605684 N 6132427
HO 293	26/11/2002	B Hugessen		2.190m	GDA94 E 605850 N 6132590

**Gauge Details:**

<b>ID</b>	<b>Date</b>	<b>By Whom</b>	<b>Lake Height</b>	<b>Location (See sketch diagram for details)</b>
1 (A)	14/5/1981	Don Munro	2m	86.0m & 63° from CALM datum 90.9m & 70° from HO 293

**Gauge Maintenance:**

<b>Date</b>	<b>By Whom</b>	<b>Details</b>
5/4/2000	Alan Clarke	Access to lake needs to be cleared with the Two Peoples Bay Ranger a few days before arrival. The CALM datum has been destroyed. Heavy machinery has been used to clear the ground where the datum should be. The gauge was in good condition so the 1m mark was adopted as correct and transferred to the DOLA datum. Lake depth on April 5 was < 0.8m.

**ARDA: Ardath****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
HL 407	13/2/2001	John Bullock & Assoc.	1.894m	251.478m	MGA94 E 609070 N 6448375
HL 407	26/03/2004	Landgate SSM		251.478m	MGA94 E 609067.676 N 6448375.902
ArdaBM	14/09/2008	Alan Clarke			WGS 84 Z 50H E 609068 N 6448377

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	12/5/2000	Alan Clarke	2m	11m west of large Casuarina tree situated on the western end of the cleared area entering the lake at its northern end.
ArdaA	14/09/2008	Alan Clarke	2m	WGS 84 Z 50H E 609060 N 6448364
ARDA A	6/11/2011	Jim Lane	2m	WGS 84 Z 50H E 609061 N 6448366

**Gauge Maintenance:**

Date	By Whom	Details
12/5/2000	Alan Clarke, Stephanie Hill	I surveyed for the deepest point of the lake using a staff from a 12' punt and 8hp outboard. The deepest point was 1.28m in the middle of the lake. I installed a 2m gauge using a galv. angle iron and plastic depth plate 11m west of the large Casuarina tree situated on the western end of the cleared area entering the lake at its northern end. The position is 609064 E and 6448365 N. The top of the fence dropper, installed by Jim Lane in September 1999, to the water was 0.055 with the gauge reading 1.28m. Gauge installed May 12.
13/2/2001	Alan Clarke	The plastic depth plate was replaced because the wire ties used to hold the plate to the angle iron had broken and the plate had cracked at the lowest bolt. The gauge was installed in April 2000 when the water level was halfway up the gauge. A DOLA benchmark was installed further up the slope and surveyed to the 2m gauge. A 1m gauge was not installed because this lake is occasionally used for water skiing. The lake depth on February 13 was estimated at 0.020m. The very soft lakebed prevented a physical measurement.
1/4/2007	Alan Clarke	Installed an 'A' and '2' and replaced the damaged 3mm plastic depth plate with a 6mm plastic depth plate. The lake was dry. The acidic water is quickly deteriorating the galv angle. An alloy, stainless or plastic angle will need to be trialled.
6/4/2016	Alan Clarke, Yvonne Winchcombe	Gauge 2A read 0.52m. Installed new 2m gauge A next to old one using stainless steel angle and plastic gauge plate. Used water level and top of old gauge to determine correct level for new gauge. Old galv. iron gauge rusted through – broke off at base with a 'small' shove from Alan.



**ATKI: Atkins Yate****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
HT 298	11/4/2000	John Bullock & Assoc.	5.395m	319.683m	AMG E 749930 N 6330350
HT 298	11/04/2000	Alan Clarke			AGD84 Z 50H E 749930 N 6330350
HT 298	22/11/2005	B Hugessen		319.683m	GDA94 50H E 750023 N 6330530
ATKI BM HT298	22/5/2015	Yvonne Winchcombe			WGS 84 Z 50H 750025 N 6330530

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	11/4/2000	Alan Clarke	6m	Against fence on southern side
2 (C)	4/4/2001	Alan Clarke	4m	
3 (B)	11/2/2002	Alan Clarke	5m	
ATKI B5	22/5/2015	Yvonne Winchcombe	5m	WGS 84 Z 50H E 749976 N 6330550
ATKI C4	22/5/2015	Yvonne Winchcombe	4m	WGS 84 Z 50H E 749974 N 6330576
ATKI D3	22/5/2015	Yvonne Winchcombe	3m	WGS 84 Z 50H E 749968 N 6330601
ATKI E2	22/5/2015	Yvonne Winchcombe	2m	WGS 84 Z 50H E 749966 N 6330619
ATKI F1	22/5/2015	Yvonne Winchcombe	1m	WGS 84 Z 50H E 749910 N 6330737

**Gauge Maintenance:**

Date	By Whom	Details
11/4/2000	Alan Clarke	The deepest point was determined by weight and line in the 3.6m punt. A 5m depth gauge was installed against the fence on the southern side. A DOLA BM was installed and surveyed to the new gauge. Lake depth on April 11 was 4.95m.
4/4/2001	Alan Clarke, Katherine Sorokine	Installed a 4m gauge using a galvanised angle iron and plastic depth plate. I levelled in the gauge height from the DOLA benchmark. Final check of the 4m mark back to the benchmark was O.K. The 4m (no. 2) gauge is 80M on a bearing of 315 from the DOLA benchmark. Lake depth at gauge 2 was 3.59m.
Sept. 2001	Alan Clarke	The water was 10cm above the 4m gauge. The lake has a 6m gauge up against the fence. A 5m gauge is needed. I installed only a 4m gauge in April 2001 because the lake had been flooded by summer cyclone rainfall and the water has been steadily declining since January 2000. The lake has received significant rain again since my visit in April 2001.
11/2/2002	Alan Clarke, Mike Scanlon	Installed a 5m gauge using a galvanised angle iron and plastic depth plate in-between the 6m and 4m gauges. I did not include the location map in my collection of maintenance lake maps so I levelled the 5m gauge in from the 6m gauge. Unfortunately during the process of looking for the best position for the angle iron up and down the bank, I placed an incorrect figure in one of the calculating columns. Once the gauge was installed I did not check the new level back to the 6m gauge but back to the DOLA datum. When I input the datum height back in the office the 5m gauge calculated out to be reading 4.87m. I will lift the gauge by 0.13 either in March on my way back to Perth from the Lake Bryde Bathymetry or in May on my way to or from Esperance. Lake depth on the 4m gauge was 3.44m @ 1900hrs.
29/1/2003	Alan Clarke, Mathilde Breton	Surveyed the 5m mark on the 5m gauge to confirm it was too low by 0.125m. The 5m mark on this gauge was reading a lake height of 4.875m because it was incorrectly surveyed in to place when installed in the February 2002 maintenance run. The 5m depth plate was replaced with a new plate and raised 0.125m. Installed a new 3m gauge using a galvanised angle iron and plastic depth plate. The new gauge is 20m into the lake from the 4m gauge and inline with this gauge and the 5m gauge. Lake depth on the new 3m gauge was 2.20m. Placed the three remaining bolts on the bottom half of the 4m gauge now that it was dry. When the 4m gauge was installed plastic ties were used to fix the plate to the angle below the water line.
11/5/2006	Alan Clarke, Lucie Southern,	Installed a separate 2m and 1m gauge. The 2m gauge is 20m further into the lake from the 3m gauge and on the same line as the 3m and 4m gauges. The 1m gauge is in the middle of the wetland away from dead timber. The gauge is not inline with the other gauges and is 50m into the wetland from the 2m gauge. The heights for these gauges were levelled in from the 3m mark on gauge D (3m).

	Steph Gadal	The depth at the new gauge F (1m) was 0.23m. This lake now contains six gauges from 6m – 1m where A is 6m through to F being the 1m gauge. Heavy regeneration vegetation surrounds the outer area of the lake. A two wheel rut track runs off the fence line track through the vegetation past the gauges and off into the paddock.
8/5/2009	Alan Clarke, Yvonne Winchcombe	Met up with new farmer Tony G. They came out to wetland with us and discussed salinity of lake. All stock has been removed from property, Tony using boundary of wetland as access way. Depth at 2m gauge E read 1.79m. Surveyed dropper between 3m gauge D and 4m gauge C. Top of dropper is 3.086m. Took water sample from small wetland on track into Atkins to test salinity for Tony.

**BAMB: Bambun****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM	29/5/1979	Don Munro	3.0m		At base of Eucalyptus tree on west side.
HZ 903	18/5/1999	DOLA	2.944m	69.878m	AMG84 E 394750 N 6522680
BAMB BM	31/07/2008	Jim Lane			WGS 84 Z 50J E 394880 N 6522829
BAMB BM HZ903	26/5/2017	Yvonne Winchcombe			WGS 84 Z 50J E 394880 N 6522829

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	29/5/1979	Don Munro	3m	238 mag. north and 19m from datum (REPLACED 20/5/1997)
2 (B)	29/5/1979	Don Munro		242 mag. north and 45m from datum
1 (C)	20/5/1997	Alan Clarke	3m	Replaces 1(A) in original location
BAMB C	31/07/2008	Jim Lane	3m	WGS 84 Z 50J E 394811 N 6522805
BAMB uid gauge	11/05/2009	Jim Lane		WGS 84 Z 50J E 394790 N 6522791
BAMB C3	26/5/2017	Yvonne Winchcombe	3m	WGS 84 Z 50J E 394809 N 6522809

**Gauge Maintenance:**

Date	By Whom	Details
20/5/1997	Alan Clarke, Jim Payne	On inspection of the gauges number 1 gauge had been broken off at the base. The deep gauge was not visible. The old CALM datum had been damaged. The main block had been knocked off, leaving only a rut in the cement were the old wood support add been. These wood supports, from previous experience, were on average 100mm high. A star iron was knocked into the ground, 100mm above the bottom of the rut left in the cement, to act as a temporary datum. A new 4m depth gauge was installed at the approximate site of the old gauge. The height was surveyed in from the adopted 3m datum. <b>The bearing and distance from the gauge to anything was not recorded.</b> A DOLA bench mark was installed near a large strainer post 75m east of the gauge, <b>a bearing and distance to the gauge was not recorded. See hand drawn survey diagram for details on DOLA datum. This bench mark has not been stamped with an official number. Lake height of bench mark is 2.943m</b>
18/5/1999	Alan Clarke	The benchmark that was installed in 1997 was stamped with a DOLA number and re-surveyed to the gauge. The gauge was further secured with stainless steal bolts below the installation date water line. The work was carried out on May 18.
3/4/2007	Alan Clarke	Installed a 'C' on the 3m gauge and replaced the damaged 3mm plastic depth plate with a 6mm plastic depth plate. The old decommissioned/broken Munro 2m gauge could be seen further into the water. The 3m gauge was dry, but the water was only 3m away.
26/5/2017	Alan Clarke, Yvonne Winchcombe	Water surface 43 cm below 2.0 on C3 gauge, depth = 1.57m. Replaced '3' and 'C' on gauge. Witness plate for BM had been pushed over by big machinery. Searched for BM, found under pile of dirt – cleared around BM HZ 903. AC checked reference marks and it appears they were not affected by soil movement. House appeared empty / abandoned?

**BENN: Bennetts**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM		Don Munro	2.0m		No details recorded (see Scanlan map)
HT 289	21/5/1998	Scanlan Surveys	2.177m	313.684m	20m south of track AMG84 E 742432 N 6314505 MGA94 Z 50 E 742437 N 6314573
BennBM	18/09/2008	Alan Clarke			WGS 84 Z 50H E 742440 N 6314572

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)		Don Munro	1m	Removed in July 2005.
(A)	May 2006	Alan Clarke	1m	Reinstalled near sight of original 1m gauge
2 (B)	14/5/1997	Grant Pearson	2m	Edge of lake where vegetation finished.
3 (C)	3/4/2001	Alan Clarke	3m	14m on a bearing of 330 from the DOLA benchmark
BennA	18/09/2008	Alan Clarke	1m	WGS 84 Z 50H E 742657 N 6314598
BennB	18/09/2008	Alan Clarke	2m	WGS 84 Z 50H E 742450 N 6314593
BennC	18/09/2008	Alan Clarke	3m	WGS 84 Z 50H E 742435 N 6314579

**Gauge Maintenance:**

Date	By Whom	Details
14/5/1997	Grant Pearson, Tania Butler	Work carried out by Grant Pearson and Tania Butler on May 14. A 2m gauge was installed on the edge of the lake where the vegetation finished. The height of this gauge has not been verified because water levels have been too high to access with survey equipment. For position details refer to 2001 CALM gauge maintenance report.
21/5/1998	Alan Clarke, Grant Pearson	The 1m mark on the 1m gauge 1 read 0.990 when surveyed to the CALM datum. The water was too deep to change the gauge. The 2m gauge installed by GBP in 1997 at the edge of the lake was not recorded in the survey results! Also not recorded in my notebook! A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauge 1. See 2001 CALM gauge maintenance report for gauge 2 details. The work was carried out on May 21.
3/4/2001	Alan Clarke, Katherine Sorokine	Installed a 3m gauge (no.3) using a galvanised angle iron and plastic depth gauge. I levelled in the gauge height from the CALM 2m datum after checking that it still had the same height difference compared to the DOLA benchmark that was installed in 1998. This 3m gauge is 14m on a bearing of 330 from the DOLA benchmark. Gauge 2 (2m) installed in 1997 and referred to by Jim Lane as 'not marked on the access map' at his visit in November 1999 is 28m and at a bearing of 20 from the DOLA benchmark. The lake depth from gauge 2 was 1.93m. The lake height of a star iron possibly installed by Grant Pearson for depth recordings has a lake height of 2.35m. This was determined by measuring from the water to the top of the star iron, which was 420mm and adding it to the lake depth of 1.93m. The star iron is at the edge of the vegetation and 10m south of gauge 2. A second star iron at the edge of the vegetation on the left-hand side of the boat launching ramp has a lake height of 2.47m. The distance from the top of the star iron to the water was 540mm.
Sep. 2001	Alan Clarke	The water was level with the top of the new 3m gauge installed in April 2001. A 4m gauge may need to be installed next year.
30/1/2003	Alan Clarke, Mathilde Breton	Located the 2m gauge and surveyed it back to the benchmark. The lake height of the 2m mark on the 2m gauge is 1.982m. The 2m mark is 18mm too low. The lake depth on this gauge was 1.43m. I decided not to correct the height of the gauge, but monitor its progress over the next few years. The 3m gauge was in good condition.
11/5/2006	Alan Clarke, Lucie Southern, Steph Gadal	Reinstalled the 1m gauge using a galvanised angle and 6mm plastic depth plate on the southern shoreline within 45m from the shore. This gauge is inside the prohibited area for skiing. DPI Albany will be notified of the position of the gauge and the skiing notice will be amended to warn of the gauge. The 1m gauge and its position has been approved by Albany DPI.
28/3/2007	Alan Clarke	Installed two bolts at the bottom of the 1m gauge A.
9/5/2009	Alan Clarke, Yvonne Winchcombe	16 hooded plovers on shore and lots of waterbirds (ducks and swans) on far side of lake (hard to see as looking into rising sun). Earthworks have been carried out very insensitively to environment. Heaps of native vegetation pushed up onto vegetation near gauge B and gravel dumped and spread at boat ramp. Large area cleared of vegetation unnecessarily. Took photos of clearing and road works from 2m gauge B and 4 wheel bike tracks around shoreline.  1m gauge A missing, Alan used GPS to locate gauge – gauge had been deliberately pushed over.

		Standing gauge A back up depth read 0.44m. Need to contact DPI Albany and advise of condition of boat ramp. Ph. 9892 7333. Also contact DEC Katanning about destruction of native vegetation. No dropper visible, Alan searched for dropper in Sept 2008 when lake was dry and could not find it. Most likely that dropper has been removed.
22/5/2015	Alan Clarke, Yvonne Winchcombe	Old 1m gauge A bent over – measured down 44cm below 0.5, depth = 0.06m. Surveyed from CALM 2m datum to A1. Checked height of 2m gauge B – reading incorrect gauge is 20cm too high? To confirm with AC. Installed new 1m gauge A, depth = 0.035m.

**BEVE: Beverley****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM	1/6/78	Don Munro	2.0m		2.5m east of S/E corner of floodway. This datum destroyed when road widened.
DoW BM	27/05/2002		9.88m	211.239m	GDA94 Z 50 E 514296 N 6432611
BeveBM	14/09/2008	Alan Clarke			WGS 84 Z 50H E 514297 N 6432612

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1	Prior to 1998	DoW	10m	21m & 3° from datum
2	Prior to 1998	DoW	9m	23m & 1° from datum
3	Since 1998	DoW	8m	Lower down
	Prior to Sep 2001	DoW	11m	Installed between Nov 2000 and Sep 2001. Gauge removed during 2005
Beve10m	14/09/2008	Alan Clarke	10m	WGS 84 Z 50H E 514297 N 6432634

**\*\*NOTE:** To convert DoW gauge readings to CALM lake depth deduct 8.16m. This is a managed system and water may also be retained in the channel when the lakes are dry. Depth may also go negative as DoW gauges are located in the channel downstream from the lake system and upstream of the weir. If dry at gauge then Beverley lake system is most probably dry so enter depth as 0 and any water sample parameters collected into comments.

**Gauge Maintenance:**

Date	By Whom	Details
5/6/1998	Alan Clarke, Grant Pearson	The CALM datum and gauges were not found. The CALM datum according to the Munro map was near to where the road had been widened and most probably destroyed. The Water Rivers Corporation datum and gauges were surveyed. See Alan Clarke's fax to Jim Lane dated 25/01/01 for conversion details to CALM levels. The WRC benchmark was levelled to an existing DOLA benchmark. The AHD of the WRC benchmark is 211.239. Work carried out on June 5.
2/08/2001 (Email)	Alan Clarke	AC spoke with Paul Earp from WRC today regarding the height of Qualandary Crossing. He said that the causeway height is 10m, which is the WRC arbitrary lake height. In 1998 the Scanlan Survey team and I levelled in an AHD height to the WRC datum. The height of the datum is 211.239 AHD. We also determined that the difference between the WRC datum up to the 10m mark on the WRC gauge was 0.1199. The AHD height of the causeway is $211.239 + 0.1199 = \underline{211.359}$
Sept. 2001	Alan Clarke	The water level was very low. Three gauges were exposed. The 1998 Scanlan survey only recorded two gauges. I assumed that the top of the highest gauge was 10m. The reading on gauge 3 in the channel was then 7.57. The causeway height is 10m but I recall that the top of the first gauge was about 1m above the causeway, which would make the top of the first gauge 11m, which would make the depth reading 8.57m. The April 1994 report by Jim Lane (Yenyenning lakes) states that the WAWA minimum recorded level is 8.585m. The depth will need to be checked in November to confirm the heights. There are no height numbers attached to the gauges.
11/2/2002	Alan Clarke, Mike Scanlon	The depth gauges at Qualandary crossing were dry. We inspected ski lakes No. s 1, 2, and 3. All were dry but difficult to walk on through the damp soft mud. Another month of dry weather and the lake surface should harden making access by the Argo more efficient.
28/02/2006 (Email)	Alan Clarke	There is a specific spot and it is 10m (WRC) which is a nail in the concrete pylon on the northern end of the flood gates. See photo 'Beverley 10m mark.doc'
26/3/2007	Alan Clarke	Three gauges were visible. The gauge highest on the bank is the 10m gauge. The top of this gauge is level with the crossing height. The 10m gauge has been reinstalled by Dept. Water. The Dept of Water has agreed to install 10, 9, & 8 signs on the top of the three gauges by the September monitoring run. The depth on the middle gauge was 8.32m. Suggested Ids are 'top', 'middle' and 'bottom'.

**BIDD: Biddy**

**Datum Details:**

<b>ID</b>	<b>Date</b>	<b>By Whom</b>	<b>Lake Height</b>	<b>AHD Height</b>	<b>Location (See sketch diagram for details)</b>
CALM	25/5/1982	Don Munro	3.0m		13.0m N/N/W from edge of turnabout
HT 296	9/4/2000	John Bullock & Assoc.	3.309m	294.528m	AMG E 681980 N 6344720
BIDD BM	15/07/2009	Jim Lane			WGS 84 Z 50H E 682152 N 6344888
BIDD F&W BM	15/07/2009	Jim Lane			WGS 84 Z 50H E 682157 N 6344895

**Gauge Details:**

<b>ID</b>	<b>Date</b>	<b>By Whom</b>	<b>Lake Height</b>	<b>Location (See sketch diagram for details)</b>
1 (A)	25/5/1982	Don Munro	2m	84.0m & 34° from datum (1m & 2m gauge plates)
BIDD gge	15/07/2009	Jim Lane		WGS 84 Z 50H E 682203 N 6344960

**Gauge Maintenance:**

<b>Date</b>	<b>By Whom</b>	<b>Details</b>
9/4/2000	Alan Clarke	The 2m mark on the gauge read 2.001 when surveyed to the CALM datum. A DOLA BM was installed and surveyed to the CALM datum and gauge. Lake depth on April 9 was 1.75m.

**BIGB: Big Boom****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
BIGB TBM	19/05/2013	Yvonne Winchcombe			WGS 84 Z 51H E 425457 N 6251683 (Temporary Bench Mark)

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
BIGBB	10/5/2012	Alan Clarke	1m	WGS 84 Z 51H E 425472 N 6251705
BIGBA	10/5/2012	Alan Clarke	2m	WGS 84 Z 51H E 425459 N 6251691
BIGB A2	19/05/2013	Yvonne Winchcombe	2m	WGS 84 Z 51H E 425459 N 6251690

**\*\*NOTE: Contact Cape Le Grand NP Ranger prior to access & for wash down  
(Cameron Hennessy 0427 766 067 or David Chadwick 0428 290 866)**

**Gauge Maintenance:**

Date	By Whom	Details
10/5/2012	Alan Clarke, Tilo Massenbauer	<p>This wetland is situated in UCL on the west side of Cape Le Grand road north of the Cape le Grand National park. The wetland is a large complex heavily vegetated swamp. It has various sections of shallow and permanent deep water areas. The dominant macrophyte is Baumea articulate. Access to the wetland is via a sandy track heading west off Cape le Grand Road. At a point nearest the southern extent of the lake access is restricted to walking through low to medium scrub and Banksia woodland.</p> <p>The gauge site was chosen in an area of more open Baumea in a deep water site that was closest to the edge of the wetland to facilitate access in the wetter months. See access map and GPS track route for more details.</p> <p>Lake depth for the depth gauges was determined by wading through the water with a depth gauge out to an open water section and back. Depth readings and their location were recorded to locate the deepest point, which was 0.6m deep. A stainless steel angle was installed near the edge of the deeper water. This is not the deepest point. A 6mm plastic depth plate and 1 were fixed at a depth of 0.6m. This will eventually be labeled A. The coordinates for the new 1m gauge A are WGS84 Z51 E 425472, N 6251705. (Note: Subsequently labelled 1m B)</p> <p>A second gauge was installed in the thick Baumea surrounding the edge of the wetland. An access track was pushed through the Baumea and an area widened to accommodate a 2m gauge. This gauge required two stainless steel angles bolted together because of the softness of the substrate. A dumpy level was used to transfer a lake height onto the top of the angle for the 2m gauge. A 6mm plastic depth plate was fixed to the angle at the correct height with a number 2. The B identification letter will be installed on the next visit. The GPS coordinates for the new 2m gauge B are WGS84 Z51 E 425459, N 6251691. (Note: Subsequently labelled 2m A)</p> <p>All the gauge maintenance work at Esperance was conducted in conjunction with the installation of rain gauges and depth loggers at monitoring wetlands in the Esperance District.</p>
16/3/2016	Alan Clarke, Yvonne Winchcombe	<p>Depth at Gauge B: 0.42m (top of gauge burnt off). Survey from Gauge A to Top of angle on Gauge B = 1.156m. Reinstalled new gauge plate and moved down 2cm as per survey. Gauge B now reading 0.44m. <b>ACTION: Adjusted previous Gauge B readings by ADDING 2cm.</b></p>



**BLUE: Blue Gum****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
HM 1000	12/2/2001	John Bullock & Assoc.	2.7425m		MGA94 E 401230 N 6615180
HM 1000	9/11/2006	B. Hugessen		202.097m	MGA94 E 401230 N 6615180
BLUE BM1	16/09/2008	Jim Lane			WGS 84 Z 50J E 401231 N 6615183

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	12/2/2001	Alan Clarke	2m	
2 (B)	10/5/2000	Alan Clarke	1m	
BLUE A	16/09/2008	Jim Lane	2m	WGS 84 Z 50J E 401238 N 6615206
BLUE B	16/09/2008	Jim Lane	1m	WGS 84 Z 50J E 401256 N 6615253
BLUE B2	3/11/2008	Jim Lane	1m	WGS 84 Z 50J E 401257 N 6615252

**Gauge Maintenance:**

Date	By Whom	Details
10/5/2000	Alan Clarke, Stephanie Hill	I used a plastic depth plate to determine the deepest point of the lake. I installed a 1m gauge near the deepest point in the middle of the lake using a galv. angle iron and plastic depth plate. I simply adjusted the plate up or down and fixed it to the angle to reflect the depth at the deepest point. I attempted to drive an angle in further up slope for a 2m gauge but the ground 30cm down was impenetrable. I will need to return with a Kanga hammer and cement the angle into the hole. So I have attached the 2m gauge to a tree. Lake depth on 10/05/00 was 0.77m.
12/2/2001	Alan Clarke	Installed a new 2m gauge to replace the gauge that was fixed to a tree in April 2000. I used a Kanger hammer to excavate a hole for the angle iron and then cemented it in place. The 2m plastic depth plate was level in from the 1m gauge. A DOLA benchmark with reference marks was installed inline with both gauges further up slope. Gauge 1 is the 2m gauge and gauge 2 is the 1m gauge these numbers were valid for the fist depth records in Sept. and Nov. 2000. The lake was dry on February 14. Transects 1 and 2 have had lake level heights transferred to the top of each of the bore casings and at ground level for their associated star irons. The height data are contained in the down loaded survey computations from the WILD digital level that accompanies the access diagram on file.
28/03/2006	Alan Clarke, Sandra Fleisher	Recovered the level from the saw cut in the tree by measuring 0.240 up from the water to the saw cut. The lake depth from gauge A was 1.45m, therefore the depth when the saw cut was made at the water level was 1.69m. An A was installed on the 2m gauge. The 1m gauge was under water.
3/4/2007	Alan Clarke	Installed a 'B' on the 1m offshore gauge and washed off the dried algae so that the depth plate is visible. The 2m gauge is labelled A.

**BOA1: Boat Harbour 1****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
HO 286	21/5/1997	DOLA, J. Payne	3.580m	8.618m	AGM E 508103 N 6124812
BOABM	16/09/2008	Yvonne Winchcombe			WGS 84 Z 50H E 508245 N 6124962

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	21/5/1997	Alan Clarke	2m	North west edge of lake (1m & 2m gauge plates)
BOA1A	16/09/2008	Yvonne Winchcombe	2m	WGS 84 Z 50H E 508224 N 6124976
BOA1B	3/5/2018	Alan Clarke	2m	WGS 84 Z 50H E 508242 N 6124985 (Logger gauge for camera)

**Gauge Maintenance:**

Date	By Whom	Details
21/5/1997	Alan Clarke, Jim Payne	Alan Clarke and Jim Payne carried out the work on May 21. Soundings were taken to determine the deepest point using a punt, oars and survey staff. The depth of 0.62m was transferred to a 2m gauge (2 by 1m plates). The datum is a fence dropper in concrete with a DOLA brass plaque (unstamped). Reference marks were placed around the datum. The soft substrate is deep. The height of the gauge will need to be checked against the datum in the future. See 2000 JBA survey data.
April 2000	Alan Clarke	A path has been forced through the dense riparian vegetation leading to the gauge. A fallen tree and its subsequent removal process have caused the path. Two new plastic plates have been fixed to the side of the gauge to make reading the gauge easier. The gauge was surveyed to the DOLA datum. The gauge has not moved since being installed in 1997.
20/3/2007	Alan Clarke, Yvonne Winchcombe	Both the 1m and 2m plastic depth plates on the side of the gauge are OK. Both stainless steel depth plates facing the road are OK. Attached an 'A' to the 2m gauge.
3/5/2018	Alan Clarke, Laurent Marsol	Installed two depth plates, 1m and 2m gauges, on the southern depth logger pole (RB0103) facing the edge of the wetland. Installed a '2' and 'B' at the top of the gauges. The height of the new depth gauges was transferred from gauge B using the calm water conditions and setting the depth on the gauge to the same as gauge A because it would not have been possible to use the Dumpy level with the fallen trees and soft substrate. Installed a 2m SS angle with a 2m alloy green post at the edge of the wetland. Installed camera BP#23 on the post viewing the new gauge B.

**BOKA:        Bokan**

**Datum Details:**

<b>ID</b>	<b>Date</b>	<b>By Whom</b>	<b>Lake Height</b>	<b>AHD Height</b>	<b>Location (See sketch diagram for details)</b>
CALM	13/7/1979	Don Munro	1.0m		2.0m west side of track & 1.5m south of large Casuarina tree
HL 419	9/5/1998	Scanlan Surveys		296.529m	AMG84 E 549226 N 6349850
BokanBM	3/11/2008	Alan Clarke			WGS 84 Z 50H E 549253 N 6349883

**Gauge Details:**

<b>ID</b>	<b>Date</b>	<b>By Whom</b>	<b>Lake Height</b>	<b>Location (See sketch diagram for details)</b>
1 (A)	13/7/1979	Don Munro	2m	45.0m & 184° from CALM datum
2 (B)	13/7/1979	Don Munro	1m	270.0m & 184° from CALM datum

**Gauge Maintenance:**

<b>Date</b>	<b>By Whom</b>	<b>Details</b>
9/5/1998	Alan Clarke, Grant Pearson	This lake is not currently monitored. The gauges were not renewed. The 2m mark on gauge 1 read 1.999 and the 1m mark on gauge 2 read 1.000 when surveyed to the CALM datum. Both gauges have been damaged by rifle fire and need replacing. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The work was carried out on May 9.

**BOYU: Boyup Brook 18239****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM	1/5/1981	Don Munro	1.0m		On approx. maximum high water mark, 120m & 240° from N/W corner of clubrooms.
HC 292	24/5/1998	Scanlan Surveys	1.197m	242.899m	AMG84 E 469722 N 6257246 MGA94 Z 50 E 469775 N 6257196
BOYU BM	13/07/2008	Jim Lane			WGS 84 Z 50H E 469777 N 6257199
BoyuBM	19/09/2008	Alan Clarke			WGS 84 Z 50H E 469776 N 6257198

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	1/5/1981	Don Munro	1m	103.0m & 295° from CALM datum
BOYU A	13/07/2008	Jim Lane	1m	WGS 84 Z 50H E 469675 N 6257230
BoyuA	19/09/2008	Alan Clarke	1m	WGS 84 Z 50H E 469675 N 6257229

**Gauge Maintenance:**

Date	By Whom	Details
24/5/1998	Alan Clarke, Grant Pearson	The 1m mark on gauge 1 read 1.001 when surveyed to the CALM datum. The gauge 1 wood board and 1m depth plate were in good condition. The gauge was not altered. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauge. Work carried out on May 24.
3/5/2007	Alan Clarke	Installed an 'A' on the 1m wood board gauge.

**BROA: Broadwater****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
HB 74	28/4/2000	John Bullock & Assoc.	1.107m	0.826m	AMG E 341 050 N 6273280
BROABM	15/09/2008	Yvonne Winchcombe			WGS 84 Z 50H E 341176 N 6273426
BROA BM HB74	31/5/2017	Yvonne Winchcombe			WGS 84 Z 50 H E341177 N 6273424

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)			1m	Fixed to fencepost
2 (B)			2m	Middle of lake
1 (C)	28/4/2000	Alan Clarke	1.5m	Near edge of main lakebed a few metres east of fence line.
2 (D)	28/4/2000	Alan Clarke	1m	75m out into lake along fence line
BROAC	15/09/2008	Yvonne Winchcombe	1.5m	WGS 84 Z 50 H E 341181 N 6273372 (Replaced 1/6/2017)
BROA C2	9/11/2015	Yvonne Winchcombe	2.0m	WGS 84 Z 50 H E 341181 N 6273372 (Replaced 1/6/2017)
BROA D1	5/11/2016	Yvonne Winchcombe	1.0m	WGS 84 Z 50 H E 341188 N 6273299 (Replaced 31/5/2017)

**Gauge Maintenance:**

Date	By Whom	Details
28/4/2000	Alan Clarke	The CALM datum could not be found, it was possibly never installed. Gauge 2, in the middle of the lake, was 4mm above gauge 1 which is fixed to one of the fence posts. Gauge 1 is the more frequently read so this was adopted as the true height. A new gauge 1, set at 1.5m, was installed near the edge of the main lakebed a few meters east of the fence line. A second 1m gauge was installed a further 75m into the lake for shallow readings. A DOLA BM was installed near the fence line and surveyed to the gauges. Lake depth on April 28 was 0.09m.
26/3/2007	Alan Clarke	Installed an 'A', '2' and a new 6mm plastic depth plate over the stainless steel plate that had lost its paint for the 2m onshore gauge. Installed a 'B', '1' and replaced the stainless steel paint stripped plate with a 6mm plastic depth plate on the 1m offshore gauge. The gauge board is old and will need replacing with a galv angle in 1- 2 years.
31/5/2017	Alan Clarke, Yvonne Winchcombe	Install 3m s/s angle at gauge D – gauge D rusted off and lying on mud. Lake bed very soft. Surveyed from BROA BM HB74 (1.107m LH) to top of angles at C and D. Lake height for top of SS angle Gauge D = 0.729m (Need to add extra length of SS Angle). Lake height for top of SS angle Gauge C = 1.503m. Alan to return tomorrow to finish and install gauge plates, numbers and letters. The original Gauge C was a 1.5m gauge which creates confusion so was replaced with a 2m gauge higher up profile.
1/6/2017	Alan Clarke	Install extra SS angle (by pushing in next to existing angle and bolted together) at Gauge C. Installed 2m depth plate on C, measured 67cm from 1m mark (bottom of depth plate) down to ground, LBL at C is 0.33m. Gauge D, measured 0.271m from top of first angle up to 1.0m mark and installed 1m gauge plate. LBL of D = 0.04m. Removed old rusted gauge D. Removed old logger supports 2 x galv angle and plastic depth logger support pole.

**BROW: Brown**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM	12/7/1979	Don Munro	4.0m		13.0m from side of track, 6.0m & 55° from prominent salmon gum. Approx. 150.0m & 52° from N/E corner of stock dam.
HL 424	6/5/1998	Scanlan Surveys	5.729m	268.230m	AMG84 E 559583 N 6397753
BrowBM	14/09/2008	Alan Clarke			WGS 84 Z 50 H E 559606 N 6397735

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 A	12/7/1979	Don Munro	2m	(Inshore) 65.0m & 46° from CALM datum
2 B	12/7/1979	Don Munro	1m	(Offshore) 215.0m & 55° from CALM datum
BrowA	14/09/2008	Alan Clarke	2m	WGS 84 Z 50 H E 559665 N 6397775
BrowB	14/09/2008	Alan Clarke	1m	WGS 84 Z 50 H E 559783 N 6397861
BROW A	11/09/2011	Jim Lane	2m	WGS 84 Z 50 H E 559665 N 6397777
BROW B	11/09/2011	Jim Lane	1m	WGS 84 Z 50 H E 559783 N 6397862

**Gauge Maintenance:**

Date	By Whom	Details
6/5/1998	Alan Clarke, Grant Pearson	The initial gauge heights have been taken from field book notes. The survey results only show final heights. The 2m mark on gauge 1 read 2.025 and the 1m mark on gauge 2 read 1.000 when surveyed to the CALM datum. The 2m depth plate on gauge 1 was replaced with a stainless steel plate and dropped 25mm. The survey results show the final level for the 2m plate was 1.999. The 1m plate on gauge 1 was replaced with a stainless steel plate at the same height. The survey results show the final level for the 1m mark was 1.000. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The work was carried out on May 6.
26/3/2007	Alan Clarke	Installed an 'A' & '2' on the 2m onshore gauge and replaced the stainless steel plate with a 6mm plastic plate. Installed a 'B' & '1' on the 2m offshore gauge and replaced the stainless steel plate with a 6mm plastic plate. The wood board is aging and will need to be replaced in two years with an alloy gauge with a plastic plate.

**BRUC: Bruce Rock 30969****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	14/5/1982	Don Munro	3.0m		Approx. 8.0m & 215° from post
HU 410	7/5/1999	Scanlan Surveys	3.792m	236.346m	AMG84 E 575000 N 6473785
BrucBM	4/11/2008	Alan Clarke			WGS 88 Z 50J E 575133 N 6473941

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	14/5/1982	Don Munro	2m	14.0m & 215° from CALM datum
2 (B)	14/5/1982	Don Munro	1m	73.0m & 180° from CALM datum

**Gauge Maintenance:**

Date	By Whom	Details
7/5/1999	Alan Clarke	This lake is not currently monitored. The gauges were not altered. The 2m mark on gauge 1 read 2.049 and the 1m mark on gauge 2 read 1.059 when surveyed to the CALM datum. The CALM datum was cracked though its base. The datum was solid, but on sloping ground. Looking at the gauge heights we suspected that the CALM datum had slipped down. Both gauges were in reasonable condition. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. Work carried out on May 7.

**BRYD: Bryde**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM	27/6/1979	Don Munro	1.5m		5.0m east of top edge of dam bank from a point 120m around from south entry 130.0m & 49° from datum
HT 290	22/5/1998	Scanlan Surveys	2.328m	293.504m	AMG84 E 669607 N 6308023 Note: Status recorded as 'Final-Damaged' which means BM damaged but useable.
BrydB	18/09/2008	Alan Clarke			WGS 84 Z 50 H E 669625 N 6308051

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	27/6/1979	Don Munro		Middle of lake (NO LONGER EXISTS)
1 (B)			2m	On shore near boat ramp
2 (C)			1m	Off shore on south east corner of lake fixed to pole.
BrydB	18/09/2008	Alan Clarke	2m	WGS 84 Z 50 H E 669651 N 6308049
BrydC	18/09/2008	Alan Clarke	1m	WGS 84 Z 50 H E 669781 N 6307951

**Gauge Maintenance:**

Date	By Whom	Details
13/5/1997	Grant Pearson, Tania Butler	Work carried out by Grant Pearson and Tania Butler on May 13. The depth plates on both gauges were replaced with stainless steel plate at the previous levels. See 1998 Scanlan report for gauge changes.
22/5/1998	Alan Clarke, Grant Pearson	The Munro map shows the original Calm datum and F+W gauge in the southern area of the lake. The original CALM datum could not be found. A PWD gauge is positioned on the Munro map between the FW gauge and original CALM datum site. The current CALM datum and gauge 1 are positioned in the northern area of the lake. Their positions have been added to the Munro map using a black pen. The 1m mark on gauge 1 read 0.969 when surveyed to the CALM datum. The depth plate was not replaced. There is no information from the survey data or my notebook to indicate which gauge, 2 or 3 referred to in the survey data, was the old F+W gauge or the PWD gauge. The level run began at the CALM datum in the north of the lake and picked up the first gauge the position of which, from looking at the Munro map, appears to be the F+W gauge. This gauge was removed. The survey results show that the 1m mark on gauge 3(suspected F+W gauge), which was removed, had a level of 0.988. The survey results for gauge 2 show that the 1m mark had a level of 1.071. This gauge was positioned at the site of the PWD gauge from looking at the Munro map. This gauge was a solid large steel pipe fitted with a depth plate. The depth plate was replaced with a stainless steel depth plate. The final level for the 1m mark on this gauge 2 was 0.999. I believe that the gauge 3 in the survey results was the F+W gauge that was removed. The reason it was not named as gauge 2 in the survey results was because the old PWD gauge was upgraded and called the new gauge 2 for the lake. A DOLA benchmark was installed with reference marks and surveyed to the gauges. The work was carried out on May 22.
Sept. 2001	Alan Clarke	I have confirmed that gauge 1, the only gauge I had previously taken depth gauge measurements from, is a 2m gauge. There was a 2 at the top of the gauge. This gauge was dry. I took this years measurement from the 1m gauge further south along and out from the bund wall.
12/2/2002	Alan Clarke, Mike Scanlon	The lake was dry and hard. The 2m mark on the 2m onshore gauge (no. 1) was levelled to the old CALM datum (2m) and found to be 31mm too low. The 1m mark on the off shore 1m gauge was exactly 1m below the 2m datum. The stainless steel plate on the onshore 2m gauge was replaced by a plastic plate and moved up 31mm.
27/3/2007	Alan Clarke	Installed a 'B' on the 2m onshore gauge. Installed a 'C' & '1' on the offshore gauge, which has two 1m stainless steel plates to 2m.
10/5/2018	Alan Clarke, Peter White	Installed a new 1m gauge C using a 2m SS angle and alloy depth plate. Lake Height was transferred from old gauge C using a 1m bubble level. Installed a '1' and 'C'. Dug around base of old gauge C support pole. Used battery operated angle grinder to cut pole at base and remove pole with two depth plates.



**BYEN: Byenup****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM		Don Munro			3.0m west of Marri tree on high water mark level. Marri approx 17.0m S/W of fence line 'A'.
B 682	3/6/1998	Scanlan	3.326m	175.828m	AMG84 E 478382 N 6182380
BYENBM	18/09/2008	Yvonne Winchcombe			WGS 84 Z 50 H E 476449 N 6182437
BYEN PWD B681	20/5/2015	Yvonne Winchcombe			WGS 84 Z 50 H E 475808 N 6182082
BYEN TBM	20/5/2015	Yvonne Winchcombe			WGS 84 Z 50 H E 475105 N 6182195 (Temporary BM for surveying to Bores)
BYEN DM 2.5	8/11/2016	Yvonne Winchcombe	2.5m		WGS 84 Z 50 H 476412 N 6182434 (Don Munro concrete 2.5m datum)

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)		Don Munro	3m	Approx. 8.00m west of CALM datum
2 (B)			2m	
BYENA	18/09/2008	Yvonne Winchcombe	3m	WGS 84 Z 50 H E 476401 N 6182441
BYEN A3	20/5/2015	Yvonne Winchcombe	3m	WGS 84 Z 50 H E 476400 N 6182443

**Gauge Maintenance:**

Date	By Whom	Details
3/6/1998	Alan Clarke	The 3m mark on gauge 1 read 2.999 and the 2m mark on gauge 2 read 1.999 when surveyed to the CALM datum. The 1m and 2m plates on gauge 1 were in poor condition and so were replaced with 2 stainless steal depth plates at the same level. The lake depth at gauge 2 on June 3 was 2.80m. The water was too high on gauge 2 to replace the rusted but solid depth plate. A PWD benchmark was used as the lake datum. Reference marks were installed and the CALM datum and gauges surveyed to the PWD benchmark. The lake height of the PWD benchmark was 3.326. The AHD of the PWD benchmark is 256.368.
23/3/2007	Alan Clarke, Yvonne Winchcombe	Roger Hearn and Ian Wheeler monitor this wetland. Gauge A is a wood board with both 2m and 3m depth plates. Roger has replaced the 3m and 2m plates with 6mm plastic plates using galvanised nails to secure the plates to the wood. We attached an 'A' and '3' to the 3m gauge. They have installed a new 2m gauge along side the old 2m gauge using a galv angle and 6mm plastic depth plate. We attached a 'B' and '2' to this new gauge.
20/5/2015	Alan Clarke, Yvonne Winchcombe	<p>Located benchmark next to gauges (Public Works Department B682). Drove around Byenup and located another benchmark (Public Works Department B681) closer to bore site on fenceline at GPS 50 H 0475808, 6182081. Installed a tempory benchmark (BYEN TBM) at bend in fence line next to strainer post opposite bore location at GPS 50 H 0475105, 6182195. Surveyed with level and staff from PWD B681 to BYEN TBM.</p> <p>From BYEN TBM surveyed to bore at northern end of Tordit-Gurrup TGN01 (6m). The padlock on the bore casing was smashed. Alida &amp; Jason Parkes drove past and stopped for chat, mentioned some pampas grass growing in reserve in sandy area about 1km from Ian Wheeler's northern gauge.</p> <p>Surveyed from BYEN TBM to Byenup bore BY01 – big tiger snake on path to bore – very cold and not in hurry to move on! Padlock on this bore casing also smashed. Levelled to top of white bore casing. (3mm misclose).</p> <p>2m Gauge B at Byenup = 1.26m. 3m Gauge A dry with LBL of 1.40m (GPS 50 H 0476400, 6182443).</p>

**CAIR: Cairlocup****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	10/4/1981	Don Munro	1.0m		8.0m from edge of samphire bordering lake (proper), on edge of ridge & marked by post at N/E corner of lake
HT 293	8/4/2000	John Bullock & Assoc.	2.514m	281.869m	AMG E 662380 N 6266660
CAIRBM	9/05/2009	Alan Clarke			WGS 84 Z 50H E 662520 N 6266817

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	10/4/1981	Don Munro	1m	85.0m & 283° from CALM datum

**Gauge Maintenance:**

Date	By Whom	Details
8/4/2000	Alan Clarke	The 1m mark on the gauge read 1.013 when surveyed to the CALM datum. The CALM datum was in wet sloppy mud. A DOLA BM was installed, 400m east of the gauge on solid dry ground, and surveyed to the new gauge. Lake depth on April 8 was <b>approximately 0.8m.</b>
9/5/2009	Alan Clarke, Yvonne Winchcombe	Track in off Cairlocup Road signposted as Dunnart Road. Track overgrown, turn off at Nature Reserve sign. Track in blocked by fallen trees so walked in. BM is approx. 300m south past strainer post and OP and located on edge of trees above the samphire flats. GPS BM (HT 293) 50H 662522, 6266817. Took photos at BM and also panarama at strainer post and OP. Lake was dry.

**CAME: Camel**

**Datum Details:**

<b>ID</b>	<b>Date</b>	<b>By Whom</b>	<b>Lake Height</b>	<b>AHD Height</b>	<b>Location (See sketch diagram for details)</b>
CALM	3/8/1980	Don Munro	1.0m		On max. high water mark at a point 48.0m & 5° from where track enters mud flat and in clearing between Mel. sp bordering lake.
HO 289	4/4/2000	John Bullock & Assoc.	1.150m	226.880m	AMG E 587900 N 6204630
HO 289	28/11/2002	B Hugessen		226.880m	GDA94 E 588033 N 6204762

**Gauge Details:**

<b>ID</b>	<b>Date</b>	<b>By Whom</b>	<b>Lake Height</b>	<b>Location (See sketch diagram for details)</b>
1 (A)	3/8/1980	Don Munro	1m	115m & 20° from CALM datum 91.5m & 20° from HO 289

**Gauge Maintenance:**

<b>Date</b>	<b>By Whom</b>	<b>Details</b>
4/4/2000	Alan Clarke	The 1m mark on the gauge read 1.000 when surveyed to the CALM datum. The CALM datum and gauge board were in good condition. The plate was badly faded. A DOLA BM was installed and surveyed to the CALM datum and gauge. Lake depth on April 4 was < 0.01m.

**CAMP:       Campion**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM	12/3/1979	Don Munro	1.5m		7.0m & 65° from tree
HU 409	8/5/1999	Scanlan Surveys	2.463m	279.357m	AMG84 E 627543 N 6554062
CAMP BM HU409	19/09/2008	Jim Lane			WGS 84 Z 50 J E 627676 N 6554227
CAMP BM KE183	19/09/2008	Jim Lane			WGS 84 Z 50 J E 627734 N 6554200
CAMP F&W BM	19/09/2008	Jim Lane			WGS 84 Z 50 J E 627735 N 6554124

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	13/3/1979	Don Munro	2m?	90.0m & 201° from CALM datum
1 (B)	11/5/2000	Alan Clarke	2m	Next to CALM datum
2 (C)	2/4/2001	Alan Clarke	1m	Replaces original Don Munro #1 gauge
(D)	30/3/2006	Alan Clarke	1m	Replaces 1m that was removed in July 2005
CAMP B	19/09/2008	Jim Lane	2m	WGS 84 Z 50 J E 627738 N 6554119
CAMP D	19/09/2008	Jim Lane	1m	WGS 84 Z 50 J E 627750 N 6554107

**Gauge Maintenance:**

Date	By Whom	Details
8/5/1999	Alan Clarke	The CALM datum was located in shallow water, 50m from shore. The gauge had been disabled when inspected by CALM officers soon after the lake filled in January 1999. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum. Work carried out on May 8. Lake depth was 1.85, the water was 0.35 above the 1.5m CALM datum.
11/5/2000	Alan Clarke, Stephanie Hill	I installed a 2m gauge using a galv. angle iron and a plastic depth plate. I levelled in the gauge height from the DOLA benchmark. The gauge is 5m out into the lake from the old CALM datum on the same bearing as the DOLA BM and the CALM datum. Lake depth May 11 was 0.945.
2/4/2001	Alan Clarke, Katherine Sorokine	Installed a 1m gauge using a galvanised angle iron and plastic depth plate. I levelled in the gauge height from the 2m (new no.1) gauge. The final check of the 1m mark was O.K. The new 1m (no. 2) gauge is at the site of the original gauge installed by Don Munro which, was 90m at a bearing of 200 from the CALM datum. The old gauge was damaged and lost when the lake flooded in 1999. The depth measurements that have been recorded since the lake was included into the September and November monitoring in 1999 have been taken from the CALM datum and the new 2m (new no.1) gauge installed in April 2000. The lakebed level at the new 1m (no. 2) gauge reads 0.038m. There was a trace of water 100m from the gauge towards the southeast. Note; need to check level of both gauges to the benchmark at next visit.
30/03/2006	Alan Clarke, Sandra Fleisher	Installed a new gauge 20m south east of gauge B. This new gauge was labelled D and has a 1m plastic depth plate. The LBL at D was 0.31m. A B and D were installed on their respective gauges.

**CAPA: Capamaura****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	9/7/1980	Don Munro	1.0m		Approx. 2.5m above edge of samphire on west side of where creek enters lake proper.
HQ 49	10/5/1999	Scanlan Surveys	1.258m	232.912m	AMG84 E 392970 N 6691308
CAPA BM	11/11/2009	Jim Lane			WGS 84 Z 50J E 393132 N 6691441
CAPA Munro Datum	11/11/2009	Jim Lane			WGS 84 Z 50J E 393128 N 6691473

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	9/7/1980	Don Munro	1m	9.0m & 6° from CALM datum
2 (B)	9/7/1980	Don Munro	1m	150.0m & 3° from CALM datum
CAPA gge1	11/11/2009	Jim Lane	1m	WGS 84 Z 50J E 393128 N 6691482

**Gauge Maintenance:**

Date	By Whom	Details
9/5/1999	Alan Clarke	This lake is not currently monitored. The gauges were not altered. The CALM datum was cracked though its base. The block was lifted off its base, the wind blown sand brushed off and the block repositioned to a snug fit. The 1m mark on gauge 1 read 1.005 and the 1m mark on gauge 2 read 1.000 when surveyed to the CALM datum. Both gauge boards were O.K., but the gauges were faded. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. Work carried out on May 9.

**CASU: Casuarina****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM	24/5/1978	Don Munro	2.0m		10.0m & 147° from corner fence post
HD 208	22/5/1998	Scanlan Surveys	2.231m	271.815m	AMG84 E 569532 N 6277311
CasuBM	19/09/2008	Alan Clarke			WGS 84 Z 50 H E 569525 N 6277315

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	24/5/1978	Don Munro	2m	68m & 147° from CALM datum (2 x 1m plates on board)
2 (B)	24/5/1978	Don Munro	1m	117.0m & 170° from CALM datum
(C)	April 2006	Alan Clarke	2m	20m towards shore from A. Gauge A was removed.
CasuC	19/09/2008	Alan Clarke	2m	WGS 84 Z 50 H E 569550 N 6277282

**Gauge Maintenance:**

Date	By Whom	Details
30/4/1997	Alan Clarke, Grant Pearson	Work carried out by Alan Clarke and Grant Pearson on April 30. The 2m mark on gauge 1 read 1.974 and the 1m mark on gauge 2 read 1.022 when surveyed to the CALM datum. Both the 1m and 2m depth plates on gauge 1 were replaced with stainless steel plates at the correct height. The 1m depth plate on gauge 2 was replaced with a stainless steel plate at the correct height. See 1998 Scanlan report for final heights of gauges.
2/4/1998	Alan Clarke, Dorian Moro	Work carried out by Alan Clarke and Dorian Moro on April 2. The 2m mark on gauge 1 read 2.000m when surveyed to the CALM datum. No further work was done.
22/5/1998	Alan Clarke, Grant Pearson	The 2m mark on gauge 1 read 2.001 and the 1m mark on gauge 2 read 1.013 when surveyed to the CALM datum. The depth plates on all gauges had been replaced in 1997. Gauges 1 and 2 were not altered. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The work was carried out on May 22.
5/4/2006	Alan Clarke, Julia Sisson	Installed a new 2m gauge C to replace the old and unstable Munro gauge board with two depth plates. Gauge C is 20m towards the shore from the old gauge, which was removed. The old gauge, when pushed, snapped at its base quite easily. The stainless steel depth plate at gauge B was replaced over the top of the old plate with a 6mm plastic plate. The alpha ID's B and C were installed on their respective gauges.

**CHAN: Chandala**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM	29/5/1979	Don Munro	1.5m		1.0m east of large Euc. Sp. North side of shed.
HZ 922	17/5/1999	Scanlan Surveys	1.397m	60.136m	AMG84 E 400390 N 6514280
CHAN BM	31/07/2008	Jim Lane			WGS 84 Z 50J E 400545 N 6514425

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	29/5/1979	Don Munro	2m	200m & 64° from CALM datum
2 (B)	29/5/1979	Don Munro	1m	150m & 50° from Gauge 1
CHAN A	31/07/2008	Jim Lane	2m	WGS 84 Z 50J E 400717 N 6514496
CHAN B	11/05/2009	Jim Lane	1m	WGS 84 Z 50J E 400828 N 6514608
CHAN B	18/12/2009	Alan Clarke	1m	WGS 84 Z 50J E 400828 B 6514607 (Removed 3/6/2010)
CHAN B new	21/6/2010	Alan Clarke	1m	WGS 84 Z 50J E 400843 N 6514652 (Replacement 3/6/2010)
CHAN B Nov2010	13/11/2010	Jim Lane	1m	WGS 84 Z 50J E 400841 N 6514648

**Gauge Maintenance:**

Date	By Whom	Details
17/5/1999	Alan Clarke	The 1m mark on gauge 1 (2m) read 0.988 and the 1m mark on gauge 2 (1m) read 0.998 when surveyed to the CALM datum. The depth plate on gauge 1 was faded, it was replaced with a plastic plate and moved up 12mm. The survey results show the final level for the 2m mark on gauge 1 was 2.000. The gauge 2 wood board was in poor condition. The depth plate was missing. The 1m mark was taken from a ware mark immediately below the 1m sign, which was still nailed to the board. A new gauge 2 was installed using a galvanised angle iron and plastic depth plate. The gauge height was levelled in from the secure CALM datum. The survey results show the final level for the 1m mark on gauge 2 was 0.999. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The work was carried out on May 17.
3/4/2007	Alan Clarke	Installed an 'A' & '2' on the 2m gauge. Installed a 'B' at the 1m gauge and installed a 3mm plastic depth plate over the stainless steel depth plate, which had lost most of its paint. The galv angle has rusted and will need replacing with an alloy or stainless angle in the next two years.
3/6/2010	Alan Clarke, Yvonne Winchcombe	2m Gauge A was dry, 1m Gauge B was bent over – depth read 0.17m. The gauge B galv angle had rusted badly and the gauge was leaning over, only held up by the 6mm plastic depth plate. Installed a new gauge using a stainless steel angle and 6mm plastic depth plate. The water was still so the plate was leveled using the water surface.

**CHIT: Chittering****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	2/5/1978	Don Munro			(Now under a levi bank that was constructed in the early 90s)
HZ 921	12/5/1999	Scanlan Surveys	1.656m	124.018m	AMG84 E 413932 N 6521142
CHIT BM	3/11/2008	Jim Lane			WGS 84 Z 50J E 414089 N 6521328

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	2/5/1978	Don Munro	2m	Located in outlet near check structure
2 (B)	2/5/1978	Don Munro	1m	123.0m & 146° from CALM datum

**Gauge Maintenance:**

Date	By Whom	Details
12/5/1999	Alan Clarke	This lake is not currently monitored. The gauges were not altered. The CALM datum was positioned, from the Munro map, under a levi bank that had been constructed in the early 90s (comms farm manager). The 2m mark on gauge 1 was adopted as the temporary datum. The 1m mark on gauge 2 read 0.992 when surveyed to the 2m mark on gauge 1. A DOLA benchmark was installed with reference marks and surveyed to the CALM gauges. The work was carried out on May 12.



**CLIF: Clifton****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM			5.0m		
HR 185	6/5/1999	Scanlan Surveys	5.413m	1.378m	AMG84 E 373900 N 6375950
CLIF BM	6/08/2008	Jim Lane			WGS 84 Z 50H E 374037 N 6376139
CLIF BM2	13/08/2008	Jim Lane			(#2) WGS 84 Z 50H E 374038 N 6376141
CLIF BM3	31/08/2008	Jim Lane			(#3) WGS 84 Z 50H E 374039 N 6376140

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)			5m	
2 (B)			4m	
1 (C)	5/5/1997	Alan Clarke	5m	On a pylon of the north side of the viewing jetty close to shore.
2 (D)	5/5/1997	Alan Clarke	4m	On the pylon that is at the northern extent of the jetty facing back to shore.
CLIF C1	22/07/2008	Jim Lane	5m	WGS 84 Z 50H E 373963 N 6376140
CLIF D1	22/07/2008	Jim Lane	4m	WGS 84 Z 50H E 373884 N 6376157
CLIF C2	6/08/2008	Jim Lane	5m	(#2) WGS 84 Z 50H E 373964 N 6376142
CLIF D2	6/08/2008	Jim Lane	4m	(#2) WGS 84 Z 50H E 373884 N 6376164
CLIF C3	13/08/2008	Jim Lane	5m	(#3) WGS 84 Z 50H E 373963 N 6376142
CLIF C4	31/08/2008	Jim Lane	5m	(#4) WGS 84 Z 50H E 373964 N 6376142

**Gauge Maintenance:**

Date	By Whom	Details
5/5/1997	Alan Clarke, Grant Pearson	Work carried out by Alan Clarke and Grant Pearson on May 5. The 5m mark on gauge 1 read 5.002 and the 4m mark on gauge 2 read 3.932 when surveyed to the CALM datum. The gauge 1 depth plate and angle iron were rusted and obscured by the new jetty so they were replaced by a 5m gauge plate on a pylon of the new jetty and adjusted down by 2mm. The gauge 2 depth plate and angle iron were heavily rusted so they were replaced by a 4m gauge plate on a pylon at the end of the new jetty and adjusted up by 68mm. See 1999 Scanlan report for final heights.
6/5/1999	Alan Clarke	The 5m mark on gauge 1 read 5.003 and the 4m mark on gauge 2 read 4.004 when surveyed to the CALM datum. CALM staff renewed both gauges in 1997. An existing DOLA benchmark was used as the new lake benchmark. The AHD of the lake benchmark is 1.378. The lake height of this benchmark is 5.413. Work carried out on May 6.
3/5/2007	Alan Clarke	Installed a 'C' on the 5m gauge attached to the jetty and replaced the 3mm plastic depth plate, which was damaged, with a 6mm plastic depth plate. Installed a 'D' on the 4m gauge attached to the pylon at the end of the jetty and washed off the algal growth on the depth plate. This plate is cracked and will need replacing next year if the water is lower, which will allow for an easier replacement.
12/3/2012	Alan Clarke, Anthony Reid	Removed old 3mm plastic, damaged depth plate at gauge D, at end of jetty on the east arm corner facing the shore. Installed a new 6mm plastic depth plate, D and 4. Depth was 3.56m. Replaced old C and 5 with new plastic 6mm versions.

## CMBG: Coomalbidgup

### Datum Details:

ID	Date	By Whom	Lake Height	AHD Height	Location
UR 276	11/4/2000	John Bullock & Assoc.	3.776m	58.704m	AMG E 349010 N 6267744 MGA94 Z 51 E 349163 N 6267888
CMBG BM	17/07/2008	Jim Lane			WGS 84 Z 51 H E 349163 N 6267892
CmbgBM	16/09/2008	Alan Clarke			WGS 84 Z 51 H E 349163 N 6267896

### Gauge Details:

ID	Date	By Whom	Lake Height	Location
1 (A)	11/4/2000	Alan Clarke	4m	
2 (B)	4/4/2001	Alan Clarke	3m	50m & 355° from DOLA datum
3 (C)	28/1/2003	Alan Clarke	2m	5m north into the lake from the end of the narrow embankment.
CMBG A	17/07/2008	Jim Lane	4m	WGS 84 Z 51 H E 349173 N 6267915
CMBG B	17/07/2008	Jim Lane	3m	WGS 84 Z 51 H E 349155 N 6267935
CMBG C	17/07/2008	Jim Lane	2m	WGS 84 Z 51 H E 349160 N 6267993
CmbgA	16/09/2008	Alan Clarke	4m	WGS 84 Z 51 H E 349178 N 6267917
CmbgB	16/09/2008	Alan Clarke	3m	WGS 84 Z 51 H E 349156 N 6267934
CmbgC	16/09/2008	Alan Clarke	2m	WGS 84 Z 51 H E 349162 N 6267996
CMBGD1	7/05/2009	Alan Clarke	1m	WGS 84 Z 51 H E 349212 N 6268134
CMBG E4	14/05/2017	Yvonne Winchcombe	4m	WGS 84 Z 51 H E 349145 N 6267916

### Gauge Maintenance:

Date	By Whom	Details
11/4/2000	Alan Clarke	The deepest point was determined by weight and line in the 3.6m punt. Lake depth on April 11 was 3.12m. A DOLA BM and a 4m depth gauge were installed. <b>The BM was connected to AHD.</b>
4/4/2001	Alan Clarke, Katherine Sorokine	Did not intent to visit this lake but stopped in for a look at the water level. The water was, from my observation, about 0.5m below the bottom of the 4m gauge (estimated lake height 2.5m). I decided to install a 3m gauge using a galvanised angle iron and plastic depth plate. I did not have the access map with the lake height of the DOLA benchmark. I levelled in the 3m gauge height from the 4m (no. 1) gauge. The check of the final height back to the 4m gauge was O.K. The 3m (no. 2) gauge is 50m on a bearing of 355 from the DOLA datum. Lake depth at gauge 2 was 2.25m.
Sept. 2001	Alan Clarke	The lake depth was 2.52m at gauge 2. The dropper installed by Jim Lane was exposed 190mm. The lake height for the top of the dropper is 2.71m.
28/1/2003	Alan Clarke, Mathilde Breton	Installed a new 2m gauge using a galvanised angle iron and plastic depth plate 5m north into the lake from the end of the narrow embankment. The new 2m gauge is visible from the old 3m gauge. Lake depth on the new 2m gauge was 1.24m.
29/3/2007	Alan Clarke	Installed an 'A' at the 4m gauge, a 'B' at the 3m gauge, a 'C' and the 2m gauge and two bolts at the base of the depth plate. The 1m gauge could not be found despite an extensive search in the area (under the water).
7/5/2009	Alan Clarke, Yvonne Winchcombe	Surveyed and installed new 1m gauge D using a galv angle and 6mm plastic depth plate. Lake bed level at 1m gauge D was 0.07m. Surveyed height of dropper as 0.834m. Replaced gauge plate at 2m gauge C and due to re-survey moved plate down 20mm. Need to amend any depth read at gauge C by adding 20mm (0.02m). A star iron installed by Grant Pearson was leveled. The lake height for the top of the star iron is 2.333m. Lake was dry and lake bed full of dead trees.
14/5/2017	Alan Clarke, Yvonne Winchcombe	Coomalbidgup is full (flooded), measured 17cm down from top of dropper to water surface. Approximate water level using line and level from BM UR 276 = 3.236m. Installed 3m s/s angle for new 4m gauge E. Surveyed from BM to dropper and new s/s angle. Top of s/s angle is 4.231m. Water level is 3.19m. Top of dropper is 3.353m. Dropper installed 11-3-2017 at water level (depth on 11-3-2017 therefore 3.353m). GPS CMBG E4 = 51 H 0349145, 6267916. Surveyed back to BM to check height. All ok.

**COBL: Coblinine****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	28/6/1979	Don Munro	5.0m		1.5m off fence-line at a point 19.0m from corner reference point
HD 215	23/5/1998	Scanlan Surveys	5.002m	258.098m	AMG84 E 564428 N 6306061
COBL BM	14/07/2009	Jim Lane			WGS 84 Z 50H E 564476 N 6306117

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	28/6/1979	Don Munro	5m	37.0m & 48° from CALM datum
2 (B)	28/6/1979	Don Munro	3m	5.0m & 87° from Gauge 1
3 (C)				
4 (D)				
COBL 3m gge	14/07/2009	Jim Lane	3m	WGS 84 Z 50H E 564506 N 6306124
COBL 4m gge	14/07/2009	Jim Lane	4m	WGS 84 Z 50H E 564497 N 6306124
COBL 5m gge	14/07/2009	Jim Lane	5m	WGS 84 Z 50H E 564485 N 6306118

**Gauge Maintenance:**

Date	By Whom	Details
23/5/1998	Alan Clarke, Grant Pearson	This lake is not currently monitored. The gauges were not renewed. The 5m mark on gauge 1 read 4.995 and the 3m mark on gauge 2 read 3.005 when surveyed to the CALM datum. Gauges 3 and 4 were broken and could not be leveled. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. Work carried out on May 23.

**COLL: Collets Road Swamp****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	15/2/2002	Alan Clarke	0.86m		50m south of Gauge on edge of fringing vegetation.
COLL Ref	4/11/2008	Yvonne Winchcombe			WGS 84 Z 50 H E 721677 N 6214394 (Temporary BM)
COLLBM	29/01/2009	Alan Clarke			WGS 84 Z 50 H E 721700 N 6214473 (Temporary BM)
COLL BM2	6/05/2009	Alan Clarke			WGS 84 Z 50 H E 721678 N 6214392 (Temporary BM)

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	15/2/2002	Alan Clarke	1m	Middle of lake
COLLA	4/11/2008	Yvonne Winchcombe	1m	WGS 84 Z 50H E 721653 N 6214434
COLLA	6/05/2009	Alan Clarke	1m	WGS 84 Z 50H E 721656 N 6214431

**Gauge Maintenance:**

Date	By Whom	Details
15/2/2002	Alan Clarke	The salt lake is 300m north of a point on Pabelup Drive, which is 1.7km west of the West Mt Barren track turnoff. Sue Elscott has taken depths and water samples from this wetland since September 2000 because South Pabelup has been dry. A 1m gauge using a galvanised angle iron and plastic depth plate was installed at the deepest point of the lake. A temporary datum, being a galvanised star iron, was installed 50m south of the gauge on the edge of the fringing vegetation and rising 0.15m from the ground. The lake height for the datum is 0.86m. The lake was dry with wet mud from heavy rain on the previous night.
6/5/2009	Alan Clarke, Yvonne Winchcombe	Installed 'A' on 1m gauge. Confirmed temporary BM location and took GPS location COLLBM2. Lake was dry. Note: Need to check GPS points collected by Yvonne Winchcombe using John Carters GPS – may not have had datum correctly set. The BM recorded by Yvonne is approx. 80m from the actual BM recorded by Alan's GPS (COLLBM2).

**COOM: Coomelberrup****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM	3/5/1978	Don Munro	1.5m		62.0m from datum
HD 211	23/5/1998	Scanlan Surveys	3.049m	261.288m	AMG84 E 573072 N 6303109 MGA94 Z 50 E 576062 N 6303126
CoomBM	19/09/2008	Alan Clarke			WGS 84 Z 50 H E 573060 N 6303130

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	3/5/1978	Don Munro	2m	1m & 2m gauge plates on wooden board
(B)	April 2006	Alan Clarke	2m	On shore gauge
CoomB	19/09/2008	Alan Clarke	2m	WGS 84 Z 50 H E 573049 N 6303143
COOM A1	6/4/2016	Yvonne Winchcombe	1m	WGS 84 Z 50 H E 573013 N 6303180

**Gauge Maintenance:**

Date	By Whom	Details
22/5/1998	Alan Clarke, Grant Pearson	The 1m mark on gauge 1 read 0.996 when surveyed to the CALM datum. The bottom 1m depth plate was replaced with a stainless steel depth plate. Both plates were moved up 4mm. The top 2m plate was secured with wood tech screws. The final level for the 1m mark on the new gauge 1 was 1.000. The gauge wood board was in reasonable condition. The lake height for the top of a wood stake used to measure water depth was 1.484. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauge. Work carried out on May 23.
4/4/2006	Alan Clarke, Julia Sisson	Installed a new 2m gauge near the shore of the lake because the original 2m gauge (wood board with two plates) is too far away when the water is around 2m deep. The original gauge is marked A and the new gauge is B and uses a galvanised angle with a 6mm plastic depth plate.
9/5/2009	Alan Clarke, Yvonne Winchcombe	2m gauge A on wooden board with both 1m and 2m gauge plates. Depth was 0.66m. Hundreds of shelduck and approx. 20 swans. Replaced metal 1m gauge plate with 6mm plastic plate using cable ties below water surface.
6/4/2016	Alan Clarke, Yvonne Winchcombe	Old A gauge has 1 & 2m plates on wooden board. 2m Gauge B on shore. Installed new 1m gauge A using stainless angle next to 2m A wooden gauge board. Depth 2A read 0.31m. Snapped off old wooden 2m board and old gauge plates.

**CORR: Corrigin 12900****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM	25/5/1982	Don Munro	1.0m		Approx. 110.0m along defined path on west side as per map.
HL 426	6/5/1998	Scanlan Surveys	2.362m	262.101m	AMG84 E 603398 N 6413137 MGA94 Z 50 E 603414 N 6413295
CorrBM	14/09/2008	Alan Clarke			WGS 84 Z 50 H E 603414 N 6413296
CORR BM	17/07/2009	Jim Lane			WGS 84 Z 50 H E 603415 N 6413294
CORR F&W BM	17/07/2009	Jim Lane			WGS 84 Z 50 H E 603389 N 6413200

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	25/5/1982	Don Munro	2m	8.0m & 290° from CALM datum
2 (B)	25/5/1982	Don Munro	2m	In N/E corner of dam, being approx. 210m & 127° from CALM datum. (1m & 2m gauge plates) (REPLACED)
2 (C)	5/5/1998	Alan Clarke	2m	Replaced original gauge 2 (1m & 2m gauge plates)
CorrA	14/09/2008	Alan Clarke	2m	WGS 84 Z 50 H E 603379 N 6413203
CorrC	14/09/2008	Alan Clarke	2m	WGS 84 Z 50 H E 603362 N 6413087
CORR A	17/07/2009	Jim Lane	2m	WGS 84 Z 50 H E 603379 N 6413204
CORR C	17/07/2009	Jim Lane	2m	WGS 84 Z 50 H E 603363 N 6413091

**Gauge Maintenance:**

Date	By Whom	Details
5/5/1998	Alan Clarke, Grant Pearson	The initial gauge heights have been taken from field book notes. The survey results only show final heights. The 2m mark on gauge 1 read 2.014 and the 1m mark on gauge 2 read 1.086 when surveyed to the CALM datum. The depth plate on gauge 1 was replaced with a stainless steel plate and lowered by 14mm. The survey results show the final level for the 2m plate was 2.001. Gauge 2 was loose in the ground and was removed. A new 2m gauge using 2 angle irons bolted together with both 1m and 2m depth plates at the correct level was installed a few metres to the left of the old gauge. The survey results show the final level for the 1m plate was 1.000. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The work was carried out on May 5.
11/2/2002	Alan Clarke, Mike Scanlon	Replaced both worn stainless steel depth plates on the 2m gauge 2 in the dam with plastic plates. The lake was dry.
1/4/2007	Alan Clarke	Installed an 'A' at the 2m onshore gauge. Installed a 'C' at the 2m gauge that is in the dam. This gauge is a tall angle with both 1m and 2m plastic depth plates. The water in the dam was below the 0.0m mark on gauge C.
12/3/2012	Alan Clarke, Anthony Reid	Replaced both old, damaged 3mm plastic depth plates on gauge C with two new 6mm plastic depth plates. Replaced old C sign with new 6mm plastic C.

**COYR: Coyrecup****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM	27/6/1979	Don Munro	2.5m		6.0m off fence at a point 10.0m from fence corner.
HD 207	22/5/1998	Scanlan Surveys	3.819m	276.571m	AMG 84 E 577057 N 6268401 MGA94 Z 50 E 577072 N 6268369
COYR BM	14/07/2008	Jim Lane			WGS 84 Z 50 H E 577072 N 6268374
CoyrBM	19/09/2008	Alan Clarke			WGS 84 Z 50 H E 577071 N 6268375

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	27/6/1979	Don Munro	3m	6.0m & 330° from CALM datum
2 (B)	27/6/1979	Don Munro	2m	90.0m & 5° from CALM datum
3 (C)	27/6/1979	Don Munro	1m	350.0m & due north 0° from CALM datum
COYR A	14/07/2008	Jim Lane	3m	WGS 84 Z 50 H E 577082 N 6268395
COYR B	14/07/2008	Jim Lane	2m	WGS 84 Z 50 H E 577073 N 6268471
COYR C	14/07/2008	Jim Lane	1m	WGS 84 Z 50 H E 577060 N 6268622
CoyrA	19/09/2008	Alan Clarke	3m	WGS 84 Z 50 H E 577080 N 6268395
CoyrB	19/09/2008	Alan Clarke	2m	WGS 84 Z 50 H E 577074 N 6268471
CoyrC	19/09/2008	Alan Clarke	1m	WGS 84 Z 50 H E 577058 N 6268622

**Gauge Maintenance:**

Date	By Whom	Details
30/4/1997	Alan Clarke, Grant Pearson	Work carried out by Alan Clarke and Grant Pearson on April 30. The old plates at gauges 2 and 3 were replaced with stainless steel plates. Both were moved up 2mm to agree with the CALM datum.
2/4/1998	Alan Clarke, Dorian Moro	Work carried out by Alan Clarke and Dorian Moro on April 2. The 3m mark on gauge 1 read 3.012 when surveyed to the CALM datum. A sledge hammer was used to knock the angle into the ground 12mm. The 2m mark on gauge 2 read 2.002 and the 1m mark on gauge 3 read 1.002 when surveyed to the CALM datum. They were not changed.
22/5/1998	Alan Clarke, Grant Pearson	The 3m mark on gauge 1 read 3.001, the 2m mark on gauge 2 read 2.004 and the 1m mark on gauge 3 read 1.004 when surveyed to the CALM datum. The depth plates on all gauges had been replaced in 1997. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The work was carried out on May 22.
5/4/2006	Alan Clarke, Julia Sisson	Replaced the depth plate at A (metal) and B (Stainless steel) with 6mm plastic plates. Gauge C was under water and could not be located because it was in water above the height of my waders. It was not possible to determine a depth from Brent Johnson's measurements made at gauge C in September 2002. An A and B were installed on their respective gauges.
27/3/2007	Alan Clarke	Beyond gauge B (2m) are two 1m gauges. The first was the usual Munro galv angle and a stainless steel plate that was faded. A 6mm plastic depth plate was installed with a '1' and labelled 'C'. At least 400m further out is a very heavy duty galv angle with steel depth plate and a plastic '1'. I assume from the plastic '1' that this is one of our gauges. A new 6mm plastic depth plate was installed and labelled 'D'. Brent Johnson recorded a measurement of '0.73 from top of angle' in 2001, but I am not sure which angle he was referring. I measured the distance from the top of the gauge C angle to the 1m mark and recorded it as 0.525m
7/4/2016	Alan Clarke, Yvonne Winchcombe	Replaced 3A gauge plate with new plate. 2B gauge ok. Wetland too deep to replace 1m gauge C or gauge D plates. C1 gauge read 0.86m.

**CRAC: Crackers****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM	10/7/1980	Don Munro	1.0m		At base of large Melaleuca approx. 43m S/W of track from a point 1.2km along track from entry. The tree is on the edge of the first open area of swamp encountered when entering along the track.
HM 1457	16/5/1998	Scanlan Surveys	1.099m	81.405m	AMG84 E 365596 N 6579497
CRAC BM	3/11/2008	Jim Lane			WGS 84 Z 50 J E 365586 N 6579519
CRAC F&W BM	3/11/2008	Jim Lane			WGS 84 Z 50 J E 365570 N 6579492

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	10/7/1980	Don Munro	2m	67.0m & 266° from CALM datum (1m & 2m gauge plates)
2 (B)	May 2000	Alan Clarke	1.5m	E 365297 N 6579760
CRAC B	16/09/2008	Jim Lane	1.5m	WGS 84 Z 50 J E 365297 N 6579774
CRAC A	3/11/2008	Jim Lane	2m	WGS 84 Z 50 J E 365512 N 6579486
CRACA	18/12/2009	Alan Clarke	2m	WGS 84 Z 50 J E 365513 N 6579484

**Gauge Maintenance:**

Date	By Whom	Details
16/5/1998	Alan Clarke, Grant Pearson	The 1m mark on gauge 1 read 1.000 when surveyed to the CALM datum. The bottom 1m plate was faded; it was replaced with a stainless steel plate at the same level. The survey results show the final level for the 1m mark on gauge 1 was 1.001. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauge. The lake was dry. The work was carried out on May 16.
May 2000	Alan Clarke, Stephanie Hill	A new 1.4m gauge, using galv. angle iron and plastic plates, was installed 42m to the west of the access track where the track turns south entering the main lake thicket. Its position is 365297 E and 6579760 N. The gauge was levelled in from the 1m gauge plate on the old gauge. In Nov. 2000 I checked the depth at both gauges. They were reading exactly the same value. Extra note: In Nov 1999 the depth was 1.04 and the water was 0.50 below the red tape place by Jim Lane in Sept 1999.
27/03/2006	Alan Clarke, Sandra Fleisher	Installed two new 6mm plastic depth plates on gauge B that had been destroyed by fire. The top of the gauge reads 1.5m. Gauge A was inspected and found to be in good order. An A and B were fixed to each gauge respectively. <u>Access</u> is now via a track that enters the reserve 100m west of the Nature Reserve sign at the north east corner of the reserve. This track intersects a firebreak 50m from the gravel road. This access track continues directly south, but a second track heads off in a southwest direction at the point of intersection with the firebreak. This south westerly track leads to the lake. This track is marked with blue tape. The blue tape continues to the second firebreak and onto the entry point for the first gauge.
12/5/2009	Alan Clarke, Yvonne Winchcombe	The access track from the fire break into the gauge was very over grown. The walk path into gauge B was cleared using a hand saw and loppers. A brush cutter and loppers were used to clear the vehicle access track. The track clearing took 2 hours to complete. The track is now clear from Nammegarra Road into the walk track and into gauge B. Lake was dry.
2/6/2010	Alan Clarke, Yvonne Winchcombe	1m (bottom) depth plate on 2m gauge A was missing. Installed 1m, 6mm plastic depth plate to old Munro wood board. Top depth plate (2m) was OK. Lake was dry, small puddles at datalogger site. LBL at 1.5m Gauge B = 0.53m.



CRAN: Cranbrook 25812

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	3/8/1980	Don Munro	2.0m		On the edge of bush bordering lake, approx 350m N/W along track from where fire-break meets fenceline.
HO 288	4/4/2000	John Bullock & Assoc.	3.198m	238.881m	AMG E 573570 N 6203270
CRANBM	5/11/2008	Yvonne Winchcombe			WGS 84 Z 50H E 573707 N 6203482
CRAN F&W BM	5/11/2008	Yvonne Winchcombe			WGS 84 Z E 573716 N 6203497

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	3/8/1980	Don Munro	1m	153.2m & 30° from HO 288
CRANA	5/11/2008	Yvonne Winchcombe		WGS 84 Z 50H E 573786 N 6203634

**Gauge Maintenance:**

Date	By Whom	Details
4/4/2000	Alan Clarke	The CALM datum was next to a large tree that had fallen over. The datum had a horizontal crack through the base of the 'block' which had originally been confined by four pieces of wood. This block could be lifted away from the base. The 1m mark on the gauge read 1.002 when surveyed to the CALM datum. The gauge board was in good condition, but the depth plate was only readable above 0.5m. A DOLA BM was installed and surveyed to the CALM datum and gauge. The lake was dry on April 4.

**CRON: Cronin**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	7/4/1981	Don Munro	1.0m		On east side of delta, 16.0m & 225° from north corner of dam
HH 281	21/5/1998	Scanlan Surveys	3.704m	382.623m	AMG84 E 760040 N 6413702
HH 281	13/04/2005	B Hugessen		382.623m	GDA94 E 760033.575 N 6413699.209 Note: AHD status recorded as Provisional
CRON BM	15/07/2009	Jim Lane			WGS 84 Z 50H E 760036 N 6413700

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	7/4/1981	Don Munro		107m & 78° from CALM datum

**Gauge Maintenance:**

Date	By Whom	Details
21/5/1998	Alan Clarke	The gauge was almost covered by the high water level. A water depth could not be determined. The CALM datum was underwater out near the dam. A DOLA benchmark was installed with reference marks but not surveyed to the gauge or datum. The work was carried out on May 21.
3/4/2001	Alan Clarke, Katherine Sorokine	The DOLA benchmark was installed in May 1998. The lake was flooded at this time. Access to the CALM datum and gauge has been restricted by the high water level since 1998. We were able to locate the CALM datum, which was solid and in good condition, and transfer its height to the DOLA benchmark. The lake height for the DOLA benchmark is 3.704. Lake depth was determined by measuring from the CALM (1m) datum up to the water surface, a distance of 105mm. Therefore lake depth was 1.105m. The depth gauge had been shot to pieces by high powered rifles. The depth plate was recovered from the bottom of the lake, it had sustained multiple bullet holes. The gauge board was splintered with large pieces missing, there were no recognisable marks to take a level from. The gauge could not be levelled to the CALM datum.
16/10/2001	Grant Pearson, Yvonne Winchcombe	Fire has been through in past, now thick regrowth surrounds lake. Post out in middle of lake but no gauge plate. Water depth at post = 850mm. 350mm exposed on post. Post is 1200mm high. Located DM datum (1m), exposed by 100-150mm water (in mud at base of trees) near NW corner of dam. Used dumpy to take reading of datum and water surface. Water still and level, calculated depth as 88.4cm. Installed new plastic gauge on galvanised angle against existing angle and broken post. New plastic gauge plate has broken top just above 0.90m Took reading from DM datum to new SCANLAN datum. New SCANLAN datum is 3.705m above deepest point in lake. Top of steel post is 86mm above top of 1m plate, thus top of steel post is 1.086m. Top of wooden post is 1.222m.

**DAVI: Davies****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
HA 57	24/5/1997	J. Payne DOLA	5.567m	2.015m	MGA94 E 318851 N 6211558
DAVIBM	15/09/2008	Yvonne Winchcombe			WGS 84 Z 50 H E 318852 N 6211560

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	24/5/1997	Alan Clarke	5m	
DAVIA	15/09/2008	Yvonne Winchcombe	5m	WGS 84 Z 50 H E 318892 N 6211607
DAVI A5	5/11/2016	Yvonne Winchcombe	5m	WGS 84 Z 50 H E 318892 N 6211605

**Gauge Maintenance:**

Date	By Whom	Details
24/5/1997	Alan Clarke	Alan Clarke and Jim Payne carried out the work on May 24. Soundings were taken to determine the deepest point using a punt, outboard and string line with weight. The deepest mark on the line was measured with a cloth tape. The depth of 4.4m was transferred to a 5m gauge at the edge of the lake. A DOLA benchmark with reference marks was installed and surveyed to the CALM gauge. The benchmark was not stamped.
19/3/2007	Alan Clarke, Yvonne Winchcombe	New entrance to Lake Davies – turn right at new entry statement and pull into first driveway on right. Walk down bank to access lake. Replaced worn stainless steel depth plate with new 6mm plastic depth plate. Attached 'A' at back of gauge.

**DOBA: Dobaderry**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM	6/4/1981	Don Munro	1.0m		On south side of swamp, 9.0m & 340° from largest wandoo tree on fringe of forest where track terminates.
HR 738	4/5/1998	Scanlan Surveys	1.393m	272.860m	AMG84 E 463091 N 6437231
DOBA BM1	19/09/2008	Jim Lane			WGS 84 Z 50H E 463077 N 6437224
DOBA F&W BM	19/9/2008	Jim Lane			WGS 84 Z 50H E 463040 N 6437217

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)			2m	(Near Shore)
2 (B)	6/4/1981	Don Munro	2m	Approx. 300.0m & 342° from datum (1m & 2m gauge) (Off Shore)
(B)		Alan Clarke	2m	1m to the south of the old gauge board
DOBA B	19/09/2008	Jim Lane	2m	WGS 84 Z 50H E 462989 N 6437371
DOBA A	10/9/2017	Jim Lane	1m	WGS 84 Z 50H E 462926 N 6437544
DOBA Nov08 spt	Nov 2008	Jim Lane		Dropper at sample point November 2008 WGS 84 Z 50 H E 462841 N 6437522

**Gauge Maintenance:**

Date	By Whom	Details
1/5/1997	Alan Clarke, Grant Pearson	The work was carried out on May 1 under the supervision of Bob McCarthy with Jim Payne as the survey operator. Jim Lane, Grant Pearson and Alan Clarke were present and assisted with the levelling and gauge maintenance. The CALM datum was secure. Two reference marks were installed for the CALM datum. The 1m mark on gauge 1, near shore (no installation record on Munro maps), read 0.622m when surveyed to the CALM datum. The two old plates were replaced with a 1m plate at the correct height. The 1m mark on gauge 2 read 0.885m. The old plate was replaced at the correct height.
4/5/1998	Alan Clarke, Grant Pearson	Both gauges at this lake have had their depth plates replaced and moved to the correct level by DOLA surveyors with supervision by CALM staff in 1997, see the 1997 BM report. The gauges were not resurveyed. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum. The work was carried out on May 4.
5/6/1998	Alan Clarke	The CALM datum and reference marks, DOLA datum and reference marks, and CALM datum to DOLA datum were resurveyed because the digital level on the previous visit at the beginning of the project was not operated correctly. Work carried out on June 5.
4/5/2007	Alan Clarke	Installed a 'B' & '2' on the 2m onshore gauge, which is a tall galv angle with both 1m and 2m depth plates. The 2m faded steel depth plate was replaced with a 6mm plastic depth plate. LBL @ B = 0.33m. The 1m gauge is a galv angle in the middle of the lake adjacent to the old Munro gauge wood board, which was de-commissioned in 1998. This gauge was labelled 'A' because it was the sight of the original gauge. A 6mm plastic depth plate was installed over the paint stripped stainless steel depth plate. LBL @ A = 0.05m.

**DOWE: Dowerin****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	14/6/1979	Don Munro	1.0m		1.5m north of fence corner
HU 12	13/2/2001	John Bullock & Assoc.	1.5654m	252.378m	MGA94 E 505691 N 6541492
DOWE BM	6/11/2008	Jim Lane			WGS 84 Z 50J E 505689 N 6541494
DOWE F&W BM	6/11/2008	Jim Lane			WGS 84 Z 50J E 505688 N 6541626

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	14/6/1979	Don Munro		107m & 316° from datum (in line with fence)
DOWE gauge	6/11/2008	Jim Lane		WGS 84 Z 50J E 505620 N 6541694

**Gauge Maintenance:**

Date	By Whom	Details
Feb. 2001	Alan Clarke	There was no Munro map to indicate the position of the CALM datum or gauges. We traveled the length of the lake eventually locating the stump of the original gauge board. We then traveled up slope in the direction that the gauge would have faced. We came upon a fence line running in the same direction. We looked amongst the scrub along the fence line until the old CALM datum was located at the change in direction of the fence near the road. The CALM datum, which was degraded, was leveled to an existing DOLA benchmark 200m south along the Dowerin-Meckering Road. The AHD of this benchmark is provided in the survey diagram.

**DULB: Dulbinning****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM	12/7/1979	Don Munro			5.0m & 320° from old fence corner
HL 427	9/5/1998	Scanlan Surveys	1.04m	298.430m	AMG84 E 557359 N 6359026
Dulbbm	13/09/2008	Alan Clarke			WGS 84 Z 50 H E 557418 N 6359015
Dulbcal mdatum	13/09/2008	Alan Clarke			WGS 84 Z 50 H E 557498 N 6359072

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	12/7/1979	Don Munro	2m	65.0m & 77° from datum (1m & 2m gauge plates)
(B)	April 2006	Alan Clarke	2m	Replaced old Munro gauge A at same site
Dulbb	13/09/2008	Alan Clarke	2m	WGS 84 Z 50 H E 557559 N 6359088
DULB B	10/11/2010	Jim Lane	2m	WGS 84 Z 50 H E 557559 N 6359088

**Gauge Maintenance:**

Date	By Whom	Details
9/5/1998	Alan Clarke, Grant Pearson	The 1m mark on gauge 1 read 0.997 when surveyed to the CALM datum. Both depth plates, 1m and 2m, were replaced on gauge 1. The survey results show the final level for the 1m plate was 1.008. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauge.
6/4/2006	Alan Clarke, Julia Sisson	The original Munro gauge consisting of a wood board with two depth plates to 2m was unstable. A new 2m gauge with two 6mm plastic depth plates and two galvanised angles joined together was installed adjacent to the old gauge. The old gauge was pulled out of the mud. This new gauge is marked as gauge B.

**DUMB: Dumbleyung****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM	28/6/1979	Don Munro			28.0m & 30° from N?W corner of Ladies WC also 4.0m north of Euc. Sp. Tree (small)
SSM DUM 173	21/5/1998	Scanlan Surveys	12.387m	266.066m	MGA94 E 560070 N 6309876
DUMBBM	9/05/2009	Alan Clarke			WGS 84 Z 50 H E 560071 N 6309876

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	28/6/1979	Don Munro	5m	23.0m & 115° from datum
2 (B)	28/6/1979	Don Munro	3m	40.0m & 86° from datum
3 (C)	28/6/1979	Don Munro	2m	120.0 & 56° from datum
4 (D)			1m	
5 (E)			1m	(REMOVED 23/5/1998)
DumbA	19/09/2008	Alan Clarke	5m	WGS 84 Z 50 H E 560135 N 6309885
DumbB	19/09/2008	Alan Clarke	4m	WGS 84 Z 50 H E 560149 N 6309906
DumbC	19/09/2008	Alan Clarke	2m	WGS 84 Z 50 H E 560165 N 6309914
DumbD	19/09/2008	Alan Clarke	1m	WGS 84 Z 50 H E 560221 N 6309944
DUMB A	10/09/2011	Jim Lane	5m	WGS 84 Z 50 H E 560135 N 6309888
DUMB B	10/09/2011	Jim Lane	4m	WGS 84 Z 50 H E 560149 N 6309908
DUMB C	10/09/2011	Jim Lane	2m	WGS 84 Z 50 H E 560164 N 6309916
DUMB D	10/09/2011	Jim Lane	1m	WGS 84 Z 50 H E 560220 N 6309946

**Gauge Maintenance:**

Date	By Whom	Details
23/5/1998	Alan Clarke, Grant Pearson	The 5m mark on gauge 1 read 4.956, the 3m mark on gauge 2 read 3.000, the 2m mark on gauge 3 read 2.005 and the 1m mark on gauge 4 read 1.018, when surveyed to the CALM datum. Gauges 1, 2 and 3 were not changed. The depth plate on gauge 4 was moved down 18mm. The final level for the 1m mark on the gauge 4 was 1.001. A 5 <sup>th</sup> gauge, which was not in operational condition, was removed. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. This mark was later upgraded to an SSM. The AHD of the lake SSM benchmark is 266.066m. The lake height of this benchmark is 12.387. Work carried out on May 23.
4/4/2006	Alan Clarke, Julia Sisson	Replaced both of the faded Munro depth plates at gauge B with 6mm plastic plates. An A and B were installed on their respective gauges. The 2m gauge C was exposed and still had the hazard boays attached.
28/3/2007	Alan Clarke	Installed a '2' and 'C' on the 2m gauge and installed a 3mm plastic depth plate over the old stainless steel depth plate. The 1m depth plate was too deep to replace. The stainless steel plate is quite readable, but will need replacing when the lake is dry. A '1' and 'D' were installed.
9/5/2009	Alan Clarke, Yvonne Winchcombe	Witness plate missing from BM/SSM. Located BM and took GPS reading. Replaced old stainless steel plate with 6mm plastic plate at 1m gauge D. Lake bed level at gauge D was 0.35m. Water present in lake (depth < 0.35m). Did not take sample (hyper saline).
6/4/2016	Alan Clarke, Yvonne Winchcombe	Used dumpy level from 1D gauge to determine top height of 2 <sup>nd</sup> post (0.620m). Measured down 35cm from top of post down to water surface. Calculated depth as 0.62 - 0.35= 0.27m. LBL of 1D gauge = 0.34m. Installed new gauge 1D using stainless steel angle next to old rusted gauge – removed old gauge.

**DUND: Dundas 33113**

**Datum Details:**

<b>ID</b>	<b>Date</b>	<b>By Whom</b>	<b>Lake Height</b>	<b>AHD Height</b>	<b>Location (See sketch diagram for details)</b>
CALM	13/3/1980	Don Munro	2.0m		21.0m south of roadside
UX 21	14/4/2000	John Bullock & Assoc.	2.186m	234.050m	AMG E 393150 N 6358500
DundasBM	6/11/2008	Alan Clarke			WGS 90 Z 51H E 391998 N 6359382

**Gauge Details:**

<b>ID</b>	<b>Date</b>	<b>By Whom</b>	<b>Lake Height</b>	<b>Location (See sketch diagram for details)</b>
1 (A)	13/3/1980	Don Munro	1m	120.0m & 152° from CALM datum 103.5m & 151° from UX 21
2 (B)				229.0m & 150° from UX21

**Gauge Maintenance:**

<b>Date</b>	<b>By Whom</b>	<b>Details</b>
14/4/2000	Alan Clarke	The 1m mark on the gauge read 1.009 when levelled to the CALM datum. The CALM datum and gauge were in good condition. Lake depth on April 14 was 0.06 in the centre of the lake, lake bed dry at gauge. A DOLA BM was installed and surveyed to the CALM datum and gauge.



**EGAN: Eganu****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM	6/7/1978	Don Munro	2.6m		Marked on Melaleuca tree located approx. 26.0m south from where track enters lake. (21.0m & 277° from tree)
HM 1454	18/5/1998	Scanlan Surveys	3.379m	230.283m	AMG84 E 391375 N 6680529 MGA94 Z 50 E 391570 N 6680552
EGAN BM1	17/09/2008	Jim Lane			WGS 84 Z 50 J E 391567 N 6680556
EGAN F&W BM	17/09/2008	Jim Lane			WGS 84 Z 50 J E 391440 N 6680554

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	6/7/1978	Don Munro	3m	21.0m & 282° from datum (on tree)
2 (B)	6/7/1978	Don Munro	1m	295.0m & 328° from gauge 1
3 (C)	18/5/1998	Alan Clarke	3m	Close to CALM datum
4 (D)	18/5/1998	Alan Clarke	2m	
EGAN 3	17/09/2008	Jim Lane	3m	WGS 84 Z 50 J E 391415 N 6680554 (Sign on tree)
EGAN C	17/09/2008	Jim Lane	3m	WGS 84 Z 50 J E 391440 N 6680554
EGAN D	17/09/2008	Jim Lane	2m	WGS 84 Z 50 J E 391370 N 6680573
EGAN B	12/11/2010	Jim Lane	1m	WGS 84 Z 50 J E 391219 N 6680742
EGAN DoW	8/11/2012	Jim Lane		WGS 84 Z 50 J E 391255 N 6680605 (DoW Gauge)
EGAN B1	24/05/2017	Yvonne Winchcombe	1m	WGS 84 Z 50 J E 391219 N 6680742
EGAN E3	24/5/2017	Yvonne Winchcombe	3m	WGS 84 Z 50 J E 391382 N 6680561

**Gauge Maintenance:**

Date	By Whom	Details
18/5/1998	Alan Clarke, Grant Pearson	The 3m mark on gauge 1 read 2.995 and the 1m mark on gauge 2 read 0.999 when surveyed to the CALM datum. Gauge 1 was a depth plate nailed to a tree. A new 3m gauge was installed close to the old CALM datum using a galvanised angle iron and stainless steel depth plate. The gauge height was levelled in from the secure CALM datum. The survey results show that the final level for the 3m mark on the new 3m gauge was 3.002. A new 2m gauge was installed using a galvanised angle iron and stainless steel depth plate. The survey results show that the final level for the 2m mark on the new 2m gauge was 1.999. Gauge 2 (1m) was in about 0.6m of water and unlikely to be used so it was left unchanged. The new 3m gauge should be referred to as number 3 and the new 2m gauge as number 4. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The work was carried out on May 18.
2/4/2007	Alan Clarke	Installed a 'C' at the 3m gauge. Installed a 'D' at the 2m gauge and installed a 'B' and '1' on the old Munro wood board gauge, which is situated 300m to the north of the other gauges. The old Munro steel depth plate was removed and replaced with a 3mm plastic depth plate. A new gauge has appeared. This gauge is typical of the Department of Water construction method with heavy galv steel pipe for facilitating a data logger (not present) with a heavy wood board as the backing for two plastic depth plates. This gauge is 50m into the lake from and on the same line as our gauge C & D. The two depth plates to a height of 1.5m are at the same level as our gauges and could therefore be used to record depth. Bill Muir's photo of the depth gauge he used for recording lake depth from his November 2006 run is of this new gauge.
24/5/2017	Alan Clarke, Yvonne Winchcombe	Access via EGAN TP2 – no defined track, cut across through shrubbery to firebreak. Follow indistinct track, quite sandy and boggy. Gauge C3 water surface 2cm below 2.0, depth is 1.98m. High water mark on C3 indicates depths of 2.39m. Water too deep to find gauge D. Installed temporary 3m gauge on old 'Don Munro' wooden board using water level – labelled E3. GPS EGAN E3 50 J 391382, 6680561. (Can measure down from 2.0 when water recedes.)

**EGRE: Egret****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
HC 294	6/5/1999	Scanlan Surveys	2.723m	3.184m	AMG84 E 379600 N 6314733
EGRE BM1	13/09/2008	Jim Lane			WGS 84 Z 50 H E 379666 N 6314855

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)			1m	
EGRE A1	13/09/2008	Jim Lane	1m	WGS 84 Z 50 H E 379644 N 6314833

**Gauge Maintenance:**

Date	By Whom	Details
6/5/1999	Alan Clarke	A Munro map could not be found for this lake. A CALM datum could not be found. The 1m mark on the gauge was used as a temporary datum. The old rusted depth plate was replaced with a plastic depth plate. A DOLA benchmark was installed with reference marks and surveyed to the gauge.
3/5/2007	Alan Clarke	The galv angle for the 1m gauge was very rusted and required replacement. A new 1m gauge was installed close to the old gauge using a galv angle and 6mm plastic depth plate. This gauge was levelled using a bubble level to the old gauge. An 'A' and '1' were installed at the top of the gauge. The old gauge was removed by pushing the angle around until it snapped at its base.

**ELLE: Ellen Brook****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM1	21/5/1979	Don Munro	0.5m		45.0m & 114° from SEC pole
CALM2	21/5/1979	Don Munro	0.4m		120.0m & 321° from CALM1 datum
HZ 924	14/5/1999	Scanlan Surveys	0.595m	17.789	AMG84 E 408600 N 6486370
ELLE BM	1/08/2009	Jim Lane			WGS 84 Z 50J E 408758 N 6486521

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	21/5/1979	Don Munro	1m	8.0m from CALM datum at approx. 125°
2 (B)	21/5/1979	Don Munro	1m	16.0m from CALM datum at approx. 325°
ELLE 1m gge	20/07/2009	Jim Lane	1m	WGS 84 Z 50J E 408797 N 6486244

**Gauge Maintenance:**

Date	By Whom	Details
14/5/1999	Alan Clarke	There is a CALM datum for each of the two gauges. The gauge 1 datum is marked 0.5 and the gauge 2 datum is marked 0.4. The 1m mark on gauge 1 read 1.001 when surveyed to its datum. The 1m mark on gauge 2 read 0.995 when surveyed to its datum. A DOLA benchmark was installed with reference marks and surveyed to both datums and their respective gauge. The work was carried out on May 14.

**ENEM: Eneminga****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM	10/7/1980	Don Munro	1.0m		On east side of swamp half way along shore and on swamp side of small grove of Melaleuca sp trees. This grove is the one furthest into lake of all others.
HM 1460	11/5/1999	Scanlan Surveys	4.224m	77.374m	AMG84 E 358547 N 6590020
ENEM BM1	16/09/2008	Jim Lane			WGS 84 Z 50 J E 358697 N 6590178
ENEM F&W BM	16/09/2008	Jim Lane			WGS 84 Z 50 J E 358925 N 6590302
ENEM BM HM1460	25/5/2017	Yvonne Winchcombe			WGS 84 Z 50 J E 358697 N 6590178

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	10/7/1980	Don Munro	1m	(Inshore) 5.0m below high water – at end of track being approx. 250m & 285° from Gauge 2
2 (B)	10/77/1980	Don Munro	1m	(Offshore) 64.0m & 201° from CALM datum
ENEM gge EAST	16/09/2008	Jim Lane		WGS 84 Z 50 J E 358911 N 6590250
ENEM gge WEST	16/09/2008	Jim Lane		WGS 84 Z 50 J E 358713 N 6590186
ENEM A	12/09/2012	Jim Lane	2m	WGS 84 Z 50 J E 358713 N 6590188
ENEM C	12/09/2012	Jim Lane	1m	WGS 84 Z 50 J E 358772 N 6590182
ENEM A2	7/11/2016	Jim Lane	2m	WGS 84 Z 50 J E 358714 N 6590186
ENEM D3	25/5/2017	Yvonne Winchcombe	3m	WGS 84 Z 50 J E 358706 N 6590183
ENEM D	5/11/2017	Jim Lane	3m	WGS 84 Z 50 J E 358706 N 6590183

**Gauge Maintenance:**

Date	By Whom	Details
11/5/1999	Alan Clarke	This lake is not currently monitored. The gauges were not altered. The 1m mark on gauge 1 read 0.992 and the 1m mark on gauge 2 read 0.994 when surveyed to the CALM datum. Gauge 1 wood board was in reasonable condition, but the depth plate was rusted and faded. Gauge 2 wood board was in reasonable condition, the bottom depth plate was missing. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. Work carried out on May 11.
26/4/2012	Alan Clarke, Anthony Reid	<p>Departed Jurien Bay in the morning and travelled to Enaminga travelling south along the Brand Hwy. Take left turn along Mimegarra Road 12.1km from Brand Hwy. Take track/cut line on left 1km from 12.1km turn off. Follow cut line down to Enaminga creek line following track as it turns right heading south east along creek line. Turn left into vague track at WPT name 'ENAMtrakent' WGS84 Z50 E 358340, N 6590205. Follow this track approximately 400m into the lake benchmark.</p> <p>The depth plate was missing from the old Munro 2m gauge. A dumpy level was used to transfer a lake height from the benchmark to the top of the original 2m gauge angle. A 6mm plastic depth plate, A and 2 were fixed to the angle at the correct height. The GPS coordinates for A are WGS 84 Z50 E 358715, N 6590187.</p> <p>The dumpy and staff were used to determine the deepest point in the basin and a new Stainless steel angle was installed at that lowest point. A lake height was transferred on to the top of the angle from the benchmark and a 6mm plastic depth plate, 1 and C were fixed to the angle at the correct height. The GPS coordinates for the new 1m gauge C are WGS 84 Z50 E 358772, N 6590183.</p> <p>The old angle on the east side of the Enaminga basin was not surveyed as the deepest point survey revealed it was in a higher position than the new gauge C. Both the up graded 2m gauge and the new 1m gauge C are on and near, respectively, the west side of the basin, which is where the west</p>

		side access enters the wetland. The wetland was dry. The depth gauge maintenance at Enaminga was completed as part of a field run north to install rain gauges and loggers at Chandala and Crackers.
25/5/2017	Alan Clarke, Yvonne Winchcombe	From Brand Hwy turn west into Mimegarra Road (bitumen), follow for 12kms then turn east onto gravel (Mimegarra Rd). At ENEM TP1 turn east down sandy track – reduce tyre pressure as sand soft. Bush burnt on south side of track. Follow break down to lake and follow track south around lake to ENEM TP2. Turn east and follow to BM HM 1460. A2 reads 1.08m Survey and installed 3m s/s angle, aluminium gauge plate, ‘D’ and ‘3’ on edge of path down to lake. A2 reading 2mm too low, D3 reading 3mm too high when surveyed back to BM.

**ESP1: Esperance 26410**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM	26/5/1982	Don Munro	0.5m		On apron of perimeter ridge on mallee line and 8.0m S/W of track
UR 272	29/5/1998	Scanlan Surveys	0.659m	73.490m	AMG84 E 304974 N 6265010
ESP1BM	7/05/2009	Alan Clarke			WGS 84 Z 51 H E 304849 N 6265010
ESP1 TBM	14/5/2017	Yvonne Winchcombe			WGS 84 Z 51 H E 304773 N 6264675 (Temporary Benchmark)

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	26/5/1982	Don Munro	1m	150.0m & 97° from datum
2 (B)	14/2/2002	Alan Clarke	2m	
3 (C)			3m	Fixed to a tree on right hand side of track at the base of the steep descent into the lake.
ESP1 B	17/07/2008	Jim Lane	2m	WGS 84 Z 51 H E 304889 N 6264883
ESP1 FW 3m	17/07/2008	Jim Lane	3m	WGS 84 Z 51 H E 304808 N 6264728
Esp1B	16/09/2008	Alan Clarke	2m	WGS 84 Z 51 H E 304893 N 6264886
Esp1A	7/05/2009	Alan Clarke	1m	WGS 84 Z 51 H E 305015 N 6264993
ESP1 C3	14/5/2015	Yvonne Winchcombe	3m	WGS 84 Z 51 H E 304841 N 6264791
ESP1 TMP 2m	14/5/2017	Yvonne Winchcombe	2m	WGS 84 Z 51 H E 304787 N 6264680 (Temporary 2m gauge attached to tree – 1m and 2m gauge plates)
ESP1 moved ggl	30/4/2018	Alan Clarke	1m	WGS 84 Z 51 H E 303792 N 6264677 (Relocated temporary gauge further in wetland – only 1m gauge plate)

**Gauge Maintenance:**

Date	By Whom	Details
29/5/1998	Alan Clarke, Grant Pearson	The 1m mark on gauge 1 read 1.072 when surveyed to the CALM datum. The wood board was in reasonable condition, but loose in the ground. A galvanised angle iron was fixed to the board to secure it in the ground. The faded depth plate was replaced with a stainless steel depth plate and moved up 72mm. The plate was secured with wood tech screws. The final level for the 1m mark on gauge 1 was 1.000. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. Work carried out on May 29. The lake was dry.
Sept. 2001	Alan Clarke	The water had flooded out into the Yate woodland. The 1m gauge in the middle of the lake was covered. I located, using the blue diamond sign, the benchmark and measured with an offset tape the distance from the benchmark up to the water surface. I calculated the lake height by adding the BM to water distance to the known lake height of the BM. A 2m gauge is required close to the entrance track. A 3m gauge already exists. It is nailed to a tree at the start of the access track into the lake.
14/2/2002	Alan Clarke, Mike Scanlon	Installed a new 2m gauge using a galvanised angle iron and plastic depth plate to the right of the track into the lake. The new gauge is reading 8mm too low. The depth on the new 2m gauge was 1.110m. A 3m gauge plate is still fixed to a tree on the right hand side of the track at the base of the steep descent into the lake.
28/1/2003	Alan Clarke, Mathilde Breton	Replaced the damaged and faded 1m depth plate on gauge 1. Replaced the 2m depth plate on gauge 2 and moved the new plate up 8mm. This gauge was installed 8mm too low in February 2002, see details from last years maintenance report. Lake depth on the 1m gauge 1 was 0.25m.
29/3/2007	Alan Clarke	Installed a 'B' on the 2m gauge. The water was too deep to reach the 1m gauge. There is an old 3m gauge on a tree near the base of the descent down onto the lake floor on the right hand side of the entrance track. The water was near the base of this tree. I channelled the water to the base of the tree and measured 0.4m up from the water to the 2m mark on the depth plate (bottom of gauge). The lake depth was 1.67 @ B + 0.4 = 2.07m. The tree has grown 0.07m since the gauge was installed. A gauge ID was not installed, but this could act as a useful datum if the water floods to this point in the future.
7/5/2009	Alan Clarke, Yvonne Winchcombe	Beautiful lake with over 800 birds. Using binoculars Alan did quick bird count - 30 black fronted plover, 8 white faced heron, numerous grey teal and black duck, 12 southern shovellers, 11 chestnut teal, 1 black winged stilt, 60 coot and 2 black swans. Depth at 1m gauge A was 0.255m. Cleaned

		gauge plate and attached an 'A'.
7/4/2011	Alan Clarke, Yvonne Winchcombe	3m gauge on tree dry. Alan waded in to 2m gauge B, depth = 1.38m. Used water level to install new 3m gauge C at GPS 51 H 0304842, 6264795 (ESP1 C3M). Measured down from bottom of 3m gauge to water surface = 62cm (2m - 0.62 = 1.38m)
13/4/2014	Alan Clarke, Yvonne Winchcombe	The 2m mark on the 3m FW gauge (read by Dave Cale in Sep 2013 and Jim Lane in Nov 2013) was 90mm above the water surface. The depth was therefore 1.91m. The 2m mark on the 3m Gauge C was 75mm above the water surface. The depth was therefore 1.925m. The difference between the two gauges is 16mm. Depth on 2m Gauge B read 1.935m.
14/5/2017	Alan Clarke, Yvonne Winchcombe	Wetland is full (flooded), temporary 2m gauge plate attached to tree on RHS of track in read 0.39m at 13:45. Drove in s/s peg as a temporary reference mark for the temporary 2m gauge. ESP1 TBM top of peg is 8cm above LBL at GPS 51 H 0304773, 6264675. Top of ESP1 TBM is 0.668 above 1m gauge. The temporary 2m gauge on tree ESP1 TMP 2m is at GPS 51 H 0304787, 6264680.
30/4/2018	Alan Clarke, Laurent Marsol	Depth at temporary depth gauge on tree was 0.13m. Removed the two depth plates on the tree and installed one of these depth plates on a tree 10m further out into the wetland. Only installed one plate because too deep (lake floor too low to reach further up, even on ladder, to fix second depth plate. Installed at 0.13m. GPS wpt ESP1 moved gg1 - Z51 E 303792 N 6264677.  Removed SAP#2 camera to use for bittern work this Spring and replaced with BP#19 on first depth gauge tree. New camera was setup on tree with original two depth plates facing the new 2 <sup>nd</sup> gauge tree. GPS wpt Z51 E 304783, N 6264676.

**ESP2: Esperance 27768 (Grass Patch)****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	10/6/1981	Don Munro	1.0m		3.0m above high water, directly down from end of track.
UE 361	14/4/2000	John Bullock & Assoc.	2.167m	190.987m	AMG Zone 51 E 388650 N 6319600
Esp2BM	6/11/2008	Alan Clarke			WGS 91 Z 51H E 388786 N 6319769

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	10/6/1981	Don Munro	1m	65.0m & 212° from CALM datum

**Gauge Maintenance:**

Date	By Whom	Details
14/4/2000	Alan Clarke	Access only by foot or argo. The 1m mark on the gauge read 0.999 when levelled to the CALM datum. The CALM datum and gauge were in good condition. Lake depth on April 14 was 0.09. A DOLA BM was installed and surveyed to the CALM datum and gauge.



**ESP3: Esperance 27985****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM	10/6/1981	Don Munro	1.0m		4.0m above high water mark being 295° and 60.0m from corner fence post (reference point)
UE 360	14/4/2000	John Bullock & Assoc.	1.450m	182.082m	AMG Zone 51 E 385840 N 6309170
Esp3BM	16/09/2008	Alan Clarke			WGS 84 Z 51H E 385963 N 6309342
Esp3 CALM DATUM	16/09/2008	Alan Clarke			WGs 84 Z 51H E 385956 N 6309331

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	10/6/1981	Don Munro	1m	75.0m & 223° from datum (1m & 2m gauge plates)
Esp3A	16/09/2008	Alan Clarke		WGS 84 Z 51H E 385905 N 6309274

**Gauge Maintenance:**

Date	By Whom	Details
14/4/2000	Alan Clarke	The 1m mark on the gauge read 0.999 when surveyed to the CALM datum. The wood gauge board is in good condition. The angle iron support is rusted but OK, replaced loose gauge plate with plastic plate. Lake depth on April 14 was 0.145m.
30/3/2007	Alan Clarke	Installed an 'A' on the 2m gauge.

**ESP4: Esperance 32128****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	27/5/1982	Don Munro	1.0m		On east side of track, 8.0m before end of track where it enters open area of lake at timber (Mel. Sp) line.
UE 365	13/4/2000	John Bullock & Assoc.	3.635m	119.612m	AMG Zone 51 E 470995 N 6278360
UE 365	22/02/2009	B Hugessen		119.612m	GDA94 Z 51 E 471180 N 6278570

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	27/5/1982	Don Munro		154.0m & 170° from CALM datum

**Gauge Maintenance:**

Date	By Whom	Details
13/4/2000	Alan Clarke	On Howick Road has only had a DOLA BM installed. The water level on April 13 was above the CALM datum and gauge. Alan or Grant will have to return when the water level recedes and connect the CALM datum and gauge to the new BM.
5/4/2001	Alan Clarke, Katherine Sorokine	The DOLA benchmark was installed in April 2000, but because the lake was flooded the CALM datum and gauge were not surveyed to the benchmark. The CALM datum was located in approximately 1m of water. We levelled from the DOLA Datum to the CALM datum and back again to transfer a lake height to the DOLA benchmark. The misclose of 4mm was applied to the final height. The lake height for the DOLA benchmark is 3.635m. After the survey I checked the stability of the datum and found it could be moved with pressure from my foot. The soil around the datum has softened because of the inundation. The datum was level and the 1m sign correctly positioned on first inspection. I believe it was close or at the same level as it was initially installed. I could not see the gauge, but even if it was visible we could not determine a level because of the distance away from the CALM datum across the water.

**ESP5: Esperance 32776****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	11/6/1981	Don Munro	1.0m		On outer edge of samphire approx 15.0m west from where track enters lakes samphire perimeter.
UE 364	13/4/2000	John Bullock & Assoc.	1.570m	159.449m	AMG Zone 51 E 438140 N 6294455
UE 364	21/02/2009	B Hugessen		159.449m	GDA94 Z 51 E 438274 N 6294596

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	11/6/1981	Don Munro	1m	85.0m & 5° from CALM datum

**Gauge Maintenance:**

Date	By Whom	Details
13/4/2000	Alan Clarke	Has difficult access in wet conditions. We used the argo to negotiate 9km round trip through numerous flooded sections along the access track. The 1m mark on the gauge read 0.995 when surveyed to the CALM datum. The CALM datum was OK but the cement is eroding away from the base. The Wood gauge board is deteriorating, angle iron support rusted but OK, gauge plate good. Lake depth on April 13 was 0.15m. A DOLA BM was installed and surveyed to the CALM datum and gauge.

**FLAG: Flagstaff**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM	28/6/1979	Don Munro	2.0m		25.0m & 132° from culvert (east side of road) or 7.0m off roadside at a point 23.0m south of culvert.
HD 221	12/5/1998	Scanlan Surveys	3.327m	243.953m	AMG84 E 523590 N 6291466
FLAG BM	18/07/2008	Jim Lane			WGS 84 Z 50 H E 523642 N 6291467
FLAG F&W BM	18/07/2008	Jim Lane			WGS 84 Z 50 H E 523661 N 6291473
FlagBM	19/09/2008	Alan Clarke			WGS 84 Z 50 H E 523642 N 6291470

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	28/6/1979	Don Munro	2m	14.0m & 58° from datum
2 (B)	28/6/79	Don Munro	1m	180m & 58° from datum
FLAG A	18/07/2008	Jim Lane	3m	WGS 84 Z 50 H E 523670 N 6291480
FLAG B	18/07/2008	Jim Lane	1m	WGS 84 Z 50 H E 523792 N 6291557
FlagA	19/09/2008	Alan Clarke	3m	WGS 84 Z 50 H E 523670 N 6291481
FlagB	19/09/2008	Alan Clarke	1m	WGS 84 Z 50 H E 523791 N 6291557

**Gauge Maintenance:**

Date	By Whom	Details
12/5/1998	Alan Clarke, Grant Pearson	The 2m mark on gauge 1 read 2.013 and the 1m mark on gauge 2 read 1.020 when surveyed to the CALM datum. Both the 1m and 2m depth plates on gauge 1 were in good condition. They were not replaced, but were dropped down 13mm. The survey results show the final level for the 2m mark on gauge 1 was 2.001. The depth plate at gauge 2 was replaced with a stainless steel plate and moved down 20mm. The survey results show the final level for the 1m mark on gauge 2 was 1.002. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The work was carried out on May 12.
4/5/2007	Alan Clarke	Installed an 'A' on the 2m onshore gauge, which is a wood board with both 1m and 2m depth plates. Installed a 'B' on the 1m offshore gauge and replaced the 1m stainless steel depth plate with a 6mm plastic depth plate.

**FORR: Forrestdale****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM	30/11/1977	Don Munro	3.0m		Approx 35.0m & 239° from corner of road (UNABLE TO LOCATE)
HZ 928	3/5/1999	Scanlan Surveys	3.032m	24.662m	AMG84 E 399900 N 6442030
FORR BM1	4/08/2008	Jim Lane			(#1) WGS 84 Z 50H E 400062 N 6442240
FORR BM2	14/09/2008	Jim Lane			(#2) WGS 84 Z 50H E 400066 N 6442240

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)			2m	(NO LONGER EXISTS)
2 (B)	30/11/1977	Don Munro	1m	239° from datum & 159° from Moore Street Junction (ie. 339° to Moore Street)
WRC (C)		WRC	23m AHD	(To convert to CALM lake depth deduct 21.63m)
FORR 23m	4/08/2008	Jim Lane	23m AHD	DoW Gauge WGS 84 Z 50H E 399940 N 6441945
FORR 23mAHD2	14/09/2008	Jim Lane	23m AHD	DoW Gauge WGS 84 Z 50H E 399940 N 6441944

**\*\*NOTE: To convert DoW gauge readings to CALM lake depth deduct 21.63m**

**Gauge Maintenance:**

Date	By Whom	Details
3/5/1999	Alan Clarke	The CALM datum was not found. A metal detector and two other ground searchers were used without success. The CALM 2m gauge 1 had fallen over. The 1m gauge 2 was in reasonable condition. The 1m mark on this gauge was adopted as the temporary CALM datum. The CALM 1m mark on gauge 2 was levelled to the 23m AHD mark on the WRC gauge used to record water depths. The survey results show that the 23m AHD equals 1.37m CALM lake height. To determine the CALM lake height from a WRC gauge reading subtract 21.63. A DOLA benchmark was installed with reference marks and surveyed to the WRC and CALM gauges. The lake benchmark was levelled to an existing DOLA benchmark. The AHD of the lake benchmark is 24.662. The lake height of this benchmark is 3.032. Work carried out May 3 and 4.

**FRAS: Fraser's**

## Datum Details:

ID	Date	By Whom	Lake Height	AHD Height	Location
HU 398	13/2/2001	John Bullock & Assoc.	2.2396m	254.102m	MGA94 Z 50 E 507238 N 6542439
FRAS BM1	18/09/2008	Jim Lane			WGS 84 Z 50J E 507236 N 6542443

## Gauge Details:

ID	Date	By Whom	Lake Height	Location
1 (A)	11/5/2000	Alan Clarke	2.0m	E 507213 N 6542446 290° from datum
2 (B)	13/2/2001	Alan Clarke	1.0m	45m & 282° from Gauge 1
FRAS A	18/09/2008	Jim Lane		WGS 84 Z 50J E 507215 N 6542449
FRAS B	18/09/2008	Jim Lane		WGS 84 Z 50J E 507171 N 6542460

## Gauge Maintenance:

Date	By Whom	Details
11/5/2000	Alan Clarke, Stephanie Hill	I used a staff to determine the deepest point, which was in the middle of the small dam within the wetland. The depth was 1.35m. I transferred this depth to a plastic depth plate fixed to a galv. angle iron. The gauge is situated on the eastern shore about 1/3 the way up from the south end. Gauge position is 507213 E and 6542446 N.
13/2/2001	Alan Clarke	Installed a 1m gauge in the dam, which is within the lake. The new 1m gauge was levelled in from the 2m gauge, which was installed in April 2000. A DOLA benchmark was installed with reference marks upslope from the 2m gauge. The 2m gauge is gauge 1 and the 1m gauge is gauge 2. The lake depth on February 13 was 0.61m. Transect 1 on the east side near the gauge has had lake level heights transferred from the benchmark to the top of each of the bore casings and at ground level for their associated star irons. The height data are contained in the down loaded survey computations from the WILD digital level that accompanies the access diagram on file.
2/4/2007	Alan Clarke	Installed an 'A' at the 2m onshore gauge. Installed a 'B' at the 1m gauge that is in the dam.

**GARD: Gardner**

**Datum Details:**

<b>ID</b>	<b>Date</b>	<b>By Whom</b>	<b>Lake Height</b>	<b>AHD Height</b>	<b>Location (See sketch diagram for details)</b>
CALM	14/5/1981	Don Munro	3.0m		2.0m off south side of access track at a point 25.0m above the high water mark – where track enters lake.
HO 291	5/4/2000	John Bullock & Assoc.	2.854m	1.115m	AMG E 605670 N 6129770
GARDBM	16/09/2008	Yvonne Winchcombe			WGS 84 Z 50H E 605828 N 6129943

**Gauge Details:**

<b>ID</b>	<b>Date</b>	<b>By Whom</b>	<b>Lake Height</b>	<b>Location (See sketch diagram for details)</b>
1 (A)	14/5/1981	Don Munro	3m	29.0m & 320° from CALM datum
2 (B)	14/5/1981	Don Munro	2m	74.0m & 290° from CALM datum
GARDA	16/09/2008	Yvonne Winchcombe		WGS 84 Z 50H E 605808 N 6129960

**Gauge Maintenance:**

<b>Date</b>	<b>By Whom</b>	<b>Details</b>
5/4/2000	Alan Clarke	The 3m mark on gauge 1 read 3.006 and on gauge 2 read 2.007 when surveyed to the CALM datum. Gauge 1 is in good condition, gauge 2 just readable. A DOLA BM was installed and surveyed to the CALM datum and gauges. Lake depth on April 5 was 2.005m.

**GIBB: Gibbs**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
HR 699	3/5/1999	Scanlan Surveys		25.006m	AMG84: E 397478 N 6441517
GIBB BM1	4/08/2008	Jim Lane			(#1) WGS 84 Z 50H E 397627 N 6441667
GIBB BM2	14/09/2008	Jim Lane			(#2) WGS 84 Z 50H E 397628 N 6441668

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
WRC (A)			25m AHD	DoW Gauge
GIBB 25mAHD1	4/08/2008	Jim Lane	25m AHD	DoW Gauge (#1) WGS 84 Z 50H E 397657 N 6441771
GIBB 25mAHD2	14/09/2008	Jim Lane	25m AHD	DoW Gauge (#2) WGS 84 Z 50H E 397660 N 6441771

**\*\*NOTE: To convert DoW gauge readings to CALM lake depth deduct 23.84m**

**Gauge Maintenance:**

Date	By Whom	Details
3/5/1999	Alan Clarke	The depth gauge at this lake is a WRC gauge, which is levelled to AHD. A DOLA benchmark was installed with reference marks and surveyed to the 25m AHD mark on the WRC gauge. The lake height for the top of a star iron picket used to measure water depth was 25.350 AHD. The deepest point of the lake needs to be found and a lake height conversion calculated for the 25m AHD mark on the WRC gauge. The work was carried out on May 3.



**GING: Gingin 31241****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	13/6/1979	Don Munro	2.0m		South side of large Melaleuca tree situated approx. 3.0m south side of channel and on approx. max. high water mark.
HZ 917	17/5/1999	Scanlan Surveys	1.960m	61.158m	AMG84 E 387733 N 6525564
GING BM1	15/09/2008	Jim Lane			WGS 84 Z 50J E 387922 N 6525676
GING F&W BM	15/09/2008	Jim Lane			WGS 84 Z 50J E 387927 N 6525662

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	13/6/1979	Don Munro	1m	Approx. 20.0m below high water at a point directly our from end of new track being 140.0m & south-east of CALM datum.
2 (B)	13/6/1979	Don Munro	2m	40.0m & 230° from CALM datum
GING 3m gauge	15/09/2008	Jim Lane	3m	WGS 84 Z 50J E 387978 N 6525549

**Gauge Maintenance:**

Date	By Whom	Details
17/5/1999	Alan Clarke	This lake is not currently monitored. The gauges were not altered. The 1m mark on gauge 1 read 0.984 and the 2m mark on gauge 2 read 1.988 when surveyed to the CALM datum. The CALM datum was at the base of a large Melaluca rhapsiophylla, which may have forced the datum up by approximately 20mm. The gauge 1 wood board and depth plate are in poor condition. The gauge 2 angle iron and depth plates are in reasonable condition. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The work was carried out on May 17.

**GINL: Gingilup****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
GINLTBM	30/08/2012	Yvonne Winchcombe			WGS84 Z 50 H E 361431 N 6200023 (temporary benchmark)
GINL RM1	24/4/2018	Alan Clarke			WGS84 Z 50 H E 361425 N 6200027 (Reference Mark # 1 West)
GINL RM2	24/4/2018	Alan Clarke			WGS84 Z 50 H E 361441 N 6200014 (Reference Mark #2 East)

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
GINLA	30/08/2012	Yvonne Winchcombe	1m	WGS84 Z 50 H E 361379 N 6199961
GINL B	24/4/2018	Alan Clarke	1m	WGS84 Z 50 H E 361431 N 6199894

**Gauge Maintenance:**

Date	By Whom	Details
9/8/2012	Alan Clarke, Yvonne Winchcombe	<p>Met Tiffany Fowler and Chris Fleay from DEC Collie at Busselton office. Drove to Milyeaup Coast Road then left into Fouracres Road (Odometer = 0.0km). At 8.5km gate on right into Bluegum plantation (just past little house on right). Follow main gravel road through plantation heading south until reach intersection just past little bridge over stream (12.2km odometer) GPS WPT 267 – GINLTURNA 50 H 362358 / 6201447. Turn right down fence line – water over road but firm underneath – drove on halfway down fence line until gravel turns into plantation to turnaround for felling operations. Park at fence and continue on foot if wet. Walk to end of fence line to get to boundary. Turn right onto reserve boundary. WPT 264 – GINLXMAS 50 H 316579 / 6200402 at 3 small Xmas tree's on left just before big strainer on fenceline. Head perpendicular to boundary towards small round Melaleuca tree, follow creek line and then head to big Melaleuca. Reserve burn in 2012 wildfires – regrowth approx. 50cm high. Narrow kangaroo track into wetland through thick fringing veg. Used Argo to transport equipment for loggers &amp; gauges to boundary at Xmas tree location.</p> <p>Established 1m Gauge A at WPT 265 – GINLA 50 H 361379 / 6199961. Depth = 0.48m  Established temporary benchmark at WPT 266 – GINLTBM 50 H 361341 / 6200023.  Installed TBRG with loggers TB0034 and TB0039 approx. 40m from reserve boundary in open area just past clump of Xmas trees.  Installed depth logger RB0118 next to Gauge A and installed RB0119 to SE side of Melaleuca. Both loggers have 2m probes. Use external aerial to call probes – RB0118 depth 412mm, battery 570v. RB0119 depth 389mm, battery 573v. Set to 8 hour logs.  To access GINL need to contact Ted Thompson, Bunbury Fibre Plantations m: 0427 080 013 or email: <a href="mailto:tthompson@bunburyfibre.com.au">tthompson@bunburyfibre.com.au</a></p>
24/4/2018	Alan Clarke, Laurent Marsol	<p>Drove to TBRG site via new access through the Bunbury Fibre managed plantation Woodarburrup property. Wetland dry, LBL at 1A read 0.03m. Installed a new 1m gauge labelled B further into the wetland using dumpy level survey from 1m mark on gauge A at wpt GINLB Z 50 E 361431, N 6199894. Installed a 2m angle with a 2m alloy post with camera BP#15 facing gauge B. LBL of B is 0.1m. Installed two reference marks approx. 10m west and east of the TBM SS angle. Both marks are a stainless steel rod, 500mm long, driven into just below ground level and surrounded by half a bag of quick set concrete. RM1 (west) Z50 E 361425, N 6200027. RM2 (east) Z50 E361441, N 6200014.</p>

**GNO1: Gnowangerup 26264****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	16/3/1980	Don Munro	1.0m		At end and on east side of track where it enters lake.
HO 296	7/4/2000	John Bullock & Assoc.	1.127m	114.158m	AMG E 635950 N 6196160
GNO1BM	17/09/2008	Yvonne Winchcombe			WGS 84 Z 50H E 636100 N 6196278

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	16/3/1980	Don Munro	1m	150.0m & 180° from CALM datum
GNO1A	17/09/2008	Yvonne Winchcombe	2m	WGS 84 Z 50H E 636102 N 6196084

**Gauge Maintenance:**

Date	By Whom	Details
7/4/2000	Alan Clarke	The 1m mark on the gauge read 0.995 when surveyed to the CALM datum. The CALM datum was in reasonable condition. The gauge post was in poor to medium condition with the bottom depth plate unreadable and the top plate OK. A DOLA BM was installed and surveyed to the CALM datum and gauge.

**GNO2: Gnowangerup 26569****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	17/6/1982	Don Munro	1.0m		Approx. 23.0m & 210° from S/E corner of bulldozed excavation
HD 229	3/4/2000	John Bullock & Assoc.	1.342m	295.032m	AMG E 636690 N 6257350
HD 229	4/4/2000	B Hugessen		295.032m	GDA94 Z 50 E 636830 N 6257497
GNO2BM	5/4/2011	Alan Clarke			WGS 84 Z 50H E 636812 N 6257486

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	17/6/1982	Don Munro	1m	100.0m & 199° from CALM datum

**Gauge Maintenance:**

Date	By Whom	Details
4/5/2000	Alan Clarke	The 1m mark on the gauge read 0.999 when surveyed to the CALM datum. The gauge board was in good condition, but the depth plates were only just readable. A DOLA BM was installed and surveyed to the CALM datum and gauge. The BM was connected to AHD. Lake depth on April 4 was < 0.01m.

**GOON:      Goonaping****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
HR 702	12/02/2001	John Bullock & Assoc.	2.4947m	256.752m	MGA94 E 461800 N 6443306
HR 702	2/06/2004	Landgate SSM		256.572m	MGA94 E 461800.000 N 6443306.000
GOON BM1	19/09/2008	Jim Lane			WGS 84 Z 50H E 461797 N 6443309

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	12/02/2001	Alan Clarke	1m	473m & 145° from datum
GOON A	19/09/2008	Jim Lane	1m	WGS 84 Z 50H E 462070 N 6442924

**Gauge Maintenance:**

Date	By Whom	Details
12/2/2001	Alan Clarke	This wetland is a large clay based lake with an 80% covering of melaleuca spp and agonis spp to an average height of 2m. We navigated using a hand held GPS to a set of UTM coordinates supplied by Stuart Halse. These coordinates were the suggested lowest point of the lake, being a small depression in the middle if the lake. We could not find any depression in the lake floor at this point or the surrounding area. We suspected that Stuart's Group used the old Aus 66 datum. So we walked 200m to the northeast and found the largest of the depressions. A 1m gauge was installed at the lowest point of the depression. The 1m gauge is 473m on a bearing of 145 from the benchmark. The height of this gauge was transferred back 473m to the benchmark at the lakes perimeter. This benchmark, HR 702, is 300m at a bearing of 127 from a witness plate out on the edge of Tribune Road, see the access diagram for details. The lake was dry on February 12.
12/2/2001	Alan Clarke	Transects 1,2 and 3 have had lake level heights transferred to the top of each of the bore casings and at ground level for their associated star irons. The height data are contained in the down loaded survey computations from the WILD digital level that accompanies the access diagram on file.
4/5/2007	Alan Clarke	Installed an 'A' & '1' on the 1m gauge and replaced the damaged 3mm plastic depth plate with a 6mm plastic depth plate. LBL @ A = 0.08m.

**GOOR: Goorly**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
HV 258	14/2/2001	John Bullock & Assoc.	1.5522m	280.042m	MGA94 E 503349 N 6664800
GOOR BM1	18/09/2008	Jim Lane			WGS 84 Z 50J E 503350 N 6664801

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	14/2/2001	Alan Clarke	1m	161.7m & 95° from datum
GOOR A	18/09/2008	Jim Lane		WGS 84 Z 50J E 503418 N 6664948

**Gauge Maintenance:**

Date	By Whom	Details
14/2/2001	Alan Clarke	The lake was surveyed for the deepest point using digital level and staff. A 1m gauge was installed at the deepest point. The first 2m angle iron was driven 1.6m into the salt/mud. A second angle was driven inside the first until it was 1.1m from the lakebed. Both angle irons were fixed together and a 1m depth plate was fixed to them. A DOLA benchmark with reference marks was installed at the highest point between the gauge and Glamoff Road. Lake depth on February 14 was 0.030m. Lake height of the top of the dropper is 0.339m. Grant Pearson installed the dropper in November 2000 to record a depth.
2/4/2007	Alan Clarke	Installed an 'A' on the 1m gauge. The lake was dry, but there was water under the salt crust. LBL of gauge is 0.05m.

**GORE: Gore**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM	15/3/1980	Don Munro	2.00m		On approx. high water mark, adjacent to a point 400.0m from junction of tracks.
UE 358	28/5/1997	Jim Payne	0.934m	17.300m	MGA94 Z 51 E 363162 N 6263531
GoreBM	16/09/2008	Alan Clarke			WGS 84 Z 51 H E 363166 N 6263536

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	15/3/1980	Don Munro	2m	25.0m & 184° from datum (2 x 1m gauge plates)
2 (B)	15/3/1980	Don Munro	1m	125.0m & 184° from datum
3 (C)	28/5/1997	Alan Clarke	2m	Upslope towards CALM datum
GoreA	16/09/2008	Alan Clarke	3m	WGS 84 Z 51 H E 363172 N 6263512 (F&W Gauge on wooden board)
GoreC	16/09/2008	Alan Clarke	2m	WGS 84 Z 51 H E 363173 N 6263523

**Gauge Maintenance:**

Date	By Whom	Details
28/5/1997	Alan Clarke, Jim Payne	Alan Clarke and Jim Payne carried out the work on May 28. On inspection the CALM datum was loose in the sandy slope. The 2m mark on gauge 1 (wood board) read 2.009 and the 1m mark on gauge 2 read 1.005 when surveyed to the CALM datum. The difference between the 1m mark at gauge 1 and the 1m mark at gauge 2 was -0.004. The old datum was deemed unreliable and most likely to have sunk in the sandy slope. As most recordings have been taken from gauge 1 this was used as the temporary datum to level in a new 2m gauge (no. 3) upslope towards the CALM datum from the weathered gauge 2. A galvanised angle iron and stainless steel depth plate were used. The gauge 2 wood post was secured with an angle iron and the old plate replaced with a stainless steel depth plate. The new plate was raised 4mm to agree with the 1m mark on gauge 1 (a level check after installation revealed the plate had slipped down 0.002). A new DOLA datum was installed, being a DOLA brass plaque set in concrete, with reference marks and surveyed to the CALM gauges. This mark was not stamped.
4/4/2001	Alan Clarke, Katherine Sorokine	Replaced the stainless steel depth plate on the 2m (no. 3) gauge installed in 1997 with a plastic plate. Replaced the 1m stainless plate that was on the wood gauge board of the 1m (no. 2) gauge with a plastic depth plate. Lake depth at the 1m (no. 2) gauge was 0.68m. The no. 1 gauge board (installed by Don Munro) is deteriorating. The 1m depth plate on the wood board has a lakebed level of about 0.4m. The 2m plate is in reasonable condition. This no. 1 gauge is no longer required because the number 2 and 3 gauges cover its depths.
29/3/2007	Alan Clarke	Installed an 'C' at the 2m gauge and an 'A' at the 3m gauge (old Munro wood board with two depth plates). The 1m gauge was under water.
8/5/2012	Alan Clarke, Tilo Massenbauer	The old Clarke 2m gauge C was in poor condition. A new stainless steel angle was installed near the old gauge C. A dumpy level was used to transfer a lake height from the benchmark to the top of the angle. A 6mm plastic depth plate, C and 2 were fixed to the new angle at the correct height. The depth on the new gauge C was 1.13m. Photo of replacement gauge not found.

**GOUN: Gounter**

**Datum Details:**

<b>ID</b>	<b>Date</b>	<b>By Whom</b>	<b>Lake Height</b>	<b>AHD Height</b>	<b>Location (See sketch diagram for details)</b>
CALM	30/7/1980	Don Munro	1.0m		Approx 25m S/E of parking area at end of Mel. sp bordering lake and 1.0m above lake side edge of same.
HH 280	20/5/1998	Scanlan Surveys	2.356m	292.398m	AMG84 E 672856 N 6413041
GOUN BM	17/07/2009	Jim Lane			WGS 84 Z 50H E 672878 N 6413022
GOUN F&W BM	17/07/2009	Jim Lane			WGS 84 Z 50H E 672899 N 6413024

**Gauge Details:**

<b>ID</b>	<b>Date</b>	<b>By Whom</b>	<b>Lake Height</b>	<b>Location (See sketch diagram for details)</b>
1 (A)	30/7/1980	Don Munro		83.0m & 80° from CALM datum
2 (B)				
(C)	20/5/1998	Alan Clarke	1m	95.0m & 80°mag. from HH 280

**Gauge Maintenance:**

<b>Date</b>	<b>By Whom</b>	<b>Details</b>
20/5/1998	Alan Clarke, Grant Pearson	This lake is not currently monitored. The original wood gauge board with depth plates had snapped off at its base and lay in the water on the lake floor. A second gauge 10m toward the shore from the original gauge was also not operational. The support metal pole was badly bent. A new 1m gauge was installed using a galvanised angle iron and a stainless steal depth plate. The gauge height was leveled in from the secure CALM datum. The final level for the 1m mark on the new gauge 1 was 1.000. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauge. The depth on the new gauge was 0.110 on May 20.



**GUND: Gundaring****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	30/5/1978	Don Munro	3.5m		Denoted with saw cut in fence post 0.30m above ground level.
HD 213	23/5/1998	Scanlan Surveys	2.686m	253.016m	AMG84 E 546967 N 6315569
GUNDBM	9/05/2009	Alan Clarke			WGS 84 Z 50H E 546974 N 6315587

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	30/5/1978	Don Munro	2m	28.0m & 300° from CALM datum (1 & 2m gauge plates)
2 (B)	30/5/1978	Don Munro		
3 (C)	30/5/1978	Don Munro		140.0 & 300° from CALM datum (REMOVED 23/5/1998)
(D)	23/5/1998	Alan Clarke	1m	Near Gauge 3

**Gauge Maintenance:**

Date	By Whom	Details
23/5/1998	Alan Clarke, Grant Pearson	This lake is not currently monitored. The gauges were renewed. The 2m mark on gauge 1 read 2.005 when surveyed to the CALM datum. The gauge 1 wood board and both 1m and 2m depth plates were in good condition. This gauge was not altered. Gauge 2 had been knocked over. It was replaced with a new 1m gauge out near gauge 3. The new 1m gauge 2 was installed using a galvanised angle iron and a stainless steel depth plate. The gauge height was leveled in from the secure CALM datum, which was a saw cut in a fence strainer post. The final level for the 1m mark on the new gauge 2 was 1.001. Gauge 3 was in poor condition, leaning badly to one side, so it was removed. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. Work carried out on May 23.
9/5/2009	Alan Clarke, Yvonne Winchcombe	Property gate locked, walked into lake along rail and wetland Nature Reserve. House looked empty. Took GPS location of BM. Took photos of lake. Lots of rabbits.

**GURA: Guraga****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
CALM	10/11/1982	Don Munro	3.0m		3.0m north side of track which runs N/W from junction 'A'
HM 1458	16/5/1998	Scanlan Surveys	2.428m	74.335m	AMG84 E 363480 N 6585400
GURA BM1	16/09/2008	Jim Lane			WGS 84 Z 50 J E 363476 N 6585412
GURA F&W BM	16/09/2008	Jim Lane			WGS 84 Z 50 J E 363502 N 6585443
GURA BM HM148	25/05/2017	Yvonne Winchcombe			WGS 84 Z 50 J E 363474 N 6585412

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
1 (A)	10/11/82	Don Munro	3m	71.0 & 223° from CALM datum
2 (B)	10/11/82	Don Munro	2m	141.0m & 223° from CALM datum
3 (C)	May 2000	Alan Clarke	4m	Next to old CALM datum
4 (D)	12/5/2009	Alan Clarke	1m	
GURA A	16/09/2008	Jim Lane	3m	WGS 84 Z 50 J E 363461 N 6585385
GURA B	16/09/2008	Jim Lane	2m	WGS 84 Z 50 J E 363422 N 6585329
GURA C	16/09/2008	Jim Lane	4m	WGS 84 Z 50 J E 363500 N 6585443
GURA B2	17/09/2009	Jim Lane	2m	WGS 84 Z 50 J E 363422 N 6585329
GURA B3	17/09/2009	Jim Lane	2m	WGS 84 Z 50 J E 363423 N 6585328
GURA D	7/11/2016	Jim Lane	1m	WGS 84 Z 50 J E 363345 N 6585218
GURA A3	25/05/2017	Yvonne Winchcombe	3m	WGS 84 Z 50 J E 363461 N 6585386
GURA B2	25/05/2017	Yvonne Winchcombe	2m	WGS 84 Z 50 J E 363421 N 6585329
GURA D1	25/05/2017	Yvonne Winchcombe	1m	WGS 84 Z 50 J E 363343 N 6585217

**Gauge Maintenance:**

Date	By Whom	Details
16/5/1998	Alan Clarke, Grant Pearson	The 3m mark on gauge 1 read 3.012 and the 2m mark on gauge 2 read 2.030 when surveyed to the CALM datum. The depth plate on gauge 1 had been damaged by rifle shots. The angle iron was secured by knocking it further into the ground. The depth plate was replaced with a stainless steel plate at the correct level. The survey results show the final level for the 3m mark on gauge 1 was 3.000. The gauge 2 depth plate was replaced with a stainless steel plate and dropped 30mm. The survey results show the final level for the 2m mark on gauge 2 was 1.996. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The work was carried out on May 16.
May 2000	Alan Clarke, Stephanie Hill	A new 4m gauge, using a galv. angle iron and plastic plate, was installed next to the old CALM datum. Using the level I calculated the distance from the CALM datum to the top of the angle to be 1.021. So I measured from the top of the angle down 21mm with an offset tape and fixed the gauge to this mark. I also levelled from the CALM 3.0m datum to the DOLA datum. The difference was -0.572. This is accurate to the mm. When compared to the Scanlan survey records. November 1999 depth determination is as follows. I knocked in a screwdriver against the tree with the saw mark, which was cut at the Nov. 1999 watermark by Alan Clarke. The top of the screwdriver to the saw mark measured 0.345. I levelled from the CALM (3.0m) datum to the top of the screwdriver. The difference was 0.053. I calculate the saw mark height to be the sum of the datum height, datum to screw driver measurement and the screwdriver to the saw mark measurement. $3.0 + 0.053 + 0.345 = 3.398\text{m}$ . The Nov. 2000 water depth was 2.91. The distance from the top of the DOLA blue sign down to the water was 0.310. I calculate the lake depth of the top of the blue sign to be $2.91 + 0.31 = 3.22\text{m}$ . Top of inshore gauge referred to by Jim Lane Sept 99 is 3.0m
27/03/2006	Alan Clarke, Sandra Fleisher	Installed a new 6mm plastic depth plate on gauge B, which had been missing since at least 2003. Replaced the damaged 4m depth plate on gauge C with a 6mm plastic plate. An A, B and C were fixed to their respective gauges.

12/5/2009	Alan Clarke, Yvonne Winchcombe	New access along reserve boundary. Old access track very overgrown with lots of sticks across track after fire. Lake dry, dust blowing across surface in strong winds. Surveyed from gauge B (1.996m) to install a new 1m gauge D approx. 25m further into lake from Jim's dropper. Lake substrate very soft – used 2 stainless steel angles and attached a new 6mm plastic gauge plate. Surveyed top of old rusted Munro angle and dropper. Lake height for top of old Munro angle is 1.272m. Lake height for top of dropper is 1.102m. Lake bed level of 1m gauge D is 0.37m. Installed two bolts at base of 2m gauge B. 5 wedge tailed eagles flying on thermals over lake.
25/5/2017	Alan Clarke, Yvonne Winchcombe	Turn west off Brand Hwy at GURA TP1 (near School children sign). Follow sandy track to Western Power high tensile lines. Turn north at power lines and access farmer's paddock through locked gate - GURA TP2 WP. Follow fenceline west to big pipeline on drain – gate into reserve - GURA TP3 GATE. Track overgrown but someone had been in very recently and smashed the vegetation down. Drove to BM HM 1458. Surveyed BM to gauges. 3m mark on A3 reads 3.003m, 2m mark on B2 reads 1.999m, 1m mark on D1 reads 0.998m. A3 – installed new 'A', '3' and aluminium gauge plate and moved down 3mm. B2 installed new aluminium gauge plate and moved up 1mm. Removed old angle iron between B and D gauges. Wetland was dry.

**HARV: Harvey 12632**

**Datum Details:**

<b>ID</b>	<b>Date</b>	<b>By Whom</b>	<b>Lake Height</b>	<b>AHD Height</b>	<b>Location (See sketch diagram for details)</b>
CALM	5/8/1980	Don Munro	3.0m		3.0m above high water mark on south side of swamp and approx. 250.0m from eastern boundary of reserve.
HR 743	6/5/1999	Scanlan Surveys	1.895m	18.792m	AMG84 E 386426 N 6348757
HARV BM	22/07/2008	Jim Lane			WGS 84 Z 50H E 386550 N 6348919
HARV BM2	31/08/2008	Jim Lane			WGS 84 Z 50H E386551 N 6348923
HARV BM3	18/03/2009	Jim Lane			WGS 84 Z 50H E386550 N 6348921

**Gauge Details:**

<b>ID</b>	<b>Date</b>	<b>By Whom</b>	<b>Lake Height</b>	<b>Location (See sketch diagram for details)</b>
1 (A)	5/8/1980	Don Munro	2m	23.0m & 30° from CALM datum (2 x 1m gauge plates)
HARV A	22/07/2008	Jim Lane	2m	WGS 84 Z 50H E 386565 N 6348939
HARV A2	18/03/2009	Jim Lane	2m	WGS 84 Z 50H E 386566 N 6348937

**Gauge Maintenance:**

<b>Date</b>	<b>By Whom</b>	<b>Details</b>
6/5/1999	Alan Clarke	The CALM datum had been a solid galvanised angle iron rising approximately 1.6m above ground. This angle was mistakenly removed from the ground and repositioned in the wetland for depth measurement when the top depth plate (2m) had fallen off the gauge. The 1m mark on the gauge was used as a temporary datum. A plastic depth plate was fixed above the 1m plate. The lake height for the top of a star iron picket used to measure water depth was 2.210. A DOLA benchmark was installed with reference marks and surveyed to the gauge. Work carried out on May 6.
3/5/2007	Alan Clarke	The gauge is a wood board with both 1m and 2m depth plates. Installed an 'A' and replaced the 1m Munro steel depth plate with a 6mm plastic depth plate. LBL of gauge 0.0m.

**HEBI: Hebiton's****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
HG 222	15/2/2001	John Bullock & Assoc.	1.2725m	237.765m	MGA94 E 345827 N 6806158
HEBI BM1	17/09/2008	Jim Lane			WGS 84 Z 50J E 345831 N 6806160

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	15/2/2001	Alan Clarke	4m	
2 (B)	15/2/2001	Alan Clarke	2m	
3 (C)	15/2/2001	Alan Clarke	1m	
HEBI 2m	17/09/2008	Jim Lane		WGS 84 Z 50J E 345828 N 6806152
HEBI gge	17/09/2008	Jim Lane		WGS 84 Z 50J E 345790 N 6806085

**Gauge Maintenance:**

Date	By Whom	Details
15/2/2001	Alan Clarke	The lake was surveyed for the deepest point using digital level and staff. A 1m gauge (gauge 3) was installed at the deepest point. A 2m gauge (gauge 2) was installed at the edge of the main basin. A DOLA benchmark with reference marks was installed 8m upslope from gauge 2. A 4m gauge (gauge 1) was installed 188m upslope from the benchmark near the water tank. This gauge was installed on advice from Adrian Pinder that in Spring 1999 the water level was out near the water tank. The lake was dry on February 15.
11/5/2009	Alan Clarke, Yvonne Winchcombe	Contacted owners who were happy for us to visit lake. Condition of wetland very poor, cattle have using wetland and it is very degraded, most of canopy trees are dead or dying and there is little understorey vegetation. Replaced broken 3mm gauge plate on 2m gauge B and 1m gauge A with 6mm gauge plates. Used old stainless steel gauge plate as a backing on 1m gauge A to try and prevent stock damage. Moved logs around base of gauges to protect from cattle damage. Lake was dry.

**HIND: Hinds****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	13/6/1979	Don Munro	3.0m		1.5m out from maximum high water mark at a point approx. 23.0m east of where track enters lake.
HM 1456	18/5/1998	Scanlan Surveys	3.942m	259.394m	AMG84 E 456858 N 6596855
HIND BM1	18/09/2008	Jim Lane			WGS 84 Z 50J E 456859 N 6596884
HIND F&W BM	18/09/2008	Jim Lane			WGS 84 Z 50J E 456889 N 6596848

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	13/6/1979	Don Munro	3m	(2m + 3m gauge plate)
2 (B)	13/6/1979	Don Munro	2m	
3 (C)	15/4/1981	Don Munro	1m	
4 (D)			4m	(between gauge 1 & 3?)
5 (E)			5m	(between gauge 1 & 3?)
6 (F)	May 2000	Alan Clarke	4m	19m down slope at 153° from 5m gauge. E 456850 N 6596831.
7 (G)	May 2000	Alan Clarke	5m	47m & 205° from DOLA datum E 456841 N 6596845
HIND 4m	18/09/2008	Jim Lane	4m	WGS 84 Z 50J E 456850 N 6596829
HIND 5m	18/09/2008	Jim Lane	5m	WGS 84 Z 50J E 456842 N 6596846
HIND A	18/09/2008	Jim Lane	3m	WGS 84 Z 50J E 456871 N 6596785
HIND B	18/09/2008	Jim Lane	2m	WGS 84 Z 50J E 457116 N 6596388
HIND C	18/09/2008	Jim Lane	1m	WGS 84 Z 50J E 457237 N 6596169
HIND gge	18/09/2008	Jim Lane		WGS 84 Z 50J E 457175 N 6596277 (Hinds old gauge)

**Gauge Maintenance:**

Date	By Whom	Details
18/5/1998	Alan Clarke	On the September 1997 depth gauge run a dropper was installed next to the CALM datum. The height from the top of the dropper to the CALM datum was measured. Soon after this measurement the datum fell apart in a pile of rubble. This height was recorded in my notebook, but left in the office on this trip. Therefore the gauges could not be levelled to the temporary datum. A DOLA benchmark was installed with reference marks and surveyed to the temporary datum. The positions from the DOLA benchmark to each of the 5 gauges were recorded for the access map. Wood tech screws were used to secure depth plates at gauge 1.
8/5/1999	Alan Clarke	The 2m mark on gauge 1 read 1.984, and the 2m mark on gauge 2 read 1.971 and the 1m mark on gauge 3 read 1.968 when surveyed to the CALM datum and DOLA benchmark. The 1m and 2m plates on gauge 1 were further secured with wood tech screws; they were not moved. The gauge 2 plate was moved up 30mm. The survey results show the final level for the 2m plate was 2.001. Gauge 3 was not altered because of the water depth. The lake depth was 1.72 on May 8.
May 2000	Alan Clarke, Stephanie Hill	I installed a 4m and 5m gauge using galv. angle irons and plastic depth plates. The lake was flooded, there were no gauges operational. I surveyed in the levels for the gauges from the DOLA benchmark. Both gauges are 20m to the west of the access track into the lake. The 5m gauge is 47m at a bearing of 205° from the DOLA datum. The 4m gauge is 19m down slope at a bearing of 153° from the 5m gauge. The depth on May 10 was 3.19m. 4m gauge is at 456850 E and 6596831 N. the 5m gauge is at 456841 E and 6596845 N.
29/03/2006	Alan Clarke, Sandra Fleisher	Fixed a 1m 6mm plastic depth plate over the paint peeled stainless steel plate at gauge C. The LBL of the salt at gauge C was 0.45m. The water level in the hole was 0.36m. Replaced the 2m metal depth plate at gauge B with a 6mm plastic plate. Replaced the 3mm plastic depth plate at gauge A (3m) with a 6mm plastic plate. An A, B, C, F and G were installed on their respective gauges.
23/5/2017	Alan Clarke, Yvonne Winchcombe	BM HM 1456. Lake bed level at C1 = 0.40, water approx. 50m from gauge - depth < 0.40m. Gauge C1 ok although rusty. Gauge B2 ok. Gauge A3 ok, replaced '3'. Gauge F4 ok, replaced 'F'. Gauge G5 ok, replaced 'G'. Getting late, sun setting. Measured width of old gauge on wooden post between B2 and C1 as 15cm. Removed/snapped off old wooden boards behind C1 and between C1 and B2. Did not survey heights of old wooden boards. Estimated depth for Jim on 6-

		11-2016 as 0.85m.
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**JAND: Jandabup**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	19/4/1978	Don Munro	0.9m		(NOT FOUND)
HZ 926	14/5/1999	Scanlan Surveys		44.839m	AMG84 E 390790 N 6486829
JAND BM	31/07/2008	Jim Lane			WGS 84 Z 50J E 390937 N 6486982

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1	19/4/1979	Don Munro	2m	
A		WRC		To convert WRC gauge to CALM lake depth deduct 43.76m.
B		WRC		
C		WRC		
JAND 45.5m	31/07/2008	Jim Lane	45.5m AHD	WGS 84 Z 50J E 390879 N 6487034
JAND 45.5m2ND	31/07/2008	Jim Lane	45.5m AHD	WGS 84 Z 50J E 390803 N 6487110
JAND 46m	31/07/2008	Jim Lane	46m AHD	WGS 84 Z 50J E 390936 N 6486978

**\*\*NOTE: To convert DoW gauge readings to CALM lake depth deduct 43.76m**

**Gauge Maintenance:**

Date	By Whom	Details
14/5/1999	Alan Clarke	The CALM datum and gauge were not found. A DOLA benchmark was installed with reference marks and surveyed to the 45m AHD mark on the first WRC gauge. The 45m mark is 0.154 above the benchmark. The work was carried out on May 14. The CALM gauge has since been found. Further effort around the gauge will probably reveal the datum. The CALM gauge and datum heights need to be levelled to the DOLA benchmark and WRC gauges in the near future.



**JASP: Jasper**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM		Don Munro	12m		
HP 254	23/5/1997	Jim Payne	10.304m	40.391m	AMG E 379595 N 6190247 (2017 Destroyed?)
JASPBm	15/09/2008	Yvonne Winchcombe			WGS 84 Z 50H E 379737 N 6190394

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)			10m	
JASPA	15/09/2008	Yvonne Winchcombe	10m	WGS 84 Z 50H E 379765 N 6190452
JASP A	26/01/2016	Jim Lane	10m	WGS 84 Z 50H E 379765 N 6190452
JASP '40'	26/01/2016	Jim Lane	40m AHD	WGS 84 Z 50 H E 379799 N 6190467 (DoW 40m gauge)

**Gauge Maintenance:**

Date	By Whom	Details
23/5/1997	Alan Clarke, Jim Payne	Alan Clarke and Jim Payne carried out the work on May 23. The CALM datum and gauge were not found. A DOLA benchmark with reference marks was installed.
April 2000	Alan Clarke	Needs a '10' fixed to the top of the gauge. The old gauge was levelled to the CALM datum and found to be reading 10.012 or 12mm too high. A new plastic gauge plate was fixed at the same level as the old faded gauge plate. The DOLA BM (installed in 1997) was surveyed to the CALM datum and gauge.
19/3/2007	Alan Clarke, Yvonne Winchcombe	Replaced broken 3mm plastic depth plate with new 6mm plastic depth plate. Attached 'A' and '10' to gauge.
13/3/2016	Alan Clarke, Yvonne Winchcombe	DoW Gauge out of water. Used dumpy level to level from DoW 40 to Gauge A to waters edge. DoW 40m mark = 9.909m lake height. Depth at water's edge = 8.372m.

**JERD: Jerdacuttup****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	16/3/1980	Don Munro	2m		(DESTROYED)
UR 273A	29/5/1998	Scanlan Surveys	2.684m	2.006m	AMG84 E 246676 N 6241845
JerdBM	15/09/2008	Alan Clarke			WGS 84 Z 51H E 246655 N 6241791
JERD SS ANGLE	14/05/2017	Yvonne Winchcombe			WGS 84 Z 51H E 245870 N 6241888 (TDG Temporary depth gauge due to flooding)
JERDTB M	30/4/2018	Alan Clarke			WGS 84 Z 51H E 245831 N 6241890

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (B)	16/3/1980	Don Munro	2m	30.0m & 10° from datum. Right hand side of entrance track through melaleuca.
2 (C)	16/3/1980	Don Munro	1m	296.0m & 13° from CALM datum.
2 (C)	28/5/1997	Alan Clarke	1m	Replaced old Munro 1m gauge C
3 (A)	28/5/1997	Alan Clarke	3m	Near CALM datum
JerdA	15/09/2008	Alan Clarke	3m	WGS 84 Z 51H E 246656 N 6241806
JerdB	15/09/2008	Alan Clarke	2m	WGS 84 Z 51H E 246671 N 6241867

**Gauge Maintenance:**

Date	By Whom	Details
28/5/1997	Alan Clarke	Alan Clarke and Jim Payne carried out the work on May 28. The 3m mark on gauge 1 read 2.987, the 2m mark on gauge 2 read 2.000 and the 1m mark on gauge 3 read 1.003 when surveyed to the CALM datum. A new 3m gauge was installed near the CALM datum, replacing the 3m gauge on the tree, using galvanised angle iron and stainless steel depth plate. A new 1m gauge was installed to replace the rusted gauge 2 using galvanised angle iron and stainless steel depth plate. A cross bar was fitted to the angle iron to reduce vertical movement. This gauge 2 will need to be resurveyed to check if movement has occurred. Reference marks were installed for the CALM datum. The lake was dry.
29/5/1998	Alan Clarke	Alan Clarke and DOLA's Jim Payne installed a new 3m gauge and new 1m gauge in 1997. See 1997 report for details. The 3m mark on gauge 3 read 3.000 and the 2m mark on gauge 1 read 1.997 and the 1m mark on gauge 2 read 1.000 when surveyed to the CALM datum. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. Work carried out on May 29.
29/1/2003	Alan Clarke, Mathilde Breton	Replaced the stainless steel depth plate on the 3m gauge near the old CALM datum with a plastic plate. The old plate was unreadable with most of the paint having peeled off. Attempted to replace the depth plate on the 2m gauge, but both batteries for the drill were flat. I decided to travel to Lake King and book a room at the Tavern. We arrived for a late lunch, charged the batteries in the room and used the phone to sked in with Woodvale because I was unable to sked in using the HF radio. In the afternoon we travelled to Atkins Yate Swamp only 10km south of the town. We returned to Jerdacuttup on January 31 to replace the 2m gauge. When inspecting the 1m gauge on January 29 out on the true lake edge I noticed that the shoreline was littered with dead and rotting Black Bream. Silver Gulls and Pacific Gulls were milling around, but only the eyes had been eaten. I did not observe birds feeding on the fish. Early in the previous week Esperance experienced a maximum temperature of 44 degrees. That high temperature day may have contributed to this fish kill.
8/5/2006	Alan Clarke, Lucie Southern, Steph Gadal	The 1m gauge at C has had a stainless steel depth plate. The paint has peeled off, so a 6mm plastic depth plate was fixed to the stainless plate. The labels were reordered so that the 3m = A, 2m = B and 1m = C. The water table in the excavated hole at C was 0.2m. This seemed to have a direct correlation to the depth of water in the lake. The edge of the water was 150m away. The LBL of C was 0.5m.
7/5/2009	Alan Clarke, Yvonne Winchcombe	Installed a 'B' on 2m gauge. Depth at 2m gauge B was 1.4m. Cleaned gauge plate which was encrusted with worm casings. 1m gauge too deep to work on.
14/5/2017	Alan Clarke, Yvonne Winchcombe	Bridge washed out before Ravensthorpe has been replaced with crossing (don't have to take detour). Southern Ocean Road from Hopetoun to JERD flooded. Installed 3m s/s angle (Temporary Depth Gauge) on south side of flooded bitumen road at GPS 51 H 0245870,6241888. Measured 45cm from top of s/s angle down to water surface. Took photos of location.
30/4/2018	Alan Clarke,	Water level has dropped below the base of the SS angle temporary depth 'gauge' (TDG). Professional

	Laurent Marsol	fishers operating two boats with multiple nets for lots! of big! Black Bream. Installed a temporary benchmark (TBM) on the southern side of the road at GPS wpt JERDTBM Z51 E 245831 N 6241890. TBM is a SS rod, 500mm long knocked into a shallow hole with half a bag of rapid set concrete. Dumpy level survey showed the TBM is 1.128m below the top of the SS angle (TDG). Dumpy level survey showed the current water level was 1.906m below the top of the SS angle (TDG). GPS wpt of SS angle TDG is Z51 E 245869, N 6241884. GPS wpt of depth dropper on south side of road opposite the Landgate benchmark is Z51 E 246655, N 6241747. Paddled on ski out to depth gauge location, but 3m gauge still under significant depth of water.
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**JOON: Joondalup****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	24/4/1978	Don Munro	4.0m		2.0m N/E of Euc. Tree
HZ 925	13/5/1999	Scanlan Surveys	3.414m	17.662m	AMG84 E 384213 N 6487296
HZ 925	23/10/2003	B Hugessen		17.662m	GDA94 Z 50 E 384352 N 6487435

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1	24/4/1978	Don Munro		Approx. 30.0m & 65° from datum
(A)		WRC		
JOON 18m	1/08/2008	Jim Lane	18m AHD	DoW Gauge WGS 84 Z 50J E 384382 N 6487422

**\*\*NOTE: To convert DoW gauge readings to CALM lake depth deduct 14.25m (from May 1999 onwards). Prior to May 1999 deduct 14.22m.**

**Gauge Maintenance:**

Date	By Whom	Details
13/5/1999	Alan Clarke	The CALM datum (4m) was surveyed to the 17m mark on the WRC gauge. The 17m mark on the WRC gauge is 1.2468 below the 4m CALM datum. The CALM lake height for the 17m mark on the WRC gauge is 2.753. To convert WRC gauge depths to CALM lake depths subtract 14.25. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and WRC gauge. The work was carried out on May 13.

**KARA: Karakin**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	24/5/1979	Don Munro	1.5m		At base of tree 200.0m & 153° from fence corner
HZ 915	11/5/1999	Scanlan Surveys	1.532m	38.623m	AMG84 E 354261 N 6563662
KARA BM	27/11/2008	Jim Lane			WGS 84 Z 50J E 354428 N 6563848
KARA F&W BM	27/11/2008	Jim Lane			WGS 84 Z 50J E 354426 N 6563849

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	24/5/1979	Don Munro	2m	210.0m & 115° from CALM datum

**Gauge Maintenance:**

Date	By Whom	Details
11/5/1999	Alan Clarke	This lake is not currently monitored. The gauge was not altered. The 2m mark on gauge 1 read 1.976 when surveyed to the CALM datum. The height difference could be caused by the close position of the CALM datum to the base of a large tree, which may have pushed the datum up. The gauge is in reasonable condition. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauge. Work carried out on May 11.

**KENT: Kent 29020**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	29/4/1981	Don Munro	0.5m		2.0m east of first Eucalypt tree located approx. 55m along track from where it enters the lake, being on the west side.
HT 295	8/4/2000	John Bullock & Assoc.	1.675m	296.223m	AMG E 605670 N 6129770
KentBM	18/09/2008	Alan Clarke			WGS 84 Z 50H E 676818 N 6307259

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	29/4/1981	Don Munro	2m	235.0M & 112° from CALM datum (1m & 2m gauge plates)
2 (B)	26/3/2009	Alan Clarke	2m	10m and 180° from Landgate SSM WGS 84 Z 50H E 676830 N 6307250
KentB	18/09/2008	Alan Clarke	2m	WGS 84 Z 50H E 676830 N 6307250
KentA	18/09/2008	Alan Clarke	2m	WGS 84 Z 50H E 677022 N 6307114
KentC	10/5/2018	Alan Clarke	1m	WGS 84 Z 50H E 677524 N 6307259

**Gauge Maintenance:**

Date	By Whom	Details
8/4/2000	Alan Clarke	The 1m mark on the gauge read 1.013 when surveyed to the CALM datum. The Calm datum was solid and under 6cm of water. Replaced 1 and 2m gauge plates at current height (i.e. 13mm too high). A DOLA BM was installed and surveyed to the CALM datum and gauge. Lake depth on April 8 was 0.56m.
27/3/2007	Alan Clarke	The 2m gauge in the middle of the lake, 200m off shore, was in 1.04m of water. The gauge consist of a wood board with two 1m plastic plates. The wood board was loose in the ground and the 2m plate was damaged. No remedial work was conducted because a new alloy gauge and plastic plate at 1m will need to be installed at this site when the water recedes. A new 2m gauge was <b>installed</b> using galv. angle and 6mm plastic depth plate. The gauge was labelled 'B'. This gauge is approximately 10m directly south, into the lake, from the DLI SSM (Yellow diamond sign).
9/5/2009	Alan Clarke, Yvonne Winchcombe	Checked star iron referred to by Grant Pearson – outstanding query. Only star iron is one with yellow SSM sign. Top of yellow sign is 2.5cm above top of star iron. Measured 88cm from top of star iron down to top of SSM using bubble level from SSM to star iron. Depth recorded by GP was 66cm below top of star iron. Top of yellow sign previously surveyed as 2.595 less 2.5cm gives top of star iron as 2.570m. Top of star iron less 66cm exposed gives depth of 1.91m  Replaced 1m and 2m gauge plates (old plastic 3mm) with new 6mm plastic plates. Installed 'A' at 2m gauge A. Secured old jarrah board to existing angle iron to stabilize wooden board. Took photos of succulent growing on lake bed (threatened ecological community). Lake was dry.
10/5/2018	Alan Clarke, Peter White	Drove into lake edge using eastern track. Walked out to GPS location where Peter had recorded the deepest water on a number of occasions. Installed a 2m SS angle. Walked back to the vehicle. Drove back around to the benchmark via the western track access. Dumpy level survey from the benchmark to the SS angle and return with 8 change points! Took over 1 hour. 5mm misclose between both survey runs. Walked back out and installed an alloy depth plate on the 1m mark. Installed a '1' and 'C'. LBL for the 1m gauge C is -0.060m. GPS cords for new gauge C Z50 E 677524, N 6307259.

**KOND: Kondinin****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	26/6/1979	Don Munro	2.0m		17.0m & 350° from north of tank stand almost on maximum high water mark.
HL 408	12/2/2001	John Bullock & Assoc.	2.6144m	258.175m	MGA94 E 612045 N 6404002
KOND BM	17/07/2009	Jim Lane			WGS 84 Z 50H E 612045 N 6404006

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	26/6/1979	Don Munro	2m	200.0m & 69° from CALM datum

**Gauge Maintenance:**

Date	By Whom	Details
April 2000	Alan Clarke	Was flooded to an estimated level of >3m. Kondinin Lake Road was cut from the east side of the lake to the west side of the lake. We boated from the east side of the lake at the entry of Kondinin Lake road across to the old Ski club area. The site where the 2m CALM datum should be was under 1- 1.5 metres of water. This lake will have to be revisited when water levels drop.
13/2/2001	Alan Clarke	The old CALM datum was located at the waters edge. The 2m datum was in reasonable condition but was beginning to be covered by sand from wave action. The lake water was 3cm (0.030) above the 2m datum. The gauge was not visible. The 2m gauge was apparently ( Munro map) 120m out in to the water with the top probably obscured by wave action if indeed it still stands. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum. The gauge, if it still stands, will have to be surveyed to the datums when the lake is dry. This work was carried out on February 13.

**KULU: Kulunilup**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
KULU PWD B704	21/05/2015	Yvonne Winchcombe			WGS 84 Z 50H E 480256 N 6200214
KULU TBM	11/05/2017	Yvonne Winchcombe			WGS 84 Z 50H E 480427 N 6200001 (Temporary Benchmark)

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
KULU A	21/05/2015	Yvonne Winchcombe	1m	WGS 84 Z 50H E 480460 N6199995

**Gauge Maintenance:**

Date	By Whom	Details
21/5/2015	Alan Clarke, Yvonne Winchcombe	Trimmed track into wetland through Mel. thicket. Sep 2014 KULU dropper was 65cm above reed bed. Lake bed quite mushy, waters edge approx. 2m from base of dropper. Water not connected through to deepest part of wetland (in north east corner). Installed SS angle near dropper GPS 50 H 0480459, 6199994. Top of angle 134cm above lake bed. Will install gauge plate when more water available and can use water to determine level from deepest point.  Continued 100m north along track to turning area and discovered PWD benchmark B704 (GPS 50 H 0480258, 6200213).
11/5/2017	Alan Clarke, Yvonne Winchcombe	Arrived KULU and installed gauge plate, '1' and 'A' on ss angle. Top of ss angle 1.64m. LBL of A = 0.30m. Dry/damp at gauge. PWD Benchmark B704 located at 50 H 0480258, 6200215 (KULU BM B704). Installed a 2m ss angle near path into lake as temporary benchmark. KULU TBM located approx. 0.765m above ground at 50 H 0480428, 6200001. Surveyed from 1m mark on A gauge to KULU TBM, lake height of top of KULU TBM is 1.908m. Surveyed from KULU TBM to KULU BM B704, lake height of BM B704 is 2.902m.



**KWOB: Kwobrup****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	27/6/1979	Don Munro	1.5m		12.0m from west side of road, right angle to the fence at a point 95.0m from fence corner reference. 4.0m above high water mark.
HD 227	4/4/2000	John Bullock & Assoc.	1.858m	282.955m	AMG E 593360 N 6267500
HD 227	17/09/2004	B Hugessen		282.955m	GDA94 Z 50 E 593500 N 6267648
KWOBBM	5/04/2011	Alan Clarke			WGS 84 Z 50H E 593491 N 6267648

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	27/6/1979	Don Munro	1m	180m & 253° from CALM datum
2 (B)	27/6/1979	Don Munro	1m	99.75 & 252° from Gauge 1 (1m & 2m gauge plates)

**Gauge Maintenance:**

Date	By Whom	Details
4/4/2000	Alan Clarke	The 1m mark on gauge 1 read 0.998 and on gauge 2 read 0.995 when surveyed to the CALM datum. Gauge 1 angle in good condition but the plate was unreadable. Gauge 2 wood board was OK, the 1m plate was readable but the 2m stainless steel plate had no paint left on the face. A DOLA BM was installed and surveyed to the CALM datum and gauges. The lake was dry on April 4.

**KWOR: Kworknicup****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	18/3/1980	Don Munro	1.0m		14.0m from roadside a point 150.0m from road junction. Datum amid melaleuca trees where possibly subject to inundation.
HO 281	2/6/1998	Scanlan Surveys	1.869m	230.144m	AMG84 E 538289 N 6176148
KWORBM	17/09/2008	Yvonne Winchcombe			WGS 84 Z 50H E 538575 N 6176168

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	18/3/1980	Don Munro	2m	(1m & 2m gauge plates)
KWOR A	21/05/2008	Jim Lane	2m	WGS 84 Z 50H E 538750 N 6176181
KWORA	17/09/2008	Yvonne Winchcombe	2m	WGS 84 Z 50H E 538748 N 6176181
KWOR A2	9/11/2016	Yvonne Winchcombe	2m	WGS 84 Z 50H E 538749 N 6176181

**Gauge Maintenance:**

Date	By Whom	Details
1/4/1998	Alan Clarke, Dorian Moro	Work carried out by Alan Clarke and Dorian Moro on April 1. The 1m mark on gauge 1 read 1.000m when surveyed to the CALM datum. The wood post was in good condition. Both the 1m and 2m plates were replaced with stainless steel plates at their previous levels.
2/6/1998	Alan Clarke, Grant Pearson	The 1m mark on gauge 1 read 1.001 when surveyed to the CALM datum. CALM staff replaced the 1m and 2m plates in April 1998. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauge. Work carried out on June 2.
22/3/2007	Alan Clarke, Yvonne Winchcombe	Replaced the 1m stainless steel depth plate with a 6mm plastic depth plate and attached an 'A'. This gauge is a wood board with both 1m and 2m depth plates. The wood board will need to be replaced with two separate 1m and 2m gauges in a few years because the wood board is deteriorating. Used spirit level to determine height of dropper left in Nov 2006 from Gauge A. Top of dropper = 0.685m.

**LITT: Little White****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	13/7/1979	Don Munro	1.5m		At base & lake side of Casuarina tree located slightly above max. high water on north side of cleared access.
HD 217	10/5/1998	Scanlan Surveys	3.692m	295.086m	AMG 84 E 541321 N 6347413
Littbm	13/09/2008	Alan Clarke			WGS 84 Z 50H E 541357 N 6347281
LITT BM	5/11/2011	Jim Lane			WGS 84 Z 50H E 541356 N 6347282

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	13/7/1979	Don Munro	2m	160.0m & 266° from CALM datum (1m & 2m gauge plates)
Litta	13/09/2008	Alan Clarke	1m	WGS 84 Z 50H E 541194 N 6347288 (Replaced and repositioned 13/3/12 – need updated GPS)
B	13/3/2012	Alan Clarke	2m	WGS 84 Z 50H E 541320 N 6347299

**Gauge Maintenance:**

Date	By Whom	Details
10/5/1998	Alan Clarke, Grant Pearson	The 1m mark on gauge 1 read 0.977 when surveyed to the CALM datum. The 1m depth plate was missing. The 2m plate was faded. Two new plates were installed on the weathered but solid gauge wood board. The plates were positioned 23mm up from the old positions. The survey results show the final level for the 1m mark on gauge 1 was 0.994. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The work was carried out on May 10.
1/4/2007	Alan Clarke	There is one gauge at this lake, which is an old weathered wood board with two depth plates to 2m. A galv angle was installed at the rear of the board to secure the board from breaking. Separate 1m and 2m gauges will need to be installed at this site in the next two years. An 'A' was installed and the 1m stainless steel depth plate was replaced with a 3mm plastic plate.
13/3/2012	Alan Clarke, Anthony Reid	<p>Conducted initial dumpy level survey to assist to locate best position for new gauge B. Installed a new stainless angle for the new gauge B on the edge of the wetland down slope of the benchmark.</p> <p>Installed a new stainless angle for the replacement 1m gauge A 12m further out into the centre of lake from the old gauge A. Conducted a dumpy level survey from the lake benchmark to both new stainless angles and returned to determine their lake heights. A misclose of 3mm was calculated so the two heights of the angles were adjusted accordingly.</p> <p>A 6mm plastic depth plate, 2 and B were fixed to the new gauge B and a 6mm plastic depth plate, 1 and A were fixed to the new gauge A. The old gauge A angle was removed. LBL of A is 0.09m. Lake depth 0.09 same as salt crust/water level, see photos. LBL of B not recorded, see photo. The coordinates for new gauge B are WGS84 Z50 E 541320, N 6347299.</p> <p>September 2011 depth determined by using dumpy level from 2m mark on gauge B to ground at September water edge determined from Jim Lane's photo. The September 2011 depth was 0.361m.</p> <p>In November 2011 Jim Lane measured from the top of the gauge A angle, down to the water because the depth plate was missing. The distance was 65cm. Lake height for the top of the 1m gauge angle (gauge A) was 1.250m. Lake depth in November 2011 was therefore 1.250 – 0.650 = 0.6m.</p>

**LOGU: Logue**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM1	23/5/1979	Don Munro	0.45m		At base of northern most Mel. Sp. 5.0m west of survey line (track) at north side of grove. (NO LONGER EXISTS)
CALM2	6/5/1982	Don Munro	3.0m		On maximum high water mark & 8.0m south of track
HQ 48	17/5/1998	Scanlan Surveys	1.722m	33.930m	AMG84 E 321121 N 6695889 MGA94 Z 50 E 321114 N 6695885
LOGU BM1	17/09/2008	Jim Lane			WGS 84 Z 50J E 321114 N 6695888
LOBU F&W BM	17/09/2008	Jim Lane			WGS 84 Z 50 J E 321131 N 6695871

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1	23/5/1979	Don Munro		60.0m & 52° from CALM1 datum (REMOVED)
2	23/5/1979	Don Munro		300.0m & 52° from CALM1 datum (REMOVED)
1 (A)	6/5/1982	Don Munro	2m	(Inshore) 70.0m & 285° from CALM2 datum (1m & 2m gauge plate)
2 (B)	6/5/1982	Don Munro	1m	(Offshore) 230.0m & 282° from CALM2 datum
3 (C)	May 2000	Alan Clarke	4m	8m south from centreline of the access track towards the bottom of the large dune. E 321135 N 6695874.
(D)	March 2000	Alan Clarke	1m	450m northwest of gauge B
LOGU A	17/09/2008	Jim Lane	3m	WGS 84 Z 50J E 321069 N 6695885
LOGU B	17/09/2008	Jim Lane	1m	WGS 84 Z 50J E 320922 N 6695900
LOGU C	17/09/2008	Jim Lane	4m	WGS 84 Z 50J E 321134 N 6695878
LOGU D	17/09/2008	Jim Lane	1m	WGS 84 Z 50J E 320514 N 6696229

**Gauge Maintenance:**

Date	By Whom	Details
17/5/1998	Alan Clarke, Grant Pearson	The 2m mark on gauge 1 read 1.996 and the 1m mark on gauge 2 read 1.000 when surveyed to the CALM datum. The 1m and 2m depth plates on gauge 1 were in good condition. They were not altered. The gauge 2 depth plate had been damaged by rifle fire. It was replaced by a stainless steel plate at the same level. The survey results show the final level for the 1m mark on gauge 2 was 0.998. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The work was carried out on May 17.
May 2000	Alan Clarke, Stephanie Hill	A new 4m gauge was installed using galv. angle iron and a plastic plate. This gauge is positioned 8m south from the centre line of the access track towards the bottom of the large dune. 321135 E and 6695874 N. Measurements were taken to assist with calculating the 1999 September and November depths. For the details of these calculations see the accompanying diagram. The depth for Sept. 1999 was 4.027 and for Nov. 1999 the depth was 3.647.
28/03/2006	Alan Clarke, Sandra Fleisher	Installed a new gauge 450m to the north west of gauge B. This new gauge was labelled D and has a 1m depth plate. Replaced the bottom 2m plate Munro) on gauge A, which has two plates with a 6mm plastic plate. The 3m plate was in good condition. An A, B and C were installed on their respective gauges.
11/5/2009	Alan Clarke, Yvonne Winchcombe	Track in along gas pipe line overgrown but can drive over vegetation. Track turning off from gas pipe line down to lake VERY overgrown. Used loppers, hand saw and brush cutter to clear access. The track clearing took approx. 3.5 hours to complete. Lake was dry.

**MARI: Maringup****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
HP 253	22/5/1997	Jim Payne	8.270m	21.080m	MGA94 E 426551 N 6144692
MARIBM	15/09/2008	Yvonne Winchcombe			WGS 84 Z 50H E 426553 N 6144690

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	22/5/1997	Alan Clarke	7m	(6m & 7m gauge plates) 30m to east of track entrance into lake
MARIA	15/09/2008	Yvonne Winchcombe	7m	WGS 84 Z 50H E 426595 N 6144732
MARI 7A	10/04/2014	Yvonne Winchcombe	7m	WGS 84 Z 50H E 426593 N 6144731
MARIB	25/4/2018	Alan Clarke	7m	WGS 84 Z 50H E 426470 N 6144711

**Gauge Maintenance:**

Date	By Whom	Details
22/5/1997	Alan Clarke	Alan Clarke and Jim Payne carried out the work on May 22. Soundings were taken to determine the deepest point using a punt, outboard and string line with weight. The deepest mark on the line was measured with a cloth tape. The depth of 5.7m was transferred to a 7m gauge (2 by 1m plates). A DOLA BM with reference marks was installed and surveyed to the CALM gauge.
19/3/2007	Alan Clarke, Yvonne Winchcombe	Installed an 'A' on the top of the gauge.
19/4/2012	Alan Clarke, Anthony Reid	Replaced both the old stainless depth plates on the gauge with 6mm plastic depth plates attached directly onto the two stainless plates. Fixed an A to the top of the gauge. Lake depth at A was 5.60m.
25/4/2018	Alan Clarke, Laurent Marsol	Gauge A read 5.68m. Installed new depth gauge B approx. 100m west (left hand side) of track entrance using a 3m Stainless angle at wpt MARIB Z50 E 426470, N 6144711. The new gauge B has a 6m and 7m depth plate. The lake height was transferred using the still water conditions because a level survey was impractical at this site. Installed a 2m SS angle and alloy post with camera BP#17 facing the new B gauge.

**MART: Martinup**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	29/6/1979	Don Munro	1.5m		5.0m & 190° from fence corner reference
HD 222	12/5/1998	Scanlan Surveys	3.419m	242.087m	AMG84 E 516458 N 6290003
MART BM	18/07/2008	Jim Lane			WGS 84 Z 50H E 516363 N 6289934
MartBM	19/09/2008	Alan Clarke			WGS 84 Z 50H E 516359 N 6289931

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	29/6/1979	Don Munro	2m	11.0m & 219° from CALM datum (1m & 2m gauge plates)
2 (B)	29/6/1979	Don Munro	1m	88.0m & 219° from CALM datum
MART A	18/07/2008	Jim Lane	2m	WGS 84 Z 50H E 516333 N 6289917
MART B	18/07/2008	Jim Lane	1m	WGS 84 Z 50H E 516292 N 6289862
MartA	19/09/2008	Alan Clarke	2m	WGS 84 Z 50H E 516331 N 6289919
MartB	19/09/2008	Alan Clarke	1m	WGS 84 Z 50H E 516293 N 6289864

**Gauge Maintenance:**

Date	By Whom	Details
12/5/1998	Alan Clarke, Grant Pearson	The 2m mark on gauge 1 read 2.000 and the 1m mark on gauge 2 read 0.998 when surveyed to the CALM datum. Both the 1m and 2m depth plates on gauge 1 were faded and rusted. They were replaced with stainless steel plates at the same level. The survey results show the final level for the 2m mark on gauge 1 was 2.000. The depth plate at gauge 2 was replaced with a stainless steel plate and moved up 2mm. The survey results show the final level for the 1m mark on gauge 2 was 1.000. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The work was carried out on May 12.
4/5/2007	Alan Clarke	Installed an 'A' on the 2m onshore gauge, which is a wood board with both 1m and 2m depth plates. LBL @ A = 0.4m. Installed a 'B' on the 1m offshore gauge and replaced the 1m stainless steel depth plate with a 6mm plastic depth plate.

**MCLA: McLarty**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
HR 744				1.360m	(Source: Final DEC Wetland BM Heights.xls)
MCLA BM	6/08/2008	Jim Lane			WGS 84 Z 50H E 379489 N 6379596
MCLA BM2	27/08/2008	Jim Lane			WGS 84 Z 50H E379490 N 6379599
MCLA BM	9/6/2015	Yvonne Winchcombe			WGS 84 Z 50H E 379490 N 6379599 (No DOLA plate)

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)			2m	(Onshore)
2 (B)	1/5/1997	Alan Clarke	1m	(Offshore)
MCLA A	6/08/2008	Jim Lane	2m	WGS 84 Z 50H E 379501 N 6379614
MCLA A2	27/08/2008	Jim Lane	2m	(#2) WGS 84 Z 50H E 379502 N 6379615
MCLA A3	25/11/2008	Jim Lane	2m	(#3) WGS 84 Z 50H E 379499 N 6379615
MCLA B	20/9/2009	Jim Lane	1m	WGS 84 Z 50H E 379436 N 6379802
MCLA A4	11/9/2016	Jim Lane	2m	(#4) WGS 84 Z 50H E 379501 N 6379615
MCLA FoLM gauge	11/9/2016	Jim Lane		(Friends of Lake McLarty Gauge) WGS 84 Z 50H E 379197 N 6380745

**Gauge Maintenance:**

Date	By Whom	Details
1/5/1997	Alan Clarke	The work was carried out on May 1 under the supervision of Bob McCarthy with Jim Payne as the survey operator. Jim Lane, Grant Pearson and Alan Clarke were present and assisted with the levelling and gauge maintenance. There was no Munro map or CALM datum to secure the onshore depth gauge. The lake depth was determined by walking through the lake with a depth plate. Onshore gauge 1 (2m) was dropped 0.005 to equal the new gauge (offshore no. 2, 1m) installed to reflect the deepest point. A DOLA BM was installed and surveyed to the gauges. The top of the star iron picket out near gauge 2 has a lake height of 1.444m.
5/5/1999	Alan Clarke	The 2m mark on gauge 1 read 2.000 and the 1m mark on gauge 2 read 0.998 when surveyed to the CALM datum. Gauge 1 was in reasonable condition. The paint stripped stainless steel depth plate on gauge 2 was replaced with a plastic depth plate. The new plate was bolted directly onto the stainless steel plate. The lake benchmark, which was installed by DOLA staff in 1997, was levelled to an existing DOLA benchmark. The AHD of the lake benchmark is 17.994. The lake height of this benchmark is 1.465. Work carried out on May 5.
3/04/2006	Alan Clarke, Julia Sisson	Replaced the 2m plate at A and the 1m plate at B. An A and B were installed on their respective gauges.
9/6/2015	Alan Clarke, Yvonne Winchcombe	Looked for Dola benchmark HR 744, could only find concrete benchmark in plastic pipe with nail in top under peppermint tree. Tree roots appear to have lifted benchmark? No plaque or witness plate. Walked along fencelines but no other 'proper' benchmarks visible. Alan to check with DOLA if a proper benchmark was ever installed. Surveyed to 2m gauge A.

MEAR: Mears

### Datum Details:

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	1/6/1978	Don Munro	3.0m		1.5m S/E of twin trunked salmon gum
HL 420	5/5/1998	Don Munro	3.989m	223.611m	AMG84 E 533104 N 6433898
MearBM	14/09/2008	Alan Clarke			WGS 84 Z 50H E 533098 N 6433941

### Gauge Details:

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	1/6/1978	Don Munro	3m	
2 (B)	1/6/1978	Don Munro	2m	140.0m & 135° from CALM datum
(C)	May 2000	Alan Clarke	4m	
(D)	8/4/2001	Alan Clarke	1m	140° from CALM datum
MearA	14/09/2008	Alan Clarke	3m	WGS 84 Z 50H E 533134 N 6433928
MearB	14/09/2008	Alan Clarke	2m	WGS 84 Z 50H E 533148 N 6433912
MearC	14/09/2008	Alan Clarke	4m	WGS 84 Z 50H E 533124 N 6433940
MearD	14/09/2008	Alan Clarke	1m	WGS 84 Z 50H E 533202 N 6433851

### Gauge Maintenance:

Date	By Whom	Details
5/5/1998	Alan Clarke, Grant Pearson	The initial gauge heights have been taken from field book notes. The survey results only show final heights. The 3m mark on gauge 1 read 2.993 and the 2m mark on gauge 2 read 2.000 when surveyed to the CALM datum. The depth plate on gauge 1 was replaced with a stainless steel plate. The final level for the 3m plate was 3.003. The depth plate on gauge 2 was replaced with a stainless steel plate. The survey results show the final level for the 2m plate was 2.002. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The lake benchmark was levelled to an existing DOLA benchmark. The AHD of the lake benchmark is 223.611. The lake height of this benchmark is 3.989. The work was carried out on May 5.
May 2000	Alan Clarke, Stephanie Hill	The lake was flooded and with winter ahead I decided to install a 4m gauge. The depth on May 12 was 2.91m. I levelled in a 4m gauge from the DOLA datum. The gauge consisted of a galv. angle iron and plastic depth plate. The new gauge is 15m upslope from the 3m gauge on the same bearing as the other gauges. The January 2000 peak flood height was 3.45m. This was calculated by measuring the erosion line using a dumpy level and staff.
8/4/2001	Alan Clarke, Katherine Sorokine	Replaced stainless steel 2m gauge plate on gauge 2 with a plastic plate. I installed a 1m gauge using a galvanised angle iron and plastic depth plate. I levelled from the secure CALM datum (3m) to the 2m mark on gauge 2 (now reading 1.996 after plate replacement) and on to the angle iron for the 1m gauge. 1m mark of the new gauge (no. 4) reads 0.997 after the final check. The new 1m gauge (no.4) is 98m from gauge 2 (2m) and on a bearing of 140 from the CALM datum. Gauge 3 (4m) was installed in April 2000 and is in line with the CALM datum and gauges 1 and 2.
26/3/2007	Alan Clarke	Installed an 'A' on the 3m gauge, a 'C' on the 4m gauge, a 'B' on the 2m gauge and a 'D' on the 1m gauge. The 3m stainless steel plate was replaced with a 6mm plastic depth plate.
10/5/2009	Alan Clarke, Yvonne Winchcombe	4m gauge C in good condition, 3m gauge A in good condition. 2m gauge B in good condition, lake bed level of gauge B is 1.0m. The 1m gauge D had a broken 3mm plastic gauge plate. This was replaced with a new 6mm plastic gauge plate. Lake bed level of 1m gauge D was 0.29m. Lake was dry.



**METT: Mettler**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	14/9/1982	Don Munro	2.0m		Down track toward swamp on north side.
HE 113	6/4/2000	John Bullock & Assoc.	1.020m	102.062m	AMG E 646280 N 6171960
METTBM	16/09/2008	Yvonne Winchcombe			WGS 84 Z 50H E 646369 N 6172015
METT BM HE113	13/05/2015	Yvonne Winchcombe			WGS 84 Z 50H E 646371 N 6172026

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	14/9/1982	Don Munro	1m	On north side of track 95.0m east of CALM datum (on tree)
2 (B)	14/9/1982	Don Munro	1m	Amid Baumea sp. on track which continues through swamp
1 (C)	4/4/2000	Alan Clarke	1m	8m into the lake from gauge on tree 61.2m & 96° from Gauge 2.
METT2	16/09/2008	Yvonne Winchcombe	2m	WGS 84 Z 50H E 646459 N 6172011 (Old 2m gauge on tree)
METT C	16/09/2008	Yvonne Winchcombe	1m	WGS 84 Z 50H E 646484 N 6172021
METT D	8/11/2011	Yvonne Winchcombe	2m	WGS 84 Z 50H E 646376 N 6172022
METT E1	17/5/2013	Yvonne Winchcombe	1m	WGS 84 Z 50H E 646560 N 6172071 (Gauge for logger camera)
METT F1	12/4/2014	Yvonne Winchcombe	1m	WGS 84 Z 50H E 646530 N 6171989
METT G3	29/4/2018	Alan Clarke	3m	WGS 84 Z 50H E 646348 N 6171915 (3m Gauge for camera)

**Gauge Maintenance:**

Date	By Whom	Details
4/4/2000	Alan Clarke	Has two new gauges to replace the gauge on the tree and the rusted star iron and plate in the tall Baumea. When surveyed to the 1.0m CALM datum the gauge on the tree read 0.988 and the old gauge on the star iron read 0.997. We installed a new 1m gauge 8m in to the lake from the gauge on the tree. We installed a new 1m gauge next to the gauge in the Baumea. Lake depth April 4 was <b>approximately</b> 0.5m. A DOLA BM was installed and surveyed to the CALM datum and all of the gauges.
20/3/2007	Alan Clarke, Yvonne Winchcombe	Attached a 'C' to the 1m gauge. Installed a new 2m gauge next to the DLI Benchmark and attached a 'D' and '2'. Water level at new gauge D is 22mm below 1m mark at base of gauge = 0.978m. 2m gauge on tree (A) read 1.0m. The gauge on the tree should be removed. DLI BM is at 1.020m. Yvonne to check Mettler records and adjust any readings taken from gauge on tree (subtract 0.022m). The 1m offshore gauge B could not be found despite an extensive search, possibly submerged.
15/3/2012	Alan Clarke, Anthony Reid	The lake height for the top of the dropper installed by Yvonne Winchcombe in September 2011 was leveled in using a dumpy level from the 1m mark on gauge C. Top of dropper lake height was 0.849m. The dumpy level and staff were used to determine the lowest point on the bare ground along the edge of the Baumea stands. The lowest point was near the dropper. A 1m gauge D with stainless steel angle, 6mm plastic plate, 1 and D were installed close to the dropper. The coordinates of the new gauge are WGS84 Z50 E 646531, N 6171990. The lake was dry. (Note: Gauge incorrectly labelled – should be 1m F)
17/5/2013	Alan Clarke, Yvonne Winchcombe	Install new 1m gauge E in Mel. Grove on edge of Baumea. GPS 50 H 0646559 / 6172071. (Approx. location is mid way between Gauge C and data logger. Installed camera on tree looking at Gauge E. (see Field Camera form) Realised that Gauge D (Yvonne's dropper) incorrect as already have Gauge D at BM. Removed D from Gauge and replaced with F Need to correct records referring to Gauge D – should be F (Done 6/11/19). Wetland was Dry.
29/4/2018	Alan Clarke, Laurent Marsol	Installed new gauge E (3m) approx. 100m south of entrance track (right side) using 3m SS angle and two depth gauges. Used still water conditions to level the depth plate. GPS wpt 'METTE' Z50 E 646348, N 6171915. Installed camera BP#18 on tree 10m west of gauge E at GPS wpt Z50 E 646340, N 6171915, viewing gauge E. (NOTE: This 3m gauge should be G not E!)

	Marsol	E 646348, N 6171915. Installed camera BP#18 on tree 10m west of gauge E at GPS wpt Z50 E 646340, N 6171915, viewing gauge E. (NOTE: Also flooded 1m Gauge E – this 3m gauge should be G!)
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**MIRI: Miripin****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	16/6/1981	Don Munro	1.0m		7.5m & 106° from large yate tree
HD 219	13/5/1998	Scanlan Surveys	1.654m	243.212m	AMG84 E 518158 N 6288702
MIRIHD219	18/09/2009	Alan Clarke			WGS 84 Z 50H E 518066 N 6288832

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	16/6/1981	Don Munro	2m	On tree 5.0m & 182° from CALM datum
2 (B)	16/6/1981	Don Munro	1m	156.0m & 103° from CALM datum
1 (C)	13/5/1998	Alan Clarke	2m	

**Gauge Maintenance:**

Date	By Whom	Details
13/5/1998	Alan Clarke, Grant Pearson	This lake is not currently monitored. The gauges were renewed. Gauge 1 was attached to a tree. The 2m mark on gauge 1 read 1.994 and the 1m mark on gauge 2 read 1.004 when surveyed to the CALM datum. A new gauge 1 was installed using a galvanised angle iron and stainless steal depth plate. The gauge height was leveled in from the secure CALM datum. The survey results show the final level for the 2m mark on gauge 1 was 2.001. The depth plate at gauge 2 was replaced with a stainless steal plate and moved down 4mm. The survey results show the final level for the 1m mark on gauge 2 was 1.000. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The work was carried out on May 13.

**MLGR: Mount Le Grand****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
UE 363	12/4/2000	John Bullock & Assoc.	3.245m	7.815m	AMG Zone 51 E 418930 N 6240030
MtlgBM	17/09/2008	Alan Clarke			WGS 84 Z 51H E 419066 N 6240163
MLGR BM	13/11/2013	Jim Lane			WGS 84 Z 51H E 419066 N 6240162

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	12/4/2000	Alan Clarke	2m	30.62m & 355° from datum
2 (B)	17/1/2003	Alan Clarke	2m	10m further into Baumea from Gauge 1
MtlgA	17/09/2008	Alan Clarke	2m	WGS 84 Z 51H E 419064 N 6240199
MLGRB	1/5/2018		2m	

**Gauge Maintenance:**

Date	By Whom	Details
April 2000	Alan Clarke	Does not have a depth plate. A DOLA BM has been installed. The BM has been levelled to the top on an angle iron in the Swamp. The deepest point was not determined because of the high water and thick Baumea. The deepest point will have to be determined at a future visit when water levels recede to the point where a walking survey can be conducted. Until this is done and a gauge plate is fixed to the angle iron visitors will have to measure down from the top of the angle iron to the water.
5/4/2001	Alan Clarke, Katherine Sorokine	A galvanised angle iron was installed near the edge of the lake in April 2000 when the DOLA benchmark was installed. At this time the lake was too deep to determine maximum depth. At the visit this year the water was low. I walked out to the middle of the lake in waders. The mud and rotting Baumea were deep. Walking was difficult, at an area where the water was just below my waders I measured the water depth with a staff to be 0.8m. I was approximately in the middle of the wetland. I placed a temporary mark at the water level out through the thick Baumea near the angle iron, which, is at the edge of the wetland. From this mark I transferred a level to the top of the angle iron and fixed a 2m plate at the appropriate height. I then levelled from the 2m mark to the DOLA benchmark and back, to determine a lake level for the benchmark. There was a 1mm misclose on the return run. Lake height for the benchmark is 3.244m.
17/1/2003	Alan Clarke	Installed a second 2m gauge 10m further into Baumea using two galv angles and a 3mm plastic depth plate.
10/5/2006	Alan Clarke, Lucie Southern, Steph Gadal	An attempt to enter the lake through the thick fire regeneration vegetation was aborted when the Baumea was found to be too thick. A second track was cut into the lake further toward the ocean 20m from the first track attempt. The gauge was found after a short trek through the Baumea after forcing a way through the Melaleuca thicket. A 2m galv. angle was attached to the gauge to help strengthen and support the location pole. A 5m long 40mm PVC pipe was attached to the gauge to help find the gauge in the tall Baumea. A "2" was attached to the top of the depth plate with an A on its reverse side. The lake depth at A was 1.18m.
30/3/2007	Alan Clarke	Installed an 'A' and replaced the '2' on the first 2m gauge that has the PVC pole attached. Gauge B was too deep to reach.
19/5/2013	Alan Clarke, Yvonne Winchcombe	Drove to Mt Le Grande to install new gauge. Vegetation surrounding wetland very thick – can't get into existing gauges. New track in GPS MTLG TRACK 51 H 0419131 / 6240153, park here on side of road and head through scrub into wetland. No visible water in wetland so could not install gauge, installed angle iron but did not attach gauge plate. Angle MTLG 'C' GPS 51 H 0419114 / 6240204. AI to revisit in November and install gauge plate if water up to angle. Can see top of existing gauge to LHS but very thick regrowth and thick Baumea make access difficult.
1/5/2018	Alan Clarke, Laurent Marsol	Installed a new 2m gauge 15cm in front of the old rusted 2m gauge B. Used a 3m SS angle and alloy depth plate. Levelled the height in by using a bubble level from top of the 2m mark on old gauge. Vegetation too thick and ground too unstable to use the Dumpy level. Took the '2' and 'B' from the old gauge and installed on the new gauge. The mud was wet and sloshy around the base of the gauge. There was water 2m further into the wetland from the gauge. LBL of gauge approx. 0.8m ie mud approx. 20cm below 1m mark on gauge B.

**MOAT: Moates****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	18/3/1980	Don Munro	5.00m		Approx. 5.0m off north side of track and approx 2.0m above max. high water mark
HO 282	1/6/1998	Scanlan Surveys	5.058m	10.355m	AMG84 E 600874 N 6131559
MOATBM	16/09/2008	Yvonne Winchcombe			WGS 84 Z 50H E 600908 N 6131536

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	18/3/1980	Don Munro	5m	70.0m & 270° from CALM datum (4m & 5m gauge plates)
MOATA	16/09/2008	Yvonne Winchcombe	6m	WGS 84 Z 50H E 600883 N 6131482 (Gauge missing 18/9/2013)
MOAT B	15/09/2014	Yvonne Winchcombe	5m	WGS 84 Z 50H E 600898 N 6131477

**Gauge Maintenance:**

Date	By Whom	Details
1/6/1998	Alan Clarke, Grant Pearson	The 5m mark on gauge 1 read 4.974 when surveyed to the CALM datum. Gauge 1 was not altered. The wood board was in reasonable condition. Both depth plates were OK. The 4m plate was beginning to fade. The lake height for the top of a wood stake used to measure water depth was 2.678. The lake height for the top of a star iron used to measure water depth was 2.074. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauge. An old gauge with measurements in inches was located amongst the baumea near the gauge. Work carried out on June 1.
20/3/2007	Alan Clarke, Yvonne Winchcombe	Replaced the 5m and 6m stainless steel depth plates with two 3mm plastic depth plates. Attached an 'A' to the gauge. Did not have a '6' to attach so left old '6' in place.
20/8/2014	Alan Clarke	Gauge A missing on 18/9/2013. Installed new 5m gauge B at WGS 84 Z50H E 600897 N 6131478. Depth at B read 4.26m

**MOLL: Mollerin**

**Datum Details:**

<b>ID</b>	<b>Date</b>	<b>By Whom</b>	<b>Lake Height</b>	<b>AHD Height</b>	<b>Location (See sketch diagram for details)</b>
CALM	8/7/1980	Don Munro	1.0m		4.00m west of fire-break & approx 13.00m above edge of deep depression
HV 262	8/5/1999	Scanlan Surveys	1.047m	312.543m	AMG84 E 554031 N 6625291
HV 262	22/03/2005	DOLA			GDA94 Z 50 E 554214 N 6625482

**Gauge Details:**

<b>ID</b>	<b>Date</b>	<b>By Whom</b>	<b>Lake Height</b>	<b>Location (See sketch diagram for details)</b>
1 (A)	8/7/1980	Don Munro		200m & 18° from CALM datum

**Gauge Maintenance:**

<b>Date</b>	<b>By Whom</b>	<b>Details</b>
8/5/1999	Alan Clarke	This lake is not currently monitored. The gauge was not altered. The gauge board and depth plate were in good condition. The 1m mark on gauge 1 read 0.990 when surveyed to the CALM datum. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauge. Work carried out on May 8 and 9.

**MORT: Mortijnup****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
UE 359	12/4/2000	John Bullock & Assoc.	3.922m	16.990m	AMG Zone 51 E 373540 N 6259270
MortBM	17/09/2008	Alan Clarke			WGS 84 Z 51H E 373710 N 6259469
MORT BM	15/5/2017	Yvonne Winchcombe			WGS 84 Z 51H E 373696 N 6259461 (new BM installed to replace one 'lost' during wildfires)
MORT RM1 SOUTH	15/5/2017	Yvonne Winchcombe			WGS 84 Z 51H E 373696 N 6259449 (Reference Mark #1 South)
MORT RM2 WEST	15/5/2017	Yvonne Winchcombe			WGS 84 Z 51H E 373684 N 6259459 (Reference Mark #2 West)

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	12/4/2000	Alan Clarke	4m	31.7m & 210° from datum
2 (B)	3/2/2003	Alan Clarke	3m	40m into lake from Gauge A
(C)	May 2006	Alan Clarke	2m	50m into the lake from gauge B.
MORT	13/07/2008	Jim Lane		WGS 84 Z 51H E 373675 N 6259426
MortA	17/09/2008	Alan Clarke	4m	WGS 84 Z 51H E 373701 N 6259450
MortB	17/09/2008	Alan Clarke	3m	WGS 84 Z 51H E 373702 N 6259435
MortC	17/09/2008	Alan Clarke	2m	WGS 84 Z 51H E 373705 N 6259386
MortD	9/5/2012	Alan Clarke	1m	WGS 84 Z 51H E 373706 N 6259334

**\*\*NOTE: Need to pick up key from owner before entering property. Mick at 8 Elysium Road, Chadwick Ph. 9071 5913**

**Gauge Maintenance:**

Date	By Whom	Details
12/4/2000	Alan Clarke	The deepest point was determined by weight and line in the 3.6m punt. Lake depth on April 12 was approximately 3.3m. A DOLA BM and a 4m depth gauge were installed.
3/2/2003	Alan Clarke, Mathilde Breton	Installed a new 3m gauge using a galvanised angle iron and plastic depth plate. The new gauge is 40m into the lake from the 4m gauge. A dropper installed by Alan Clarke for the November depth gauge run was surveyed. The lake height for the top of the dropper is 2.468m. A star iron installed by Grant Pearson for the September depth gauge run was surveyed. The lake height for the top of the star iron is 2.785m. The new 3m gauge was dry. The water was approximately 0.5m below the bottom of the 3m gauge. Estimated lake depth was 1.5m.
9/5/2006	Alan Clarke, Lucie Southern, Steph Gadal	Installed a new 2m gauge (C) using a galvanised angle iron and 6mm plastic depth plate. This gauge is 50m into the lake from gauge B (3m). An A, B and C were fixed to their respective gauges. The lake depth at C was 1.55m.
8/5/2009	Alan Clarke, Yvonne Winchcombe	Picked up key from Mick (Roger Jaensch's brother in law) at 8 Ellicium Road (off Warden Road) Large house on top of hill overlooking Lake Warden with native plant nursery. He manages farm and has done a lot of fencing of wetlands. Replaced broken 3mm gauge plate with new 6mm gauge plate at 3m gauge B. Replaced broken 3mm gauge plate with new 6mm gauge plate and '2' at 2m gauge C. Depth was 1.21m. Approx. 50 swans on lake and numerous ducks. Deer footprints on beach.
9/5/2012	Alan Clarke, Tilo Massenbauer	Picked up key from Mick near Lake Warden and travelled to Lake. Loaded up gear and walked into lake edge. The water was very low exposing soft mud on the flat base of the lake. Time was taken to investigate a number of options for the placement of a 1m gauge. Soft sediment prevented location of the gauge further into the wetland to allow for very low water levels to be recorded. The final position of the new 1m gauge D was in line with the other gauges 52m into the lake from gauge C. The GPS coordinates for the new 1m gauge D are WGS84 Z51 E 373706, N 6259334.  A new stainless steel angle was installed 52m in from gauge C. A dumpy level was used to transfer a lake height from the 2m mark on gauge C to the top of the new angle. A 6mm plastic depth plate, D and 1 were fixed to the new angle at the correct height. The depth on the new gauge D was <0.5m. The LBL of D is 0.5m.
15/5/2017	Alan Clarke,	Could not find old BM due to firebreaks being pushed through to wetland during Esperance fires.

	Yvonne Winchcombe	<p>Installed BM and 2 reference marks. Dug holes for reference marks and drove in 500mm s/s rod until approx. 15cm below natural surface. GPS for MORT RM1 SOUTH is at 51 H 0373696, 6259449 and MORT RM2 WEST is at 51 H 0373684, 6259459. Dug hole for BM, filled bottom with water and some KWIKSET concrete. Install BM and fill surround with concrete, top of BM is 20cm above natural surface. MORT BM (new 2017) is 51 H 0373695, 6259461.</p> <p>Gauge 2C = 1.73m. Surveyed lake heights of MORT BM, MORT RM1 SOUTH and MORT RM2 WEST based on height of gauge 2C. Deer footprints on beach.</p>
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**MOWE: Mowen**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
MOWE BM	2/2/2017	Yvonne Winchcombe			WGS 84 Z 50H E 345889 N 6239182
MOWE RM1	2/2/2017	Yvonne Winchcombe			WGS 84 Z 50H E 345890 N 6239177 (Reference Mark - South)
MOWE RM2	2/2/2017	Yvonne Winchcombe			WGS 84 Z 50H E 345885 N 6239185 (Reference Mark – West)

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
MOWE A1	2/2/2017	Yvonne Winchcombe	1m	WGS 84 Z 50H E 345861 N 6239265

**Gauge Maintenance:**

Date	By Whom	Details
2/2/2017	Alan Clarke, Yvonne Winchcombe	<p>From Busselton travel south on Sue's Road, right into Mowen Road, left (south) into Great North Road. 4.4km south turn left into Oasis Road. Follow track for 1.8km to turn in/parking point (GPS MOWE TP1). Map 73 – South West Region Atlas</p> <p>Loaded equipment into wheelbarrow and pushed through swamp to dropper. Puddles at base of dropper, wetland damp. 25m beyond dropper was 10cm water. Measured from top of dropper down to wet puddle = 47cm. Bottom of wetland muddy with wet puddles, uneven due to tussock rushes and holes.</p> <p>Installed SS angle in approx. 13cm water. MOWE A - GPS 50H 0345861, 6239265. Sediment soft clay – needs 2<sup>nd</sup> angle to attach gauge plate. Distance from top of angle to water surface is 46cm. Depth from water surface to lake bed is 13cm. Lake bed is pot-hole, not flat even surface.</p> <p>Returned to 'island' shore and located site for BM. MOWE BM at GPS 50H 0345889, 6239182.</p> <p>Positioned reference peg RM1, 5m south of BM on bearing of 200°. Reference peg is a 12mm x 450mm tent peg. MOWE RM1 GPS 50H 0345890 6239177. Dug hole 45cm deep and drive tent peg into base leaving 20cm peg exposed. Fill hole with water and soak. Fill around peg with rapid set concrete and add water leaving top of peg exposed. Top of peg approx. 18cm below natural surface.</p> <p>2<sup>nd</sup> reference peg RM2 installed 5m west on bearing of 280° from MOWE BM. MOWE RM2 GPS 50H 0345885, 6239185.</p> <p>Dug 50cm hole at BM location, installed BM (50cm long,unlabelled) so that top of BM is 50mm above natural surface. Concreted in place.</p> <p>Surveyed levels using staff and dumpy level.            Top of MOWE RM1 = 0.177m below MOWE BM and 5m bearing 200 from BM.            Top of MOWE RM2 = 0.290m below MOWE BM and 5m and bearing 280 from BM.            Top of SS Angle = 0.253m below MOWE BM.            Top of MOWE dropper = 0.248m below MOWE BM.</p>
17/2/2017	Alan Clarke	<p>Attached 2<sup>nd</sup> SS angle, attached gauge board, 'A' and '1' to angle. Measured from top of 1m gauge plate down to top of 1<sup>st</sup> SS angle = 0.411m. Top of 1<sup>st</sup> SS angle = 1.0 – 0.411 = 0.589m.</p> <p>Lake height of BM = 0.589m + 0.253m = 0.842m            Lake height of dropper = 0.842 - 0.248 = 0.594m</p>

**MTMA: Mount Marshall 26687****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	16/7/1981	Don Munro	1.0m		7.0m above vegetation line around lake perimeter and 10.0m north of track.
HV 263	8/5/1999	Scanlan Surveys	1.541m	290.130m	AMG84 E 560816 N 6579513
HV 263	25/03/2004	DOLA			GDA94 Z 50 E 560937 N 6579648

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	16/7/1981	Don Munro	1m	150m & 295° from CALM datum

**Gauge Maintenance:**

Date	By Whom	Details
8/5/1999	Alan Clarke	This lake is not currently monitored. The gauge was not altered. The gauge board had snapped off at its base. The board was fitted back onto the stump and leveled to the CALM datum. The 1m mark on gauge 1 read 1.002 when surveyed to the CALM datum. The CALM datum was weathered but solid. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauge. The lake was dry on May 8.

**MUIR: Muir****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM1	4/8/1980	Don Munro	1.0m		3.0m off west side of track and 5.0m lake side of main line of bush – north end of lake. (NO LONGER EXISTS)
CALM2			3.0m		East side of lake
HP 255	17/4/2000	John Bullock & Assoc.	1.399m	172.375m	AMG E 470860 N 6184900
MUIRBM	18/09/2008	Yvonne Winchcombe			WGS 84 Z 50H E 471032 N 6185028

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	4/8/1980	Don Munro		230m & 162° from CALM1 datum – north end of lake. (NO LONGER EXIST)
2 (B)	4/8/1980	Don Munro		630 & 162° from CALM1 datum – north end of lake. (NO LONGER EXIST)
1 (C)			2m	5.35m & 299° from DOLA datum
2 (D)			1m	80.4m & 272° from DOLA datum
MUIRC	18/09/2008	Yvonne Winchcombe	2m	WGS 84 Z 50H E 471028 N 6185031 (13/9/2017 Damaged – not replaced)
MUIRD	18/09/2008	Yvonne Winchcombe	1m	WGS 84 Z 50H E 470945 N 6185029
MUIR D1	8/11/2016	Yvonne Winchcombe	1m	WGX 84 Z 50H E 470944 N 6185033

**Gauge Maintenance:**

Date	By Whom	Details
3/6/1998	Alan Clarke, Grant Pearson	The original access map for Lake Muir was used to attempt to locate the gauges on the north end of the lake adjacent to Muir highway. The gauges at this site are no longer operational. I did not know of the current site on the east side of the lake at the time of the survey. A DOLA benchmark was installed with reference marks at the old site. Work carried out on June 3 and 4.
17/4/2000	Alan Clarke	The 2m mark on gauge 1 read 0.992 when surveyed to the CALM datum. We replaced the faded depth plate with a plastic plate. The 1m mark on gauge 2 read 1.000 when surveyed to the CALM datum. The depth plate was faded and the angle iron was badly rusted. A new 1m gauge was installed next to the old gauge 2. The old gauge was then removed. A DOLA BM was installed and surveyed to the CALM datum and gauges. Lake depth on April 17 was 0.56m.
16/2/2002	Alan Clarke, Mike Scanlon	The 1m and 2m plastic depth plates on gauges 1 and 2 have been broken off along the length of the gauge where it sits off the angle iron. The cattle footprints around the base of both gauges suggest that cattle have been scratching themselves against the gauges and or attempting to eat the salty plastic, which has caused the plates to snap off in bite size pieces. Both depth plates were replaced with plastic plates at the same levels. The lake was dry.
23/3/2007	Alan Clarke, Yvonne Winchcombe	Attached a 'C' to the 2m onshore gauge. Replaced the 3mm plastic depth plate on the 1m gauge with a 6mm plastic depth plate and attached a 'D' and '1'.

**MUNG: Mungala**

**Datum Details:**

<b>ID</b>	<b>Date</b>	<b>By Whom</b>	<b>Lake Height</b>	<b>AHD Height</b>	<b>Location (See sketch diagram for details)</b>
CALM	12/6/1979	Don Munro	1.0m		At base and on west side of fence junction.
HZ 918	18/5/1999	Scanlan Surveys	1.184	68.588m	AMG84 E 395050 N 6521250
MUNG BM	2/11/2008	Jim Lane			WGS 84 Z 50J E 395151 N 6521364
MUNG F&W BM	2/11/2008	Jim Lane			WGS 84 Z 50J E 395150 N 6521363

**Gauge Details:**

<b>ID</b>	<b>Date</b>	<b>By Whom</b>	<b>Lake Height</b>	<b>Location (See sketch diagram for details)</b>
1 (A)	12/6/1979	Don Munro		28m & 275° from CALM datum

**Gauge Maintenance:**

<b>Date</b>	<b>By Whom</b>	<b>Details</b>
18/5/1999	Alan Clarke	This lake is not currently monitored. The gauge was not altered. The gauge had broken off at its base. The CALM datum was eventually found on the old fence line. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum. The work was carried out on May 18.

**MURA: Murapin****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	16/6/1981	Don Munro	2.0m		23.0m & 230° from corner strainer post.
HD 220	13/5/1998	Scanlan Surveys	3.105m	242.695m	AMG84 E 517630 N 6289374
MURABM	19/9/2008	Alan Clarke			WGS 84 Z 50H E 517681 N 6289397

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	16/6/1981	Don Munro		(Nearshore) on tree, 35.0m & 205° from CALM datum
2 (B)	16/6/1981	Don Munro	1m	(Offshore) 233.0m & 202° from CALM datum
1 (C)	12/5/1998	Alan Clarke	2m	

**Gauge Maintenance:**

Date	By Whom	Details
12/5/1998	Alan Clarke	This lake is not currently monitored. The gauges were renewed. Gauge 1 was secured to a fallen tree. A new gauge 1 was installed using a galvanised angle iron and stainless steel depth plate. The gauge height was leveled in from the secure CALM datum. The survey results show the final level for the 2m mark on gauge 1 was 1.999. The depth plate at gauge 2 was replaced with a stainless steel plate and moved up 3mm. The survey results show the final level for the 1m mark on gauge 2 was 0.999. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The work was carried out on May 12.

**MURR: Murray 24739**

**Datum Details:**

<b>ID</b>	<b>Date</b>	<b>By Whom</b>	<b>Lake Height</b>	<b>AHD Height</b>	<b>Location (See sketch diagram for details)</b>
CALM	2/5/1981	Don Munro	0.6m		Beneath marker peg located 1.0m on west side of fire-break at a distance of 185m from junction of fire-break and access track.
HR 741	5/5/1999	Scanlan Surveys	0.455m	0.692m	AMG84 E 378648 N 6381888
MURR BM	6/08/2008	Jim Lane			WGS 84 Z 50H E 378784 N 6382052

**Gauge Details:**

<b>ID</b>	<b>Date</b>	<b>By Whom</b>	<b>Lake Height</b>	<b>Location (See sketch diagram for details)</b>
1 (A)	2/5/1981	Don Munro	1m	6.0m & 290° from CALM datum
2 (B)	2/5/1981	Don Munro	1m	37.0m & 290° from CALM datum
MURR FW1	6/08/2008	Jim Lane		WGS 84 Z 50H E 378776 N 6382066

**Gauge Maintenance:**

<b>Date</b>	<b>By Whom</b>	<b>Details</b>
5/5/1999	Alan Clarke	This lake is not currently monitored. The gauges were not altered. The 1m mark on gauge 1 read 1.101 and the 1m mark on gauge 2 read 0.993 when surveyed to the CALM datum. Both gauges were in reasonable condition. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. Work carried out on May 5.

**NAMB: Nambung**

**Datum Details:**

<b>ID</b>	<b>Date</b>	<b>By Whom</b>	<b>Lake Height</b>	<b>AHD Height</b>	<b>Location (See sketch diagram for details)</b>
CALM	12/6/1979	Don Munro	1.0m		55.0m & 280° from fence junction
HZ 919	18/5/1999	Scanlan Surveys	1.286	68.761m	AMG84 E 394450 N 6521750
NAMB BM	27/11/2008	Jim Lane			WGS 84 Z 50J E 394607 N 6521821
NAMB F&W BM	27/11/2008	Jim Lane			WGS 84 Z 50J E 394605 N 6521807

**Gauge Details:**

<b>ID</b>	<b>Date</b>	<b>By Whom</b>	<b>Lake Height</b>	<b>Location (See sketch diagram for details)</b>
1	12/6/1979	Don Munro	1m	55.0m & 272° from CALM datum

**Gauge Maintenance:**

<b>Date</b>	<b>By Whom</b>	<b>Details</b>
18/5/1999	Alan Clarke	This lake is not currently monitored. The gauge was not altered. The 1m mark on the gauge read 0.996 when surveyed to the CALM datum. The gauge wood board and depth plate are in poor condition. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauge. The work was carried out on May 18.

**NGOP: Ngopitchup****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
HD 226	3/4/2000	John Bullock & Assoc.	1.417m	377.795m	AMG E 531580 N 6242540
NGOP BM	14/07/2008	Jim Lane			WGS 84 Z 50H E 531747 N 6242644
NGOPBM	17/09/2008	Yvonne Winchcombe			WGS 84 Z 50H E 531744 N 6242645

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	3/4/2000	Alan Clarke	1m	32.3m & 293° from datum
NGOP A	14/07/2008	Jim Lane	1m	WGS 84 Z 50H E 531717 N 6242655
NGOP A1	6/11/2016	Yvonne Winchcombe	1m	WGS 84 Z 50H E 531718 N 6242657

**Gauge Maintenance:**

Date	By Whom	Details
3/4/2000	Alan Clarke	Was surveyed for the deepest point using Digital level and staff. The deepest point was located just in front of the track entrance to the lake. A 1m gauge was installed at the deepest point with a DOLA BM installed further up the slope. On April 3 the lake was dry.
21/3/2007	Alan Clarke, Yvonne Winchcombe	Replaced the stainless steel depth plate with a 6mm plastic depth plate and attached an 'A' to the 1m gauge.



NINA: Ninan

### Datum Details:

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	5/7/978	Don Munro	2.0m		
HM 1455	19/5/1998	Scanlan Surveys	3.648m	239.645m	AMG84 E 467083 N 6575665
NINA BM1	18/09/2008	Jim Lane			WGS 84 Z 50J E 467029 N 6575597

### Gauge Details:

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	5/7/1978	Don Munro	2m	150m & 323° from datum
2 (B)			1m	78.5m & 321° from datum
2 (C)	19/5/1998	Alan Clarke	1m	78.5m & 321° from datum
NINA A	18/09/2008	Jim Lane	2m	WGS 84 Z 50J E 466989 N 6575642
NINA B	18/09/2008	Jim Lane	1m	WGS 84 Z 50J E 466935 N 6575700
NINA X	12/11/2010	Jim Lane		WGS 84 Z 50J E 466919 N 6575719 (Old gauge – Jim took photos)

### Gauge Maintenance:

Date	By Whom	Details
19/5/1998	Alan Clarke, Grant Pearson	The 2m mark on gauge 1 read 1.999 when surveyed to the CALM datum. The 2m plate was faded towards the bottom, but it was not replaced. Gauge 2 was not operational, being encrusted in a thick layer of salt. A new 1m gauge was installed using 2 galvanised angle irons bolted together and a stainless steel depth plate. The gauge height was levelled in from the secure CALM datum. The survey results show that the final level for the 1m mark on the new gauge 2 was 1.002. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The work was carried out on May 19.
29/03/2006	Alan Clarke, Sandra Fleisher	An attempt to remove the 1m gauge and replace it was not successful. The gauge consists of two 2m galvanised angle irons joined together. Approximately 1.5m of angle is in the ground. The angle is heavily rusted, but still secure. A 1m plastic depth plate was fixed over the original stainless-steel plate. An A and B were installed on their respective gauges.

**NINE: Nine Mile****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	17/6/1981	Don Munro	3.0m		2.0m south side of track where it emerges from bush line on approx. max. high water mark (NO LONGER EXISTS)
HR 742	5/5/1999	Scanlan Surveys	2.861m	10.278m	AMG84 E 385413 N 6376287
NINE BM	6/08/2008	Jim Lane			WGS 84 Z 50H E 385536 N 6376505
NINE BM HR742	9/6/2015	Yvonne Winchcombe			WGS 84 Z 50H E 385536 N 6376507
NINE TBM	9/6/2015	Yvonne Winchcombe	0.743m		WGS 84 Z 50H E 385897 N 6376713

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1	17/6/1981	Don Munro	1m	(Nearshore) 43.0m & 43° from CALM datum. No longer exists.
2	17/6/1981	Don Munro	2m	(Offshore) 225.0m & 60° from CALM datum
NINE B	6/08/2008	Jim Lane	2m	WGS 84 Z 50H E 385718 N 6376633
NINE B2	9/6/2015	Yvonne Winchcombe	2m	WGS 84 Z 50H E 385718 N 6376632
NINE D1	9/6/2015	Yvonne Winchcombe	1m	WGS 84 Z 50H E 385836 N 6376745

**Gauge Maintenance:**

Date	By Whom	Details
May 1999	Alan Clarke	A metal detector was used to locate the CALM datum, it was under a large fallen tree. The datum was damaged beyond providing any lake height details. Since the last depth gauge run vandals had removed gauge 1. Gauge 2 was in reasonable condition, so it was used as the temporary datum. The old depth plates were replaced with plastic plates. A DOLA benchmark was installed with reference marks and surveyed to the CALM gauge 2.
3/5/2007	Alan Clarke	The gauge is a wood board with both 1m and 2m depth plates. The typha has increased its coverage making the gauge more difficult to find. Installed a 'B' and replaced the 1m stainless steel depth plate with a 6mm plastic depth plate. LBL of gauge B is 0.30m.
09/12/2010	Alan Clarke, Yvonne Winchcombe	Installed a 1m gauge (C) next to the depth logger using galv angle and plastic depth plate. New gauge level was surveyed in from 1m mark on gauge B. A misclose of 10mm from the levelling runs was halved and applied to the height of the new gauge.
9/6/2015	Alan Clarke, Yvonne Winchcombe	Arrived Nine Mile and located Dola benchmark HR 742 (AHD 10.278m, lake height 2.861m), GPS 50 H 0385536, 6376507. Recorded GPS location of track in NINE TP1, parking area NINE TP2 and walk track through typha NINE TP3. Surveyed from benchmark to bottom of lake and installed new 1m gauge D (GPS 50 H 0385836, 6376745), lake bed level of gauge = -0.240m (boggy depression dug out in middle of lake bed). Installed a temporary benchmark NINE TBM on edge of surrounding Mel. shrubs by hammering in a length of angle – 17cm above lake bed (GPS 50 H 0385897m 6376713). Lake was dry.

**NONA: Nonalling****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	11/7/1979	Don Munro	2.0m		130.0m & 125° from gate
HL 422	6/5/1998	Scanlan Surveys	2.370m	264.943m	AMG84 E 557249 N 6400137
NONA BM	17/07/2009	Jim Lane			WGS 84 Z 50H E 557243 N 6400132
NONA F&W BM	17/07/2009	Jim Lane			WGS 84 Z 50H E 557261 N 6400133

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	11/7/1979	Don Munro	2m	150m & 55° from CALM datum
2 (B)	11/7/1979	Don Munro		350m & 60° from Gauge 1

**Gauge Maintenance:**

Date	By Whom	Details
6/5/1998	Alan Clarke, Grant Pearson	This lake is not currently monitored. The gauges were not renewed. The initial gauge heights have been taken from field book notes. The survey results only show final heights. The 2m mark on gauge 1 read 2.028 when surveyed to the CALM datum. The depth plate on gauge 2 was badly rusted; there was no mark to level to. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The work was carried out on May 6.

**NOOB: Noobijup****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
HP 257	26/4/2000	John Bullock & Assoc.	2.883m	222.552m	AMG E 480725 N 6192505 MGA94 Z 50 E 480864 N 6192650
NOOBBM	18/09/2008	Yvonne Winchcombe			WGS 84 Z 50H E 480867 N 6192653
NOOB BM HP257	20/05/2015	Yvonne Winchcombe			WGS 84 Z 50H E 480865 N 6192651

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	26/4/2000	Alan Clarke	2m	20.7m & 301° from datum
NOOB A	21/05/2008	Jim Lane	2m	WGS 84 Z 50H E 480848 N 6192661
NOOB U	21/05/2008	Jim Lane	1m	WGS 84 Z 50H E 480825 N 6192669
NOOBA	18/09/2008	Yvonne Winchcombe	2m	WGS 84 Z 50H E 480849 N 6192662
NOOBU	18/09/2008	Yvonne Winchcombe	1m	WGS 84 Z 50H E 480826 N 6192670 (Unlabelled gauge)
NOOB A2	20/05/2015	Yvonne Winchcombe	2m	WGS 84 Z 50H E 480847 N 6192660
NOOB B1	20/5/2015	Yvonne Winchcombe	1m	WGS 84 Z 50H E 480825 N 6192669
NOOB IW1	20/5/2015	Yvonne Winchcombe	1m	WGS 84 Z 50H E 480825 N 6192671 (Ian Wheeler's unlabelled gauge)

**Gauge Maintenance:**

Date	By Whom	Details
26/4/2000	Alan Clarke	Deepest point on April 26 was 0.95. A 2m gauge was installed with 1m and 2m plastic plates. A DOLA BM was installed and surveyed to the new gauge. The top of the star iron, used for previous measurements, has a lake depth of 1.88m.
21/3/2007	Alan Clarke, Yvonne Winchcombe	Attached an 'A' to the 2m gauge. Difficult to install a 1m gauge as lake the bed is very soft. Roger Hearn (Regional Ecologist Manjimup) advised us on Friday 23 March that he and Ian Wheeler would be installing a 1m gauge at this lake soon.
20/5/2015	Alan Clarke, Yvonne Winchcombe	Located DOLA BM HP257. Surveyed to top of white bore casing NB01 (6m). Padlock smashed – the padlocks are too large and break the plastic of the casing when you lift up the padlock to unlock it – hence all the padlocks have broken the casing lids. Depth at 1m Ian Wheeler gauge = 0.05m. Both 1m IW gauge and 2A gauge have been damaged by fire. The 1m gauge is all melted, warped and shrunken. Surveyed from BM and installed new 1m gauge B, depth = 0.04m. 1m gauge at exactly 1m. Removed lower melted portion (1m gauge plate) from 2m gauge A.

**NOON: Noonying**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	14/6/1979	Don Munro	3.0m		180.0m east of fence line (Nth/Sth) and 2.0m south of fence (East/West) (NO LONGER EXISTS)
HU 408	19/5/1998	Scanlan Surveys	3.242m	239.642m	AMG84 E 542474 N 6497793
NOON BM1	19/09/2008	Jim Lane			WGS 84 Z 50J E 542507 N 6497744
NOON BM HU408	23/5/2017	Yvonne Winchcombe			WGS 84 Z 50J E 542506 N 6497743

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	14/6/1979	Don Munro	2m	110.0 & 185° from CALM datum (1m & 2m gauge plates)
NOON A	19/09/2008	Jim Lane	2m	WGS 84 Z 50J E 542497 N 6497652
NOON B2	23/5/2017	Yvonne Winchcombe	2m	WGS 84 Z 50J E 542496 N 6497696

**Gauge Maintenance:**

Date	By Whom	Details
20/5/1998	Alan Clarke, Grant Pearson	The CALM datum was not found. An extensive search using a metal detector around the area indicated on the Munro map, failed to locate the datum. The bearing and distance taken from the Munro map put the datum in a paddock behind a new fence, which was in a different alignment to the old fence drawn on the map. The bottom 1m depth plate was replaced with a stainless steel depth plate. The top 2m plate was secured with wood tech screws. The gauge wood board was in reasonable condition. A DOLA benchmark was installed with reference marks and surveyed to the gauge. The work was carried out on May 20.
2/4/2007	Alan Clarke	Installed an 'A' at the 2m gauge. This gauge is a tall angle with both 1m and 2m depth plates.
23/5/2017	Alan Clarke, Yvonne Winchcombe	Parked in sheep graveyard – farmer using reserve to dump dead animals! Gauge 2A reads 1.11m. High water mark on trees approx. 35cm above water surface (approx. 1.46m). Surveyed and installed 2m s/s angle, aluminium gauge plate, '2' and 'B', depth read 1.12m. Gauge 2B GPS 50 J 0542496, 6497696. Gauge 2A is reading 10mm too low – will need to replace in future.

**NPAR: North Parriup****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
UR 274	15/4/2000	John Bullock & Assoc.	2.235m	4.568m	AMG E 281440 N 6250085
NparBM	16/09/2008	Alan Clarke			WGS 84 Z 51H E 281562 N 6250268

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	15/4/2000	Alan Clarke	1m	130.9m & 181° from datum
2 (B)	14/2/2002	Alan Clarke	2m	On left of track entering the lake
NparB	16/09/2008	Alan Clarke	2m	WGS 84 Z 51H E 281574 N 6250256

**Gauge Maintenance:**

Date	By Whom	Details
15/4/2000	Alan Clarke	The deepest point was determined by walking through the lake with a gauge plate. Lake depth on April 15 was 0.66m. A DOLA BM and a 1m depth gauge were installed.
Sept. 2001	Alan Clarke	The water had flooded up out of the main basin and into the track. The 1m gauge was not visible. I installed a dropper at the water level. The dropper is 7m in a SSW direction from the benchmark. A 2m gauge may have to be installed at this lake.
14/2/2002	Alan Clarke, Mike Scanlon	Installed a new 2m gauge using a galvanised angle iron and plastic depth plate to the left of the track entering the lake. Lake height on the new 2m gauge was 1.05m. Lake height for the top of the dropper installed by Alan Clarke in September 2001 was 1.485. Lake height for the top of the star iron installed in November by Grant Pearson was 2.218m.
9/5/2006	Alan Clarke, Lucie Southern, Steph Gadal	Measured from the top of the angle down to the 2m mark on gauge B. This distance was 0.157m. The LBL of B is 0.82m. Fixed the bottom section of the 2m plate at B to the galv. angle with stainless bolts. Fixed a new 1m sign and A to the 1m gauge in the middle of the lake. The 3mm depth plate needs replacing, but the water was too high. The gauge is still functional. The depth at A was 0.76m.
7/5/09	Alan Clarke, Yvonne Winchcombe	Replaced fallen over 1m gauge A with new stainless steel angle and 6mm gauge plate at same location. Lake bed level at new 1m gauge A was 0.02m. Lake was dry. Lake height for the top of the dropper is 0.432m.

**OWIN: Owingup****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	31/3/1998	Alan Clarke	1.338m		10.43m & 125° from DOLA datum
HO 287	16/4/2000	John Bullock & Assoc.	1.449m	2.097m	AMG E 507122 N 6126650
OWINBM	16/09/2008	Yvonne Winchcombe			WGS 84 Z 50H E 507258 N 6126756

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	31/3/1998	Alan Clarke	2m	96.9m & 289° from DOLA datum
2 (B)	31/3/1998	Alan Clarke	1m	100.0m & 286° from Gauge A
3 (C)	16/4/2000	Alan Clarke	2m	9.82m & 244° from DOLA datum
OWINC	16/09/2008	Yvonne Winchcombe	2m	WGS 84 Z 50H E 507248 N 6126752
OWIND2m	4/4/2011	Alan Clarke	2m	WGS 84 Z 50H E 507180 N 6126765
OWIN B1	14/3/2016	Yvonne Winchcombe	1m	WGS 84 Z 50H E 506997 N 6126841
OWIN C2	9/11/2016	Yvonne Winchcombe	2m	WGS 84 Z 50H E 507250 N 6126753
OWIN D2	9/11/2016	Yvonne Winchcombe	2m	WGS 84 Z 50H E 507176 N 6126768

**Gauge Maintenance:**

Date	By Whom	Details
31/3/1998	Alan Clarke, Dorian Moro	Work carried out by Alan Clarke and Dorian Moro on March 31. Soundings were taken to determine the deepest point using a punt, outboard and string line with weight. The deepest mark on the line was measured with a cloth tape. The depth of 0.6m was transferred to a 2m gauge on dry ground near the edge of the water. A datum was constructed of a dropper driven into the ground until no return with a brass bolt as the survey mark. The dropper was surrounded by cement encased in a section of plastic storm water drain. The 1.338m lake height of this CALM datum (Clarke) was levelled in from the gauge.
April 2000	Alan Clarke	Alan Clarke installed the CALM datum and both gauges in April 1998. The 2m mark on gauge 1 read 0.996 when surveyed to the CALM datum. This gauge was in good condition. Gauge 2 was under water. A new 2m gauge was installed near the CALM datum. This new gauge is now gauge 1 and the others gauges 2 and 3. A DOLA BM was installed and surveyed to the CALM datum and gauge.
16/2/2002	Alan Clarke, Mike Scanlon	The star iron used by Jim Lane for depth measurements on the edge of the track could not be found. There were no star iron pickets anywhere in the vicinity. A very old rusted star iron that was out near gauge two was levelled. The top of this picket was 1.170m. The old stainless steel depth plate on gauge 2 was replaced with a new plastic depth plate. Lake depth was determined by measuring down from the bottom of gauge 2 to the water. Lake depth was 0.95m.
20/3/2007	Alan Clarke, Yvonne Winchcombe	Attached a 'C' to the 2m onshore gauge (installed April 2000) and an 'A' to the 2m offshore gauge. Installed a new plastic depth plate over the old stainless steel plate on 1m gauge 'B'. Attached 'B' and '1' on 1m gauge.
4/4/2011	Alan Clarke, Yvonne Winchcombe	Installed 2m gauge D to west of Baumea thicket and old gauge A. GPS 50 H 0507180, 6126765. Surveyed from BM to gauge C. 2m mark exactly 2.000m. Surveyed out to new gauge angle. Final height of new gauge D = 1.999m.

**PABE: Pabelup South****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
HE 114	7/4/2000	John Bullock & Assoc.	1.233m	72.349m	AMG E 725630 N 6222120
HE 114	10/01/2007	Landgate SSM		72.349m	MGA94 E 725799.607 N 6222283.914
PABEBM	17/09/2008	Yvonne Winchcombe			WGS 84 Z 50H E 725800 N 6222286
PABEBM	29/01/2009	Alan Clarke			WGS 84 Z 50H E725800 N 6222286

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	7/4/2000	Alan Clarke	1m	127.0m & 255° from datum. REMOVED 6/5/2009
2 (B)	6/5/2009	Alan Clarke	1m	WGS 84 Z 50H E 725614 N 6222214
PABEA	17/09/2008	Yvonne Winchcombe	1m	WGS 84 Z 50H E 725678 N 6222250 REMOVED 6/5/2009
PabeB1	6/05/2009	Alan Clarke	1m	WGS 84 Z 50H E 725614 N 6222214

**Gauge Maintenance:**

Date	By Whom	Details
7/4/2000	Alan Clarke	Was surveyed for the deepest point using Digital level and staff. The deepest point was located just north of the centre of the lake. A 1m gauge was installed at the deepest point with a DOLA BM installed out near Collets Road. <b>The BM was connected to AHD.</b> On April 7 the lake was dry.
6/5/2009	Alan Clarke, Yvonne Winchcombe	Installed new 1m gauge B near dropper left by Yvonne. Used dumpy level to confirm that the area of Yvonne's dropper was lower (0.3m) than gauge A. Lake height (new) of dropper is 0.708m. Multiple measurements were taken around the area to confirm the position of the lowest point. Put bottom of gauge at ground level = 0.0m at lowest point. GPS location of 1m gauge B is 50H 0725614, 6222214. Removed existing 1m gauge A (as no depths have ever been recorded at this location). Put yellow tape on trees at approx. 2m high on trees to mark path into 1m gauge B. Lake was dry. GPS recorded for 1m gauge A same as that already recorded by Yvonne.



**PALL: Pallarup****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	31/7/1980	Don Munro	1.0m		On lake side of line of scrub (running parallel to and approx. 40m from lake edge) and within turning circle of track
HT 299	10/4/2000	John Bullock & Assoc.	1.668m	306.933m	AMG E 756745 N 6322250
PallBM	5/11/2008	Alan Clarke			WGS 89 Z 50H E 756890 N 6322415
PALL BM	15/07/2009	Jim Lane			WGS 84 Z 50H E 756890 N 6322416
PALL F&W BM	15/07/2009	Jim Lane			WGS 84 Z 50H E 756893 N 6322364

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	31/7/1980	Don Munro	1m	140.0m & 157° from CALM datum
PALL 1m gge	15/07/2009	Jim Lane	1m	WGS 84 Z 50H E 756932 N 6322266

**Gauge Maintenance:**

Date	By Whom	Details
10/4/2000	Alan Clarke	The 1m mark on the gauge read 0.988 when surveyed to the CALM datum. The gauge board and depth plate were in good condition. The CALM datum was in good condition. A DOLA BM was installed and surveyed to the CALM datum and gauge. Lake depth on April 10 was 0.55.

**PARK: Parkeyerring****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	25/5/1978	Don Munro	2.0m		Carved in side of Casuarina situated on R/H side of track and being closest tree to lake perimeter.
HD 212	11/5/1998	Scanlan Surveys	4.069m	250.428m	AMG84 E 533220 N 6307298 MGA94 Z 50 E 533156 N 6307260
PARK BM	18/07/2008	Jim Lane			WGS 84 Z 50H E 533156 N 6307263
ParkBM	19/09/2008	Alan Clarke			WGS 84 Z 50H E533158 N 6307265

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (B)			2m	2m gauge plate nailed to tree
2 (A)	25/5/1978	Don Munro	2m	100m & 283° from CALM datum (1m & 2m gauge plates)
(C)	April 2006	Alan Clarke	2m	On Shore 30m north of gauge on tree
PARK A	18/07/2008	Jim Lane	1m	WGS 84 Z 50H E 533021 N 6307269
PARK C	18/07/2008	Jim Lane	2m	WGS 84 Z 50H E 533111 N 6307260
ParkA	19/09/2008	Alan Clarke	1m	WGS 84 Z 50H E 533022 N 6307271
ParkC	19/09/2008	Alan Clarke	2m	WGS 84 Z 50H E 533112 N 6307262

**Gauge Maintenance:**

Date	By Whom	Details
11/5/1998	Alan Clarke, Grant Pearson	The CALM datum was a cut mark in a tree. The tree had grown over the mark making an accurate level determination impossible. Gauge 1 had been nailed to the same tree. The gauge was solid and in good condition. When the 2m mark on gauge 1 was levelled to the 2m mark out at gauge 2 the later was found to be 3mm lower. The 2m mark on gauge 1 was adopted as the temporary datum. The gauge 2 wood board was weathered but in reasonable condition. Both depth plates were replaced with stainless steel plates at the same level (taken from field book notes). A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The lake benchmark was levelled to an existing DOLA benchmark. The AHD of the lake benchmark is 250.428. The access diagram reads that the lake height of this benchmark is 4.069 higher than gauge 1. Assuming the level was taken from the 2m mark (old datum height), the lake height of the benchmark is 4.069. The work was carried out on May 11.
5/4/2006	Alan Clarke, Julia Sisson	Installed a new 2m gauge near the shore of the lake because the original 2m gauge (Munro wood board with two plates) is too far away from the shore when the water is around 2m deep. The original gauge is marked A. The gauge nailed to the tree is gauge B, but is not marked so. The new 2m gauge is C and uses a galvanised angle with a 6mm plastic depth plate.
14/3/2012	Alan Clarke, Anthony Reid	The old Munro wood board was missing the 1m plate, but the 2m plate was still fixed to the board. The water was 32cm below the bottom of the depth plate making the lake depth 0.68m. The wood board was in poor condition so a new stainless angle was installed near the old gauge. A dumpy level survey was used to determine the lake height of the top of the new angle from the 2m mark on gauge C. The two way survey revealed a 1mm misclose. A 6mm plastic plate, 1 and A were fixed to the stainless angle. The old wood board and angle were removed.
5/4/2016	Alan Clarke, Yvonne Winchcombe	1A Gauge read 0.25m. Replaced 'A' and installed bolts on gauge plate.

**PILL: Pillenorup**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
HO 290	5/4/2000	John Bullock & Assoc.	0.749m	195.193m	AMG E 601310 N 6187680
PILLBM	6/05/2009	Alan Clarke			WGS 84 Z 50H E 601412 N 6187773

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	5/4/2000	Alan Clarke	1m	337.5m & 230° from datum.
2 (B)	7/4/2001	Alan Clarke	1m	40m & 70° from Gauge 1
3 (C)	22/3/2007	Alan Clarke	2m	NAD27 UTM 50 E601581 N 6187353
4 (D)	22/3/2007	Alan Clarke	3m	WGS 84 Z 50H E 588751 N 6217127
PILLC	4/11/2008	Yvonne Winchcombe	2m	WGS 84 Z 50H E 601518 N 6187605
PILLA1	6/05/2009	Alan Clarke	1m	WGS 84 Z 50H E 601158 N 6187551
PILLB1	6/05/2009	Alan Clarke	1m	WGS 84 Z 50H E 601110 N 6187534
PILLC2	6/05/2009	Alan Clarke	2m	WGS 84 Z 50H E 601515 N 6187601
PILLD	6/05/2009	Alan Clarke	3m	WGS 84 Z 50H E 602018 N 6187453
PILLE2	6/05/2009	Alan Clarke	2m	WGS 84 Z 50H E 601374 N 6187734

**Gauge Maintenance:**

Date	By Whom	Details
5/4/2000	Alan Clarke	The swamp can be seen when standing on a vehicle using binoculars when the vehicle is at the 'T' junction at the southern end of East Chester Track (ref. CALM 1:50 000). This is the point to begin the walk ESE along the track into the lake. The track is overgrown with prickly shrubs as it descends to the scarp floor. Adrian Pinder suggests that there will be shallow water in winter for >800m along the clear flat section of the track leading to the blue BM sign. The total walk in is around 2.2km. Once the Blue BM sign has been located near the edge of the track, in a open sedge area, the gauge can be found using the bearing and distance provided on the access diagram. The gauge is positioned in front of the Baumea articulata. Refer to the aerial and ground photos. The deepest point of the lake was found by using a depth plate to measure depths throughout the swamp. The deepest point on April 5 was 0.39m. A 1m depth gauge was installed on the edge of the Baumea. A DOLA BM was installed 290m back near the edge of the track.
7/4/2001	Alan Clarke, Katherine Sorokine	Installed a 1m gauge using a galvanised angle iron and plastic depth plate inside the tall Baumea within the main wetland. I levelled in the gauge height from the 1m gauge (no.1) that was installed in April 1999. The new 1m gauge (no. 2) is 40m on a bearing of 70 from gauge 1. There is a difference of 6 - 11 mm between both gauges. That is, the 1m mark at gauge 2 is slightly above the 1m mark on gauge 1. The ground was soft causing movement of the dumpy level and change points. The lake height of the string around the dropper used to mark the water depth in November 2000 was 0.229m+ or - 5mm. The lake was dry.
22/3/2007	Alan Clarke, Yvonne Winchcombe	Sara and Yvonne used a pruning saw and shears to clear the east access track. This track is less steep and much easier to access the lake than from the west. Need to update access diagram. Alan used a surfboard to paddle into lake carrying GPS and located Benchmark (sign just out of water) and found Gauge 2 (submerged) in chest deep water. Alan then paddled to western edge of lake and found dropper left in Nov 2006, which had water up to it. Water surface used to determine depth levels across lake. Measured from Benchmark (submerged) up to water surface = 820mm. Benchmark is at 0.749 thus depth = 0.749 + 0.820 = 1.569m. <b>Installed</b> a new 2m gauge 'C' at GDA coordinates 50 601581E, 6187353N NAD27 UTM. Recorded on Yvonne's GPS as Pill C2. <b>Installed</b> a new 3m gauge 'D' recorded on Yvonne's GPS as Pill D3. Bottom of gauge (2m) is 440mm above water surface. (2m - 0.440 = 1.56m) When water level recedes need to check depth of Gauge 2 against BM. Depth reading from Gauge 2 = 1.56m, depth reading calculated from BM = 1.569m. 9mm discrepancy between two measurements.
6/5/2009	Alan Clarke, Yvonne Winchcombe	Walked in to 2m gauge C. GPS location redone as different to existing location. New GPS of 2m gauge C. Located 1m gauge A. Attached an 'A' and depth read 0.72m. LBL of A = 0.380m (measured underwater). GPS location of PILLA1. Located 1m gauge B and attached 'B', depth read 0.715 (slightly below 0.72). GPS location of PILLB1. Submerged dropper located near gauge B, top of dropper was 9cm below water surface. Top of dropper = 0.63m. Took panarama shots at gauge B. Installed 2m gauge E approx. 50m from BM in general direction of gauge A &

		B. Put a '1' at base of gauge plate. GPS location of PILLE2. Water surface at BM was 3cm below nipple. BM depth from survey notes = 0.749. Depth confirmed as 0.72m. Took panarama shots at BM. Installed four bolts to base of plastic depth plate at gauge C.
6/4/2011	Alan Clarke, Yvonne Winchcombe	Replaced gauge board at 1m gauge A, galvanised angle iron in good condition. Check locations of old print photographs, take photos and GPS locations.

**PINJ: Pinjarrega****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	22/5/1979	Don Munro	3.0m		2.0m down and on east side of lane from south entrance.
HX 615	10/5/1999	Scanlan Surveys	2.975m	224.602m	AMG84 E 395272 N 6670431
PINJ BM	18/09/2009	Jim Lane			WGS 84 Z 50J E 395416 N 6670552

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	22/5/1979	Don Munro		West side of lane 133.0m & 15° from CALM datum
2 (B)	22/5/1979	Don Munro	2m	In sparsely vegetated area toward end of lane, 193.0m & 20° from Gauge 1.
3 (C)	22/5/1979	Don Munro	1m	In open area of lake 90.0m & 11° from Gauge 2

**Gauge Maintenance:**

Date	By Whom	Details
10/5/1999	Alan Clarke	This lake is not currently monitored. The gauges were not altered. Gauge 1 had fallen over and could not successfully be repositioned. The 2m mark on gauge 2 read 1.963 and the 1m mark on gauge 3 read 0.986 when surveyed to the CALM datum. Gauge 2 wood board was badly warped and the depth plate badly rusted. Gauge 3 angle was O.K. but the plate was faded. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. Work carried out on May 10.

**PLAN: Plantagenet 25386****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	18/3/1980	Don Munro	1.0m		On approx. High water mark, N/E side of ridge, S/E side of cleared area on ridge.
HO 283	1/6/1998	Scanlan Surveys	1.690m	162.524m	AMG84 E 597720 N 6176630
PLANBM	4/11/2008	Yvonne Winchcombe			WGS 84 Z 50H E 597710 N 6176617

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	18/3/1980	Don Munro	2m	100.0m & 50° from CALM datum (1m & 2m gauge plates)
PLANA	4/11/2008	Yvonne Winchcombe	2m	WGS 84 Z 50H E 597864 N 6176784

**Gauge Maintenance:**

Date	By Whom	Details
1/6/1998	Alan Clarke, Grant Pearson	This lake is not currently monitored. The gauges were not altered. The CALM datum block had broken off at ground level from the concrete base. Gauge 1 wood board and 2m plate were in good condition. The 1m plate on gauge 1 had faded, but it was legible. The 1m mark on gauge 1 was adopted as the temporary datum. A DOLA benchmark was installed with reference marks and surveyed to the gauge. The depth at gauge 1 on June 1 was 1.58m.

**PLEA: Pleasant View****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	17/3/1980	Don Munro	2.00m (marked on datum as 3m)		8.0m from side of turn about track at a point approx. 34.0m from branch junction of turn point.
HO 280	1/6/1998	Scanlan Surveys	2.10m	85.986m	AMG84 E 608385 N 6145281 MGA94 Z 50 E 608362 N 6145315
PLEABM	16/09/2008	Yvonne Winchcombe			WGS 84 Z 50H E 608357 N 6145314
PLEA BM HO280	12/05/2015	Yvonne Winchcombe			WGS 84 Z 50H E 608360 N 6145310

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	17/3/1980	Don Munro	3m	11.0m & 252° from CALM datum (2m & 3m gauge plates)
2 (B)		Don Munro	1m	
(C)	1/6/1998	Alan Clarke	2m	48.1M & 306° mag. from DOLA datum
PLEAA	16/09/2008	Yvonne Winchcombe	3m	WGS 84 Z 50H E 608346 N 6145327
PLEAB	16/09/2008	Yvonne Winchcombe	1m	WGS 84 Z 50H E 608240 N 6145375
PLEAC	16/09/2008	Yvonne Winchcombe	2m	WGS 84 Z 50H E 608316 N 6145338
PLEA D1	17/5/2013	Yvonne Winchcombe	1m	WGS 84 Z 50H E 608374 N 6145978
PLEAE	27/4/2018	Alan Clarke	2m	WGS 84 Z 50H E 606266 N 6145387

**Gauge Maintenance:**

Date	By Whom	Details
1/6/1998	Alan Clarke, Grant Pearson	The CALM datum was marked with the number '3' but is indicated on the Munro map as 2m. The survey results confirmed that the CALM datum was at 2m. The 3m mark on gauge 1 read 3.041 when surveyed to the CALM datum. The 2m and 3m plates were replaced with stainless steel depth plates and moved down 41mm. The plate was secured with wood tech screws. The final level for the 3m mark on gauge 1 was 3.002. Both depth plates were left at less than vertical positions because of the persistent presence of a tiger snake at the base of the gauge. Gauges to be improved at a later date. A new 2m gauge was installed using a galvanised angle iron and a stainless steel depth plate. The gauge height was levelled in from the secure CALM datum. The final level for the 2m mark on the new gauge 2 was 2.000. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. Work carried out on June 1.
15/2/2002	Alan Clarke, Mike Scanlon	The 1m mark on the 1m gauge installed by Don Munro was 7mm below the 1m mark on the 2m gauge installed in 1998. This gauge was leveled in from the Munro datum and a height transferred to the DOLA datum. The true 1m mark was levelled in from the DOLA datum and a new plastic depth plate fixed 7mm higher. The depth at both the 2m and newly adjusted 1m gauge was 0.76m. Sue Elscott has installed two droppers with string attached towards to base of each to indicate water depth for the September and November 2001 recordings. The measurement, using an offset tape, from the water surface down to the string on the southern or left-hand side dropper looking into the wetland was 400mm. The measurement from the water surface down to the string on the northern or right hand side dropper looking into the wetland was 390mm.
20/3/2007	Alan Clarke, Yvonne Winchcombe	Installed an 'A' and a '3' on the 3m wood board onshore gauge. Attached a 'B' to the 1m gauge B. Note that gauge B is not on the same line as gauges A and C. Gauge B is approx. 100m from Gauge C and to the right. Replaced both stainless steel depth plates on the 2m gauge C with two 6mm plastic depth plates and attached a 'C' and a '2'. Lake Bed Level of the 2m gauge C = 0.67m
17/5/2013	Alan Clarke, Yvonne Winchcombe	Install new 1m Gauge D at 50 H 0608374 / 6145978. Water level 0.30m. (see Field Camera form)
27/4/2018	Alan Clarke, Laurent Marsol	Surveyed the heights of Gauge A and C from the benchmark with the dumpy level. The 2m mark on gauge a was 1.945m. Moved both the 2m and 3m depth plates on gauge A up 55mm. The 2m

		mark on gauge C was 1.997m so was not changed. Depth @ C = 0.89m @ 1505hrs. Depth @ B = 0.89m @ 1510hrs. Installed a new 2m gauge E approx. 20m north of gauge B in behind the tall Baumea for security reasons. The wpt is PLEAE Z50 E606266, N 6145387. Installed a 2m SS angle and alloy post with camera BP#20 facing the new gauge E.
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**POOR: Poorginup****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM		Don Munro	1.5m		2.5m & 260° W/SW of conspicuous large tree.
B 684	3/6/1998	Scanlan Surveys	1.380m	176.574m	AMG84 E 476405 N 6177093
POORBM	18/09/2008	Yvonne Winchcombe			WGS 84 Z 50H E 476447 N 6177128

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)		Don Munro	1m	30.0m & 330° of tree
POORA	18/09/2008	Yvonne Winchcombe	1m	WGS 84 Z 50H E 476422 N 6177137
POOR A1	8/11/2016	Yvonne Winchcombe	1m	WGS 84 Z 50H E 476419 N 6177134

**Gauge Maintenance:**

Date	By Whom	Details
3/6/1998	Alan Clarke, Grant Pearson	The CALM datum was found using a metal detector. The top of the datum was 20mm below the surface. The 1m mark on gauge 1 read 0.995 when surveyed to the CALM datum. The gauge was not altered. A metal detector was used to search for a PWD benchmark around a tree, which had a PWD sign nailed to it. The PWD benchmark was used as the lake datum. Reference marks were installed and the CALM datum and gauges surveyed to the PWD benchmark. The lake height of the PWD benchmark was 1.380. The AHD of the PWD benchmark is 176.574. Work carried out on June 3.
23/3/2007	Alan Clarke, Yvonne Winchcombe	Attached an 'A' and '1' to the 1m gauge. The existing stainless steel depth plate is OK and was wiped clean.

**POWE: Powell**

**Datum Details:**

<b>ID</b>	<b>Date</b>	<b>By Whom</b>	<b>Lake Height</b>	<b>AHD Height</b>	<b>Location (See sketch diagram for details)</b>
CALM	14/6/1981	Don Munro	2.0m		12.0m off roadside from a point 17.0m west of guide post.
SF 12A	16/4/2000	John Bullock & Assoc.	2.565m	1.796m	AMG E 567380 N 6124950
POWEBM	16/09/2008	Yvonne Winchcombe			WGS 84 Z 50H E 567497 N 6125091

**Gauge Details:**

<b>ID</b>	<b>Date</b>	<b>By Whom</b>	<b>Lake Height</b>	<b>Location (See sketch diagram for details)</b>
1 (A)	14/6/1981	Don Munro	2m	83.0m & 224° from datum (1m & 2m gauge plates)
POWEA	16/09/2008	Yvonne Winchcombe	2m	WGS 84 Z 50H E 567451 N 6125033
POWE A2	7/11/2016	Yvonne Winchcombe	2m	WGS 84 Z 50H E 567449 N 6125035

**Gauge Maintenance:**

<b>Date</b>	<b>By Whom</b>	<b>Details</b>
April 2000	Alan Clarke	The 1m mark on the gauge read 1.003 when levelled to the CALM datum. Both the 1m and 2m plates were replaced at the same height. A DOLA BM was installed and surveyed to the CALM datum and gauge.
20/3/2007	Alan Clarke, Yvonne Winchcombe	Attached an 'A' to the 2m gauge.

**QUEE: Queerearrup**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	24/5/1978	Don Munro	2.0m		Situated north of and between two large Casuarina trees.
HD 210	11/5/1998	Scanlan Surveys	3.065m	242.373m	AMG84 E 521244 N 6291517
QueeBM	9/11/2008	Alan Clarke			WGS 84 Z 50H E 521251 N 6291518

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	24/5/1978	Don Munro	2m	15.0m & 48° from CALM datum
2 (B)	24/5/1978	Don Munro	1m	110.0m & 48° from CALM datum (REMOVED)

**Gauge Maintenance:**

Date	By Whom	Details
11/5/1998	Alan Clarke	This lake is not currently monitored. The 2m mark on gauge 1 read 2.010 and the 1m mark on gauge 2 read 1.012 when surveyed to the CALM datum. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. This lake is used for recreational skiing. Gauge 1 was not removed because it posed no danger to boats up on the bank of the lake inside a rocky point. Gauge 2 was completely removed. The work was carried out on May 11.

**RANG: Range Road Yate****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
HT 294	8/4/2000	John Bullock & Assoc.	2.163m	292.025m	AMG E 665930 N 6275015
RANG BM	14/07/2008	Jim Lane			WGS 84 Z 50H E 666083 N 6275186
RangBM	18/09/2008	Alan Clarke			WGS 84 Z 50H E666083 N 6275191

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	8/4/2000	Alan Clarke	2m	25.5m & 324° from datum
2 (B)	12/2/2002	Alan Clarke	1m	82m & 300° from Gauge 1 (A)
RANG A	14/07/2008	Jim Lane	2m	WGS 84 Z 50H E 666068 N 6275209
RANG B	14/07/2008	Jim Lane	1m	WGS 84 Z 50H E 666002 N 6275255
RangA	18/09/2008	Alan Clarke	2m	WGS 84 Z 50H E 666067 N 6275212
RangB	18/09/2008	Alan Clarke	1m	WGS 84 Z 50H E 665999 N 6275256

**Gauge Maintenance:**

Date	By Whom	Details
8/4/2000	Alan Clarke	The deepest point was determined by weight and line in the 3.6m punt. A 2m depth gauge was installed. A DOLA BM was installed and surveyed to the new gauge. Lake depth on April 8 was 1.76m.
Sept. 2001	Alan Clarke	I installed a dropper 30m into the lake from the 2m gauge. The measurement was 490mm exposed. A 1m gauge will need to be installed next year and all dropper measurements converted.
12/2/2002	Alan Clarke, Mike Scanlon	Installed a 1m gauge using a galvanised angle iron and plastic depth plate, 82m on a bearing of 300 from the 2m onshore gauge (no.1). The lake bed level of the 1m gauge is 0.1m. There were three small pools of water near the gauge, which were 0.050m deep. Lake heights for the top of droppers used to measure depth were determined. Dropper on track just inside fringing vegetation is 2.139m. September 2001 dropper is 0.961m. November 2001 dropper is 1.01m.
27/3/2007	Alan Clarke	Installed an 'A' on the 2m onshore gauge and a 'B' on the 1m offshore gauge.

**REDB: Red (Bruce Rock)****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	17/7/1981	Don Munro	2.0m		Approx. 58.0m & 105° from Sth end of gate, being 40m from edge of breakaway on south side of parking (track) area.
HL 431	7/5/1999	Scanlan Surveys	3.870m	257.287m	AMG84 E 602419 N 6436959
RedbBM	14/09/2008	Alan Clarke			WGS 84 Z 50H E 602548 N 6437065

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	17/7/1981	Don Munro	2m	100.0m & 119° from CALM datum (1m & 2m gauge plates)
RedbA	14/09/2008	Alan Clarke	1m	WGS 84 Z 50H E 602642 N 6437000

**Gauge Maintenance:**

Date	By Whom	Details
7/5/1999	Alan Clarke	At the time of the survey the lake was not on the list of monitored wetlands. The gauge was not altered. The 1m mark on gauge 1 read 1.007 when surveyed to the CALM datum. The gauge wood board and both the 1m and 2m depth plates were in good condition. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauge. Work carried out on May 7.
1/4/2007	Alan Clarke	There is one gauge at this lake, which is an old weathered wood board with both 1m and 2m depth plates. Separate 1m and 2m gauges will need to be installed at this site in the next two years. An 'A' was installed and the 1m stainless steel depth plate was replaced with a 3mm plastic depth plate.
13/3/2012	Alan Clarke, Anthony Reid	Munro depth gauge A with wood board and two depth plates to two meters had snapped off at the base. A dumpy level survey was conducted from the lake benchmark out to a new Stainless steel angle and back to the benchmark. The survey contained only a 1mm misclose so the top of angle lake height off 2.660m was adopted. A 6mm 1m plastic depth plate was installed with an A and 1. The lake bed level of the new gauge was 0.040m. The remains of the old wood board and support angle were removed from the lake.

**REDM: Red (Manjimup)****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	15/12/1977	Don Munro	1.5m		On northern point of drain entry
HP 256	27/4/2000	John Bullock & Assoc.	2.568m	175.370m	AMG E 468450 N 6189430
REDMBM	18/09/2008	Yvonne Winchcombe			WGS 84 Z 50H E 468592 N 6189580

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	15/12/1977	Don Munro	1m	(Refer to as #3 from 8/3/1989)
2 (B)	8/3/1989	Don Munro	2m	(Referred to as #1 from 8/3/1989) 10m & 134° from HP 256
3 (C)	8/3/1989	Don Munro	3m	(Referred to as #2 from 8/3/1989) 8.66m & 111° from HP 256
REDMB	18/09/2008	Yvonne Winchcombe	2m	WGS 84 Z 50H E 468601 N 6189573
REDMC	18/09/2008	Yvonne Winchcombe	3m	WGS 84 Z 50H E 468599 N 6189577

**Gauge Maintenance:**

Date	By Whom	Details
27/4/2000	Alan Clarke	The CALM datum was not found, probably destroyed, possibly by widening of the drainage channel between the culvert and the lake. All three gauges were levelled. Assuming the 1m gauge in the centre of the lake is 1.000m the 2m gauge read 1.952 and the 3m gauge read 2.955. gauges 2 and 3 are similar (3mm difference) and probably more correct. The 1m gauge is in soft mud and most likely to have sunk about 0.045. A DOLA BM was installed and surveyed to the gauges. Lake depth on April 27 was 0.39m, <b>reading taken from 1m gauge in the centre of the main lake.</b>

**RONN: Ronnerup****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
HT 297	11/4/2000	John Bullock & Assoc.	2.878m	313.710m	AMG E 744020 N 6317630 MGA94 Z 50 E 744169 N 6317784
RonnBM	18/09/2008	Alan Clarke			WGS 84 Z 50H E 744169 N 6317786

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	11/4/2000	Alan Clarke	3m	21.05m & 331° from datum
2 (B)	3/4/2001	Alan Clarke	2m	82m & 300° from datum
3 (C)	30/1/2003	Alan Clarke	1m	50m from 2m Gauge 2
RonnA	18/09/2008	Alan Clarke	3m	WGS 84 Z 50H E 744160 N 6317804
RonnB	18/09/2008	Alan Clarke	2m	WGS 84 Z 50H E 744115 N 6317814
RonnC	18/09/2008	Alan Clarke	1m	WGS 84 Z 50H E 744081 N 6317822
RONN A3	22/05/2015	Yvonne Winchcombe	3m	WGS 84 Z 50H E 744159 N 6317802
RONN C1	22/05/2015	Yvonne Winchcombe	1m	WGS 84 Z 50H E 744079 N 6317821

**Gauge Maintenance:**

Date	By Whom	Details
11/4/2000	Alan Clarke	The deepest point was determined by weight and line in the 3.6m punt. A DOLA BM and a 3m depth gauge were installed. Lake depth on April 11 was 2.35m.
3/4/2001	Alan Clarke, Katherine Sorokine	Replaced the '3' sign indicating the 3m height of gauge 1 with a plastic '3'. Removed the plastic tie supports towards the bottom of the gauge and fitted two stainless bolts below the April 2000 water line when the gauge was installed. Installed a 2m gauge using galvanised angle iron and plastic depth plate. I levelled in the gauge height from the DOLA benchmark. Final check of the 2m mark back to the benchmark was O.K. The 2m (no.2) gauge is 82m on a bearing of 300 from the DOLA benchmark. Lake depth at gauge 2 was 1.16m.
Sept. 2001	Alan Clarke	The depth was calculated by measuring with an offset tape from the bottom of gauge 2 (installed in April 2001) down to the water. A 1m gauge may need to be installed next year.
30/1/2003	Alan Clarke, Mathilde Breton	Installed a new 1m gauge using a galvanised angle iron and plastic depth plate. The new gauge is 50m into the lake from the 2m gauge and inline with this gauge and the 3m gauge. The lake was dry. Placed the two remaining bolts on the bottom half of the 2m gauge now that it was dry. When the 2m gauge was installed in 2001 plastic ties were used to fix the plate to the angle below the water line. A dropper out on the lake floor near the new 1m gauge used for depth measurements last September and November was surveyed. The lake height of the top of the dropper is 0.795m.
28/3/2007	Alan Clarke	Installed an 'A' on the 3m gauge. Installed a 'B' on the 2m gauge and replaced the damaged 3mm plastic depth plate with a 6mm plastic depth plate. Installed a 'C' on the 1m gauge and replaced the damaged 3mm plastic depth plate with a 6mm plastic depth plate.
22/5/2015	Alan Clarke, Yvonne Winchcombe	Benchmark is DOLA HT 297. Surveyed from BM to gauge C. Old 1m gauge C = 0.08m. Old gauge broken off at 0.17m. Replaced broken gauge with new 1m gauge C at same height (0.08m).

**SHAR: Shark****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	14/3/1980	Don Munro	3.0m		Approx. 2.0m out from reed line or approx. 5.0m above high water mark on south side of pathway through reeds.
UE 356	30/5/1998	Scanlan Surveys	1.962m	57.331m	AMG84 E 394588 N 6263079
SharBM	16/09/2008	Alan Clarke			WGS 84 Z 51H E 394568 N 6263073

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	14/3/1980	Don Munro	2m	22.0m & 252° from CALM datum
2 (B)	29/5/1997	Alan Clarke	3m	12.7m & 253° from DOLA datum
SharB	16/09/2008	Alan Clarke	3m	WGS 84 Z 51H E 394551 N 6263068

**Gauge Maintenance:**

Date	By Whom	Details
29/5/1997	Alan Clarke	Alan Clarke and Jim Payne carried out the work on May 29. The 2m mark on gauge 1 read 1.998 when surveyed to the CALM datum. The rusted depth plate was replaced at the same level by a stainless steel depth plate. Reference marks were installed for the CALM datum. Replace 2m gauge and checked, new gauge still reads -2mm from 2m.
30/5/1998	Alan Clarke, Grant Pearson	Alan Clarke and DOLA's Jim Payne carried out survey work and gauge maintenance 1997. See 1997 report for details. The 2m mark on gauge 1 read 1.997 when surveyed to the CALM datum. Gauge 1 was not altered. A new 3m gauge was installed using a galvanised angle iron and a stainless steel depth plate. The gauge height was levelled in from the secure CALM datum. The final level for the 3m mark on the new gauge 2 was 3.001. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The depth at gauge 1 on May 30 was 1.58m.
30/3/2007	Alan Clarke	Installed a 'B' on the 3m gauge and replaced the damaged 3mm plastic depth plate with a 6mm plastic depth plate. The 2m gauge was under water.



SHAS: Shaster

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	1/8/1980	Don Munro	2.0m		On south end of small low island approx. 70.0m & 205° from where track enters lake.
UR 275	15/4/2000	John Bullock & Assoc.	1.819m	0.772m	AMG E 287030 N 6250550
SHASBM	7/05/2009	Alan Clarke			WGS 84 Z 51H E 287219 N 6250710

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	1/8/1980	Don Munro	1m	64.0m & 205° from datum
2 (B)	1/8/1980	Don Munro	2m	Approx. 80.0m offshore from a point approx. 400m around east shore from where track enters lake.
3 (C)	1/8/1980	Don Munro	1m	210m & 142° from point.

**Gauge Maintenance:**

Date	By Whom	Details
April 2000	Alan Clarke	The access is difficult to find because the old track is over grown. When surveyed to the CALM datum gauge 1, in good condition, 1m mark read 0.999; gauge 2, in good condition, the 2m mark read 1.992 and gauge 3 the 1m mark read 1.028. The third gauge board was OK but the gauge was badly rusted and unreadable. A DOLA BM was installed and surveyed to the CALM datum and gauges.
7/5/2009	Alan Clarke, Yvonne Winchcombe	Walked down overgrown track to lake and found BM. GPS location of BM is 51H 0287219, 6250710. Lake was dry.

**STAT: Station (previously referred to as Mullet)**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	14/3/1980	Don Munro	1.0m		On lake side of ridge, 10.0m S/E of where track ends.
UE 355	30/5/1998	Scanlan Surveys	1.307m	5.068m	AMG84 E 402696 N 6259247
StatBM	17/09/2008	Alan Clarke			WGS 84 Z 51H E 402615 N 6259237

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	14/3/1980	Don Munro	2m	60.0m & 211° from CALM datum (1m & 2m gauge plates)
StatA	17/09/2008	Alan Clarke	2m	WGS 84 Z 51H E 402585 N 6259184
StatB	16/3/2016		1m	

**Gauge Maintenance:**

Date	By Whom	Details
28/5/1997	Alan Clarke	Alan Clarke and Jim Payne carried out the work on May 28. The 1m mark on gauge 1 read 1.000 when surveyed to the CALM datum. The wood board, galvanised angle support and depth plate were in good condition. A reference mark was installed for the CALM datum.
30/5/1998	Alan Clarke, Grant Pearson	Alan Clarke and DOLA's Jim Payne carried out survey work and gauge maintenance 1997. See 1997 report for details. The 1m mark on gauge 1 read 1.001 when surveyed to the CALM datum. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauge. Work carried out on May 30. The lake was dry.
30/3/2007	Alan Clarke	Installed an 'A' on the 2m gauge (wood board with two depth plates).
16/3/2016	Alan Clarke, Yvonne Winchcombe	Station BM UE355 1.307m lake height. Gauge A: 0.13m. Gauge A attached to wooden board and in mud, galv. angle very rusted. Decided to install new 1m B gauge closer to shore and leave A2 as is. Installed angle onto shore and surveyed from BM. Top of s/s angle 1.538m. Lake bed level of 1m Gauge B is 0.34m. <b>TO DO September 2016 – take GPS position at Gauge B.</b>

**STRE: Streets**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	6/7/1978	Don Munro	2.0m		Sawcut in tree 3.0m north of fence at a point 17.0m from fence corner.
HM 1459	9/5/1999	Scanlan Surveys	1.828m	201.688m	AMG84 E 402311 N 6614731
STRE BM1	16/09/2008	Jim Lane			WGS 84 Z 50J E 402493 N 6614985

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	6/7/1978	Don Munro	2m	102.0m & 6° from CALM datum
2 (B)	6/7/1978	Don Munro		135.0m & 18° from Gauge 1
1 (C)			2m	Nailed to tree close to shore
STRE F&W gbord	16/09/2008	Jim Lane		WGS 84 Z 50J E 402504 N 6615079 (F&W gaugeboard)
STRE F&WBMtree	16/09/2008	Jim Lane		WGS 84 Z 50J E 402502 N 6614986 (F&W Benchmark tree sawcut)

**Gauge Maintenance:**

Date	By Whom	Details
9/5/1999	Alan Clarke	This lake is not currently monitored. The gauges were not altered. The CALM datum, which was a saw cut in a tree, was not recognisable. A third gauge had been nailed to a tree close to shore. This new gauge has been marked on the Munro map with black pen and the gauges renumbered so that the new gauge is number 1 and the old number 1 changed to gauge 2. Gauge 3 could not be found, it was most likely under water. The 2m mark on gauge 1 was adopted as the temporary datum. Gauge 2 read 2.007 when surveyed to the 2m mark on gauge 1. A DOLA benchmark was installed with reference marks and surveyed to the CALM gauges. Work carried out on May 9.

**TAAN: Taarblin North****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	May 2004	Alan Clarke	2.237m		CALM Datum is a galv. angle at WGS 84 Z50 E 552389 N 6355458 on left side of access track.
TAAN 'DATUM'	17/07/2009	Jim Lane			WGS 84 Z 50H E 552386 N 6355457 (TBM Angle)
TAANbenchmark	9/5/2018	Alan Clarke	1.942m		WGS 84 Z 50H E 552241 N 6355660

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
(A)	April 2006	Alan Clarke	1m	1300m in from the road at the access track. WGS 84 Z50 E 552446 N 6354789
(B)	April 2006	Alan Clarke	1m	300m south into the lake from the road at the access track. WGS 84 Z50 E 552085 N 6355389
Taanb	13/09/2008	Alan Clarke	1m	WGS 84 Z 50H E 552087 N 6355387
TAANA	9/11/2009	Alan Clarke	1m	WGS 84 Z 50H E 552448 N 6354789
TAANC	11/5/2018	Alan Clarke	2m	WGS 84 Z 50H E 552201 N 6355611

**Gauge Maintenance:**

Date	By Whom	Details
6/4/2006	Alan Clarke, Julia Sisson	<p>Two galvanised angle irons were installed during the bathymetry project in 2004 for the purpose of providing a height for a depth gauge at each site. The bathymetry survey involved RTK GPS shots at 50m intervals along east west transects spaced 100m apart. The RTK GPS was accurate to +/- 25mm. Therefore the deepest point found during the survey may not be the actual deepest point. Both of these factors have contributed to a CALM deepest point datum that is not accurate. An RTK generated height was taken on top of each of the angle irons for use later to attach a depth gauge.</p> <p>On April 6 the far gauge A, 1300m into the wetland along the east side from the road, had a 1m depth plate installed. The RTK height for the top of the gauge is 1.356m CALM LH. 0.356 down from the top of the angle represented the 1m mark for the lake. This height was used to survey 1000m back towards the road to establish a new gauge (B) in an area that often has water during winter. The original on shore angle was positioned too far to the east of the access track on ground that rarely has open water. This angle now acts as the CALM lake datum.</p> <p>Gauge B is also a 1m depth plate and is positioned closer to the entrance track in an area that often has water during winter so that the long walk into the gauge A is only required when the water level is very low. The lake depth at both gauges was 0.33m.</p>
10/5/2009	Alan Clarke, Yvonne Winchcombe	Surveyed dropper from 1m gauge B. Lake was dry, lake bed level at 1m gauge B was 0.11m. Lake full of dead trees. Top of dropper surveyed as 0.791m. January 2006 depth recorded as 48cm below top of dropper. Depth for Jan 06 calculated as 0.311m.
9/5/2018	Alan Clarke, Peter White	Installed a DBCA benchmark and two reference marks. The DBCA benchmark is a 2m SS angle knocked into the ground until no return. One bag of rapid set concrete surrounds the SS angle and a 200mm diameter PVC pipe was inserted into the concrete to form a neat support for the concrete. The GPS wpt is TAANbenchmark Z50 552241, N 6355660. The reference marks are a 8mm diameter SS rod, 500mm long, driven into the ground so the top is just below the surface (ground) and surrounded by a half bag of rapid set concrete in the hole. RM1 is approximately 10m west of the benchmark at GPS wpt TAANreff1 Z50 E 552230, N 6355665. Both reference marks were levelled two way to the benchmark. RM1 is 0.051m above the benchmark with a Lake Height of 1.993m. RM2 is approximately 10m east of the benchmark at GPS wpt TAANreff2 Z50 E 552250, N 6355659. RM2 is 0.010m above the benchmark with a Lake Height of 1.953m.
10/5/2018	Alan Clarke, Peter White	<p>Dumpy level survey from DBCA benchmark out to gauge B and return to transfer Lake Height from gauge B to new benchmark. Misclose of 1mm. Lake height of DBCA benchmark = 1.942m. Also picked up Dave's September 2017 dropper. Top of dropper is 2.238m. Top of dropper to the ground is 682mm. Alan's November 2017 dropper top of = 1.419m. Depth @ B = 0.51m.</p> <p>Used Dumpy level and staff to determine height of ground at various positions down the profile from Dave's September 2017 dropper to help position the new 2m gauge C. I wanted the gauge to be where the ground was approximately 0.7m so that depths above 0.7m could be measured from</p>

	<p>the closer gauge C instead of wading out through deeper water over submerged dead timber. Installed a 2m SS angle with alloy depth plate, '2' and 'C'. Lake height transferred with dumpy level survey from benchmark. LBL of gauge C = 0.75m. GPS wpt TAANC Z50 E 552201, N 6355611.</p> <p>Travelled back to Narrogin. Dropped of Peter White at Wheatbelt Regional office. Conversation with Mike Fitzgerald regarding Recovery catchment goals and gauge maintenance work. Informed Maria Lee about new Toolibin gauges.</p>
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**TAAR: Taarblin South****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	31/5/1978	Don Munro	1.5m		Set in granite outcrop 8.0m west of track (boat ramp) on tree line of live Melaleuca sp.
HL 416	5/5/1998	Scanlan Surveys	5.533m	300.470m	AMG84 E 551309 N 6350370
Taarbm	13/09/2008	Alan Clarke			WGS 84 Z 50H E 551258 N 6350395

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	31/5/1978	Don Munro	2m	96.0m & 30° from CALM datum
2 (B)	31/5/1978	Don Munro	1m	346.0m & 32° from CALM datum (1m & 2m gauge plates)
Taara	13/09/2008	Alan Clarke	2m	WGS 84 Z 50H E 551273 N 6350528
Taarb	13/09/2008	Alan Clarke	1m	WGS 84 Z 50H E 551386 N 6350724

**Gauge Maintenance:**

Date	By Whom	Details
8/5/1998	Alan Clarke, Grant Pearson	The 1m mark on gauge 1 read 0.993 and the 1m mark on gauge 2 read 0.992 when surveyed to the CALM datum. Both depth plates, 1m and 2m, were replaced on gauge 1 and shifted up 7mm. The survey results show the final level for the 1m plate was 1.000. The initial survey results for the height of gauge 2 show the height for the top of the wood post. The staff could not be held directly on top of the depth plate. An offset tape was used to measure down to the gauge. The depth plate was replaced with a stainless steel plate and moved up 8mm. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The lake benchmark was levelled to an existing DOLA benchmark. The AHD of the lake benchmark is 300.416. The lake height of this benchmark is 5.533. The work was carried out on May 8.
1/4/2007	Alan Clarke	Installed an 'A' at the 2m onshore gauge, which has both 1m (LBL 0.27) and 2m depth plates. Installed a 'B' at the 1m offshore gauge.
10/5/2009	Alan Clarke, Yvonne Winchcombe	1m gauge B broken and on ground. Surveyed from 1m mark on gauge A to install a new 1m gauge B. A galvanised angle was used with a new 6mm gauge plate and '1' and 'B'. Lake dry, lake bed level at 1m gauge B was 0.03m. Checked 2m gauge A and reattached existing stainless steel 1m plate. Installed '2'. Lake bed level at 2m gauge A was 0.275m. Surveyed top of dropper as 0.900m. Depth for Nov 2008 was recorded as 64cm below dropper, depth calculated as 0.26m.

**THOM: Thomsons****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	9/3/1978	Don Munro	3.0m		9.0m E/N/E of largest Euc. tree on east side of track.
HZ 929	4/5/1999	Scanlan Surveys	1.902m	13.677m	AMG84 E 389412 N 6441385
THOM BM1	4/08/2008	Jim Lane			(#1) WGS 84 Z 50H E 389516 N 6441482
THOM BM2	14/09/2008	Jim Lane			(#2) WGS 84 Z 50H E 389518 N 6441483
THOM BM HZ929	22/5/2017	Yvonne Winchcombe			WGS 84 Z 50H E 389519 N 6441483

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	9/3/1978	Don Munro	2m	
2 (B)	9/3/1978	Don Munro	2m	355° from datum (1m & 2m gauge plates). Removed May 2007.
3 (C)			1m	Offshore
2 (D)	4/5/1999	Alan Clarke	2m	
(E)	April 2000	Alan Clarke	1m	
THOM A1	4/08/2008	Jim Lane	2m	WGS 84 Z 50H E 389516 N 6441513
THOM E	4/08/2008	Jim Lane	1m	WGS 84 Z 50H E 389519 N 6441539
THOM oldwp&gg e	4/08/2008	Jim Lane		(Old witness plate & gauge – now Gauge F) WGS 84 Z 50H E 389507 N 6441529
THOM A2	14/09/2008	Jim Lane	2m	WGS 84 Z 50H E 389518 N 6441515
THOM C	9/11/2015	Jim Lane	1m	WGS 84 Z 50H E 389509 N 6441710
THOM D	9/11/2015	Jim Lane	2m	WGS 84 Z 50 H E 389535 N 6441582
THOM A2	22/5/2017	Yvonne Winchcombe	2m	WGS 84 Z 50H E 389518 N 6441514
THOM C1	22/5/2017	Yvonne Winchcombe	1m	WGS 84 Z 50H E 389510 N 6441710
THOM D2	22/5/2017	Yvonne Winchcombe	2m	WGS 84 Z 50H E 389536 N 6441581 (Removed 22/5/2017)
THOM E1	22/5/2017	Yvonne Winchcombe	1m	WGS 84 Z 50H E 389519 N 6441541 (Removed 22/5/2017)
THOM F1	22/5/2017	Yvonne Winchcombe	1m	WGS 84 Z 50H E 389509 N 6441530

**Gauge Maintenance:**

Date	By Whom	Details
4/5/1999	Alan Clarke	The 2m mark on gauge 1 read 1.985, the 1m mark on gauge 2 read 0.984 and the 1m mark on gauge 3 read 0.987 when surveyed to the CALM datum. All three gauges were low by a similar amount. It was thought that the CALM datum had probably moved up. It was decided to install and replace gauges and depth plates at their original level. Gauge 1 was not altered. The Gauge 2 wood board and depth plates were in poor condition. A new gauge 2 was installed (see access diagram for the new position) using a galvanized angle iron with a plastic depth plate. The gauge height was levelled in from gauge 1. The final level for the 1m mark on gauge 2 was the same as the 1m mark on gauge 1. The rusted and faded depth plate on gauge 3 was replaced at the same level with a plastic depth plate. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. Work carried out May 4.
3/4/2006	Alan Clarke, Julia Sisson	The original 2m gauge (wood board with two plates) is currently covered by Typha and “lost” from view. The gauge installed in 1999 is also “lost” in the Typha. A new 1m gauge was installed in front of the Typha 24m north of the 2m gauge nearest to the CALM datum. The gauge alpha ID’s on the original gauge maintenance page are incorrect. I have reallocated the ID’s by hand on the old copy and will edit the new copy to reflect the current situation. The stainless steel depth plate on the 1m gauge (old allocation of C, new is B) was replaced with a 6mm plastic plate.
3/5/2007	Alan Clarke	The 1m gauge installed directly in front of the typha, 24m into the lake from the 2m onshore gauge A in April 2006 was incorrectly labelled with a D. D gauge is in fact the 2m gauge installed in May

		<p>1999, during the benchmark installation. This 2m gauge is a tall angle iron with both 1m and 2m plates attached. This gauge could not be located in April 06 and therefore was not labelled.</p> <p>At this visit the gauge D was located and a D installed. The gauge is in good condition. The 1m gauge labelled D the previous year was re-labelled E.</p> <p>The old wood board with two depth plates to 2m (Munro) was located and removed because it was loose in the ground and damaged. This 2m wood board gauge was gauge B, but not labelled. The lake was dry.</p> <p>The typha in this area has been sprayed and this has enabled the gauges to be more easily located. A 1m gauge was found 20m to the west of gauge E. An old benchmark with a white diamond location sign is immediately adjacent to this gauge. These old white signs are usually associated with the old PWD series of benchmarks. I did not have any levelling equipment with me so I was unable to determine if this gauge was at the same height as the DEC gauges. I will attempt to determine its relationship to our gauges in September this year during the depth gauge run, providing there is sufficient water up to the gauges.</p>
22/5/2017	Alan Clarke, Yvonne Winchcombe	<p>No key to reserve gate, could not fit wheelbarrow through 'people' gate. Walked from road down to wetland carrying all equipment. Surveyed from BM HZ 929 to gauges – all incorrect!</p> <p>Gauge 2A – firm, needs new gauge plate, reading 50mm too high</p> <p>Gauge 1E – very wobbly, reading 103mm too low</p> <p>Gauge 2D – reading 38mm too low</p> <p>Gauge 1C (middle of wetland) – reading 13mm too low</p> <p>Unmarked gauge next to track – reading 10mm too low</p> <p>Removed gauges 1E and 2D. Left Gauge 1C as is. Replaced gauge plate on 2A with aluminium plate and moved down 50mm. Replaced gauge plate with aluminium plate on unmarked gauge and installed a '1' and 'F'. The top of angle is 250mm above 1m. Wetland is dry. <b>17/9/2018 JL visited THOM on 10-9-18, Gauge A is reading 100mm TOO HIGH, need to RAISE gauge plate by 100mm!!</b></p>



**TOOL: Toolibin****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	31/5/1978	Don Munro	3.0m		4.0m & 270° from largest Casuarina located on s/w corner of track junction.
HL 417	7/5/1998	Scanlan Surveys	3.650m	299.705m	AMG84 E 557653 N 6357270 MGA94 Z 50 E 557651 N 6357249
ToolBM	3/11/2008	Alan Clarke			WGS 84 Z 50H E 557650 N 6357248

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	31/5/1978	Don Munro	3m	52.0m & 289° from CALM datum (2m & 3m gauge plates)
2 (B)	31/5/1978	Don Munro	1m	250.0m & 265° from CALM datum.
ToolA	3/11/2008	Alan Clarke	3m	WGS 84 Z 50H E 557595 N 6357254
ToolB	3/11/2008	Alan Clarke	1m	WGS 84 Z 50H E 557376 N 6357230
TOOL A	11/09/2011	Jim Lane	3m	WGS 84 Z 50H E 557593 N 6357256 (removed 9-5-2018)
TOOL B	11/09/2011	Jim Lane	1m	WGS 84 Z 50H E 557375 N 6357233
TOOLC	9/5/2018	Alan Clarke	2m	WGS 84 Z 50H E 557570 N 6357265
TOOLD	9/5/2018	Alan Clarke	3m	WGS 84 Z 50H E 557635 N 6357254

**Gauge Maintenance:**

Date	By Whom	Details
31/4/1997	Alan Clarke, Grant Pearson	Work carried out by Alan Clarke and Grant Pearson on April 31. The 2m mark on gauge 1 read 2.008 and the 1m mark on gauge 2 read 1.077 when surveyed to the CALM datum. At gauge 1, from the notes in GBP's field book, a new depth plate was installed on top of the old plate. The depth plate at gauge 2 was replaced 0.077 below the old mark. See 1998 Scanlan report for gauge height changes. The lake was dry.
7/5/1998	Alan Clarke, Grant Pearson	The 2m mark on gauge 1 read 2.154 and the 1m mark on gauge 2 read 1.005m when surveyed to the CALM datum. The 2m and 3m depth plates were replaced with stainless steel plates and adjusted. Gauge 2 was not changed. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The lake benchmark was levelled to an existing DOLA benchmark. The AHD of the lake benchmark is 299.705. The lake height of this benchmark is 3.650. The 1m mark on the Water Corp. gauge has a CALM lake height of 1.390. The work was carried out on May 7 and 8.
1/4/2007	Alan Clarke	Installed an 'A' at the 3m onshore gauge, which has both 2m (LBL 1.1m) and 3m depth plates. Installed a 'B' at the 1m offshore gauge and installed a 3mm plastic depth plate over the stainless steel depth plate.
9/5/2018	Alan Clarke, Peter White	Installed a new 2m depth gauge (gauge C) on a stainless steel angle about 25m further into the wetland from the old wood board gauge (gauge A). New gauge C GPS wpt is TOOLC at Z50 E 557570, N 6367265. We used the Dumpy level to survey in the 2m height from the Benchmark so that it read 2m. We did the same to install a new 3m gauge on the edge of the wetland (gauge D). Gauge D GPS wpt TOOLD Z50 E 557635, N 6357254.  The 2m mark on gauge A was levelled to the benchmark. The height of the 2m mark on gauge A was 1.993m. LBL of gauge a was 1.10m  Once both new depth gauges were installed we removed the old wood board gauge (gauge A) and it only required a slight push for it to snap and fall over, so it was a timely replacement.

**TORD: Tordit-Gurru****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	14/3/1978	Don Munro	4.0m		2.0m east of large Marri tree
B 683	3/6/1998	Scanlan Surveys	6.195m	178.760m	AMG84 E 476227 N 6179473
TORDBM	18/09/2008	Yvonne Winchcombe			WGS 84 Z 50H E 476135 N 6179406
TORD BM B683	19/05/2015	Yvonne Winchcombe			WGS 84 Z 50H E 476135 N 6179409

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	14/3/1978	Don Munro	4m	4.0m & 280° from CALM datum
2 (B)	14/3/1978	Don Munro	3m	27.0m & 280° from CALM datum (REPLACED 3/6/1998)
2 (C)	3/6/1998	Alan Clarke	3m	47.0m & 282° from B 683
TORDA	18/09/2008	Yvonne Winchcombe	4m	WGS 84 Z 50H E 476115 N 6179411
TORDC	18/09/2008	Yvonne Winchcombe	3m	WGS 84 Z 50H E 476088 N 6179414
TORDD	18/09/2008	Yvonne Winchcombe	2m	WGS 84 Z 50H E 476001 N 6179421
TORDE	8/6/2011	Alan Clarke		WGS 84 Z 50H E 475818 N 6179437

**Gauge Maintenance:**

Date	By Whom	Details
3/6/1998	Alan Clarke, Grant Pearson	The 4m mark on gauge 1 read 4.000 and the 3m mark on gauge 2 read 2.993 when surveyed to the CALM datum. Gauge 1 was fixed to a broken, thin wood post. A new 4m gauge using a galvanised angle iron and a stainless steal depth plate replaced gauge 1. The gauge height was levelled in from the secure CALM datum. The final level for the 4m mark on the new gauge 1 was 4.001. The gauge 2 depth plate had been damaged by high-powered rifle fire and the old galvanised angle iron was rusted. A new 3m gauge was installed using a galvanised angle iron and a stainless steal depth plate. The gauge height was levelled in from the secure CALM datum. The final level for the 3m mark on the new gauge 2 was 3.000. A metal detector was used to search for a PWD benchmark around a tree, which had a PWD sign nailed to it. The PWD benchmark was used as the lake datum. Reference marks were installed and the CALM datum and gauges surveyed to the PWD benchmark. The lake height of the PWD benchmark was 6.195. The AHD of the PWD benchmark is 178.760. Work carried out on June 3.
16/2/2002	Alan Clarke, Mike Scanlon	Replaced the worn stainless steel depth plates on the 3m and 4m gauges with plastic depth plates at the same levels. The water was 6m from the 3m gauge. A 3 <sup>rd</sup> gauge is not necessary for this lake.
23/3/2007	Alan Clarke, Yvonne Winchcombe	Followed Roger Hearn through cocky gate next to Bench Mark at BYENUP and into reserve. Track through reserve looks like it gets a bit boggy. Followed along fence line on inside of reserve to end of private property. At intersection at corner of private property turn left. This track becomes Neeranup Road. 3.9km from corner turn right at M62 water sign, this leads to Tordit-Gurru. Roger and Ian have installed a new 2m gauge using the water level (in choppy conditions) to determine the height of the gauge. We attached an 'A' to the 4m gauge, a 'C' to 3m gauge, a 'D' and '2' to the new 2m gauge. Used spirit level to check the height of the new 2m gauge back to the 3m gauge. 0.001m difference between 2m and 3m gauges.
19/5/2015	Alan Clarke, Yvonne Winchcombe	Located benchmark TORDBM (Public Works Department B683) 50 H 0476135, 6179409. Surveyed to top of white bore casing TG502 (6m) which was 85cm above lake bed level. Bore casing is 4.314m below PWD B683 (+/- 1mm). Note that the outer yellow bore casing is not stable – can easily move up and down so measured to the top of the inner white bore casing.

**TOWE: Towerrinning****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	22/5/1978	Don Munro	3.0m		Datum mark on 4 <sup>th</sup> pier from end of northern most jetty and on north side 400mm below underside of jetty decking.
HC 290	14/5/1998	Scanlan Survey	3.649m	220.138m	AMG84 E 480710 N 6283895 MGA94 Z 50 E 480705 N 6283949
TOWE BM	18/07/2008	Jim Lane			WGS 84 Z 50H E 480708 N 6283950
ToweBM	19/09/2008	Alan Clarke			WGS 84 Z 50H E 480707 N 6283949

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (B)	22/5/1978	Don Munro	4m	Nailed to pier. Previously only 3m, updated to 4m in April 2006.
2 (A)	22/5/1978	Don Munro	2m	Near swimming buoys to n/w of pier
(C)	April 2006	Alan Clarke	3.7m	Opposite side of jetty from B on pier pylon
TOWE B	18/07/2008	Jim Lane	4m	WGS 84 Z 50H E 480676 N 6283961 (3m + part 4m gauge plates)
ToweC	19/09/2008	Alan Clarke	3.7m	WGS 84 Z 50H E 480675 N 6283959 (removed 2016)

**Gauge Maintenance:**

Date	By Whom	Details
25/5/1998	Alan Clarke, Grant Pearson	The 4m mark on gauge 1 read 4.000 when surveyed to the CALM datum. The CALM datum was a saw mark in the jetty pylon at the base of the gauge. The 1m depth plate was in good condition. The gauge was not altered. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauge. Work carried out on May 25.
4/4/2006	Alan Clarke, Julia Sisson	On inspection I realised that gauge B was not a 4m gauge, but in fact a 3m gauge. The new access map and GM notes page will be updated to reflect this. The survey notes show that the difference between the CALM datum (3m) and the DLI benchmark as 0.649. The Lake height of the benchmark is therefore <u>3.649m</u> .  Installed a part 4m plate on the railing above the 3m gauge plate at B. Installed a part 4m gauge on the opposite side of the jetty at C. The gauge at C will fill in the gap between the two plates at B. It was considered that a gauge plate protruding below the jetty railing would be hazardous, so the 4m gauge was made flush to the existing railing and the gauge at C was installed.
14/3/2012	Alan Clarke, Anthony Reid	Lake depth at B = 2.64m. Installed a B and 4 on gauge B which is above the jetty and replaced the old metal 3 with a new plastic 3.
5/4/2016	Alan Clarke, Yvonne Winchcombe	Checked BM HC 290. Gauge B is partial 4m gauge – gauge plate 3.4m to 4.0m. There is a 3m gauge B under the jetty at this point. Decided that it is confusing to have a partial gauge for the 3.0 – 3.4m gap – simpler and less confusing to measure down from base of 4m gauge to water surface. Therefore Gauge C which has been removed was not replaced. A logger has been installed on opposite side (LHS) of jetty. Measured 37cm below 3.4m on Gauge B, depth = 3.03m.

**TWIN: Twin Swamps (N-W)****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	21/5/1979	Don Munro	0.10		Gauge & Datum together 3.0m off side of track
HZ 923	14/5/1999	Scanlan Surveys	0.167m	28.038m	AMG84 E 406430 N 6489973
TWIN BM	20/07/2009	Jim Lane			WGS 84 Z 50J E 406579 N 6490175
TWIN F&W BM	20/07/2009	Jim Lane			WGS 84 Z 50J E 406586 N 6490170

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	21/5/1979	Don Munro	1m	
TWIN gge	20/07/2009	Jim Lane		WGS 84 Z 50J E 406585 N 6490170 (Unidentified gauge next to Munro Datum)

**Gauge Maintenance:**

Date	By Whom	Details
14/5/1999	Alan Clarke	The 1m gauge had broken off at its base. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum. The work was carried out on May 14. I installed a 1m gauge at the site for Phil Fuller at the end of the field program.

**UNIC: Unicup**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	30/4/1981	Don Munro	2.0m	201.355m	18.0m & 153° from bottom south corner of boat ramp.
B 695	Existing	DOLA	8.232m	207.587m	MGA94 E 474444 N 6200043
UNICBM	18/09/2008	Yvonne Winchcombe			WGS 84 Z 50H E 474399 N 6200082

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	30/4/1981	Don Munro	2m	125m & 130° from CALM datum (1m & 2m gauge plates)
2 (B)	30/4/1981	Don Munro	1m	350m & 117° from CALM datum
UNICA	18/09/2008	Yvonne Winchcombe	2m	WGS 84 Z 50H E 474490 N 6199937
UNICC	18/09/2008	Yvonne Winchcombe	3m	WGS 84 Z 50H E 474416 N 6199995
UNIC C	26/01/2016	Jim Lane	3m	WGS 84 Z 50H E 474417 N 6199994
UNIC A	26/01/2016	Jim Lane	2m	WGS 84 Z 50H E 474491 N 6199937

**Gauge Maintenance:**

Date	By Whom	Details
21/5/1997	Alan Clarke, Jim Payne	Alan Clarke and Jim Payne carried out the work on May 21. The 1m mark on gauge 1 (2m gauge) read 1.001m when surveyed to the CALM datum. Both plates were replaced at the same level. The CALM datum was levelled to a DOLA benchmark that was located near the ski sheds. The AHD level of the CALM 2m datum is 201.355m. The Water Corp. gauge 1m mark reads 1.955m CALM lake height.
16/2/2002	Alan Clarke, Mike Scanlon	Replaced the worn stainless steel 2m plate on gauge 1 with a plastic plate at the same level. The depth at gauge 2 was 0.90m.
21/3/2007	Alan Clarke, Yvonne Winchcombe	Attached a 'C' to the 3m gauge. Attached an 'A' to the 2m gauge and a 'D' on the new 1m gauge installed by Ian Wheeler (Recovery Catchment Officer, Manjimup). The new 1m gauge is a plastic star iron picket with a 6mm plastic depth plate. Did not check gauge height with survey equipment because the gauge is not expected to survive very long?

**VARL: Varley**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	9/6/1981	Don Munro	2.0m		Approx. 150.0m down fence-line from road, on south side near corner
HH 282	10/4/2000	John Bullock & Assoc.	1.866m	310.125m	AMG E 724430 N 6379670
VarlBM	15/09/2008	Alan Clarke			WGS 84 Z 50H E 722520 N 6379843

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (B)	9/6/1981	Don Munro	2m	250.0m out from edge of samphire being in line with fence (1m & 2m gauge plates)
2 (A)	10/4/2000	Alan Clarke	2m	Edge of main lake bed near end of fence
VarlA	15/09/2008	Alan Clarke	2m	WGS 84 Z 50H E 722232 N 6380162
VarlB	15/09/2008	Alan Clarke	2m	WGS 84 Z 50H E 722096 N 6380319 (1m & 2m gauge plates)

**Gauge Maintenance:**

Date	By Whom	Details
10/4/2000	Alan Clarke	The 1m mark on the gauge read 0.998 when surveyed to the CALM datum. Both gauge plates and wood board were in good condition. A new 2m gauge was installed at the edge of the main lake bed near the end of the fence. A DOLA BM was installed and surveyed to the CALM datum and gauges. Lake depth on April 10 was 1.12m.
12/5/2006	Alan Clarke, Lucie Southern, Steph Gadal	Replaced the 2m damaged 3mm plastic depth plate on gauge A with a 6mm plastic depth plate and installed an A. Installed a B to the wood board off shore Munro gauge that has two 1m plates at 1 & 2m. The gauge ID's have been reversed.
31/3/2007	Alan Clarke	Installed an 'A' on the 2m onshore gauge and replaced the '2'. The 2m offshore gauge (Munro wood board with two depth plates) is labelled B.
8/5/2009	Alan Clarke, Yvonne Winchcombe	Replaced old 1m metal plate with 6mm plastic plate on 2m gauge B (both 1m & 2m plates) Lake was dry, lake bed level at 2m gauge B was 0.01m.

**WAGI: Wagin 2088****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	31/5/1982	Don Munro	1.0m		At base of large dead Casuarina tree on S/W side of track near high water mark
HD 214	11/5/1998	Scanlan Surveys	1.522m	247.836m	AMG84 E 533266 N 6311875
WAGI BM	14/07/2009	Jim Lane			WGS 84 Z 50H E 533281 N 6311808
WAGI F&W BM	14/07/2009	Jim Lane			WGS 84 Z 50H E 533293 N 6311794

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	31/5/1982	Don Munro	2m	18.0m & 150° from CALM datum
2 (B)	31/5/1982	Don Munro		196.0m & 153° from CALM datum
WAGI 2m gge	14/07/2009	Jim Lane	2m	WGS 84 Z 50H E 533304 N 6311778

**Gauge Maintenance:**

Date	By Whom	Details
10/5/1998	Alan Clarke	This lake is not currently monitored. The gauges were not renewed. The 2m mark on gauge 1 read 1.995 when surveyed to the CALM datum. The gauge 1 wood post and depth plate were in good condition. The second gauge could not be found. The dry lakebed had numerous motor bike tracks. The second gauge has most probably been destroyed. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauge. The work was carried out on May 10 and 11.

**WALB: Walbyring****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	12/7/1979	Don Munro	1.5m		2.0m above high water mark at the base of Eucalypt sp. (south side) being 45.0m & 339° from dissection of road junction
UD 7	8/5/1998	Scanlan Surveys	2.537m	299.231m	AMG84 E 555519 N 6355255
Walbbm	13/09/2008	Alan Clarke			WGS 84 Z 50H E 555534 N 6355214

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	12/7/1979	Don Munro	2m	6.0m & 330° from CALM datum
2 (B)	12/7/1979	Don Munro	1m	146.0m & 347° from CALM datum
Walba	13/09/2008	Alan Clarke	2m	WGS 84 Z 50H E 555522 N 6355329
Walbb	13/09/2008	Alan Clarke	1m	WGS 84 Z 50H E 555494 N 6355454
WALB A	11/09/2011	Jim Lane	2m	WGS 84 Z 50H E 555522 N 6355329
WALB B	11/09/2011	Jim Lane	1m	WGS 84 Z 50H E 555496 N 6355455

**Gauge Maintenance:**

Date	By Whom	Details
8/5/1998	Alan Clarke, Grant Pearson	The 2m mark on gauge 1 read 2.004 and the 1m mark on gauge 2 read 0.965 when surveyed to the CALM datum. Gauge 1 was not changed. The survey results are 'titled final heights for gauges', but show only initial heights. The final gauge heights have been taken from field book notes. The depth plate on gauge 2 was replaced by a stainless steel plate and moved up 35mm. An established DOLA benchmark situated immediately over the road was levelled to the CALM datum. The AHD of the benchmark is 229.231. The lake height of the benchmark is 2.537. The work was carried out on May 8.
1/4/2007	Alan Clarke	Installed an 'A' at the 2m onshore gauge. Installed a 'B' and '1' at the 1m offshore gauge and installed a 3mm plastic depth plate over the stainless steel depth plate.



**WALL: Wallering****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	13/7/1981	Don Munro	1.5m		83.0m north of southern boundary fence at a point 440m from gate to farm house. Datum is 7.0m north of largest Eucalypt tree in above reference area.
HZ 920	18/5/1999	Scanlan Surveys	1.343m	68.095m	AMG84 E 395570 N 6521440
WALL BM1	15/09/2008	Jim Lane			WGS 84 Z 50J E 395706 N 6521624
WALL F&W BM	15/09/2008	Jim Lane			WGS 84 Z 50J E 395709 N 6521619

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	13/7/1981	Don Munro	1m	57.0m & 50° from CALM datum.
WALL 2m gauge	15/09/2008	Jim Lane	2m	WGS 84 Z 50J E 395749 N 6521653

**Gauge Maintenance:**

Date	By Whom	Details
18/5/1999	Alan Clarke	This lake is not currently monitored. The gauge was not altered. The 1m mark on the gauge read 1.006 when surveyed to the CALM datum. The gauge wood board and depth plate are in reasonable condition. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauge. The work was carried out on May 18.

**WALY: Walyormouring****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	5/7/1978	Don Munro	3.0m		
HZ 902	19/5/1998	Scanlan Surveys	0.919m	264.069m	AMG84 E 488051 N 6554391 MGA94 Z 50 E 488021 N 6554455
WALY BM1	18/09/2008	Jim Lane			WGS 84 Z 50J E 488021 N 6554454
WALY F&W BM	18/09/2008	Jim Lane			WGS 84 Z 50J E 488010 N 6554468 (Fisheries & Wildlife Benchmark)
WALY BM HZ 902	23/05/2017	Yvonne Winchcombe			WGS 84 Z 50J E 488024 N 6554456

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	5/7/1978	Don Munro		170m & 227° from CALM datum
(B)		Don Munro		
1 (C)	19/5/1998	Alan Clarke	2m	(1m & 2m plates) *17/07/2019 Changed label to Gauge D
2 (D)	19/5/1998	Alan Clarke	1m	*17/07/2019 Changed label to Gauge C
WALY C	18/09/2008	Jim Lane	2m	WGS 84 Z 50J E 487969 N 6554378 *17/07/19 Changed to Gauge D
WALY D	18/09/2008	Jim Lane	1m	WGS 84 Z 50J E 487854 N 6554211 *17/07/19 Changed to Gauge C
WALY C1	23/05/2017	Yvonne Winchcombe	1m	WGS 84 Z 50J E 487855 N 6554214
WALY D2	23/05/2017	Yvonne Winchcombe	2m	WGS 84 Z 50J E 487969 N 6554381

**Gauge Maintenance:**

Date	By Whom	Details
19/5/1998	Alan Clarke, Grant Pearson	Both gauges were not operational because the wood boards had snapped off at their bases. The old CALM datum, which was in good condition, was used to level in the new gauges. A new 2m gauge was installed using 2 galvanised angle irons bolted together with 2 stainless steel depth plates. The survey results show that the final level for the 1m mark on the new gauge 1, being 2 by 1m depth plates, was 1.004. A new gauge 2 (1m) gauge was installed using a galvanised angle iron and stainless steel depth plate. Both of the new gauge heights were levelled in from the secure CALM datum. The final level for the 1m mark on gauge 2 was 0.999. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The work was carried out on May 19.
2/4/2001	Alan Clarke, Katherine Sorokine	Gauge 1 has a height of 2m. The ground height is 0.6m. The bottom 1m stainless steel plate (paint peeling off) was replaced with a plastic plate. The gauge 2 stainless steel 1m plate (paint completely removed) was replaced with a plastic plate at the same height. The lake was dry.
2/4/2007	Alan Clarke	Installed an 'C' at the 2m onshore gauge, which is a tall angle with both 1m (LBL 0.32m) and 2m depth plates. Installed a 'D' and a '1' at the 1m offshore gauge and fixed two bolts to the bottom of the gauge.
23/05/2017	Alan Clarke, Yvonne Winchcombe	Parked at 'Oak Park Picnic Area'. Surveyed to gauges. Gauge C1 read 0.19m. Replaced D2 with 3m s/s angle, aluminium gauge plate, '2' and 'D'. Replaced C1 with 2m s/s angle, aluminium gauge plate, '1' and 'C'.
17/07/2019	Yvonne Winchcombe	Between 2/04/2007 and 23/5/2017 the 2m gauge was referred to/labelled as C and the 1m gauge was referred/labelled to as D. Photos and field sheets have been checked and gauges changed so that the 2m gauge is now referred to/labelled as D and the 1m gauge as C which is how they were labelled in the field on 23/05/2017.

WANN: Wannamal

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	6/7/1978	Don Munro	2.0m		Cut in Euc. Tree
HZ 914	12/5/1999	Scanlan Surveys	2.062m	165.277m	AMG84 E 409509 N 6556557
WANN BM1	15/09/2008	Jim Lane			WGS 84 Z 50J E 409642 N 6556691

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	6/7/1978	Don Munro	2m	88m & 259° from CALM datum
2 (B)			1m	
WANN A	15/09/2008	Jim Lane	2m	WGS 84 Z 50J E 409620 N 6556675
WANN B	13/11/2010	Jim Lane	1m	WGS 84 Z 50J E 409545 N 6556656

**Gauge Maintenance:**

Date	By Whom	Details
12/5/1999	Alan Clarke	The CALM datum was a saw cut in a large tree, but the cut had grown over. The top of the 2m sign marking the datum was used to level to the gauges. The measurement from the top of the 2m sign to its base, the base presumably would have aligned with the saw cut, was 91mm. This measurement was added to the height of the datum for survey calculation purposes. The 2m mark on gauge 1 read 2.000 and the 1m mark on gauge 2 read 0.994 when surveyed to the temporary CALM datum. The depth plates on both gauges were replaced with plastic plates. The survey results show the final level for the 2m mark on gauge 1 was 2.000 and the 1m mark on gauge 2 was 1.004. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The work was carried out on May 12.
3/4/2007	Alan Clarke	Installed an 'A' & '2' on the 2m onshore gauge and installed a 3mm plastic depth plate over the faded stainless steel depth plate. LBL of A is approximately 0.8m. Installed a 'B' & '1' at the 1m gauge and installed a 3mm plastic depth plate over the stainless steel depth plate, which had lost most of its paint. LBL of B is 0.27m.

**WARD: Warden**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	14/3/1980	Don Munro	2.0m		20.0m east of track & approx. 2.0m above high water.
UE 357	30/5/1998	Scanlan Surveys	1.962m	4.303m	AMG84 E 396833 N 6257473
WardBM	16/09/2008	Alan Clarke			WGS 84 Z 51H E 396947 N 6257428

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	14/3/1980	Don Munro	3m	138.0m & 312° from CALM datum (2m & 3m gauge plates) (Removed)
2 (B)	14/3/1980	Don Munro	1m	170.0m & 280° from Gauge 1 (Removed)
3 (C)	14/3/1980	Don Munro	1m	230.0m & 280° from Gauge 2 (Removed)
4 (D)	17/1/2003	Alan Clarke	3m	Next to 2m CALM datum (Reinstalled)
WardD	16/09/2008	Alan Clarke	3m	WGS 84 Z 51H E 396932 N 6257469
WardE	9/5/2012	Alan Clarke	2m	WGS 84 Z 51H E 396840 N 6257522
WardF	9/5/2012	Alan Clarke	1m	WGS 84 Z 51H E 396620 N 6257576

**Gauge Maintenance:**

Date	By Whom	Details
29/5/1997	Alan Clarke, Jim Payne	Alan Clarke and Jim Payne carried out the work on May 29. Reference marks were installed for the CALM datum. The 2m mark on gauge 1 read 2.005 when surveyed to the CALM datum. Both plates were replaced with stainless steel depth plates 0.005 below their previous position. The level run for gauges 2 and 3, when checked by Alan Clarke back in the office, were incorrect. There were errors with decimal points and incorrect heights entered into the digital level. Gauge 2 was left as it was found. Gauge 3 did not have a depth plate. A 1m plate was levelled on to the gauge 3 wood post, but at the wrong level. The subsequent DOLA benchmark installation and gauge survey in 1998 presented the following gauge heights. The 2m mark on gauge 1 read 2.000, the 1m mark on gauge 2 read 0.989 and the 1m mark on gauge 3 read 0.854 when surveyed to the CALM datum.
30/5/1998	Alan Clarke, Jim Payne	Alan Clarke and DOLA's Jim Payne carried out survey work and gauge maintenance 1997. See 1997 report for details. The 2m mark on gauge 1 read 2.001 and the 1m mark on gauge 2 read 0.989 and the 1m mark on gauge 3 read 0.854 when surveyed to the CALM datum. Gauge 1 was not altered. The gauge 2 depth plate was faded and replaced with a stainless steel depth plate and moved up 11mm. The plate was secured with wood tech screws. The final level for the 1m mark on gauge 2 was 1.001. Gauge 3 was not altered; this gauge needs to be removed when water levels recede. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The lake benchmark was levelled to an existing DOLA benchmark. The AHD of the lake benchmark is 4.303. The lake height of this benchmark is 1.962. The depth at gauge 2 on May 30 was 0.58m.
6/4/2001	Alan Clarke, Katherine Sorokine	Gauge 1 wood board did not have any depth plates on it, the 3m sign was all that remained. I fixed a 3m and 2m plate to the gauge board using wood tech screws. I placed the top plate against the bottom of the 3m sign. The bottom of this plate abutted a weathered mark where the two old plates met. The lake depth at gauge 1 was 1.78m. The depth of the lake prevented us from levelling out to the gauge. Gauges 2 and 3 were under water.
Sept. 2001	Alan Clarke	A 3m gauge is needed close to the benchmark. The depth this year was 2.45. The current gauge 1 has a 3m and 2m plate attached but is 118m from the benchmark, which was half a meter under water itself this year.
17/1/2003	Alan Clarke	A new 3m gauge, which is a galv angle and 3mm plastic depth plate, was installed next to the 2m CALM datum.
30/3/2007	Alan Clarke	Installed a 'D' on the 3m onshore gauge and replaced the damaged 3mm plastic depth plate with a 6mm plastic depth plate. The Munro 3m wood board gauge was too deep to reach so the 'A' was not installed.
9/5/2012	Alan Clarke, Tilo Massenbauer	John Lizamore had removed all of the accessible gauges that were installed by Don Munro or Alan Clarke. John had replaced these gauges with his own aluminum depth gauges.  Two stainless steel angles were installed for a 1m and 2m gauge. A dumpy level was used to transfer a lake height from the benchmark to the top of the two new angles. The return survey back to the benchmark calculated a misclose of 4mm. The lake height for each gauge was calculated for

	<p>each angle. A 6mm plastic depth plate was fixed to each gauge. A 2 and 1 were fixed to their respective gauges. An E and F will need to be fixed to these gauges at the next visit. The GPS coordinates for the new 2m gauge E are WGS84 Z51 E396840, N 6257522. The GPS coordinates for the new 1m gauge F are WGS84 Z51 E396620, N 6257576.</p> <p>A new stainless angle was installed near the site of the old 3m gauge. A lake height was transferred to the top of the angle using a dumpy level from the benchmark. A 6mm plastic depth plate was fixed to the angle with a 3. A 'D' will need to be fixed to this gauge on the next visit. The GPS coordinates for the replacement 3m gauge D are WGS84 Z51 E396933, N 6257471.</p> <p>Lake depth on the 1m gauge was 0.58m.</p>
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**WARG: Wardering****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	24/5/1978	Don Munro	2.0m		Corner fence post
HD 209	12/5/1998	Scanlan Surveys	2.032m	243.229m	AMG84 E 523339 N 6290230
HD 209	26/10/2004	B Hugessen		243.229m	GDA94 Z 50 E 523381 N 6290253

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	24/5/1978	Don Munro	2m	67.0m & 134° from CALM datum

**Gauge Maintenance:**

Date	By Whom	Details
12/5/1998	Alan Clarke	This lake is not currently monitored. The gauge was not renewed. The 2m mark on gauge 1 read 2.008 when surveyed to the CALM datum. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauge. The old access detailed on the Munro map has been blocked by new fencing. See the corresponding Scanlan map for the new access details. The work was carried out on May 12.

**WARR: Warrinup****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	19/3/1980	Don Munro	1.00m		4.0m south of where track enters lake proper.
HO 284	2/6/1998	Scanlan Survey	0.899m	256.368m	AMG 84 E 523536 N 6199426
WARR BM	21/05/2008	Jim Lane			WGS 84 Z 50H E 523499 N 6199486
WARRBM	17/09/2008	Yvonne Winchcombe			WGS 84 Z 50H E 523495 N 6199485

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	19/3/1980	Don Munro	2m	On edge of Cladium stand. 74.0m & 41° from CALM datum (1m & 2m gauge plates)
2 (B)	8/4/2001	Alan Clarke	1m	80m & 50° from DOLA datum
WARR B	21/05/2008	Jim Lane		WGS 84 Z 50H E 523538 N 6199532
WARRB	17/09/2008	Yvonne Winchcombe	1m	WGS 84 Z 50H E 523538 N 6199534
WARRA2	5/05/2009	Alan Clarke	2m	WGS 84 Z 50H E 523594 N 6199607
WARR B1	6/11/2016	Yvonne Winchcombe	1m	WGS 84 Z 50H E 523540 N 6199535
WARR A2	10/09/2017	Yvonne Winchcombe	2m	WGS 84 Z 50H E 523594 N 6199610

**Gauge Maintenance:**

Date	By Whom	Details
2/6/1998	Alan Clarke, Grant Pearson	The 1m mark on gauge 1 read 0.998 when surveyed to the CALM datum. The 1m and 2m plates were good condition and not altered. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauge. The lake benchmark was levelled to an existing DOLA benchmark. The AHD of the lake benchmark is 256.368. The lake height of this benchmark is 0.899. Work carried out on June 2.
8/4/2001	Alan Clarke, Katherine Sorokine	Installed a 1m (no. 2) gauge using a galvanised angle iron and plastic depth plate. The final check of the 1m mark back to the benchmark was O.K. This gauge is 80m on a bearing of 50 from the DOLA benchmark. I levelled in the gauge from the DOLA benchmark, which, was installed in May 1998. The lake was dry.
21/3/2007	Alan Clarke, Yvonne Winchcombe	The Munro 2m gauge could not be found. Attached a 'B' to the 1m gauge. Lake bed level at B= 0.25m.
5/5/2009	Alan Clarke, Yvonne Winchcombe	Located dropper which was approx. 6m from existing 2m gauge A (hidden in baumea). GPS location of gauge A UTM 0523594, 6199606. Installed galvanised angle to back of wooden gauge board. Attached 'A'. Trampled baumea to improve access and visibility. Lake dry. Gauge B was surveyed to the BM and was found to be 13mm too high. Gauge B was banged down so that 1m now reads 1.000m. Lake bed level of Gauge B is 0.25m. Surveyed from Gauge B to 1m mark on 2m gauge A. 1m mark on gauge A was 1.007m (7mm too high). This was not altered. Also surveyed top of dropper from Gauge B. Lake height of dropper is 0.813m.

**WEST: West Arthur 5456****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	5/8/1980	Don Munro	1.0m		On max. high water mark, approx. 25.0m S/W from centre of turn-about
HC 291	24/5/1998	Scanlan Surveys	1.752m	230.540m	AMG 84 E 496500 N 6293081
WEST BM	18/07/2008	Jim Lane			WGS 84 Z 50H E 496510 N 6293047
WEST F&W BM	18/07/2008	Jim Lane			WGS 84 Z 50H E 496503 N 6293040
WestBM	19/09/2008	Alan Clarke			WGS 84 Z 50H E 496506 N 6293045

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	5/8/1980	Don Munro	2m	9.0m & 228° from CALM datum
2 (B)	5/8/1980	Don Munro	1m	287.0m & 220° from CALM datum
WEST A	18/07/2008	Jim Lane	2m	WGS 84 Z 50H E 496496 N 6293035
WEST B	18/07/2008	Jim Lane	1m	WGS 84 Z 50H E 496359 N 6292851 (New 1m B installed 14/3/12 no GPS coords)
WestA	19/09/2008	Alan Clarke	2m	WGS 84 Z 50H E 496493 N 6293033

**Gauge Maintenance:**

Date	By Whom	Details
25/5/1998	Alan Clarke, Grant Pearson	The 2m mark on gauge 1 read 1.998 and the 1m mark on gauge 2 read 0.993 when surveyed to the CALM datum. The wood board and depth plate on gauge 1 were in good condition. The depth plate on gauge 2 was faded. It was replaced with a stainless steel depth plate and moved up 7mm. The plate was secured with wood tech screws. The final level for the 1m mark on the gauge 2 was 0.999. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. Work carried out on May 25.
4/5/2007	Alan Clarke	Installed an 'A' & '2' on the 2m onshore gauge, which is a wood board with both 1m and 2m depth plates. LBL @ A = 0.5m. Replaced both the 1m and 2m stainless steel depth plates with 6mm plastic depth plates. The 1m offshore gauge is a wood board with a 1m depth plate. The wood board is weathered and will need replacing in two years. Installed a 'B' and replaced the 1m stainless steel depth plate with a 6mm plastic depth plate.
14/3/2012	Alan Clarke, Anthony Reid	A new 1m gauge B was installed in the middle of the lake using a stainless steel angle and 6mm plastic depth plate with 6mm plastic 1 and B. The height of the top of the angle was surveyed in using a dumpy level from the lake benchmark out to the angle and back to the benchmark. The misclose on the level survey was 2mm. The coordinates for the new gauge B were not recorded. The lake was dry.
5/4/2016	Alan Clarke, Yvonne Winchcombe	Checked BM HC 291. Gauge 2A read 0.56m. Depth query from 7-11-2011 shows photo of log – log is actually floating so depth unable to be determined. Depth recorded as < 0.45 (LBL of 2A).



**WHEA: Wheatfield****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
UE 362	14/4/2000	John Bullock & Assoc.	2.756m	5.788m	AMG E 400925 N 6258680 MGA94 Z 51 E 401066 N 6258819
WheaBM	17/09/2008	Alan Clarke			WGS 84 Z 51H E 401069 N 6258818

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (B)	14/4/2000	Alan Clarke	2m	17.2m & 75° from UE 362
2 (A)	5/4/2001	Alan Clarke	3m	9m from DOLA benchmark just left of a line to Gauge 1
WheaA	17/09/2008	Alan Clarke	3m	WGS 84 Z 51H E 401063 N 6258816
WheaB	17/09/2008	Alan Clarke	2m	WGS 84 Z 51H E 401051 N 6258814

**Gauge Maintenance:**

Date	By Whom	Details
14/4/2000	Alan Clarke	The deepest point was determined by weight and line in the 3.6m punt. Lake depth on April 14 was 1.68m. A DOLA BM and a 2m depth gauge were installed.
5/4/2001	Alan Clarke, Katherine Sorokine	Checked height difference between benchmark and 2m (no. 1) gauge. I installed a 3m gauge using a galvanised angle iron and plastic depth plate. I levelled in the gauge height from the DOLA benchmark. The final check on the 3m mark was O.K. The 3m (no. 2) gauge is 9m from the DOLA benchmark just left of a line to gauge 1. Lake depth at gauge 1 was 1.235m.
Sept. 2001	Alan Clarke	I was unable to find Jim Lane's dropper because the lake was flooded. Hopefully the water will have subsided in November for Grant to calculate a lake height. If not a depth gauge maintenance run in April 2002 will pick it up.
10/5/2006	Alan Clarke, Lucie Southern, Steph Gadal	Replaced the 3m plastic depth plate, which had been smashed by vandals, with a stainless steel plate and plastic depth plate over the front. The stainless plate will provide a strong backing board for the 6mm plastic gauge. Fixed and A (3m) and B (2m) to their respective gauges. The depth at B was 1.5m.
30/3/2007	Alan Clarke	Installed an 'A' and replaced the '3' at the 3m gauge and washed the algae off gauge B.
8/5/2009	Alan Clarke, Yvonne Winchcombe	2m gauge B had depth of 1.43m. Replaced rusted angle iron with stainless steel angle and new 6mm gauge plate and 2B. Used cable ties below 1.4m to secure gauge plate (under water surface). Old gauge, rusted angle, was removed.
7/4/2011	Alan Clarke, Yvonne Winchcombe	2m gauge B was dry, water line approx. 4m from gauge and well below the 1m mark, estimated depth <0.80m. Replaced 2m gauge plate with steel and plastic gauge plate to prevent vandalism. Fringing Melaleuca's falling over and in decline.
15/5/2017	Alan Clarke, Yvonne Winchcombe	Replaced burnt gauge plate on gauge 3C, old metal plate still OK but paint peeling off, plastic plate completely burnt. Unscrewed and replaced plastic plate leaving metal plate on as backing. Put new '3' and 'C' on top. (NOTE: Should be gauge 3A not 3C)
1/5/2018	Alan Clarke, Laurent Marsol	Replaced the 'C' on the 3m gauge with a 'A'. Replaced the damaged 'B' on the 2m gauge with a new 'B'.

**WHIA: White (Albany)****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	13/6/1981	Don Munro	2.0m		Approx 25.0m & 144° from prominent Melaleuca tree on north side of peninsular.
HO 292	6/4/2000	John Bullock & Assoc.	1.934m	117.572m	AMG E 606270 N 6152320
WHIABM	16/09/2008	Yvonne Winchcombe			WGS 84 Z 50H E 606407 N 6152434

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	13/6/1981	Don Munro	2m	Located 24m & 269° from CALM datum
2 (B)	13/6/1981	Don Munro	1m	Located 77m & 251° from CALM datum
WHIAA	16/09/2008	Yvonne Winchcombe	2m	WGS 84 Z 50H E 606378 N 6152435 (Approx. location of Gauge A – gauge fallen over and lying on ground)

**Gauge Maintenance:**

Date	By Whom	Details
6/4/2000	Alan Clarke	The 1m mark on gauge 1 read 1.009 and on gauge 2 read 1.02 when surveyed to the CALM datum. The CALM datum and both gauges were in good condition. Gauge 1 wood board was loose in the ground. Gauge 2 is in thick baumea were it could possibly have been forced up by the unstable vegetation base. A DOLA BM was installed and surveyed to the CALM datum and gauges.

**WHIN: White Lake Narrogin****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	16/6/1981	Don Munro	2.0m		10.0m & 45° from corner fence post
HD 218	10/5/1998	Scanlan Surveys	2.398m	294.496m	AMG84 E 542558 N 6347370
Whinbm	13/09/2008	Alan Clarke			WGS 84 Z 50H E 542630 N 6347335
WHIN MUNRO BM	5/11/2011	Jim Lane	2.0m		WGS 84 Z 50H E 542630 N 6347340 (CALM Datum)
WHIN BM	5/11/2011	Jim Lane			WGS 84 Z 50H E 542626 N 6347336

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	16/6/1981	Don Munro	2m	(Nearshore) 30.0m & 42° from CALM datum
2 (B)	16/6/1981	Don Munro	1m	(Offshore) 375.0m & 42° from CALM datum
Whina	13/09/2008	Alan Clarke	2m	WGS 84 Z 50H E 542657 N 6347360
Whinb	13/09/2008	Alan Clarke	1m	WGS 84 Z 50H E 542867 N 6347603
WHIN A	5/11/2011	Jim Lane	2m	WGS 84 Z 50H E 542649 N 6347361
WHIN B	5/11/2011	Jim Lane	1m	WGS 84 Z 50H E 542863 N 6347605

**Gauge Maintenance:**

Date	By Whom	Details
9/5/1998	Alan Clarke, Grant Pearson	The 2m mark on gauge 1 read 1.999 and the 1m mark on gauge 2 read 0.977 when surveyed to the CALM datum. Gauge 1 was not altered. The depth plate at gauge 2 was replaced with a stainless steel plate and moved up 23mm. The survey results show the final level for the 1m mark on gauge 2 was 1.002. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The lake benchmark was levelled to an existing DOLA benchmark. The AHD of the lake benchmark is 294.496. The lake height of this benchmark is 2.398. The work was carried out on May 9.
1/4/2007	Alan Clarke	Installed an 'A' at the 2m onshore gauge. Installed a 'B' and '1' at the 1m offshore gauge and replaced the Munro depth plate with a 3mm plastic plate.

**WHIW: White Water****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	8/6/1981	Don Munro	2.0m		1.0m below maximum high water being 25.0m east from side of road at a point 62.0m south from gate.
HL 423	6/5/1998	Scanlan Surveys	2.102m	264.650m	AMG84 E 558738 N 6399922
WhiwBM	14/09/2008	Alan Clarke			WGS 84 Z 50H E 558770 N 6399914

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	8/6/1981	Don Munro	2m	(Inshore) 48.0m & 100° from CALM datum (1m & 2m gauge plates)
2 (B)	8/6/1981	Don Munro	2m	(Offshore) 385.0m & 100° from CALM datum (1m & 2m gauge plates)
WhiwA	14/09/2008	Alan Clarke	2m	WGS 84 Z 50H E 558830 N 6399905
WhiwB	14/09/2008	Alan Clarke	2m	WGS 84 Z 50H E 559113 N 6399864
WHIW A	10/09/2011	Jim Lane	2m	WGS 84 Z 50H E 558827 N 6399907

**Gauge Maintenance:**

Date	By Whom	Details
6/5/1998	Alan Clarke, Grant Pearson	The initial gauge heights have been taken from field book notes. The survey results only show final heights. The 1m mark on gauge 1 read 1.006 and the 1m mark on gauge 2 read 1.015 when surveyed to the CALM datum. The 2m depth plate on gauge 1 was replaced with a stainless steel plate and dropped 6mm. The survey results show the final level for the 2m plate was 2.001. Both depth plates on gauge 2 were lowered 15mm. The bottom 1m plate was replaced with a stainless steel plate. The survey results show the final level for the 1m mark was <u>1.009</u> . A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The work was carried out on May 6.
2/4/2001	Alan Clarke, Katherine Sorokine	Travelled to lake with the intention of replacing 1m plate at gauge 2 because the plates at gauge 1 were replaced by me in November 2000 and I thought the 1m gauge would need the same. On inspection the 1m plate at gauge 2 was in good order. Gauge 1 only needed three additional screws to fix the 1m plate into the wood board below the November 2000 water line.
26/3/2007	Alan Clarke	Installed an 'A' on the 2m onshore gauge and replaced the 1m Munro plate with a 6mm plastic plate, LBL 0.4m. Installed a 'B' on the 2m offshore gauge. This gauge has a Munro plate and a stainless steel plate, both will need replacing in two years. The wood board is aging and will need to be replaced in two years with an alloy gauge with a plastic plate.

**WILD: Wild Horse****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	15/6/1981	Don Munro	2.0m		16.0m & 145° from taped fence post (Ref II) which is 250.0m from gate (Ref I)
HC 295	3/4/2000	John Bullock & Assoc.	2.126m	210.022m	AMG E 473600 N 6273300
WILDHC295	18/09/2009	Alan Clarke			WGS 84 Z 50H E 473637 N 6273462

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	15/6/1981	Don Munro	1m	85.0m & 126° from CALM datum

**Gauge Maintenance:**

Date	By Whom	Details
4/4/2000	Alan Clarke	The 1m mark on the gauge read 0.982 when surveyed to the CALM datum. The CALM datum was tilted. The close proximity to the base of a large Casuarina tree may have caused the datum to rise at an angle. The gauge is in good condition. A DOLA BM was installed and surveyed to the CALM datum and gauge. The Nature Reserve is fenced with locked gates. Lake depth on April 4 was < 0.01m.

**WILS: Wilson**

**Datum Details:**

ID	Installation Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
UM 88	28/5/1997	Jim Payne	0.934m	41.852m	MGA94 E 382396 N 6189431
WILSBM	15/09/2008	Yvonne Winchcombe			WGS 84 Z 50H E 382325 N 6189429

**Gauge Details:**

ID	Installation Date	By Whom	Lake Height	Location (See sketch diagram for details)
1	28/5/1997	Alan Clarke	4m	10m west along shore from lake access.
WILSA	15/09/2008	Yvonne Winchcombe	4m	WGS 84 Z 50H E 382364 N 6189496
WILS A	26/01/2016	Jim Lane	4m	WGS 84 Z 50H E 382364 N 6189496

**Gauge Maintenance:**

Date	By Whom	Details
23/05/1997	Alan Clarke	Alan Clarke and Jim Payne carried out the work on May 23. Soundings were taken to determine the deepest point using a punt, outboard and string line with weight. The deepest mark on the line was measured with a cloth tape. The depth of 3.3m was transferred to a 4m gauge at the edge of the lake. An old photo point, being a star iron in concrete, was used as the CALM lake datum. Reference marks were placed around the datum. The new CALM datum was levelled to DOLA benchmark UM88, which was out on the main track. The AHD level of the CALM datum (photo point 84293/v51) is 37.206m. Lake height of the CALM datum is 7.106m.
19/3/2007	Alan Clarke, Yvonne Winchcombe	The angle iron is rusted and will need replacing in a few years. Replaced stainless steel depth plate with a 6mm plastic depth plate. Attached 'A' to gauge.
26/3/2014	Alan Clarke, Yvonne Winchcombe	<p>AC waded around bank and found 4m Gauge A – lot of gauge plate curled due to wildfire. Undergrowth on banks thick and vigorous blocking old access footpath, fallen branches obscure gauge. Walked along path past gauge location to dead tree overhanging bank. Installed 2 x new stainless angles and gauge plate at same depth as existing gauge and closer to dead tree overhanging bank. Gauge A read 3.165m, new Gauge A read 3.165m. Old gauge rusty but firm – left in place.</p> <p>Top of stainless angle measured 380mm above top of 4m gauge plate. Top of angle is 4.380m. Installed letter 'A' 100mm below top of angle. Top of plastic 'A' is 4.280m, bottom of plastic 'A' is 4.190m.</p> <p>Left 50mm gap below 'A' and installed number '4'. Top of plastic '4' is 4.140m and bottom of plastic '4' is 4.050m.</p> <p>There is 50mm gap between bottom of '4' and top of 4.000m gauge plate.</p> <p>Dug channel from waters edge to base of dropper. Measured 80mm from base of dropper down to water surface. By eye the top of dropper is approx 101cm above water surface. (Difficult to measure due to vegetation on bank). Removed dropper, measured length of dropper as 940mm. Top of dropper (940 + 80 = 1020mm) is 1.02m above water surface. Lake height of top of dropper is 3.165 + 1.02 = 4.185m.</p>

**YAAL: Yaalup****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	30/5/1982	Don Munro	2.0m		On north side of E-W fence along edge of firebreak at a point approx. 5.0m into lagoon from normal high water mark. Removed May 27, 1997.
HT 292	27/5/97	J. Payne DOLA	0.851m	290.369m	Approx. 75m @ 290° from gauge A. GDA94 E 647440 N 6263829
YAAL BM	14/07/2008	Jim Lane			WGS 84 Z 50H E 647443 N 6263830
YaalBM	18/09/2008	Alan Clarke			WGS 84 Z 50H E 647441 N 6263827

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	30/5/1982	Don Munro	2m	70.0m & 290° from CALM datum
2 (B)	30/5/1982	Don Munro	1m	110.0m & 355° from Gauge 1
(C)	27/5/1997	Alan Clarke	1m	Adjacent to old Gauge 2
YAAL C	14/07/2008	Jim Lane	1m	WGS 84 Z 50H E 647385 N 6263942
YAAL D	14/07/2008	Jim Lane	3m	WGS 84 Z 50H E 647397 N 6263802
YaalA	18/09/2008	Alan Clarke	2m	WGS 84 Z 50H E 647381 N 6263848
YaalC	18/09/2008	Alan Clarke	1m	WGS 84 Z 50H E 647384 N 6263944
YaalD	18/09/2008	Alan Clarke	3m	WGS 84 Z 50H E 647393 N 6263804

**Gauge Maintenance:**

Date	By Whom	Details
27/5/1997	Alan Clarke, Jim Payne	Alan Clarke and Jim Payne carried out the work on May 27. The 2m mark on gauge 1 read 1.994 and the 1m mark on gauge 2 read 0.995 when surveyed to the CALM datum. The old CALM datum block was loose in the ground. After pulling the block out of the ground it was found to be sitting on tree roots, which were most likely the cause of the height difference. A new datum was made with a star iron picket and concrete set with a DOLA brass plaque with two reference marks. The DOLA benchmark was not stamped. The 2m gauge post was found to be solid in the ground so the 2m mark was adopted as the temporary datum. Most readings in the past would have been taken from this gauge and there is only a 0.002 difference between gauges suggesting little vertical movement. The old 2m plate at gauge 1 had faded so it was replaced. A new angle iron and 1m depth plate were installed adjacent to the old gauge 2. This gauge had rusted badly and was removed. The 1m mark on the new gauge is now exactly 1m below the 2m mark of gauge 1. The lake was dry.
Sept. 2001	Alan Clarke	Three depth plates need replacing and the 3m gauge needs to be resurrected.
27/3/2007	Alan Clarke	The 1m gauge was missing its depth plate. The height of the 1m mark was confirmed to be at the base of the '1'm sign on the galv angle by spirit levelling from the 2m mark on the 2m gauge. The top of the angle for the 1m gauge C is 1.112m. A new 6mm plastic depth plate and 'C' were installed on the 1m gauge. Installed an 'A' on the 2m gauge and replace the old paint peeled stainless steel plate with a new 6mm plastic depth plate. The old 3m gauge had been run over and flattened. The depth plate was missing. The angle was pushed backup straight and a 3m mark was spirit levelled onto the angle from the 2m gauge. A 6mm plastic plate was installed and labelled with a 'D' and '3'.

**YARN: Yarnup****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	30/4/1981	Don Munro	1.0m		On high water mark. 2.0m on high side of large Eucalypt located on south side of track at lake edge.
B 702	4/6/1998	Scanlan Surveys	4.341m	232.614m	AMG84 E 487307 N 6196536
YARNBM	18/09/2008	Yvonne Winchcombe			WGS 84 Z 50H E 487368 N 6196543

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	30/4/1981	Don Munro	2m	20.0m & 87° from datum
2 (B)			2m	(1m & 2m gauge plates)
YARN A	21/05/2008	Jim Lane	2m	WGS 84 Z 50H E 487398 N 6196529
YARN B	21/05/2008	Jim Lane	2m	WGS 84 Z 50H E 487419 N 6196531
YARNA	18/09/2008	Yvonne Winchcombe	2m	WGS 84 Z 50H E 487400 N 6196528
YARN A2	8/11/2016	Yvonne Winchcombe	2m	WGS 84 Z 50H E 487400 N 6196529
YARN B2	8/11/2016	Yvonne Winchcombe	2m	WGS 84 Z 50H E 487420 N 6196528 (1m & 2m gauge plates)

**Gauge Maintenance:**

Date	By Whom	Details
4/6/1998	Alan Clarke, Grant Pearson	The 2m mark on gauge 1 read 1.996 and the 2m mark on gauge 2 read 1.996 when surveyed to the CALM datum. Gauge 1 was in good condition and not altered. The 2m plate on gauge 2 was in good condition, but the 1m plate rusted and was replaced with a stainless steel depth plate at the same level. A metal detector was used to search for a PWD benchmark around a tree, which had a PWD sign nailed to it on the roadside. The PWD benchmark was used as the lake datum. Reference marks were installed and the CALM datum and gauges surveyed to the PWD benchmark. The lake height of the PWD benchmark was 4.341. The AHD of the PWD benchmark is 232.614. The lake depth at gauge 2 was 0.43m. Work carried out on June 4.
21/3/2007	Alan Clarke, Yvonne Winchcombe	Attached an 'A' to the 2m onshore gauge. Attached a 'B' to 2m offshore gauge. This gauge is a wood board with both 1m and 2m depth plates. This gauge will need to be replaced in a few years because the wood board has deteriorated.



**YARR: Yarra Yarra****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	15/7/1981	Don Munro	1.0m		On approx. high water mark, being 33m & 74° from corner fence.
HX 614	17/5/1998	Scanlan Surveys	1.547m	242.717m	AMG84 E 379896 N 6726844
YARR BM1	17/09/2008	Jim Lane			WGS 84 Z 50J E 379957 N 6726980
YARR BM HX614	24/5/2017	Yvonne Winchcombe			WGS 84 Z 50J E 379957 N 6726980

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	15/7/1981	Don Munro		(Nearshore) 75m & 106° from CALM datum. Removed May 1998.
2 (B)	15/7/1981	Don Munro		(Offshore) 413m & 106° from CALM datum
1 (C)	17/5/1998	Alan Clarke	2m	(1m & 2m gauge plates) replacing old Gauge 1
YARR A	17/09/2008	Jim Lane	2m	WGS 84 Z 50J E 380032 N 6726974
YARR B	17/09/2008	Jim Lane	1m	WGS 84 Z 50J E 380303 N 6726907
YARR A2	24/05/2017	Yvonne Winchcombe	2m	WGS 84 Z 50J E 380028 N 6726973

**Gauge Maintenance:**

Date	By Whom	Details
17/5/1998	Alan Clarke, Grant Pearson	The CALM datum was not found. There was a hole in the ground where the datum should have been and associated cement pieces on the dry lakebed below this area. There was evidence of human disturbance at the site. Gauge 1 had been badly damaged by high-powered rifle fire. The 1m mark on this gauge was adopted as the temporary datum. A new gauge 1 was installed using 2 galvanised angle irons bolted together with both 1m and 2m plates attached at the previous levels. The 1m mark on gauge 2 read 0.992 when surveyed to the 1m mark on gauge 1. The depth plate was in reasonable condition. The plate was left on, but further secured by wood tech screws. The gauge post was in reasonable condition, but the supporting angle iron was rusted through. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The work was carried out on May 17.
28/03/2006	Alan Clarke, Sandra Fleisher	Replaced the faded original Munro 1m plate at gauge B with a 6mm plastic plate. The LBL of the salt was 0.25m. The water level in the hole was 0.14m. An A and B were installed on their respective gauges.
24/5/2017	Alan Clarke, Yvonne Winchcombe	Located BM HX 614 under fallen tree. Surveyed out to gauges. Lake bed level at A2 = 0.22m. 1m mark is 3mm too low – reads 0.997. Replace A2 with 3m s/s angle and aluminium gauge plate, 'A' and '2' and moved up 3mm. Replace wooden gauge B with 2m s/s angle, aluminium gauge plate and '1' and 'B'. Surveyed back to BM. Water in distance beyond Gauge B, lake surface covered in thick salt crust, water level at B = 0.10m (below salt crust).

**YEAG: Yeagarup****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location
YEAG TBM	17/09/2014	Yvonne Winchcombe			WGS 84 Z 50H E 396813 N 6177185 (Temporary Benchmark)

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
YEAG A	17/09/2014	Yvonne Winchcombe	10.64m	WGS 84 Z 50H E 396813 N 6177154 (Installed on LHS pilon under jetty)

**Gauge Maintenance:**

Date	By Whom	Details
26/3/2014	Alan Clarke, Yvonne Winchcombe	Measured 45cm from underside of wooden jetty at first metal rail down to water surface. AC used Spirit Ski to conduct bathymetry of lake using weighted tape measure and GPS. Light breeze. Deepest point determined at 10.20m. Decided to install gauge board on wooden pillon under jetty on board walk section. Measured down 44cm from underside of deck down to water surface. Water surface is 10.20m therefore top of gauge plate cut off at 0.64m (water level reads 0.20 on gauge). Gauge plate shows depths from 10.000m to 10.640m. Underside of wooden decking/jetty has a lake height of 10.640m.
27/3/2014	Alan Clarke, Yvonne Winchcombe	<p>Installed temporary benchmark on left hand side of footpath that leads down to jetty. Used white plastic DOLA stake and hammered into ground midway between first 2 pine bollards that bar access to lake edge. Line of bollards from path edge up to shelter. YEAG TBM GPS 34°32'30.8" south, 115°52'31.7" east. (+/- 5m) on AC new GPS – coverage not great as under canopy.</p> <p>GPS of Gauge A is 34°south, 115°east. (Yvonne to confirm GPS when next visit) Underside of decking has lake height of 10.640m, measured decking board 52mm. <b>Lake height of top of decking &amp; jetty (where it is level) is 10.692m.</b></p> <p>Survey Gauge A to YEAG BM. <b>Lake height of YEAG TBM is 11.973m</b></p> <p>Screwed Gauge board and 'A' to underside of jetty – water level, <b>Gauge A =10.20m</b></p>

**YEAL: Yealering****Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	1/6/1978	Don Munro	2.5m		Situated on fence line at max. high water mark.
HL 421	7/5/1998	Scanlan Surveys	2.705m	271.906m	AMG84 E 58536 N 6393399
Yealbm	14/09/2008	Alan Clarke			WGS 84 Z 50H E 558587 N 6393389
YEAL BM	10/11/2010	Jim Lane			WGS 84 Z 50H E 558589 N 6393389

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	1/6/1978	Don Munro	2m	140.0m & 174° from CALM datum (in line with fence)
2 (B)	1/6/1978	Don Munro	1m	
1 (C)	6/5/1998	Alan Clarke	2m	On lake edge in front of Yealering Caravan Park
2 (D)	6/5/1998	Alan Clarke	1m	On lake edge in front of Yealering Caravan Park
YealC	14/09/2008	Alan Clarke	2m	WGS 84 Z 50H E 558588 N 6393365
YEAL C	10/11/2010	Jim Lane	2m	WGS 84 Z 50H E 558588 N 6393365
YEAL D	10/11/2010	Jim Lane	1m	WGS 84 Z 50H E 558558 N 6393144
YEALE	9/5/2018	Alan Clarke	3m	WGS 84 Z 50H E 558591 N 6393378

**Gauge Maintenance:**

Date	By Whom	Details
13/5/1997	Grant Pearson, Tania Butler	Work carried out by Grant Pearson and Tania Butler on May 13. A new depth plate was installed on gauge 1 at the same height. See 1998 Scanlan report for gauge changes.
6/5/1998	Alan Clarke, Grant Pearson	GBP and Tania Butler replaced the 2m depth plate on the old gauge 1 in May 1997. Two new gauges and the associated DOLA benchmark were installed on the lake edge in front of the Yealering Caravan Park. The gauge heights were transferred from the old CALM datum. The survey results show the final level for the 2m mark on gauge 1 was 2.000. The survey results show the final level for the 1m mark on gauge 2 was 0.997. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. The lake benchmark was levelled to an existing DOLA benchmark. The AHD of the DOLA lake benchmark is 271.906. The work was carried out on May 6 and 7.
17/2/2002	Alan Clarke, Mike Scanlon	The lake bed level of the 1m offshore gauge is 0.5m. The lake had approximately 0.4m of water in a large pool, its edge was 200m to the south of the gauge. The lake bed was too soft and wet to attempt to level and install a second 1m gauge. This work will need to be carried out before the first winter rains to maximise the possibility of installing a new gauge.
26/3/2007	Alan Clarke	Installed a 'C' on the 2m gauge and a 'D' on the 1m gauge. The 2m and 1m Stainless steel plates on gauge C and D had lost their paint so they were replaced with 6mm plastic plates. The LBL at D is 0.55m. The area around the gauge was 'dry', but the mud was wet. Water filled the hole from activity replacing the gauge. Depth on the gauge read 0.49m. There was water in a small pool 200m away in a lower part of the lake.
9/5/2018	Alan Clarke, Peter White	Installed a 3m gauge E up the lake edge profile from gauge C and in line with the benchmark and gauge C. GPS wpt YEALE Z50 E 558591, N 6393378. Installed gauge E using a 3m SS angle and alloy depth plate. Installed a 3 and 'E'. LBL of gauge E = approx. 1.7m. Transferred height for new gauge using Dumpy level survey from the benchmark. Lake Height of the 2m mark on gauge C = 2.005m.

**YEAS: Yeagarup South**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location
YEAS A	17/09/2014	Yvonne Winchcombe	4m	WGS 84 Z 50H E 396321 N 6176122

**Gauge Maintenance:**

Date	By Whom	Details
15/3/2012	Alan Clarke, Anthony Reid	<p>Travelled from Pemberton to Yeagarup via Ritter Road. Dropped tyre pressure and traversed steep accent to the top of the large dune. Good view of South Yeagarup lake from top of dune. Parked vehicle on top of dune and loaded up equipment for walk into south east end of Lake. See GPS track for best access route.</p> <p>Water was 0.550m below top of dropper that was installed by Yvonne Winchcombe in September and November 2011. Native minnows were present.</p> <p>Highest winter water mark/tied rack was 0.8m-1m above current water level. Will need to return in April next year to install a permanent depth gauge. Bathymetry to determine the deepest point will require dragging/carrying Spirit ski into lake.</p>
27/3/2014	Alan Clarke, Yvonne Winchcombe	<p>Drove up onto top of Yeagarup dune at new dune access point. Reduce tyre pressure. Parked at top of first dune. Dragged ski and carried equipment across dunes for bathymetric survey and gauge installation at Yeagarup South.</p> <p>Old dropper #1 measured 135mm from top of dropper down to water surface. Sept 2013 dropper #2 measured 580mm from top of dropper down to water surface.</p> <p>AC conducted bathymetric survey of wetland. Swamp hen, musk duck and largish brown bird noticed by YW. Deepest depth recorded 2.80m.</p> <p>Installed stainless angle and a 4m gauge board – top of board extends above angle. Also fitted a partial 3m gauge board. No room to install an ‘A’. GPS of YEAS A 34°33’05.0” south, 115°52’11.9” east. <b>Gauge A read 2.80m.</b></p> <p>Confirmed height of droppers and removed them. Lake height of top of dropper # 1 is 2.80 + 135mm = 2.935m. Lake height of top of dropper #2 (Sept 2013) is 2.80 + 580mm = 3.38m.</p>

**YELL: Yellilup****Datum Details:**

ID	Installation Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	4/11/1985	Don Munro	1.0m		On timber line 3.0m north of track
HE 112	31/5/1998	Scanlan Surveys	5.268m	86.865m	AMG84 E 686966 N 6201315
YELL BM	19/05/2008	Jim Lane			WGS 84 Z 50H E 686899 N 6201353
YELLBM	17/09/2008	Yvonne Winchcombe			WGS 84 Z 50H E 686903 N 6201352
YELL CALM	7/4/2011	Alan Clarke			WGS 84 Z 50H E 686766 N 6201372 (Don Munro Datum)
YELL BM HE112	23/05/2015	Yvonne Winchcombe			WGS 84 Z 50H E 686898 N 6201350

**Gauge Details:**

ID	Installation Date	By Whom	Lake Height	Location (See sketch diagram for details)
1 (A)	4/11/1985	Don Munro	2m	On dead tree near CALM datum
2 (B)	4/11/1985	Don Munro	1m	50m & 270° from CALM datum
1 (C)	2/4/1998	Alan Clarke	5m	16.8m & 253° from DOLA datum
2 (D)	2/4/1998	Alan Clarke	4m	19.7m & 253° from DOLA datum
3 (E)	6/4/2001	Alan Clarke	3m	50m & 270° from 4m gauge.
4 (F)	11/1/2009	Alan Clarke	2m	MGA Zone 50 E 686770 N 6201355
YELL C	19/05/2008	Jim Lane	5m	WGS 84 Z 50H E 686885 N 6201348
YELL D	19/05/2008	Jim Lane	4m	WGS 84 Z 50H E 686865 N 6201342
YELL E	19/05/2008	Jim Lane	3m	WGS 84 Z 50H E 686827 N 6201345
YELL Old1m	19/05/2008	Jim Lane	1m	WGS 84 Z 50H E 686720 N 6201365
YELLC	17/09/2008	Yvonne Winchcombe	5m	WGS 84 Z 50H E 686884 N 6201345
YELLD	17/09/2008	Yvonne Winchcombe	4m	WGS 84 Z 50H E 686865 N 6201341
YELLE	17/09/2008	Yvonne Winchcombe	3m	WGS 84 Z 50H E 686827 N 6201344
YELL 1B	7/04/2011	Alan Clarke	1m	WGS 84 Z 50H E 686719 N 6201363
YELL C5	23/05/2015	Yvonne Winchcombe	5m	WGS 84 Z 50H E 686885 N 6201345
YELL D4	23/05/2015	Yvonne Winchcombe	4m	WGS 84 Z 50H E 686865 N 6201340
YELL E3	23/05/2015	Yvonne Winchcombe	3m	WGS 84 Z 50H E 686826 N 6201343
YELL F2	23/05/2015	Yvonne Winchcombe	2m	WGS 84 Z 50H E 686771 N 6201353

**Gauge Maintenance:**

Date	By Whom	Details
2/4/1998	Alan Clarke, Dorian Moro	Work carried out by Alan Clarke and Dorian Moro on April 2. The original 1m CALM (Munro) datum and gauges have been inundated for some time. A replacement gauge had been nailed to a tree further up the embankment at some time. A 4m gauge and a 5m gauge were installed. The heights for the new gauges were levelled from the bottom of the old gauge nailed to the tree (4m mark). Accuracy of this gauge on the tree is unknown. A datum was constructed of a dropper driven into the ground until no return with a brass bolt as the survey mark. The dropper was surrounded by cement encased in a section of plastic storm water drain. The 5.451m lake height of this CALM datum (Clarke) was levelled in from the gauge.
31/5/1998	Alan Clarke, Grant Pearson	Alan Clarke and Dorian Moro carried out survey work and gauge maintenance in April 1998. See 1998 report for details. The old Munro gauges have been covered by permanent water for some time. The 5m mark on the new gauge 1 read 5.000 and the 4m mark on the new gauge 2 read 3.998 and when surveyed to the CALM datum (installed in April 1998). The gauges were not altered. Tech screws were replaced with stainless steel bolts. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. Work carried out on May 31.

6/4/2001	Alan Clarke, Katherine Sorokine	Inspected access way down to water, which was very low. I found two depth plates on the ground that were probably (confirmed by Ian Peacock) installed on a near by tree by Don Munro. Suspect that these plates were the old 2 and 3 meter plates. I installed a 3m gauge using a galvanised angle iron and plastic depth plate. I levelled in the gauge height from the DOLA benchmark. Final check of the 3m mark read 3.003m. The 3m gauge is 50m on a bearing of 270 from the 4m gauge installed in 1998. The old gauges installed by Munro are no longer serviceable. In 1998 a 5m and a 4m gauge were installed. They were numbered 1 and 2 respectively with the new 3m gauge installed this year being number 3. The lake height of the bottle installed in the ground to indicate the 2000 November water level is 2.314m. Lake depth was determined by dumpy level with the staff placed at the waters edge. The calculated depth was 1.463m.
21/3/2007	Alan Clarke, Yvonne Winchcombe	Attached 'E' to 3m gauge, 'D' to 4m gauge and 'C' to 5m gauge. Cleaned 3m gauge plate.
11/1/2009	Alan Clarke, John Graff	<p>Installed a 2m gauge (F) at Yellilup about 10m north of Yvonne's dropper. WGS84 coords for the new gauge are Zone 50 686 770 E, 6201 355N.</p> <p>Gauge D is a 4m gauge, but has a 3m plate underneath with a LBL of 2.5ish, I used the 3m height to survey from because it was easier to level from this point. I levelled from Gauge D (3m) to gauge E (3m) and found E to be 3mm lower than D, ie the 3m mark on E was LH=2.997. From the gauge maintenance notes the Scanlon surveyor installing the BM surveyed the height of gauge D and found it to be 3.998. So, the 3m mark on D is 2mm lower than it should be. The combination of Gauge D being 2mm low and determining E to be 3mm lower than D means E is 5mm lower than it should be (ie 2.995LH).</p> <p>I needed to know the real height of E so that I could use it to level the dropper and new gauge to determine their heights. Levelling from the BM with the steep slope would bring in more error than levelling from gauge E to the dropper and new gauge.</p> <p>I levelled between the 3m mark on E out to the dropper and the difference was -1.226m. When this difference is applied to the known point (E = 2.995) the dropper LH height is 1.769m. In addition, as a check for my new gauge install, I measured the distance from the top of the dropper down to the water. This distance was 0.280m. The height of the water is therefore 1.489 (or 1.49m for checking using the water height).</p> <p>I positioned an angle iron approximately 10m north in an area least likely to be prone to trees falling and damaging the gauge. It is not in line with the D and E gauges, but is in line with the lake access track. I then levelled the top of the angle and determined the LH height to be 2.307m. I measured down 0.307m from the top of the angle and marked that point. I placed the 1m mark of the gauge plate up to this mark and the water read 0.49m. With the gauge being 2m the depth on the gauge was 1.49m, meaning I was on target. I fixed the gauge and the attached photo shows the gauge in position.</p>
7/4/2011	Alan Clarke, Yvonne Winchcombe	AC surveyed old 1m CALM Datum GPS YELL CALM 50 H 0686766, 6201372 to the 2m mark on gauge F. The 2m mark is +0.025m high to the old CALM datum. Surveyed to 1m old Munro gauge and old 1m Munro CALM Datum. The 1m gauge was reading 0.985 to the Datum. Installed new SS angle approx 2m from old gauge B. 1m mark surveyed in from 2m mark on gauge F. Depth at new 1m gauge B = 0.20m. Gauge F reads 0.025 below the CALM datum height.
23/5/2015	Alan Clarke, Yvonne Winchcombe	Benchmark is DOLA HE 112 (lake height = 5.268m). Surveyed from DOLA BM to C5, D4, E3, F2, and 1m gauge B. Depth at 1B=0.265m. AC calculated B1 lake height as 1.028m (1m mark is reading 28mm too high). Gauges all reading high – did not survey back to BM. Installed 3m gauge E at correct height (3.0m).

**YURI: Yurine**

**Datum Details:**

ID	Date	By Whom	Lake Height	AHD Height	Location (See sketch diagram for details)
CALM	31/5/1979	Don Munro	2.5m		At base of Euc. sp. tree near gate
HZ 916	12/5/1999	Scanlan Surveys	1.464m	48.985m	AMG84 E 385028 N 6543449
YURI BM	31/07/2008	Jim Lane			WGS 84 Z 50J E 385171 N 6543598
YURI BM HZ916	25/5/2017	Yvonne Winchcombe			WGS 84 Z 50J E 385169 N 6543598

**Gauge Details:**

ID	Date	By Whom	Lake Height	Location (See sketch diagram for details)
1	31/5/1979	Don Munro	3m	10.0m & 56° from CALM datum (disused)
2	31/5/1979	Don Munro	1m	70.0m & 60° from CALM datum
YURI 3m	31/07/2008	Jim Lane	3m	WGS 84 Z 50J E 385169 N 6543580
YURI board	31/07/2008	Jim Lane		WGS 84 Z 50J E 385211 N 6543600
YURI A	02/06/2010	Alan Clarke	1m	WGS 84 Z 50J E 385253 N 6543601
YURI B	02/06/2010	Alan Clarke	2m	WGS 84 Z 50J E 385186 N 6543604
YURI A	15/9/2011	Jim Lane	1m	WGS 84 Z 50J E 385252 N 6543602
YURI B	7/11/2016	Jim Lane	2m	WGS 84 Z 50J E 385185 N 6543602
YURI A1	25/5/2017	Yvonne Winchcombe	1m	WGS 84 Z 50J E 385250 N 6543601
YURI B2	25/5/2017	Yvonne Winchcombe	2m	WGS 84 Z 50J E 385187 N 6543604

**Gauge Maintenance:**

Date	By Whom	Details
12/5/1999	Alan Clarke	This lake is not currently monitored. The gauges were not altered. Gauge 1 was bent and leaning to one side. The gauge 2 wood board was O.K. but both depth plates were rusted with the bottom plate rapped several times around the wood board. The 1m mark on gauge 2 read 0.996 when surveyed to the CALM datum. A DOLA benchmark was installed with reference marks and surveyed to the CALM datum and gauges. Work carried out on May 12.
02/06/2010	Alan Clarke & Yvonne Winchcombe	This lake is now included in the regular monitoring program. A 1m (A) and 2m (B) gauge were installed into the lake. Their heights were surveyed in from the Landgate Benchmark HZ 916. Gauge A was positioned by surveying the lake bed for the deepest point. Gauge A was installed at a lake bed level of 0.010m. The 2m gauge (B) is positioned at the edge of the wetland near the benchmark. The 3m mark on gauge 1 was surveyed and found to be 3.049m LH.
25/5/2017	Alan Clarke, Yvonne Winchcombe	Removed broken plate and installed new aluminium gauge plate at A1 at same level. Depth read 0.30m.