



TropWATER Analytical Services

James Cook University Townsville 4811 QLD Australia

Tel: 07 4781 4262 Fax: 07 4781 5589 Email: actfr.laboratory@jcu.edu.au

Certificate of Analysis

Client Details

Client Name: JBS Swift
Postal Address: PO Box 1160
 AITKENVALE QLD 4810
Attention: Trevor Govindsamy
Telephone: 07 4720 8029
Email: Trevor.Govindsamy@jbssa.com.au

Laboratory Contact

Michelle Tink
 (MRACI C.Chem.)
 Laboratory Manager
 Phone: 07 4781 5214
 Fax: 07 4781 5589
 Email: michelle.tink@jcu.edu.au

Analysis Results:

Analysis	Unit	TMB2 9/08/2017 J18-0251/1	TMB3 7/08/2018 J18-0251/2	TMB4 7/08/2018 J18-0251/3	TMB5 7/08/2018 J18-0251/4
Ammonia	µg N/L	50	<1	<1	<1
Nitrate	µg N/L	5	3	10	538
Nitrite	µg N/L	2	1	2	9
Total Nitrogen	µg N/L	369	211	613	936
Filterable Reactive Phosphorus	µg P/L	439	18	49	13
Total Phosphorus	µg P/L	696	82	164	116

Analysis	Unit	TMB6 7/08/2018 J18-0251/5	PMB1 7/08/2018 J18-0251/6	PMB2 7/08/2018 J18-0251/7	PMB3 7/08/2018 J18-0251/8
Ammonia	µg N/L	<1	28	2	<1
Nitrate	µg N/L	1	13	37	78
Nitrite	µg N/L	1	17	1	2
Total Nitrogen	µg N/L	393	157	104	369
Filterable Reactive Phosphorus	µg P/L	33	25	26	18
Total Phosphorus	µg P/L	202	47	27	36

Analysis	Unit	PMB4 9/08/2018 J18-0251/9	Stuart Ck 7/08/2018 J18-0251/10
Ammonia	µg N/L	3	4
Nitrate	µg N/L	422	<1
Nitrite	µg N/L	1	2
Total Nitrogen	µg N/L	528	379
Filterable Reactive Phosphorus	µg P/L	224	5
Total Phosphorus	µg P/L	249	32



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Comment:

Patrick Cunningham
Laboratory Technician
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Michelle Tink MRACI C.Chem
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Analysis Results:

Analysis	Unit	TMB2 5/09/2018 J18-0286/1	TMB3 5/09/2018 J18-0286/2	TMB4 5/09/2018 J18-0286/3	TMB5 5/09/2018 J18-0286/4
Ammonia	µg N/L	28	9	5	11
Nitrate	µg N/L	65	16	14	909
Nitrite	µg N/L	4	2	3	6
Total Nitrogen	µg N/L	775	356	430	1,383
Filterable Reactive Phosphorus	µg P/L	1,072	93	59	47
Total Phosphorus	µg P/L	1,500	254	155	125

Analysis	Unit	TMB6 5/09/2018 J18-0286/5	PMB#1 5/09/2018 J18-0286/6	PMB#2 5/09/2018 J18-0286/7	PMB#3 5/09/2018 J18-0286/8
Ammonia	µg N/L	17	26	6	6
Nitrate	µg N/L	15	36	77	138
Nitrite	µg N/L	2	2	2	2
Total Nitrogen	µg N/L	239	482	492	613
Filterable Reactive Phosphorus	µg P/L	64	31	8	24
Total Phosphorus	µg P/L	141	71	51	50

Analysis	Unit	PMB#4 5/09/2018 J18-0286/9
Ammonia	µg N/L	18
Nitrate	µg N/L	441
Nitrite	µg N/L	2
Total Nitrogen	µg N/L	812
Filterable Reactive Phosphorus	µg P/L	290
Total Phosphorus	µg P/L	304



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Analysis Results:

Analysis	Unit	TMB2 4/10/2018 J18-0320/1	TMB3 4/10/2018 J18-0320/2	TMB4 4/10/2018 J18-0320/3	TMB5 4/10/2018 J18-0320/4
Ammonia	µg N/L	37	3	2	4
Nitrate	µg N/L	43	20	27	1,029
Nitrite	µg N/L	6	5	5	20
Total Nitrogen	µg N/L	1,032	307	495	1,118
Filterable Reactive Phosphorus	µg P/L	893	37	77	62
Total Phosphorus	µg P/L	1,515	115	133	104

Analysis	Unit	TMB6 4/10/2018 J18-0320/5	PMB1 4/10/2018 J18-0320/6	PMB2 4/10/2018 J18-0320/7	PMB3 4/10/2018 J18-0320/8
Ammonia	µg N/L	7	25	2	1
Nitrate	µg N/L	34	17	41	147
Nitrite	µg N/L	5	5	5	5
Total Nitrogen	µg N/L	347	247	250	331
Filterable Reactive Phosphorus	µg P/L	72	17	16	29
Total Phosphorus	µg P/L	199	31	35	35

Analysis	Unit	PMB4 4/10/2018 J18-0320/9
Ammonia	µg N/L	3
Nitrate	µg N/L	404
Nitrite	µg N/L	5
Total Nitrogen	µg N/L	507
Filterable Reactive Phosphorus	µg P/L	273
Total Phosphorus	µg P/L	279



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Analysis Results:

Analysis	Unit	PMB 1 16/11/2018 J18-0378/1	PMB 2 16/11/2018 J18-0378/2	PMB 4 16/11/2018 J18-0378/3	TMB 2 16/11/2018 J18-0378/4
Total Nitrogen	µg N/L	376	248	308	1,821
Ammonia	µg N/L	37	34	56	142
Nitrate	µg N/L	32	13	27	71
Nitrite	µg N/L	3	2	2	5
Total Phosphorus	µg P/L	63	78	132	2,154
Filterable Reactive Phosphorus	µg P/L	43	23	43	1,517

Analysis	Unit	TMB 3 16/11/2018 J18-0378/5	TMB 4 16/11/2018 J18-0378/6	TMB 5 16/11/2018 J18-0378/7	TMB 6 16/11/2018 J18-0378/8
Total Nitrogen	µg N/L	397	561	1,275	256
Ammonia	µg N/L	17	4	11	3
Nitrate	µg N/L	6	276	653	39
Nitrite	µg N/L	2	2	5	23
Total Phosphorus	µg P/L	100	272	78	22
Filterable Reactive Phosphorus	µg P/L	20	171	9	8

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Analysis Results:

Analysis	Unit	PMB1 11/12/2018 J18-0410/1	PMB2 11/12/2018 J18-0410/2	PMB3 11/12/2018 J18-0410/3	TMB2 11/12/2018 J18-0410/4
Ammonia	µg N/L	73	6	<1	28
Filterable Reactive Phosphorus	µg P/L	37	22	22	419
Total Dissolved Nitrogen	µg N/L	~	~	~	15,490
Total Nitrogen	µg N/L	447	174	776	15,571
Total Dissolved Phosphorus	µg P/L	~	~	~	813
Total Phosphorus	µg P/L	80	24	56	900
Nitrite	µg N/L	1	<1	<1	1,016
Nitrate	µg N/L	30	51	99	14,396

Analysis	Unit	TMB3 11/12/2018 J18-0410/5	TMB5 11/12/2018 J18-0410/6	TMB6 11/12/2018 J18-0410/7
Ammonia	µg N/L	51	21	43
Filterable Reactive Phosphorus	µg P/L	18	40	33
Total Nitrogen	µg N/L	532	1,300	247
Total Phosphorus	µg P/L	81	109	123
Nitrite	µg N/L	10	7	<1
Nitrate	µg N/L	40	792	7

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Analysis Results:

Analysis	Unit	PMB1 9/01/2019 J19-0004/1	PMB2 9/01/2019 J19-0004/2	PMB3 9/01/2019 J19-0004/3	TMB2 9/01/2019 J19-0004/4
Total Nitrogen	µg N/L	566	158	364	102,981
Total Dissolved Nitrogen	µg N/L	~	~	~	96,756
Nitrite	µg N/L	1	<1	<1	404
Nitrate	µg N/L	25	51	135	59,497
Ammonia	µg N/L	49	1	6	121
Total Phosphorus	µg P/L	66	22	29	489
Total Dissolved Phosphorus	µg P/L	~	~	~	422
Filterable Reactive Phosphorus	µg P/L	34	16	24	366

Analysis	Unit	TMB3 9/01/2019 J19-0004/5	TMB4 9/01/2019 J19-0004/6	TMB5 9/01/2019 J19-0004/7	TMB6 9/01/2019 J19-0004/8
Total Nitrogen	µg N/L	417	6,675	1,101	841
Nitrite	µg N/L	9	188	12	<1
Nitrate	µg N/L	21	3,518	621	<1
Ammonia	µg N/L	5	64	<1	28
Total Phosphorus	µg P/L	108	346	98	156
Filterable Reactive Phosphorus	µg P/L	24	56	71	60

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Analysis Results:

Analysis	Unit	PMB2 4/04/2019 J19-0096/1	TMB3 4/04/2019 J19-0096/2	PMB4 4/04/2019 J19-0096/3	TMB2 4/04/2019 J19-0096/4
Ammonia	µg N/L	5	25	4	43
Filterable Reactive Phosphorus	µg P/L	20	36	306	694
Total Nitrogen	µg N/L	164	141	483	28,502
Total Phosphorus	µg P/L	28	45	315	833
Oxidized Nitrogen	µg N/L	113	41	422	28,156
Nitrite	µg N/L	<1	<1	<1	182
Nitrate	µg N/L	112	40	421	27,974

Analysis	Unit	TMB4 4/04/2019 J19-0096/5	TMB5 4/04/2019 J19-0096/6	TMB6 4/04/2019 J19-0096/7
Ammonia	µg N/L	49	24	158
Filterable Reactive Phosphorus	µg P/L	175	39	44
Total Nitrogen	µg N/L	4,709	1,279	575
Total Phosphorus	µg P/L	343	92	67
Oxidized Nitrogen	µg N/L	103	997	19
Nitrite	µg N/L	24	20	<1
Nitrate	µg N/L	79	977	19

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Analysis	Unit	PMB2 4/04/2019 J19-0096/1	TMB3 4/04/2019 J19-0096/2	PMB4 4/04/2019 J19-0096/3	TMB2 4/04/2019 J19-0096/4
Ammonia	µg N/L	5	25	4	43
Filterable Reactive Phosphorus	µg P/L	20	36	306	694
Total Nitrogen	µg N/L	164	141	483	28,502
Total Phosphorus	µg P/L	28	45	315	833
Oxidized Nitrogen	µg N/L	113	41	422	28,156
Nitrite	µg N/L	<1	<1	<1	182
Nitrate	µg N/L	112	40	421	27,974

Analysis	Unit	TMB4 4/04/2019 J19-0096/5	TMB5 4/04/2019 J19-0096/6	TMB6 4/04/2019 J19-0096/7
Ammonia	µg N/L	49	24	158
Filterable Reactive Phosphorus	µg P/L	175	39	44
Total Nitrogen	µg N/L	4,709	1,279	575
Total Phosphorus	µg P/L	343	92	67
Oxidized Nitrogen	µg N/L	103	997	19
Nitrite	µg N/L	24	20	<1
Nitrate	µg N/L	79	977	19

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Analysis Results:

Analysis	Unit	PMB#1 18/06/2019 J19-0157/1	PMB#2 18/06/2019 J19-0157/2	PMB#3 18/06/2019 J19-0157/3	PMB#4 18/06/2019 J19-0157/4
Electrical Conductivity	µS/cm	97,420	4,134	9,336	17,870
Total Nitrogen	µg N/L	441	99	347	370
Nitrite	µg N/L	<1	<1	<1	<1
Nitrate	µg N/L	32	96	157	349
Ammonia	µg N/L	23	2	1	3
Total Phosphorus	µg P/L	70	43	49	391
Filterable Reactive Phosphorus	µg P/L	49	34	48	379

Analysis	Unit	TMB2/BH2 18/06/2019 J19-0157/5	TMB3/BH3 18/06/2019 J19-0157/6	TMB4/BH4 18/06/2019 J19-0157/7	TMB5/BH5 18/06/2019 J19-0157/8
Electrical Conductivity	µS/cm	4,513	12,150	7,450	19,840
Total Nitrogen	µg N/L	7,192	113	1,452	1,228
Nitrite	µg N/L	392	4	<1	33
Nitrate	µg N/L	4,493	4	6	1,149
Ammonia	µg N/L	20	2	26	5
Total Phosphorus	µg P/L	850	89	201	115
Filterable Reactive Phosphorus	µg P/L	591	47	66	98

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Analysis	Unit	TMB6/BH6 18/06/2019 J19-0157/9
Electrical Conductivity	$\mu\text{S/cm}$	17,390
Total Nitrogen	$\mu\text{g N/L}$	182
Nitrite	$\mu\text{g N/L}$	<1
Nitrate	$\mu\text{g N/L}$	3
Ammonia	$\mu\text{g N/L}$	5
Total Phosphorus	$\mu\text{g P/L}$	128
Filterable Reactive Phosphorus	$\mu\text{g P/L}$	73

Comment:

A handwritten signature in black ink, appearing to read "Patrick Cunningham".

Patrick Cunningham
Laboratory Technician
TropWATER

A handwritten signature in black ink, appearing to read "Michelle Tink".

Michelle Tink MRACI C.Chem
Laboratory Manager
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Analysis Results:

Analysis	Unit	PMB#1 27/05/2019 J19-0136/1	PMB#2 27/05/2019 J19-0136/2	PMB#3 27/05/2019 J19-0136/3	TMB1/BH4 27/05/2019 J19-0136/4
Total Nitrogen	µg N/L	235	120	269	2,581
Nitrite	µg N/L	<1	<1	<1	<1
Nitrate	µg N/L	52	85	131	19
Ammonia	µg N/L	38	2	5	148
Total Phosphorus	µg P/L	28	23	32	265
Filterable Reactive Phosphorus	µg P/L	19	18	23	141

Analysis	Unit	TMB2/BH2 27/05/2019 J19-0136/5	TMB3/BH3 27/05/2019 J19-0136/6	TMB4/BH4 27/05/2019 J19-0136/7	TMB5/BH5 27/05/2019 J19-0136/8
Total Nitrogen	µg N/L	20,379	154	570	1,113
Nitrite	µg N/L	859	5	<1	33
Nitrate	µg N/L	19,398	15	365	795
Ammonia	µg N/L	150	10	4	22
Total Phosphorus	µg P/L	887	49	341	122
Filterable Reactive Phosphorus	µg P/L	649	25	246	74

Analysis	Unit	TMB6/BH6 27/05/2019 J19-0136/9
Total Nitrogen	µg N/L	461
Nitrite	µg N/L	<1
Nitrate	µg N/L	25
Ammonia	µg N/L	82
Total Phosphorus	µg P/L	121
Filterable Reactive Phosphorus	µg P/L	26

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Electrical Conductivity	µS/cm	97,420	4,134	9,336	17,870
Total Nitrogen	µg N/L	441	99	347	370
Nitrite	µg N/L	<1	<1	<1	<1
Nitrate	µg N/L	32	96	157	349
Ammonia	µg N/L	23	2	1	3
Total Phosphorus	µg P/L	70	43	49	391
Filterable Reactive Phosphorus	µg P/L	49	34	48	379

Analysis	Unit	TMB2/BH2 18/06/2019 J19-0157/5	TMB3/BH3 18/06/2019 J19-0157/6	TMB4/BH4 18/06/2019 J19-0157/7	TMB5/BH5 18/06/2019 J19-0157/8
Electrical Conductivity	µS/cm	4,513	12,150	7,450	19,840
Total Nitrogen	µg N/L	7,192	113	1,452	1,228
Nitrite	µg N/L	392	4	<1	33
Nitrate	µg N/L	4,493	4	6	1,149
Ammonia	µg N/L	20	2	26	5
Total Phosphorus	µg P/L	850	89	201	115
Filterable Reactive Phosphorus	µg P/L	591	47	66	98

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Electrical Conductivity	$\mu\text{S/cm}$	17,390
Total Nitrogen	$\mu\text{g N/L}$	182
Nitrite	$\mu\text{g N/L}$	<1
Nitrate	$\mu\text{g N/L}$	3
Ammonia	$\mu\text{g N/L}$	5
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Analysis Results:

Analysis	Unit	PMB#3 28/06/2019 J19-0176/1	PMB1/BH4 28/06/2019 J19-0176/2	TMB2/BH2 28/06/2019 J19-0176/3	TMB3/BH3 28/06/2019 J19-0176/4
Electrical Conductivity	µS/cm	9,273	48,450	5,057	11,440
Total Nitrogen	µg N/L	563	366	7,037	172
Nitrite	µg N/L	2	2	147	2
Nitrate	µg N/L	44	161	3,799	4
Ammonia	µg N/L	16	2	74	8
Total Phosphorus	µg P/L	68	61	484	58
Filterable Reactive Phosphorus	µg P/L	16	55	404	28

Analysis	Unit	TMB4/BH4 28/06/2019 J19-0176/5	TMB5/BH5 28/06/2019 J19-0176/6	TMB6/BH6 28/06/2019 J19-0176/7	PMB#1 28/06/2019 J19-0176/8
Electrical Conductivity	µS/cm	8,335	18,980	17,660	96,080
Total Nitrogen	µg N/L	1,185	1,624	187	205
Nitrite	µg N/L	2	4	2	3
Nitrate	µg N/L	2	908	15	16
Ammonia	µg N/L	110	4	27	25
Total Phosphorus	µg P/L	148	63	99	38
Filterable Reactive Phosphorus	µg P/L	26	18	39	35

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Client Details

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Laboratory Contact

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 Laboratory Manager
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Analysis Results:

Analysis	Unit	PMB#1 24/07/2019 J19-0206/1	PMB#2 24/07/2019 J19-0206/2	PMB#3 24/07/2019 J19-0206/3	TMB2/BH2 24/07/2019 J19-0206/4
Electrical Conductivity	µS/cm	95,690	4,184	9,172	5,034
Total Nitrogen	µg N/L	176	122	293	2,391
Nitrite	µg N/L	3	2	2	70
Nitrate	µg N/L	25	37	57	917
Ammonia	µg N/L	29	14	3	49
Total Phosphorus	µg P/L	67	21	26	465
Filterable Reactive Phosphorus	µg P/L	36	10	11	301

Analysis	Unit	TMB3/BH3 24/07/2019 J19-0206/5	TMB4/BH4 24/07/2019 J19-0206/6	TMB5/BH5 24/07/2019 J19-0206/7	TMB6/BH6 24/07/2019 J19-0206/8
Electrical Conductivity	µS/cm	11,300	9,118	19,520	16,850
Total Nitrogen	µg N/L	210	920	1,546	199
Nitrite	µg N/L	3	6	18	2
Nitrate	µg N/L	3	7	859	3
Ammonia	µg N/L	5	77	7	17
Total Phosphorus	µg P/L	47	112	64	94
Filterable Reactive Phosphorus	µg P/L	21	19	43	36

Certificate of Analysis

Analysis	Unit	PMB1/BH4 24/07/2019 J19-0206/9
Electrical Conductivity	$\mu\text{S/cm}$	49,780
Total Nitrogen	$\mu\text{g N/L}$	337
Nitrite	$\mu\text{g N/L}$	<1
Nitrate	$\mu\text{g N/L}$	215
Ammonia	$\mu\text{g N/L}$	3
Total Phosphorus	$\mu\text{g P/L}$	73
Filterable Reactive Phosphorus	$\mu\text{g P/L}$	68

Comment:

A handwritten signature in black ink, appearing to read "Patrick Cunningham".

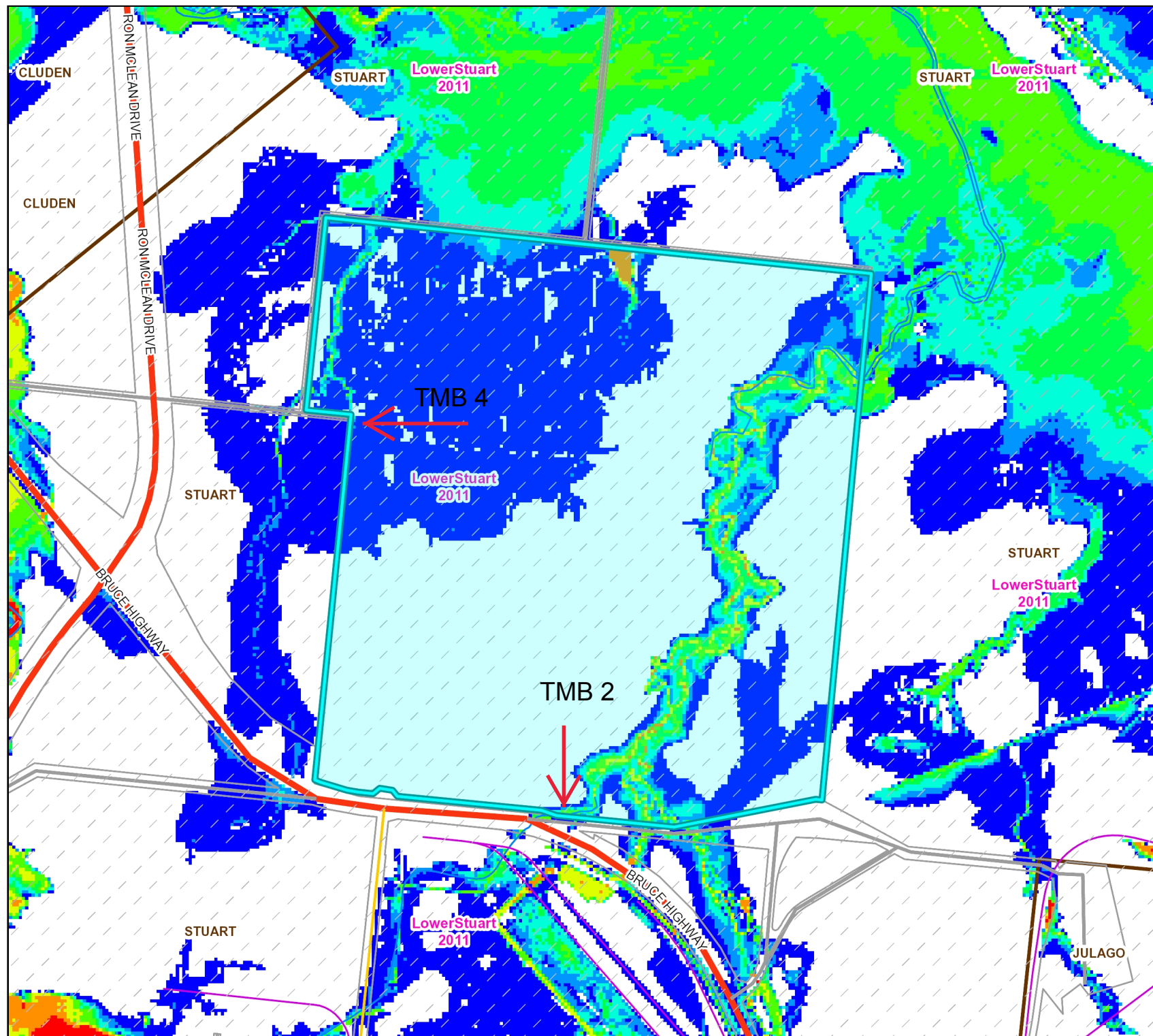
Patrick Cunningham
Laboratory Technician
TropWATER

A handwritten signature in black ink, appearing to read "Michelle Tink".

Michelle Tink MRACI C.Chem
Laboratory Manager
TropWATER

Reference	Sample	Sample	Bottle ID for Sample	pH
	No.	Date	Bottle	
Units				
J19-0176	1	28/06/2019	PMB#3	7.12
J19-0176	2	28/06/2019	PMB1/BH4	7.33
J19-0176	3	28/06/2019	TMB2/BH2	7.93
J19-0176	4	28/06/2019	TMB3/BH3	7.31
J19-0176	5	28/06/2019	TMB4/BH4	7.44
J19-0176	6	28/06/2019	TMB5/BH5	7.25
J19-0176	7	28/06/2019	TMB6/BH6	7.49
J19-0176	8	28/06/2019	PMB#1	6.88
J19-0206	1	24/07/2019	PMB#1	6.96
J19-0206	2	24/07/2019	PMB#2	7.65
J19-0206	3	24/07/2019	PMB#3	6.98
J19-0206	4	24/07/2019	TMB2/BH2	7.55
J19-0206	5	24/07/2019	TMB3/BH3	7.09
J19-0206	6	24/07/2019	TMB4/BH4	7.24
J19-0206	7	24/07/2019	TMB5/BH5	7.1
J19-0206	8	24/07/2019	TMB6/BH6	7.37
J19-0206	9	24/07/2019	PMB1/BH4	7.16
Analysis by Tropwater				

TCC Flood Mapping



Legend

	Flood Study Areas		1% AEP & 2% AEP Depth (1:250-1:5000)
	Properties		Water Depth - 0.01 - 0.3m
	Land Parcels		Water Depth - 0.3 - 0.5m
	Suburbs		Water Depth - 0.5 - 0.75m
	Flood Contours (1:250-1:5000)		Water Depth - 0.75 - 1.0m
	1% AEP Flood Height Contours		Water Depth - 1.0 - 1.5m
	2% AEP Flood Height Contours		Water Depth - 1.5 - 2.0m
	Water Height (1:250-1:5000)		Water Depth - 2.0 - 3.0m
	2% AEP Height		Water Depth - 3.0 - 25.0m
	1% AEP Height		



0 203.2 406.40

Meters

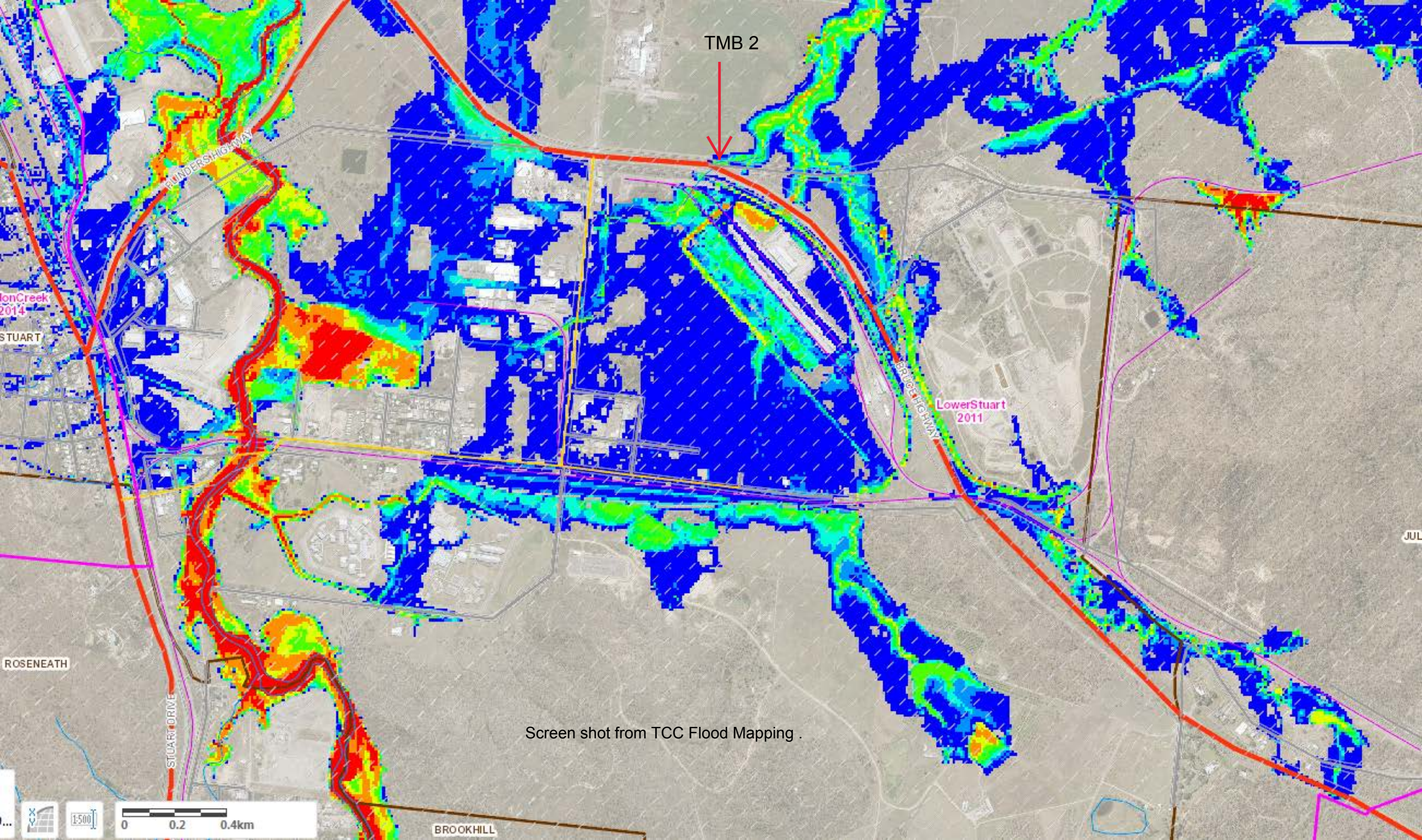
Date: 29/7/2019 10:56 AM

Scale 1: 16,000.00

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DISCLAIMER: Visible Scale - 1: 250 - 1: 5,000. The flooding contained in this map does not in itself indicate whether any particular property has or has not been affected by floods. The flooding information depicted shows inundation resulting from rainfall of river flows resulting from rainfall and does not include inundation due to Storm Tide. The council considers that the information presented in the map is the best available at the time of preparation. However the modelling results contained in this map are based upon projections, assumptions and analysis is about circumstances that may not eventuate, or may eventuate in different combinations and with different outcomes. Because of that, the information in the map is not provided with the intention that persons will rely upon its accuracy or completeness for the purpose of making decisions with financial or legal implications. Neither the council nor its officers will be liable in contract, negligence or otherwise for the consequences of any deficiency, inaccuracy or error in the map or for the consequences of any person relying upon the map. The Flood Study Areas layer indicates the date of the flood study that has generated the flood map data. Infrastructure constructed since the completion of a flood study has the potential to alter flood levels and extents to those shown.





TMB 2

Lower Stuart
2011

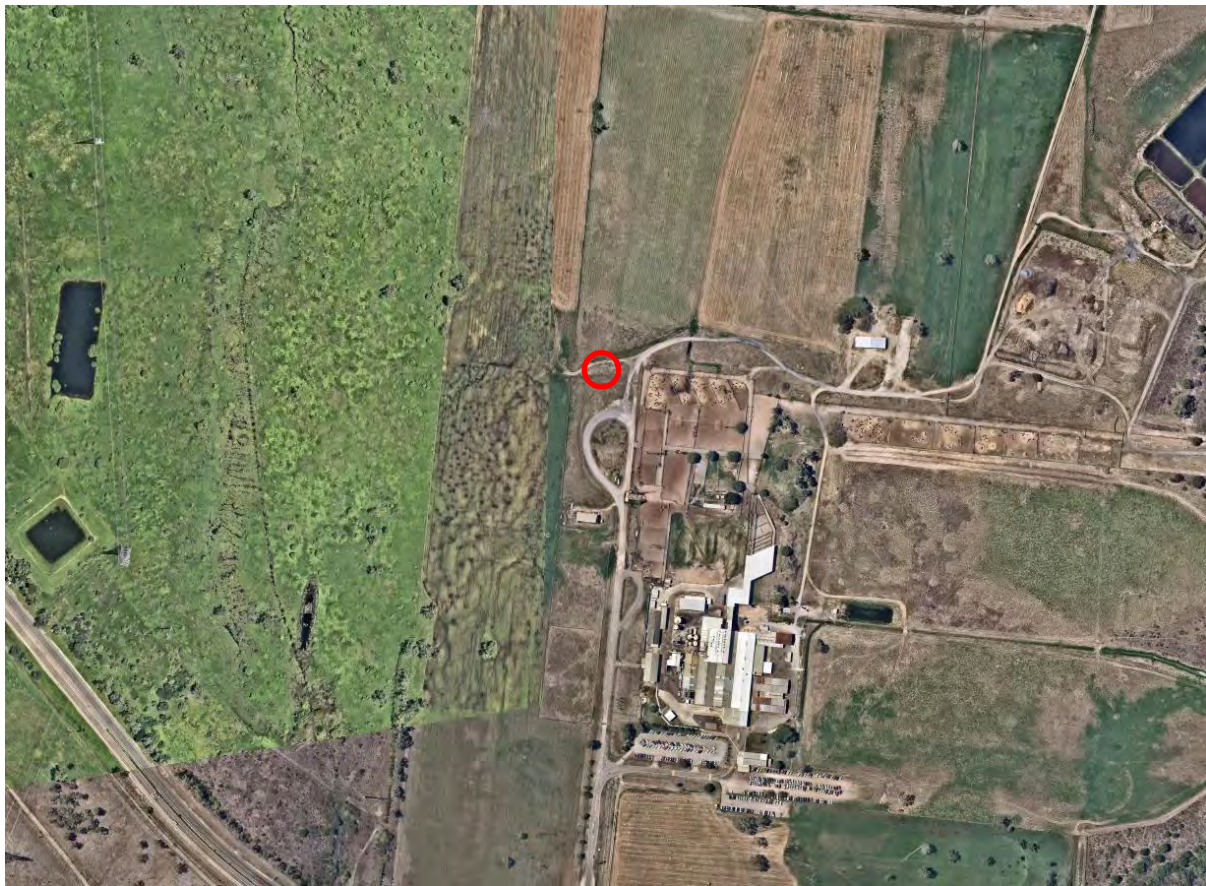
Screen shot from TCC Flood Mapping .

0 0.2 0.4km

BROOKHILL





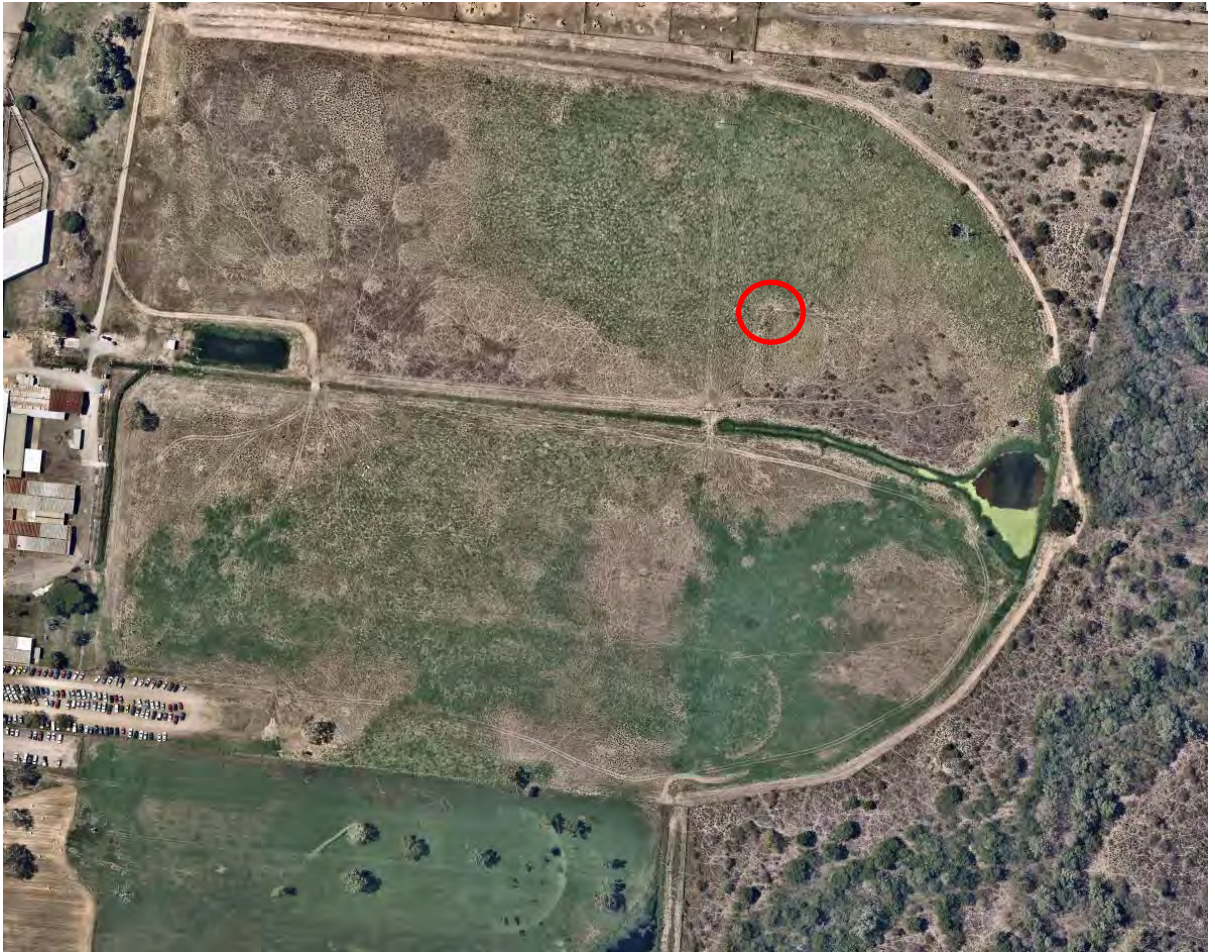


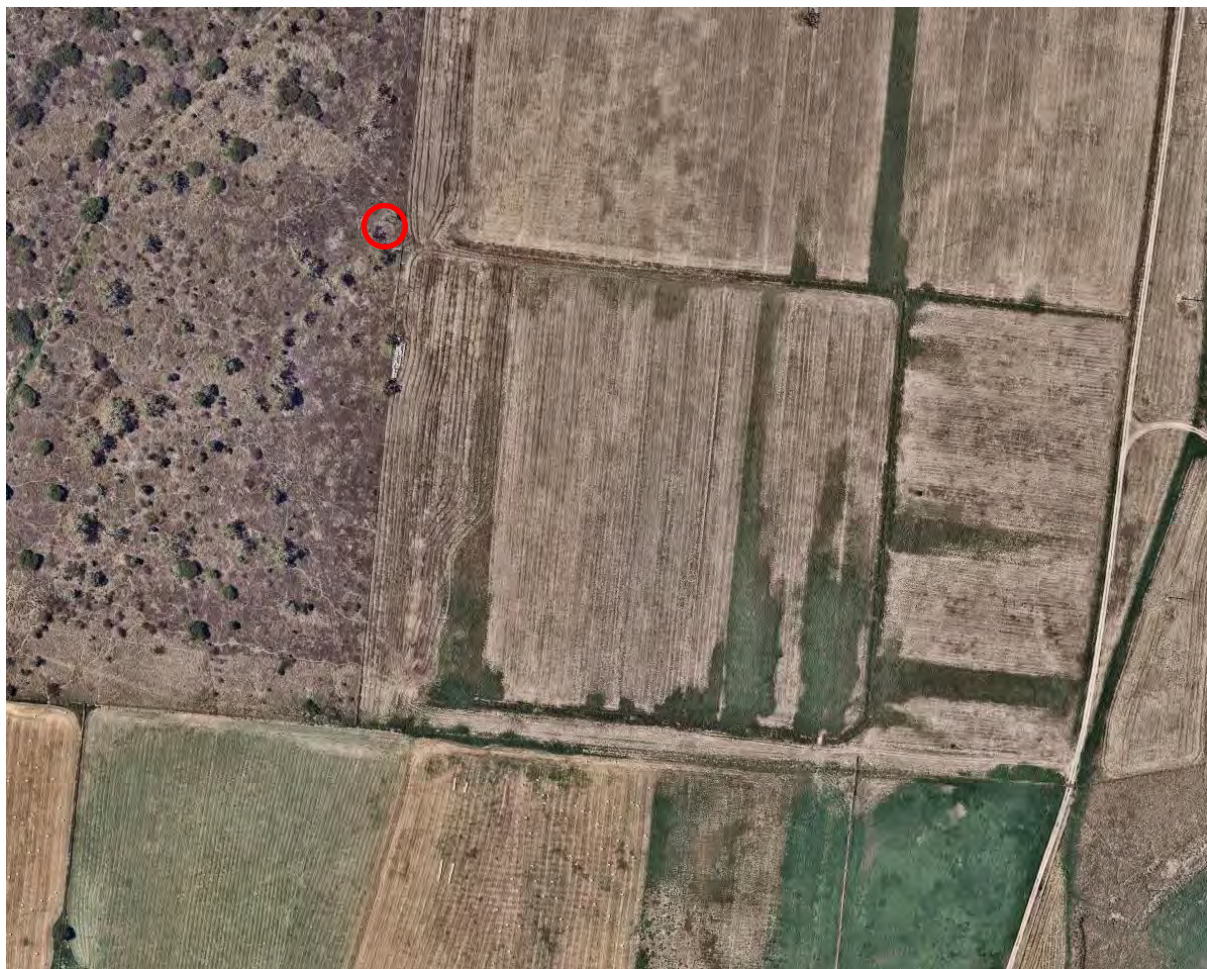
Images supplied by JBS



Images supplied by JBS



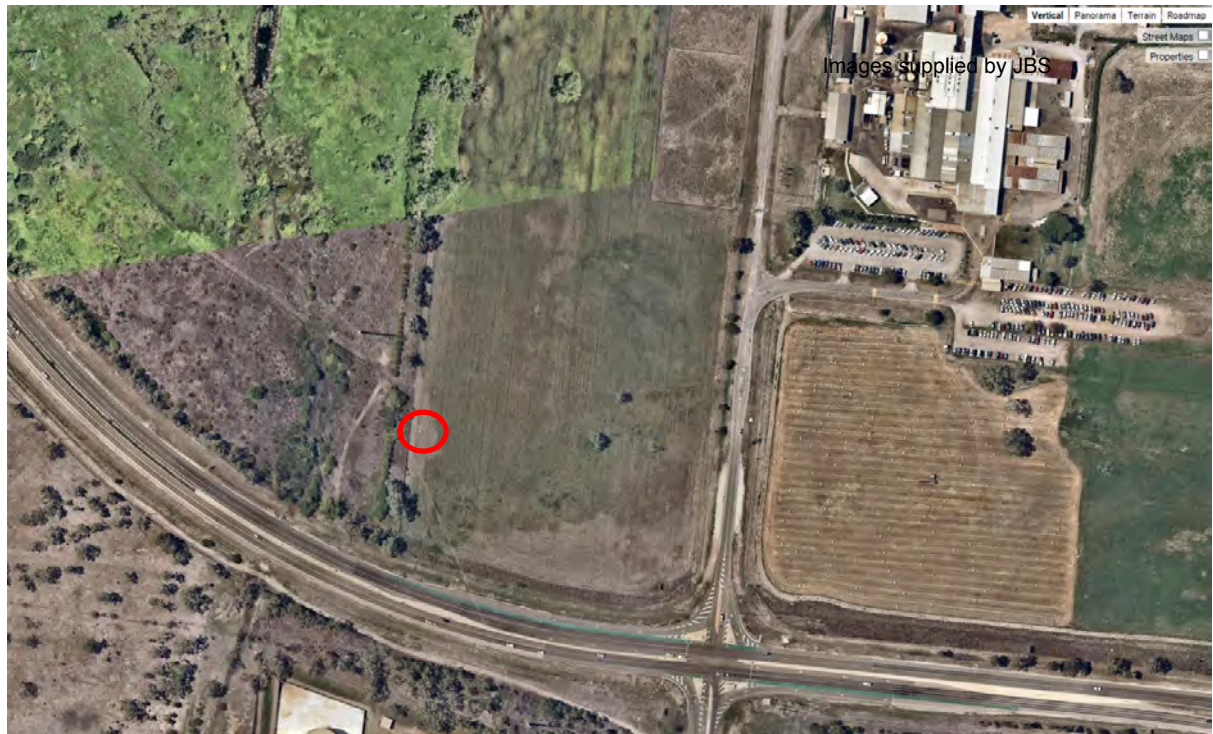




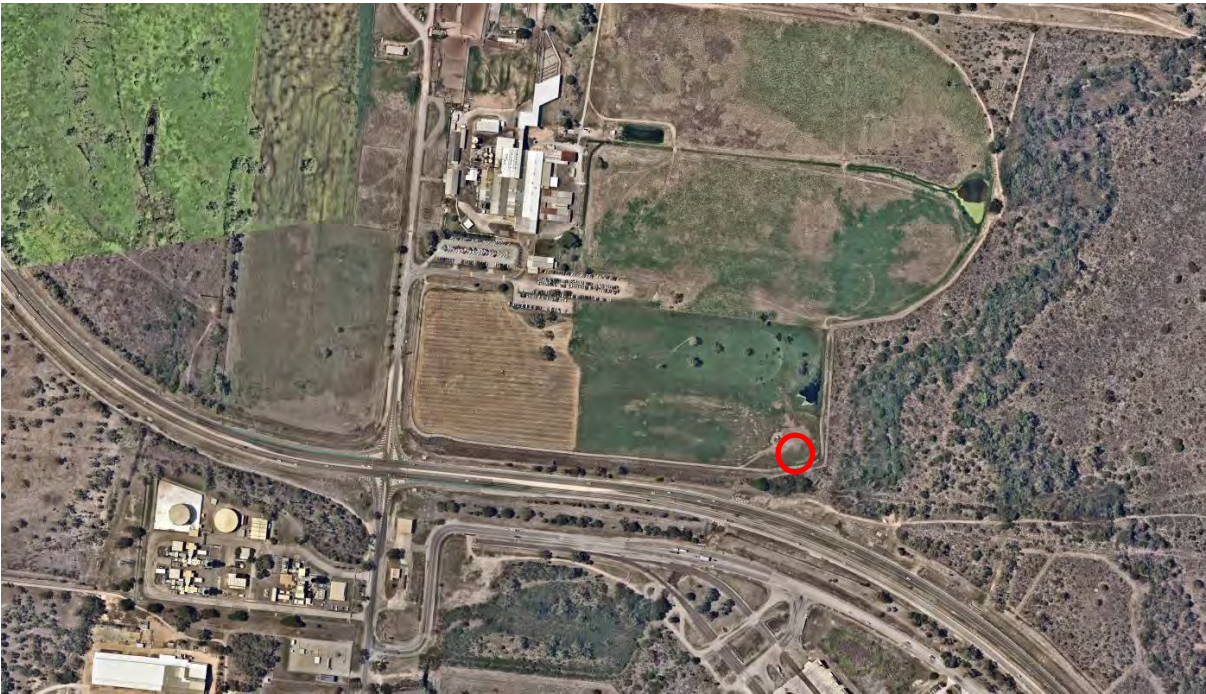
Images supplied by JBS







Images supplied by JBS

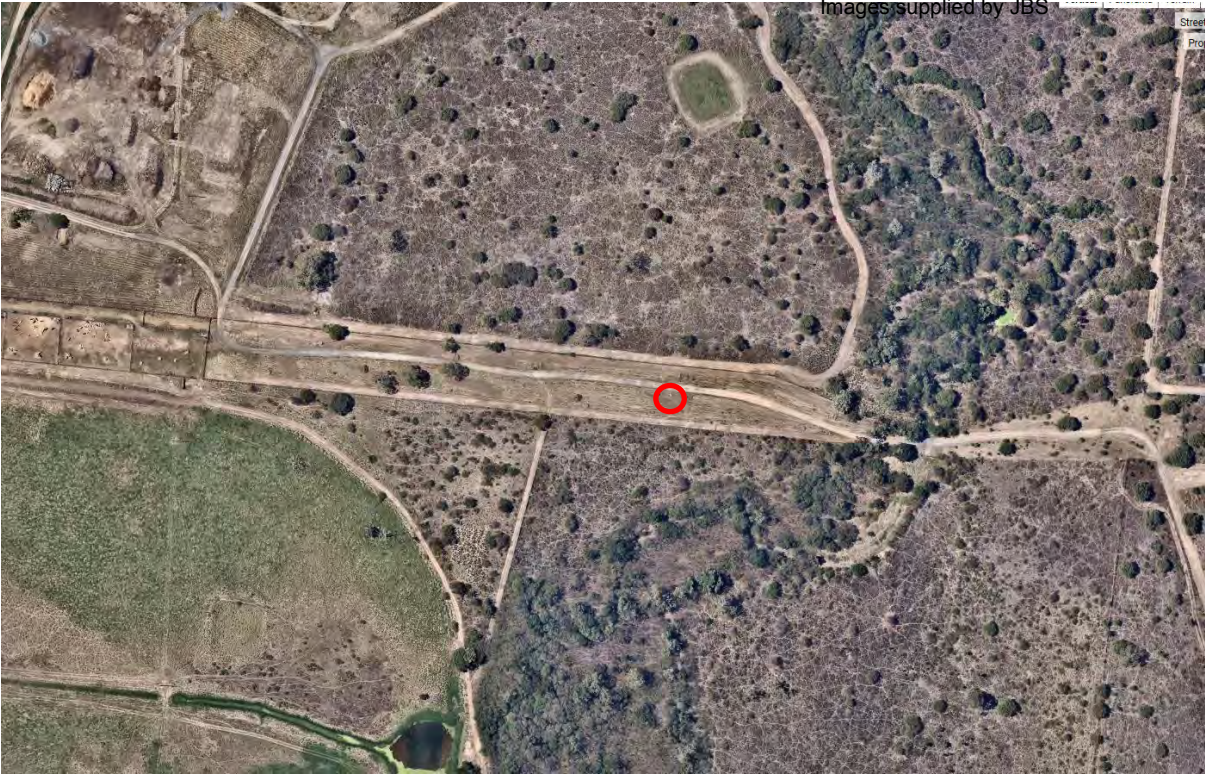


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