



ANNUAL COMPLIANCE REPORT

(Combined Approval 60CA581273)

2020/21

Contact: David Hilton - Manager Assets and Operations

LICENCE COMPLIANCE REPORT 2020/21

PREFACE

This report is prepared by Western Murray Irrigation Limited (WMI) as part of licence requirements which WMI holds with the NSW Government - Department of Planning Industry and Environment - Water (DPIE Water) and the Environmental Protection Authority (EPA). It discusses our annual compliance performance, including the environmental performance and impacts of the works and infrastructure owned or controlled by WMI and the quality of irrigation wastewater discharged from works and infrastructure.

Our environmental programs, which aim to exceed our environmental obligations, demonstrate our commitment to ensuring that our operations do not impact negatively on the environment.

**Western Murray Irrigation Limited
2020/21 Annual Compliance report**

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INTRODUCTION

WMI supplies water to customers in its three irrigation areas, Buronga, Coomealla and Curlwaa under Combined Approval Number 60CA581273. The Statement of Approval has a date of effect 01 July 2004 and expiry of 23 February 2030. Details of the Statement of Approval can be found at:
<https://waterregister.watarnsw.com.au/water-register-frame>.

Operating licence for Western Murray Irrigation was renewed and amended for a period of ten years on 24th January 2018, published in NSW Government Gazette No 10 of 25 January 2018:

Government Notices

WATER MANAGEMENT ACT 2000

Sections 123 and 124

RENEWAL AND AMENDMENT OF OPERATING LICENCE

NOTICE is given that, pursuant to sections 123 and 124 of the *Water Management Act 2000*, the Governor of New South Wales has, on 24th January 2018, renewed and amended the Operating Licence of Western Murray Irrigation Limited, for a period of ten years. The renewed Operating Licence commences on the day this notice is published in the NSW Government Gazette.

[n2018-247]

This Compliance Report details the monitoring and reporting activities undertaken by WMI during the 2020/21 financial year to comply with the water management licences. It also outlines irrigation development data that explains the trends in monitoring results.

All mapping details are using projected coordinate system: GDA-1994- MGA-Zone 54.

STATEMENT OF APPROVAL 60CA581273 – COMPLIANCE OF CONDITIONS

Take of Water

MW0655-00001

All water supply works authorised by this approval take water in compliance with the conditions of the access licence under which water is being taken.

MW2452-00001

Water is taken through metering equipment that meet the following requirements:

- A. The metering equipment accurately measures and records the flow of all water taken through the water supply work authorised by this approval.
- B. Status of metering equipment compliance with the current Australian Standard AS 4747: 'Meters for non-urban supply':
 - Buronga pump station meter (1) is pattern approved to NMI-M-10; installed/commissioned 05May21.
 - Coomealla pump station meters (1-6) are pattern approved to NMI-M-10; installed/commissioned 01July2021.
 - Curlwaa pump station meters (1-2) are pattern approved to NMI-M-10. Installed/commissioned 12July21(1) and 12Jun21(2)

Commissioning of Telemetry for DAS – WMI are working with WaterNSW to commission our existing telemetry in accordance with 'Marketing engagement policy for metering and telemetry; Part 3 – Assessment process for 'other telemetry systems'.

- C. All metering equipment is sited and installed at a place in the pipe, between the water source and the first discharge outlet. There is no flow of water into or out of the pipe, between the water source and the metering equipment.
 - D. The metering equipment is always operated and maintained in a proper and efficient manner. Calibration certificates follow.
-

Metering Calibration Certificates

Buronga Pump Station.

SIEMENS

Buronga Main Pumps

Factory Calibration Certificate / Werkskalibrierungszertifikat / Certificat d'étalonnage usine

Topic / Thema / Sujet: SITRANS F Flowmeter / Durchflussmessgerät / Débitmètre

Object / Betreff / Objet:

Siemens order / Siemensauftrag / Commande Siemens	:	0001894029/000090
Flowmeter type / Durchflussmessgerättyp / Type de débitmètre	:	Sitrans FM MAG5100 W
Sensor diameter / Messaufnehmer-Nennweite / Diamètre nominal	:	DN 600 (24")
Product order No. / Produktbestellnummer / N° de référence d'appareil	:	FDK-083X13685
System serial No. / System Seriennummer / N° de série du système	:	974403H280
Sensor serial No. / Messaufnehmer Seriennummer / N° de série de capteur	:	475403H340

Technical data / Technische Daten / Données techniques:

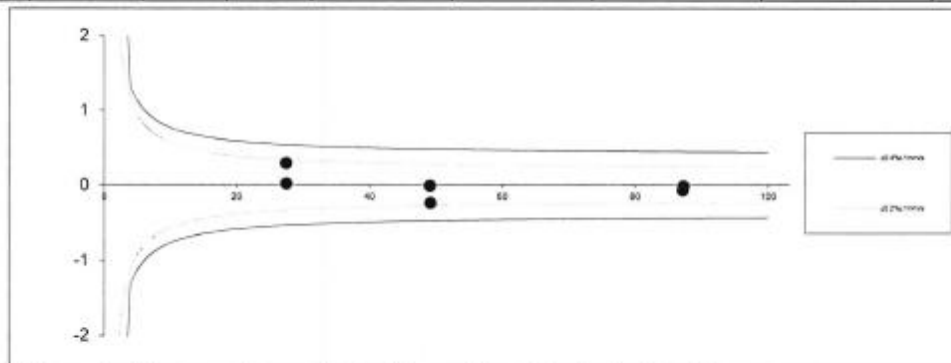
Calibration factor / Kalibrierungsfaktor / Facteur d'étalonnage	:	247.8485993
Calibration medium / Kalibriermedium / Moyen de calibration	:	Water / Wasser / Eau
Calibrated full scale flow / Kalibrierter Messbereichsendwert / Fin de plage de mesure étalonnée	:	2800 m³/h / 12328.033 US gpm
Calibration rig / Kalibrierstand / Plate-forme d'étalonnage	:	Banc HNU 3

Standards / Normen / Normes:

Reference meter method (reference meter calibrated according to ISO 4185-1980) /
Referenzmessgerätmethode (Referenzgerät kalibriert laut ISO 4185-1980) / Méthode
avec compteur de référence (étalonné suivant ISO 4185-1980)

Results / Ergebnisse / Résultats:

Point # Messpunkt nr Point mesure n°	Flowrate Durchfluss Débit	Fluid temperature Flüssigkeitstemperatur Température du fluide		Reference flow value Referenz Durchflusswert Débit de référence		Flowmeter output / Durchflussmessgerätausgang / Sortie de débitmètre		
						Flowrate Durchflussmenge / Débit		Error Fehler / Erreur
		[%]	[°C]	[°F]	[m³/h]	[US gpm]	[m³/h]	[US gpm]
1	87	15.8	60.4	2445.06	10765.26	2444.66	10763.52	-0.02
2	27	15.9	60.6	769.17	3386.56	769.29	3387.10	0.02
3	27	15.9	60.6	767.86	3380.76	770.05	3390.42	0.29
4	49	15.8	60.4	1376.46	6060.36	1373.18	6045.94	-0.24
5	49	15.8	60.4	1374.06	6049.82	1373.96	6049.35	-0.01
6	87	15.9	60.6	2 441.80	10750.90	2440.06	10743.28	-0.07



Summary of the results / Zusammenfassung der Ergebnisse: / Sommaire des résultats obtenus :

- The measured values are within the specified limits / Die gemessenen Werte liegen innerhalb der Toleranzen / Les résultats de mesure se trouvent dans les tolérances définies

Siemens SAS Etablissement de Haguenau	Issued by / Erstellt von / émis par Bon	Date / Datum / Date 2020/10/22
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Cooma Pump Station - Pump A

SIEMENS Pump A**Factory Calibration Certificate / Werkskalibrierungszertifikat /
Certificat d'étalonnage usine****Topic / Thema / Sujet:** SITRANS F Flowmeter / Durchflussmessgerät / Débitmètre**Object / Betreff / Objet:**

Siemens order / Siemensauftrag / Commande Siemens	:	0001894029/000190
Flowmeter type / Durchflussmessgerättyp / Type de débitmètre	:	Sitrans FM MAG5100 W
Nominal sensor diameter / Messaufnehmer-Nennweite / Diamètre nominal de capteur	:	DN 500 (20")
Product order No. / Produktbestellnummer / N° de référence d'appareil	:	FDK-083X13539
System serial No. / System Seriennummer / N° de série du système	:	982003H280
Sensor serial No. / Messaufnehmer Seriennummer / N° de série de capteur	:	318602H019

Technical data / Technische Daten / Données techniques:

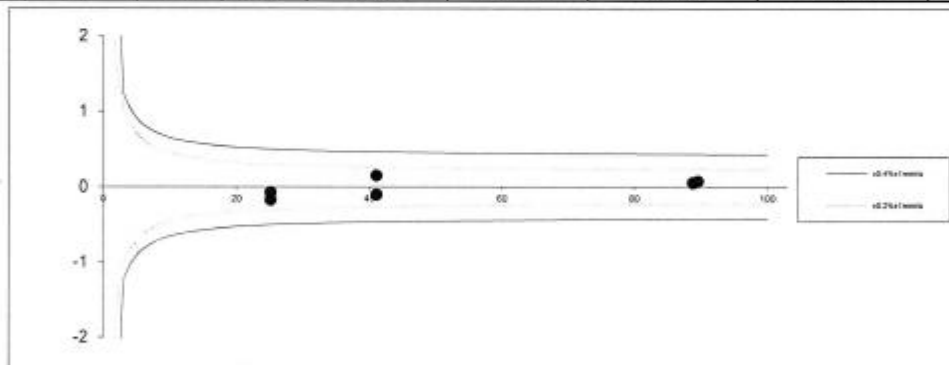
Calibration factor / Kalibrierungsfaktor / Facteur d'étalonnage	:	239.2740657
Calibration medium / Kalibriermedium / Moyen de calibration	:	Water / Wasser / Eau
Calibrated full scale flow / Kalibrierter Messbereichsendwert / Fin de plage de mesure étalonnée	:	2800 m³/h / 12328.033 US gpm
Calibration rig / Kalibrierstand / Plate-forme d'étalonnage	:	Banc HNU 3

Standards / Normen / Normes:

Reference meter method (reference meter calibrated according to ISO 4185-1980) /
Referenzmessgerätmethode (Referenzgerät kalibriert laut ISO 4185-1980) / Méthode
avec compteur de référence (étalonné suivant ISO 4185-1980)

Results / Ergebnisse / Résultats:

Point # Messpunkt nr Point mesure n°	Flowrate Durchfluss Débit	Fluid temperature Flüssigkeitstemperatur Température du fluide		Reference flow value Referenz Durchflusswert Débit de référence		Flowmeter output / Durchflussmessgerätausgang / Sortie de débitmètre		Error Fehler / Erreur
		[°C]	[°F]	[m³/h]	[US gpm]	[m³/h]	[US gpm]	
1	90	14.2	57.6	2506.29	11034.86	2507.99	11042.33	0.07
2	25	14.2	57.6	703.80	3098.73	703.32	3096.63	-0.07
3	25	14.2	57.6	703.42	3097.09	702.21	3091.72	-0.17
4	41	14.2	57.6	1149.30	5060.21	1150.98	5067.63	0.15
5	41	14.2	57.6	1149.11	5059.39	1147.93	5054.16	-0.10
6	89	14.2	57.6	2485.94	10945.26	2487.25	10951.04	0.05

**Summary of the results / Zusammenfassung der Ergebnisse / Sommaire des résultats obtenus :**

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Etablissement de Haguenau

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2020/10/26

Coomaalla Pump Station - Pump B

SIEMENS

Pump B

Factory Calibration Certificate / Werkskalibrierungszertifikat / Certificat d'étalonnage usine

Topic / Thema / Sujet: SITRANS F Flowmeter / Durchflussmessgerät / Débitmètre

Object / Betreff / Objet:

Siemens order / Siemensauftrag / Commande Siemens	0001894029/000190
Flowmeter type / Durchflussmessgerättyp / Type de débitmètre	Sitrans FM MAG5100 W
Nominal sensor diameter / Messaufnehmer-Nennweite / Diamètre nominal de capteur	DN 500 (20")
Product order No. / Produktbestellnummer / N° de référence d'appareil	FDK-083X13539
System serial No. / System Seriennummer / N° de série du système	982203H280
Sensor serial No. / Messaufnehmer Seriennummer / N° de série de capteur	474703H340

Technical data / Technische Daten / Données techniques:

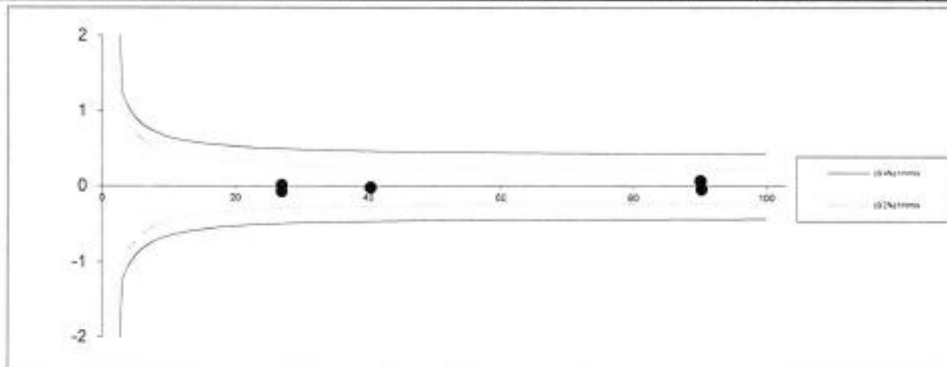
Calibration factor / Kalibrierungsfaktor / Facteur d'étalonnage	241.5720851
Calibration medium / Kalibriermedium / Moyen de calibration	Water / Wasser / Eau
Calibrated full scale flow / Kalibrierter Messbereichsendwert / Fin de plage de mesure étalonnée	2800 m³/h / 12328.033 US gpm
Calibration rig / Kalibrierstand / Plate-forme d'étalonnage	Banc HNU 3

Standards / Normen / Normes:

Reference meter method (reference meter calibrated according to ISO 4185-1980) /
Referenzmessgerätmethode (Referenzgerät kalibriert laut ISO 4185-1980) / Méthode
avec compteur de référence (étalonné suivant ISO 4185-1980)

Results / Ergebnisse / Résultats:

Point # Messpunkt nr. Point mesure n°	Flowrate Durchfluss Débit	Fluid temperature Flüssigkeitstemperatur Température du fluide		Reference flow value Referenz Durchflusswert Débit de référence		Flowmeter output / Durchflussmessgerätausgang / Sortie de débitmètre		Error Fehler / Erreur
		[°C]	[°F]	[m³/h]	[US gpm]	[m³/h]	[US gpm]	
1	90	17.0	62.6	2521.40	11101.39	2523.07	11108.73	0.07
2	27	17.0	62.6	756.12	3329.09	755.62	3326.89	-0.07
3	27	17.0	62.6	755.53	3326.51	755.62	3326.91	0.01
4	40	17.0	62.6	1130.68	4978.23	1130.44	4977.17	-0.02
5	40	17.0	62.6	1129.10	4971.26	1128.81	4970.02	-0.02
6	90	17.0	62.6	2525.73	11120.46	2524.60	11115.46	-0.04



Summary of the results / Zusammenfassung der Ergebnisse: / Sommaire des résultats obtenus :

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Siemens SAS Etablissement de Haguenau	Issued by / Erstellt von / émis par Bon	Date / Datum / Date 2020/10/26
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Cooma Pump Station - Pump C

SIEMENS

Pump C

**Factory Calibration Certificate / Werkskalibrierungszertifikat /
Certificat d'étalonnage usine****Topic / Thema / Sujet:** SITRANS F Flowmeter / Durchflussmessgerät / Débitmètre**Object / Betreff / Objet:**

Siemens order / Siemensauftrag / Commande Siemens	0001894029/000190
Flowmeter type / Durchflussmessgerättyp / Type de débitmètre	Sitrans FM MAG5100 W
Nominal sensor diameter / Messaufnehmer-Nennweite / Diamètre nominal de capteur	DN 500 (20")
Product order No. / Produktbestellnummer / N° de référence d'appareil	FDK-083X13539
System serial No. / System Seriennummer / N° de série du système	982303H280
Sensor serial No. / Messaufnehmer Seriennummer / N° de série de capteur	475003H340

Technical data / Technische Daten / Données techniques:

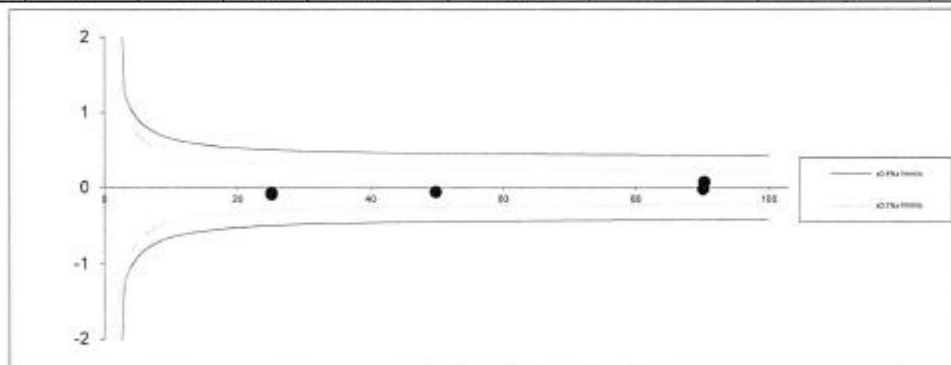
Calibration factor / Kalibrierungsfaktor / Facteur d'étalonnage	237.8848719
Calibration medium / Kalibriermedium / Moyen de calibration	Water / Wasser / Eau
Calibrated full scale flow / Kalibrierter Messbereichsendwert / Fin de plage de mesure étalonnée	2800 m ³ /h / 12328.033 US gpm
Calibration rig / Kalibrierstand / Plate-forme d'étalonnage	Banc HNU 3

Standards / Normen / Normes:

Reference meter method (reference meter calibrated according to ISO 4185-1980) /
Referenzmessgerätmethode (Referenzgerät kalibriert laut ISO 4185-1980) / Méthode
avec compteur de référence (étalonné suivant ISO 4185-1980)

Results / Ergebnisse / Résultats:

Point # Messpunkt nr Point mesure n°	Flowrate Durchfluss Débit	Fluid temperature Flüssigkeitstemperatur Température du fluide		Reference flow value Referenz Durchflusswert Débit de référence		Flowmeter output / Durchflussmessgerätausgang / Sortie de débitmètre		Error Fehler / Erreur
		[°C]	[°F]	[m ³ /h]	[US gpm]	[m ³ /h]	[US gpm]	
1	90	14.4	57.9	2526.92	11125.71	2528.71	11133.56	0.07
2	25	14.5	58.1	702.36	3092.39	701.86	3090.21	-0.07
3	25	14.5	58.1	702.51	3093.07	701.90	3090.38	-0.09
4	50	14.5	58.1	1395.95	6146.18	1395.12	6142.54	-0.06
5	50	14.5	58.1	1395.11	6142.50	1394.25	6138.71	-0.06
6	90	14.7	58.5	2521.65	11102.49	2521.16	11100.33	-0.02

**Summary of the results / Zusammenfassung der Ergebnisse: / Sommaire des résultats obtenus :**

- The measured values are within the specified limits / Die gemessenen Werte liegen innerhalb der Toleranzen / Les résultats de mesure se trouvent dans les tolérances définies

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Coomaalla Pump Station - Pump D

SIEMENS

Pump D

Factory Calibration Certificate / Werkskalibrierungszertifikat / Certificat d'étalonnage usine

Topic / Thema / Sujet: SITRANS F Flowmeter / Durchflussmessgerät / Débitmètre

Object / Betreff / Objet:

Siemens order / Siemensauftrag / Commande Siemens	:	0001894029/000190
Flowmeter type / Durchflussmessgerättyp / Type de débitmètre	:	Sitrans FM MAG5100 W
Nominal sensor diameter / Messaufnehmer-Nennweite / Diamètre nominal de capteur	:	DN 500 (20")
Product order No. / Produktbestellnummer / N° de référence d'appareil	:	FDK-083X13539
System serial No. / System Seriennummer / N° de série du système	:	982503H280
Sensor serial No. / Messaufnehmer Seriennummer / N° de série de capteur	:	474403H340

Technical data / Technische Daten / Données techniques:

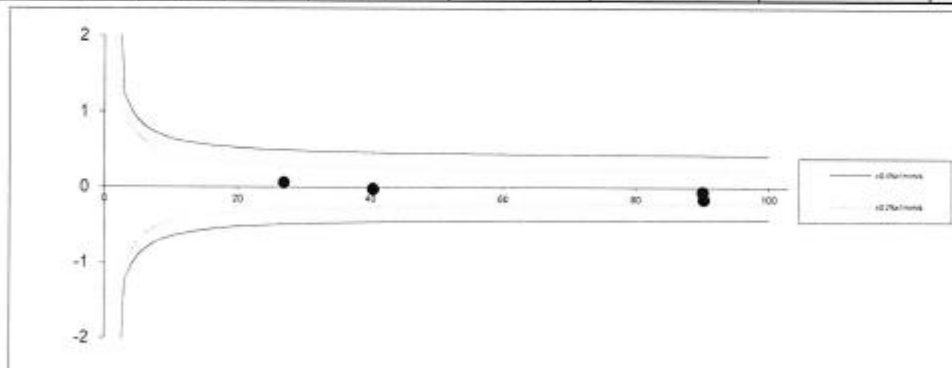
Calibration factor / Kalibrierungsfaktor / Facteur d'étalonnage	:	238.9135762
Calibration medium / Kalibriermedium / Moyen de calibration	:	Water / Wasser / Eau
Calibrated full scale flow / Kalibrierter Messbereichsendwert / Fin de plage de mesure étalonnée	:	2800 m ³ /h / 12328.033 US gpm
Calibration rig / Kalibrierstand / Plate-forme d'étalonnage	:	Banc HNU 3

Standards / Normen / Normes:

Reference meter method (reference meter calibrated according to ISO 4185-1980) /
Referenzmessgerätmethode (Referenzgerät kalibriert laut ISO 4185-1980) / Méthode
avec compteur de référence (étalonné suivant ISO 4185-1980)

Results / Ergebnisse / Résultats:

Point # Messpunkt nr Point mesure n°	Flowrate Durchfluss Débit	Fluid temperature Flüssigkeitstemperatur Température du fluide		Reference flow value Referenz Durchflusswert Débit de référence		Flowmeter output / Durchflussmessgerätausgang / Sortie de débitmètre		Error Fehler / Erreur
		[°C]	[°F]	[m ³ /h]	[US gpm]	[m ³ /h]	[US gpm]	
1	90	17.0	62.6	2521.40	11101.39	2519.87	11094.64	-0.06
2	27	16.9	62.4	756.12	3329.09	756.58	3331.12	0.06
3	27	17.0	62.6	755.53	3326.51	755.97	3328.43	0.06
4	40	17.0	62.6	1130.68	4978.23	1130.37	4976.87	-0.03
5	40	17.0	62.6	1129.10	4971.26	1128.86	4970.23	-0.02
6	90	17.0	62.6	2525.73	11120.46	2521.64	11102.43	-0.16


Summary of the results / Zusammenfassung der Ergebnisse: / Sommaire des résultats obtenus :

- The measured values are within the specified limits / Die gemessenen Werte liegen innerhalb der Toleranzen / Les résultats de mesure se trouvent dans les tolérances définies

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Cooma Pump Station - Pump E

SIEMENS

Pump E

**Factory Calibration Certificate / Werkskalibrierungszertifikat /
Certificat d'étalonnage usine****Topic / Thema / Sujet:** SITRANS F Flowmeter / Durchflussmessgerät / Débitmètre**Object / Betreff / Objet:**

Siemens order / Siemensauftrag / Commande Siemens	:	0001894029/000190
Flowmeter type / Durchflussmessgerättyp / Type de débitmètre	:	Sitrans FM MAG5100 W
Nominal sensor diameter / Messaufnehmer-Nennweite / Diamètre nominal de capteur	:	DN 500 (20")
Product order No. / Produktbestellnummer / N° de référence d'appareil	:	FDK-083X13539
System serial No. / System Seriennummer / N° de série du système	:	982603H280
Sensor serial No. / Messaufnehmer Seriennummer / N° de série de capteur	:	474603H340

Technical data / Technische Daten / Données techniques:

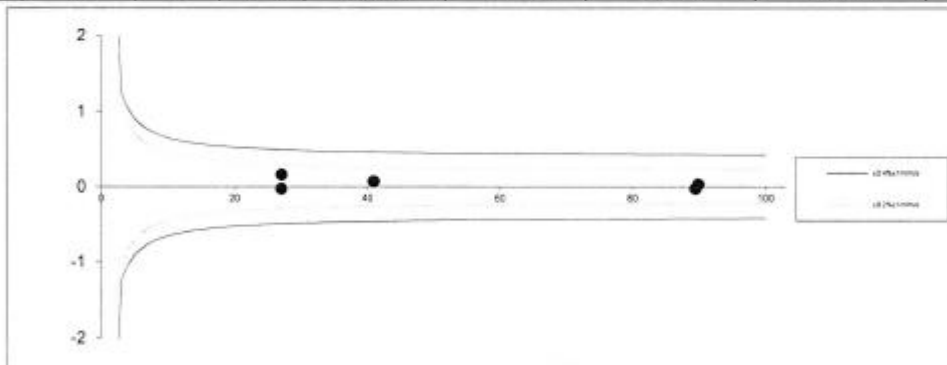
Calibration factor / Kalibrierungsfaktor / Facteur d'étalonnage	:	242.1660215
Calibration medium / Kalibriermedium / Moyen de calibration	:	Water / Wasser / Eau
Calibrated full scale flow / Kalibrierter Messbereichsendwert / Fin de plage de mesure étalonnée	:	2800 m ³ /h / 12328.033 US gpm
Calibration rig / Kalibrierstand / Plate-forme d'étalonnage	:	Banc HNU 3

Standards / Normen / Normes:

Reference meter method (reference meter calibrated according to ISO 4185-1980) /
Referenzmessgerätmethode (Referenzgerät kalibriert laut ISO 4185-1980) / Méthode
avec compteur de référence (étalonné suivant ISO 4185-1980)

Results / Ergebnisse / Résultats:

Point # Messpunkt nr Point mesure n°	Flowrate	Fluid temperature		Reference flow value		Flowmeter output / Durchflussmessgerätausgang / Sortie de débitmètre		
	Durchfluss	Flüssigkeitstemperatur		Referenz Durchflusswert		Flowrate		Error
	Débit	Température du fluide		Débit de référence		Durchflussmenge / Débit		
	[%]	[°C]	[°F]	[m³/h]	[US gpm]	[m³/h]	[US gpm]	[%]
1	90	17.7	63.9	2515.72	11076.38	2516.37	11079.24	0.03
2	27	17.8	64.0	757.84	3336.65	757.64	3335.79	-0.03
3	27	17.7	63.9	758.80	3340.90	760.02	3346.26	0.16
4	41	17.7	63.9	1145.68	5044.28	1146.46	5047.69	0.07
5	41	17.7	63.9	1145.28	5042.52	1146.03	5045.82	0.07
6	89	17.7	63.9	2504.99	11029.13	2504.29	11026.07	-0.03

**Summary of the results / Zusammenfassung der Ergebnisse: / Sommaire des résultats obtenus :**

- The measured values are within the specified limits / Die gemessenen Werte liegen innerhalb der Toleranzen / Les résultats de mesure se trouvent dans les tolérances définies

Siemens SAS Etablissement de Haguenau	Issued by / Erstellt von / émis par Pfaff	Date / Datum / Date 2020/10/26
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Cooma Pump Station - Pump F

SIEMENS

Pump F

Factory Calibration Certificate / Werkskalibrierungszertifikat / Certificat d'étalonnage usine

Topic / Thema / Sujet: SITRANS F Flowmeter / Durchflussmessgerät / Débitmètre

Object / Betreff / Objet:

Siemens order / Siemensauftrag / Commande Siemens	: 0001894029/000160
Flowmeter type / Durchflussmessgerättyp / Type de débitmètre	: Sitrans FM MAG5100 W
Sensor diameter / Messaufnehmer-Nennweite / Diamètre nominal	: DN 350 (14")
Product order No. / Produktbestellnummer / N° de référence d'appareil	: FDK-083X13536
System serial No. / System Seriennummer / N° de série du système	: 979503H280
Sensor serial No. / Messaufnehmer Seriennummer / N° de série de capteur	: 473903H340

Technical data / Technische Daten / Données techniques:

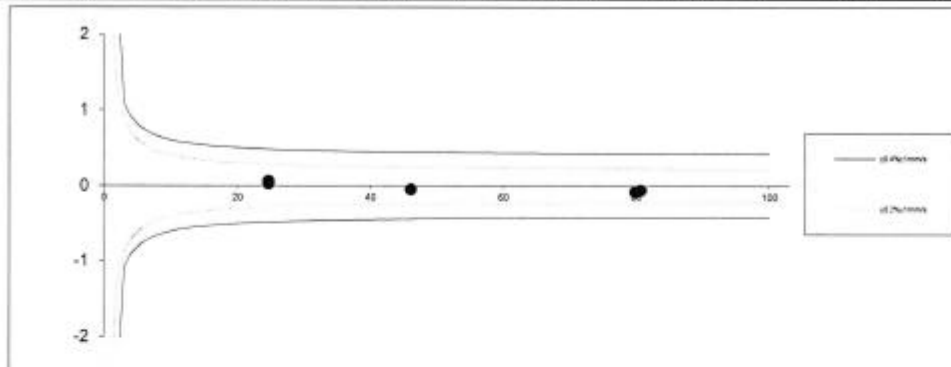
Calibration factor / Kalibrierungsfaktor / Facteur d'étalonnage	: 88.79692363
Calibration medium / Kalibriermedium / Moyen de calibration	: Water / Wasser / Eau
Calibrated full scale flow / Kalibrierter Messbereichsendwert / Fin de plage de mesure étalonnée	: 1700 m ³ /h / 7484.871 US gpm
Calibration rig / Kalibrierstand / Plate-forme d'étalonnage	: Banc HNU 3

Standards / Normen / Normes:

Reference meter method (reference meter calibrated according to ISO 4185-1980) /
Referenzmessgerätmethode (Referenzgerät kalibriert laut ISO 4185-1980) / Méthode
avec compteur de référence (étalonné suivant ISO 4185-1980)

Results / Ergebnisse / Résultats:

Point # Messpunkt nr. Point mesure n°	Flowrate Durchfluss Débit	Fluid temperature Flüssigkeitstemperatur Température du fluide		Reference flow value Referenz Durchflusswert Débit de référence		Flowmeter output / Durchflussmessgerätausgang / Sortie de débitmètre		
		[°C]	[°F]	[m ³ /h]	[US gpm]	Flowrate Durchflussmenge / Débit		Error Fehler / Erreur
						[m ³ /h]	[US gpm]	
1	81	15.9	60.6	1371.13	6036.90	1370.34	6033.41	-0.06
2	25	15.8	60.4	418.97	1844.66	419.21	1845.73	0.06
3	25	15.8	60.4	419.07	1845.12	419.22	1845.76	0.03
4	46	15.8	60.4	783.60	3450.08	783.24	3448.51	-0.05
5	46	15.8	60.4	783.69	3450.48	783.26	3448.61	-0.05
6	80	15.8	60.4	1357.65	5977.57	1356.62	5973.00	-0.08


Summary of the results / Zusammenfassung der Ergebnisse: / Sommaire des résultats obtenus :

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Siemens SAS Etablissement de Haguenau	Issued by / Erstellt von / émis par Bonamy	Date / Datum / Date 2020/10/22
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Curlwaa Pump Station – Main.

SIEMENS

Curlwaa Main. Meter,

**Factory Calibration Certificate / Werkskalibrierungszertifikat /
Certificat d'étalonnage usine****Topic / Thema / Sujet:** SITRANS F Flowmeter / Durchflussmessgerät / Débitmètre**Object / Betreff / Objet:**

Siemens order / Siemensauftrag / Commande Siemens	:	0001937932/000010
Flowmeter type / Durchflussmessgerättyp / Type de débitmètre	:	Sitrans FM MAG5100 W
Sensor diameter / Messaufnehmer-Nennweite / Diamètre nominal	:	DN 700 (28")
Product order No. / Produktbestellnummer / N° de référence d'appareil	:	FDK-083X13686
System serial No. / System Seriennummer / N° de série du système	:	918903H480
Sensor serial No. / Messaufnehmer Seriennummer / N° de série de capteur	:	244803H500

Technical data / Technische Daten / Données techniques:

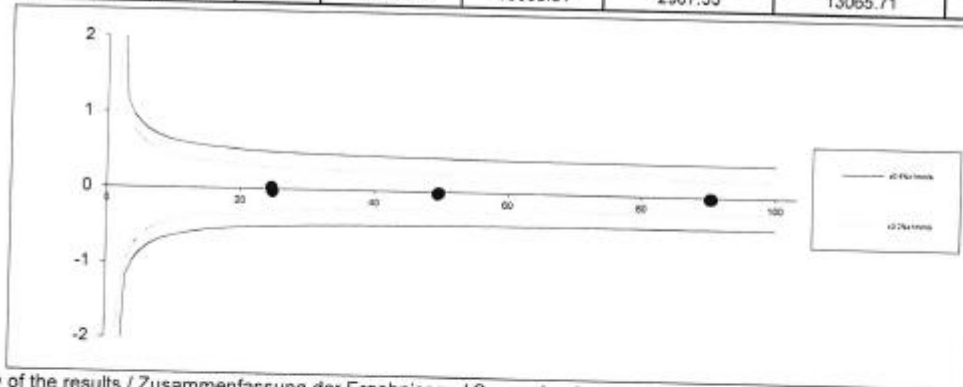
Calibration factor / Kalibrierungsfaktor / Facteur d'étalonnage	:	405.7660443
Calibration medium / Kalibriermedium / Moyen de calibration	:	Water / Wasser / Eau
Calibrated full scale flow / Kalibrierter Messbereichsendwert / Fin de plage de mesure étalonnée	:	6000 m³/h / 26417.211 US gpm
Calibration rig / Kalibrierstand / Plate-forme d'étalonnage	:	Banc HNU 4

Standards / Normen / Normes:

Reference meter method (reference meter calibrated according to ISO 4185-1980) /
Referenzmessgerätmethode (Referenzgerät kalibriert laut ISO 4185-1980) / Méthode
avec compteur de référence (étalonné suivant ISO 4185-1980)

Results / Ergebnisse / Résultats:

Point # Messpunkt nr Point mesure n°	Flowrate Durchfluss Débit	Fluid temperature Flüssigkeitstemperatur Température du fluide		Reference flow value Referenz Durchflusswert Débit de référence		Flowmeter output / Durchflussmessgerätausgang / Sortie de débitmètre		Error Fehler / Erreur
		[°C]	[°F]	[m³/h]	[US gpm]	[m³/h]	[US gpm]	
1	91	15.2	59.4	5431.35	23913.53	5430.31	23908.93	-0.02
2	25	15.2	59.4	1477.86	6506.83	1478.15	6508.09	0.02
3	25	15.3	59.5	1488.65	6554.35	1488.22	6552.44	-0.03
4	90	15.3	59.5	5415.24	23842.58	5414.25	23838.22	-0.02
5	50	15.4	59.7	2979.20	13117.02	2979.02	13116.24	-0.01
6	49	15.4	59.7	2 968.25	13068.81	2967.55	13065.71	-0.02

**Summary of the results / Zusammenfassung der Ergebnisse: / Sommaire des résultats obtenus :**

- The measured values are within the specified limits / Die gemessenen Werte liegen innerhalb der Toleranzen / Les résultats de mesure se trouvent dans les tolérances définies

Siemens SAS Etablissement de Haguenau	Issued by / Erstellt von / émis par Bon	Date / Datum / Date 2021/03/22
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Curlwaa Pump Station - By-pass

SIEMENS

Curlwaa Tower Bypass

**Factory Calibration Certificate / Werkskalibrierungszertifikat /
Certificat d'étalonnage usine****Topic / Thema / Sujet:** SITRANS F Flowmeter / Durchflussmessgerät / Débitmètre**Object / Betreff / Objet:**

Siemens order / Siemensauftrag / Commande Siemens	:	0001894029/000140
Flowmeter type / Durchflussmessgerättyp / Type de débitmètre	:	Sitrans FM MAG5100 W
Sensor diameter / Messaufnehmer-Nennweite / Diamètre nominal	:	DN 250 (10")
Product order No. / Produktbestellnummer / N° de référence d'appareil	:	FDK-083X13683
System serial No. / System Seriennummer / N° de série du système	:	978303H280

Technical data / Technische Daten / Données techniques:

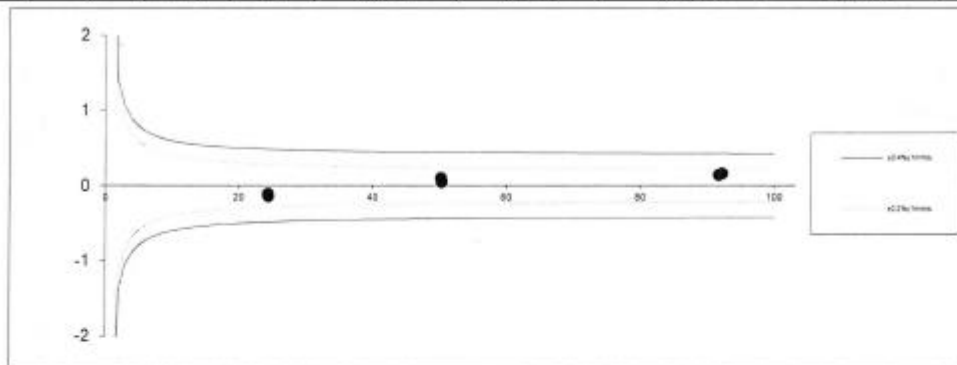
Calibration factor / Kalibrierungsfaktor / Facteur d'étalonnage	:	40.56126624
Calibration medium / Kalibriermedium / Moyen de calibration	:	Water / Wasser / Eau
Calibrated full scale flow / Kalibrierter Messbereichsendwert / Fin de plage de mesure étalonnée	:	900 m³/h / 3963 US gpm
Calibration rig / Kalibrierstand / Plate-forme d'étalonnage	:	Banc HNU 3

Standards / Normen / Normes:

Reference meter method (reference meter calibrated according to ISO 4185-1980) /
Referenzmessgerätmethode (Referenzgerät kalibriert laut ISO 4185-1980) / Méthode
avec compteur de référence (étalonné suivant ISO 4185-1980)

Results / Ergebnisse / Résultats:

Point # Messpunkt nr Point mesure n°	Flowrate Durchfluss Débit	Fluid temperature Flüssigkeitstemperatur Température du fluide		Reference flow value Referenz Durchflusswert Débit de référence		Flowmeter output / Durchflussmessgerätausgang / Sortie de débitmètre		Error Fehler / Erreur
		[°C]	[°F]	[m³/h]	[US gpm]	[m³/h]	[US gpm]	
1	92	15.9	60.6	825.82	3635.99	826.99	3641.12	0.14
2	24	15.8	60.4	219.64	967.06	219.33	965.69	-0.14
3	24	15.9	60.6	219.31	965.60	219.08	964.60	-0.10
4	50	15.9	60.6	451.65	1988.54	452.09	1990.49	0.10
5	50	15.8	60.4	452.59	1992.71	452.82	1993.70	0.05
6	92	15.8	60.4	830.34	3655.86	831.66	3661.68	0.16

**Summary of the results / Zusammenfassung der Ergebnisse: / Sommaire des résultats obtenus :**

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Siemens SAS Etablissement de Haguenau	Issued by / Erstellt von / émis par Bon	Date / Datum / Date 2020/10/08
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Water Management Works**MW3192-00001**

Government-provided metering equipment is not installed on any of WMI water supply works authorised by this approval, any water taken using the works is metered as detailed at MW2452-00001 above.

MW0491-00001

All works authorised by this approval remain in use; there are presently no future plans to decommission the works.

Monitoring and Recording**MW2338-00001**

The metered usage is recorded electronically at least every 15 minutes and stored on WMI servers; historical data can be accessed back at least 10 years.

MW2336-00001

The purpose for which water is taken is based on the WMI Crop Report. It is not feasible to create a record each time water is used for type, area, dates of planting and harvesting of each individual owner's crop.

MW2337-00001

The following information is recorded electronically for each 15-minute period that all water is taken:

- A. Time, date, volume of water, start and end times and flowrate.
- B. The access licence number under which the water is taken; also, our order system records individual customer orders; each customer meter is read each quarter.
- C. The approval number under which the water is taken.
- D. Volume of water taken for domestic consumption and/or stock watering is not recorded separately; this is recorded on customer metered outlets.

MW0482-00001

A water meter is installed on all water supply works authorised by this approval, the meter reading is recorded at least every 15 minutes.

MW2339-00001

All works are metered and fitted with a data logger. The metered records are sent directly to WaterNSW every 15 minutes and daily to MDBA via telemetry; Historical records are also recorded on WMI servers.

Reporting**MW0051-00001**

WMI are not aware any breaches of the conditions on this approval. There were several administrative errors discovered on the new 'Statement of Approval'; a marked-up copy of the 'Statement of Approval' was attached to 2017/18 Annual Compliance Report, these modifications have not been updated on the current statement of approval.

Other Conditions - Monitoring and Recording**DK5891-00004**

Monitoring and Reporting has been carried out as specified in the 'Western Murray Irrigation Limited Monitoring and Reporting Plan for 60CA581273', dated 16 March 2018, as below.

WMIL – MONITORING AND REPORTING PLAN FOR COMBINED APPROVAL 60CA581273**Schedule 1 – Requirements**

The Approval Holder of 60CA 581273 has provided all data in the format detailed in each specific requirement of the Monitoring and Reporting Plan, unless otherwise authorised by the DPIE-Water. The data is to be submitted to the nominated officer within DPIE - Water.

Reporting and Notification Requirements:**Submission of an Annual Compliance Report.****Condition 1**

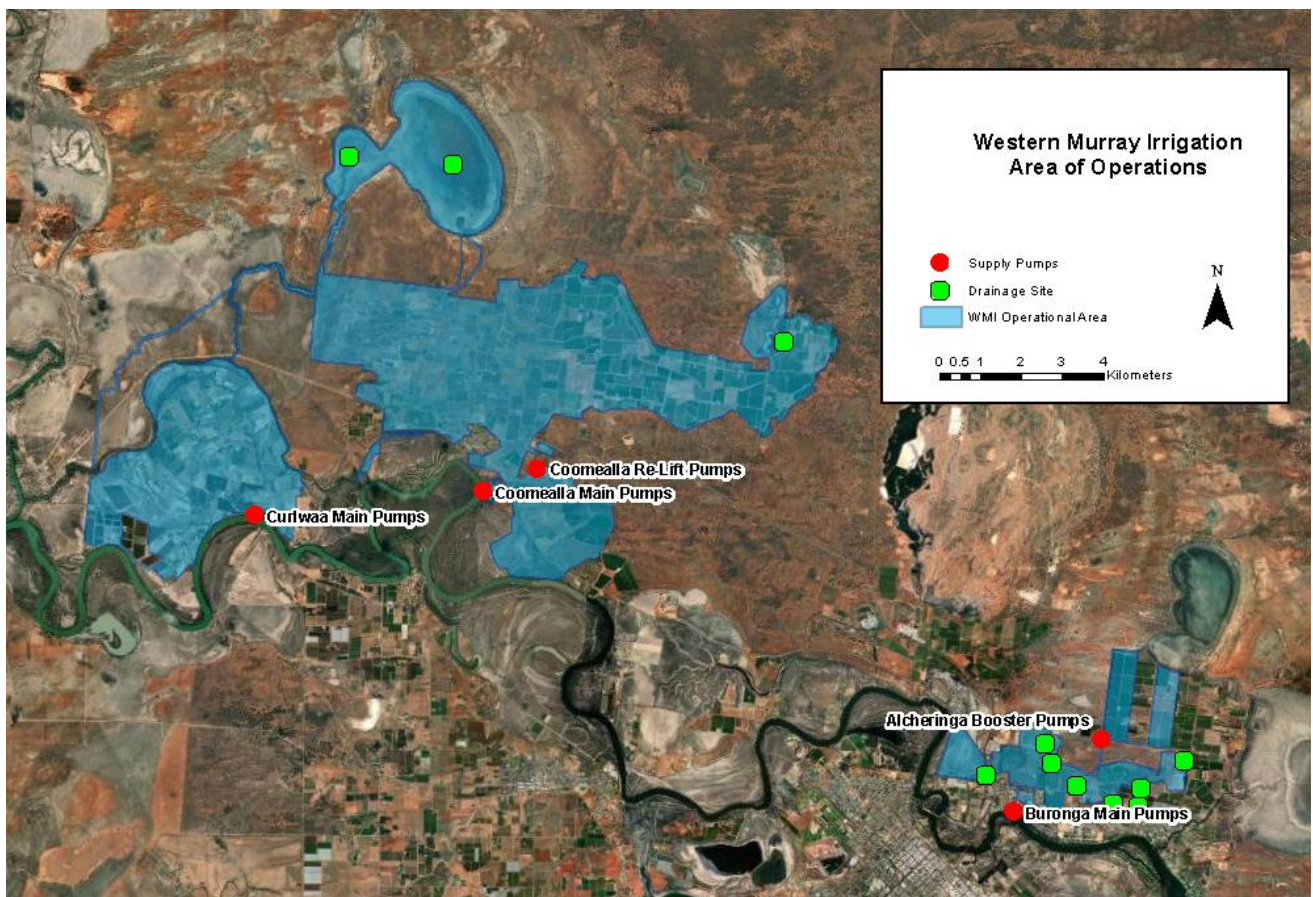
The Approval Holder has, by the 31st of October each year, submitted to the Minister an electronic copy of an Annual Compliance Report for the preceding water year (from 1 July to 30 June).

Condition 2

Following are plans of WMI Irrigation Limited Infrastructure for the year 2020/21.

Condition 2.1

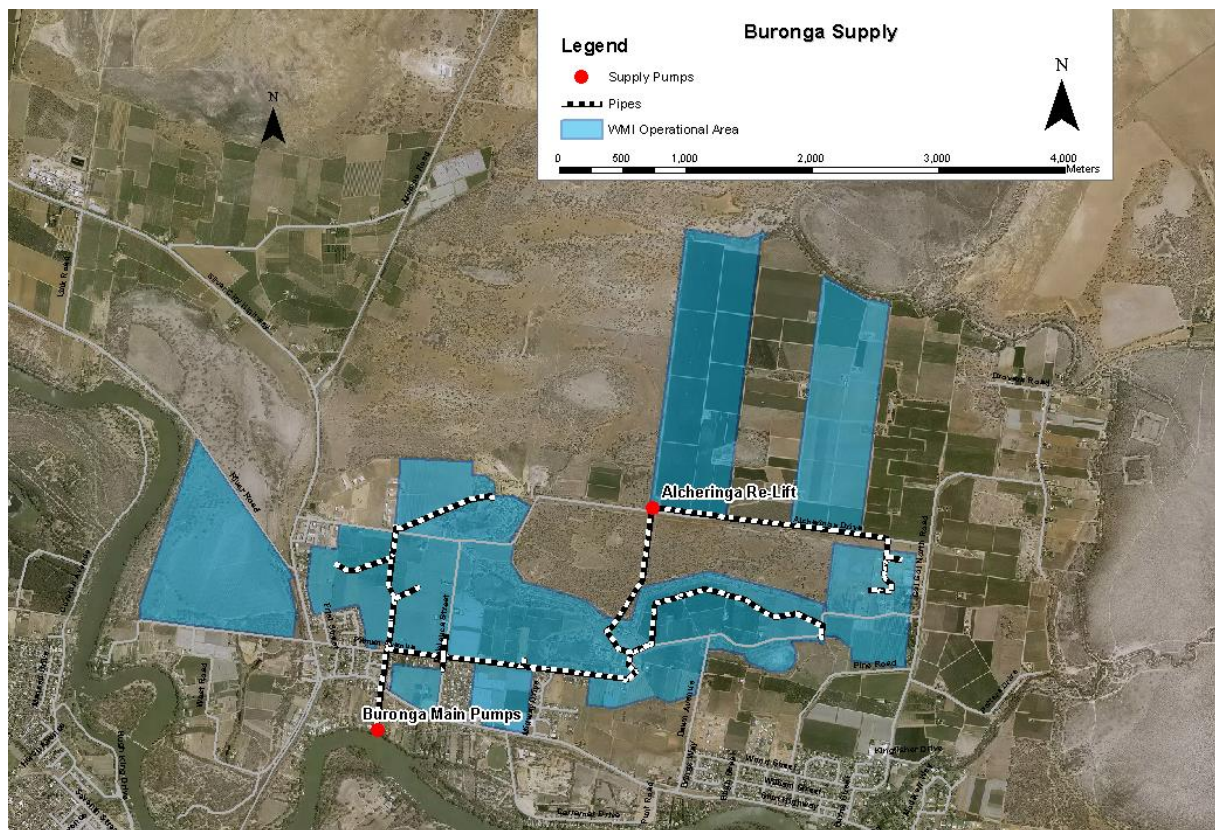
Area of Operations, existing on 30 June 2021, showing, to the Minister's satisfaction, the boundary of all included land and including any amendments made by the inclusion and exclusion of lands in accordance with sections 131 and 135 of the *WMA 2000*, and showing the boundary of any other land water is supplied to that are not included in the Area of Operations. Zero changes to area of operations in financial year 2020/21.



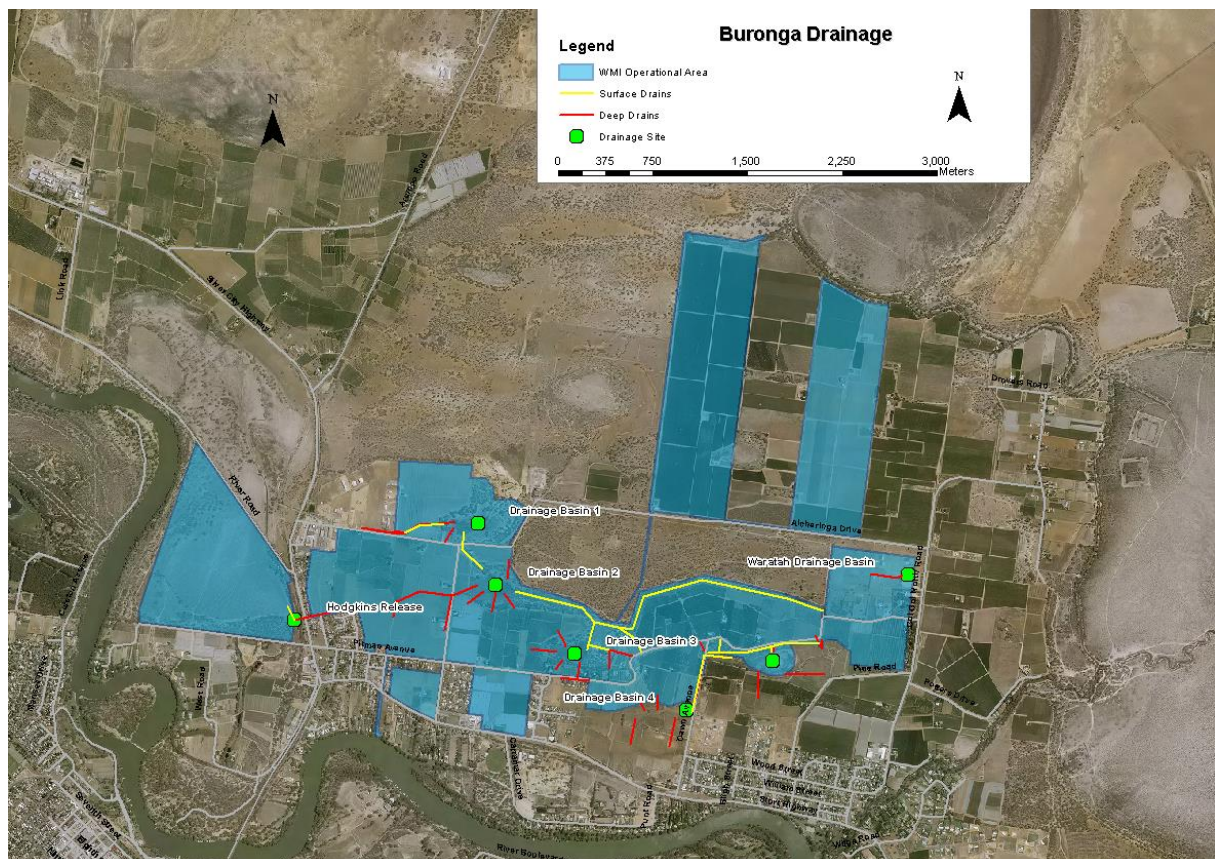
WMI Operational Area

Condition 2.2

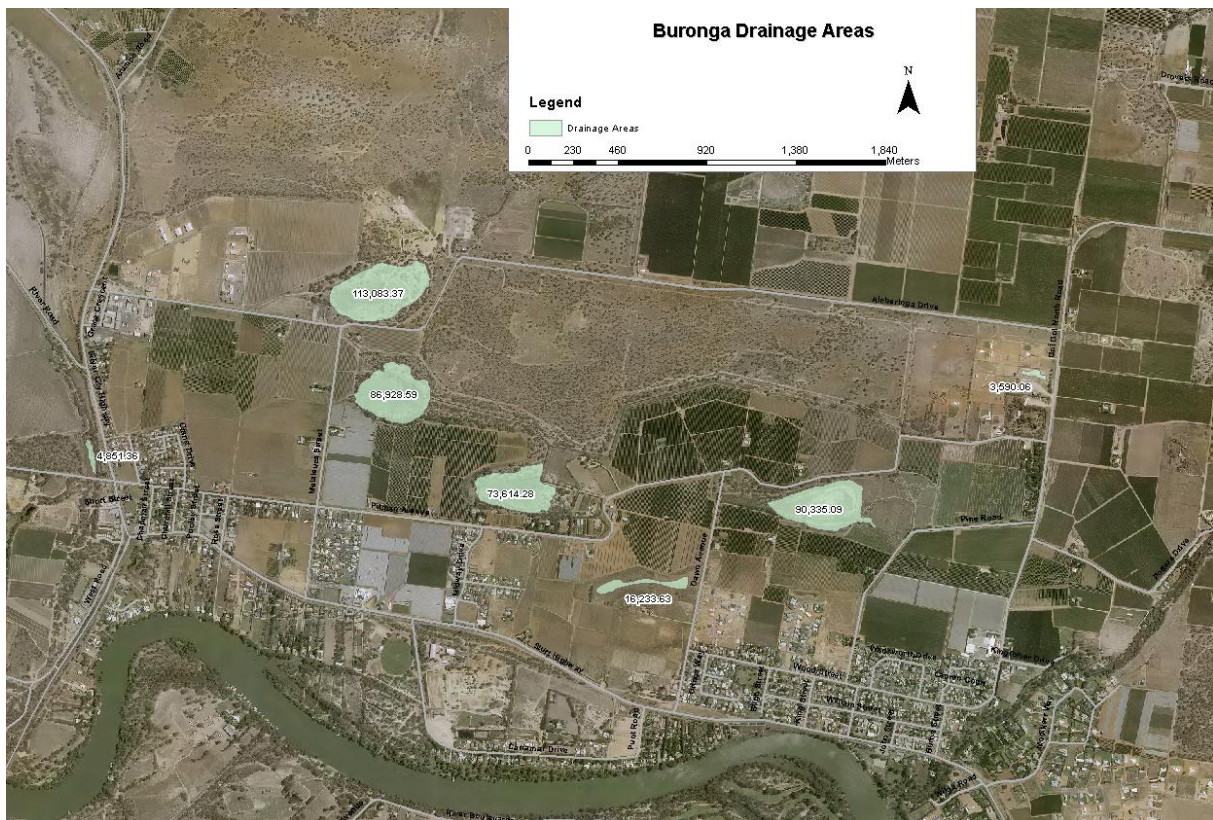
Plans showing current location of Major water courses, Authorised works and supply infrastructure, Drainage infrastructure, Drainage disposal sites and Monitoring sites.



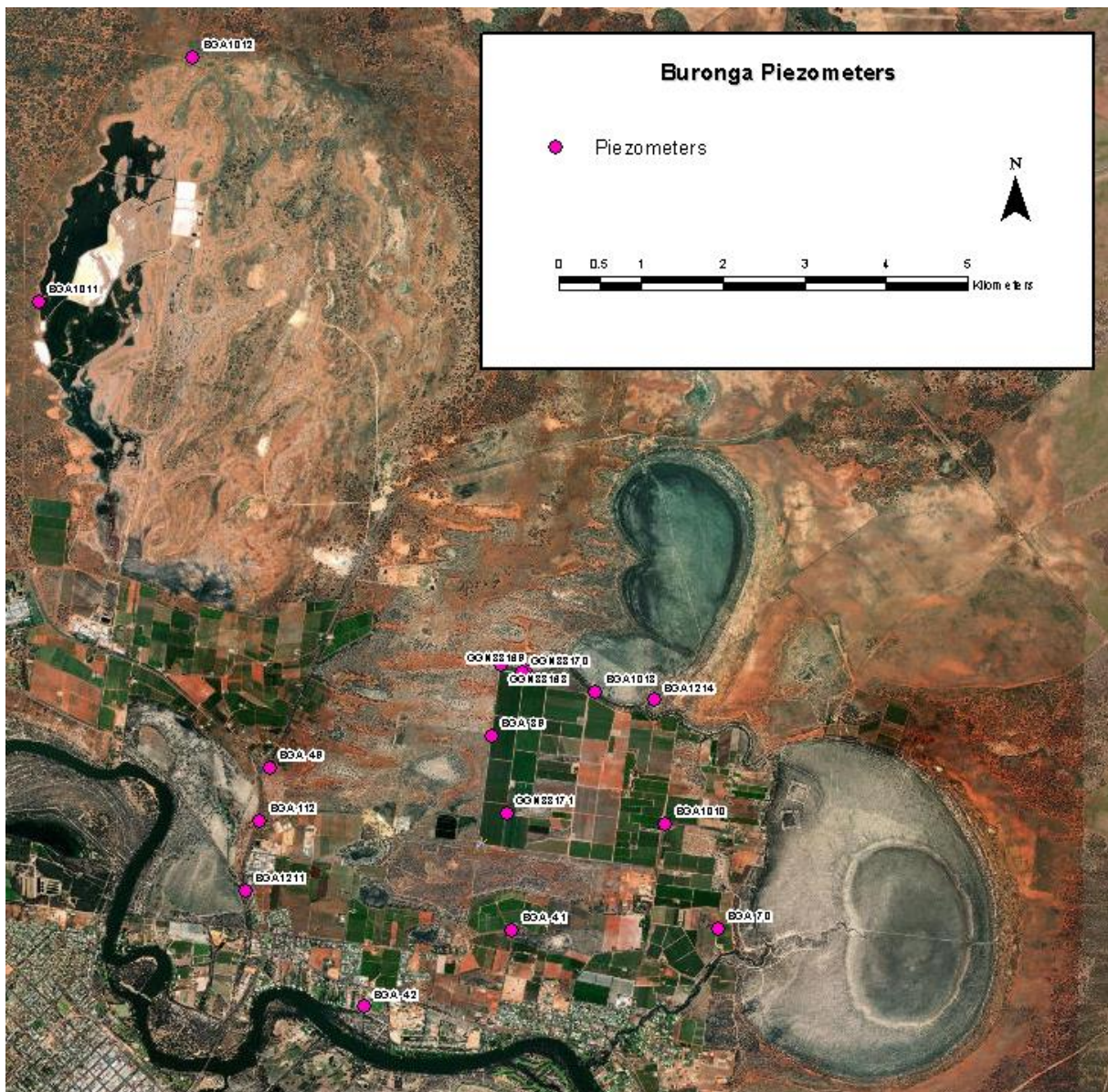
W01 – Buronga supply. Area of operations.



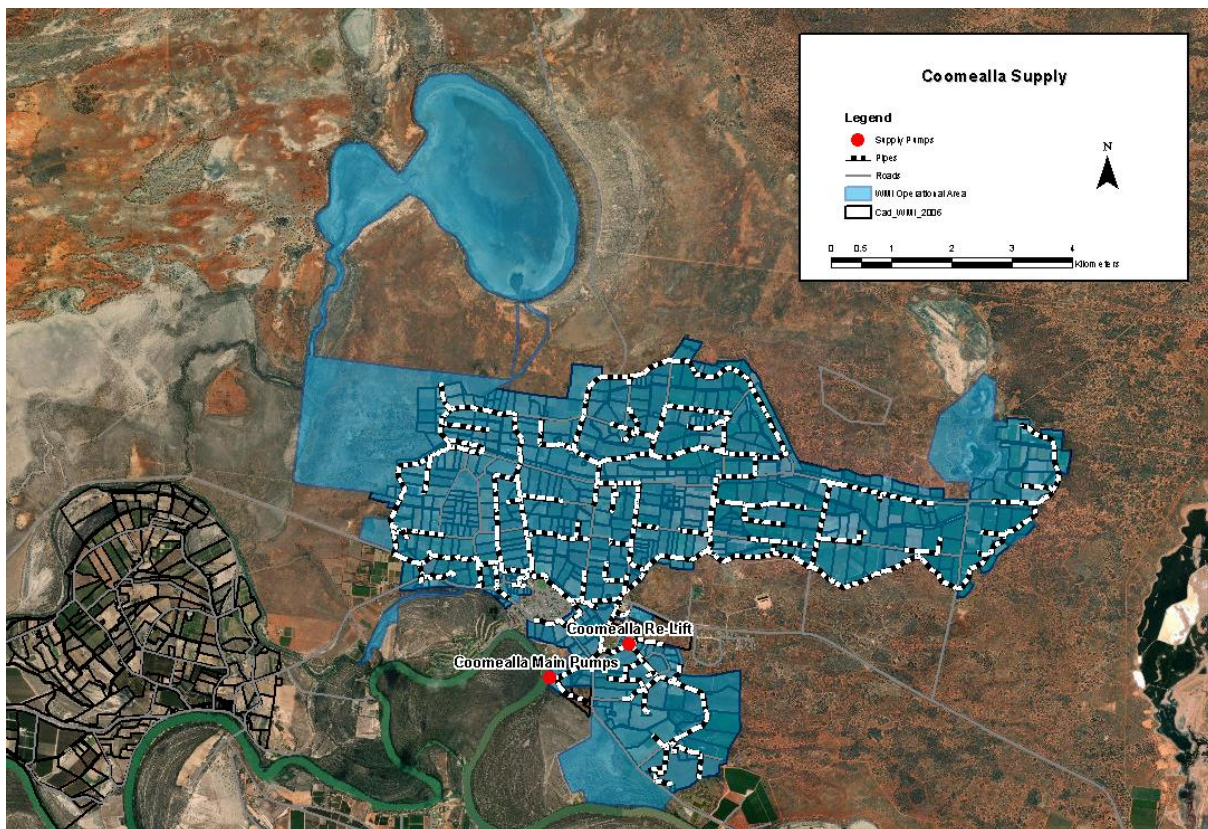
Buronga drainage infrastructure



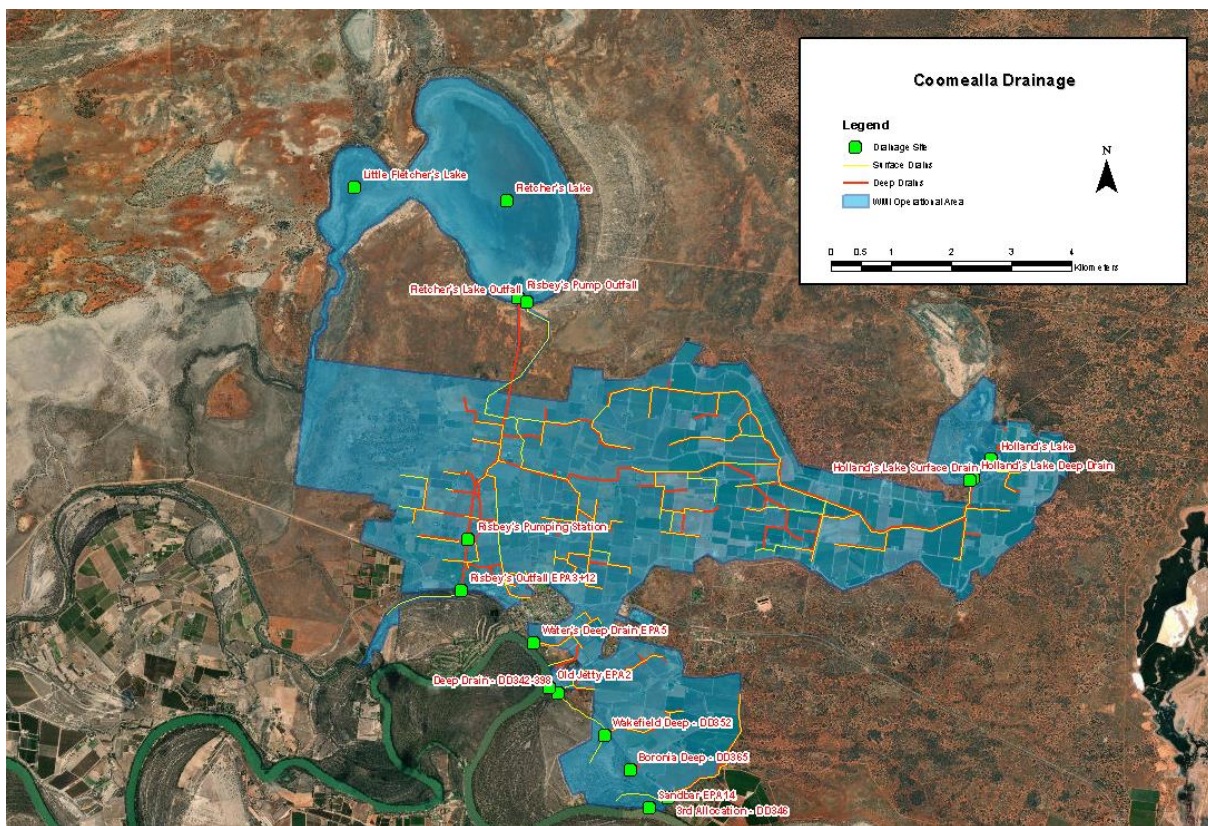
Buronga - Extent of area (square metres) that are temporarily inundated to store drainage and storm water (evaporation basins).



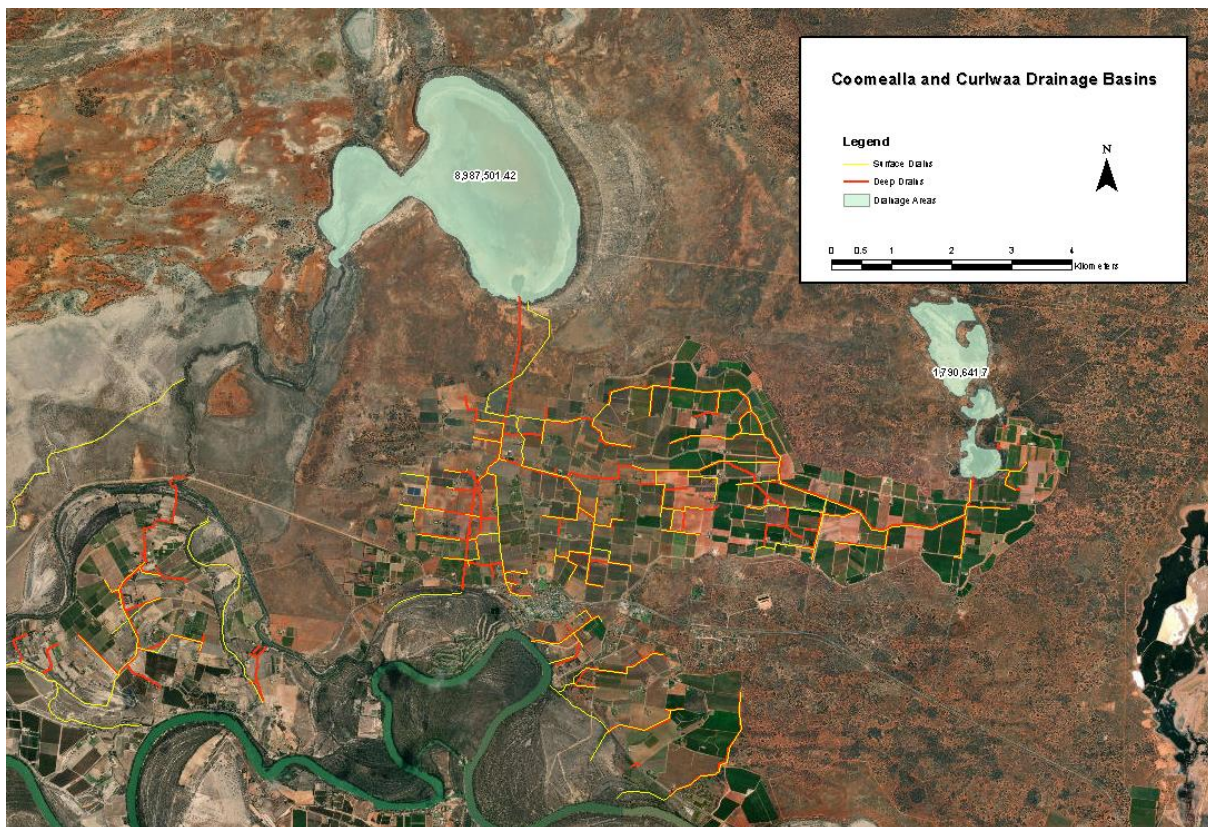
Buronga Piezometers



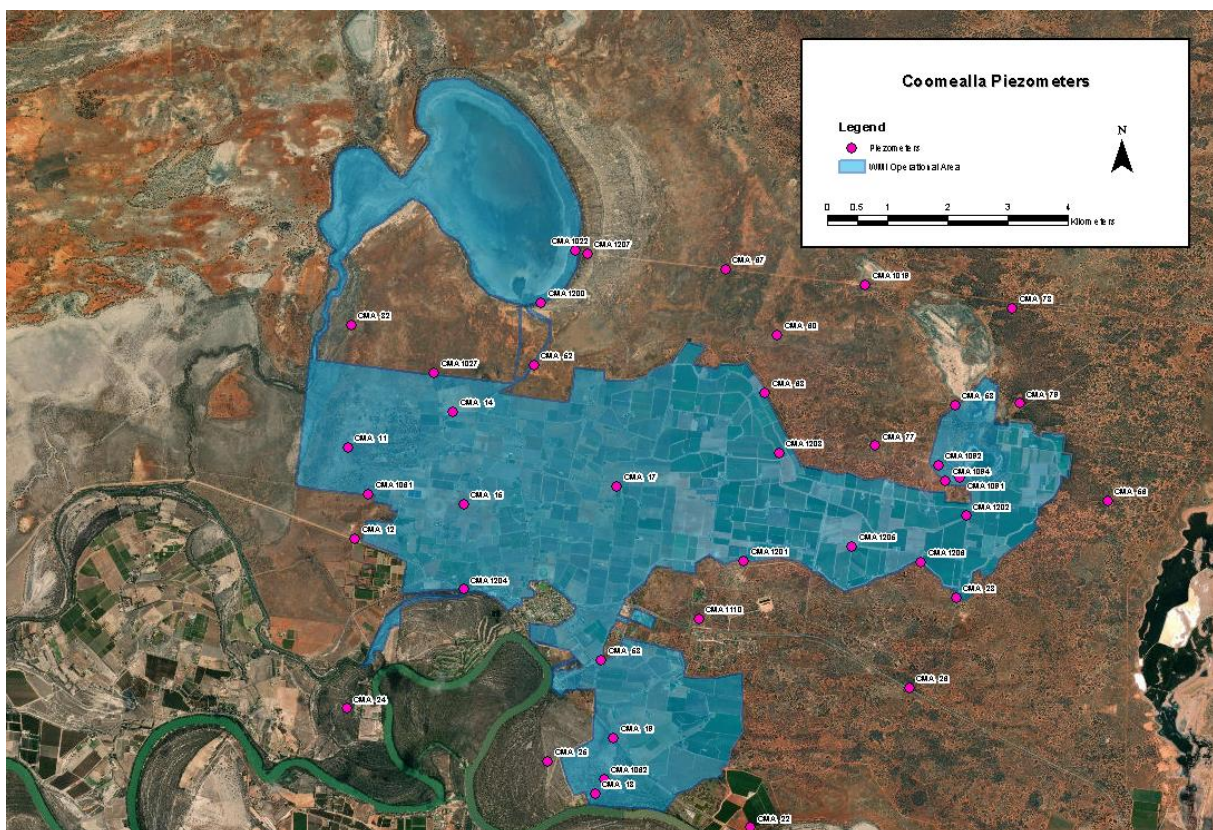
W02 - Coomealla supply.



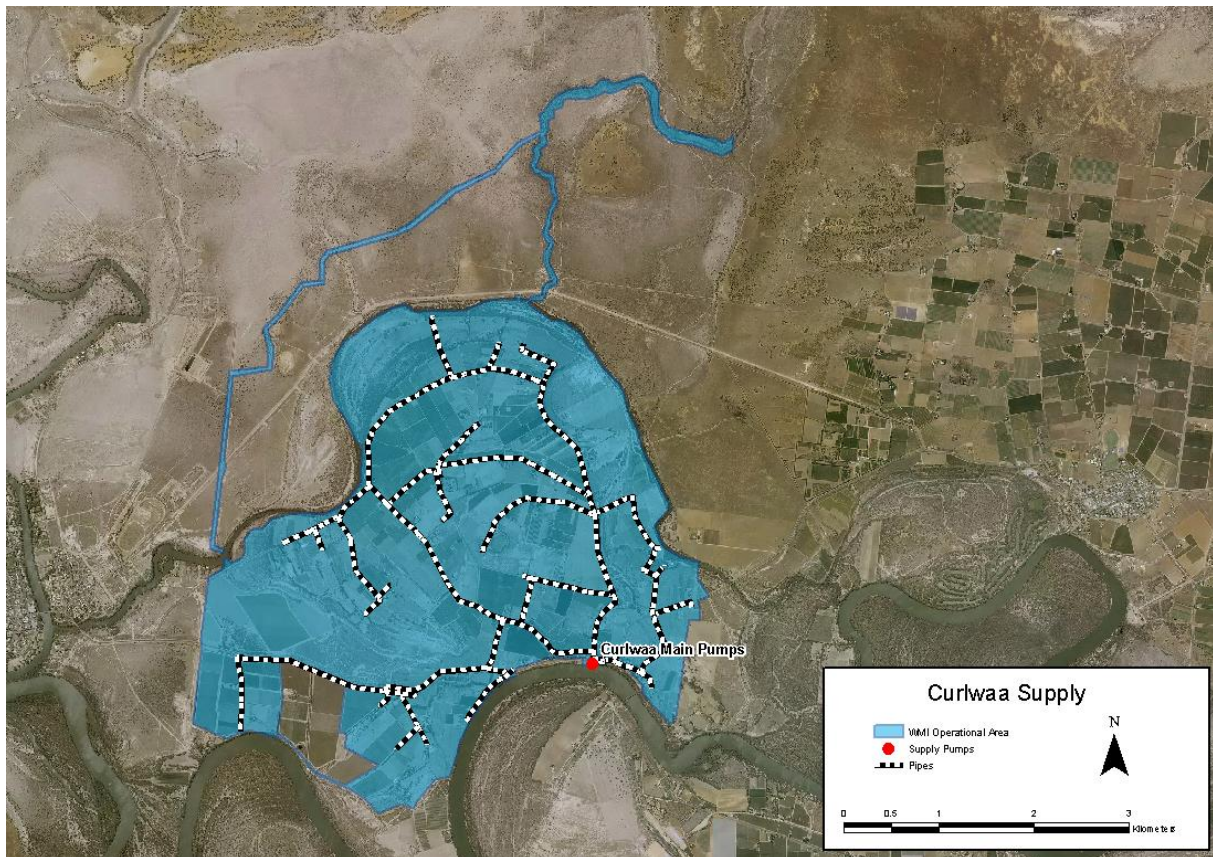
Coomealla Drainage Infrastructure



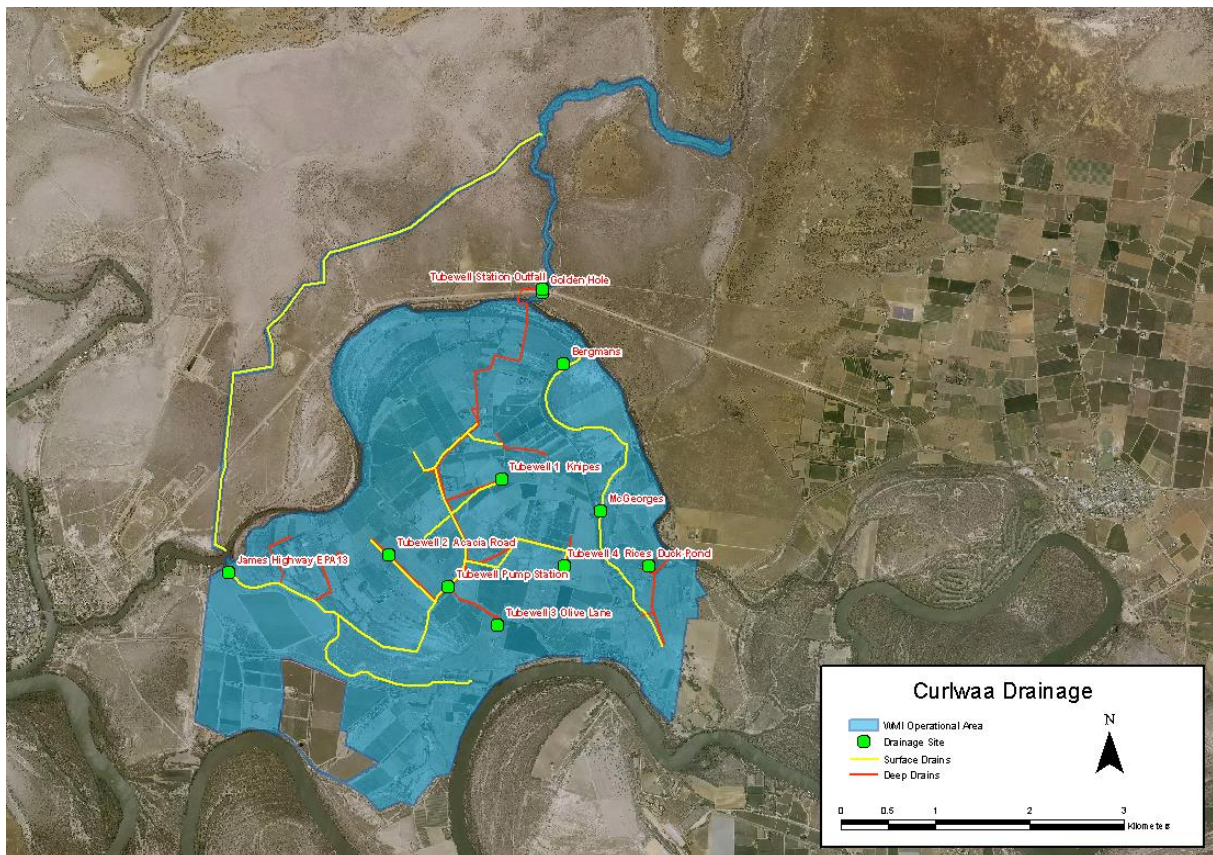
Coomaella and Curlwaa - Extent of area (square metres) that are temporarily inundated to store drainage and storm water (evaporation basins).



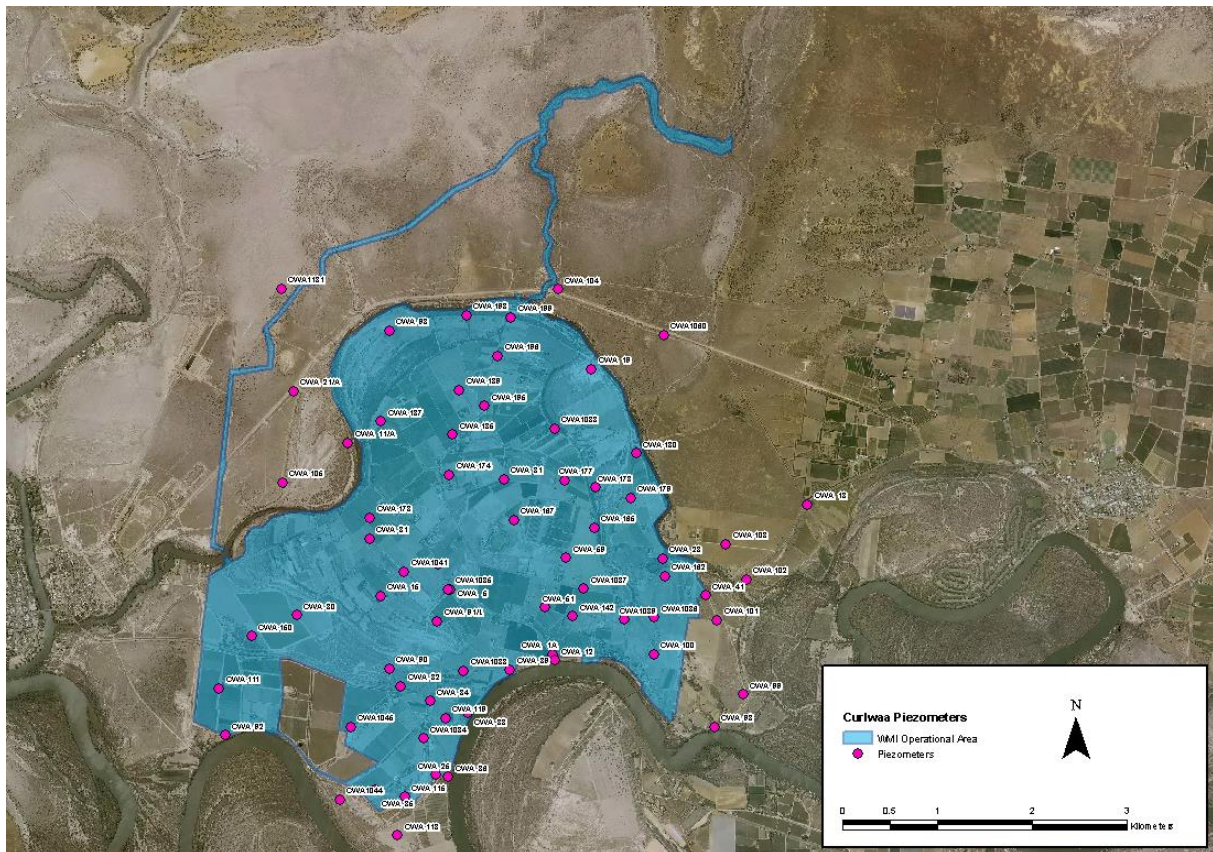
Coomealla Piezometers



W03 - Curlwaa pumping plant and supply infrastructure



Curlwaa Drainage Infrastructure



Curlwaa piezometers

Statement of Compliance

Condition 2.3

WMI is in compliance of Approval number 60CA581273.

Groundwater monitoring results showing destroyed, dry, inactive, and active piezometers are included in this report.

An attempt to re-condition the Salt Interception Scheme (SIS) tubewell at Knipes failed in 2015/16.

The SIS has operated since the late 1960's under various configurations; controlled by government until 1995 and WMI thereafter. NRAR have informed WMI on 18August2021 there is now a requirement for a works approval and WAL to operate the SIS; WMI will investigate the process of licensing.

WMI has attached a consultant's groundwater hydrogeologist report October 2020, this is a long-term audit of our groundwater control and monitoring. This has been used to establish the best course of action for either replacement or retirement of the failed tubewell and destroyed piezometers. Extract from report:

Recommendations for Groundwater Monitoring

It is recommended that WMI continue monitoring within their operating network to comply with conditions of the water use approval, maintain a consistent data set, and ensure the collection of time series salinity data (which is not routinely collected as part of state monitoring. For the WMI monitoring program going forward the following recommendations may be adopted to confirm and or improve confidence in monitoring data quality. This includes:

- *Confirm correct bore location details by taking GPS co-ordinates at each site comparing the results to the existing WMI records and NSW government records to identify the correct dataset.*
- *Measure total bore depth during the next annual monitoring round and comparison of this data to known construction details to confirm that monitoring bores remain open to the aquifer.*

■ Exclude dry bores from ongoing monitoring where the 2019-2020 monitoring data indicates the screen is mostly or completely blocked.

■ Survey the natural surface elevation and reference elevation of bores in the current network where this data is unavailable (10 bores) so that depth to water measurements can be compared to river levels and changes in groundwater gradients can be assessed.

■ It is recommended that a selection of bores in the WMI network (20%) are surveyed. This data can be compared to the existing data to assess the accuracy of reference elevation data as most sites have no documented survey methodology. Additional survey may then be required to improve confidence in groundwater elevations and the assessment of groundwater trends.

Several bores within the WMI networks have been destroyed or are listed as dry, despite this the existing monitoring data provides a relatively good spatial coverage of the irrigation footprint to identify the potential impacts of irrigation and drainage. However, it is recommended that the network distribution be reviewed following the collection of data listed above, particularly confirmation of correct bore locations and measurement of total bore depth. This data can then be used to identify gaps in the current monitoring network and determine if existing bores not currently monitored by WMI can be included in the annual monitoring round or if replacement bores are required where there are gaps. It is then recommended that a groundwater monitoring plan be developed and presented to the regulator to provide an agreed monitoring strategy going forward. This should also include an update of the agreed set of reporting outputs or performance indicators to be included in the annual compliance report.

It is also recommended that WMI continue the collection of 3 yearly crop report data to capture changes in irrigation methods, irrigated area, and crops. This is a valuable data set and can be used to support the analysis of groundwater trends.

Recommendations for SIS Operations

The review of the operational and monitoring data indicates that the Curlwaa SIS does not need to operate under current conditions and there is currently no need to refurbish tubewell 1. However, groundwater monitoring data should continue to be collected annually and reviewed against trigger levels to provide a safeguard if groundwater levels begin to rise. Groundwater levels should be reviewed in the context of rainfall and river level data as hydrograph analysis shows that the floodplain aquifer responds to flood and rainfall events which may result in rises in groundwater levels that are only short term. Irrigation supply and method data should also be reviewed with groundwater trends. Previous communications with Department of Natural Resources by WMI have suggested a trigger level of 31.8mAHD (i.e., 1m above pool level) as a trigger to reinstate SIS operation. This trigger level is considered reasonable however it is also proposed that if groundwater levels rise to 31.3 MAHD (0.5m above pool level) this should trigger a review of SIS operations and the development of a plan to reinstate pumping. This is to prevent a significant time lag for reinstating groundwater pumping if the 31.8mAHD level is reached.

It has been noted Schedule One – ‘Authorised Supply Works’ needs to be updated:

W02 Work details should read:

5 Variable axial flow pumps of 55.2, 55.2, 55.2, 55.2, 63ML/day.

3 Variable centrifugal pumps of 10, 10, 10MLD

3 original (55.2MLD) pumps have been replaced with 3 63MLD pumps. We have a 2-year plan to replace the remaining pumps with 63ML pumps.

3 variable centrifugal pumps of 10, 10, 10 MLD – used as auxiliary/winter pumps.

After upgrade is complete our capacity will be 346MLD (as current W02).

Presentation of Data and Analyses

Condition 2.4

Data from all monitoring required by this Monitoring and Reporting Plan has been supplied in electronic format, including:

- PDF of this report.
- Original Excel spreadsheets used for calculations and presentations within this report.
- Other original documents forming part of this report.

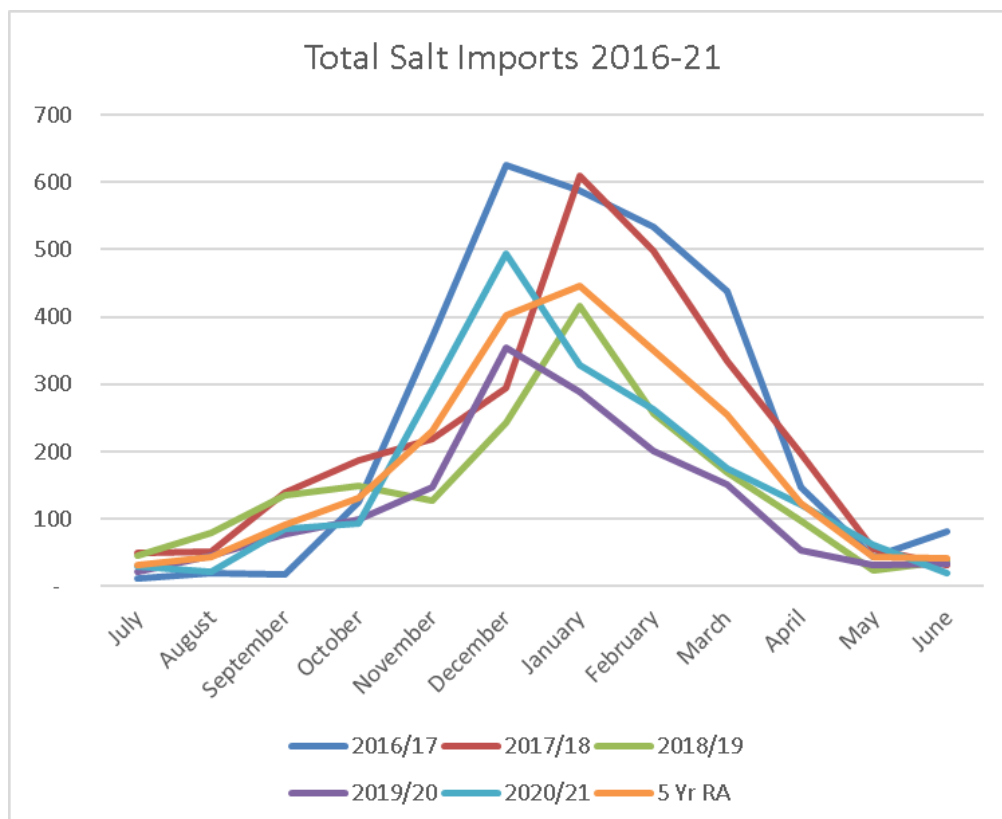
Condition 2.5

Salinity

There have been no significant salt load discharges and no changes to any works or practices that could lead to increased impact trends on the River Murray. EC is low due to drought conditions.

a) Comparable salinity import data for at least 2 years (5 years):

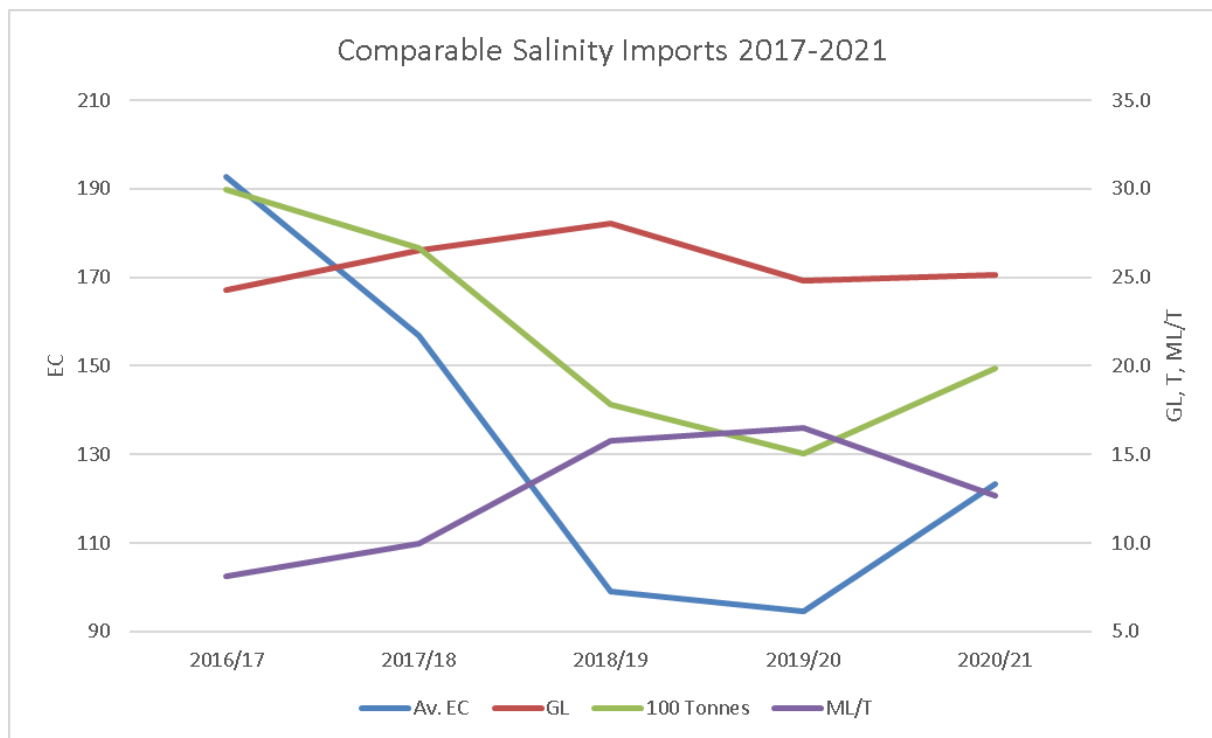
Total Salt Imports (Tonnes)						
Month	2016/17	2017/18	2018/19	2019/20	2020/21	5 Yr RA
July	12	50	46	22	29	32
August	20	52	79	46	22	44
September	17	140	135	77	86	91
October	124	186	149	100	94	131
November	370	218	127	147	292	231
December	626	295	242	354	494	402
January	587	610	417	289	328	446
February	533	497	256	200	262	350
March	438	335	170	151	175	254
April	146	197	97	53	122	123
May	43	55	23	31	61	43
June	81	31	38	34	19	41
Year to Date	2,998	2,666	1,779	1,504	1,984	2,186
Total	2,998	2,666	1,779	1,504	1,984	2,186
Average EC	163	138	139	114	123.51	135



The chart shows seasonal water usage affecting salt imports for each month; this is in line with normal annual irrigation. For annual trends, see para 2.5 Salinity (b).

Comparable Salinity import data for a year being at least 5 years prior:

Annual	2016/17	2017/18	2018/19	2019/20	2020/21	5 Yr RA
Av. EC	193	157	99	95	123	133
GL	24.3	26.5	28.1	24.8	25.1	25.8
100 Tonnes	30.0	26.7	17.8	15.0	19.8	21.9
ML/T	8.1	10.0	15.8	16.5	12.7	11.8



This chart shows the effect of EC on annual salt imports.

There are no new targets identified, the salt imports are controlled purely by the salt content of the river and quantity of water extracted. In previous years WMI has reported the five-year average EC as a daily average of the river EC; In this report (and subsequent reports) the annual EC average has been calculated by daily salt imported in tonnes /daily water pumped in GL/0.64; this gives a true average EC of 'supplied' water. This is an identified benchmark although we have no control over this.

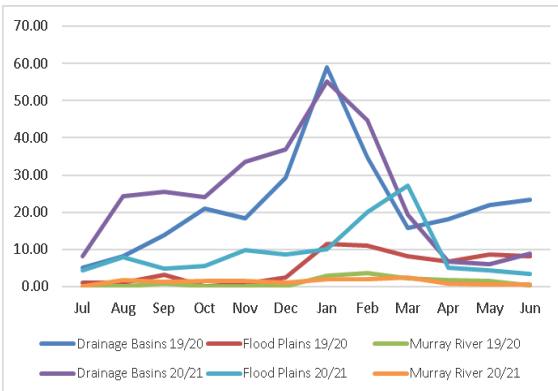
Supply remains in a range between 24-28GL per year. Salt imports have dropped since the high river event in 2016/17 when average EC was very high, conditions in 2020/21 have moved closer to the average. Average EC and salt imports are expected to rise in 21-22 with more significant rain events and higher than normal river events; supply is likely to move to the mid-range of 24-28GL, as more land is put back into production.

Discharge

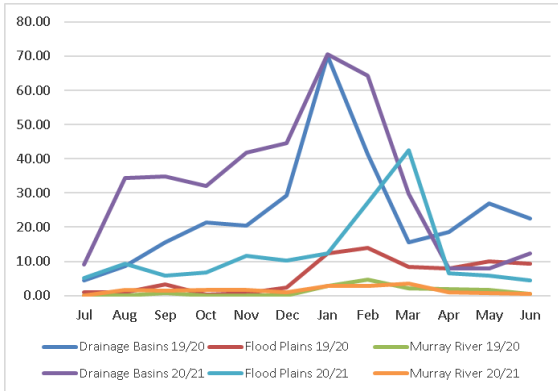
a) Discharges from all drainage outfalls for the 2020/21 year:

Buronga			Coomealla			Curlwaa			Total		
Total Drainage			Total Drainage			Total Drainage			Total Drainage		
ML	Av. EC	Salt (T)	ML	Av. EC	Salt (T)	ML	Av. EC	Salt (T)	ML	Av. EC	Salt (T)
13.35	1,089	9.31	405.76	2,108	547.53	0.00	NA	0.00	419.11	1598.91	556.83
Drainage Basins			Drainage Basins			Drainage Basins			Drainage Basins		
ML	Av. EC	Salt (T)	ML	Av. EC	Salt (T)	ML	Av. EC	Salt (T)	ML	Av. EC	Salt (T)
13.35	1,089	9.31	279.93	2,123	380.28	0.00	NA	0.00	293.28	1606.00	389.58
Flood Plains			Flood Plains			Flood Plains			Flood Plains		
ML	Av. EC	Salt (T)	ML	Av. EC	Salt (T)	ML	Av. EC	Salt (T)	ML	Av. EC	Salt (T)
0.00	NA	0.00	110.55	2,091	147.97	0.00	NA	0.00	110.55	2091.45	147.97
Murray River			Murray River			Murray River			Murray River		
ML	Av. EC	Salt (T)	ML	Av. EC	Salt (T)	ML	Av. EC	Salt (T)	ML	Av. EC	Salt (T)
0.00	NA	0.00	15.28	1,971	19.28	0.00	NA	0.00	15.28	1971.33	19.28

Drainage water (ML) - Comparable data for last 2 years						
	Drainage Basins 19/20	Flood Plains 19/20	Murray River 19/20	Drainage Basins 20/21	Flood Plains 20/21	Murray River 20/21
Jul	5.02	1.08	0.00	8.22	4.37	0.00
Aug	8.24	1.09	0.00	24.27	7.88	1.65
Sep	13.79	3.22	0.76	25.58	4.77	1.25
Oct	20.95	0.17	0.00	24.08	5.59	1.45
Nov	18.27	0.86	0.00	33.48	9.86	1.46
Dec	29.21	2.55	0.00	36.78	8.54	0.98
Jan	58.87	11.56	2.92	55.19	9.96	2.12
Feb	34.77	11.12	3.77	44.60	20.00	1.95
Mar	15.85	8.13	2.22	19.36	27.21	2.42
Apr	18.24	6.74	1.69	6.79	5.02	0.81
May	22.00	8.59	1.51	6.00	4.47	0.68
Jun	23.38	8.11	0.40	8.92	3.32	0.52

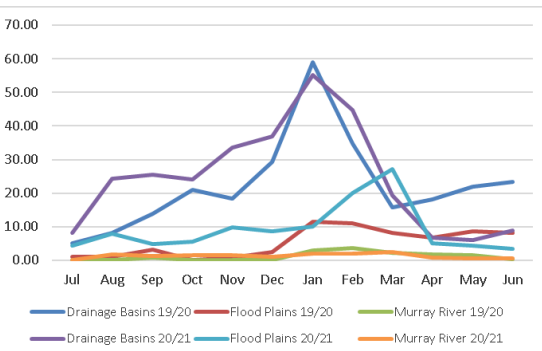


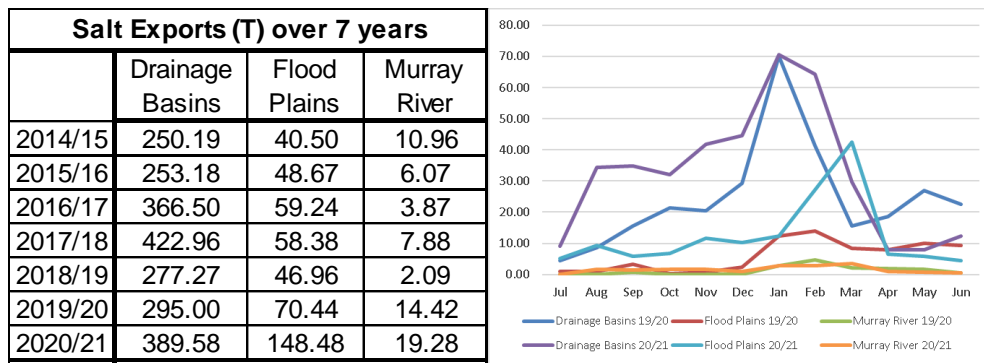
Salt Exports (T) - Comparable data for last 2 years						
	Drainage Basins 19/20	Flood Plains 19/20	Murray River 19/20	Drainage Basins 20/21	Flood Plains 20/21	Murray River 20/21
Jul	4.37	1.04	0.00	9.21	5.18	0.00
Aug	8.60	1.02	0.00	34.43	9.39	1.71
Sep	15.67	3.24	0.73	34.77	5.95	1.52
Oct	21.30	0.18	0.00	31.98	6.75	1.71
Nov	20.52	0.79	0.00	41.76	11.77	1.66
Dec	29.25	2.45	0.00	44.49	10.35	1.06
Jan	69.99	12.41	2.74	70.48	12.37	2.79
Feb	41.43	13.90	4.75	64.25	27.15	2.82
Mar	15.70	8.37	2.21	29.84	42.60	3.64
Apr	18.72	7.88	1.88	7.94	6.60	0.99
May	26.95	9.92	1.68	8.05	5.82	0.81
Jun	22.49	9.25	0.44	12.37	4.55	0.59



b) Comparable data for a year being at least 5 years prior:

Drainage Water (ML) over 7 years			
	Drainage Basins	Flood Plains	Murray River
2014/15	258.62	43.15	12.78
2015/16	227.98	47.84	6.33
2016/17	285.71	62.57	3.30
2017/18	352.41	58.93	17.57
2018/19	221.99	46.33	1.81
2019/20	268.59	63.23	13.27
2020/21	293.28	111.00	15.28





- c) The majority of the drainage water trend follows the irrigation demand and to a lesser degree rainfall events. 2020/21 irrigation supply was 98% of the 5-year average; Rainfall was 238.4mm, below the 50-year average of 283mm but more than the last 3 years; there was an increase in drainage water. September 2019 WMI introduced pulsed hydrogen peroxide dosing, currently at 4 hours a day at 5ppm at all our extraction sites, this is increased up to 24/7 depending on river water quality and demand; This is to control bryozoan growths in the pipeline, aimed at improved water quality at customer outlets; Customers have generally noticed their on-farm filters have been running for longer between backflushes, this has reduced the quantity of backflush water returned to the surface drain system; although when river water quality is bad, peroxide dosing cannot dissolve organic matter in the pipeline.
- d) Salt exported follows a similar pattern to drainage water throughout the year; Long term change from dominant furrow irrigation in 1997 to dominant drip irrigation in 2021 has reduced drainage water from 4848ML in 1998/99 to 420ML in 2020/21; exported salt in 1998/99 was 6538 tonnes, while 2020/21 was 557 tonnes. If this is compared against salt imports, it appears the imported salt is now being retained on irrigated land; sustained rainfall may control the salinity to some extent.
- Individual salinity and salt load of schedule 1 extraction sites is continued at condition 2.14.
 - Individual salinity and salt loads of attachment 1 discharge sites is found at condition 2.15
 - A simple salt balance report is found at condition 2.16

Groundwater

The Curlwaa salt interception scheme tubewell pumps have been mostly turned off for the 2020/21 irrigation season, with maintenance runs only. With low ground water the pumps run dry as the ground water flow cannot keep up with the pump output. The low ground water has not warranted the continued operation and the expense of running these pumps. Following advice from 'Department of Natural Resources' in 2009, pumping may be suspended when groundwater falls to 0.5m above river level. Pumping will recommence when ground water levels rise to 1 metre above pool level (currently 31.80 m AHD). As mentioned previously 'Knipes' tubewell has failed, re-construction will be reviewed if long term groundwater levels rise to 0.5M above pool level; in line with following advice from groundwater hydrogeologist 2019/20:

Recommendations for SIS Operations

The review of the operational and monitoring data indicates that the Curlwaa SIS does not need to operate under current conditions and there is currently no need to refurbish tubewell 1. However, groundwater monitoring data should continue to be collected annually and reviewed against trigger levels to provide a safeguard if groundwater levels begin to rise. Groundwater levels should be reviewed in the context of rainfall and river level data as hydrograph analysis shows that the floodplain aquifer responds to flood and rainfall events which may result in rises in groundwater levels that are only short term. Irrigation supply and method data should also be reviewed with groundwater trends. Previous communications with Department of Natural Resources by WMI have suggested a trigger level of 31.8m AHD (i.e., 1m above pool level) as a trigger to reinstate SIS operation. This trigger level is considered reasonable however it is also proposed that if groundwater levels rise to 31.3 MAHD (0.5m above pool level) this should trigger a review of SIS operations and the development of a plan to reinstate pumping. This is to prevent a significant time lag for reinstating groundwater pumping if the 31.8m AHD level is reached.

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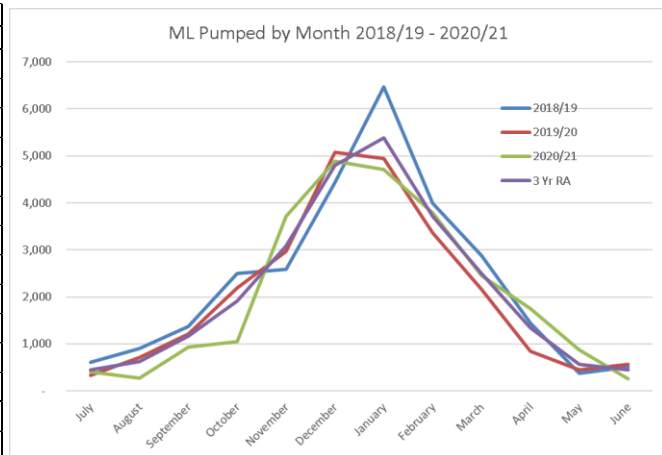
The water table has remained low for the past year, as expected during a dry season. Drip is now the dominant irrigation method; this retains water around the plantings' root ball, which does not tend to recharge the water table as much.

Full details of groundwater at Condition 2.17.

Extraction

Comparable extraction data (ML) for at least 2 previous years (3 years):

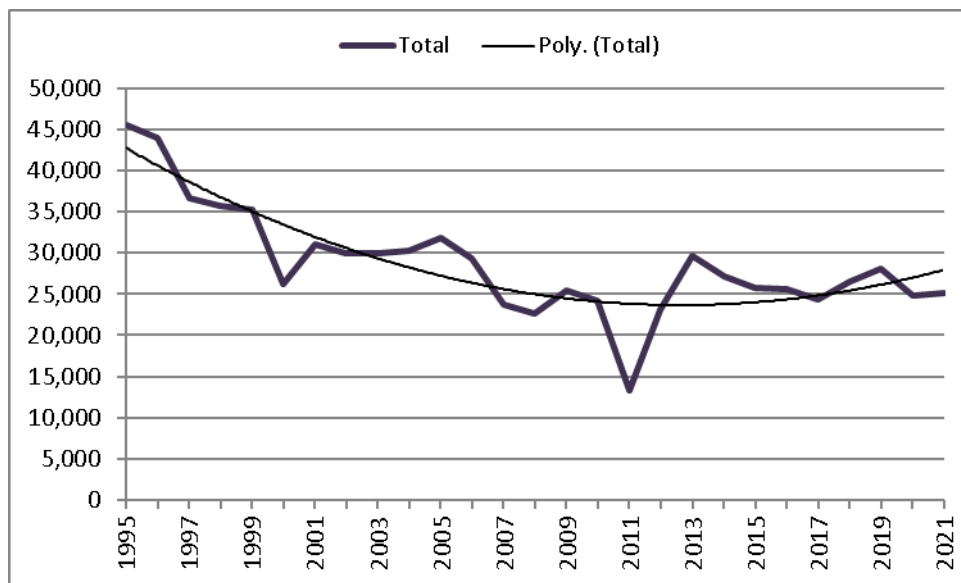
Month	TOTAL				
	2018/19	2019/20	2020/21	3 Yr RA	%
July	612	335	404	450	90%
August	904	714	268	629	43%
September	1,366	1,204	936	1,169	80%
October	2,498	2,193	1,044	1,911	55%
November	2,583	2,967	3,710	3,087	120%
December	4,435	5,071	4,885	4,797	102%
January	6,472	4,945	4,718	5,378	88%
February	3,995	3,364	3,794	3,718	102%
March	2,881	2,165	2,451	2,499	98%
April	1,437	841	1,748	1,342	130%
May	371	444	879	565	156%
June	514	572	262	449	58%
Year to Date	28,067	24,816	25,099	25,994	97%
Total	28,067	24,816	25,099	25,994	



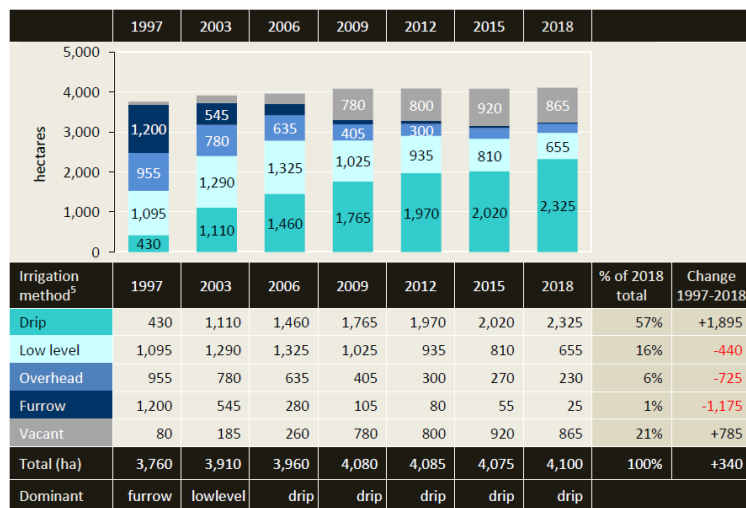
2020/21 extraction (ML) was 3% below the 3-year average, an unremarkable year.

Comparable data for a year being at least five years (27 years):

Jun-30	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Buronga	3,387	3,585	3,496	3,277	2,925	2,505	2,879	3,245	3,494	3,385	3,466	3,053	2,472	2,285	3,006	3,223	1,822	3,273	4,033	3,289	2,816	2,906	2,892	3,248	3,542	2,338	2,578
Coomesallee	34,661	33,385	25,987	25,238	25,537	18,199	21,831	20,509	21,218	21,031	21,930	20,502	16,640	16,199	17,877	16,733	9,108	15,943	20,478	19,319	18,596	18,376	17,751	19,266	20,584	18,871	19,269
Quirrawa	7,413	6,953	7,145	7,245	6,798	5,509	6,314	6,139	5,309	5,804	6,373	5,750	4,676	4,134	4,525	4,323	2,380	3,909	5,132	4,534	4,352	4,353	3,660	4,027	3,943	3,607	3,252
Total	45,461	43,923	36,628	35,760	35,260	26,213	31,024	29,893	30,021	30,220	31,769	29,305	23,788	22,618	25,408	24,279	13,310	23,125	29,643	27,142	25,764	25,635	24,303	26,541	28,069	24,816	25,099



Long term extraction shows a marked reduction in water usage; utilisation of irrigation area is presently at 79%, 1997 this was 98%; Irrigable area has increased by 9% from 1997. Water savings have largely been achieved by a change from dominant furrow irrigation in 1997 to dominant drip irrigation in 2021.



Long term climate tends to go through long periods of drought followed by heavy rainfall. 2020/21 was just below average annual rainfall 238.4mm (283mm 50-year average), with over half of this rain falling between July and October.

Water Use

- 2020/21 WMI extracted 25,099ML for water use (see 2.5 a) Extraction for 2-year data), this was used predominantly for horticulture with a small amount of this allocated for General Security (64ML) and Domestic and Stock use (560ML).
- WMI crops are surveyed every three years:

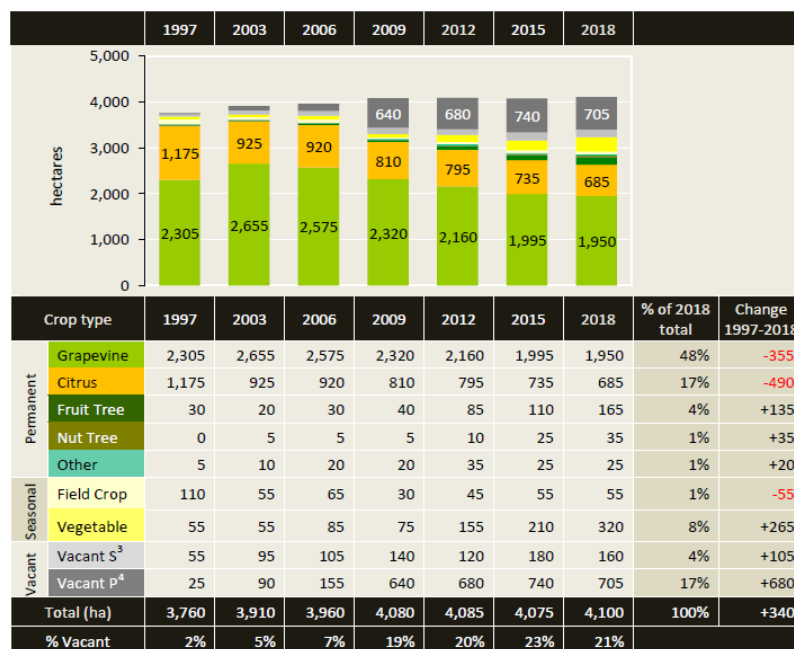
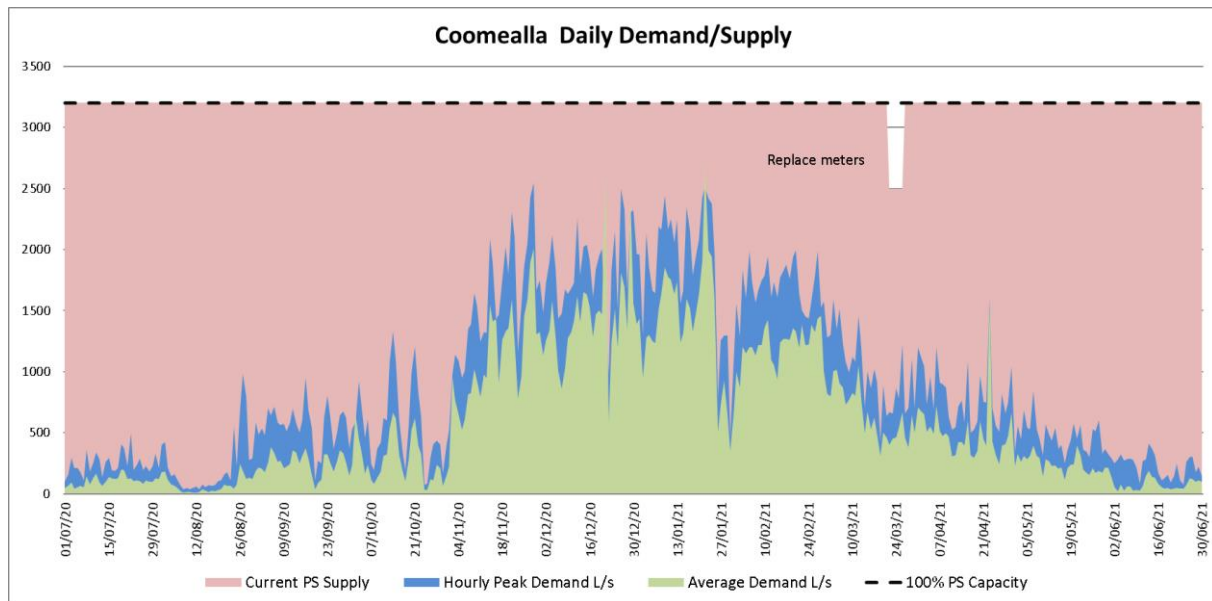


Figure 2: Western Murray Irrigation – crop types from 1997 to 2018

³ Vacant S: not irrigated but previously an irrigated seasonal crop

⁴ Vacant P: not irrigated but previously an irrigated permanent planting

- It has been noticed the horticulture business is gaining some momentum within WMI. Short term trends indicate more irrigable land is being put back into production; this will also increase water usage which will challenge our infrastructure in its current configuration.
- We are pumping less water annually than 1997, but drip irrigation puts excessive intra-day pressure on our infrastructure (designed around furrow irrigation); days above 40C create very high peaks of demand from drip irrigation systems, a pipeline upgrade is planned in winter 2022 to alleviate a low-pressure problem area:



Three rain events can be clearly seen effecting demand in August, October, and January. Coomealla pump station manages current peak demand in December/January by making all pumps available.

Condition 2.6

The following have been identified as possible data omissions and discrepancies with an explanation of action undertaken/proposed to remedy the monitoring and reporting deficiency.

- Partial failure of salt interception scheme - Knipes tubewell as previously reported at 'Condition 2.5 – Groundwater'.
- Several destroyed piezometers have not been replaced; however, consideration is being given to which piezometers are required to achieve the appropriate reporting coverage with consultation with a groundwater hydrogeologist. Rehabilitation of several piezometers has been attempted in 2017/18; we will know if they are functional if the ground water rises to a measurable level. Piezometers are currently being checked for GPS location and as built screen depths being updated from historical files, See condition 2.17.

Condition 2.7

All files including the Compliance Report and all associated Excel spread sheets have been provided; as a record of monitoring and testing data for discharged water salinity and volume and groundwater conditions. These are provided in an unrestricted access, electronic format.

Condition 2.8

"Salinity Training Manual"; Published by NSW Department of Primary Industries, June 2014 is used as a reference for understanding the effects of salination and methods for monitoring and control. Quality assurance is achieved by annual calibration of our extraction meters for extraction volume. MDBA website is used for salinity readings from Wentworth weir. Volume of exports is measured by V-notch or electronically; Salinity is measured with a salinity meter which is calibrated before every use with a test solution. These measurements are increased during flood/rain events. As part of EPA reporting, at least once a year (depending on drainage flow) drainage water samples are sent to consultants 'Pinion Advisory-Mildura' for NATA approved laboratory testing for chemical content (at NMI, 105 Delhi Road, North Ryde, NSW 2113). Piezometers are measured in accordance with the works approval. Training is also carried out, so at least 3 staff are familiar with the current monitoring procedures. Consultants are used for advice when required.

New Measures to Limit Groundwater Recharge and Discharge of Salt

Condition 2.9

A continuing trend towards drip irrigation requires much finer filtration, this requires more frequent operation of filter backflush systems; Hydrogen peroxide treatment was introduced in 2019/20 to stop the growth of pipeline bryozoans and other organic growths, it is expected to reduce backflush water into the surface drainage, thereby reducing groundwater recharge and discharge of salt.

The water table has been below trigger-level for several years, minimising discharge of salt into the Murray River system.

Reporting on Water Management

Condition 2.10

In respect of each water supply work listed in schedule one (of the Monitoring and Reporting Plan for Combined Approval 60CA581273) the reconciled monthly water volumes in megalitres are as follows:

- a) Extracted under water access licences held by the approval holder. Domestic+Stock, General Security and High Security are not metered separately. There is a 0.8ML totalised discrepancy between Water NSW statements and WMI reported figures.

Water NSW - Reconciled Usage		
IWAS Statement		
Type	WAL	ML
HS	60AL581271	24,542.2
DS	60AL581272	490.0
DS	60AL682421	34.0
GS	60AL583086	32.0
	Total	25,098.2

WMI – Reconciled Usage for each Authorised supply works

	BURONGA				COOMEALLA				CURLWAA				TOTAL					
Month	2018/19	2019/20	2020/21	3 Yr RA	2018/19	2019/20	2020/21	3 Yr RA	2018/19	2019/20	2020/21	3 Yr RA	2018/19	2019/20	2020/21	3 Yr RA	%	
July	45	16	43	35	437	224	287	316	130	95	74	100	612	335	404	450	90%	
August	110	63	26	66	631	500	197	443	163	151	45	120	904	714	268	629	43%	
September	158	103	109	123	943	879	652	825	265	222	175	221	1,366	1,204	936	1,169	80%	
October	306	232	133	224	1,822	1,611	757	1,397	370	350	154	291	2,498	2,193	1,044	1,911	55%	
November	330	272	374	325	1,928	2,276	2,890	2,365	325	419	446	397	2,583	2,967	3,710	3,087	120%	
December	528	413	482	474	3,426	4,031	3,837	3,765	481	627	566	558	4,435	5,071	4,885	4,797	102%	
January	791	433	427	550	4,923	3,904	3,752	4,193	759	608	538	635	6,472	4,945	4,718	5,378	88%	
February	519	348	370	412	2,926	2,522	2,973	2,807	550	494	451	498	3,995	3,364	3,794	3,718	102%	
March	401	263	288	317	2,038	1,563	1,788	1,796	442	339	375	385	2,881	2,165	2,451	2,499	98%	
April	208	86	209	168	962	625	1,290	959	267	130	249	215	1,437	841	1,748	1,342	130%	
May	77	56	85	73	209	314	649	391	85	74	145	101	371	444	879	565	156%	
June	69	53	32	51	339	422	196	319	106	97	34	79	514	572	262	449	58%	
Year to Date	3,542	2,338	2,578	2,819	20,583	18,871	19,269	19,574	3,942	3,607	3,252	3,601	28,067	24,816	25,099	25,994	97%	
Total	3,542	2,338	2,578	2,819	20,583	18,871	19,269	19,574	3,942	3,607	3,252	3,601	28,067	24,816	25,099	25,994		

- b) No other water access licences were used for extraction. WAL60AL583565 Domestic and Stock licence (36ML) was transferred to WMI on 23May2021, we were unable to extract this water as there was no provision for ordering.
- c) No water was extracted for environmental or river operational purposes.
- d) All water is delivered to customers except for leakage and scouring; scouring used 14.5ML.

Condition 2.11

Water discharged from (drainage) sites listed in Attachment 1:

- a) Discharged without credit:
- 403.55 ML was retained in area of operations.
 - 15.28 ML was returned to Murray River.
- b) Nil discharges for environmental or river operational purposes.

Condition 2.12

- a) The annual water balance is all water extracted, there is zero irrigation water returned to river. Customer field meters compared with pump station extraction meters:

ALL Areas 2020-21		Pumped - from Pump Station		Field - from meter reads		Quarterly Difference			YTD Difference		
		Totaliser	Quarter	Totaliser	Quarter	ML	% Diff	Del. Factor	ML	%	Del. Factor
	Q1	1,605	1,605	1,515.3	1,515.3	90	105.92%	5.92%	90	105.92%	5.92%
	Q2	8,837	7,232	8,926.8	7,411.5	-179	97.58%	-2.42%	-90	98.99%	-1.01%
	Q3	22,098	13,261	22,506.4	13,579.6	-319	97.65%	-2.35%	-408	98.19%	-1.81%
	end of May	24,832	2,734	25,276.1	2,769.7	-36	98.70%	-1.30%	-444	98.24%	-1.76%
EOY	EOY	25,098	266	25,521.5	245.4	20	108.30%	8.30%	-424	98.34%	-1.66%
			25,098		25,521.50	-423.90	98.34%				

Correction > -1.66%

Pump stations are not stopped during meter reads; an extra meter reading is taken in May to allow customers to balance their water accounts before end of year; 30 June pump station meters are read at midnight.

- b) Negligible losses in fully pipelined network.
- c) No change to offline storages (balance towers).

Condition 2.13

The estimated annual values in measurement units requested for:

- a) Rainfall = 238.4mm
- b) Evapo-transpiration = 2,452mm
- c) Water deliveries for horticulture = 21,726ML (87%)
- d) Water deliveries for summer crops = 2,431ML (10%)
- e) Water deliveries for winter crops = 34ML (<1%)

Table 3: Western Murray Irrigation – irrigated crops in 2018

Crop type		2018 (ha)	2018 %	Description
Permanent crops	Grapevine	Dried	245	6%
		Table	70	2%
		Wine	1,635	40%
	Citrus		685	17%
	Fruit tree	Avocado	35	1%
		Fig	40	1%
		Stone fruit	35	1%
		Other	25	1%
		Pomegranate	30	1%
	Nut tree	Almond	25	1%
		Walnut	10	<1%
	Other	Miscellaneous	25	1%
	Permanent crops (sub-total)		2,860	70%
Seasonal crops	Vacant P ¹	705	17%	Vacant/not irrigated
	Field crop	Pasture	35	1%
		Other	20	<1%
	Vegetable	Asparagus	40	1%
		Cucurbit	250	6%
		Other	30	1%
	Seasonal crops (sub-total)		375	9%
	Vacant S ²	160	4%	Vacant/not irrigated
	Total all crop areas		4,100	100%

- f) Water deliveries for Domestic and Stock = 524ML (2%).
- g) Application areas for the water uses c) to f) estimated from locally relevant crop water use factors = (2860+375) = 3,235ha.

- h) The distribution of irrigation intensity (ML/ha/year) in at least three intensity ranges for the main supply sub-division areas. This includes all farms where alternative irrigation supply is possible, this is extremely variable and will skew the ML/Ha figures.

Larger farms were surveyed from each irrigation area to represent water usage (ML/Ha) for the three major crop types in each area. Farms were selected with mature crops (except vegetables) in commercial production; use solely WMI irrigation supply and considered a well-managed commercial agribusiness. Newly planted, minimal irrigation (no commercial crop i.e., in receivership) and dual irrigation supplies were avoided, to enable reliable water usage figures ML/Ha:

- Average Buronga Irrigated Area = 2,578ML/ (490-60)
= 2,578ML/430
= 6.0ML/ha/year
 - On Farm production usage
 - Grapevines = 8.5ML/Ha (F45)
 - Citrus = 6.61ML/Ha (F27,28,29)
 - Vegetables winter/spring = No Data

Crop type		1997	2003	2006	2009	2012	2015	2018	% of 2018 total	Change 1997-2018
Permanent	Grapevine	105	180	160	250	220	200	235	48%	+130
	Citrus	225	160	160	135	140	135	130	27%	-95
	Fruit Tree	5	0	5	5	5	5	5	1%	0
	Nut Tree	-	-	-	-	-	-	-	-	-
	Other	-	-	-	-	-	-	-	-	-
Seasonal	Field Crop	-	-	-	-	-	-	-	-	-
	Vegetable	45	0	5	20	60	45	60	12%	+15
Vacant	Vacant S ⁷	0	0	0	0	0	30	30	6%	+30
	Vacant P ⁸	5	15	15	45	30	40	30	6%	+25
	Total (ha)	385	355	345	455	455	455	490	100%	+105
% Vacant		1%	4%	4%	10%	7%	15%	12%		

- Average Coomealla Irrigated Area = 19,269ML/ (2735-445)
= 19,269ML/2290
= 8.41ML/ha/year
 - On Farm production usage
 - Grapevines = 6.4ML/Ha (F253)
 - Citrus = 8.3ML/Ha (F316)
 - Vegetable Watermelon = 7.8ML/Ha (F117)

Crop type		1997	2003	2006	2009	2012	2015	2018	% of 2018 total	Change 1997-2018
Permanent	Grapevine	2,015	2,205	2,135	1,860	1,750	1,605	1,555	57%	-460
	Citrus	435	320	320	305	305	285	280	10%	-155
	Fruit Tree	15	10	15	30	75	100	145	5%	+130
	Nut Tree	0	5	5	5	10	25	35	1%	+35
	Other	5	5	20	20	30	25	25	1%	+20
Seasonal	Field Crop	10	10	35	20	15	20	20	1%	+10
	Vegetable	5	50	75	55	95	155	230	8%	+225
Vacant	Vacant S ¹¹	5	20	20	30	30	50	35	1%	+30
	Vacant P ¹²	15	35	90	410	430	475	410	15%	+395
Total (ha)		2,505	2,660	2,715	2,735	2,740	2,740	2,735	100%	+230
% Vacant		1%	2%	4%	16%	17%	19%	16%		

- Average Curlwaa Irrigated Area = 3,252ML/ (875-360)
= 3,252/515
= 6.31ML/ha/year
 - On Farm production usage
 - Grapevines = 7.25ML/Ha (F4)
 - Citrus = 4.72ML/Ha (F223)
 - Vegetable Watermelon = No Data

Crop type	1997	2003	2006	2009	2012	2015	2018	% of 2018 total	Change 1997-2018
Permanent	Grapevine	185	270	280	210	190	160	18%	-25
	Citrus	515	445	440	370	350	275	31%	-240
	Fruit Tree	10	10	10	5	5	15	2%	+5
	Nut Tree	-	-	-	-	-	-	-	-
	Other	0	5	0	0	5	0	0%	0
Seasonal	Field Crop	100	45	30	10	30	35	4%	-65
	Vegetable	5	5	5	0	0	10	3%	+25
Vacant	Vacant S ¹⁵	50	75	85	110	90	100	11%	+45
	Vacant P ¹⁶	5	40	50	185	220	265	30%	+260
Total (ha)		870	895	900	890	880	875	100%	+5
% Vacant		6%	13%	15%	33%	35%	37%	41%	

COVID19 has discouraged planting of short crops due to lack of pickers; some crops were unpicked this year.

Reporting on Salinity and Saltload

Condition 2.14

The salinity and saltload of extractions at the sites listed in schedule 1, and in accordance with requirements set out in schedule 1:

- Flow - ML/Month
- Salt Loads - Tonnes/Month
- Salinity - micro-Siemens/cm
- In table format

	BURONGA W01		COOMEALLA W02		CURLWAA W03		Average EC
Month	ML	Salt (T)	ML	Salt (T)	ML	Salt (T)	
July	43	3	287	21	74	5	112
August	26	2	197	16	45	4	128
September	109	10	652	60	175	16	144
October	133	12	757	68	154	14	141
November	374	30	2,890	227	446	35	123
December	482	49	3,837	388	566	57	158
January	427	30	3,752	261	538	37	109
February	370	27	2,973	205	451	30	108
March	288	21	1,788	127	375	27	112
April	209	16	1,290	89	249	17	109
May	85	6	649	45	145	10	108
June	32	2	196	14	34	3	113
Year to Date	2,578	208	19,269	1,521	3,252	255	124

All Areas	2020/21		
	ML	Salt (T)	AV EC
Year to Date	25,099	1,984	124

Condition 2.15

The salinity and salt loads of discharges at the sites listed in Attachment 1, and in accordance with the requirements set out in Attachment 1:

- Volume - ML/Month
- Salt Load - Tonnes/Month
- Monthly min, max, average
- Table format

District	Curlwaa										Location Details				Type	Centrifugal Pumps			
Work/Site Identifier	CW 6										Coordinates (WGS84)				Dimensions	80mm & 200mm			
Name	James' Highway										586760E 6225910N				Capacity	X- Section = 0.04m ²			
Representing discharge	Discharges to Fletchers Lake/Tuckers Creek															13 ML/D			
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Totals	Max	Min	Av.	Site Visits		
Volume (ML)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 ML	0.0	0.0	0.0	Flow	No Flow	
Salt Load (T)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 T	0.0	0.0	0.0			
Average EC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		0	0	NA	0	52	

District	Buronga										Location Details				Type	Weir - 90° V Notch			
Work/Site Identifier	B1										Coordinates (WGS84)				Dimensions	300mm Pipe			
Name	Corbett Ave										609902E 6219514N				Capacity	X- Section = 0.07m ²			
Representing disc	Discharges to Basin No.1															2 ML/D			
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Totals	Max	Min	Av.	Site Visits		
Volume (ML)	0.6	1.8	0.7	0.17	0.7	1.9	1.52	1.7	2.181	1.7	0.4	0.01	13.3 ML	2.2	0.0	1.1	Flow	No Flow	
Salt Load (T)	0.4	1.3	0.6	0.11	0.4	1.4	1.08	1.3	1.490	1.0	0.2	0.01	9.3 T	1.5	0.0	0.8			
Average EC	995	1,127	1,236	1,057	931	1,139	1,109	1,196	1,067	944	1,049	758		1,236	758	1,089	52	0	

District	Cooamealla										Location Details				Type	Weir - 60° V Notch			
Work/Site Identifier	CM 5										Coordinates (WGS84)				Dimensions	600mm Pipe			
Name	Hollands Lake Main Deep Drain										603200E 6228800N				Capacity	X- Section = 1.13m ²			
Representing discharge	Discharge to Hollands Lake															8 ML/D			
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Totals	Max	Min	Av.	Site Visits		
Volume (ML)	3.1	11.8	9.3	6.1	18.5	21.4	34.0	25.6	16.1	4.3	3.6	1.3	155.2 ML	34.0	1.3	12.9	Flow	No Flow	
Salt Load (T)	3.8	17.8	11.9	8.3	23.5	26.9	45.8	41.8	25.8	5.7	4.7	2.0	218.0 T	45.8	2.0	18.2			
Average EC	1,912	2,350	1,994	2,122	1,985	1,964	2,101	2,552	2,507	2,068	2,055	2,325		2,552	1,912	2,194	52	0	

District	Cooamealla										Location Details				Type	Weir - 90° V Notch			
Work/Site Identifier	CM 1										Coordinates (WGS84)				Dimensions	600mm Pipe			
Name	Risbey's Outfall - Risbey's Main Deep Drain										594080E 6226900N				Capacity	X- Section = 1.13m ²			
Representing discharge	Discharge to Tuckers Creek															8 ML/D			
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Totals	Max	Min	Av.	Site Visits		
Volume (ML)	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.5 ML	0.3	0.0	0.0	Flow	No Flow	
Salt Load (T)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.0	0.0	0.5 T	0.4	0.0	0.0			
Average EC	NA	NA	NA	NA	NA	NA	NA	NA	1,236	1,959	NA	NA		1,959	1,236	1,758	3	49	

District	Cooamealla										Location Details				Type	Weir - 90° V Notch			
Work/Site Identifier	CM 2										Coordinates (WGS84)				Dimensions	600mm Pipe			
Name	Risbey's Outfall - Branch Channel No.1 Main Deep Drain										594080E 6226900N				Capacity	X- Section = 1.13m ²			
Representing discharge	Discharge to Tuckers Creek															8 ML/D			
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Totals	Max	Min	Av.	Site Visits		
Volume (ML)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 ML	0.0	0.0	0.0	Flow	No Flow	
Salt Load (T)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 T	0.0	0.0	0.0			
Average EC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0		0	0	NA	0	52	

District	Cooamealla										Location Details				Type	Bank & Pipe			
Work/Site Identifier	CM 7										Coordinates (WGS84)				Dimensions	150mm Pipe			
Name	Water's Deep Drain										595825E 6226100N				Capacity	X- Section = 0.07m ²			
Representing discharge	Discharges to Murray River															0.5 ML/D			
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Totals	Max	Min	Av.	Site Visits		
Volume (ML)	0.0	0.8	0.0	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4 ML	0.8	0.0	0.1	Flow	No Flow	
Salt Load (T)	0.0	0.9	0.0	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5 T	0.9	0.0	0.1			
Average EC	NA	1,650	NA	1,600	1,900	NA	NA	NA	NA	NA	NA	NA		1,900	1,600	1,665	6	46	

District	Cooamealla										Location Details				Type	Bank & Pipe			
Work/Site Identifier	CM 21										Coordinates (WGS84)				Dimensions	150mm Pipe			
Name	Old Jetty										596298E 6225511N				Capacity	X- Section = 0.07m ²			
Representing discharge	Discharges to Murray River															0.5 ML/D			
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Totals	Max	Min	Av.	Site Visits		
Volume (ML)	0.0	0.8	1.2	1.0	1.3	1.0	2.1	2.0	2.4	0.8	0.7	0.5	13.9 ML	2.4	0.0	1.2	Flow	No Flow	
Salt Load (T)	0.0	0.9	1.5	1.3	1.4	1.1	2.8	2.8	3.6	1.0	0.8	0.6	17.8 T	3.6	0.0	1.5			
Average EC	NA	1,579	1,900	1,940	1,757	1,684	2,059	2,253	2,350	1,925	1,881	1,767		2,350	1,579	2,003	37	15	

District	Cooamealla										Location Details				Type	Bank & Pipe			
Work/Site Identifier	CM 12&13										Coordinates (WGS84)				Dimensions	150mm Pipe			
Name	Deep Drain 342-398 WMIL Depot										596125E 6225325N				Capacity	X- Section = 0.07m ²			
Representing discharge	Discharges to Murray River Flood Plain															0.5 ML/D			
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Totals	Max	Min	Av.	Site Visits		
Volume (ML)	0.0	0.8	1.2	1.0	1.3	1.0	2.1	2.0	2.5	0.8	0.8	0.3	14.0 ML	2.5	0.0	1.2	Flow	No Flow	
Salt Load (T)	0.0	0.9	1.5	1.3	1.4	1.1	2.8	2.8	3.8	1.0	1.0	0.4	17.9 T	3.8	0.0	1.5			
Average EC	NA	1,579	1,900	1,940	1,757	1,684	2,059	2,253	2,336	1,925	1,864	1,700		2,336	1,579	2,002	38	14	

District	Coomoalla									Location Details Coordinates (WGS84)				Type	Bank & Pipe			
Work/Site Identifier	CM 14													Dimensions	150mm Pipe			
Name	Wakefield Deep DD352														X- Section = 0.07m ²			
Representing discharge	Discharges to Murray River Flood Plain									597200E 6224650N				Capacity	0.5 ML/D			
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Totals	Max	Min	Av.	Site Visits	
Volume (ML)	1.8	3.2	2.0	2.8	4.6	3.0	3.6	5.1	9.5	1.6	1.7	1.3	40.2 ML	9.5	1.3	3.4	Flow	No Flow
Salt Load (T)	2.0	3.9	2.6	3.3	5.6	3.5	4.4	6.2	13.4	2.0	2.2	1.7	50.8 T	13.4	1.7	4.2		
Average EC	1,756	1,913	1,966	1,840	1,900	1,846	1,900	1,900	2207	2,032	1,939	2,063		2,207	1,756	1,974	52	0

District	Coomoalla									Location Details Coordinates (WGS84)				Type	Bank & Pipe			
Work/Site Identifier	CM 15													Dimensions	150mm Pipe			
Name	Boronia Deep Drain - DD365														X- Section = 0.07m ²			
Representing discharge	Discharges to Murray River Flood Plain									597500E 6224050N				Capacity	0.5 ML/D			
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Totals	Max	Min	Av.	Site Visits	
Volume (ML)	0.0	0.8	0.2	0.2	0.5	0.8	0.9	1.3	1.5	0.4	0.3	0.2	7.2 ML	1.5	0.0	0.6	Flow	No Flow
Salt Load (T)	0.0	0.9	0.2	0.3	0.6	1.0	1.0	1.3	1.7	0.4	0.4	0.2	8.0 T	1.7	0.0	0.7		
Average EC	NA	1,708	2,000	1,800	1,940	1,824	1,726	1,454	1824.1	1,808	1,900	1,800		2,000	1,454	1,743	25	27

District	Coomoalla									Location Details Coordinates (WGS84)				Type	Bank & Pipe			
Work/Site Identifier	CM 17													Dimensions	150mm Pipe			
Name	3rd Allocation Main Deep Drain - DD346														X- Section = 0.07m ²			
Representing discharge	Discharges to Murray River Flood Plain									597850E 6223350N				Capacity	0.5 ML/D			
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Totals	Max	Min	Av.	Site Visits	
Volume (ML)	2.6	3.0	1.3	1.6	3.5	3.7	3.3	11.6	13.5	1.6	1.5	1.5	48.7 ML	13.5	1.30	4.1	Flow	No Flow
Salt Load (T)	3.1	3.7	1.6	1.9	4.1	4.8	4.2	16.9	23.6	2.3	2.2	2.2	70.8 T	23.6	1.6	5.9		
Average EC	1,914	1,926	1,963	1,941	1,847	2,001	1,969	2,274	2725.4	2,234	2,280	2,359		2,725	1,847	2,269	51	1

Condition 2.16

A simple annual salt balance representing the imported, exported and retained salt load for the area associated with each separate water supply work:

WMI Supply Imports

Buronga			Coomealla			Curlwaa		
Main Pumping Station			Main Pumping Station			Main Pumping Station		
ML	Av. EC	Salt (T)	ML	Av. EC	Salt (T)	ML	Av. EC	Salt (T)
2,578	126	208	19,269	123	1,521	3,252	123	255

WMI Drainage Outfalls

Buronga			Coomealla			Curlwaa			Total		
Total Drainage			Total Drainage			Total Drainage			Total Drainage		
ML	Av. EC	Salt (T)	ML	Av. EC	Salt (T)	ML	Av. EC	Salt (T)	ML	Av. EC	Salt (T)
13.35	1,089	9.31	405.76	2,108	547.53	0.00	NA	0.00	419.11	1598.91	556.83
Drainage Basins			Drainage Basins			Drainage Basins			Drainage Basins		
ML	Av. EC	Salt (T)	ML	Av. EC	Salt (T)	ML	Av. EC	Salt (T)	ML	Av. EC	Salt (T)
13.35	1,089	9.31	279.93	2,123	380.28	0.00	NA	0.00	293.28	1606.00	389.58
Flood Plains			Flood Plains			Flood Plains			Flood Plains		
ML	Av. EC	Salt (T)	ML	Av. EC	Salt (T)	ML	Av. EC	Salt (T)	ML	Av. EC	Salt (T)
0.00	NA	0.00	110.55	2,091	147.97	0.00	NA	0.00	110.55	2091.45	147.97
Murray River			Murray River			Murray River			Murray River		
ML	Av. EC	Salt (T)	ML	Av. EC	Salt (T)	ML	Av. EC	Salt (T)	ML	Av. EC	Salt (T)
0.00	NA	0.00	15.28	1,971	19.28	0.00	NA	0.00	15.28	1971.33	19.28

WMI Salt Balance

Salt (T)	Buronga	Coomealla	Curlwaa	Total
Imported	208.00	1,521.00	255.00	1,984.00
Exported to Drainage Basins	9.31	380.28	0.00	389.58
Exported to Murray Flood Plains	0.00	147.97	0.00	147.97
Exported to Murray River	0.00	19.28	0.00	19.28
Retained on Irrigated Land	198.69	973.47	255.00	1,427.17

Retained salt T/ha			
	Buronga	Coomealla	Curlwaa
Irrigated ha	430	2290	515
Tonnes salt retained	199	973	255
Average T/ha	0.46	0.43	0.50

Reporting Groundwater Requirements

Condition 2.17

The results of monitoring of groundwater conditions by means of piezometers and groundwater control bores (tube-wells) in accordance with the monitoring and reporting requirements set out in Attachment 2.

On advice from NRAR, WMI have had the groundwater monitoring network reviewed by a consultant hydrogeologist, this report will be sent with the Annual Compliance Report. In accordance with this report the following audit will be started in 2021/22:

- 100% of WMI controlled Piezometers accounted for.
- GPS location re-established for GDA1994 and GDA2020
- AHD, screen depth and overall depth measured and confirmed at each piezometer.
- Assess dry/destroyed piezometers for rehabilitation.
- Liaise with other stakeholders to establish a plan of rectification for the whole piezo network.

Attachment 2- p.1

Piezometers are read in accordance with appropriate procedures and standards detailed in: DPI NSW, Salinity Training Manual - 2014, Chapter 13.

Current listing of piezometers by area:

Buronga							
Site ID	Use Y/N	Top of Pipe above NS (M)	NS (AHD)	Screen depth below top of pipe (M)	Easting	Northing	Condition
BGA 39	Y	0.1	38.77	6.59	611510	6220739	Dry 04Aug17
BGA 41	Y	0.1	38.65	5.51	611750	6218350	5.76
BGA 42	Y	0.16	36.84	5.11	609937	6217397	5.27
BGA 49	Y	0.1	38.54	7.26	608768	6220369	7.61
BGA 70	Y	0.15	38.64	6.70	614225	6218250	6.42
BGA 94	N	0.03	37.79	destroyed	608828	6217974	Destroyed @ 07Aug17
BGA 112	Y	0.1	38.52	7.67	608647	6219723	7.63
BGA 113	Y	0.09	37.21	dry	608286	6219773	Dry @ 04Aug17
BGA1010	Y	0.17	38.58	6.73	613675	6219700	7
BGA1011	Y	0.22	33.44	2.67	606000	6226025	2.3
BGA1012	Y	0.15	33.50	2.20	607775	6229125	3.13
BGA1013	Y	0.5	33.15	1.70	613025	6221300	1.83
BGA1080	Y	0.16	35.40	dry	612100	6218225	Dry @ 04Aug17
BGA1211	Y	0.2	NK	10.12	608450	6218875	10.32
BGA1214	Y	0.3	34.41	2.49	613450	6221225	2.64
GGN 88168	Y	0.55	NK	5.28	611628	6221659	5.12
GGN 88169	Y	0.5	NK	3.96	611917	6221650	3.85
GGN 88170	Y	0.52	NK	6.59	611861	6221572	6.44
GGN 88171	Y	0.33	NK	5.81	611657	6219793	Destroyed @13Aug19
GGN 88172	N	0.68	NK	destroyed	611532	6219385	Destroyed @ 07Aug17

Coomealla							
Site ID	Use Y/N	Top of Pipe above NS (M)	NS (AHD)	Depth below top of pipe (M)	Easting	Northing	Condition
CMA 11	Y	0.15	47.15	Dry	592475	6229550	Dry @ 02Aug17
CMA 12	Y	0.12	45.92	Dry	592892	6227823	Destroyed 15Sep19
CMA 13	N	0.34	38.61	Destroyed	592925	6226550	Dry 15Sep19
CMA 14	Y	0.09	41.81	Dry	594525	6230009	Dry @ 02Aug17
CMA 15	Y	0.03	35.28	4.07	594699	6228408	Destroyed @15Sep19
CMA 17	Y	0.1	47.08	Dry	597298	6228762	Destroyed @15Sep19
CMA 19	N	0.4	46.56	Destroyed	597311	6224728	Destroyed @ 02Aug17
CMA 22	Y	0.07	38.34	6.98	599484	6223007	7.01
CMA 23	Y	0.12	51.22	19.05	602968	6226852	19.11
CMA 24	N	0.28	35.98	Destroyed	592875	6225200	Destroyed @ 02Aug17
CMA 25	Y	0.08	35.83	5.24	596130	6224133	5.69
CMA 26	Y	0.04	54.09	22.2	602096	6225347	22.14
CMA 52	Y	0.15	39.25	Dry	595870	6230789	Dry @ 02Aug17
CMA 53	Y	0.07	53.2	Dry	597031	6225833	Dry @ 02Aug17
CMA 56	N	0.075	57.75	Destroyed	605451	6228489	Destroyed @ 02Aug17
CMA 58	Y	0.18	35.58	Dry	602810	6230049	Dry @ 02Aug17
CMA 60	Y	0.15	48.57	17.75	599888	6231317	Dry @ Aug18
CMA 63	Y	0.07	47.3	Dry	599739	6230307	Dry @ 02Aug17
CMA 67	Y	0.11	48.94	18.23	599068	6232409	Dry @ 15Sep19
CMA 77	Y	0.22	51.07	Dry	601564	6229345	Dry @ 04Aug17
CMA 78	Y	0.16	44.25	Dry	603888	6231673	Dry @ 04Aug17
CMA 79	Y	0.14	40.56	Dry	603980	6230093	Dry @ 04Aug17
CMA 82	Y	0.12	35.59	Dry	592849	6231395	Dry @ 04Aug17
CMA1019	Y	0.2	36.1	Dry	601450	6232125	Destroyed @ 15Sep19
CMA1022	Y	0.36	32.09	1.99	596325	6232700	1.74
CMA1027	Y	0.33	40.67	10.23	594300	6230725	10.06
CMA1061	Y	0.36	42.36	11.98	593150	6228525	11.77
CMA1062	Y	0.34		Dry	597025	6223775	Dry @ 04Aug17
CMA1091	Y	0.3		3.11	603075	6228950	2.93
CMA1092	Y	0.25		Dry	602775	6229150	Dry @ 04Aug17
CMA1094	N	0.4		Destroyed	602875	6229000	Destroyed @ 04Aug17
CMA1110	N			Destroyed	598750	6226700	Destroyed @ 04Aug17
CMA1200	Y	0.26	34.09	3.91	595975	6232150	3.65
CMA1201	Y	0.28		19.89	599275	6227425	19.74
CMA1202	Y	0.32		4.43	603025	6228250	4.28
CMA1203	Y	0.4		5.78	599800	6229075	5.7
CMA1204	Y	0.34		10.71	594675	6226925	Dry @ 15Sep19
CMA1205	Y	0.4		10.05	601300	6227675	9.85
CMA1206	Y	0.2		18.52	602325	6227425	18.62
CMA1207	Y	0.34	37.67	7.64	596650	6232625	7.45

Curlwaa							
Site ID	Use Y/N	Top of Pipe above NS (M)	NS (AHD)	Depth below top of pipe (M)	Easting	Northing	Condition
CWA 1/A	Y	0.2	35.89	dry	590180	6224995	5.69
CWA 5	Y	0.08	33.07	dry	589106	6225671	Dry @ 09Aug2017
CWA 6	GC	0.21	35.14	5.89	588966	6225938	6.04
CWA 11/A	Y	0.2	33.1	dry	587690	6226720	Destroyed @ 10Sep19
CWA 12	Y	0.22	35.4	dry	590197	6224932	4.83
CWA 13	N	0.03	34.89	destroyed	587515	6223575	Destroyed @ 09Aug2017
CWA 15	N	0.3	35.24	destroyed	588235	6225525	Destroyed @ 09Aug2017
CWA16s	GC	0.46	34.36	5.78	588965	6226025	5.06
CWA 19	N	0.26	34.35	destroyed	590592	6227997	Destroyed @ 09Aug2017
CWA 21/A	Y	0.23	35.21	dry	587155	6226355	Destroyed @ 10Sep19
CWA 23	Y	0.25	33.28	3.49	591120	6225815	3.59
CWA 25	N	0.4	33.19	destroyed	588951	6223709	Destroyed @ 09Aug2017
CWA 27	GC	0.16	34.36	destroyed			Destroyed @ 10Sep19
CWA 28	GC	0.18	34.36	4.7			5
CWA 31	N	0	34.36	destroyed	589300	6226890	Destroyed @ 09Aug2017
CWA 41	Y	0.15	36.42	6.33	591650	6225490	6.56
CWA 48	GC	0.14	35.82	5.96			6.15
CWA 50	GC	0.17	35.52	5			5.21
CWA 51	GC	0.08	35.29	4.98	589970	6225560	5.27
CWA 59	GC	0.06	35.52	5.61	590120	6225640	5.95
CWA 60	GC	0.26	35.52	5.3			5.55
CWA 80	Y	0.07	35.12	5.69	587385	6224900	Destroyed @ 10Sep19
CWA 81	GC	0.08	33.56	dry	588248	6226209	Dry @ 09Aug2017
CWA 82	Y	0.22	34.89	dry	588578	6224649	Dry @ 09Aug2017
CWA 84	Y	0.06	33.88	3.33	588892	6224491	3.4
CWA 85	N	0.09	33.88	destroyed	588515	6223035	Destroyed @ 09Aug2017
CWA 86	Y	0.12	34.83	4.52	589067	6223662	4.43
CWA 87	Y	0.1	34.38	4.87	589079	6222362	3.92
CWA 88	Y	0.09	35.42	4.65	589288	6224374	4.69
CWA 89	Y	0.02	35.5	5.06	589732	6224824	5.34
CWA 90	Y	0.15	33.8	4.18	588410	6224485	4.21
CWA 91/L	GC	0.15	33.5	4.04	588855	6225375	4.15
CWA 92	N	0.16	34.39	destroyed	586731	6224136	Destroyed @ 09Aug2017
CWA 93	Y	0.11	34.44	dry	589990	6225950	Dry @ 09Aug2017
CWA 98	Y	-0.03	35.96	5.44	591930	6224150	5.65
CWA 99	Y	0.2	36.52	6.26	592170	6224520	6.37
CWA 100	Y	0.7	35.36	5.05	591170	6224850	DestroyedAug2020
CWA 101	Y	0.15	36.24	dry	591780	6225240	Dry @ 09Aug2017
CWA 102	Y	0.13	35.83	5.93	592020	6225660	6.39
CWA 103	Y	0.08	37.78	dry	591795	6226050	Destroyed 10Sep19
CWA 104	GC	0.15	35.15	5.66	589690	6227510	5.8
CWA 105	Y	0.23	34.34	dry	590533	6225685	Dry @ 09Aug2017
CWA 111	N		33.89	destroyed	586780	6224807	Destroyed @ 09Aug2017
CWA 113	N		33.71	destroyed	588670	6223255	Destroyed @ 09Aug2017
CWA 115	N		33.92	destroyed	588740	6223660	Destroyed @ 09Aug2017
CWA 119	N		34.61	destroyed	589170	6224490	Destroyed @ 09Aug2017
CWA 142	N		35.84	destroyed			Destroyed @ 09Aug2017
CWA 150	N		32.39	destroyed	587130	6225355	Destroyed @ 09Aug2017
CWA 162	Y	0.1	34.6	dry	591180	6225620	Destroyed @ 10Sep19
CWA 165	N	0.15	36.3	destroyed	590380	6226475	Destroyed @ 09Aug2017
CWA 167	N	0.01	35.01	destroyed	589555	6226485	Destroyed @ 09Aug2017
CWA 173	N		34.26	destroyed	588375	6226605	Destroyed @ 09Aug2017
CWA 174	GC	0.1	34.69	dry	588795	6226890	Destroyed @ 10Sep19
CWA 177	GC	0.02	35.69	dry	590005	6226945	Destroyed @ 10Sep19
CWA 178	Y	0.005	34.26	dry	590360	6226500	Destroyed @ 10Sep19
CWA 179	Y	0.13	34.81	dry	590720	6226420	Dry @ 09Aug2017
CWA 180	GC	0.12	35.58	dry	590720	6226910	Dry @ 09Aug2017
CWA 185	GC	0.02	34.21	dry	588785	6227310	Dry @ 09Aug2017
CWA 187	GC	0.005	35.5	dry	588372	6227446	Destroyed 10Sep19
CWA 189	Y	0.07	35.27	dry	589198	6227779	Dry @ 09Aug2017
CWA 195	Y	0.09	35.18	dry	589585	6227785	Destroyed 10Sep19
CWA 196	Y	0.15	35.22	dry	589170	6227790	Destroyed 10Sep19
CWA 198	Y	0.09	35.43	dry	588790	6228165	Destroyed 10Sep19
CWA 199	Y	0.09	35.18	dry			Destroyed 10Sep19
CWA1039	Y	0.22	34.72	dry	590900	6225375	Dry @ 09Aug2017
CWA1041	GC	1.2	34.35	4.74	588600	6225850	5.06
CWA1044	Y	0.32	34.06	3.96	588050	6223275	3.91
CWA1045	Y	0.31	35.19	5.13	588000	6224175	4.93
CWA1060	Y	0.24	34.66	5.04	591325	6228350	5.05
CWA1083	Y	0.3	34.63	4.65	589325	6224800	4.32
CWA1084	Y	0.2	34.93	4.3	588775	6224100	Destroyed 10Sep19
CWA1085	Y	0.18	32.36	4.85	589075	6225650	4.98
CWA1086	Y	0.32	34.88	4.89	591375	6225275	4.94
CWA1087	Y	0.08	35.88	6.4	590575	6225650	6.2
CWA1088	Y	0.16	35.85	6.7	590175	6227400	6.53
CWA1131	Y	0.17	33.69	4.65	587450	6229100	4.74

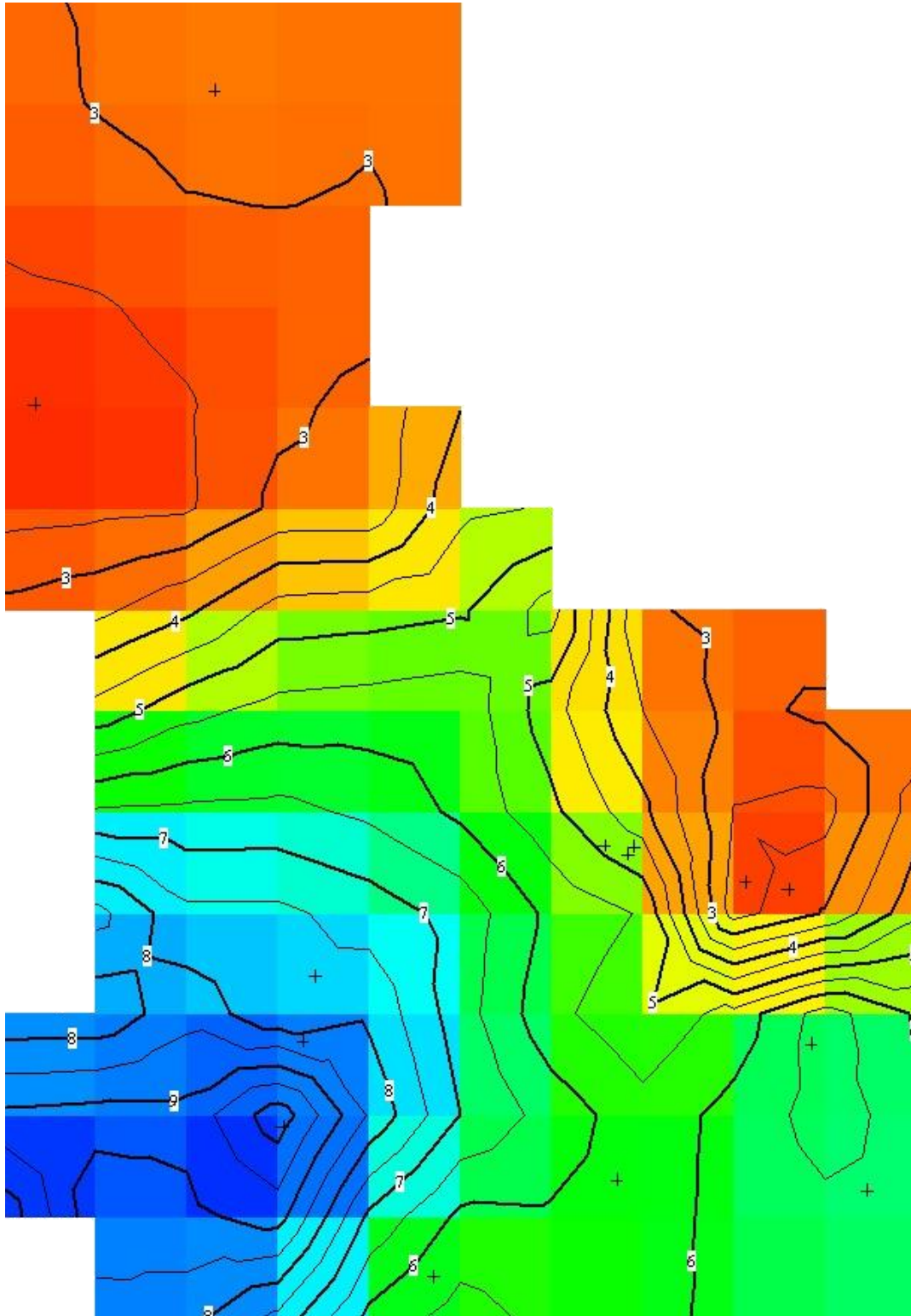
Attachment 2, p.2 - Condition 1

Map of groundwater depth below natural surface @ 2M contour intervals and including first 1M. Dry/destroyed piezometers are not used for constructing contour lines.

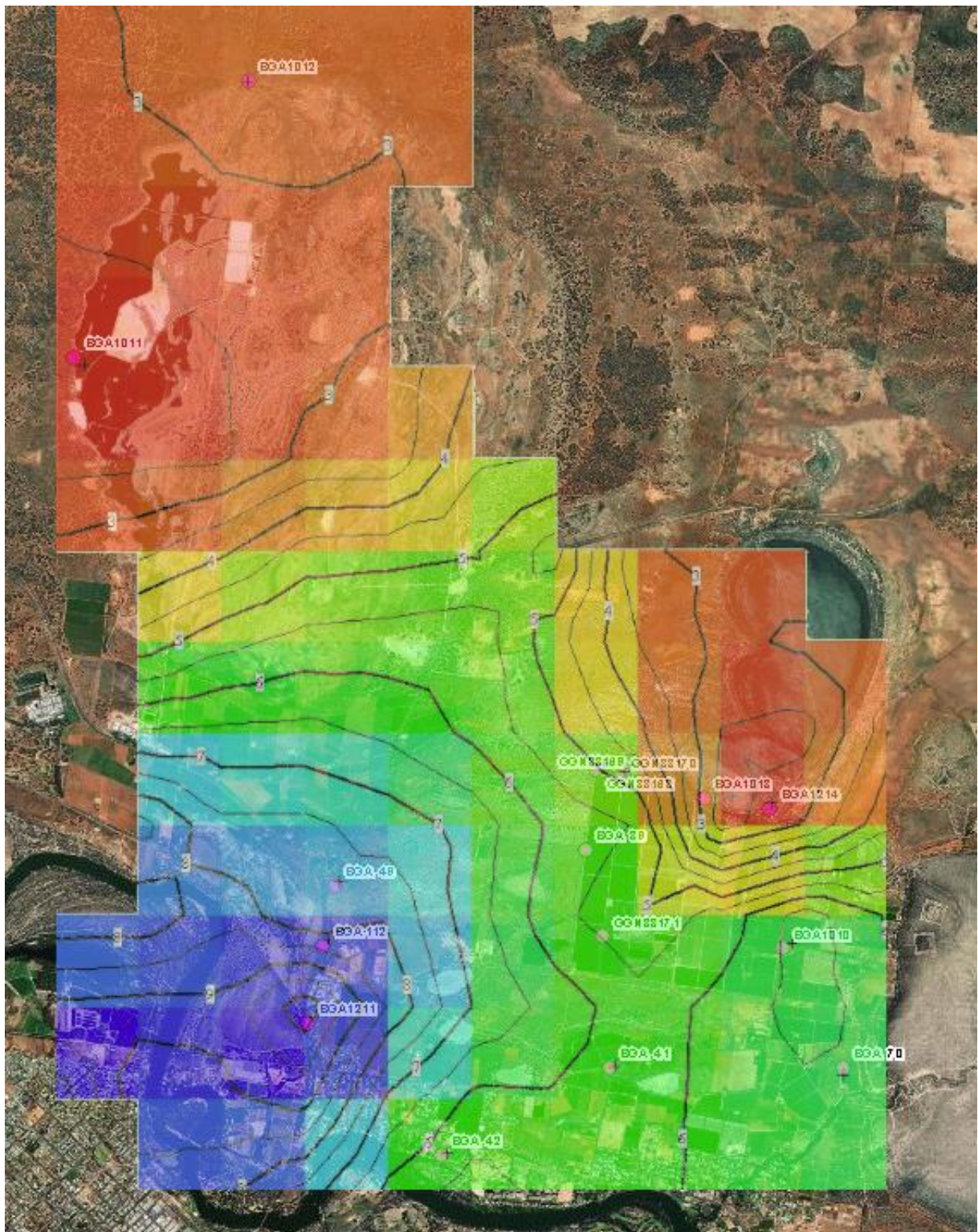
Location of Buronga Piezometers:



Buronga groundwater heights below natural surface (M)



Buronga groundwater heights below natural surface (M), combined image:



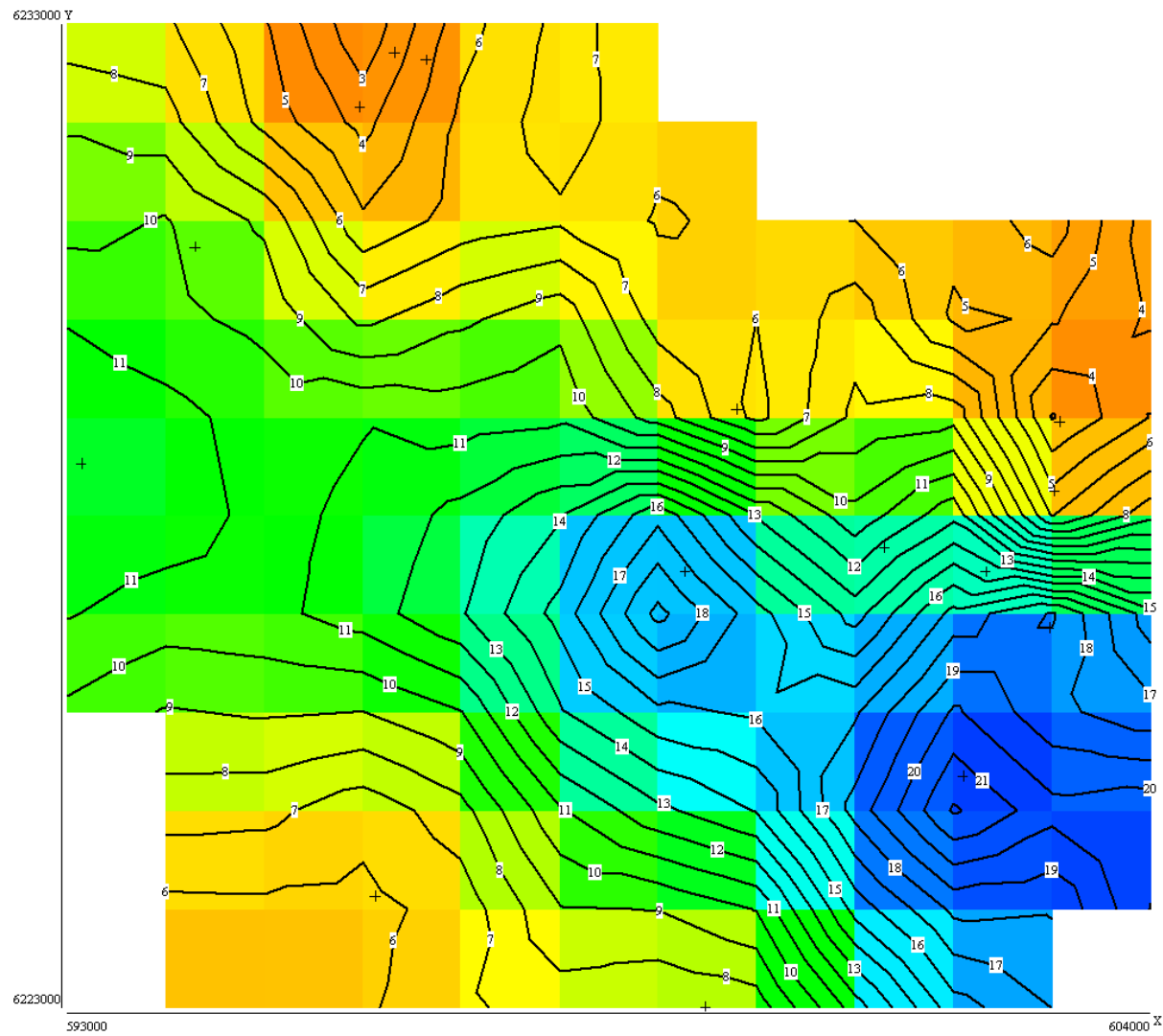
Coomealla Piezometers

Legend

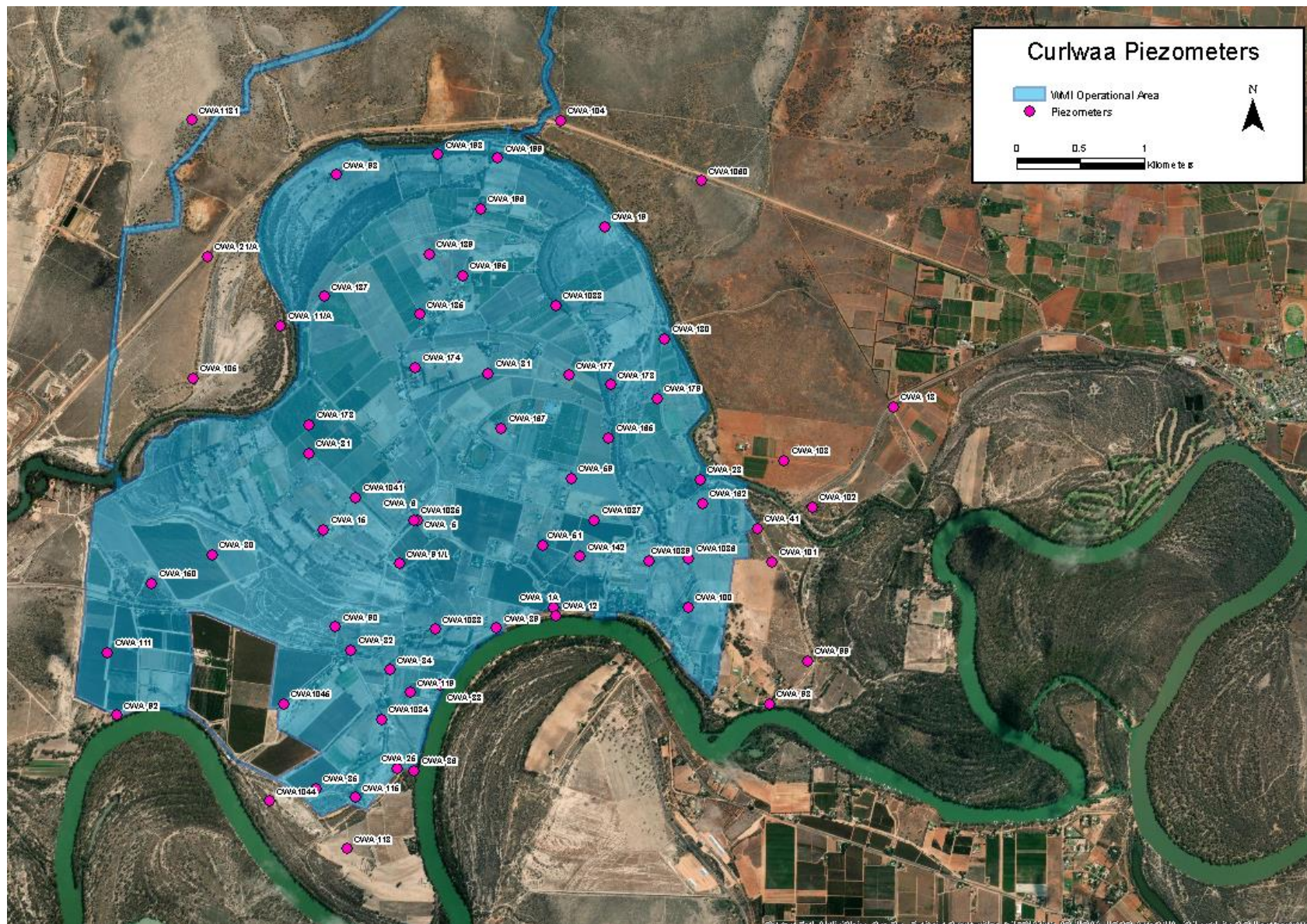
- Piezometers
- WIMI Operational Area

0 0.5 1 2 3 Kilometers

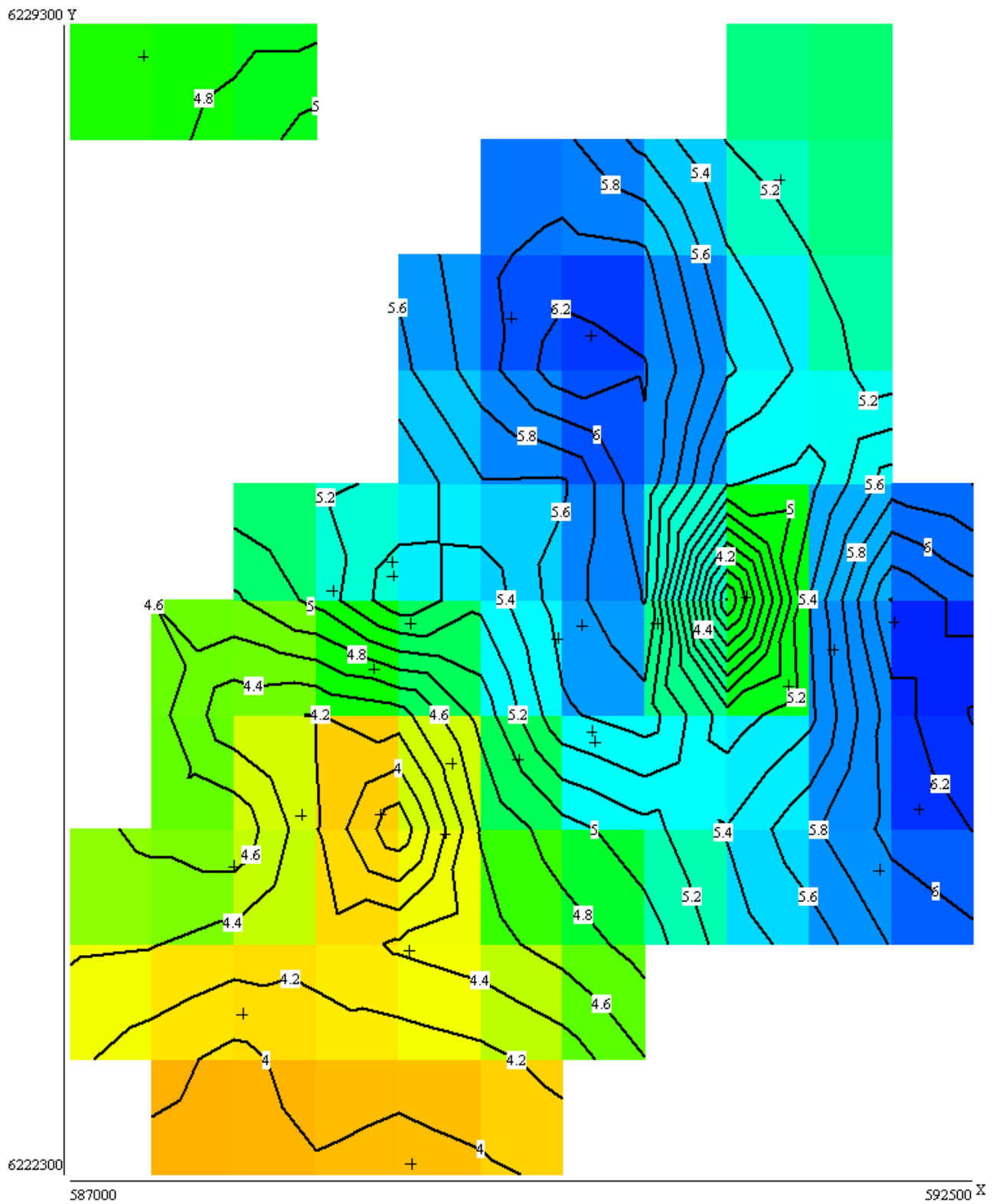
Coomealla groundwater height below natural surface (M):



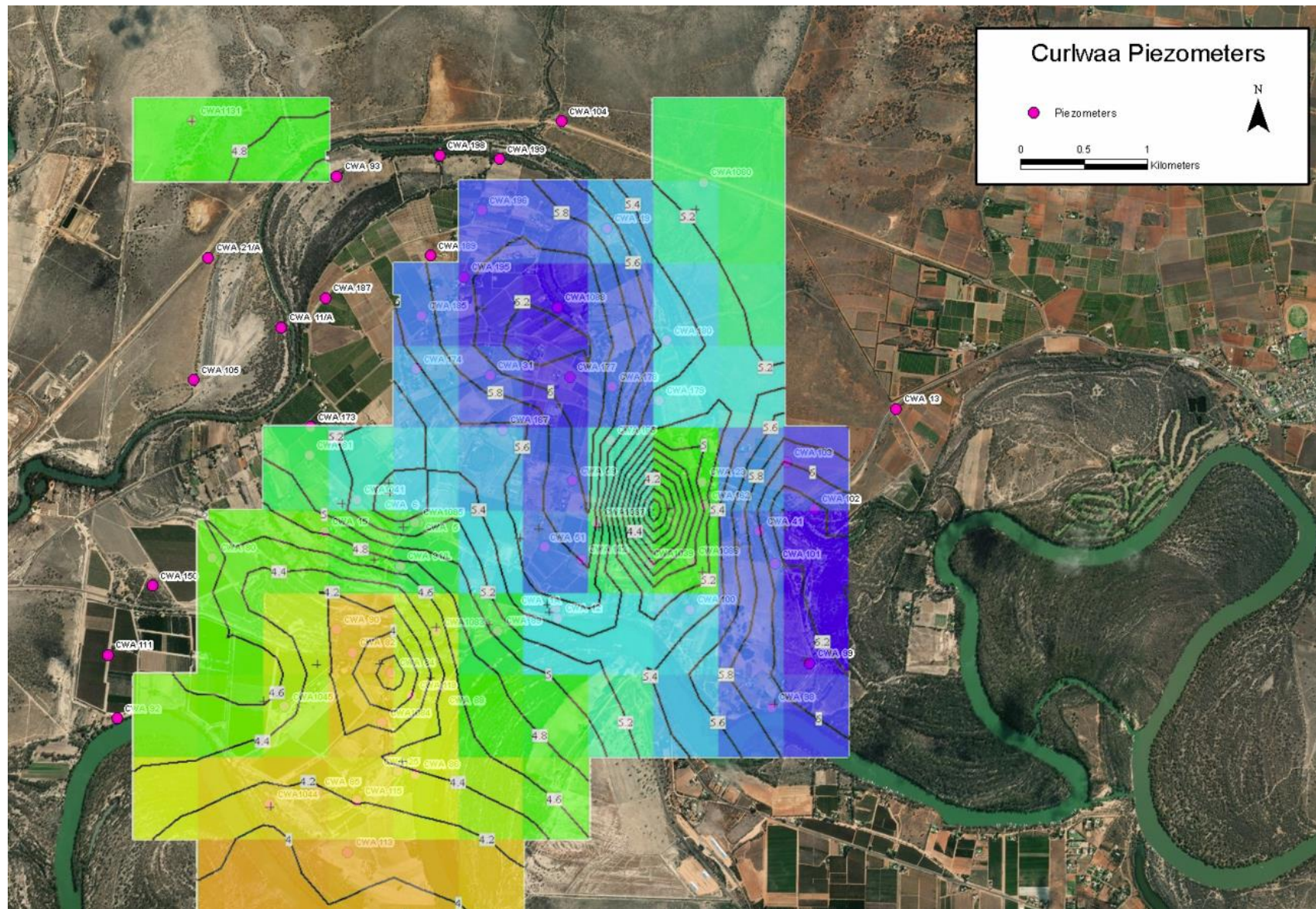
Location of Curlwaa piezometers:



Curlwaa groundwater height below natural surface (M):



Coomealla groundwater heights below natural surface (M), combined image:



Attachment 2, p.2 - Condition 2.

No consultation with the minister required, where levels have risen above the historical reference.

Contour maps have been provided at condition 1; groundwater levels have remained low for 2020/21. Continuing dry conditions have slowed down groundwater recharge; all piezometers are read in August/September of each year.

Attachment 2, p.2 - Condition 3.

Table of the area (ha) of shallow (<2M), moderate (2-4M) and >4M groundwater depth.

Approximate areas at different depths of groundwater (Ha)				
	<2M	2-4M	>4M	Total mapped area
Buronga	450	2340	6570	8910
Coomealla	0	200	9500	9700
Curlwaa	0	315	2275	2590

- Evaporation basins form a large part of our area of operations, the figures indicate this as being a large area of high groundwater, whereas it is a low laying drainage/evaporation basin.

Attachment 2, p.2 –Condition 4.

Table of the change in the three depth class areas (ha) within the area of operations, relative to the previous and historical reference years:

Approximate areas at different heights of groundwater (ha)

2020/21				
	<2M	2-4M	>4M	Total op. area
Buronga	0	30	627	657
Coomealla	0	0	4,181	4,181
Curlwaa	0	5	1,636	1,641
2019/20				
	<2M	2-4M	>4M	Total op. area
Buronga	0	35	622.29	657
Coomealla	0	200	3980.74	4,181
Curlwaa	0	90	1551	1,641
2018/19				
	<2M	2-4M	>4M	Total op. area
Buronga	0	52.5	604.79	657
Coomealla	0	200	3980.74	4,181
Curlwaa	0	70	1571	1,641
2010/11				
	<2M	2-4M	>4M	Total op. area
Buronga	3.2	13.75	640.34	657
Coomealla	473.55	204.28	3502.91	4,181
Curlwaa	0	54.91	1586.09	1,641

2020/21 - 2019/20 difference (ha)			
	<2M	2-4M	>4M
Buronga	0	-5	5
Coomealla	0	-200	200
Curlwaa	0	-85	85
2019/20 - 2018/19 difference (ha)			
	<2M	2-4M	>4M
Buronga	0	-17.5	17.5
Coomealla	0	0	0
Curlwaa	0	20	-20

2020/21 - 2010/11 difference (ha)			
	<2M	2-4M	>4M
Buronga	-3.2	16.25	-13.05
Coomealla	-473.55	-204.28	677.83
Curlwaa	0	-49.91	49.91
2019/20 - 2010/11 difference (ha)			
	<2M	2-4M	>4M
Buronga	-3.2	21.25	-18.05
Coomealla	-473.55	-4.28	477.83
Curlwaa	0	35.09	-35.09

River has remained at normal level and low rainfall has not charged the water table. Water table appears to have dropped slightly in all areas. 2010/11 has been used as a significant historical year; up until August 2010 the prior year was close to average rainfall, followed by the wettest year ever. Groundwater monitoring and SIS review made an observation that significant rainfall changes the groundwater temporarily; below are monthly rainfall figures covering this monitoring period.

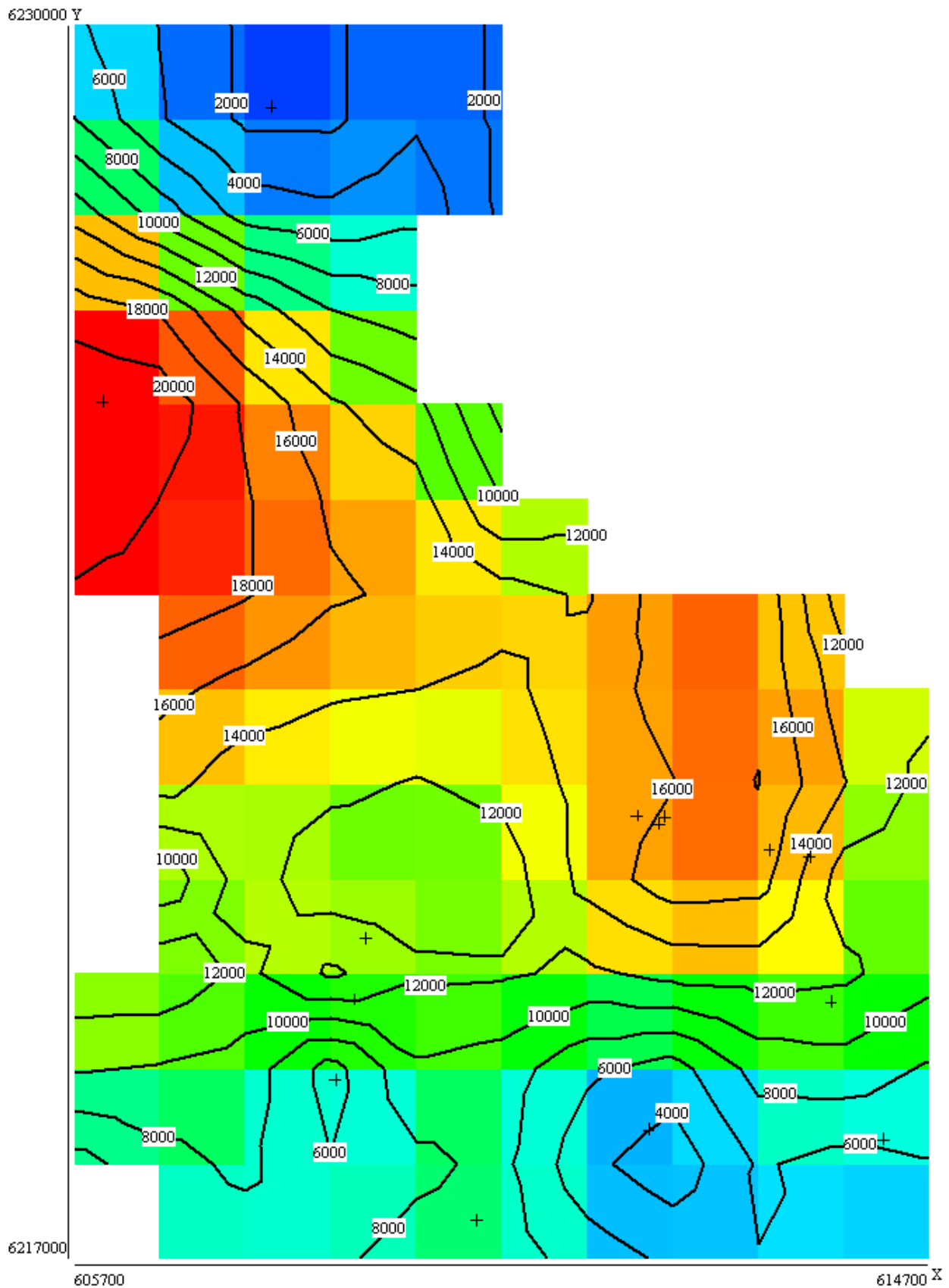
Monthly rainfall BOM – Mildura Airport:

Season	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total	Total 2 years	Total 3 years
2009/10	11.8	8.2	30.4	10.8	65.6	13.2	8.4	19.8	35.8	18.8	51.2	14.6	288.6	517.6	668.4
2010/11	25.6	28.8	54.8	88.8	103.6	141.0	129.4	192.6	122.0	12.6	14.2	10.6	924.0	1,212.6	1,441.6
2011/12	15.4	20.8	7.2	27.6	43.4	61.8	12.6	36.6	64.2	4.0	2.6	8.0	304.2	1,228.2	1,516.8
2012/13	41.4	17.0	13.6	7.0	4.6	4.4	1.2	14.6	10.8	6.2	29.2	35.8	185.8	490.0	1,414.0
2013/14	14.8	10.4	18.8	14.4	2.4	57.8	0.6	67.2	29.2	58.4	22.8	6.4	303.2	489.0	793.2
2014/15	13.0	18.2	18.6	0.6	13.4	9.6	57.0	0.6	0.0	93.0	10.2	30.6	264.8	568.0	753.8
2015/16	11.6	12.0	13.0	3.8	6.0	1.6	68.2	0.2	0.4	3.0	43.4	18.2	181.4	446.2	749.4
2016/17	19.2	30.8	93.6	24.8	51.2	5.6	29.4	5.2	4.2	44.0	19.6	1.8	329.4	510.8	775.6
2017/18	4.0	34.0	4.0	23.0	55.4	45.0	3.4	0.2	2.2	1.8	17.4	19.2	209.6	539.0	720.4
2018/19	3.4	10.6	0.8	12.2	19.2	44.6	2.6	2.8	3.0	1.8	48.0	13.4	162.4	372.0	701.4
2019/20	10.4	5.4	12.0	0.0	13.8	2.6	2.8	11.0	27.6	48.6	48.1	8.4	190.7	353.1	562.7
2020/21	10.4	41.6	25.0	59.0	5.2	8.6	45.0	0.2	4.8	0.0	8.0	30.6	238.4	429.1	591.5
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total		
50 Yr Average	23.2	25.2	27.1	28.2	25.5	27.0	24.6	20.3	16.8	21.1	23.0	21.1	283.1		
Max Year in 50	53.6	74.8	93.6	120.6	103.6	181.2	129.4	192.6	122.0	120.4	70.2	82.2	924.0	2010/11	924.0
Min Year in 50	0.6	1.2	0.8	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	97.4	1982/83	97.4

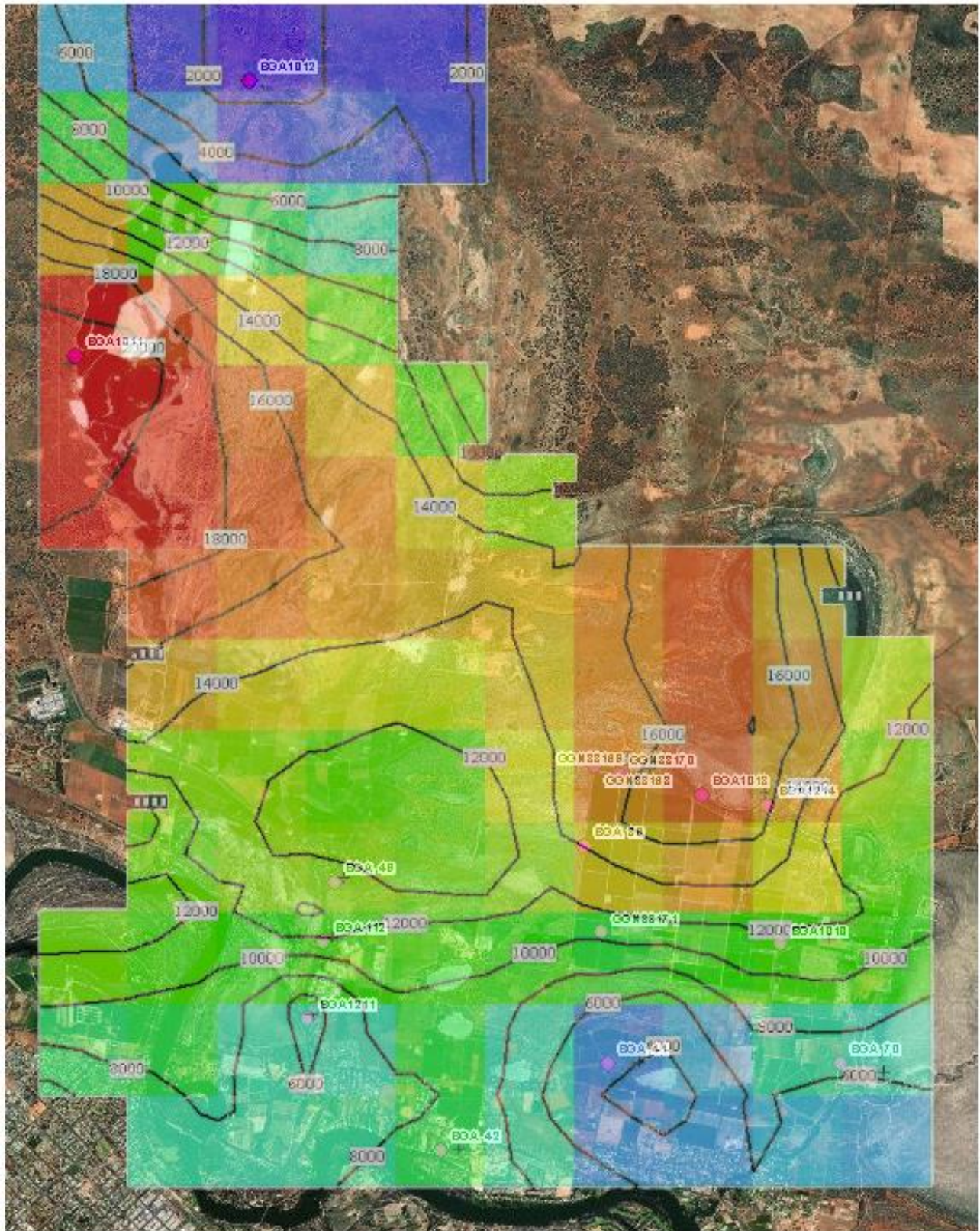
Attachment 2, p.2 – Condition 5

Groundwater salinity @ 0-2000, -5000,-10,000, -20,000,-30,000,-40,000 micro-Siemens/cm contours:

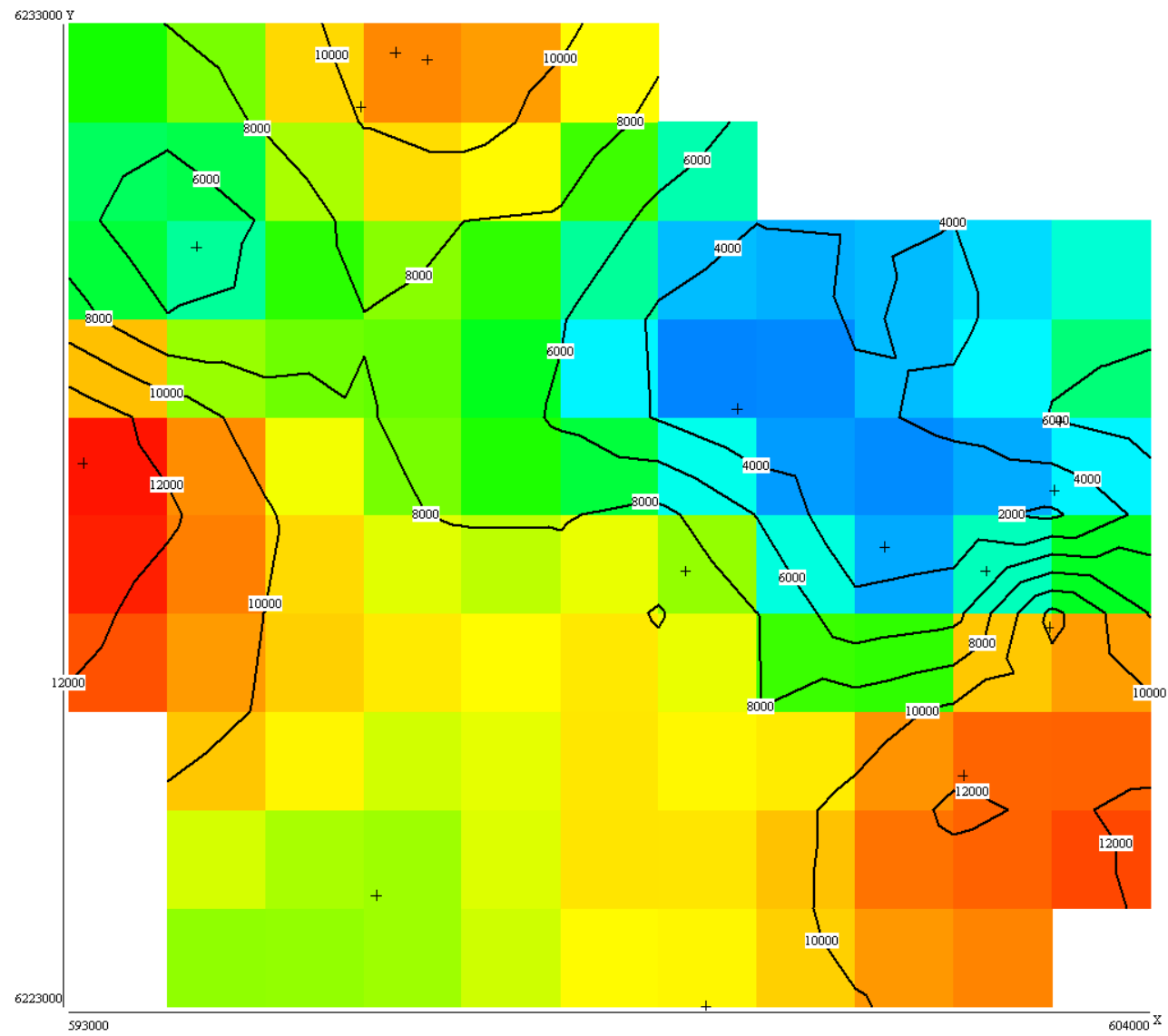
Buronga Salinity Contours:



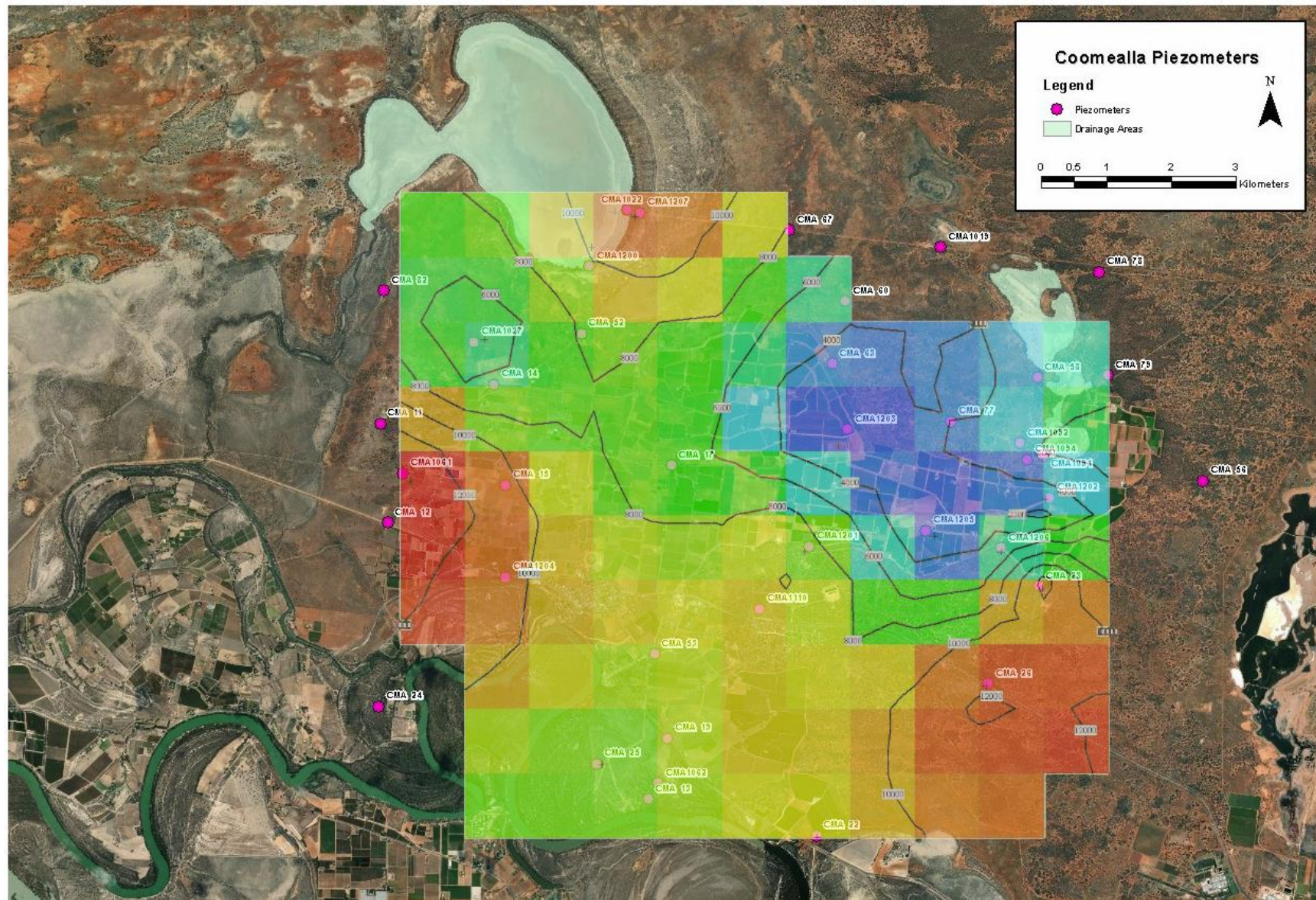
Buronga Salt Contours – Combined Image:



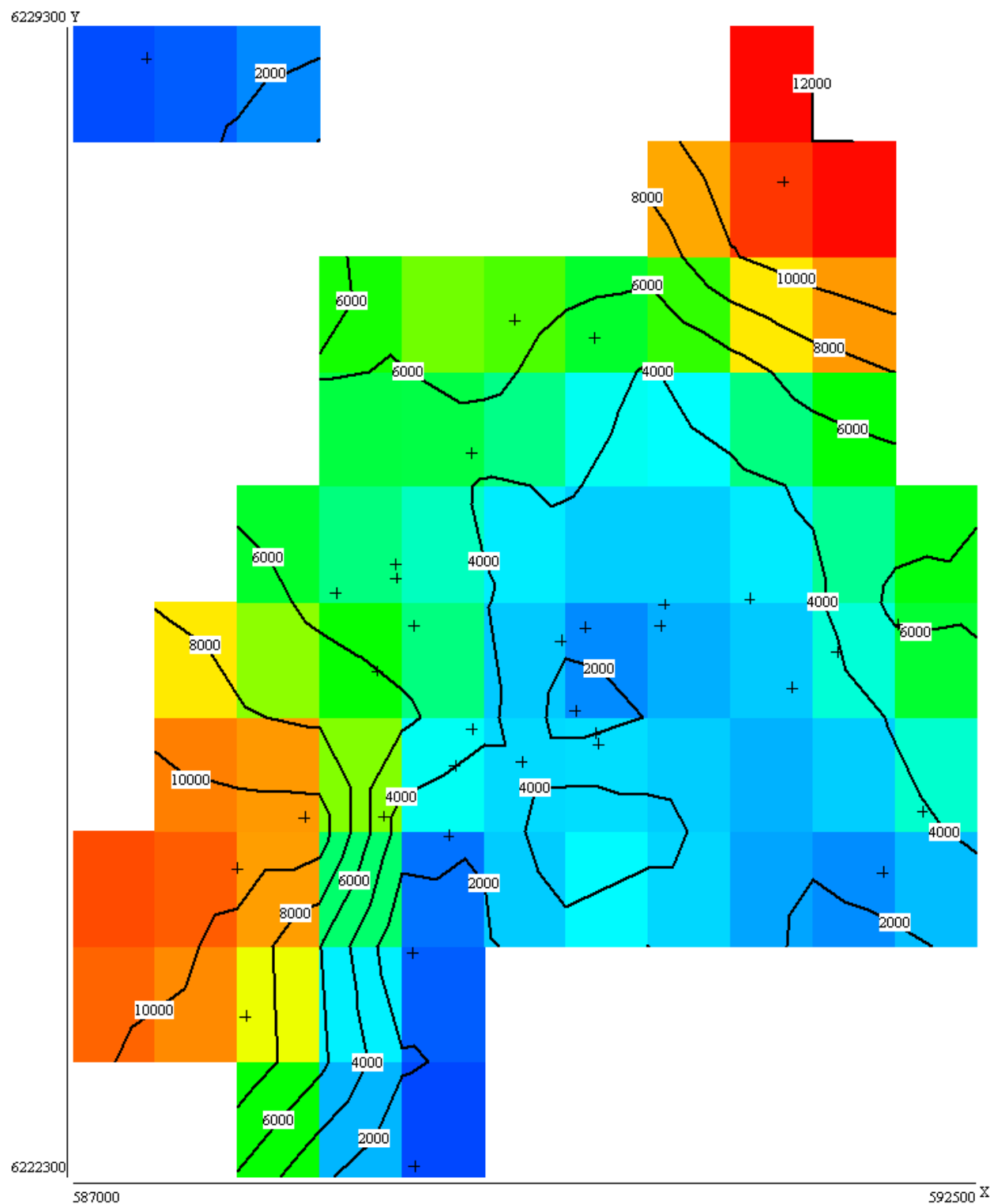
Coomealla Salinity Contours:



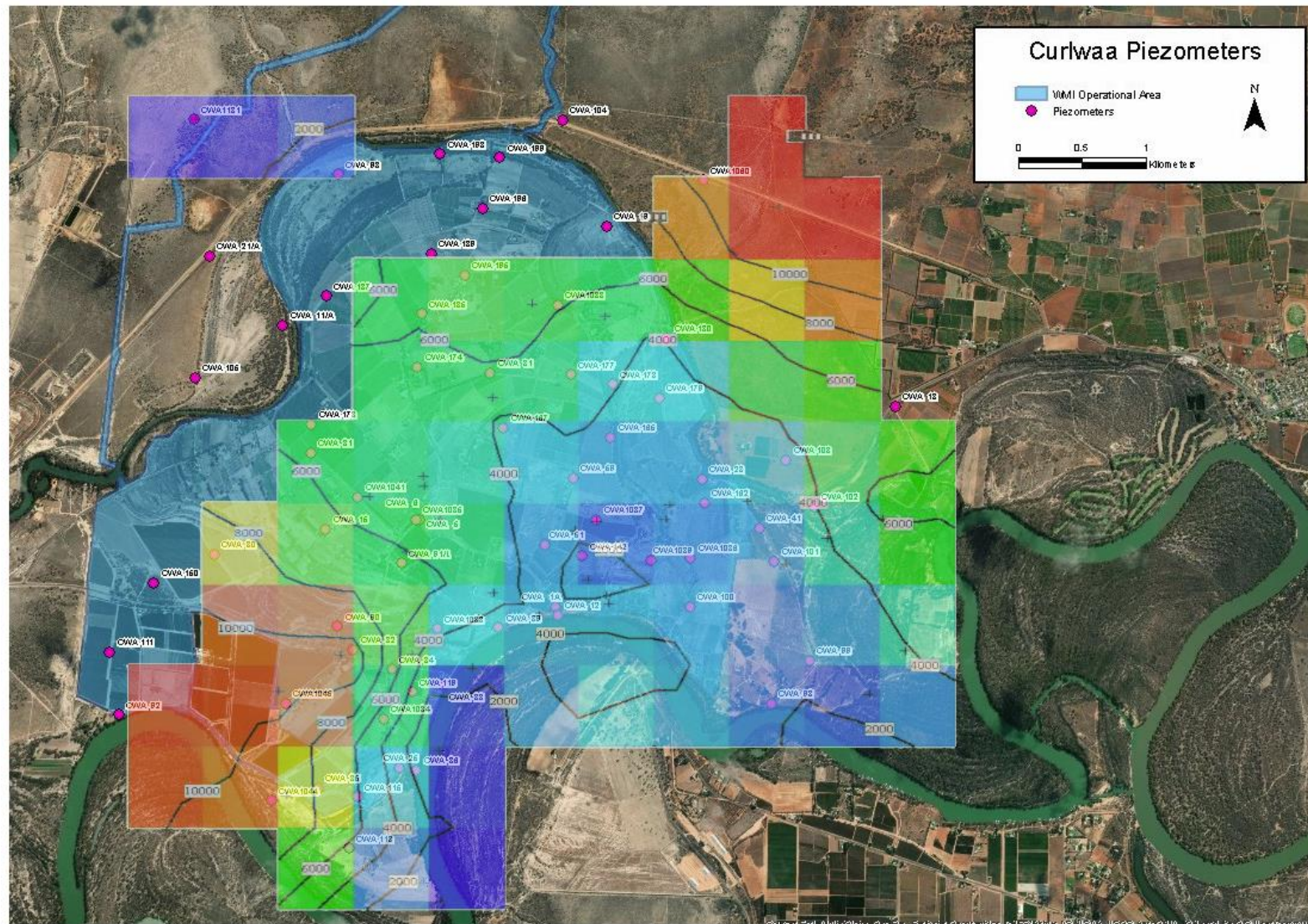
Coomealla Salt Contours – Combined Image:



Curlwaa Salinity Contours:



Coomealla Salt Contours – Combined Image:



Tabulated approximate salinity (microSiemens/cm) interval areas, within areas of operations boundary, relative to the previous and historical reference year:

Approximate areas at different EC of groundwater (ha)

2020/21							
	0-2000	-5000	-10000	-20,000	-30,000	-40,000	Total op. area
Buronga	0	90	210	357	0	0	657
Coomealla	0	1200	2231	750	0	0	4,181
Curlwaa	0	525	1046	70	0	0	1,641
2019/20							
	0-2000	-5000	-10000	-20,000	-30,000	-40,000	Total op. area
Buronga	0	90	297	270	0	0	657
Coomealla	0	900	1400	1881	0	0	4,181
Curlwaa	315	560	556	210	0	0	1,641
2018/19							
	0-2000	-5000	-10000	-20,000	-30,000	-40,000	Total op. area
Buronga	0	100	500	57	0	0	657
Coomealla	5	1120	1656	1400	0	0	4,181
Curlwaa	280	735	521	105	0	0	1,641
2010/11							
	0-2000	-5000	-10000	-20,000	-30,000	-40,000	Total op. area
Buronga	7	20	154	141	148	188	657
Coomealla	123	615	984	1312	943	205	4,181
Curlwaa	43	756	194	432	130	86	1,641

2020/21 - 2019/20 difference (ha)						
	0-2000	-5000	-10000	-20,000	-30,000	-40,000
Buronga	0	0	-87	87	0	0
Coomealla	0	300	831	-1131	0	0
Curlwaa	-315	-35	490	-140	0	0
2019/20 - 2018/19 difference (ha)						
	0-2000	-5000	-10000	-20,000	-30,000	-40,000
Buronga	0	-10	-203	213	0	0
Coomealla	-5	-220	-256	481	0	0
Curlwaa	35	-175	35	105	0	0

2020/21 - 2010/11 difference (ha)						
	0-2000	-5000	-10000	-20,000	-30,000	-40,000
Buronga	-7	70	56	216	-148	-188
Coomealla	-123	585	1247	-562	-943	-205
Curlwaa	-43	-231	852	-362	-130	-86

Attachment 2, p.2 – Condition 6.

It is unknown whether there are alternative presentation formats approved by the minister, therefore presentation is as close as possible to requested.

Attachment 2, p.3

Groundwater Control bores (Tubewells) Details

The tubewells have been mainly inoperative due to low groundwater levels, maintenance runs have only been carried out, Knipes remains inoperative as explained earlier in the report:

District	Curlwaa										Location Details				Type	Submersible Pumps			
Work/Site Identifier	CWA 1										Coordinates (WGS84)				Dimensions	100mm			
Name	Tubewell Pump Station										E				N	X- Section = 0.01m ²			
Representing discharge	Discharge to Fletchers Creek										Capacity					2 ML/D			
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Totals	Max	Min	Av.	Site Visits		
Volume (ML)	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0 ML	0.0	0.0	0.0	Flow	No Flow	
Salt Load (T)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0 T	0.0	0.0	0.0			
Average EC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0	NA	0	52	

District	Curlwaa										Location Details				Type	Submersible Pump			
Work/Site Identifier	CW 2										Coordinates (WGS84)				Dimensions	100mm			
Name	Tubewell Pump No.1 - Knipes										E				N	X- Section = 0.01m ²			
Representing discharge	Discharges to James' Highway										Capacity					0.5 ML/D			
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Totals	Max	Min	Av.	Site Visits		
Volume (ML)	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 ML	0.0	0.0	0.0	Flow	No Flow	
Salt Load (T)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 T	0.0	0.0	0.0			
Average EC	0	NA	0	0	NA	0	0	0	0	0	NA	0	0	0	0	NA	0	52	

District	Curlwaa										Location Details				Type	Submersible Pump			
Work/Site Identifier	CW 3										Coordinates (WGS84)				Dimensions	100mm			
Name	Tubewell Pump No.2 - Acacia Road										E				N	X- Section = 0.01m ²			
Representing discharge	Discharges to Tubewell Station										Capacity					0.5 ML/D			
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Totals	Max	Min	Av.	Site Visits		
Volume (ML)	0.00	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.02	0.0	0.0 ML	0.0	0.0	0.0	Flow	No Flow	
Salt Load (T)	0.0	0.0	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00 T	0.0	0.0	0.0			
Average EC	NA	NA	NA	NA	NA	135	NA	NA	NA	NA	135	NA	0	135	135	135	2	50	

District	Curlwaa										Location Details				Type	Submersible Pump			
Work/Site Identifier	CW 4										Coordinates (WGS84)				Dimensions	100mm			
Name	Tubewell Pump No.3 - Olive Lane										E				N	X- Section = 0.01m ²			
Representing discharge	Discharges to Tubewell Station										Capacity					0.5 ML/D			
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Totals	Max	Min	Av.	Site Visits		
Volume (ML)	0.00	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.04	0.0	0.1 ML	0.0	0.0	0.0	Flow	No Flow	
Salt Load (T)	0.0	0.0	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01 T	0.0	0.0	0.0			
Average EC	NA	NA	NA	NA	NA	135	NA	NA	NA	NA	135	NA	0	135	135	135	2	50	

District	Curlwaa										Location Details				Type	Submersible Pump			
Work/Site Identifier	CW 5										Coordinates (WGS84)				Dimensions	100mm			
Name	Tubewell Pump No.4 - Rice's										590420E				6226103N	X- Section = 0.01m ²			
Representing discharge	Discharges to Tubewell Station										Capacity					0.5 ML/D			
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Totals	Max	Min	Av.	Site Visits		
Volume (ML)	0.00	0.0	0.00	0.0	0.0	0.02	0.0	0.0	0.00	0.0	0.02	0.0	0.05 ML	0.02	0.00	0.0	Flow	No Flow	
Salt Load (T)	0.0	0.0	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.004 T	0.002	0.0	0.0			
Average EC	NA	NA	NA	NA	NA	135	NA	NA	NA	NA	135	NA	0	135	135	135	2	50	

Quality Assurance for Monitoring & Reporting

Condition 3.

All monitoring and reporting is carried out in accordance with the DPI NSW publication "Salinity Training Manual" (2014).

Presentation of Data

Condition 4.

There has been no written request from the minister for presentation of any primary monitoring data or other material.

Environment Protection and Management Requirements

Discharge of Noxious Aquatic weeds

Condition 5.

WMI did not identify any noxious aquatic weeds. The natural flow of the river during the year continued to flush weeds through the river system.

Discharge of Blue-Green Algae

Condition 6.

WMI pumps directly from the River Murray and has a fully pipelined system. Blue green algae monitoring on the river is performed by external parties and reported to stakeholders, including WMI. No discharge of Blue-Green Algae.

Basin Salinity Management Strategy

Condition 7.

There were no practices undertaken to increase the salinity debit, however it is evident that WMI has improved salinity management over the long term.
