

EPL20350 WATER MONITORING RESULTS 2015/2016 - QUARTER 4

LICENCE HOLDER PREMISES	Santos NSW (Eastern) Pty Ltd Narrabri Gas Field X Line Road, NARRABRI NSW 2390
LICENCE NUMBER	Environment Protection Licence 20350
EPL LINK (EPA SITE)	http://www.epa.nsw.gov.au/prpoeapp/ViewPOEOLicence.aspx?DOCID=33816&SYSUID=1&LICID=20350
SCHEDULED ACTIVITY	Coal seam gas exploration, assessment and production
REPORTING PERIOD	2015/2016, Quarter 4 - February / April 2016
PUBLISHED DATE	May 2016
MONITORING BY ANALYSIS BY	Santos ALS Laboratory, Smithfield

TABLE 1: EPL20350 WATER MONITORING LOCATIONS

Spatial reference: GDA94 MGA Zone 55

EPA Identification No.	Monitoring type	Location	Easting	Northing
7	Groundwater quality monitoring	BWD27PRORA01	755429.176	6604670.682
8	Groundwater quality monitoring	BWD27PRUPS02	755433.048	6604684.807
9	Groundwater quality monitoring	BWD26PRUPS01	749372.750	6609376.690
10	Groundwater quality monitoring	BWD26PRLPS02	749364.450	6609363.350
11	Groundwater quality monitoring	DWH14PRUPS01	764703.313	6617145.443
12	Groundwater quality monitoring	DWH14PRLPS02	764689.147	6617119.109
13	Groundwater quality monitoring	DWH14PRUP03	764696.211	6617132.298
14	Groundwater quality monitoring	DWH3PRUPS01	762239.680	6605589.320
15	Groundwater quality monitoring	DWH3PRLPS02	762251.050	6605598.980
16	Groundwater quality monitoring	NYOPRORA01	736293.460	6643110.400
17	Groundwater quality monitoring	NYOPRUPS02	736308.800	6643107.840
18	Groundwater quality monitoring	BWD27PRLPS03	755436.361	6604699.035
20	Groundwater quality monitoring	BHN14PRORA01	747158.130	6626109.120
21	Groundwater quality monitoring	BHN14PRUPS02	747152.710	6626123.910
22	Groundwater quality monitoring	TULPRNAP01	774464.070	6612048.130
23	Groundwater quality monitoring	TULPRDGY02	774466.480	6612032.980
24	Groundwater quality monitoring	BWDMW13D	753863.300	6608108.510
25	Groundwater quality monitoring	BWDMW13S	753864.820	6608109.300
26	Groundwater quality monitoring	BWDMW12S	753830.650	6608202.740
27	Groundwater quality monitoring	BWDMW12D	753831.910	6608203.710
28	Groundwater quality monitoring	BWDMW12I	753832.680	6608202.250
29	Groundwater quality monitoring	BWDMW2	753912.830	6608241.350
30	Groundwater quality monitoring	BWDMW3	753935.870	6608254.020
31	Groundwater quality monitoring	BWDMW4D	753980.810	6608285.740
32	Groundwater quality monitoring	BWDMW4	753984.140	6608288.040
33	Groundwater quality monitoring	BWDMW15S	753868.090	6608258.340
34	Groundwater quality monitoring	BWDMW15D	753867.100	6608256.750
35	Groundwater quality monitoring	BWDMW16S	753858.950	6608316.490
36	Groundwater quality monitoring	BWDMW16D	753856.980	6608315.570
37	Groundwater quality monitoring	LWDMW1D	751387.930	6623862.960
38	Groundwater quality monitoring	LWDMW1S	751388.920	6623862.460
39	Groundwater quality monitoring	LWDMW1I	751390.640	6623861.850
40	Groundwater quality monitoring	LWDMW2S	751102.840	6622293.020
41	Groundwater quality monitoring	LWDMW2D	751101.810	6622293.150
42	Groundwater quality monitoring	LWDMW3D	751876.160	6622163.760
43	Groundwater quality monitoring	LWDMW3S	751876.470	6622164.930
44	Groundwater level monitoring	DWH8AGMB1	765546.740	6616987.990
45	Groundwater level monitoring	DWH8AGMB2	765546.740	6616987.990

EPA Identification No.	Monitoring type	Location	Easting	Northing
46	Groundwater level monitoring	DWH8AGMB3	765546.740	6616987.990
47	Groundwater level monitoring	BWD28QGUPS01	752949.898	6604219.732
48	Groundwater level monitoring	BWD28QGLPS01	752949.898	6604219.732
49	Groundwater level monitoring	BWD28QGPUR01	752949.898	6604219.732
50	Groundwater quality monitoring	WPKMW01	755684.140	6638105.310
51	Groundwater quality monitoring	WPKMW01D	755689.750	6638097.350
52	Groundwater quality monitoring	WPKMW02	755671.200	6638034.290
53	Groundwater quality monitoring	WPKMW04	755632.500	6637993.070
54	Groundwater quality monitoring	WPKMW07	755501.160	6638207.530
55	Groundwater quality monitoring	WPKMW08	755634.110	6638166.870
56	Groundwater quality monitoring	WPKMW09D	755663.980	6637988.200
57	Groundwater quality monitoring	WPKMW09S	755664.400	6637990.540
58	Groundwater quality monitoring	WPKMW12S	755456.180	6638228.910
59	Groundwater quality monitoring	WPKMW13I	755552.650	6638189.560
60	Groundwater quality monitoring	WPKMW13S	755554.880	6638189.050
61	Groundwater quality monitoring	WPKMW14D	755364.510	6638049.060
62	Groundwater quality monitoring	WPKMW14S	755364.770	6638048.260
63	Groundwater quality monitoring	WPKMW15D	755365.480	6638233.360
64	Groundwater quality monitoring	WPKMW15S	755365.500	6638230.740
65	Groundwater quality monitoring	WPKMW16D	755051.030	6637988.500
66	Groundwater quality monitoring	WPKMW16S	755050.530	6637986.640
67	Groundwater quality monitoring	WPKMW17D	756151.060	6638128.320
68	Groundwater quality monitoring	WPKMW17S	756149.540	6638128.050
69	Produced water storage dam	BWDPD2	753875.870	6607995.060
70	Produced water storage dam	BWDPD3	753992.170	6608125.970
71	Produced water storage dam	LWDPD1CELL4	751473.349	6623513.252
72	Produced water storage dam	LWDPD1CELL3	751460.723	6623323.850
73	Produced water storage dam	LWDPD1CELL2	751428.103	6623124.978
74	Produced water storage dam	LWDPD1CELL1	751390.223	6622935.575
75	Produced water storage dam	TFDPD1	755611.600	6638072.850
76	Produced water storage dam	TFDPD2	755480.110	6638099.040

TABLE 2: ANALYTES MONITORED, FREQUENCY AND SAMPLING METHOD

Analyte	Units of measure	Frequency	Sampling method
Aluminium	milligrams per litre	Every 6 months	Grab sample
Ammonia	milligrams per litre	Every 6 months	Grab sample
Arsenic	milligrams per litre	Every 6 months	Grab sample
Barium	milligrams per litre	Every 6 months	Grab sample
Beryllium	milligrams per litre	Every 6 months	Grab sample
Bicarbonate	milligrams per litre	Every 6 months	Grab sample
Boron	milligrams per litre	Every 6 months	Grab sample
Bromide	milligrams per litre	Every 6 months	Grab sample
Cadmium	milligrams per litre	Every 6 months	Grab sample
Calcium	milligrams per litre	Every 6 months	Grab sample
Carbonate	milligrams per litre	Every 6 months	Grab sample
Chloride	milligrams per litre	Every 6 months	Grab sample
Chromium	milligrams per litre	Every 6 months	Grab sample
Cobalt	milligrams per litre	Every 6 months	Grab sample
Copper	milligrams per litre	Every 6 months	Grab sample
Dissolved Oxygen	milligrams per litre	Quarterly	In situ
Electrical Conductivity	microsiemens per centimetre	Quarterly	In situ
Fluoride	milligrams per litre	Every 6 months	Grab sample
Iron	milligrams per litre	Every 6 months	Grab sample
Lead	milligrams per litre	Every 6 months	Grab sample
Magnesium	milligrams per litre	Every 6 months	Grab sample
Manganese	milligrams per litre	Every 6 months	Grab sample
Mercury	milligrams per litre	Every 6 months	Grab sample
Methane	milligrams per litre	Every 6 months	Grab sample
Molybdenum	milligrams per litre	Every 6 months	Grab sample
Nickel	milligrams per litre	Every 6 months	Grab sample
Nitrate	milligrams per litre	Every 6 months	Grab sample
Nitrite	milligrams per litre	Every 6 months	Grab sample
pH	pH Unit	Quarterly	In situ
Potassium	milligrams per litre	Every 6 months	Grab sample
Reactive Phosphorus	milligrams per litre	Every 6 months	Grab sample
Redox Potential	millivolts	Quarterly	In situ
Selenium	milligrams per litre	Every 6 months	Grab sample
Sodium	milligrams per litre	Every 6 months	Grab sample
Sodium Adsorption Ratio	-	Every 6 months	Grab sample
Standing Water Level	metres below ground level	Quarterly	In situ
Strontium	milligrams per litre	Every 6 months	Grab sample
Sulfate	milligrams per litre	Every 6 months	Grab sample
Total Dissolved Solids	milligrams per litre	Every 6 months	Grab sample
Total Organic Carbon	milligrams per litre	Every 6 months	Grab sample
Total Phosphorus	milligrams per litre	Every 6 months	Grab sample
Uranium	milligrams per litre	Every 6 months	Grab sample
Vanadium	milligrams per litre	Every 6 months	Grab sample
Zinc	milligrams per litre	Every 6 months	Grab sample

Table 3: Water Monitoring Results 4th Quarter - February / April 2016

EPA Identification no.		7	8	9	10	11	12	13	14
Location		BWD27PRORA01	BWD27PRUPS02	BWD26PRUPS01	BWD26PRLPS02	DWH14PRUPS01	DWH14PRLPS02	DWH14PRPUR03	DWH3PRUPS01
Date Sampled		6/04/2016	6/04/2016	12/04/2016	12/04/2016	5/04/2016	5/04/2016	5/04/2016	12/04/2016
Sample obtained		No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample method		DRY WELL	In Situ	In Situ	In Situ	In Situ	In Situ	In Situ	In Situ
Units		LOR	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Aluminium	mg/L	0.01	-	-	-	-	-	-	-
Ammonia	mg/L	0.01	-	-	-	-	-	-	-
Arsenic	mg/L	0.001	-	-	-	-	-	-	-
Barium	mg/L	0.001	-	-	-	-	-	-	-
Beryllium	mg/L	0.001	-	-	-	-	-	-	-
Bicarbonate	mg/L	1	-	-	-	-	-	-	-
Boron	mg/L	0.05	-	-	-	-	-	-	-
Bromide	mg/L	0.01	-	-	-	-	-	-	-
Cadmium	mg/L	0.0001	-	-	-	-	-	-	-
Calcium	mg/L	1	-	-	-	-	-	-	-
Carbonate	mg/L	1	-	-	-	-	-	-	-
Chloride	mg/L	1	-	-	-	-	-	-	-
Chromium	mg/L	0.001	-	-	-	-	-	-	-
Cobalt	mg/L	0.001	-	-	-	-	-	-	-
Copper	mg/L	0.001	-	-	-	-	-	-	-
Dissolved Oxygen	mg/L	-	2.56	1.42	0.45	1.28	0.95	0.89	2.72
Electrical Conductivity	µS/cm	-	144.9	74.5	151.4	206.6	200	618	120.2
Fluoride	mg/L	0.1	-	-	-	-	-	-	-
Iron	mg/L	0.05	-	-	-	-	-	-	-
Lead	mg/L	0.001	-	-	-	-	-	-	-
Magnesium	mg/L	1	-	-	-	-	-	-	-
Manganese	mg/L	0.001	-	-	-	-	-	-	-
Mercury	mg/L	0.0001	-	-	-	-	-	-	-
Methane	µg/L	10	-	-	-	-	-	-	-
Molybdenum	mg/L	0.001	-	-	-	-	-	-	-
Nickel	mg/L	0.001	-	-	-	-	-	-	-
Nitrate	mg/L	0.01	-	-	-	-	-	-	-
Nitrite	mg/L	0.01	-	-	-	-	-	-	-
pH	pH Unit	-	4.75	5.38	5.79	5.01	5.23	10.34	4.6
Potassium	mg/L	1	-	-	-	-	-	-	-
Reactive Phosphorus	mg/L	0.01	-	-	-	-	-	-	-
Redox Potential	mV	-	167.2	168.9	-53.8	211.8	65.6	-239.5	279
Selenium	mg/L	0.01	-	-	-	-	-	-	-
Sodium	mg/L	1	-	-	-	-	-	-	-
Sodium Adsorption Ratio (Storages)	-	0.01	-	-	-	-	-	-	-
Standing Water Level	mbgl	-	38.79	29.335	28.83	53.37	54.12	53.43	67.41
Strontium	mg/L	0.001	-	-	-	-	-	-	-
Sulfate	mg/L	1	-	-	-	-	-	-	-
Total Dissolved Solids	mg/L	10	-	-	-	-	-	-	-
Total Organic Carbon (Storages)	mg/L	1	-	-	-	-	-	-	-
Total Phosphorus (Storages)	mg/L	0.01	-	-	-	-	-	-	-
Uranium	mg/L	0.001	-	-	-	-	-	-	-
Vanadium	mg/L	0.01	-	-	-	-	-	-	-
Zinc	mg/L	0.005	-	-	-	-	-	-	-

EPA Identification no.	15	16	17	18	20	21	22	23		
Location	DWH3PRLPS02	NYOPRORA01	NYOPRUPS02	BWD27PRLPS03	BHN14PRORA01	BHN14PRUPS02	TULPRNAP01	TULPRDGY02		
Date Sampled	12/04/2016	7/04/2016	7/04/2016	6/04/2016	7/04/2016	7/04/2016	6/04/2016	6/04/2016		
Sample obtained	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Sample method	In Situ	In Situ	In Situ	In Situ	In Situ	In Situ	In Situ	In Situ		
Units	LOR	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT		
Aluminium	mg/L	0.01	-	-	-	-	-	-		
Ammonia	mg/L	0.01	-	-	-	-	-	-		
Arsenic	mg/L	0.001	-	-	-	-	-	-		
Barium	mg/L	0.001	-	-	-	-	-	-		
Beryllium	mg/L	0.001	-	-	-	-	-	-		
Bicarbonate	mg/L	1	-	-	-	-	-	-		
Boron	mg/L	0.05	-	-	-	-	-	-		
Bromide	mg/L	0.01	-	-	-	-	-	-		
Cadmium	mg/L	0.0001	-	-	-	-	-	-		
Calcium	mg/L	1	-	-	-	-	-	-		
Carbonate	mg/L	1	-	-	-	-	-	-		
Chloride	mg/L	1	-	-	-	-	-	-		
Chromium	mg/L	0.001	-	-	-	-	-	-		
Cobalt	mg/L	0.001	-	-	-	-	-	-		
Copper	mg/L	0.001	-	-	-	-	-	-		
Dissolved Oxygen	mg/L	-	1.8	0.2	0.4	1.3	0.12	0.22	2.53	3.72
Electrical Conductivity	µS/cm	-	136	1296	1280	207.3	506.5	471.3	6928	6793
Fluoride	mg/L	0.1	-	-	-	-	-	-	-	-
Iron	mg/L	0.05	-	-	-	-	-	-	-	-
Lead	mg/L	0.001	-	-	-	-	-	-	-	-
Magnesium	mg/L	1	-	-	-	-	-	-	-	-
Manganese	mg/L	0.001	-	-	-	-	-	-	-	-
Mercury	mg/L	0.0001	-	-	-	-	-	-	-	-
Methane	µg/L	10	-	-	-	-	-	-	-	-
Molybdenum	mg/L	0.001	-	-	-	-	-	-	-	-
Nickel	mg/L	0.001	-	-	-	-	-	-	-	-
Nitrate	mg/L	0.01	-	-	-	-	-	-	-	-
Nitrite	mg/L	0.01	-	-	-	-	-	-	-	-
pH	pH Unit	-	4.89	7.78	7.77	5.19	6.93	6.92	6.73	6.6
Potassium	mg/L	1	-	-	-	-	-	-	-	-
Reactive Phosphorus	mg/L	0.01	-	-	-	-	-	-	-	-
Redox Potential	mV	-	259.3	-227.8	-188.9	142.3	-141.4	-149.1	-98	-242.1
Selenium	mg/L	0.01	-	-	-	-	-	-	-	-
Sodium	mg/L	1	-	-	-	-	-	-	-	-
Sodium Adsorption Ratio (Storages)	-	0.01	-	-	-	-	-	-	-	-
Standing Water Level	mbgl	-	67.62	0.81	0	38.28	26.49	15.19	100.03	74.59
Strontium	mg/L	0.001	-	-	-	-	-	-	-	-
Sulfate	mg/L	1	-	-	-	-	-	-	-	-
Total Dissolved Solids	mg/L	10	-	-	-	-	-	-	-	-
Total Organic Carbon (Storages)	mg/L	1	-	-	-	-	-	-	-	-
Total Phosphorus (Storages)	mg/L	0.01	-	-	-	-	-	-	-	-
Uranium	mg/L	0.001	-	-	-	-	-	-	-	-
Vanadium	mg/L	0.01	-	-	-	-	-	-	-	-
Zinc	mg/L	0.005	-	-	-	-	-	-	-	-

EPA Identification no.			24	25	26	27	28	29	30	31
Location			BWDMW13D	BWDMW13S	BWDMW12S	BWDMW12D	BWDMW12I	BWDMW2	BWDMW3	BWDMW4D
Date Sampled			2/03/2016	1/03/2016	29/02/2016	2/03/2016	2/03/2016	29/02/2016	2/03/2016	2/03/2016
Sample obtained			Yes	No	No	Yes	Yes	No	Yes	Yes
Sample method			Grab	Dry Well	Dry Well	Grab	Grab	Dry Well	Grab	Grab
Units	LOR	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Aluminium	mg/L	0.01	0.02			0.07	< 0.01		< 0.01	0.01
Ammonia	mg/L	0.01	< 0.01			< 0.01	< 0.01		4.41	< 0.01
Arsenic	mg/L	0.001	< 0.001			< 0.001	< 0.001		0.005	< 0.001
Barium	mg/L	0.001	0.766			4.00	7.96		0.155	0.085
Beryllium	mg/L	0.001	< 0.001			< 0.001	< 0.001		< 0.001	< 0.001
Bicarbonate	mg/L	1	132			4360	8000		101	55
Boron	mg/L	0.05	< 0.05			< 0.05	< 0.05		< 0.05	< 0.05
Bromide	mg/L	0.01	1.11			5.58	8.82		0.580	0.138
Cadmium	mg/L	0.0001	0.0002			< 0.0001	< 0.0001		< 0.0001	< 0.0001
Calcium	mg/L	1	11			30	4		8	4
Carbonate	mg/L	1	< 1			< 1	< 1		< 1	< 1
Chloride	mg/L	1	465			1280	2090		188	40
Chromium	mg/L	0.001	< 0.001			< 0.001	0.002		< 0.001	< 0.001
Cobalt	mg/L	0.001	0.014			0.001	0.011		0.012	< 0.001
Copper	mg/L	0.001	< 0.001			0.001	0.001		< 0.001	< 0.001
Dissolved Oxygen	mg/L	-	2.30			6.64	3.32		1.35	4.09
Electrical Conductivity	µS/cm	-	1453			10451	16801		856	299.3
Fluoride	mg/L	0.1	0.1			1.2	1.1		0.2	0.1
Iron	mg/L	0.05	< 0.05			< 0.05	< 0.05		5.39	< 0.05
Lead	mg/L	0.001	< 0.001			< 0.001	< 0.001		< 0.001	< 0.001
Magnesium	mg/L	1	47			428	615		16	4
Manganese	mg/L	0.001	0.090			0.009	0.013		1.77	0.003
Mercury	mg/L	0.0001	< 0.0001			< 0.0001	< 0.0001		< 0.0001	< 0.0001
Methane	µg/L	10	< 10			< 10	< 10		968	< 10
Molybdenum	mg/L	0.001	< 0.001			0.002	0.002		< 0.001	< 0.001
Nickel	mg/L	0.001	0.010			0.003	0.005		0.018	< 0.001
Nitrate	mg/L	0.01	0.21			0.11	0.30		0.86	0.30
Nitrite	mg/L	0.01	< 0.01			< 0.01	< 0.01		0.10	< 0.01
pH	pH Unit	-	5.29			7.10	7.21		4.23	6.53
Potassium	mg/L	1	19			45	48		12	6
Reactive Phosphorus	mg/L	0.01	< 0.01			< 0.05	0.13		0.04	< 0.01
Redox Potential	mV	-	160.2			108.9	107.7		65.3	88.9
Selenium	mg/L	0.01	< 0.01			< 0.01	< 0.01		< 0.01	< 0.01
Sodium	mg/L	1	176			2110	2990		121	42
Sodium Adsorption Ratio (Storages)	-	0.01								
Standing Water Level	mbgl	-	30.36			30.53	19.94		30.66	30.06
Strontium	mg/L	0.001	0.165			0.939	0.308		0.113	0.018
Sulfate	mg/L	1	8			37	17		24	17
Total Dissolved Solids	mg/L	10	1060			6730	11400		920	314
Total Organic Carbon (Storages)	mg/L	1								
Total Phosphorus (Storages)	mg/L	0.01								
Uranium	mg/L	0.001	< 0.001			0.087	0.172		< 0.001	< 0.001
Vanadium	mg/L	0.01	< 0.01			0.01	0.04		< 0.01	< 0.01
Zinc	mg/L	0.005	0.044			0.008	0.008		0.040	< 0.005

EPA Identification no.			32	33	34	35	36	37	38	39
Location			BWDMW4	BWDMW15S	BWDMW15D	BWDMW16S	BWDMW16D	LWDMW1D	LWDMW1S	LWDMW1I
Date Sampled			29/02/2016	1/03/2016	2/03/2016	1/03/2016	2/03/2016	9/03/2016	9/03/2016	9/03/2016
Sample obtained			No	No	Yes	No	Yes	Yes	No	No
Sample method			Dry Well	Dry Well	Grab	Dry Well	Grab	Grab	Dry Well	Dry Well
Units			LOR	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Aluminium	mg/L	0.01			0.04		0.12	< 0.01		
Ammonia	mg/L	0.01			< 0.01		< 0.01	0.02		
Arsenic	mg/L	0.001			< 0.001		< 0.001	< 0.001		
Barium	mg/L	0.001			0.048		0.078	0.434		
Beryllium	mg/L	0.001			< 0.001		< 0.001	< 0.001		
Bicarbonate	mg/L	1			40		39	200		
Boron	mg/L	0.05			< 0.05		< 0.05	0.13		
Bromide	mg/L	0.01			0.227		0.260	1.23		
Cadmium	mg/L	0.0001			< 0.0001		< 0.0001	< 0.0001		
Calcium	mg/L	1			3		1	7		
Carbonate	mg/L	1			< 1		< 1	< 1		
Chloride	mg/L	1			82		105	608		
Chromium	mg/L	0.001			< 0.001		< 0.001	< 0.001		
Cobalt	mg/L	0.001			< 0.001		< 0.001	< 0.001		
Copper	mg/L	0.001			< 0.001		< 0.001	< 0.001		
Dissolved Oxygen	mg/L	-			5.01		5.07	0.73		
Electrical Conductivity	µS/cm	-			462.8		465.4	2266		
Fluoride	mg/L	0.1			< 0.1		< 0.1	0.3		
Iron	mg/L	0.05			< 0.05		< 0.05	< 0.05		
Lead	mg/L	0.001			< 0.001		< 0.001	< 0.001		
Magnesium	mg/L	1			4		3	13		
Manganese	mg/L	0.001			0.003		0.014	0.029		
Mercury	mg/L	0.0001			< 0.0001		< 0.0001	< 0.0001		
Methane	µg/L	10			< 10		< 10	< 10		
Molybdenum	mg/L	0.001			< 0.001		< 0.001	0.001		
Nickel	mg/L	0.001			< 0.001		0.002	0.010		
Nitrate	mg/L	0.01			0.24		0.20	0.21		
Nitrite	mg/L	0.01			< 0.01		< 0.01	< 0.01		
pH	pH Unit	-			6.92		7.56	6.28		
Potassium	mg/L	1			7		6	13		
Reactive Phosphorus	mg/L	0.01			< 0.01		< 0.01	0.10		
Redox Potential	mV	-			117.2		111.9	84.6		
Selenium	mg/L	0.01			< 0.01		< 0.01	< 0.01		
Sodium	mg/L	1			67		72	428		
Sodium Adsorption Ratio (Storages)	-	0.01								
Standing Water Level	mbgl	-			30.1		29.94	29.97		
Strontium	mg/L	0.001			0.024		0.014	0.136		
Sulfate	mg/L	1			33		2	20		
Total Dissolved Solids	mg/L	10			294		700	1310		
Total Organic Carbon (Storages)	mg/L	1								
Total Phosphorus (Storages)	mg/L	0.01								
Uranium	mg/L	0.001			< 0.001		< 0.001	< 0.001		
Vanadium	mg/L	0.01			< 0.01		< 0.01	< 0.01		
Zinc	mg/L	0.005			0.010		0.014	0.129		

EPA Identification no.			40	41	42	43	50	51	52	53
Location			LWDMW2S	LWDMW2D	LWDMW3D	LWDMW3S	WPKMW1	WPKMW1D	WPKMW2	WPKMW4
Date Sampled			8/03/2016	9/03/2016	9/03/2016	9/03/2016	15/03/2016	15/03/2016	15/03/2016	16/03/2016
Sample obtained			No	Yes	Yes	No	Yes	Yes	Yes	Yes
Sample method			Dry Well	Grab	Grab	Dry Well	Grab	Grab	Grab	Grab
Units	LOR	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Aluminium	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.08	< 0.01	< 0.01
Ammonia	mg/L	0.01	0.01	0.03	< 0.01	0.11	0.01	0.01	0.01	0.01
Arsenic	mg/L	0.001	0.001	0.006	0.003	0.005	0.004	0.004	0.004	0.004
Barium	mg/L	0.001	0.365	0.084	0.020	0.113	0.046	0.017	0.017	0.017
Beryllium	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Bicarbonate	1		252	137	626	541	1210	867	867	867
Boron	mg/L	0.05	0.11	0.09	0.24	0.21	0.30	0.30	0.30	0.30
Bromide	mg/L	0.01	0.788	0.436	0.278	0.175	1.16	0.582	0.582	0.582
Cadmium	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Calcium	mg/L	1	15	2	3	7	4	2	2	2
Carbonate	mg/L	1	< 1	< 1	13	26	25	26	26	26
Chloride	mg/L	1	448	230	101	50	420	202	202	202
Chromium	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Cobalt	mg/L	0.001	0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Copper	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.004	< 0.001	< 0.001	< 0.001
Dissolved Oxygen	mg/L	-	2.93	0.30	1.57	0	1.01	1.54	1.54	1.54
Electrical Conductivity	µS/cm	-	1996	1016	1446	1220	3370	2151	2151	2151
Fluoride	mg/L	0.1	0.4	0.2	0.7	0.8	0.7	1.1	1.1	1.1
Iron	mg/L	0.05	< 0.05	1.92	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Lead	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Magnesium	mg/L	1	20	5	< 1	2	< 1	< 1	< 1	< 1
Manganese	mg/L	0.001	0.073	0.049	< 0.001	0.110	0.005	0.002	0.002	0.002
Mercury	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Methane	µg/L	10	< 10	< 10	< 10	37	< 10	< 10	< 10	< 10
Molybdenum	mg/L	0.001	0.002	0.001	0.001	< 0.001	0.003	0.002	0.002	0.002
Nickel	mg/L	0.001	0.002	0.013	0.006	0.001	0.004	0.003	0.003	0.003
Nitrate	mg/L	0.01	0.24	0.08	0.18	< 0.01	0.03	0.05	0.05	0.05
Nitrite	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
pH	pH Unit	-	6.72	6.55	8.10	8.31	8.04	8.24	8.24	8.24
Potassium	mg/L	1	24	10	3	3	7	5	5	5
Reactive Phosphorus	mg/L	0.01	0.13	0.16	0.45	0.12	0.61	0.66	0.66	0.66
Redox Potential	mV	-	103.9	-26.10	49.9	-66.70	59.3	16.3	16.3	16.3
Selenium	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Sodium	mg/L	1	347	203	306	254	689	529	529	529
Sodium Adsorption Ratio (Storages)	-	0.01								
Standing Water Level	mbgl	-	25.95	21.10	16.20	15.98	15.32	16.01	16.01	16.01
Strontium	mg/L	0.001	0.230	0.032	0.033	0.066	0.066	0.028	0.028	0.028
Sulfate	mg/L	1	22	9	< 1	< 1	< 1	< 1	< 1	< 1
Total Dissolved Solids	mg/L	10	1120	526	817	601	1950	1270	1270	1270
Total Organic Carbon (Storages)	mg/L	1								
Total Phosphorus (Storages)	mg/L	0.01								
Uranium	mg/L	0.001	0.001	< 0.001	< 0.001	< 0.001	0.003	0.002	0.002	0.002
Vanadium	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Zinc	mg/L	0.005	0.007	0.060	0.030	0.019	0.086	0.054	0.054	0.054

EPA Identification no.			55	56	57	58	59	60	61	62
Location			WPKMW8	WPKMW9D	WPKMW9S	WPKMW12S	WPKMW13I	WPKMW13S	WPKMW14D	WPKMW14S
Date Sampled			23/03/2016	15/03/2016	23/03/2016	16/03/2016	23/03/2016	23/03/2016	16/03/2016	16/03/2016
Sample obtained			Yes	Yes	Yes	No	Yes	Yes	Yes	No
Sample method			Grab	Grab	Grab	Dry Well	Grab	Grab	Grab	Dry Well
Units	LOR	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Aluminium	mg/L	0.01	< 0.01	0.07	< 0.01		0.01	< 0.01	0.03	
Ammonia	mg/L	0.01	< 0.01	0.07	0.03		0.09	0.01	0.08	
Arsenic	mg/L	0.001	0.003	0.005	0.003		0.005	0.004	0.002	
Barium	mg/L	0.001	0.032	0.113	0.258		0.040	0.092	0.303	
Beryllium	mg/L	0.001	< 0.001	< 0.001	< 0.001		0.002	0.001	< 0.001	
Bicarbonate	mg/L	1	930	562	1640		589	1170	566	
Boron	mg/L	0.05	0.28	0.22	0.37		0.31	0.38	0.21	
Bromide	mg/L	0.01	0.763	0.178	1.18		0.204	1.08	0.176	
Cadmium	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001		< 0.0001	< 0.0001	< 0.0001	
Calcium	mg/L	1	4	4	9		2	4	7	
Carbonate	mg/L	1	< 1	30	36		24	< 1	28	
Chloride	mg/L	1	268	50	392		60	361	50	
Chromium	mg/L	0.001	< 0.001	< 0.001	< 0.001		< 0.001	< 0.001	< 0.001	
Cobalt	mg/L	0.001	< 0.001	< 0.001	< 0.001		< 0.001	< 0.001	< 0.001	
Copper	mg/L	0.001	0.002	< 0.001	< 0.001		0.015	0.011	< 0.001	
Dissolved Oxygen	mg/L	-	2.47	2.16	1.56		0.47	2.61	1.23	
Electrical Conductivity	µS/cm	-	2388	1243	4304		1279	3068	1214	
Fluoride	mg/L	0.1	0.6	0.9	0.9		0.8	0.6	0.7	
Iron	mg/L	0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	
Lead	mg/L	0.001	< 0.001	< 0.001	< 0.001		< 0.001	< 0.001	< 0.001	
Magnesium	mg/L	1	1	< 1	3		< 1	1	1	
Manganese	mg/L	0.001	< 0.001	0.210	0.049		0.015	0.008	0.029	
Mercury	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001		< 0.0001	< 0.0001	< 0.0001	
Methane	µg/L	10	< 10	33	< 10		< 10	< 10	21	
Molybdenum	mg/L	0.001	0.002	0.001	0.003		0.004	0.004	0.003	
Nickel	mg/L	0.001	< 0.001	0.008	< 0.001		0.002	< 0.001	0.003	
Nitrate	mg/L	0.01	0.47	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01	
Nitrite	mg/L	0.01	< 0.01	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01	
pH	pH Unit	-	7.95	8.31	7.94		8.32	7.61	8.25	
Potassium	mg/L	1	8	3	11		10	14	4	
Reactive Phosphorus	mg/L	0.01	0.40	0.26	0.39		0.25	0.28	0.18	
Redox Potential	mV	-	99.8	-92.80	103.9		-23.70	48.4	-76.90	
Selenium	mg/L	0.01	< 0.01	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01	
Sodium	mg/L	1	552	245	964		272	646	269	
Sodium Adsorption Ratio (Storages)	-	0.01								
Standing Water Level	mbgl	-	16.64	15.52	15.67		16.84	16.95	21.07	
Strontium	mg/L	0.001	0.046	0.069	0.137		0.021	0.050	0.045	
Sulfate	mg/L	1	1	< 1	193		< 1	< 1	1	
Total Dissolved Solids	mg/L	10	1540	652	3030		614	1920	722	
Total Organic Carbon (Storages)	mg/L	1								
Total Phosphorus (Storages)	mg/L	0.01								
Uranium	mg/L	0.001	0.001	< 0.001	0.007		< 0.001	0.002	< 0.001	
Vanadium	mg/L	0.01	< 0.01	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01	
Zinc	mg/L	0.005	< 0.005	0.013	< 0.005		< 0.005	< 0.005	0.011	

EPA Identification no.			63	64	65	66	67	68	69	70
Location			WPKMW15D	WPKMW15S	WPKMW16D	WPKMW16S	WPKMW17D	WPKMW17S	BWDPD2	BWDPD3
Date Sampled			16/03/2016	23/03/2016	16/03/2016	16/03/2016	16/03/2016	23/03/2016	1/03/2016	1/03/2016
Sample obtained			Yes	Yes	Yes	No	Yes	Yes	No	No
Sample method			Grab	Grab	Grab	Dry Well	Grab	Grab	NOT OPERATIONAL	NOT OPERATIONAL
Units	LOR	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Aluminium	mg/L	0.01	< 0.01	0.02	< 0.01		< 0.01	< 0.01		
Ammonia	mg/L	0.01	0.12	< 0.01	0.02		0.10	< 0.01		
Arsenic	mg/L	0.001	0.003	0.008	0.002		0.002	0.003		
Barium	mg/L	0.001	0.226	2.09	0.184		0.135	0.415		
Beryllium	mg/L	0.001	< 0.001	0.001	< 0.001		< 0.001	< 0.001		
Bicarbonate	mg/L	1	624	3750	563		516	1280		
Boron	mg/L	0.05	0.19	0.57	0.07		< 0.05	0.28		
Bromide	mg/L	0.01	0.209	3.10	0.207		0.183	0.491		
Cadmium	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001		< 0.0001	< 0.0001		
Calcium	mg/L	1	8	8	7		3	8		
Carbonate	mg/L	1	6	500	< 1		< 1	< 1		
Chloride	mg/L	1	54	927	57		50	149		
Chromium	mg/L	0.001	< 0.001	0.009	< 0.001		< 0.001	< 0.001		
Cobalt	mg/L	0.001	< 0.001	< 0.001	< 0.001		< 0.001	< 0.001		
Copper	mg/L	0.001	< 0.001	0.013	< 0.001		< 0.001	< 0.001		
Dissolved Oxygen	mg/L	-	0.07	4.61	0.28		0.22	1.46		
Electrical Conductivity	µS/cm	-	1381	9146	1280		1146	2672		
Fluoride	mg/L	0.1	0.6	1.0	0.6		0.8	0.7		
Iron	mg/L	0.05	0.15	< 0.05	< 0.05		< 0.05	< 0.05		
Lead	mg/L	0.001	< 0.001	< 0.001	< 0.001		< 0.001	< 0.001		
Magnesium	mg/L	1	2	13	2		1	3		
Manganese	mg/L	0.001	0.119	< 0.001	0.026		0.051	0.007		
Mercury	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001		< 0.0001	< 0.0001		
Methane	µg/L	10	94	< 10	< 10		< 10	< 10		
Molybdenum	mg/L	0.001	0.010	0.005	0.007		0.009	0.008		
Nickel	mg/L	0.001	0.004	< 0.001	0.004		0.002	< 0.001		
Nitrate	mg/L	0.01	< 0.01	0.16	< 0.01		< 0.01	< 0.01		
Nitrite	mg/L	0.01	< 0.01	0.53	< 0.01		< 0.01	< 0.01		
pH	pH Unit	-	8.15	7.89	8.27		7.58	7.65		
Potassium	mg/L	1	7	35	10		6	15		
Reactive Phosphorus	mg/L	0.01	0.34	0.74	0.29		0.07	0.45		
Redox Potential	mV	-	-129.90	110.2	-8.80		-45.20	65.7		
Selenium	mg/L	0.01	< 0.01	< 0.01	< 0.01		< 0.01	< 0.01		
Sodium	mg/L	1	316	2490	294		257	598		
Sodium Adsorption Ratio (Storages)	-	0.01								
Standing Water Level	mbgl	-	22.22	22.53	26.57		18.04	21.23		
Strontium	mg/L	0.001	0.076	0.301	0.054		0.021	0.072		
Sulfate	mg/L	1	14	< 1	23		< 1	< 1		
Total Dissolved Solids	mg/L	10	852	6010	740		682	1840		
Total Organic Carbon (Storages)	mg/L	1								
Total Phosphorus (Storages)	mg/L	0.01								
Uranium	mg/L	0.001	< 0.001	0.002	0.005		0.001	0.006		
Vanadium	mg/L	0.01	< 0.01	0.01	< 0.01		< 0.01	< 0.01		
Zinc	mg/L	0.005	0.018	< 0.005	0.051		0.020	< 0.005		

EPA Identification no.			71	72	73	74	75	76
Location			LWDPD1CELL4	LWDPD1CELL3	LWDPD1CELL2	LWDPD1CELL1	TFDPD1	TFDPD2
Date Sampled			16/02/2016	9/03/2016	9/03/2016	9/03/2016	16/03/2016	16/03/2016
Sample obtained			Yes	Yes	Yes	Yes	Yes	No
Sample method			Grab	Grab	Grab	Grab	Grab	NOT OPERATIONAL
Units	LOR	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT	RESULT
Aluminium	mg/L	0.01	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Ammonia	mg/L	0.01	< 0.01	0.02	1.55	< 0.05	41.0	
Arsenic	mg/L	0.001	< 0.010	< 0.010	1.04	0.011	< 0.010	
Barium	mg/L	0.001	0.928	2.41	4.98	6.76	3.52	
Beryllium	mg/L	0.001	< 0.010	< 0.010	0.631	< 0.010	< 0.010	
Bicarbonate	mg/L	1	8730	7520	8970	10200	9460	
Boron	mg/L	0.05	1.14	1.00	1.07	0.71	1.19	
Bromide	mg/L	0.01	3.08	3.54	4.20	30.0	11.9	
Cadmium	mg/L	0.0001	< 0.0010	< 0.0010	0.142	< 0.0010	< 0.0010	
Calcium	mg/L	1	2	11	9	19	20	
Carbonate	mg/L	1	5340	7760	6790	27200	12100	
Chloride	mg/L	1	1350	1530	1680	5730	3590	
Chromium	mg/L	0.001	< 0.010	< 0.010	0.842	< 0.010	< 0.010	
Cobalt	mg/L	0.001	< 0.010	< 0.010	0.772	< 0.010	< 0.010	
Copper	mg/L	0.001	< 0.010	< 0.010	0.543	< 0.010	< 0.010	
Dissolved Oxygen	mg/L	-	4.58	4.01	5.60	2.77	4.34	
Electrical Conductivity	µS/cm	-	23208	25150	26374	56472	8991	
Fluoride	mg/L	0.1	7.9	7.5	7.5	24.8	10.4	
Iron	mg/L	0.05	< 0.10	0.15	< 0.10	0.39	< 0.10	
Lead	mg/L	0.001	< 0.010	< 0.010	0.483	< 0.010	< 0.010	
Magnesium	mg/L	1	9	13	12	17	9	
Manganese	mg/L	0.001	< 0.010	0.011	0.758	0.047	0.027	
Mercury	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	
Methane	µg/L	10	119	45	90	796	8980	
Molybdenum	mg/L	0.001	< 0.010	< 0.010	< 0.010	0.012	< 0.010	
Nickel	mg/L	0.001	< 0.010	< 0.010	0.785	< 0.010	< 0.010	
Nitrate	mg/L	0.01	0.14	< 0.01	< 0.05	< 0.05	< 0.1	
Nitrite	mg/L	0.01	< 0.01	0.03	< 0.05	< 0.01	< 0.01	
pH	pH Unit	-	9.73	9.73	9.74	10.06	7.88	
Potassium	mg/L	1	77	83	81	622	145	
Reactive Phosphorus	mg/L	0.01						
Redox Potential	mV	-	128.5	79.1	84.1	96.2	-26.70	
Selenium	mg/L	0.01	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Sodium	mg/L	1	8430	7630	8230	19100	12400	
Sodium Adsorption Ratio (Storages)	-	0.01	566	369	422	767	578	
Standing Water Level	mbgl	-						
Strontium	mg/L	0.001	0.664	1.06	1.21	2.02	3.53	
Sulfate	mg/L	1	25	< 10	< 10	< 10	197	
Total Dissolved Solids	mg/L	10	17200	18800	20200	51900	31700	
Total Organic Carbon (Storages)	mg/L	1	143	1640	1720	6130	576	
Total Phosphorus (Storages)	mg/L	0.01	0.04	0.05	0.11	5.57	35.4	
Uranium	mg/L	0.001	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	
Vanadium	mg/L	0.01	< 0.10	< 0.10	0.97	< 0.10	< 0.10	
Zinc	mg/L	0.005	< 0.050	< 0.050	0.429	< 0.050	< 0.050	

TABLE 4: GROUNDWATER LEVEL RESULTS FOR 4th QUARTER - FEBRUARY / APRIL 2016

EPA Identification no.	Analyte	Unit	Number of samples required	Number of samples collected	Lowest sample value	Mean of sample	Highest sample value
44	Standing Water Level	Metres	Continuous	Continuous	-35.80	-35.60	-35.30
45	Standing Water Level	Metres	Continuous	Continuous	18.10	18.60	19.00
46	Standing Water Level	Metres	Continuous	Continuous	-59.90	-59.60	-59.40
47	Standing Water Level	Metres	Continuous	Continuous	11.90	11.90	11.90
48	Standing Water Level	Metres	Continuous	Continuous	8.90	8.90	8.90
49	Standing Water Level	Metres	Continuous	Continuous	14.90	14.90	15.00